

Contents

Figure Table	2
Execution Summary	4
Introduction.....	4
Data Source Description	5
E-Commerce dataset explanation Table	5
Related Business Questions	6
Report Objectives	6
Key Findings	7
Revenue and Order Time Outcomes Findings	7
Revenue and Customer Location Outcomes Findings	10
Revenue and Product Outcomes Findings	12
Revenue and Customer Info Outcomes Findings	14
Popular Product Outcomes Findings	17
Key Influencer & Decomposition Tree Outcomes Findings	19
Power BI Question-Answer	21
Conclusions.....	21
Recommendations	21
References.....	22
Appendix	22
Importing Data-Sheet in power bi desktop	22
Load the data sheet in power-bi.....	22
Data Cleansing & Transformation Steps in Datasheet	24
Removing Null Columns from Data Sheet	25
Removing Null values in Column	27
Changing Data Types of Columns	27
Adding an Index Column	29
Extracting Column.....	30
Conditional Column.....	32
Bi Data Modeling	33
Fact and Dimension in Datasheet	33
Difference between Fact and Dimension Table.....	34

List of fact and dimension table	34
Making of fact and dimension table	34
List of Fact and Dimensions Tables	39
Data models and relationships	40
Star Schema [1:1 relationship]	40
Manage Relationship	41
Data Visualization	45
DAX Command.....	45
Adding Canvas Background.....	46
Insert label cards.....	47
Buttons and bookmarks.....	49
Page navigation	50

Figure Table

Figure-1. Revenue and Order Time Dashboard	8
Figure-2. Chart- Order Month wise Revenue Amount	8
Figure-3. Chart- Year wise Sale Amount	9
Figure-4. Chart- Quantities Sold and Order by Year	9
Figure-5. Chart- Quantities Sold and Order by Month	10
Figure-6. Revenue and Customer Location Dashboard	10
Figure-7. Chart- Country wise Revenue Amount	11
Figure-8. Chart- Continent Wise Sale Amount.....	11
Figure-9. Chart- Quantities Sold and Order by Customer Country	12
Figure-10. Revenue and Product Dashboard	13
Figure-11. Chart- Product Category wise Revenue Amount.....	13
Figure-12. Chart- Product Category wise Order and Sold Quantities	13
Figure-13. Chart- Order and Sold Quantities by Product.....	14
Figure-14. Chart- Product wise Revenue Summary	14
Figure-15. Revenue and Customer Info Dashboard	15
Figure-16. Chart- Customer Gender wise Revenue.....	15
Figure-17. Chart- Day Duration wise Order and Sold Quantities	16
Figure-18. Chart- Order and Sold Quantities by Gender	16
Figure-19. Chart- E-mail Domain wise Sale Summary	17
Figure-20. Popular Product Outcomes Findings Dashboard.....	17
Figure-21. Chart- Popular Product Outcomes Findings	18
Figure-22. Chart- Continent wise popular Product	18
Figure-23. Chart- Gender wise popular Product	19
Figure-24. Chart- Year wise popular Product.....	19

Figure-25. Key Influencer & Decomposition Tree Dashboard	20
Figure-26. Key Influencer & Decomposition Tree Dashboard	20
Figure-27. Power BI Question-Answer Dashboard.....	21
Figure-28: Data Importing Option	23
Figure-29: View of the Data Sheet	23
Figure-30: Data View In power BI.....	24
Figure-31: Data Transformation Option	24
Figure-32. View of Data Transformation	25
Figure-33. Null Columns in Dataset.....	26
Figure-34: Removing Null Columns	27
Figure-35: Data Type of 'product price'	28
Figure-36: Changed Data Type of 'product price'	28
Figure-37: Data Type of 'order day'	29
Figure-38: Changed Data Type of 'order day'	29
Figure-39: Add column: Index Column Option	30
Figure-40: Index Column Added.....	30
Figure-41. Extracting Column option.....	31
Figure-42. Extracting Column: range selection	31
Figure-43. Extracted Column	31
Figure-44. Extracting Column: name change	32
Figure-45. Conditional column option.....	32
Figure-47. Fact and dimension table	34
Figure-48: Dimension Dim_Cust_Info Table	35
Figure-49: Dimension Dim_Prod_Info	36
Figure-50: Dimension Dim_Location	36
Figure-51: Dimension Dim_Date_Time	37
Figure-52: Fact_Amount Table	38
Figure-53: Saving of Dimension and Fact Table	38
Figure-54: Applied step of data transformation	39
Figure-55: Loading of Dimension and Fact Table	39
Figure-56: List of fact and dimensions.....	40
Figure-57: Manage Relationship Option.....	41
Figure-58: Manage Relationship pop up	41
Figure-59: Create Relationship b/w Fact_Amount & Dim_Cust_Info	42
Figure-60: Create Relationship b/w Fact_Amounts & Dim_Prod_Info	42
Figure-61: Create Relationship b/w Fact_Amounts & Dim_Date_Time.....	43
Figure-62: Create Relationship b/w Fact_Amount & Dim_Location	43
Figure-63: View of Relationship	44
Figure-64: View of Relationship b/w Fact and Dimension Table	44
Figure-65: View of Canvas Background	46
Figure-67: Format & Icon of Card.....	47
Figure-68: View of Label-Card 1	48
Figure-69: View of Label-Card 2	48
Figure-70: View of buttons	49
Figure-73. View of Bookmarks and selection.....	50

Execution Summary

This project report on **E-Commerce** datasets offers a thorough examination of metrics pertaining to customers and products, illuminating important facets of the company.

Customer Id, Customer Name, Customer Email, Customer Gender, Customer Ip, Product Name, Product Price, Cost Of Good, Product Category, Customer Country, Customer Continent, Order Time, Order Day, Order Month, Quantity Sold, discount Per Quantity, sale Price, and Order Year are just a few of the important details included in the dataset.

Examining purchasing behavior, regional dispersion, and demographics, the analysis dives into customer-centric information. It investigates patterns in the **gender, IP address, and country of origin of customers**, providing insightful data for focused marketing campaigns. The metrics pertaining to the product aid in providing a comprehensive picture of the sales environment. **Product Name, Product Price, Cost Of Good, Product Category, and Quantity Sold** are all included in this. The study looks into cost-effectiveness, product appeal, and pricing tactics in several areas.

Seasonality and peak buying times are determined by analyzing order-related data, including **Order Time, Order Day, Order Month, and Order Year. Quantity Sold** gives information about changes in product demand, and **sale Price** and **discount Per Quantity** show how promotions affect sales.

The main motive behind the study of this dataset is to provide practical insights for improving pricing strategies, inventory management, and marketing campaigns by combining these disparate statistics. It is an invaluable tool for those involved in e-commerce who want to boost overall performance, expand their product offers, and better understand consumer behavior.

Introduction

This project report explores important consumer and product indicators through a thorough examination of an **E-Commerce dataset**. The dataset provides a multifaceted view of the e-commerce landscape by encompassing a variety of dimensions, such as **Customer Id, Customer Name, Customer Email, Customer Gender, Customer Ip, Product Name, Product Price, Cost Of Good, Product Category, Customer Country, Customer Continent, Order Time, Order Day, Order Month, Quantity Sold, discount Per Quantity, sale Price, and Order Year**. The project's main target is to gain important insights into customer behavior and sales trends through a thorough examination of an e-commerce dataset. The dataset offers a wealth of information for comprehending the

dynamics of e-commerce transactions, including data on orders, items, and customers. For e-commerce companies, this project offers insightful information that can help with marketing plans, strategic decision-making, and product optimization to increase revenue and improve consumer pleasure. We have to evaluate the effectiveness of discounts on sales and explore temporal trends in sales, identifying peak seasons or low-demand periods. Investigate the geographical distribution of customers and its impact on sales.

Basically in this report we have to analyse an E-Commerce dataset and manage the complexities of order-related patterns, product dynamics, and customer behaviour. It is an essential tool for everyone involved in e-commerce who wants to improve the way they run their business, increase the range of products they sell, and remain aware of how their clientele's needs are changing all the time.

Data Source Description

This dataset of E-Commerce includes all of the pertinent information needed for analysis and insights. Customer Id, Customer Name, Customer Email, Customer Gender, and Customer Ip are among the data in the dataset. Product Name, Product Price, Cost Of Good, and Product Category are among the product-related details it includes. Customer Country and Customer Continent address geographic characteristics. Temporal analysis is made easier by time-related data, such as Order Time, Order Day, Order Month, and Order Year. Furthermore, the dataset offers quantitative indicators such as Quantity Sold, discount Per Quantity, and sale Price, which provide an extensive assessment of e-commerce patterns and consumer conduct. The data sheet has around 15300 rows and 18 columns.

E-Commerce dataset explanation Table

ID	COLUMN NAME	DESCRIPTION	DATA TYPE
1	Customer Id	Shows the unique id of customer	INT
2	Customer Name	Name of customer	VAR/CHAR
3	Customer Email	Mail id of customer	VAR/CHAR
4	Customer Gender	Gender of customer	VAR/CHAR
5	Customer Ip	Ip of customer	VAR/CHAR
6	Product Name	Name of product	VAR/CHAR
7	Product Price	Price of product	DECIMAL
8	Cost Of Good	Cost of good	DECIMAL

9	Product Category	Category of product	VAR/CHAR
10	Customer Country	Country of customer origin	VAR/CHAR
11	Customer Continent	Continent of customer	VAR/CHAR
12	Order Time	Time of order	DATE/TIME
13	Order Day	Day of order	VAR/CHAR
14	Order Month	Month of order	VAR/CHAR
15	Quantity Sold	Total quantity sold out	DECIMAL
16	Discount Per Quantity	Total discount per quantity	INT
17	Sale Price	Sales price of product	INT
18	Order Year	Year of order	VAR/CHAR

Related Business Questions

Some business questions that come to mind while studying the report are as follows:

- In which month is the maximum revenue generated?
- In which year the number of sales amounts was recorded the highest?
- Which country generates the highest number of revenues?
- Which category of products got the most profit from selling?
- What was the total revenue generated by female customers?
- In which time the highest number of orders were placed?
- Which domain generated the most revenue and how much was it?
- Which was the most popular product in the African continent?
- Which country's customers placed the least number of orders?

Report Objectives

The main objectives behind this project report on E-Commerce dataset are as follows:

- **Analyze the Effect of Sales Discounts** - Examine the connection between discount Per Quantity and sale Price to learn how various discount policies impact the total amount sold as well as the quantity sold. Determine the best discount percentages to offer in order to increase sales while maintaining a reasonable profit margin.

- **Examine Time-Based Sales Trends** - Look at **Order Day, Order Month, and Order Year** to see how sales have changed over time. Determine when demand is at its highest or lowest, which will help the e-commerce company plan its marketing efforts and efficiently manage its inventory.
- **Examine Customer Geographic Distribution and How It Affects Sales** - To comprehend how clients are distributed worldwide, examine **Customer Country and Customer Continent**. Analyze how geography affects sales so that the online retailer may adjust its product offerings and marketing tactics to suit local tastes.
- **Recognize the behavior of customers** - Examine Customer Gender to find any trends in product preferences or buying patterns that are exclusive to a certain gender. Analyze Customer Ip to learn about the locations and any geographical preferences of your customers.
- **Enhance Your Product Selection and Price Points** - Examine Product Category to learn about the relative popularity of various product categories. Assess the correlation among Product Price, Cost Of Good, and sale Price in order to maximize profit margins and optimize pricing strategies.

Key Findings

This section will examine the work done on Power Bi and the dataset visualizations in order to, solve the business problems and provide relevant results and recommendations.

Revenue and Order Time Outcomes Findings

Below dashboard of power bi shows the summarize information about E-Coocommerce such as - sales, total profit, quantities sold and number of total orders. According to this the total sale price is around 39.83M , total net profit is 17.78M, Total quantities sold is 83880 and total number of orders is approx. 15300.

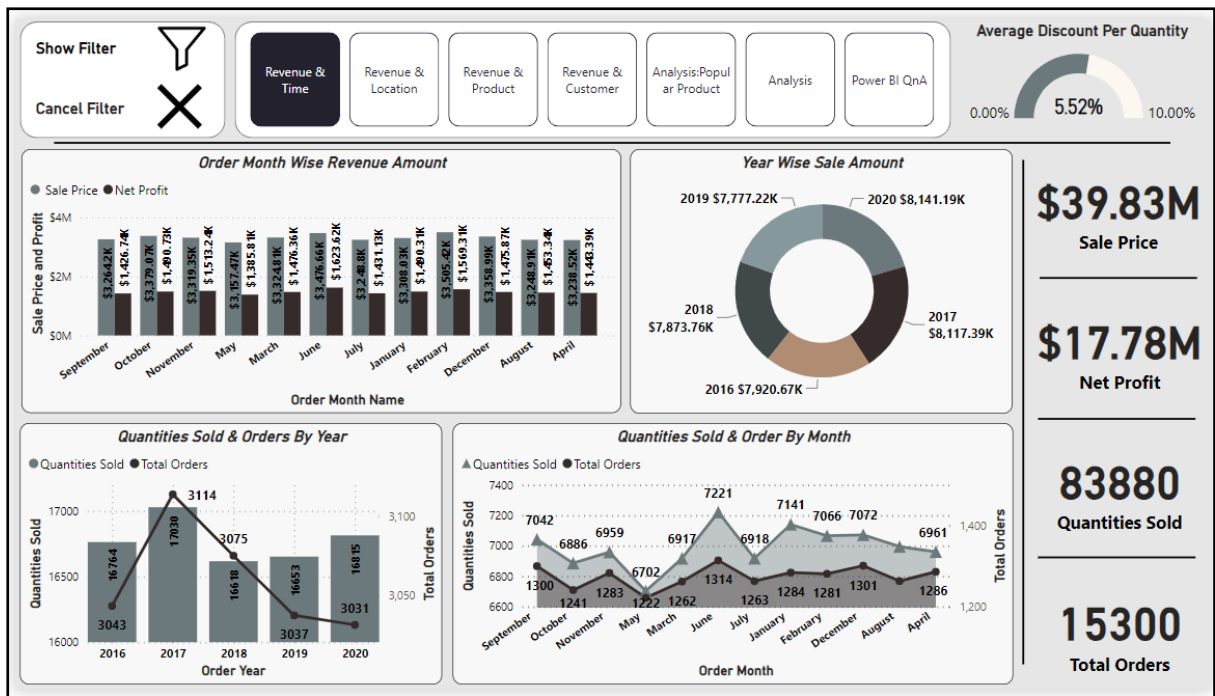


Figure-1. Revenue and Order Time Dashboard

Order Month wise Revenue Amount:

Below graph shows the total revenue generated in particular month. According to this representation in the month of February the sale price is higher than that of other months and the total net profit is higher in the month of June

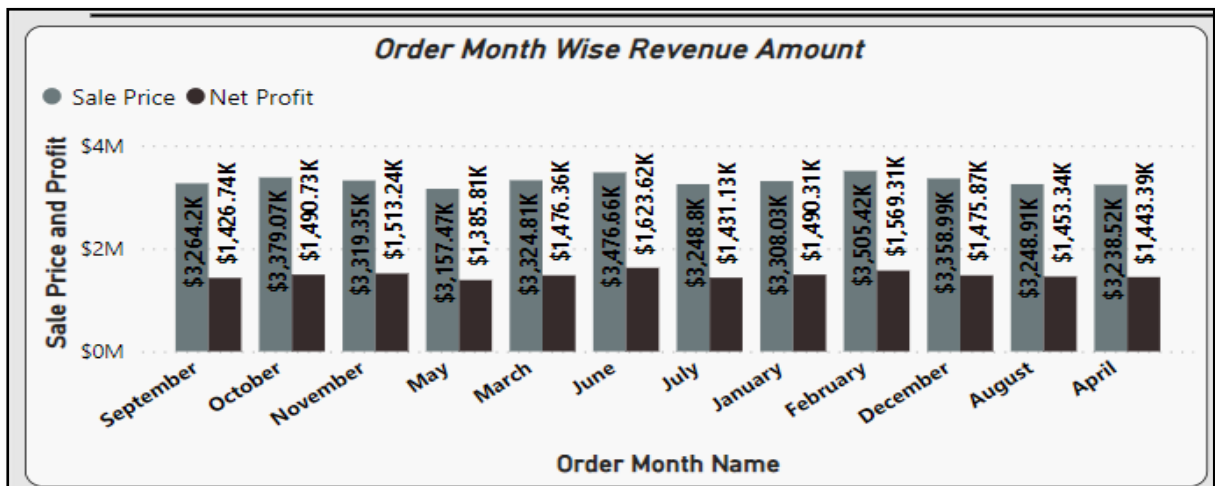


Figure-2. Chart- Order Month wise Revenue Amount

Year wise Sale Amount:

This donut chart shows the sales amount in particular year. As per the chart in the year 2020 the sale price is highest than that of other year -

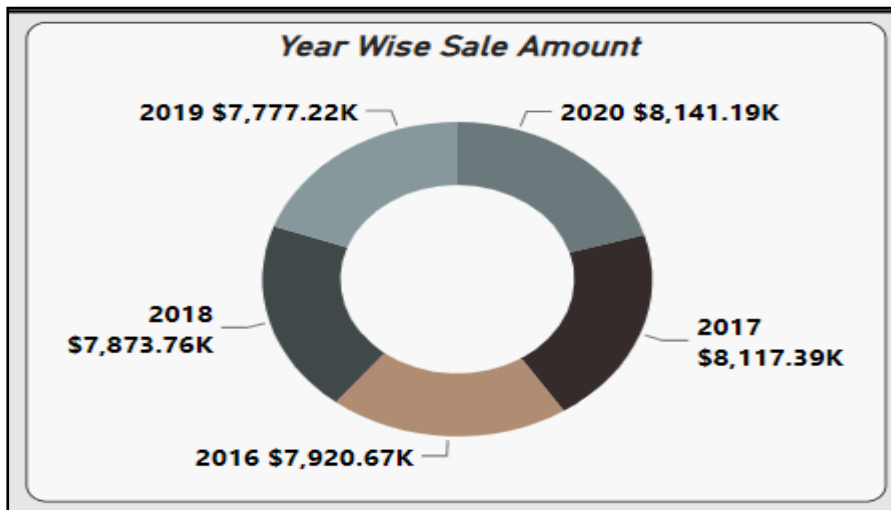


Figure-3. Chart- Year wise Sale Amount

Quantities Sold and Order by Year:

Below representation shows the total quantities sold in particular year. In the year 2017 the total number of product sold is highest as compared to other years

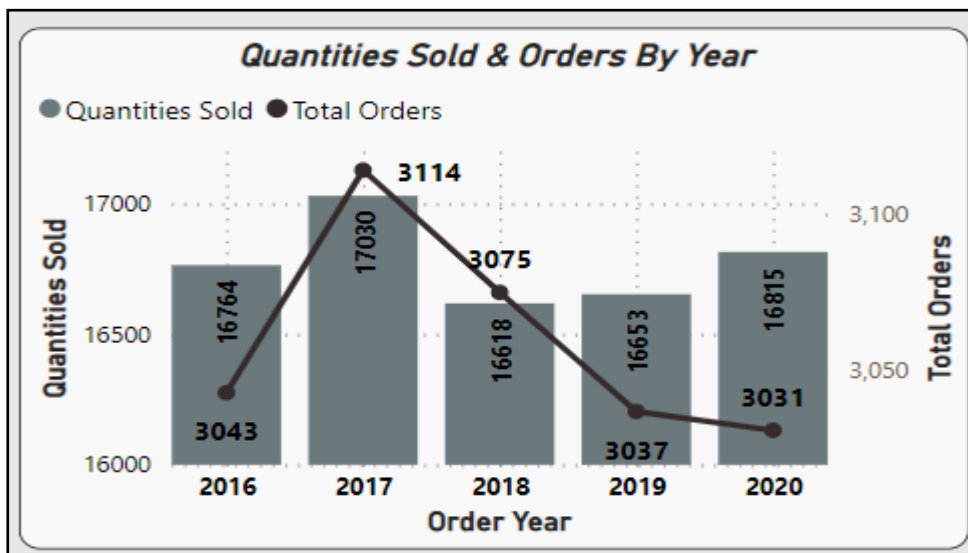


Figure-4. Chart- Quantities Sold and Order by Year

Quantities Sold and Order by Month:

This chart shows the total quantities sold in particular month and total number of orders in particular month

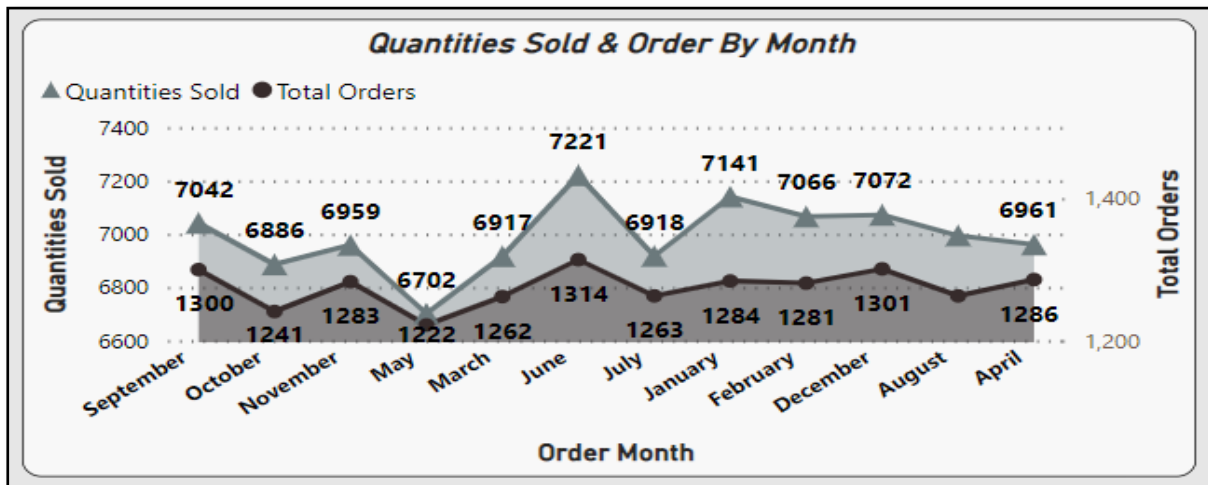


Figure-5. Chart- Quantities Sold and Order by Month

Revenue and Customer Location Outcomes Findings

Below dashboard represents other necessary information like – available service in number of continents, countries and islands and total number of orders -

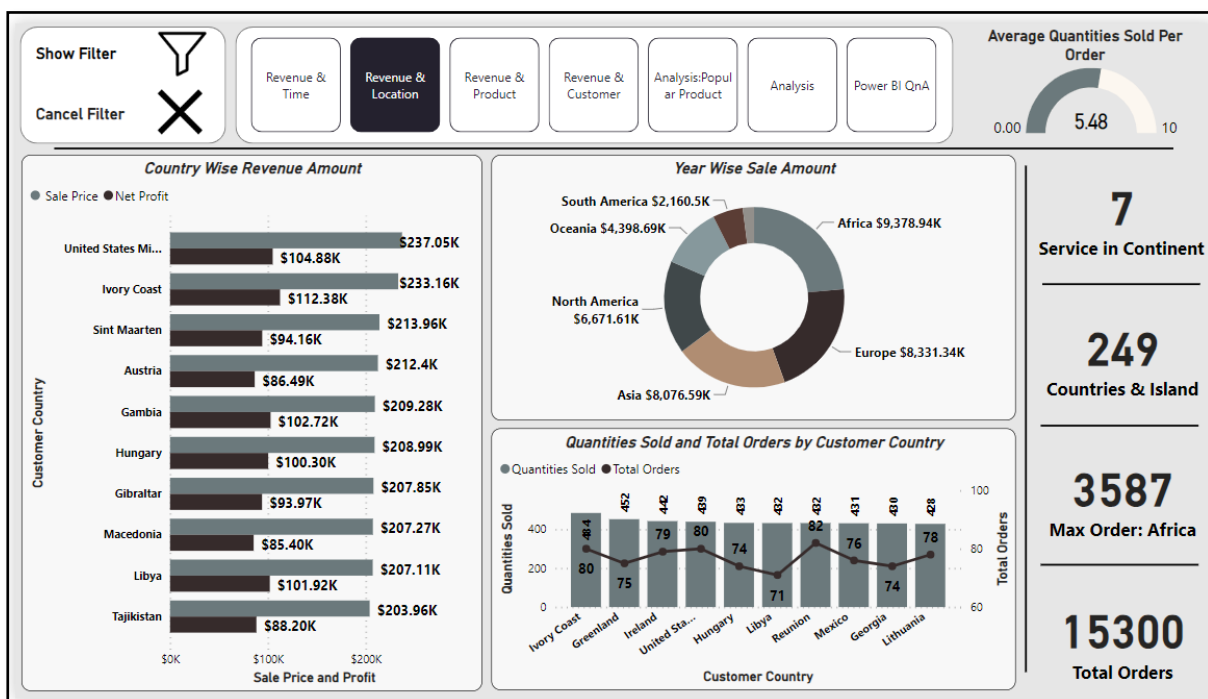


Figure-6. Revenue and Customer Location Dashboard

Country wise Revenue Amount:

Below chart shows the total revenue generated from particular country. According to this from United States, company generated the highest revenue which is around \$237.05K-

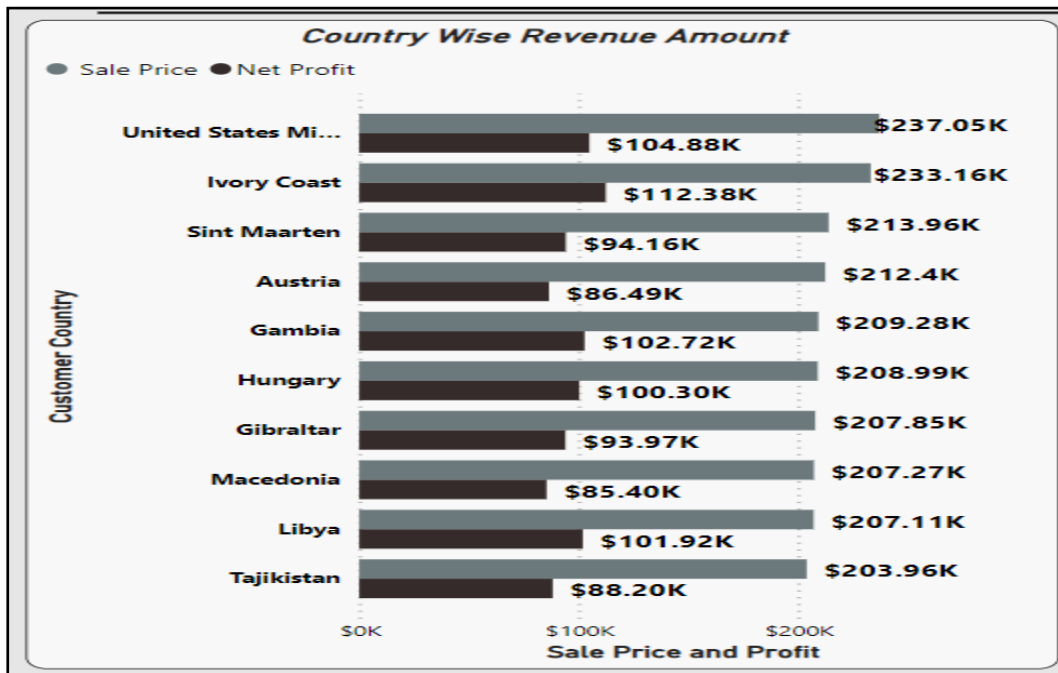


Figure-7. Chart- Country wise Revenue Amount

Continent Wise Sale Amount:

Below donut chart shows the pictorial representation of total sales amount from different continent. According to this chart from Africa the total generated sales amount is highest as compared to other continents -

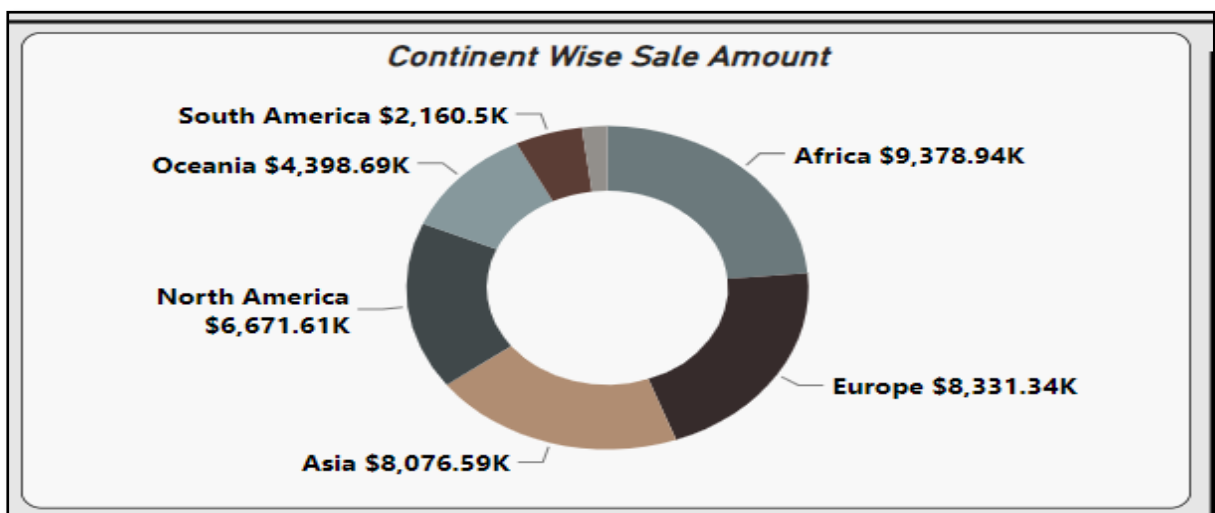


Figure-8. Chart- Continent Wise Sale Amount

Quantities Sold and Order by Customer Country:

Below graph shows the total quantities sold and total orders by customer country. According to this the highest quantity of products sold in ivory coast area -

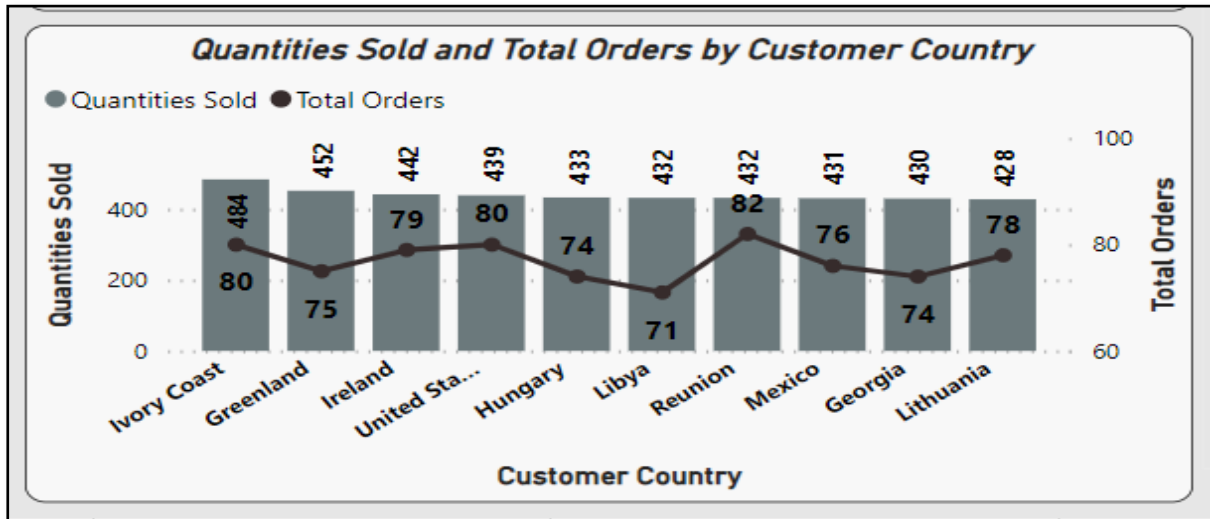


Figure-9. Chart- Quantities Sold and Order by Customer Country

Revenue and Product Outcomes Findings

This dashboard representation shows the total number of product category which is 22, Cost of goods which is \$22.05M, total number of products and total profit which is around \$17.78M -

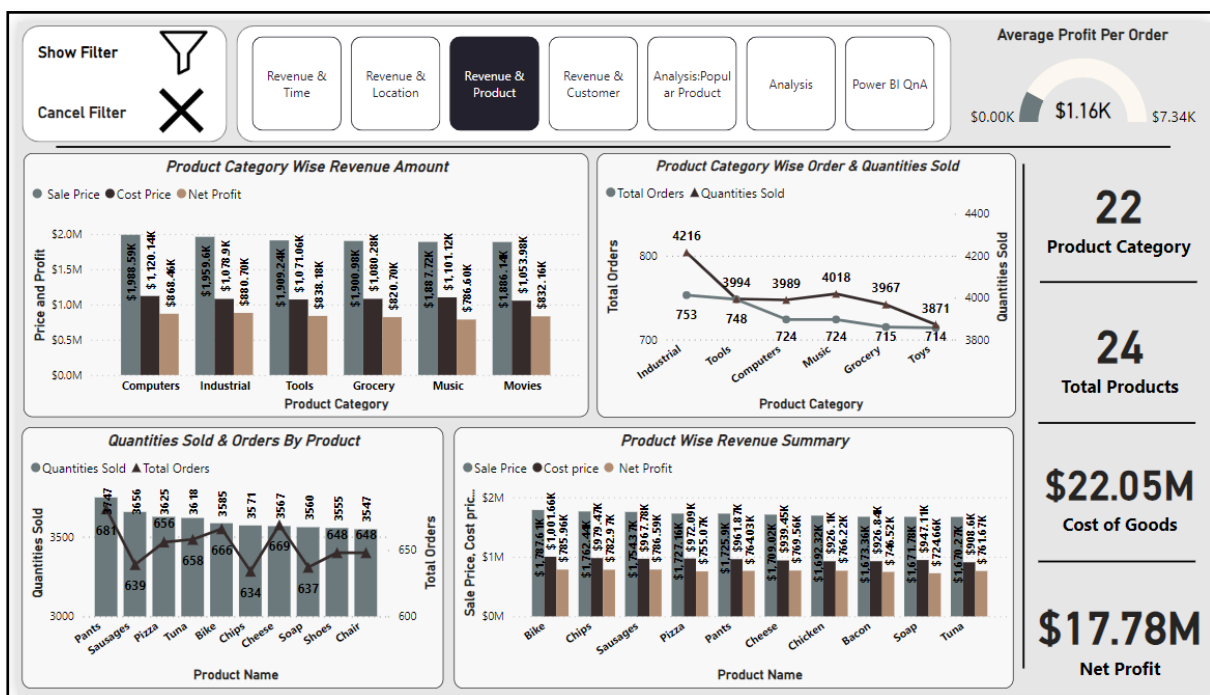


Figure-10. Revenue and Product Dashboard

Product Category wise Revenue Amount:

Below graph shows the total revenue generated by particular product category. As per the graph the highest revenue is generated from Computers -

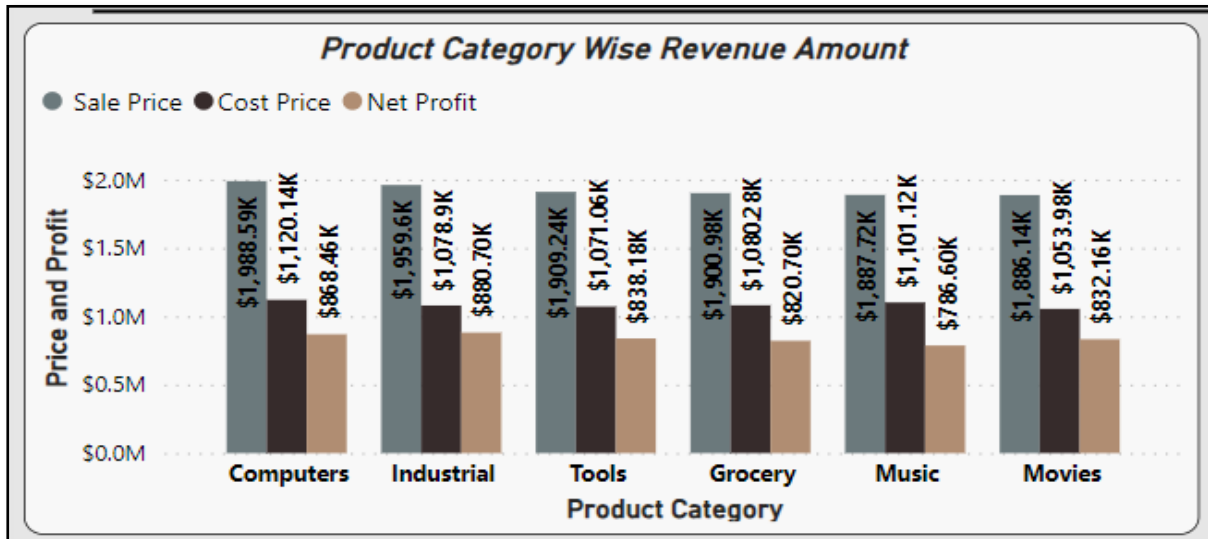


Figure-11. Chart- Product Category wise Revenue Amount

Product Category wise Order and Sold Quantities:

Below graph shows the total number of orders and sold quantities for particular product type -

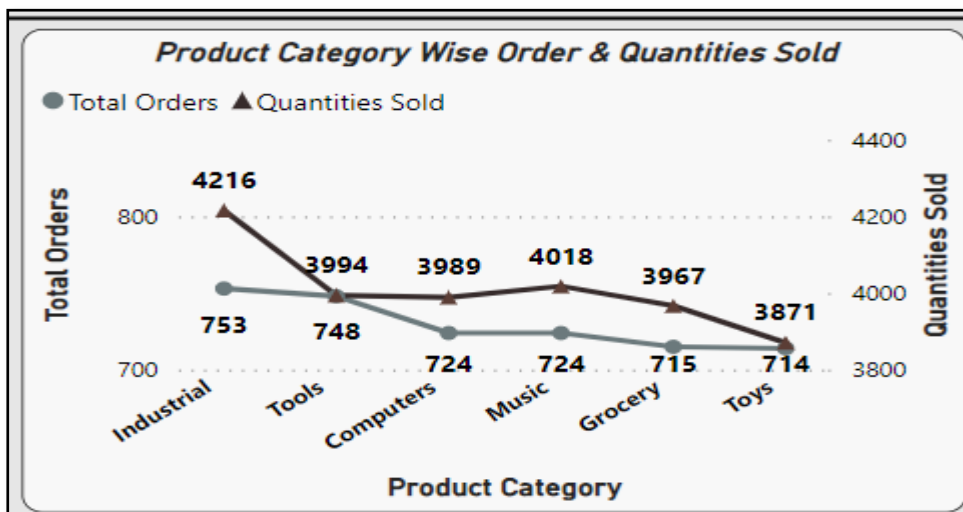


Figure-12. Chart- Product Category wise Order and Sold Quantities

Order and Sold Quantities by Product:

Same as above graph, this shows the total number of orders and sold quantities by product name -

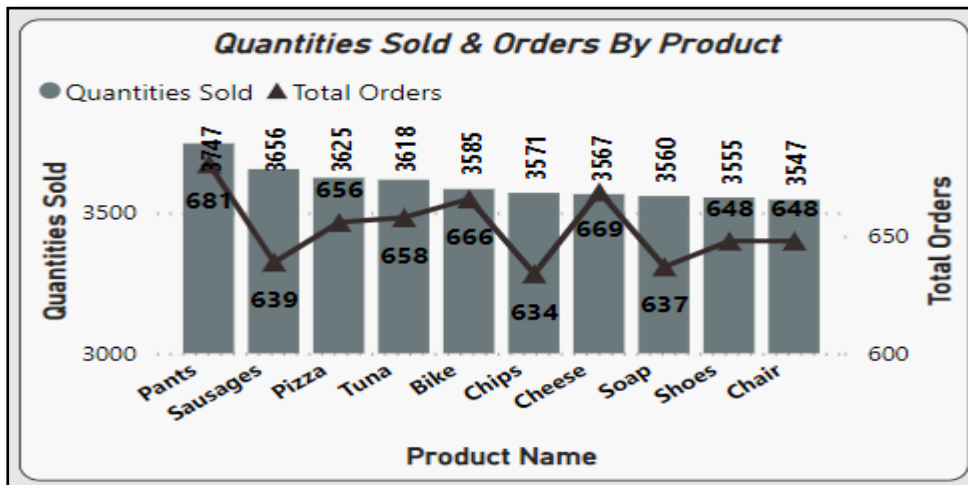


Figure-13. Chart- Order and Sold Quantities by Product

Product wise Revenue Summary:

Below graph shows the summarize representation of product and revenue generated -

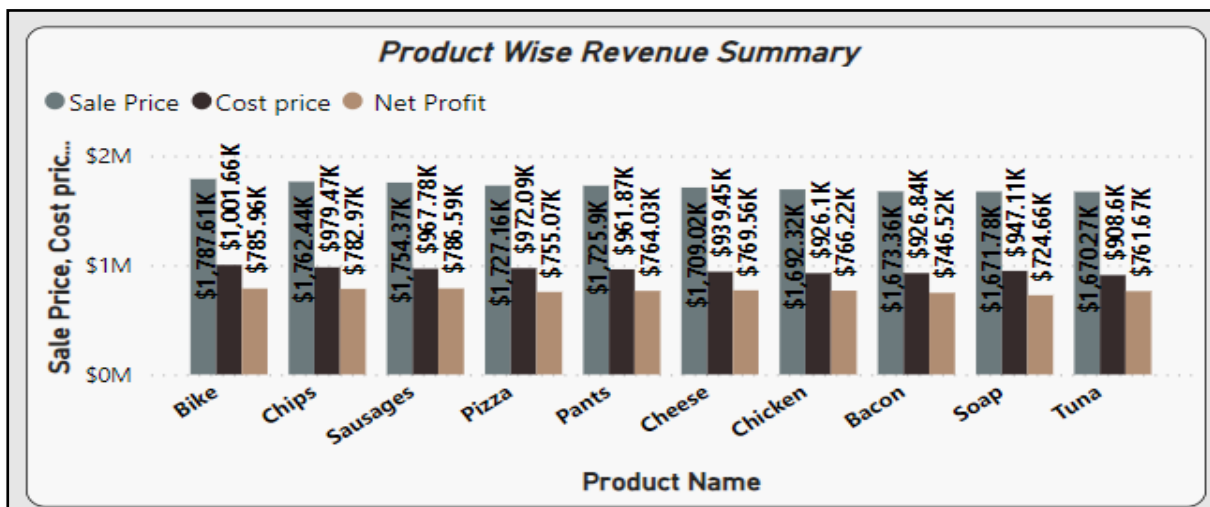


Figure-14. Chart- Product wise Revenue Summary

Revenue and Customer Info Outcomes Findings

Below dashboard shows the total number of customers which is around 4529, total number of female customers, total number of Gmail domain and yahoo domain -

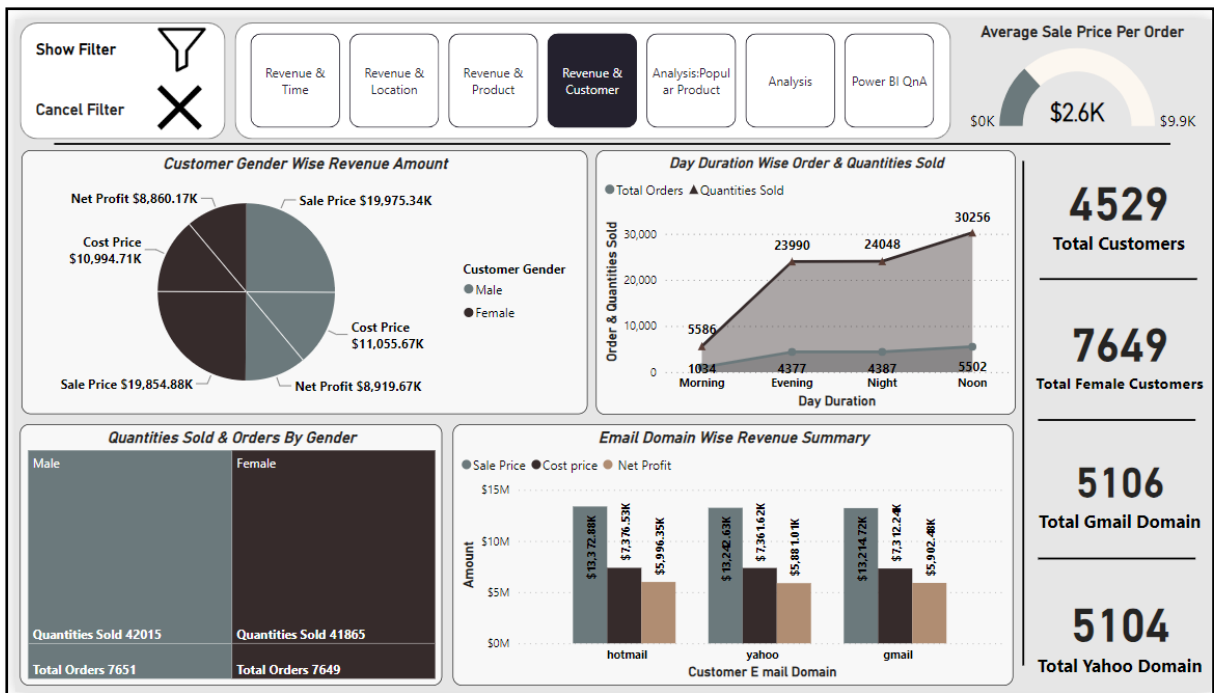


Figure-15. Revenue and Customer Info Dashboard

Customer Gender wise Revenue:

Below donut chart shows the total revenue generated by gender of customer. As per the chart the revenue generated by male customers is greater than that of female customers -

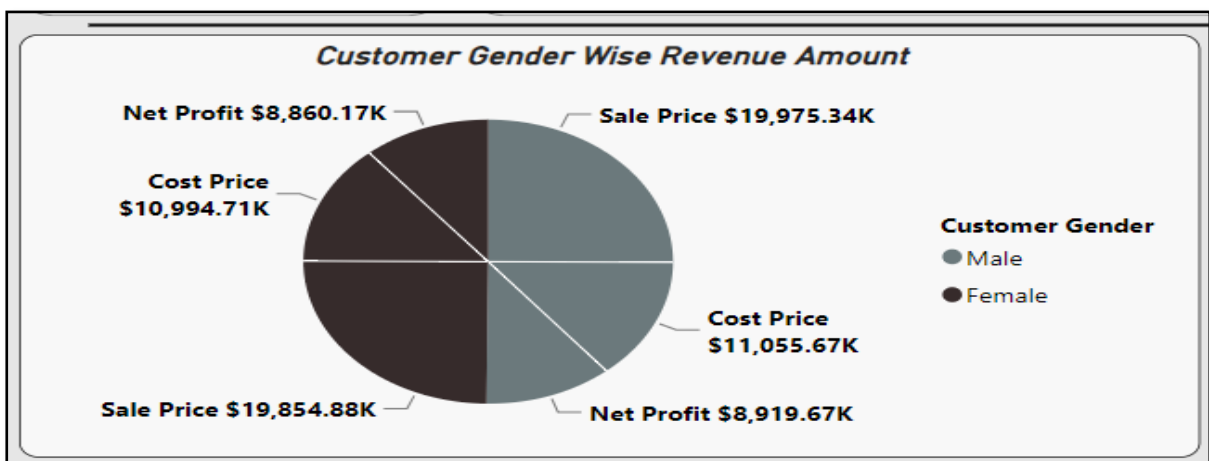


Figure-16. Chart- Customer Gender wise Revenue

Day Duration wise Order and Sold Quantities:

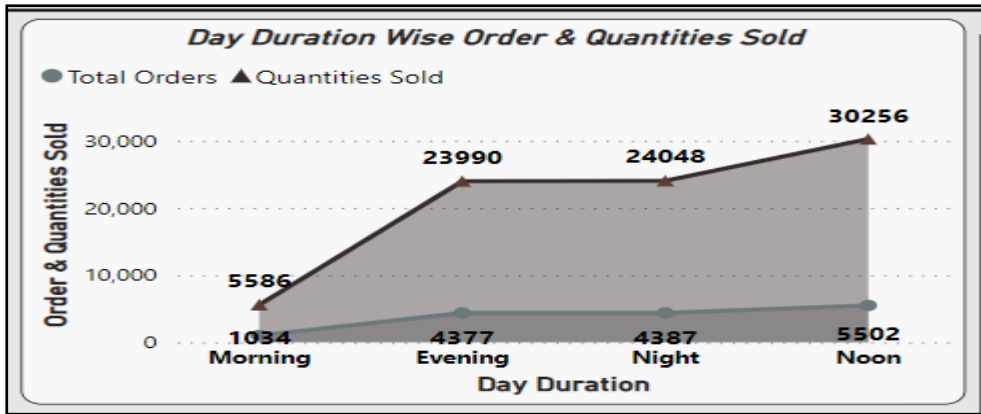


Figure-17. Chart- Day Duration wise Order and Sold Quantities

Order and Sold Quantities by Gender:

Below representation shows the order and sold quantities by gender -

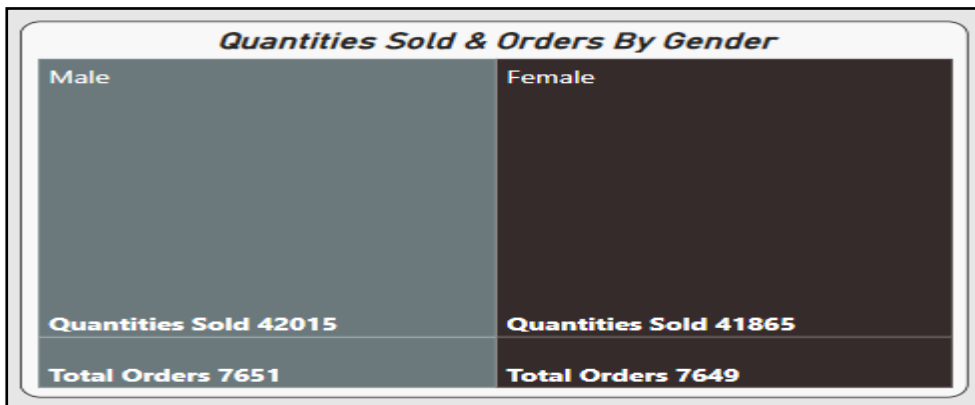


Figure-18. Chart- Order and Sold Quantities by Gender

E-mail Domain wise Sale Summary:

Below summarized representation shows the sales with particular domain. According to below representation the sales price is highest for hotmail due to this the net profit is also highest for this domain as compared to others -

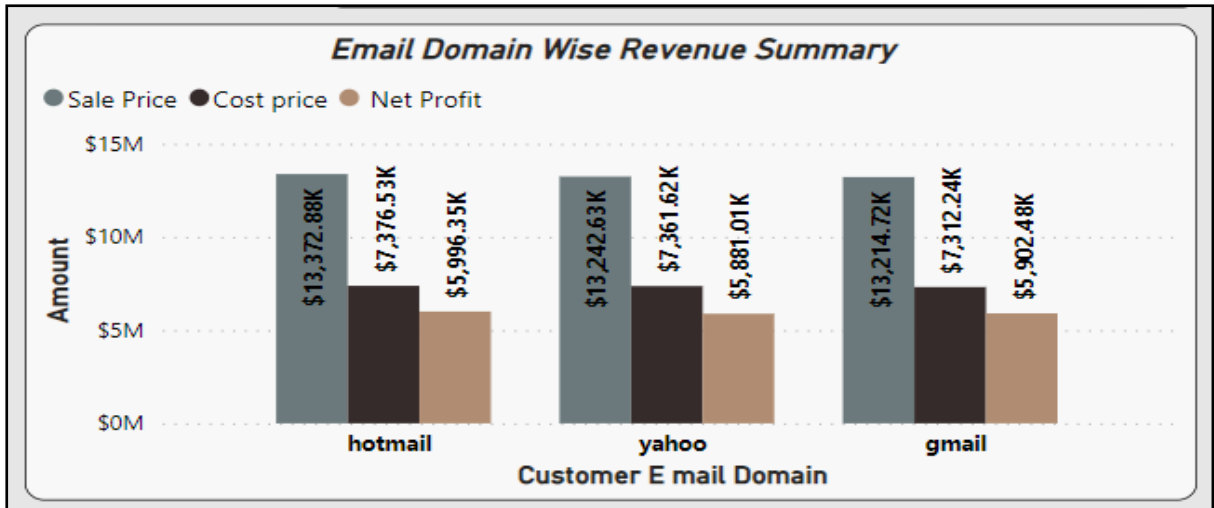


Figure-19. Chart- E-mail Domain wise Sale Summary

Popular Product Outcomes Findings

Below dashboard shows the total customers, total number of female customers, sale price and cost price -

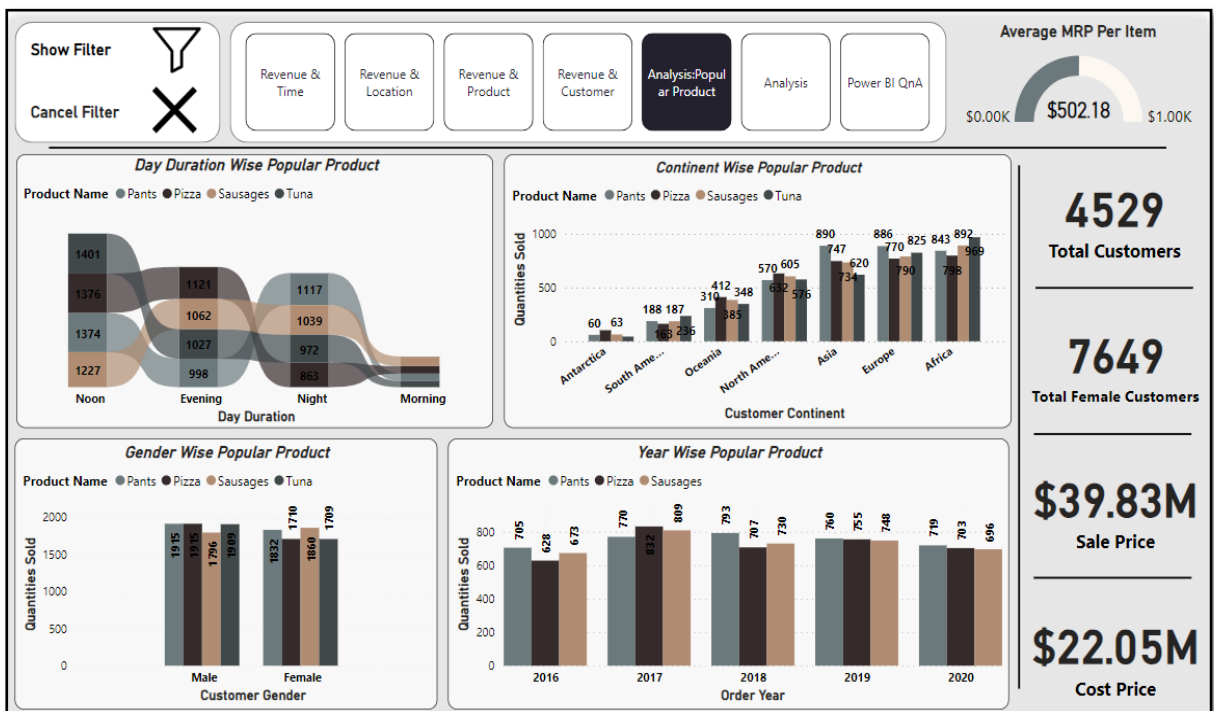


Figure-20. Popular Product Outcomes Findings Dashboard

Day Duration wise popular Product:

Below representation shows the popular products by time duration. As per the chart the popularity of Tuna is highest at noon than that of other products -

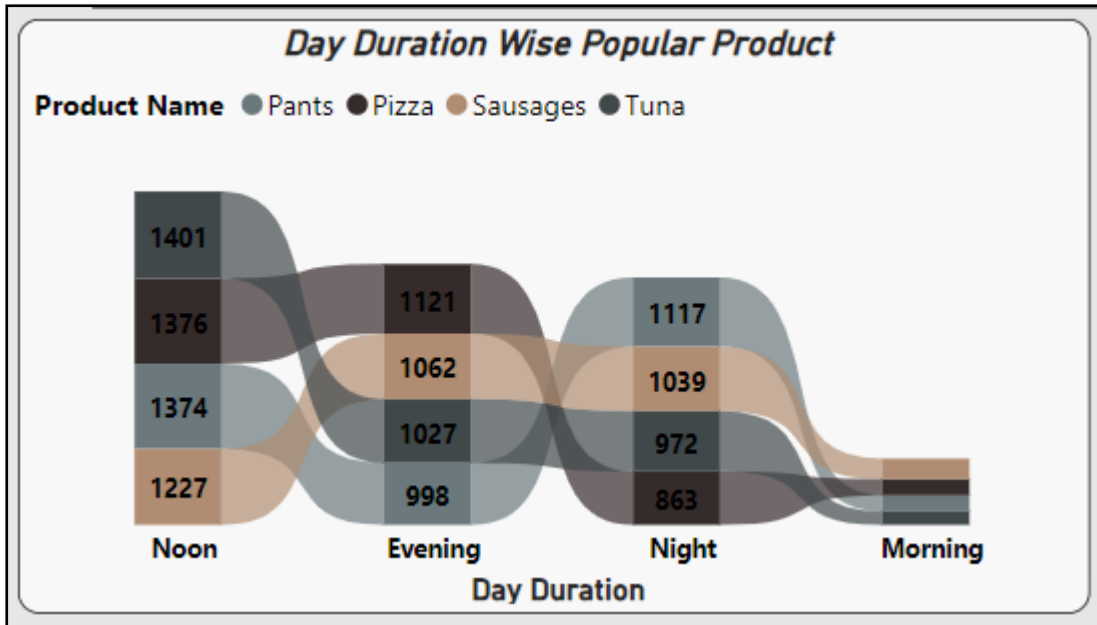


Figure-21. Chart- Popular Product Outcomes Findings

Continent wise popular Product:

Below graph shows the popular product in particular continent. As per the below graph the pizza is highly popular in Africa continent -

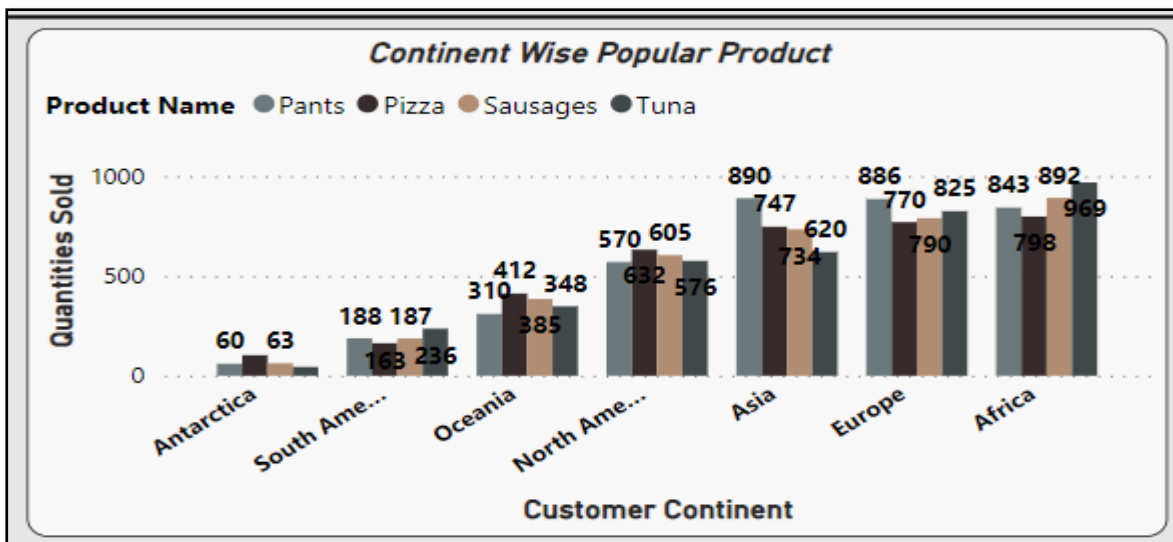


Figure-22. Chart- Continent wise popular Product

Gender wise popular Product:

Below graph shows the popular products as per the gender of customer. This graph shows that Pants and Pizza is highly popular in male customers -

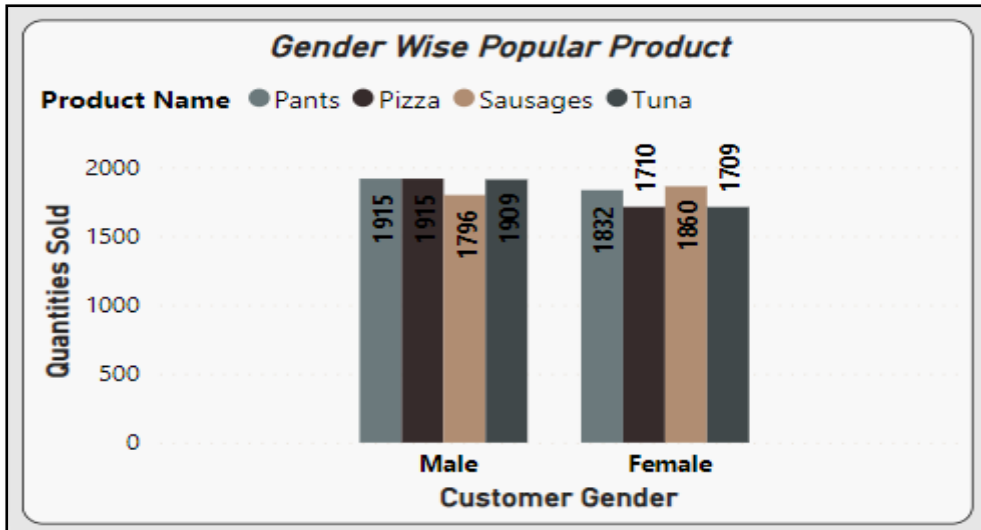


Figure-23. Chart- Gender wise popular Product

Year wise popular Product:

This chart shows the popularity of products in particular year -

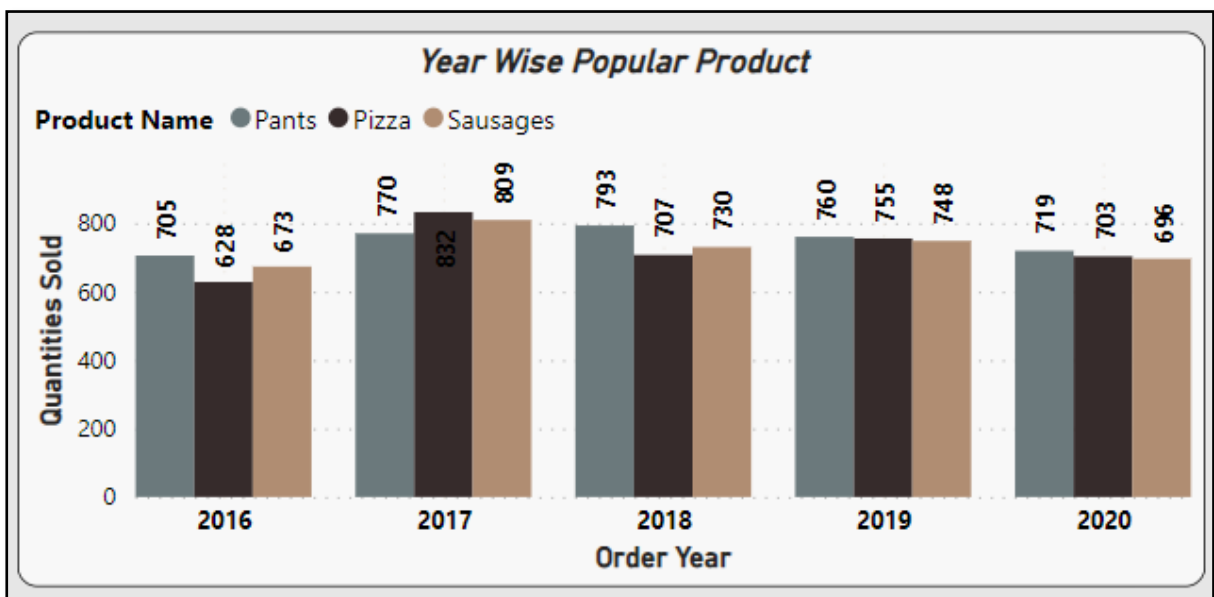


Figure-24. Chart- Year wise popular Product

Key Influencer & Decomposition Tree Outcomes Findings

Below dashboard shows the decomposition tree type representation of available data such as – customer email, month, duration and year etc. -

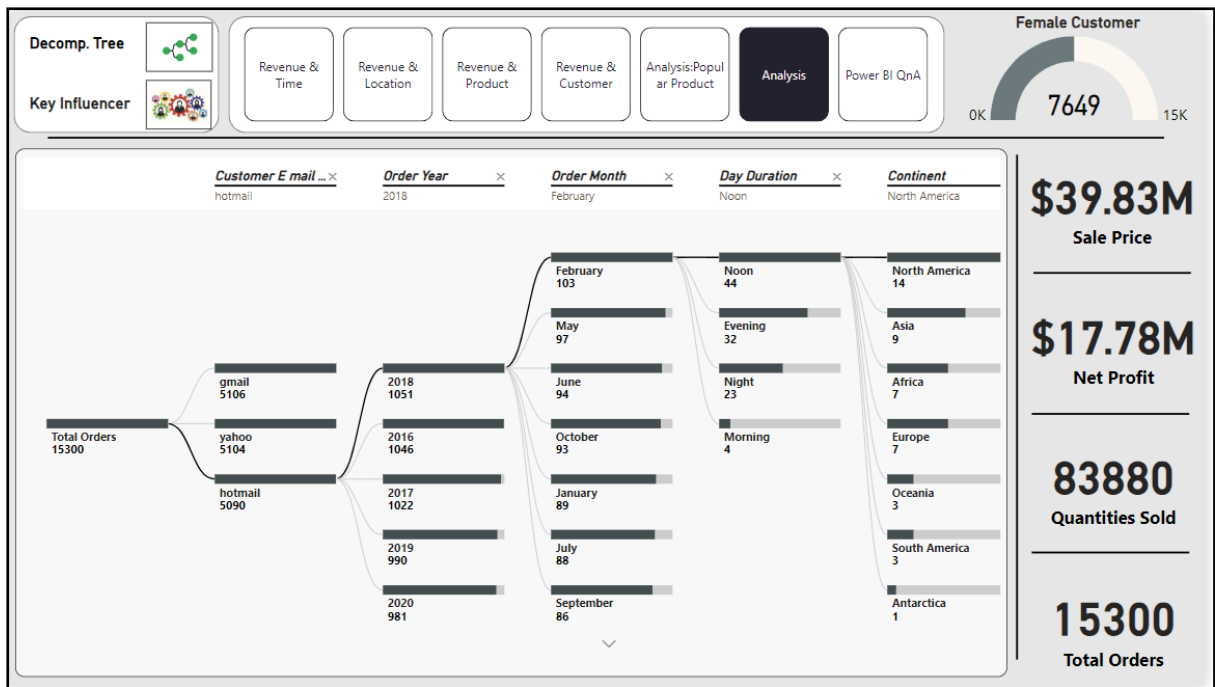


Figure-25. Key Influencer & Decomposition Tree Dashboard

Total sale price is \$39.83M, Net profit is around \$17.78M , total number of quantities sold out is 83880 and total number of order is 15300.

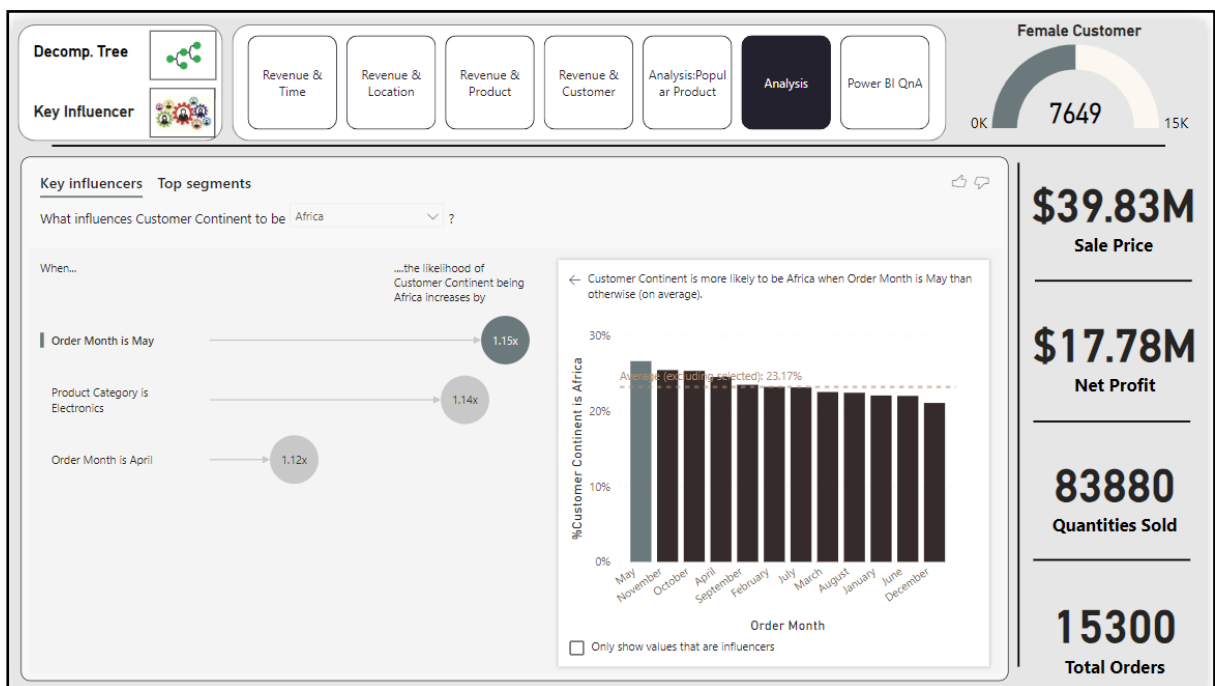


Figure-26. Key Influencer & Decomposition Tree Dashboard

Power BI Question-Answer

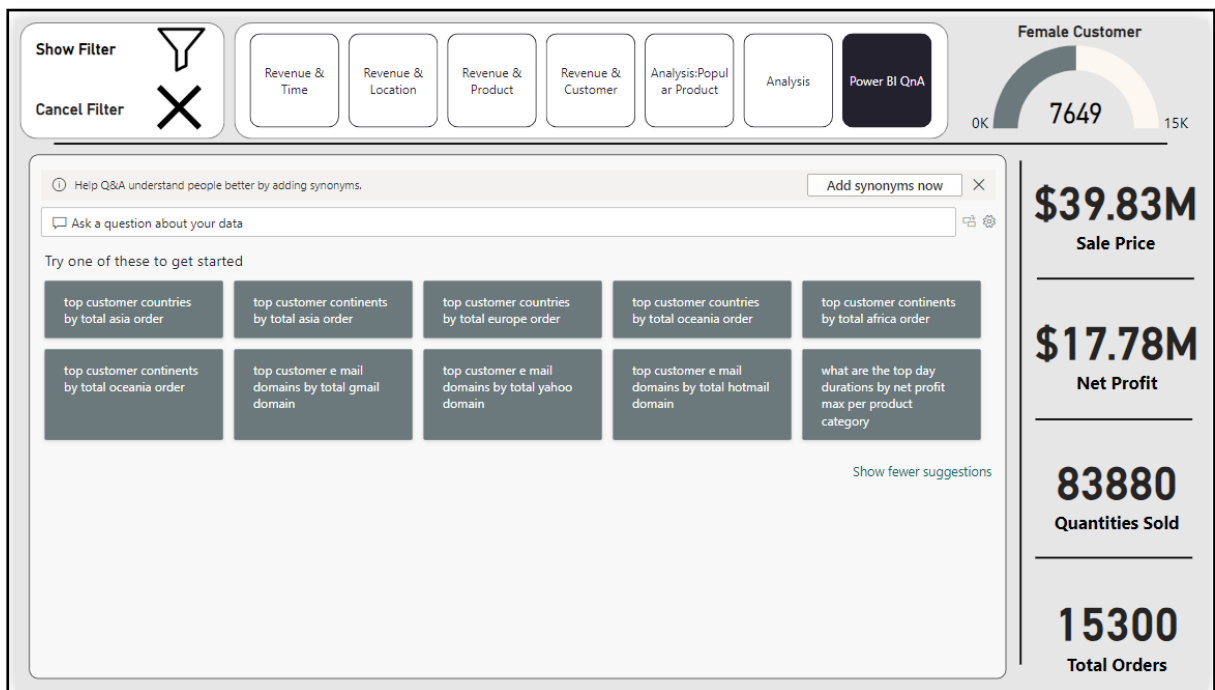


Figure-27. Power BI Question-Answer Dashboard

Conclusions

The overall target of this project report on E-Commerce is to give e-commerce companies useful information that they can use to make decisions about when to launch marketing campaigns, when to offer discounts, where to target customers, how to best understand their behavior, and how to best offer products at competitive prices. After studying this report closely, we have reached some conclusions which are as follows:

- The sale amount was highest in the year 2020.
- The highest amount of revenue generated by the United States
- The highest sale price was for computer products
- Highest number of orders were received for products of industrial purpose.
- The generated revenue from male customers is highest than that of female.
- The highest net profit was achieved through Hotmail domain.

Recommendations

- The company should pay attention to the quality of the types of products whose sales are decreasing.
- Hotmail should be held accountable for highest revenue generation and rewarded for same.

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Appendix

Data must be converted or made ready for use in the future by organizing, merging, and structuring it for use in analytics, business intelligence, and visualizations. This will allow for the trustworthy acquisition of insights from the data (Stedman, Burns and Pratt,2022). Additionally, data preparation can aid in producing reliable and consistent data outputs. As a result, the actions listed below were taken to construct an analysis in Power-BI: locating the data, importing it into Power-BI, processing the data, modeling it, and carrying out the necessary changes before visualizing, designing, and branding the information.

Importing Data-Sheet in power bi desktop

[Load the data sheet in power-bi](#)

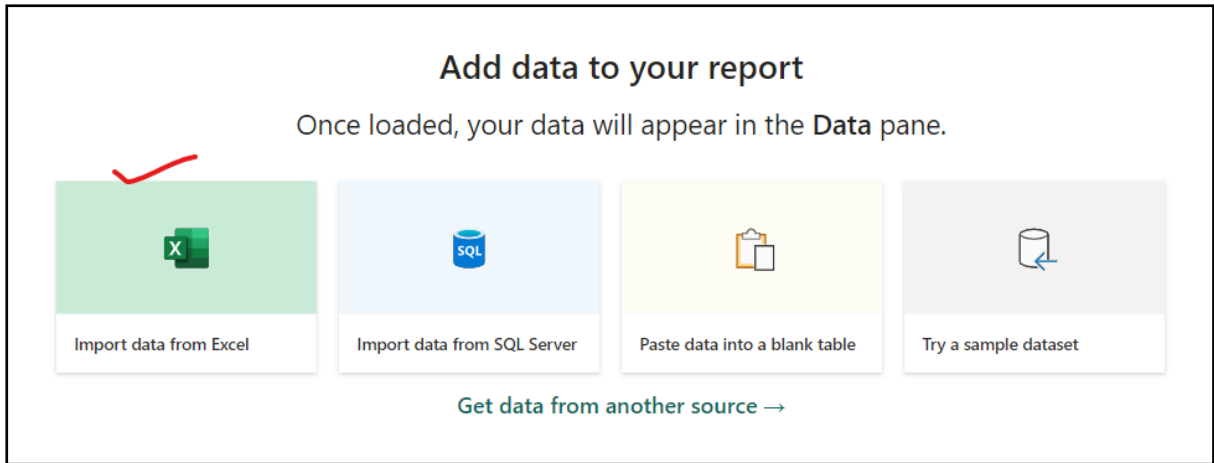


Figure-28: Data Importing Option

- After the selection of the file from Excel, the loading file is on.

E-Commerce Dataset.csv

File Origin: 1252: Western European (Windows) | Delimiter: Comma | Data Type Detection: Based on first 200 rows

CustomerId	CustomerName	CustomerEmail	CustomerGender	CustomerIp	ProductName	ProductPrice	Cost
4070	Roberta Lesch	Rodrick_Kassulke88@gmail.com	Female	138.152.90.54	Hat	713	
2530	Adaline Hoeger	Vicky93@yahoo.com	Female	35.240.213.166	Cheese	60	
2697	Yesenia Hahn	Linda48@gmail.com	Male	180.226.79.181	Chips	310	
2405	Fern Stark	Eriberto5@yahoo.com	Female	227.148.70.138	Chair	468	
4394	Ronaldo Bashirian	Nicole56@hotmail.com	Male	85.197.31.229	Chicken	360	
2013	Moses Runolfsdottir	Polly99@hotmail.com	Male	118.177.129.243	Salad	190	
396	Jared Purdy	Nicholaus77@hotmail.com	Female	6.136.10.26	Keyboard	860	
4151	Minerva O'Kon	Daphne_Kessler@yahoo.com	Female	122.246.199.255	Gloves	95	
2987	Shana Beier	Valentine89@gmail.com	Female	129.204.15.31	Pants	188	
26	Tristin Bogan	Jaylen15@hotmail.com	Female	69.224.113.170	Keyboard	915	
4205	Bernard West	Jakob_Wintheiser@gmail.com	Male	79.237.168.36	Chair	180	
1462	Rodrigo Swift	Jerome.VonRueden30@hotmail.com	Female	211.175.54.230	Keyboard	326	
705	Ena Roberts	Cornelius.Lakin88@hotmail.com	Female	5.100.150.96	Chair	265	
2388	Miles McDermott	Joshuah_Cruickshank97@hotmail.com	Male	103.91.207.71	Tuna	162	
4303	Rosalia Graham	Emory21@yahoo.com	Female	192.8.48.121	Soap	642	
4269	Olin Blanda	Chyna.Skiles@hotmail.com	Female	82.195.168.140	Towels	196	
2822	Rick Kunze	Reggie.Ruecker@yahoo.com	Female	145.165.117.81	Computer	692	
2271	Minnie Fadel	Cheyenne41@hotmail.com	Male	112.223.174.18	Bacon	642	
235	Vernie Labadie	Ima_Walker@yahoo.com	Male	68.205.51.63	Sausages	570	
2209	Rosina Ernser	Fae_Maggio38@hotmail.com	Male	62.38.157.198	Shirt	235	

Extract Table Using Examples

Load Transform Data Cancel

Figure-29: View of the Data Sheet

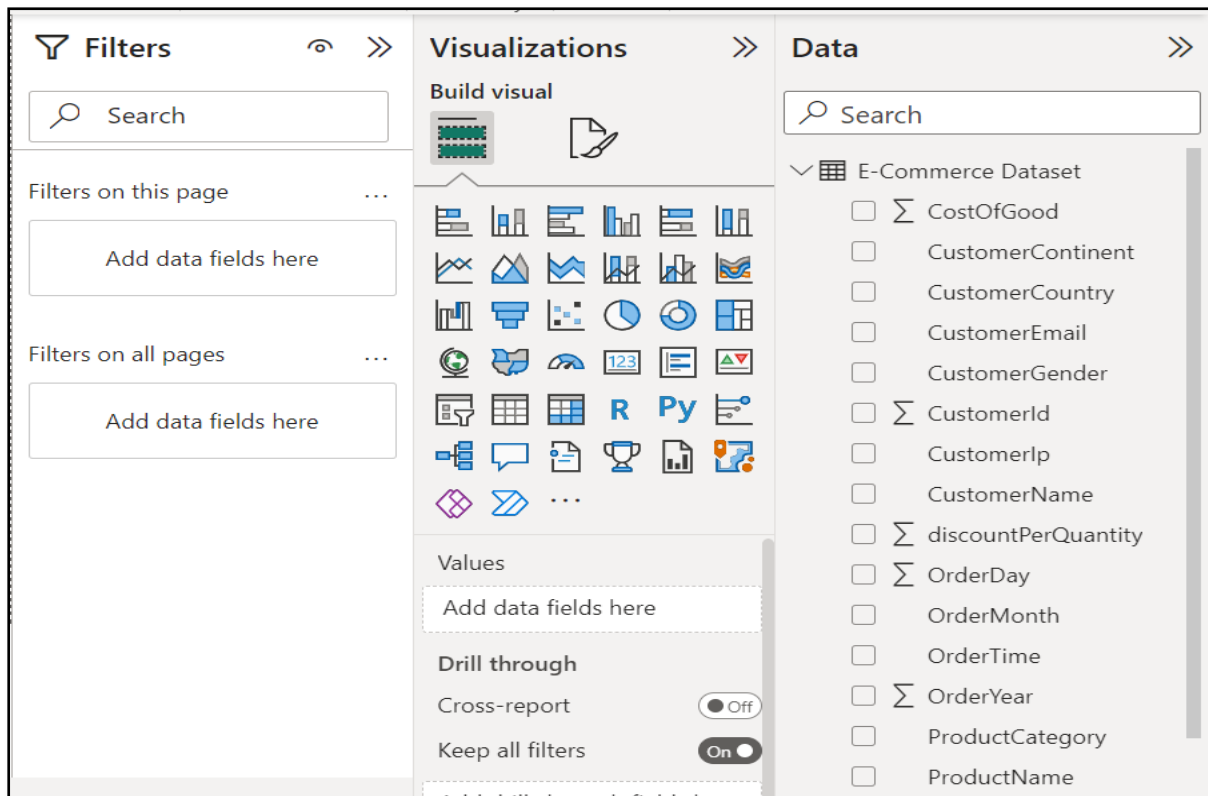


Figure-30: Data View In power BI

Data Cleansing & Transformation Steps in Datasheet

The datasets must be cleaned in order for analysis to take place and for visualizations to be displayed with accuracy and dependability. The convert data button on the home tab was clicked, opening the data cleansing tool.

The data will be preprocessed and cleaned using the power query editor. The query editor has a number of tools for cleaning and transforming data.

In order to transform the data set, click on “Transform data” option available in the ribbon menu.

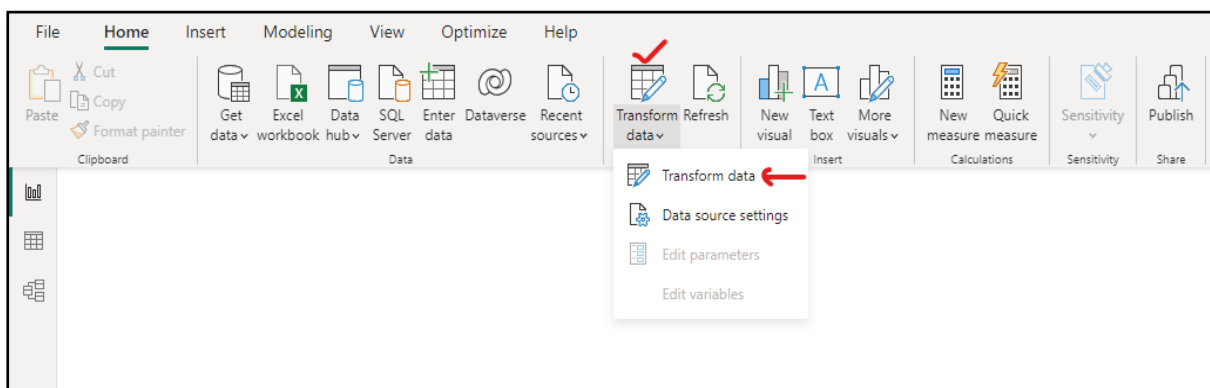


Figure-31: Data Transformation Option

Queries [1] ✕ ✓ fx = Table.TransformColumnTypes(#"Promoted Headers",{{"CustomerId", Int64.Type}, {"CustomerName", type

	123 CustomerId	A6C CustomerName	A6C CustomerEmail	A6C CustomerGender	A6C CustomerIp
1	4070	Roberta Lesch	Rodrick_Kassulke88@gmail.com	Female	138.152.90.54
2	2530	Adaline Hoeger	Vicky93@yahoo.com	Female	35.240.213.166
3	2697	Yesenia Hahn	Linda48@gmail.com	Male	180.226.79.181
4	2405	Fern Stark	Eriberto5@yahoo.com	Female	227.148.70.138
5	4394	Ronaldo Bashirian	Nicole56@hotmail.com	Male	85.197.31.229
6	2013	Moses Runolfsdottir	Polly99@hotmail.com	Male	118.177.129.243
7	396	Jared Purdy	Nicholaus77@hotmail.com	Female	6.136.10.26
8	4151	Minerva O'Kon	Daphne_Kessler@yahoo.com	Female	122.246.199.255
9	2987	Shana Beier	Valentine89@gmail.com	Female	129.204.15.31
10	26	Tristin Bogan	Jaylen15@hotmail.com	Female	69.224.113.170
11	4205	Bernard West	Jakob_Wintheiser@gmail.com	Male	79.237.168.36
12	1462	Rodrigo Swift	Jerome.VonRueden30@hotmail.com	Female	211.175.54.230

Figure-32. View of Data Transformation

The corresponding M-language for the data set are given below:

The corresponding M-language for the data set are given below.

```
= Table.TransformColumnTypes(#"Promoted Headers",{{"CustomerId", Int64.Type}, {"CustomerName", type text}, {"CustomerEmail", type text}, {"CustomerGender", type text}, {"CustomerIp", type text}, {"ProductName", type text}, {"ProductPrice", Int64.Type}, {"CostOfGood", type number}, {"ProductCategory", type text}, {"CustomerCountry", type text}, {"CustomerContinent", type text}, {"OrderTime", type time}, {"OrderDay", Int64.Type}, {"OrderMonth", type text}, {"QuantitySold", Int64.Type}, {"discountPerQuantity", type number}, {"salePrice", type number}, {"OrderYear", Int64.Type}})
```

Removing Null Columns from Data Sheet

If the datasheet has any column completely null then it can be removed from the data sheet.

= Table.TransformColumnTypes(#"Promoted Headers",{{"Attrition", type text}, {"Business Travel", type text}, {"CF_age band", type text}, {"CF_attri								
nn41	ABC 123 Column42	ABC 123 Column43	ABC 123 Column44	ABC 123 Column45	ABC 123 Column46	ABC 123 Column47		
1	null	null	null	null	null	null		n
2	null	null	null	null	null	null		n
3	null	null	null	null	null	null		n
4	null	null	null	null	null	null	p	n
5	null	null	null	null	null	null		n
6	null	null	null	null	null	null		n
7	null	null	null	null	null	null		n
8	null	null	null	null	null	null		n
9	null	null	null	null	null	null		n
10	null	null	null	null	null	null		n
11	null	null	null	null	null	null		n
12	null	null	null	null	null	null		n
13	null	null	null	null	null	null		n
14	null	null	null	null	null	null		n
15	null	null	null	null	null	null		n
16	null	null	null	null	null	null		n
17	null	null	null	null	null	null		n
18	null	null	null	null	null	null		n
19	null	null	null	null	null	null		n
20	null	null	null	null	null	null		n
21	null	null	null	null	null	null		n
22	null	null	null	null	null	null		n
23	null	null	null	null	null	null		n
24	null	null	null	null	null	null		n
25	null	null	null	null	null	null		n
26	null	null	null	null	null	null		n
27	null	null	null	null	null	null		n
28	null	null	null	null	null	null		n
29	null	null	null	null	null	null		n
30	null	null	null	null	null	null		n
31	null	null	null	null	null	null		n
32	null	null	null	null	null	null		n
33	null	null	null	null	null	null		n
34	null	null	null	null	null	null		n
35	null	null	null	null	null	null		n
36	null	null	null	null	null	null		n
37	null	null	null	null	null	null		n

Figure-33. Null Columns in Dataset

The null column can removed by two ways, Either by options “remove Columns” in Ribbon tab or By clicking right column on null column header.

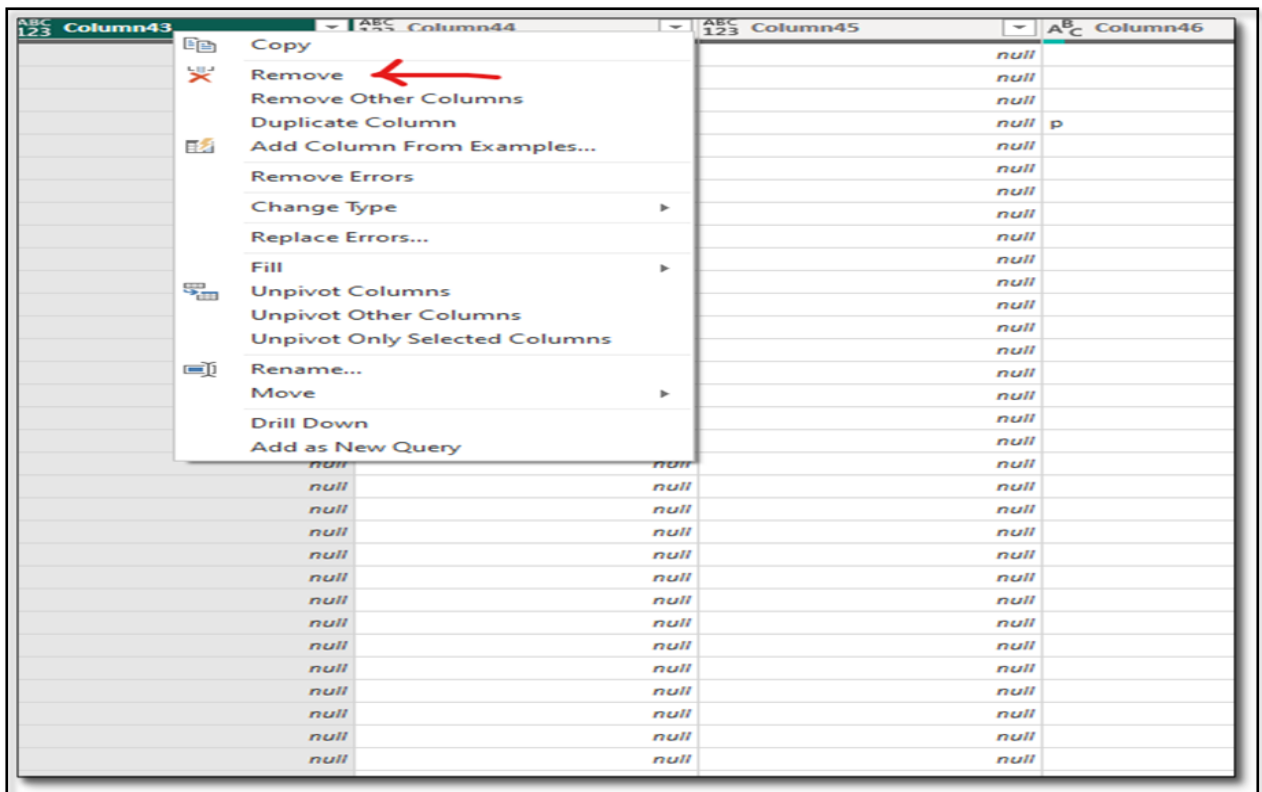


Figure-34: Removing Null Columns

Removing Null values in Column

To avoid issues, remove null values from your Power BI data sets. By removing null values, you can ensure that the analyses and visualizations you create are based on complete and accurate data. Because there will be less data to evaluate, removing null values can help speed up the processing of your Power BI dashboards and reports. Replace values may be used to change any column that contains null values.

Here in the data set no values are replace.

Changing Data Types of Columns

- Product Price- Text → Whole number
- Order Day Text → Whole number

Figure-35 shows the initial state of the 'E-Commerce Dataset' query. The formula bar contains the formula: `= Table.RenameColumns("#Changed Type",{"ProductPrice", "Product Price"})`. The data table has columns: Product Price, CostOfGood, ProductCategory, CustomerCountry, and Customer. The 'Product Price' column contains decimal values.

	Product Price	CostOfGood	ProductCategory	CustomerCountry	Customer
1	713.00	249.55	Movies	Seychelles	Africa
2	60.00	47.4	Health	Qatar	Asia
3	310.00	145.7	Sports	Cameroon	Africa
4	468.00	149.76	Beauty	Guadeloupe	North Ame
5	360.00	140.4	Health	Swaziland	Africa
6	190.00	119.7	Health	Costa Rica	North Ame
7	860.00	576.2	Health	Kuwait	Asia
8	95.00	51.3	Music	Kazakhstan	Asia
9	188.00	52.64	Toys	Andorra	Europe
10	915.00	356.85	Baby	Tunisia	Africa
11	180.00	144	Music	Hungary	Europe
12	326.00	273.84	Music	Luxembourg	Europe
13	265.00	124.55	Electronics	Djibouti	Africa

Figure-35: Data Type of 'product price'

Figure-36 shows the 'E-Commerce Dataset' query after transforming the 'Product Price' column to Int64 type. The formula bar contains the formula: `= Table.TransformColumnTypes("#Renamed Columns",{"Product Price", Int64.Type})`. The data table has columns: Product Price, CostOfGood, ProductCategory, CustomerCountry, and Customer. The 'Product Price' column now contains integer values.

	Product Price	CostOfGood	ProductCategory	CustomerCountry	Customer
1	713	249.55	Movies	Seychelles	Africa
2	60	47.4	Health	Qatar	Asia
3	310	145.7	Sports	Cameroon	Africa
4	468	149.76	Beauty	Guadeloupe	North Ame
5	360	140.4	Health	Swaziland	Africa
6	190	119.7	Health	Costa Rica	North Ame
7	860	576.2	Health	Kuwait	Asia
8	95	51.3	Music	Kazakhstan	Asia
9	188	52.64	Toys	Andorra	Europe
10	915	356.85	Baby	Tunisia	Africa
11	180	144	Music	Hungary	Europe

Figure-36: Changed Data Type of 'product price'

= Table.TransformColumnTypes("#Renamed Columns1",{"Product Price ", Int64.Type}))

	Order Day	OrderMonth	QuantitySold	discountPerQuantity	salePrice
1	43:00 1	February		3	0.09
2	25:00 11	February		5	0.02
3	14:00 25	September		2	0.03
4	13:00 30	June		1	0.1
5	50:00 28	September		6	0.08
6	15:00 30	December		5	0.09
7	56:00 8	June		2	0.1
8	34:00 4	May		2	0.02
9	15:00 2	April		2	0.1
10	57:00 24	June		1	0.01

Figure-37: Data Type of 'order day'

	Order Day	OrderMonth	QuantitySold	discountPerQuantity	salePrice
1	43:00 1	February		3	0.09
2	25:00 11	February		5	0.02
3	14:00 25	September		2	0.03
4	13:00 30	June		1	0.1
5	50:00 28	September		6	0.08
6	15:00 30	December		5	0.09
7	56:00 8	June		2	0.1
8	34:00 4	May		2	0.02
9	15:00 2	April		2	0.1
10	57:00 24	June		1	0.01
11	56:00 30	February		8	0.07

Figure-38: Changed Data Type of 'order day'

= Table.TransformColumnTypes(#"Renamed Columns1",{{"Order Day", Int64.Type}})

Adding an Index Column

An index column in Power BI DAX is a calculated column that generates an ordered sequence of integers, generally starting from 1. The index column acts as a unique identifier for each row in the dataset and helps perform different operations like sorting and filtering.

The index column can be added to any data model table and calculated based on the row context.

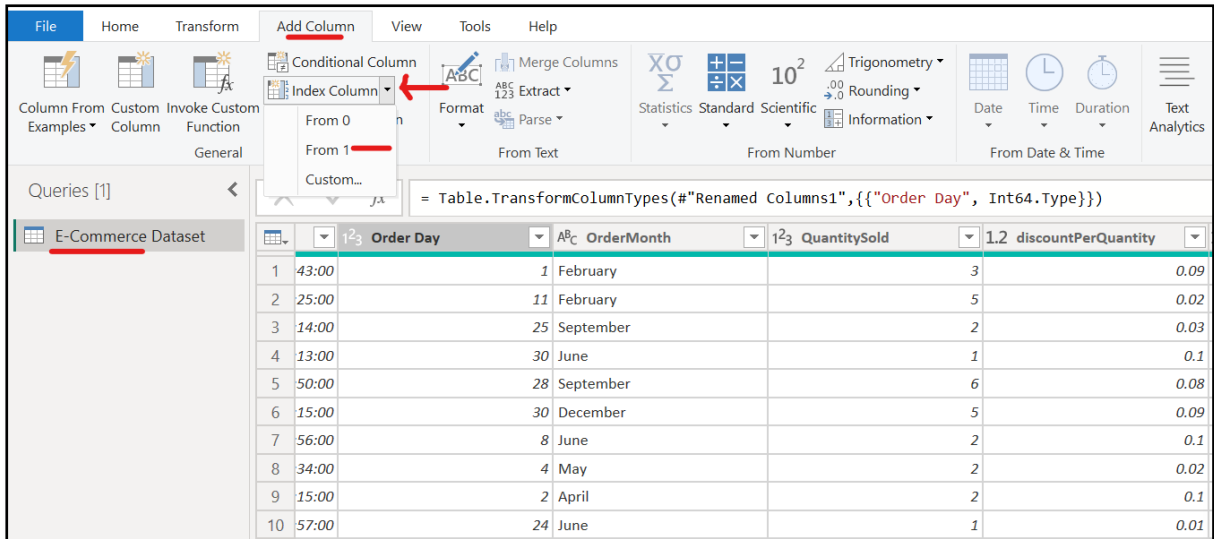


Figure-39: Add column: Index Column Option

Queries [1]

✖

✓

f_x

= Table.ReorderColumns("#Added Index",{"Index", "CustomerId", "CustomerName", "CustomerEmail"})

E-Commerce Dataset

123 Index

123 CustomerId

A^BC CustomerName

A^BC CustomerEmail

1

1

4070

Roberta Lesch

Rodrick_Kassulke88@gmail.com

2

2

2530

Adaline Hoeger

Vicky93@yahoo.com

3

3

2697

Yesenia Hahn

Linda48@gmail.com

4

4

2405

Fern Stark

Eriberto5@yahoo.com

5

5

4394

Ronaldo Bashirian

Nicole56@hotmail.com

6

6

2013

Moses Runolfsdottir

Polly99@hotmail.com

7

7

396

Jared Purdy

Nicholaus77@hotmail.com

8

8

4151

Minerva O'Kon

Daphne_Kessler@yahoo.com

9

9

2987

Shana Beier

Valentine89@gmail.com

10

10

26

Tristin Bogan

Jaylen15@hotmail.com

11

11

4205

Bernard West

Jakob_Wintheiser@gmail.com

12

12

1462

Rodrigo Swift

Jerome.VonRueden30@hotmail.com

13

13

705

Ena Roberts

Cornelius.Lakin88@hotmail.com

14

14

2388

Miles McDermott

Joshuah_Cruickshank97@hotmail.com

15

15

4303

Rosalia Graham

Emory21@yahoo.com

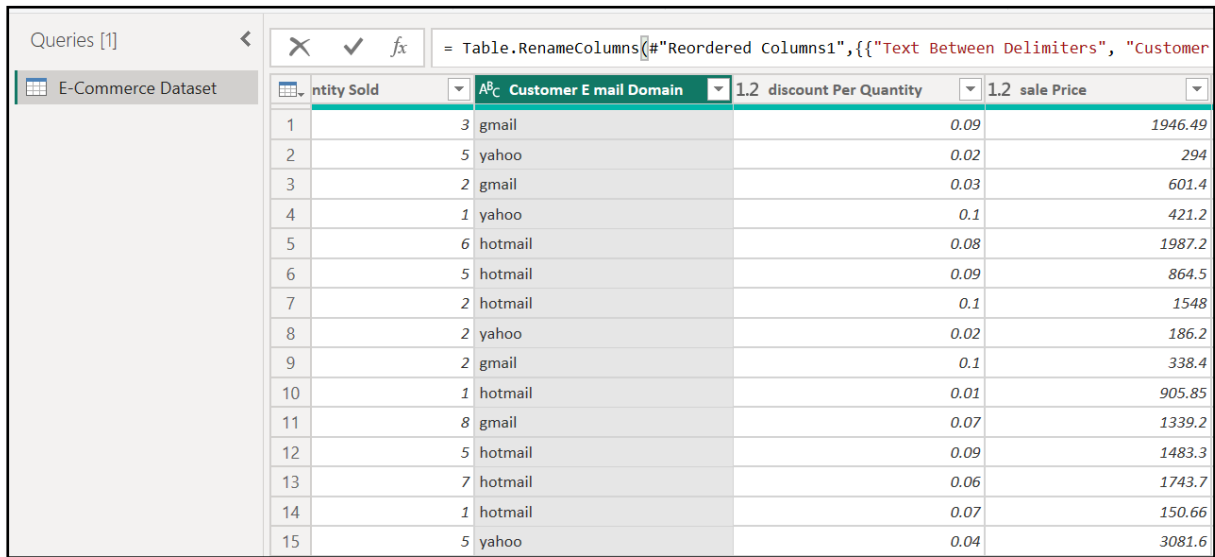
Figure-40: Index Column Added

= Table.AddIndexColumn("#Changed Type2", "Index", 1, 1, Int64.Type)

Extracting Column

In order fin out the e-mail domain of the customer, we simply go to ‘Add Column’ then click on ‘Extract’.

= Table.AddColumn("#Renamed Columns2", "Text Between Delimiters", each
Text.BetweenDelimiters([Customer E mail], "@", "."), type text)



Queries [1] fx = Table.RenameColumns("#Reordered Columns1",{{"Text Between Delimiters", "Customer E mail Domain"}})

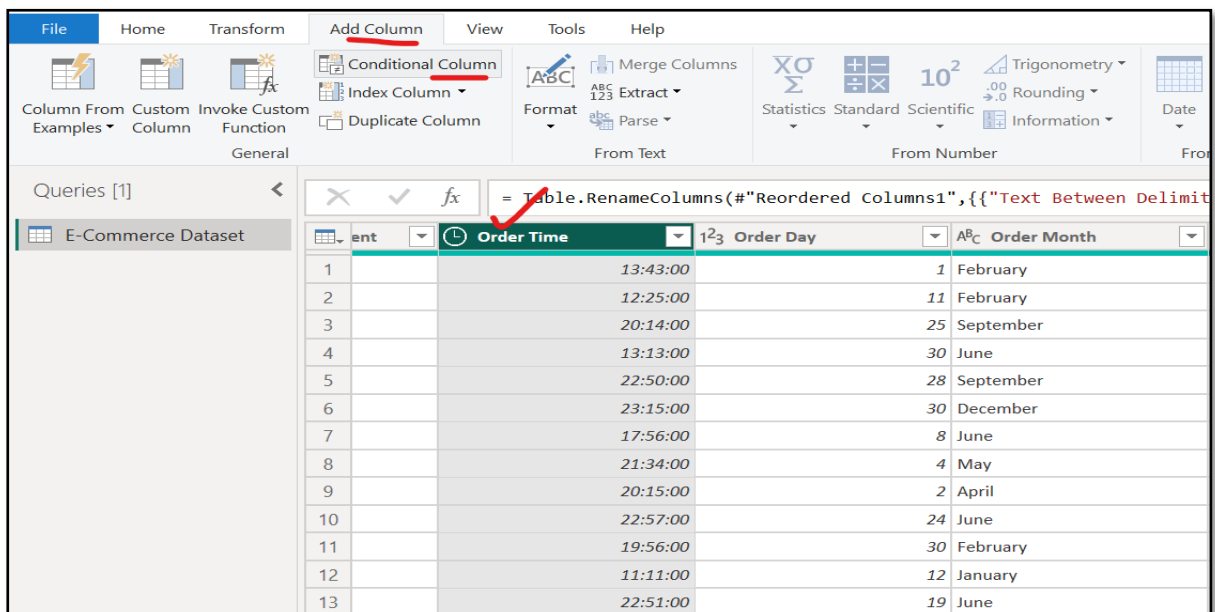
	Entity Sold	Customer E mail Domain	discount Per Quantity	sale Price
1	3	gmail	0.09	1946.49
2	5	yahoo	0.02	294
3	2	gmail	0.03	601.4
4	1	yahoo	0.1	421.2
5	6	hotmail	0.08	1987.2
6	5	hotmail	0.09	864.5
7	2	hotmail	0.1	1548
8	2	yahoo	0.02	186.2
9	2	gmail	0.1	338.4
10	1	hotmail	0.01	905.85
11	8	gmail	0.07	1339.2
12	5	hotmail	0.09	1483.3
13	7	hotmail	0.06	1743.7
14	1	hotmail	0.07	150.66
15	5	yahoo	0.04	3081.6

Figure-44. Extracting Column: name change

= Table.RenameColumns("#Reordered Columns1",{{"Text Between Delimiters", "Customer E mail Domain"}})

Conditional Column

By conditional column, we can manage the time of order to the duration of the day like, night, noon, morning and evening.



File Home Transform Add Column View Tools Help

Column From Examples Custom Column Invoke Custom Function Conditional Column Index Column Duplicate Column Merge Columns Format Extract Parse Statistics Standard Scientific Trigonometry Rounding Information Date

Queries [1] fx = Table.RenameColumns("#Reordered Columns1",{{"Text Between Delimiters", "Customer E mail Domain"}})

	Order Time	Order Day	Order Month
1	13:43:00	1	February
2	12:25:00	11	February
3	20:14:00	25	September
4	13:13:00	30	June
5	22:50:00	28	September
6	23:15:00	30	December
7	17:56:00	8	June
8	21:34:00	4	May
9	20:15:00	2	April
10	22:57:00	24	June
11	19:56:00	30	February
12	11:11:00	12	January
13	22:51:00	19	June

Figure-45. Conditional column option

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name
Custom

	Column Name	Operator	Value		Output
If	time	is less than	06:00:00	Then	Night
Else If	time	is less than	12:00:00	Then	Morning
Else If	time	is less than	16:00:00	Then	Noon

Add Clause

Else
Evening

OK Cancel

Figure-46. Conditional column values

```
= Table.AddColumn("#Removed Columns6", "Custom", each if [time] > #time(6, 0, 0) then "Morning" else if [time] > #time(12, 0, 0) then "Noon" else if [time] > #time(16, 0, 0) then "Evening" else "Night")
```

Bi Data Modeling

Fact and Dimension in Datasheet

Dimension Table:

A dimension table typically stores descriptive information, such as categories, attributes, or hierarchies, that provide context to the data in a data warehouse. Dimensions are often used to filter, group, and navigate data, offering a framework for meaningful analysis.

Fact Table:

fact table contains quantitative data, also known as measures or metrics, and serves as the central repository for key performance indicators (KPIs) and numerical information. Fact tables are linked to dimension tables through keys, forming a relationship that allows users to analyze and understand data in a multidimensional manner.

Difference between Fact and Dimension Table

List of fact and dimension table

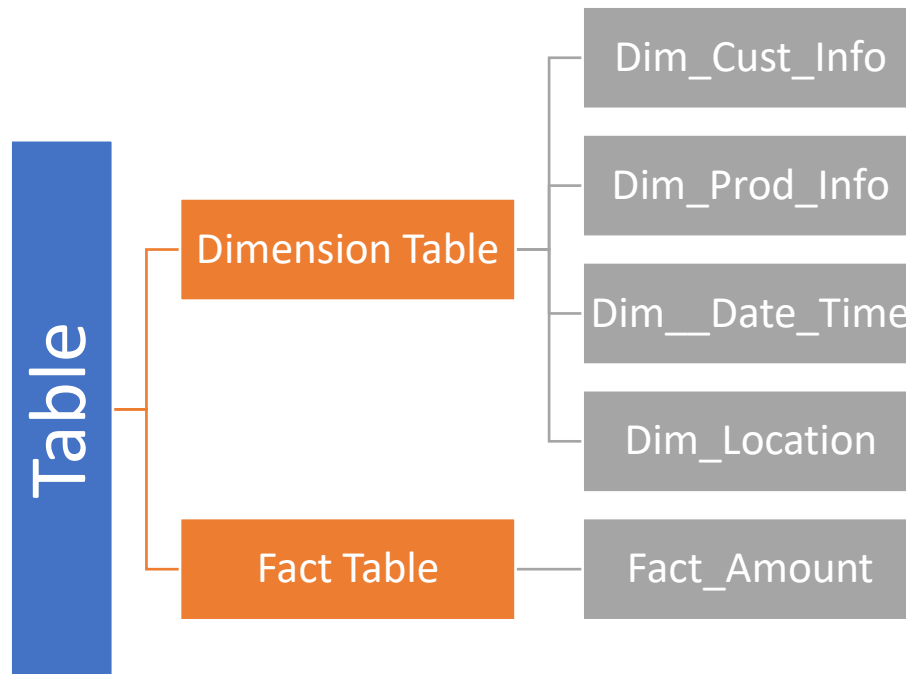


Figure-47. Fact and dimension table

Making of fact and dimension table

1. Dimension Dim_Cust_Info

The “Dim_Cust_Info” table contains the following columns -

- a) Index
- b) Customer Id
- c) Customer Name
- d) Customer E mail
- e) Customer E mail Domain
- f) Customer Gender
- g) Customer Ip

Queries [2]	= Table.SelectColumns("#Reordered Columns2",{ "Index", "Customer Id", "Customer Name", "Customer E					
E-Commerce Dataset	1 ² 3 Index	1 ² 3 Customer Id	A ⁸ Customer Name	A ⁸ Customer E mail	A ⁸ Customer G	
Dim_Cust_Info	1	1	4070 Roberta Lesch	Rodrick_Kassulke88@gmail.com	Female	
	2	2	2530 Adaline Hoeger	Vicky93@yahoo.com	Female	
	3	3	2697 Yesenia Hahn	Linda48@gmail.com	Male	
	4	4	2405 Fern Stark	Eriberto5@yahoo.com	Female	
	5	5	4394 Ronaldo Bashirian	Nicole56@hotmail.com	Male	
	6	6	2013 Moses Runolfsdottir	Polly99@hotmail.com	Male	
	7	7	396 Jared Purdy	Nicholaus77@hotmail.com	Female	
	8	8	4151 Minerva O'Kon	Daphne_Kessler@yahoo.com	Female	
	9	9	2987 Shana Beier	Valentine89@gmail.com	Female	
	10	10	26 Tristin Bogan	Jaylen15@hotmail.com	Female	
	11	11	4205 Bernard West	Jakob_Wintheiser@gmail.com	Male	
	12	12	1462 Rodrigo Swift	Jerome.VonRueden30@hotmail.com	Female	
	13	13	705 Ena Roberts	Cornelius.Lakin88@hotmail.com	Female	
	14	14	2388 Miles McDermott	Joshuah_Cruickshank97@hotmail.com	Male	
	15	15	4303 Rosalia Graham	Emory21@yahoo.com	Female	
	16	16	4269 Olin Blanda	Chyna.Skiles@hotmail.com	Female	
	17	17	2822 Rick Kunze	Reggie.Ruecker@yahoo.com	Female	

Figure-48: Dimension Dim_Cust_Info Table

= Table.SelectColumns("#Reordered Columns2",{ "Index", "Customer Id", "Customer Name", "Customer E mail", "Customer Gender", "Customer Ip", "Customer E mail Domain"})

Dimension Dim_Prod_Info

The “Dim_Prod_Info” table contains the following columns-

- Index
- Product Category
- Product Name

Queries [3] < X ✓ fx = Table.SelectColumns("#Reordered Columns2",{ "Index", "Product Name", "Product Category"})

123 Index	APC Product Name	APC Product Category
1	1 Hat	Movies
2	2 Cheese	Health
3	3 Chips	Sports
4	4 Chair	Beauty
5	5 Chicken	Health
6	6 Salad	Health
7	7 Keyboard	Health
8	8 Gloves	Music
9	9 Pants	Toys
10	10 Keyboard	Baby
11	11 Chair	Music
12	12 Keyboard	Music
13	13 Chair	Electronics
14	14 Tuna	Shoes
15	15 Soap	Music

Figure-49: Dimension Dim_Prod_Info

```
= Table.SelectColumns("#Reordered Columns2",{ "Index", "Product Name", "Product Category"})
```

Dimension Dim_Location

The “Dim_Location” table contains the following columns

- Index
- Customer Country
- Customer Continent

Queries [4] < X ✓ fx = Table.SelectColumns("#Reordered Columns2",{ "Index", "Customer Country", "Customer Continent"})

123 Index	APC Customer Country	APC Customer Continent
1	1 Seychelles	Africa
2	2 Qatar	Asia
3	3 Cameroon	Africa
4	4 Guadeloupe	North America
5	5 Swaziland	Africa
6	6 Costa Rica	North America
7	7 Kuwait	Asia
8	8 Kazakhstan	Asia
9	9 Andorra	Europe
10	10 Tunisia	Africa
11	11 Hungary	Europe
12	12 Luxembourg	Europe
13	13 Djibouti	Africa
14	14 Guinea	Africa

Figure-50: Dimension Dim_Location

```
= Table.SelectColumns("#Reordered Columns2",{ "Index", "Customer Country", "Customer Continent"})
```

Dimension Dim_Date_Time

The “Dim_Date_Time” table contains the following columns

- a) Index
- b) Order Time
- c) Order Day
- d) Order Month
- e) Order Year

	1 ² 3 Index	Order Time	1 ² 3 Order Day	A ^B C Order Month
1	1	13:43:00	1	February
2	2	12:25:00	11	February
3	3	20:14:00	25	September
4	4	13:13:00	30	June
5	5	22:50:00	28	September
6	6	23:15:00	30	December
7	7	17:56:00	8	June
8	8	21:34:00	4	May
9	9	20:15:00	2	April
10	10	22:57:00	24	June
11	11	19:56:00	30	February
12	12	11:11:00	12	January
13	13	22:51:00	19	June
14	14	12:54:00	11	November
15	15	10:40:00	11	October
16	16	15:58:00	10	April

Figure-51: Dimension Dim_Date_Time

```
= Table.SelectColumns("#Reordered Columns2",{ "Index", "Order Time", "Order Day",  
"Order Month", "Order Year"})
```

Fact Fact_Amount

The “Fact_Amount” table contains the following columns

- a) Index
- b) sale Price
- c) discount Per Quantity
- d) Quantity Sold
- e) Cost Of Good
- f) Product Price

Queries [5]

✓

fx

= Table.SelectColumns(#"Removed Columns",{ "Index", "Product Price", "Cost Of Good",

Fact_Amount

Dim_Cust_Info

Dim_Prod_Info

Din_Location

Dim_Date_Time

123 Index	123 Product Price	1.2 Cost Of Good	123 Quantity Sold
1	713	249.55	3
2	60	47.4	5
3	310	145.7	2
4	468	149.76	1
5	360	140.4	6
6	190	119.7	5
7	860	576.2	2
8	95	51.3	2
9	188	52.64	2
10	915	356.85	1
11	180	144	8
12	326	273.84	5
13	265	124.55	7
14	162	64.8	1
15	642	526.44	5

Figure-52: Fact_Amount Table

= Table.SelectColumns(#"Removed Columns",{ "Index", "Product Price", "Cost Of Good",
"Quantity Sold", "discount Per Quantity", "sale Price"}))

File

Home

Transform

Add Column

View

Tools

Help

Close & Apply

Close

New Source

New Query

Recent Sources

Enter Data

Data source settings

Data Sources

Manage Parameters

Parameters

Refresh Preview

Query

Properties

Advanced Editor

Choose Columns

Manage Columns

Remove Columns

Keep Rows

Reduce Rows

Remove Rows

Sort

Split Column

Group By

Data

Tra

Queries [5]

<

Figure-53: Saving of Dimension and Fact Table

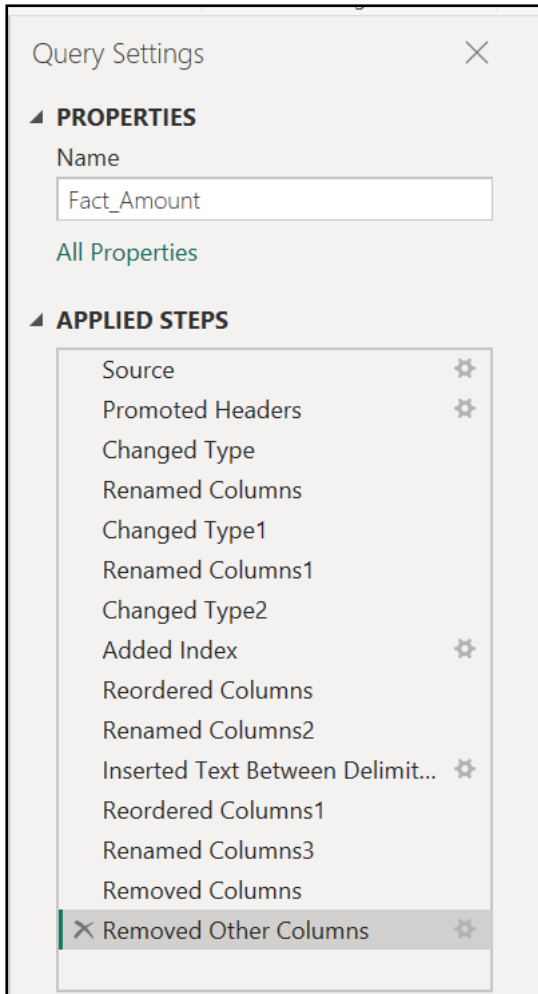


Figure-54: Applied step of data transformation



Figure-55: Loading of Dimension and Fact Table

List of Fact and Dimensions Tables

The list of all fact and dimension tables can be seen in right-top side of the power-bi screen. Here in the following image, the list of fact and dimension can be seen.

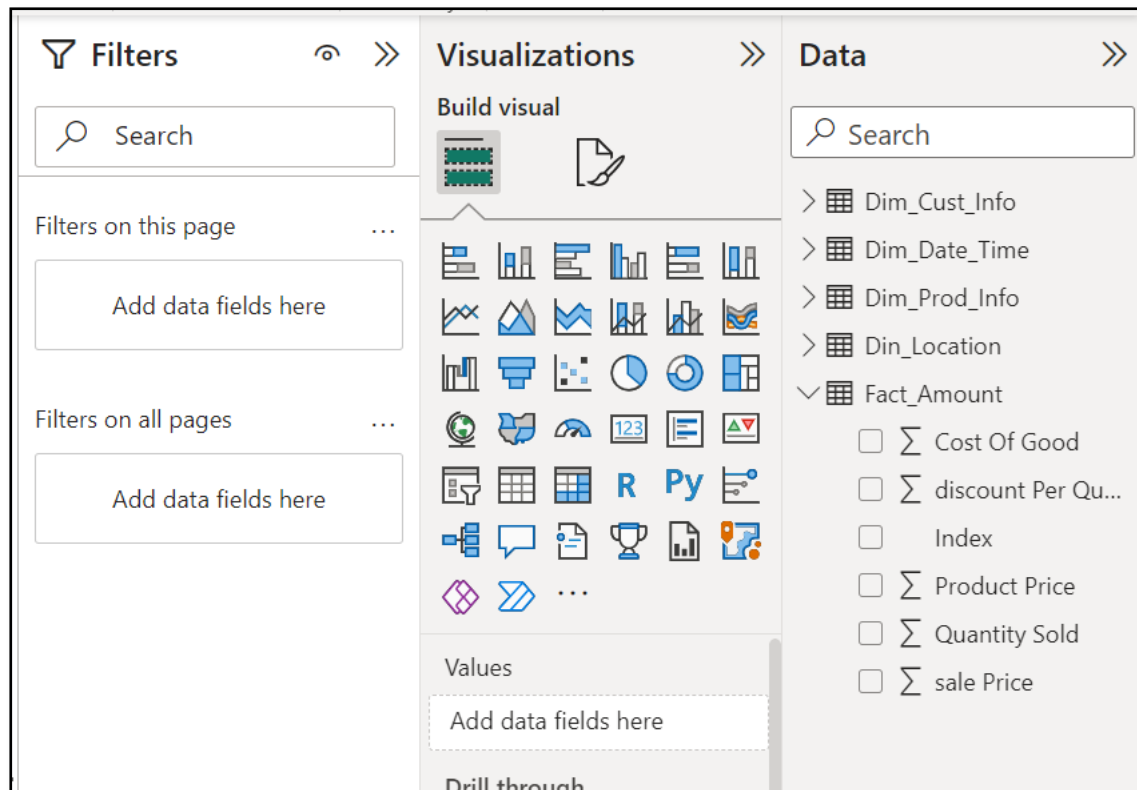


Figure-56: List of fact and dimensions

Data models and relationships

To visualize the data in power-bi, first the relationship between the fact and dimension should be developed.

The relationship developed here, is based on the “Star-schema”.

Star Schema [1:1 relationship]

- The Star simplifies querying and reporting, making it easier for analysts to retrieve and analyze information.

Manage Relationship

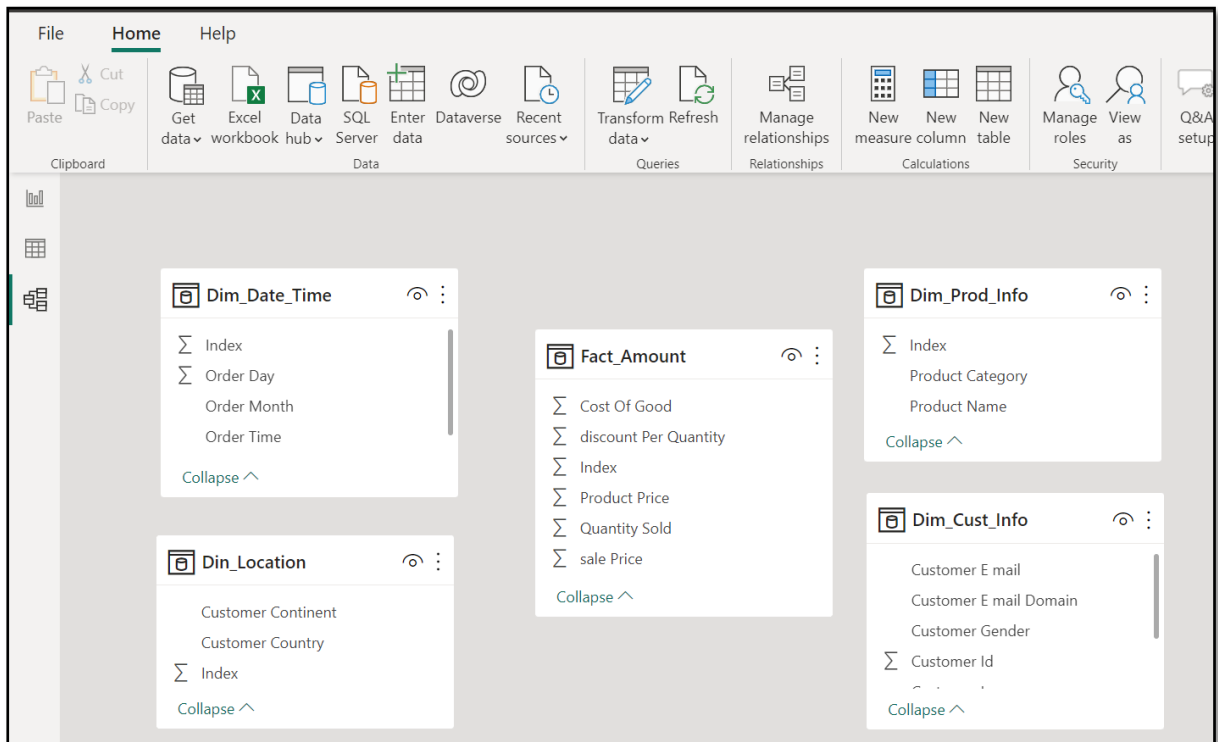


Figure-57: Manage Relationship Option

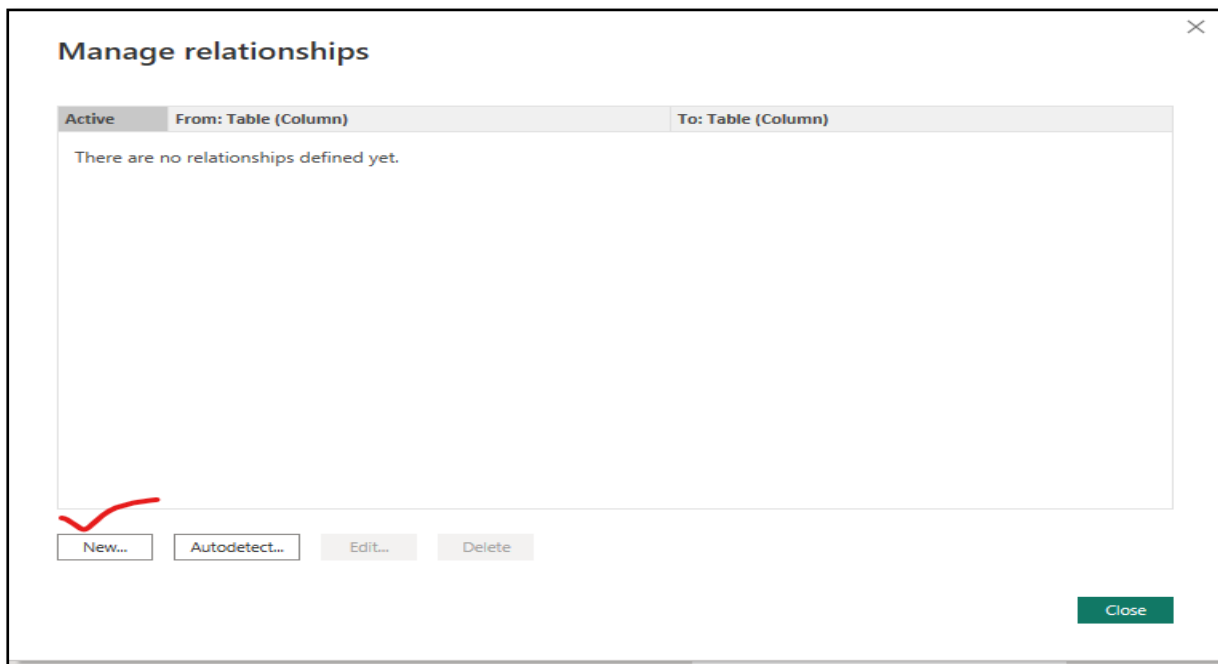


Figure-58: Manage Relationship pop up

×

Create relationship

Select tables and columns that are related.

Fact_Amount

Product Price	Cost Of Good	Quantity Sold	discount Per Quantity	sale Price	Index
968	358.16	1	0.08	890.56	98
955	544.35	1	0.08	878.6	219
211	67.52	1	0.08	194.12	252

Dim_Cust_Info

Index	Customer Id	Customer Name	Customer E mail	Customer Gender	Customer Ip	Custor
19	235	Vernie Labadie	Ima_Walker@yahoo.com	Male	68.205.51.63	yahoo
37	1126	Nickolas Rau	Damian_Heaney@yahoo.com	Male	49.16.156.200	yahoo
39	2288	Isac Morar	Cristian_Parker@yahoo.com	Male	141.120.155.161	yahoo

Cardinality

Cross filter direction

One to one (1:1)

Both

☒ Make this relationship active
 ☐ Assume referential integrity

OK

Cancel

Figure-59: Create Relationship b/w Fact_Amount & Dim_Cust_Info

×

Create relationship

Select tables and columns that are related.

Fact_Amount

Product Price	Cost Of Good	Quantity Sold	discount Per Quantity	sale Price	Index
968	358.16	1	0.08	890.56	98
955	544.35	1	0.08	878.6	219
211	67.52	1	0.08	194.12	252

Dim_Prod_Info

Index	Product Name	Product Category
16	Towels	Industrial
21	Pizza	Industrial
25	Tuna	Industrial

Cardinality

Cross filter direction

One to one (1:1)

Both

☒ Make this relationship active
 ☐ Assume referential integrity

OK

Cancel

Figure-60: Create Relationship b/w Fact_Amounts & Dim_Prod_Info

×

Create relationship

Select tables and columns that are related.

Fact_Amount

Product Price	Cost Of Good	Quantity Sold	discount Per Quantity	sale Price	Index
968	358.16	1	0.08	890.56	98
955	544.35	1	0.08	878.6	219
211	67.52	1	0.08	194.12	252

Dim_Date_Time

Index	Order Time	Order Day	Order Month	Order Year
100	16:55:00	2	February	2018
132	10:14:00	8	February	2018
200	17:48:00	9	February	2018

Cardinality

One to one (1:1)

Cross filter direction

Both

☒ Make this relationship active
 ☐ Assume referential integrity

OK

Cancel

Figure-61: Create Relationship b/w Fact_Amounts & Dim_Date_Time

×

Create relationship

Select tables and columns that are related.

Fact_Amount

Product Price	Cost Of Good	Quantity Sold	discount Per Quantity	sale Price	Index
968	358.16	1	0.08	890.56	98
955	544.35	1	0.08	878.6	219
211	67.52	1	0.08	194.12	252

Din_Location

Index	Customer Country	Customer Continent
119	Reunion	Africa
513	Reunion	Africa
1165	Reunion	Africa

Cardinality

One to one (1:1)

Cross filter direction

Both

☒ Make this relationship active
 ☐ Assume referential integrity

OK

Cancel

Figure-62: Create Relationship b/w Fact_Amount & Dim_Location

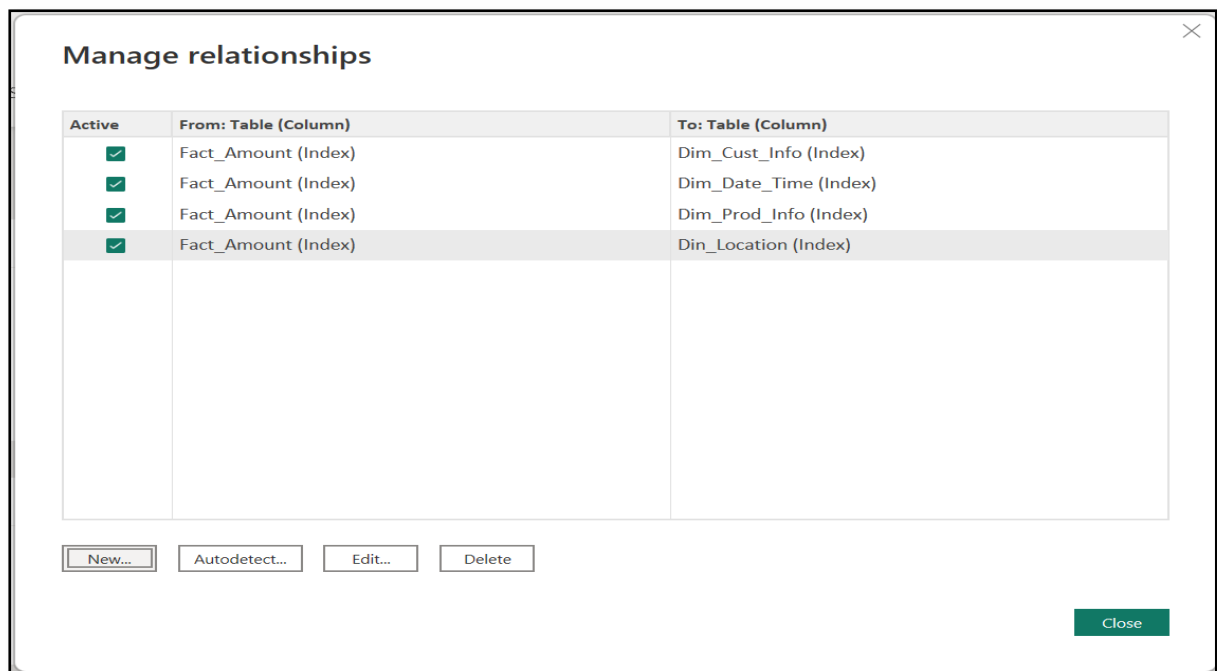


Figure-63: View of Relationship

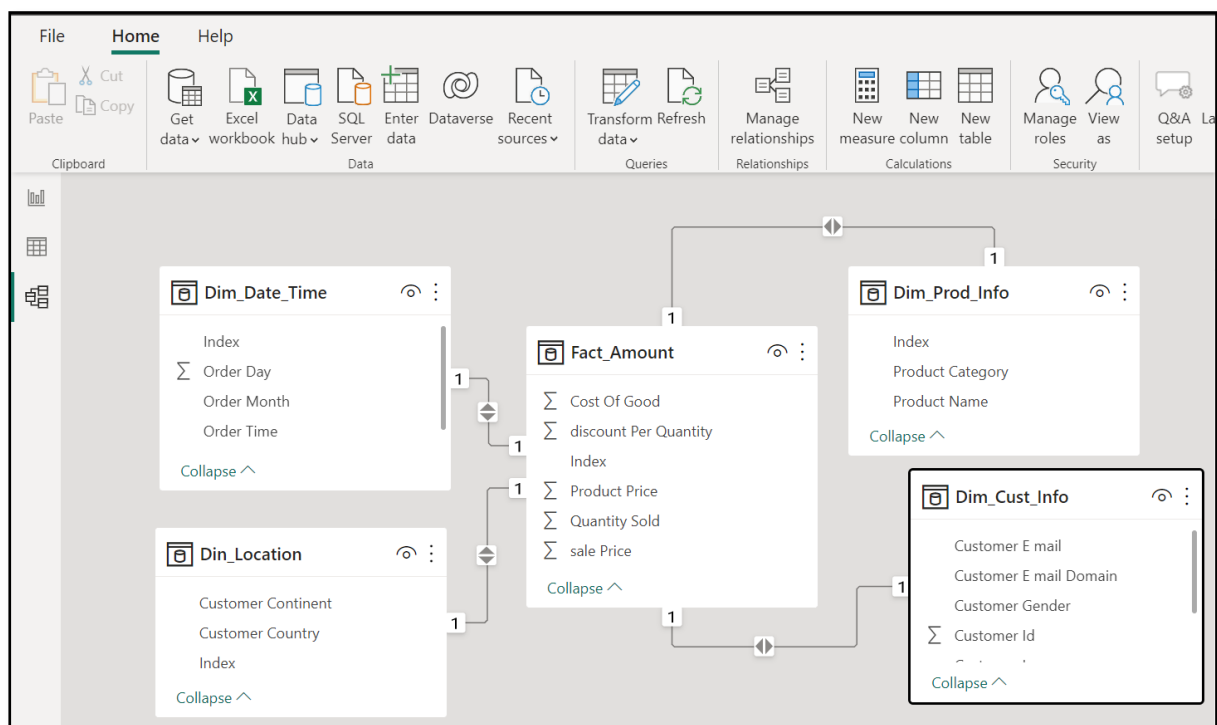


Figure-64: View of Relationship b/w Fact and Dimension Table

Data Visualization

DAX Command

S. No.	Measure Name	DAX Command
1.	Total Africa Order	Total Africa Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"Africa"))
2.	Total Antarctica Order	Total Antarctica Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"Antarctica"))
3.	Total Asia Order	Total Asia Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"Asia"))
4.	Total Europe Order	Total Europe Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"Europe"))
5.	Total South America Order	Total South America Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"South America"))
6.	Total Oceania Order	Total Oceania Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"Oceania"))
7.	Total North America Order	Total North America Order = CALCULATE(COUNT('Dim_Location'[Customer Continent]),CONTAINSSTRING('Dim_Location'[Customer Continent],"North America"))
8.	Total Yahoo domain	Total Yahoo domain = CALCULATE(COUNT('Dim_Cust_Info'[Customer E mail Domain]),CONTAINSSTRING('Dim_Cust_Info'[Customer E mail Domain],"Yahoo"))

9.	Total Hotmail domain	Total Hotmail domain = CALCULATE(COUNT('Dim_Cust_Info'[Customer E mail Domain]),CONTAINSSTRING('Dim_Cust_Info'[Customer E mail Domain],"Hotmail"))
10.	Total Gmail domain	Total Gmail domain = CALCULATE(COUNT('Dim_Cust_Info'[Customer E mail Domain]),CONTAINSSTRING('Dim_Cust_Info'[Customer E mail Domain],"gmail"))
11.	First Product Category max per Net Profit	First Product Category max per Net Profit = MAXX(KEEPFILTERS(VALUE('Fact_Amount'[Net Profit])), CALCULATE(MIN('Dim_Prod_Info'[Product Category])))
12.	Net Profit max per Product Category	Net Profit max per Product Category = MAXX(KEEPFILTERS(VALUE('Dim_Prod_Info'[Product Category])), CALCULATE(SUM('Fact_Amount'[Net Profit])))
13.	Total Female Customers	Total Female Customers = CALCULATE(COUNT('Dim_Cust_Info'[Customer Gender]),CONTAINSSTRING('Dim_Cust_Info'[Customer Gender],"Female"))

Adding Canvas Background

- In Power BI, the canvas background refers to the background area of a report or dashboard where visualizations, charts, and other elements are placed.

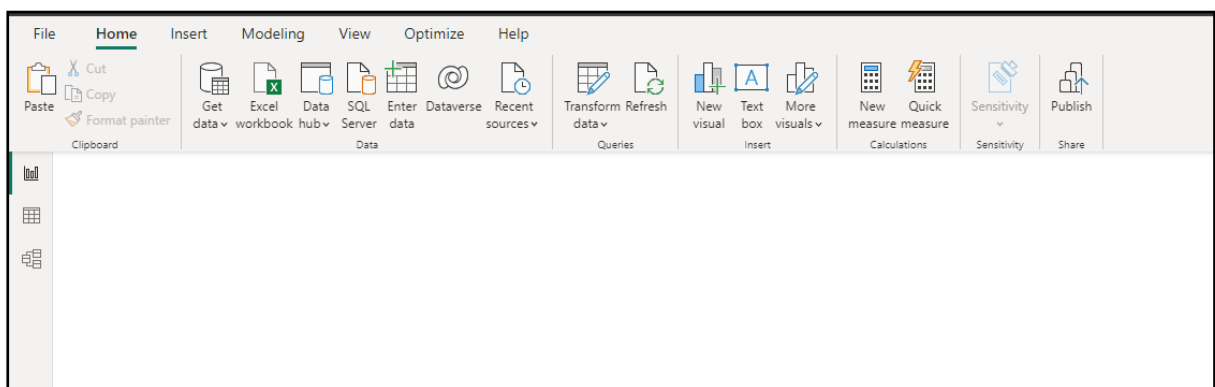


Figure-65: View of Canvas Background

Insert label cards

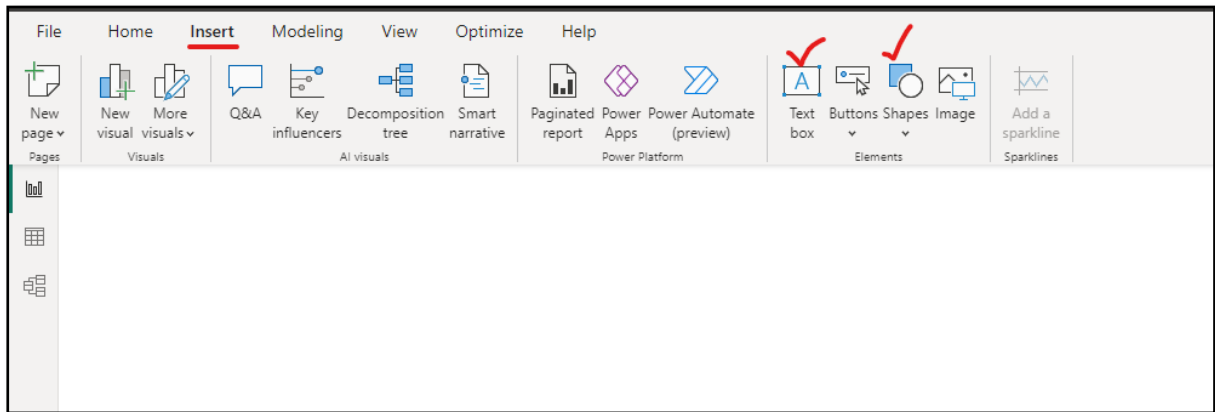


Figure-66: Label-Card Option

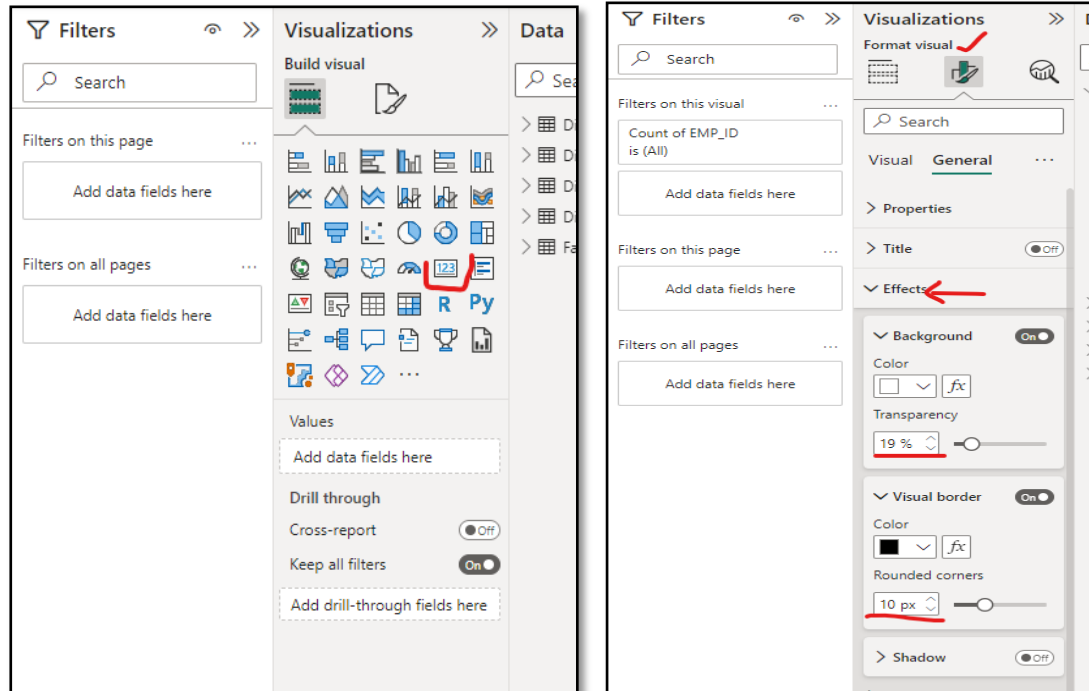


Figure-67: Format & Icon of Card

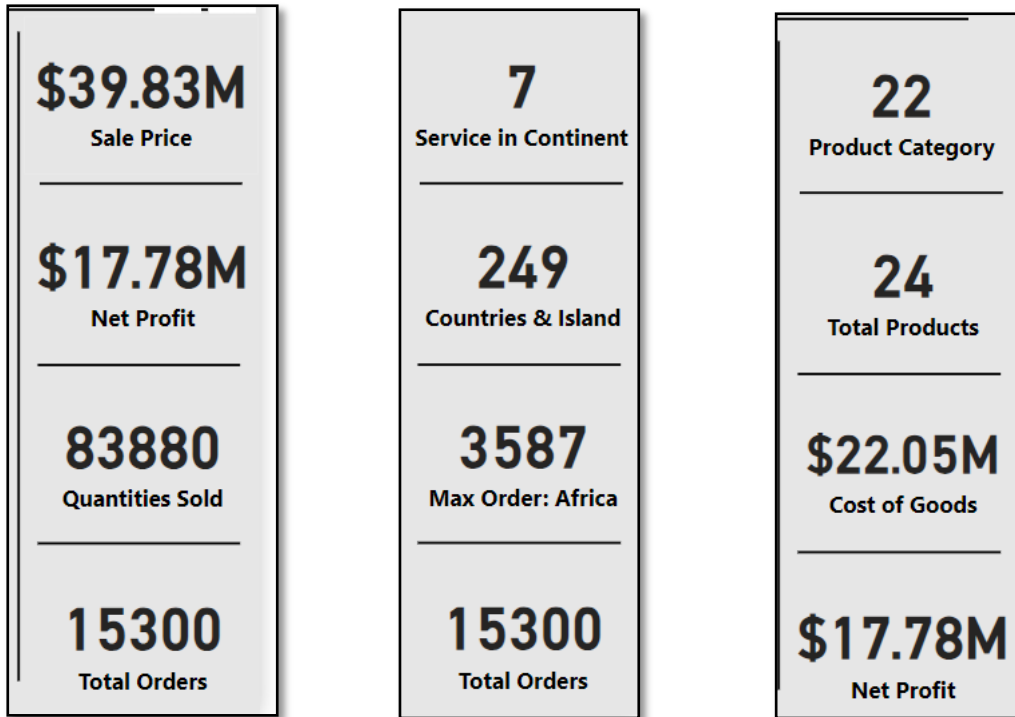


Figure-68: View of Label-Card 1

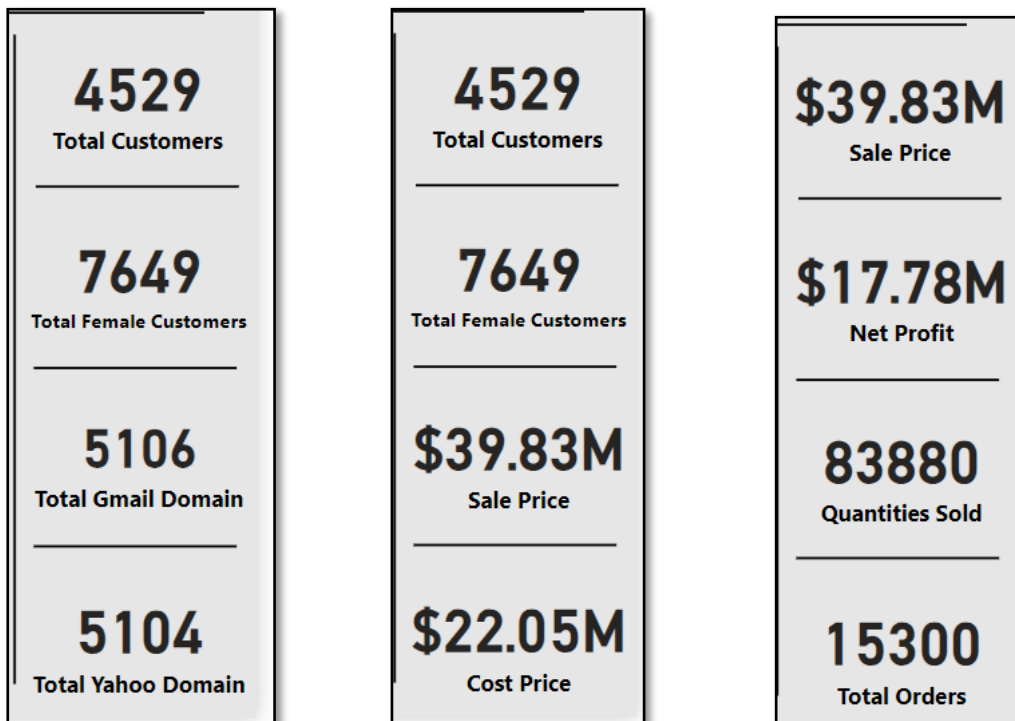


Figure-69: View of Label-Card 2

Buttons and bookmarks

The button on the analysis page is given to switch between the key influencer and decomposition tree.

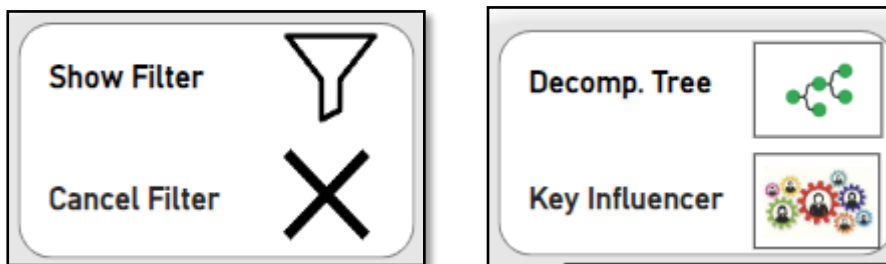


Figure-70: View of buttons



Figure-71: Working of buttons 'cancel slicer'

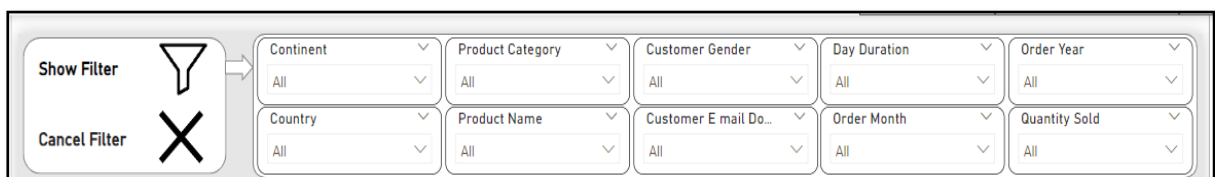


Figure-72: Working of buttons 'show slicer'

The following bookmark format is set to display between both.

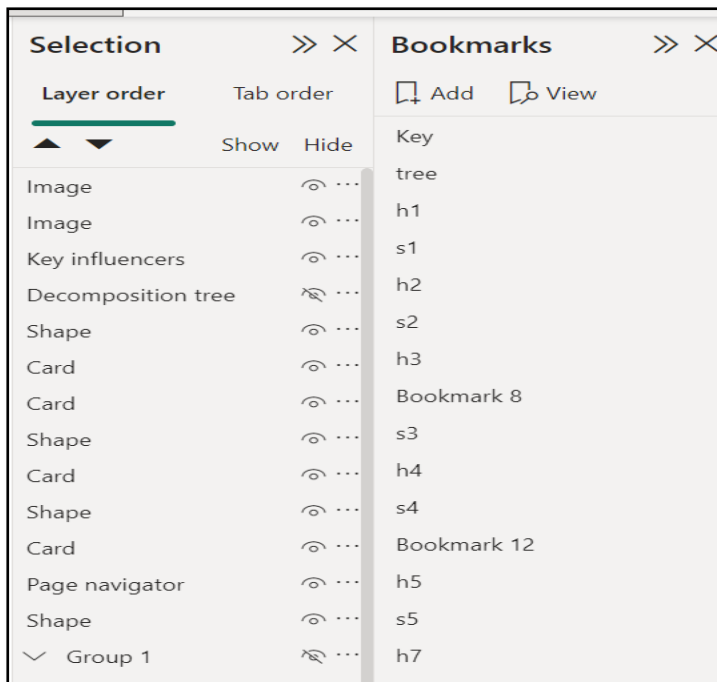


Figure-73. View of Bookmarks and selection

Page navigation

The page navigation button has following buttons:

1. Revenue & Time
2. Revenue & Location
3. Revenue & Product
4. Revenue & Customer
5. Analysis: Popular Product
6. Analysis
7. Power BI QnA

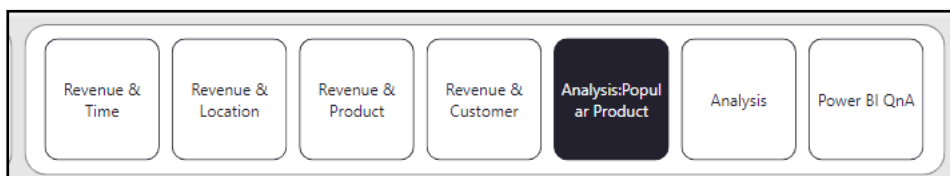


Figure-74: Page Navigation Buttons

[END]