

# ***From Data to Decisions***

## **A Journey Through the Supply Chain**

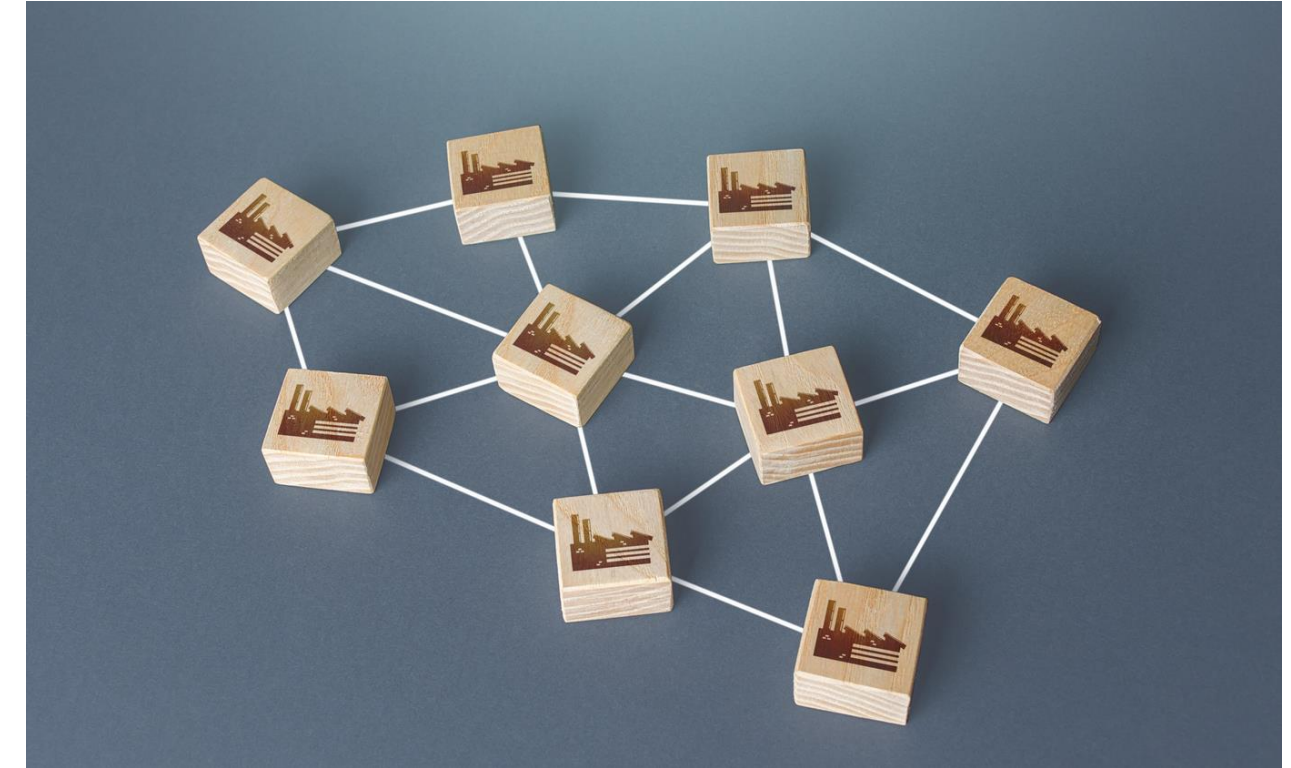
**AST-DAT-GIE**

**DEPI Graduation Project**



# Why Supply Chain Analysis?

We chose supply chain analysis because it is a crucial component for organizations aiming to optimize operations. As supply chains grow more complex in global markets, accurate analysis becomes essential for improving efficiency, reducing costs, and managing risks. this project , this one offers a unique opportunity to explore how data can enhance customer experience and support data-driven decision-making.





# Analysis & Prediction Questions

- 1-What is the total sales amount generated?**
- 2-How much total discount has been applied?**
- 3-What is the total profit earned?**
- 4-What is the average sales value per order?**
- 5-Which payment methods are most commonly used for sales?**
- 6-Which customer segments contribute the most to sales?**
- 7-Which customer segment generates the highest order profit?**
- 8-Which countries have the highest profit per order?**
- 9-Which product categories are generating the most sales?**



# Analysis & Prediction Questions



- 10-Which products are the most profitable based on order profit?**
- 11-Which cities have the highest number of customer orders?**
- 12-What is the distribution of order statuses ?**
- 13-Which countries have the highest number of suspected fraudulent orders?**
- 14-Which countries have the highest customer orders?**
- 15-Which states have the most customer orders?**
- 16-Which customers are suspected of fraudulent activities the most?**





# Analysis & Prediction Questions



**17-What are the different segments for delivery status ?**

**18-What shipping modes are most frequently used for orders**

**19-How do sales vary based on late delivery risk**

**20- Which shipping modes are the most profitable?**



# Explore & clean data by SQL



Connect to Database Engine

## SQL Server

Login | Connection Properties | Always Encrypted | Additional Connection Parameters

Server

Server type: Database Engine

Server name: .

Authentication: Windows Authentication

User name: DESKTOP-0TE4213\Electronica Care

Password:

☐ Remember password

Connection Security

Encryption: Mandatory

☒ Trust server certificate

Host name in certificate:

Connect Cancel Help Options <<

```
select * from [dbo].[DataCoSupplyChain] -- to show all table data

-- Delete useless Columns
ALTER TABLE [dbo].[DataCoSupplyChain]
DROP COLUMN [Customer_Password], -- Useless values
[Customer_Email], -- Useless values
[Order_Item_Cardprod_Id], -- duplicated with Product card ID
[Product_Description], -- Useless values
[Order_Profit_Per_Order], -- duplicated with benefit per order
[Product_Image], -- Useless values
[Product_Status], -- Useless values
[Order_Zipcode], -- Useless values
[Order_Customer_Id], -- duplicated with customer ID
[Order_Item_Total], -- duplicated with Sales per Customer
[Order_Item_Product_Price], -- duplicated with Product Price
[Category_Id] -- duplicated with Product Category ID
```



# Explore & clean data by SQL

```
-- Checking missing data in some necessary columns
SELECT * FROM [dbo].[DataCoSupplyChain] WHERE
[Sales_per_customer] IS NULL OR
[Delivery_Status] IS NULL OR
[Late_delivery_risk] IS NULL OR
[Category_Id] IS NULL OR
[Category_Name] IS NULL OR
[Customer_Id] IS NULL OR
[Department_Id] IS NULL OR
[Department_Name] IS NULL OR
[Order_Id] IS NULL OR
[Order_Item_Discount] IS NULL OR
[Order_Item_Discount_Rate] IS NULL OR
[Order_Item_Id] IS NULL OR
[Sales] IS NULL OR
[Order_Item_Total] IS NULL OR
[Product_Category_Id] IS NULL OR
[Product_Name] IS NULL OR
[Product_Price] IS NULL
```

```
-- Checking Dublication data
SELECT [Order_Id],[Order_Item_Id], COUNT(*) AS DuplicateCount
FROM [dbo].[DataCoSupplyChain]
GROUP BY [Order_Id],[Order_Item_Id]
HAVING COUNT(*) > 1;

-- Change Payment type 'payment' to Other
UPDATE [dbo].[DataCoSupplyChain]
SET [Type]= case
when [Type]='PAYMENT' then 'OTHER'
else [Type]
end;
```

77 %

Results Messages

Order_Id	Order_Item_Id	DuplicateCount
----------	---------------	----------------



# Analyze Data by SQL



```
-- Get Total Sales , total orders , Total Quanntaty , total profit
-- total Discount , AVG Sales , total Customers
SELECT CONCAT(ROUND((SUM([Sales])) / 1000000, 2), ' Million')
AS Total_Sales ,
COUNT(DISTINCT [Order_Id]) AS Total_Orders ,
Sum([Order_Item_Quantity]) AS Total_quantity ,
CONCAT(ROUND((SUM([Benefit_per_order])) / 1000000, 2), ' Million')
AS Total_Profit ,
CONCAT(ROUND((SUM([Order_Item_Discount])) / 1000000, 2), ' Million')
AS Total_Discount ,
ROUND ((SUM([Sales]) / count (DISTINCT [Customer_Id]) ), 2)
AS AVG_Sales_per_customer ,
COUNT(DISTINCT [Customer_Id]) AS Count_Of_Customers
FROM [dbo].[DataCoSupplyChain]
```

Results Messages

Total_Sales	Total_Orders	Total_quantity	Total_Profit	Total_Discount	AVG_Sales_per_customer	Count_Of_Customers
36.78 Million	65752	384079	3.97 Million	3.73 Million	1781.17	20652

```
--top 10 total sales , orders and customers per country
```

```
SELECT top 10[Order_Country],
CONCAT(ROUND((SUM([Sales])) / 1000, 2), ' K') AS Total_Sales ,
COUNT(DISTINCT [Order_Id]) AS Total_Orders , COUNT( DISTINCT [Customer_Id]) AS Customer_num
FROM [dbo].[DataCoSupplyChain]
GROUP BY [Order_Country]
ORDER BY ROUND((SUM([Sales])) / 1000, 2) DESC;
```

84 %

Results Messages

	Order_Country	Total_Sales	Total_Orders	Customer_num
1	Estados Unidos	4879.67 K	8270	6102
2	Francia	2879.94 K	4866	4245
3	México	2633.2 K	4395	3706
4	Alemania	2074.17 K	3518	3188
5	Australia	1694.62 K	3798	3586
6	Reino Unido	1612.09 K	2785	2582
7	Brasil	1594.32 K	2650	2399
8	China	1172.9 K	2616	2529
9	Italia	1072.18 K	1880	1785
10	India	962.4 K	2152	2094



# Analyze Data by SQL



```
--total sales , orders and customers per market
SELECT [Market],
CONCAT(ROUND((SUM([Sales])) / 1000, 2), ' K') AS Total_Sales ,
COUNT(DISTINCT [Order_Id]) AS Total_Orders , COUNT( DISTINCT [Customer_Id]) AS Customer_num
FROM [dbo].[DataCoSupplyChain]
GROUP BY [Market]
ORDER BY ROUND((SUM([Sales])) / 1000, 2) DESC;
```

```
--total sales , orders and customers per Order Region
SELECT [Order_Region],
CONCAT(ROUND((SUM([Sales])) / 1000, 2), ' K') AS Total_Sales ,
COUNT(DISTINCT [Order_Id]) AS Total_Orders , COUNT(DISTINCT [Customer_Id]) AS Customer_num
FROM [dbo].[DataCoSupplyChain]
GROUP BY [Order_Region]
ORDER BY ROUND((SUM([Sales])) / 1000, 2) DESC;
```

	Market	Total_Sales	Total_Orders	Customer_num
1	Europe	10872.4 K	18561	11657
2	LATAM	10277.6 K	17181	9325
3	Pacific Asia	8273.74 K	17577	13267
4	USCA	5066.53 K	8579	6256
5	Africa	2294.45 K	3854	3311

	Order_Region	Total_Sales	Total_Orders	Customer_num
1	Western Europe	5894.38 K	10010	7695
2	Central America	5665.71 K	9396	6564
3	South America	2960.88 K	4979	4131
4	Northern Europe	2155.83 K	3716	3340
5	Southern Euro...	2047.92 K	3543	3192
6	Oceania	2016.65 K	4362	4042
7	Southeast Asia	1932.5 K	4356	4101
8	Caribbean	1651.02 K	2806	2506

```
--top 10 total sales and orders per CAT
Select top 10 [Category_Name],
CONCAT(ROUND((SUM([Sales])) / 1000, 0), ' K') AS Total_Sales ,
COUNT(DISTINCT [Order_Id]) AS Total_Orders
FROM [dbo].[DataCoSupplyChain]
group by [Category_Name]
ORDER BY ROUND((SUM([Sales])) / 1000, 2) DESC;
```

	Category_Name	Total_Sales	Total_Orders
1	Fishing	6930 K	15164
2	Cleats	4432 K	20386
3	Camping & Hiking	4118 K	12299
4	Cardio Equipment	3695 K	11355
5	Women's Apparel	3148 K	17869
6	Water Sports	3114 K	13758
7	Men's Footwear	2892 K	18783
8	Indoor/Outdoor Games	2889 K	16623
9	Shop By Sport	1310 K	10136
10	Computers	663 K	442

# Analyze Data by SQL

```
--top 10 total sales and orders per Order Status
Select [Order_Status],
CONCAT(ROUND((SUM([Sales])) / 1000, 0), ' K') AS Total_Sales ,
COUNT(DISTINCT [Order_Id]) AS Total_Orders
FROM [dbo].[DataCoSupplyChain]
group by [Order_Status]
ORDER BY ROUND((SUM([Sales])) / 1000, 2) DESC;
```

84 %

Results Messages

	Order_Status	Total_Sales	Total_Orders
1	COMPLETE	12095 K	21716
2	PENDING_PAYMENT	8107 K	14382
3	PROCESSING	4504 K	7901
4	PENDING	4121 K	7321
5	CLOSED	4023 K	7249
6	ON_HOLD	1982 K	3624
7	SUSPECTED_FRAUD	826 K	1488
8	CANCELED	744 K	1367



# Analyze Data by Power BI



the last one (1) • Last saved: today at 12:43 AM

Home Insert Modeling View Optimize Help External tools

Cut Copy Format painter Clipboard

Get data Excel OneLake SQL Server Enter data Dataverse Recent sources Transform Refresh data New visual Text box

SQL Server database

Server ①

Database (optional)

Data Connectivity mode ①

☒ Import

☐ DirectQuery

Advanced options

OK Cancel

Home Help External tools

Cut Copy Format Comment Uncomment Find Replace Command palette Copilot (preview) Copilot

Run Update model with changes (0) Share feedback

Results Result 1 of 1 Copy

	DataCoSupplyChainDat...	DataCoSupplyChainDat...	DataCoSupplyChainDat...	DataCoSupplyChainDat...	DataCoSupplyChainDat...	DataCoSupplyChainDat...	DataCo
1	DEBIT	6	2	-679.97	399.98	Late delivery	
2	DEBIT	2	2	199.99	399.98	Shipping on time	
3	DEBIT	6	2	167.43	363.98	Late delivery	
4	DEBIT	6	2	176.39	359.98	Late delivery	
5	DEBIT	6	2	120.51	331.98	Late delivery	
6	DEBIT	6	2	171.07	363.98	Late delivery	
7	DEBIT	6	2	121.67	359.98	Late delivery	
8	DEBIT	5	2	120.51	331.98	Late delivery	
9	DEBIT	4	2	167.99	399.98	Late delivery	
10	DEBIT	4	2	29.1	387.98	Late delivery	
11	DEBIT	2	2	132.13	363.98	Shipping on time	
12	DEBIT	4	2	175.99	351.98	Late delivery	
13	DEBIT	4	2	39.32	347.98	Late delivery	
14	DEBIT	5	2	-42.5	339.98	Late delivery	
15	DEBIT	4	2	161.27	335.98	Late delivery	
16	DEBIT	4	2	81	299.99	Late delivery	

Query 1 +

# Analyze Data by Power BI

Power BI Desktop interface showing the DataCoSupplyChainDat... data source and the Calendar Table.

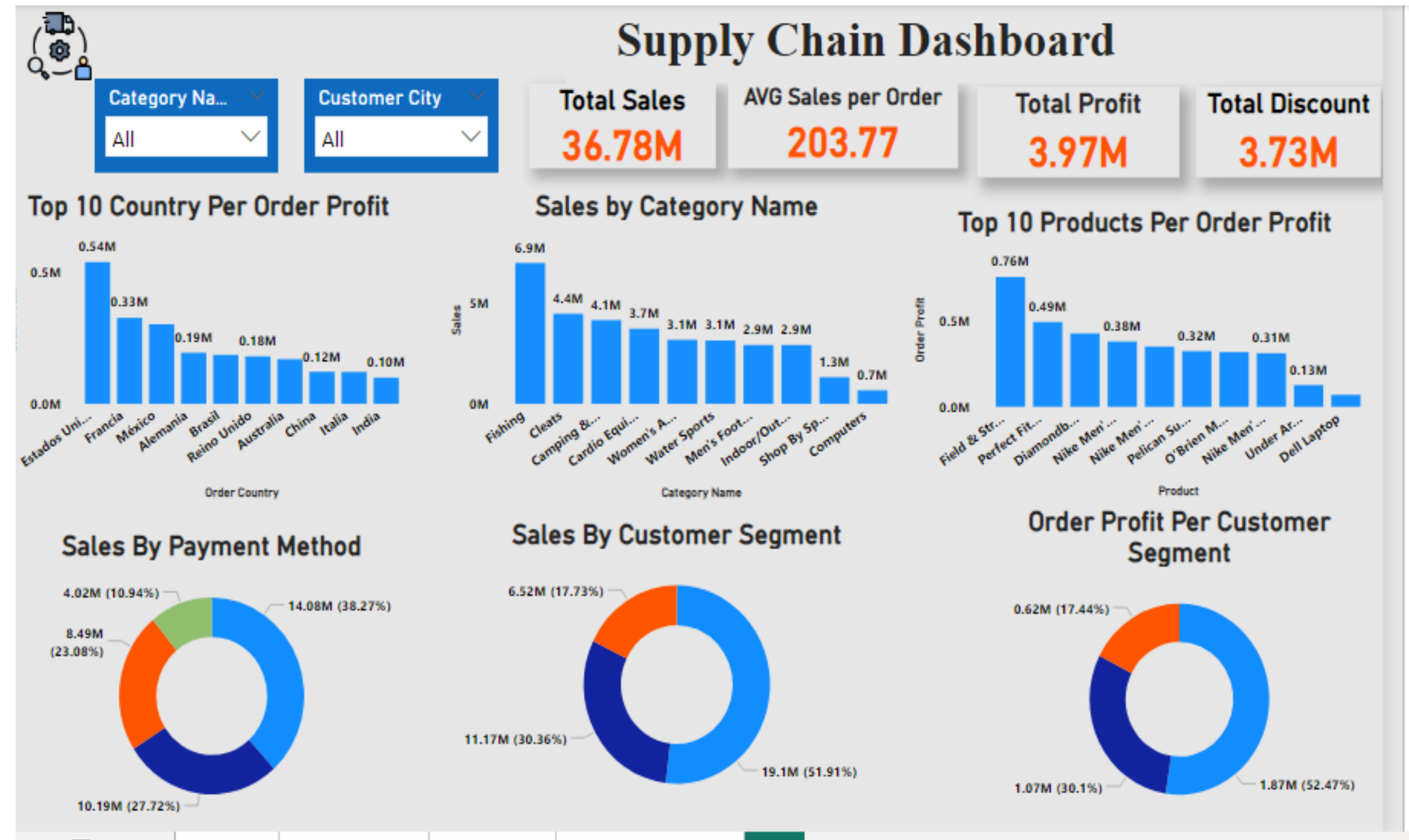
**DataCoSupplyChainDat... Fields:**

- Benefit per order
- Category Id
- Category Name
- Customer City
- Customer Country
- Customer Fname
- Customer Id
- Customer Lname
- Customer Segment

**Calendar Table Fields:**

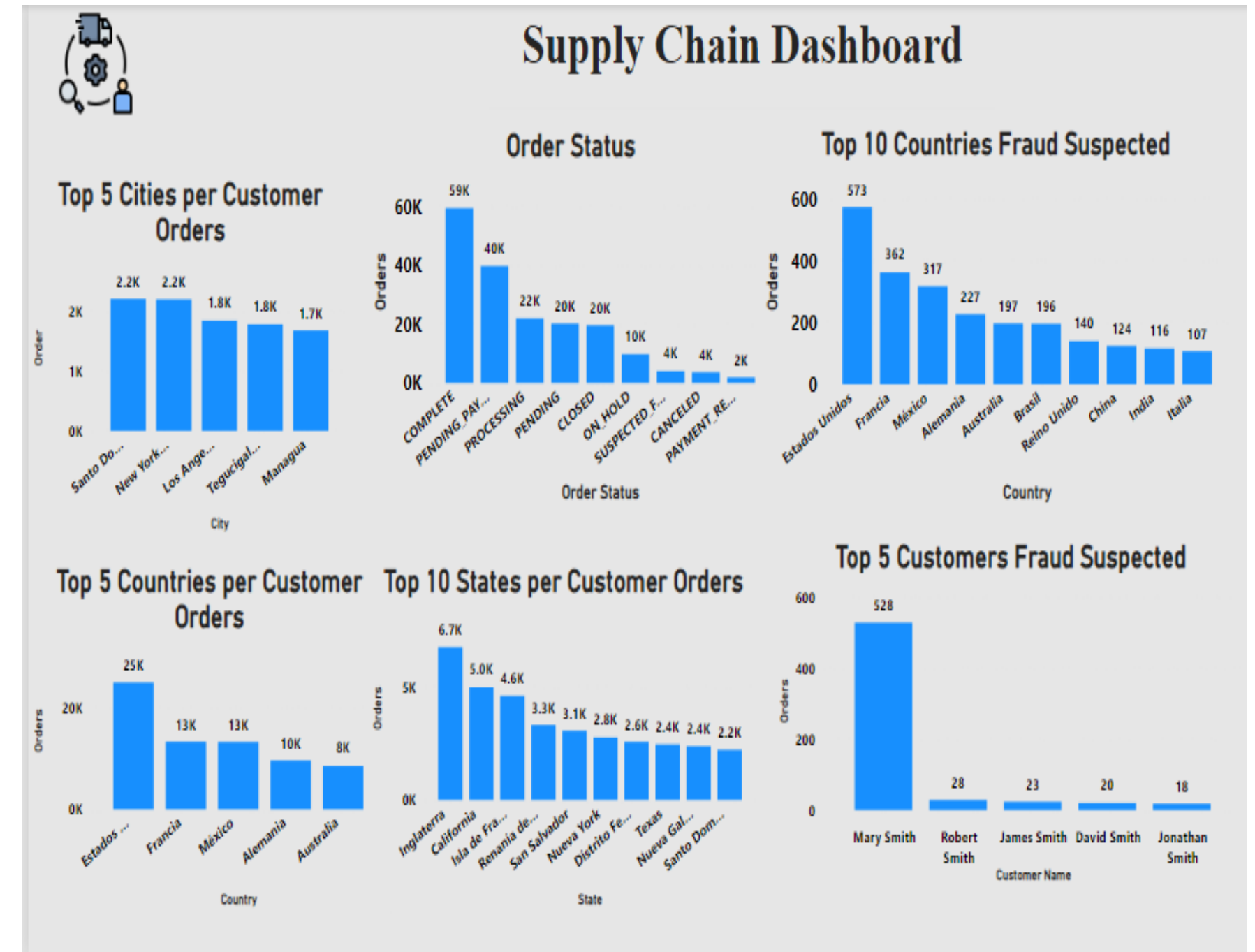
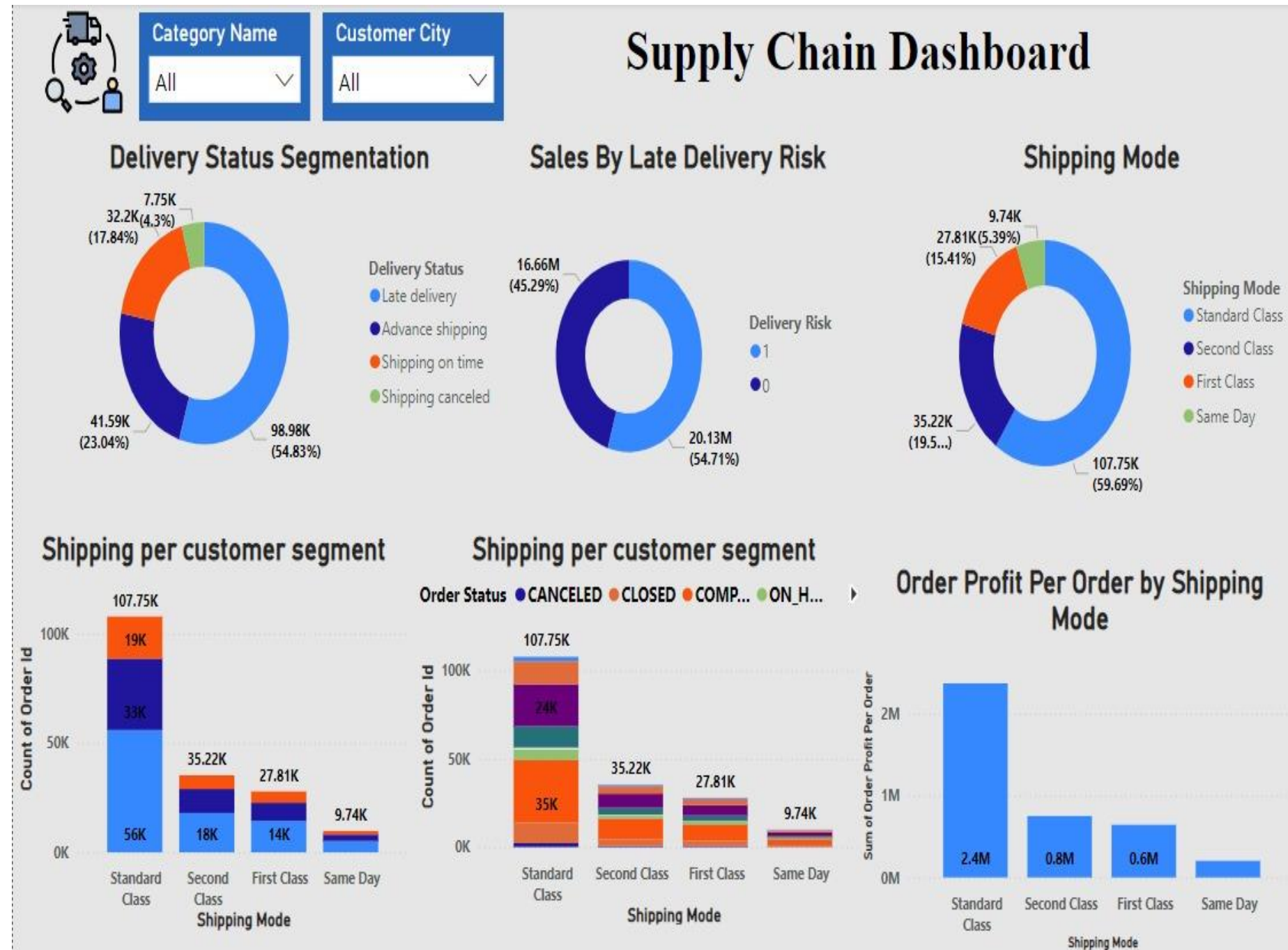
- Date
- month
- week
- year

Buttons: Cut, Copy, Get data, Excel workbook, OneLake data hub, SQL Server, Enter data, Dataverse, Recent sources, Transform data, Refresh data.

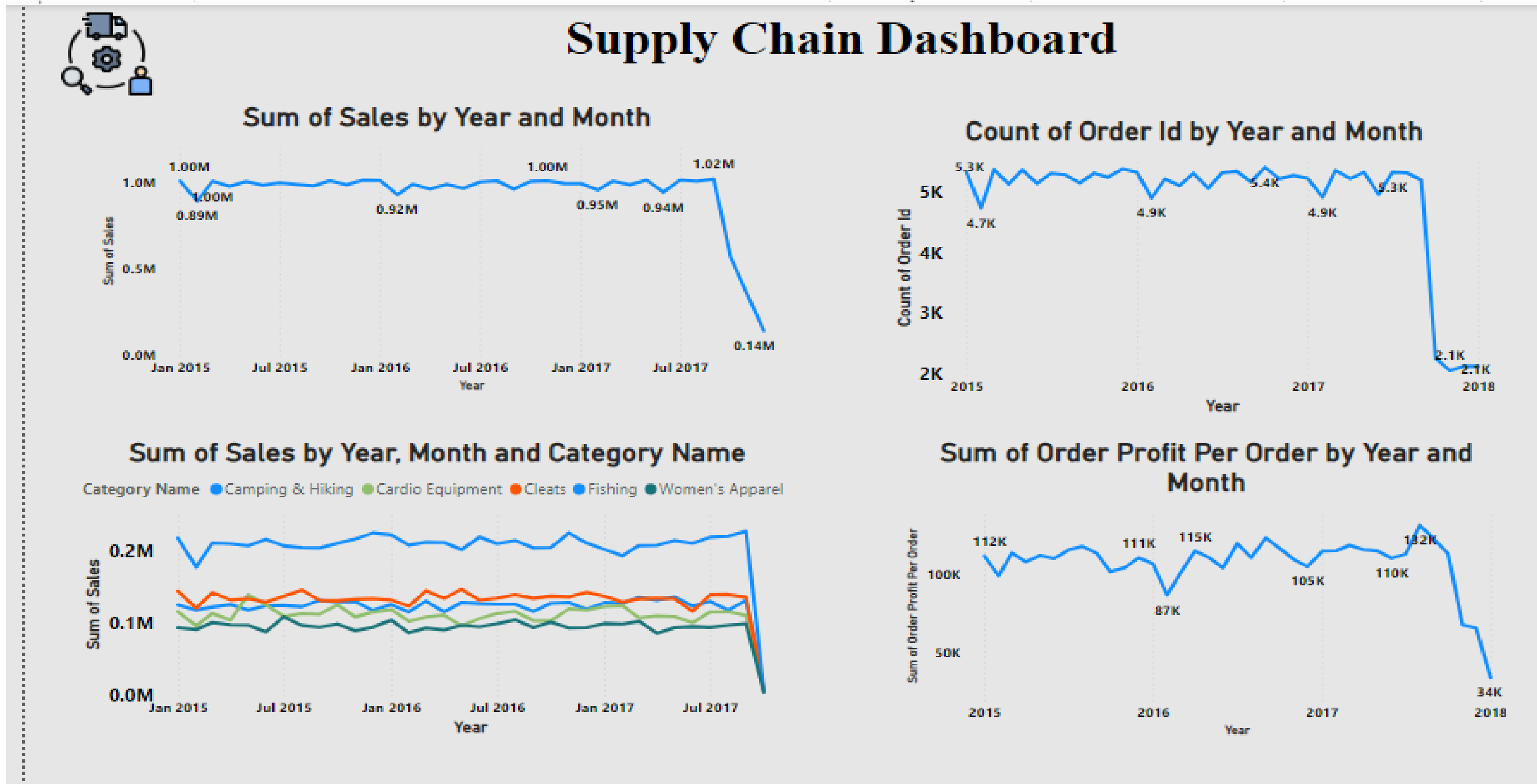




# Analyze Data by Power BI



# Analyze Data by Power BI



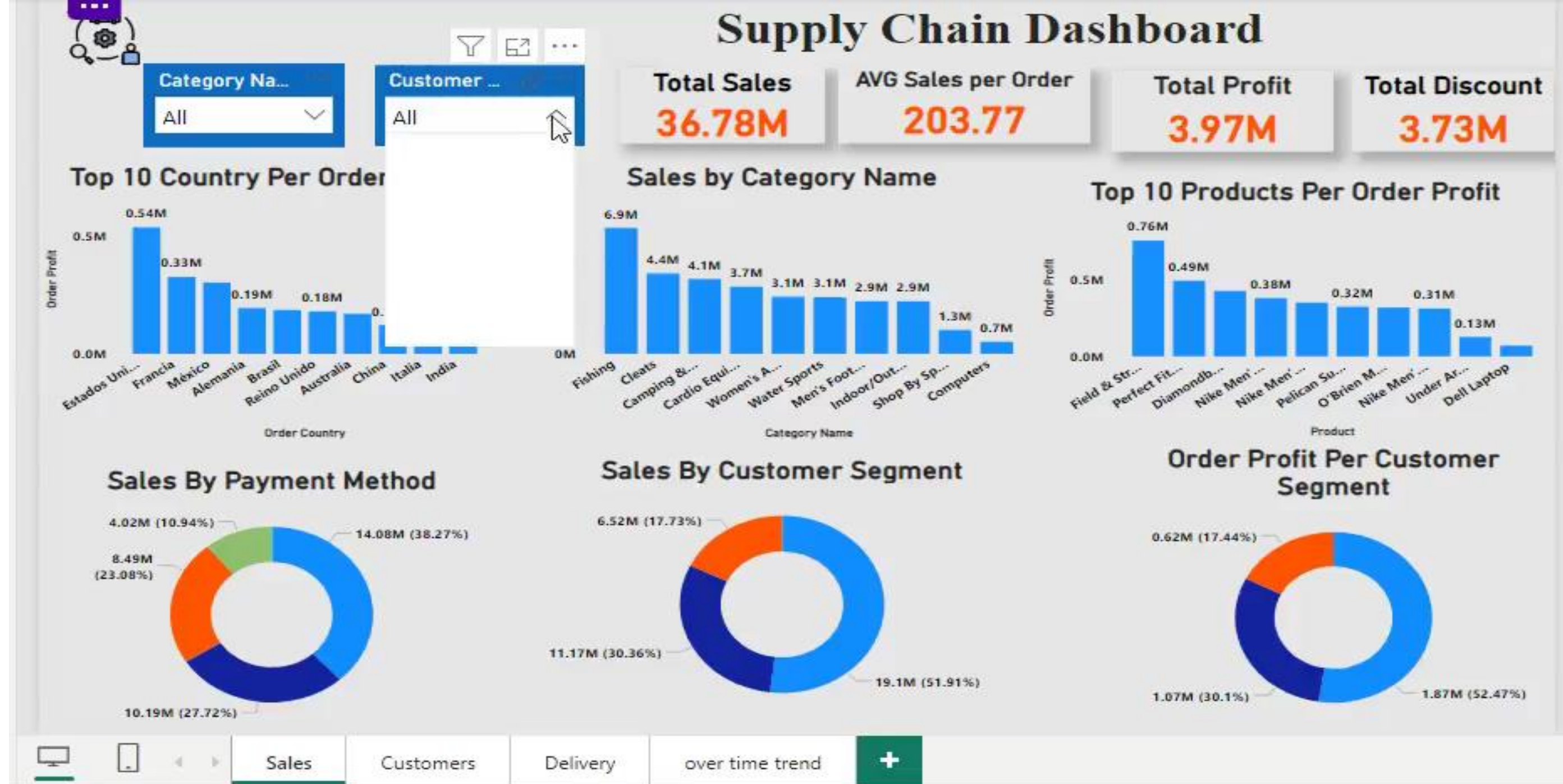


# Strategic Recommendations

- 1-Enhance Bank Transfer Payment Option**
- 2-Optimize Standard Shipping**
- 3-Focus on the Consumer Segment**
- 4-Reduce Delivery Delay Risk**
- 5-Expand Fraud Prevention Strategies**
- 6- Improve Shipping Performance by Mode**



# Related Video





# Our Team



**Khaled Waled**

**Taha Atef**

**Mohamed Abdelaal**

**Mohamed Ragheb**

**Asmaa Ahmed**

# Thank You

**Data Analysis AST-DAT-GIE**

**DEPI Graduation Project**

**Under Supervision Eng. Mohamed Ahmed**