# RETAIL COSTUMER ANALYSIS

## DATA VISUALIZATION & INTERPRETATION

**SURYANSH MISHRA**

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SURYANSH MISHRA

# INTRODUCTION

The Power BI dashboard constructed from this dataset features a user-friendly interface that enables to gain insights into various aspects of the business. By leveraging dynamic visualizations such as stacked column charts, pie charts, and line graphs, users can explore critical metrics related to sales performance, return rates, and customer demographics.

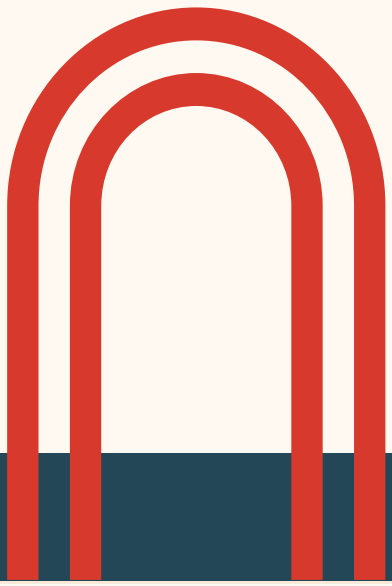
Key functionalities such as drill-down capabilities, slicers, and cross-filtering are integrated into the dashboard, enhancing interactivity and allowing users to delve deeper into the data. Users can filter data by year uncovering trends and patterns that inform strategic decision-making.

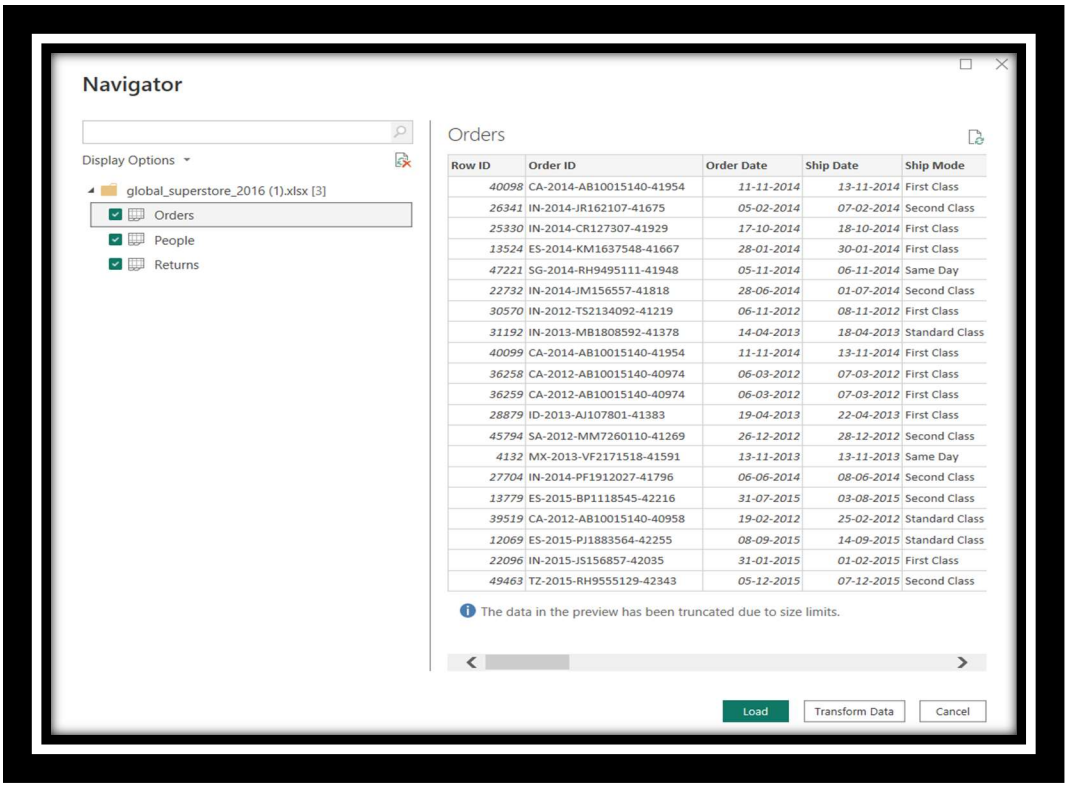
Overall, this dashboard serves as a powerful tool for analysing the Super Store dataset, enabling business leaders to make informed decisions based on comprehensive and real-time data insight

# DATASET EXPLANATION:

The dataset used in this report consists of three main tables: **Orders**, **Returns**, and **People**. Each table provides critical information that, when analyzed together, offers valuable insights into customer behavior, sales performance, and return rates in a retail context.

1. **Orders Table**: This table includes detailed information regarding customer orders, such as Order ID, Order Date, Sales, Quantity, and Product Category. Analysing this data enables businesses to understand sales trends, identify best-selling products, and evaluate overall revenue generation.
2. **Returns Table**: This table captures data on product returns linked to the corresponding Order ID. Understanding the reasons for returns is crucial for improving product quality and customer satisfaction. Analysing this data alongside the orders provides insights into return rates and their impact on sales performance.
3. **People Table**: The People table contains demographic information about customers, including their names and regions. This data allows for an examination of customer preferences and behaviour across different geographic areas, facilitating targeted marketing strategies and regional sales performance analysis.




Navigator
Display Options
global_superstore_2016 (1).xlsx [3]
Orders
People
Returns
Orders
Row ID | Order ID | Order Date | Ship Date | Ship Mode
40098 | CA-2014-AB10015140-41954 | 11-11-2014 | 13-11-2014 | First Class
26341 | IN-2014-JR162107-41675 | 05-02-2014 | 07-02-2014 | Second Class
25330 | IN-2014-CR127307-41929 | 17-10-2014 | 18-10-2014 | First Class
13524 | ES-2014-KM1637548-41667 | 28-01-2014 | 30-01-2014 | First Class
47221 | SG-2014-RH9495111-41948 | 05-11-2014 | 06-11-2014 | Same Day
22732 | IN-2014-JM156557-41818 | 28-06-2014 | 01-07-2014 | Second Class
30570 | IN-2012-TS2134092-41219 | 06-11-2012 | 08-11-2012 | First Class
31192 | IN-2013-MB1808592-41378 | 14-04-2013 | 18-04-2013 | Standard Class
40099 | CA-2014-AB10015140-41954 | 11-11-2014 | 13-11-2014 | First Class
36258 | CA-2012-AB10015140-40974 | 06-03-2012 | 07-03-2012 | First Class
36259 | CA-2012-AB10015140-40974 | 06-03-2012 | 07-03-2012 | First Class
28879 | ID-2013-AJ107801-41383 | 19-04-2013 | 22-04-2013 | First Class
45794 | SA-2012-MM7260110-41269 | 26-12-2012 | 28-12-2012 | Second Class
4132 | MX-2013-VF2171518-41591 | 13-11-2013 | 13-11-2013 | Same Day
27704 | IN-2014-PF1912027-41796 | 06-06-2014 | 08-06-2014 | Second Class
13779 | ES-2015-BP1118545-42216 | 31-07-2015 | 03-08-2015 | Second Class
39519 | CA-2012-AB10015140-40958 | 19-02-2012 | 25-02-2012 | Standard Class
12069 | ES-2015-PJ1883564-42255 | 08-09-2015 | 14-09-2015 | Standard Class
22096 | IN-2015-JS156857-42035 | 31-01-2015 | 01-02-2015 | First Class
49463 | TZ-2015-RH9555129-42343 | 05-12-2015 | 07-12-2015 | Second Class
The data in the preview has been truncated due to size limits.
Load
Transform Data
Cancel

# DATA TRANSFORMATIONS:

### #1. HANDLING MISSING VALUES

Checked for missing values in important columns and removed it using

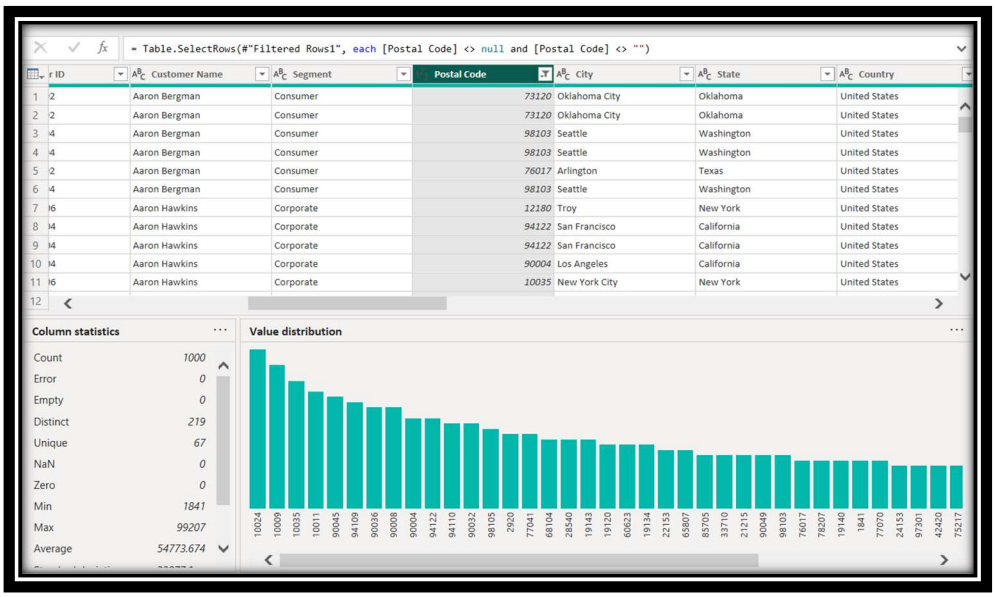
### #2.DATA TYPE STANDARDIZATION

Data types were standardized across all columns to ensure consistency, especially for numerical data and dates, allowing for accurate calculations and analysis.

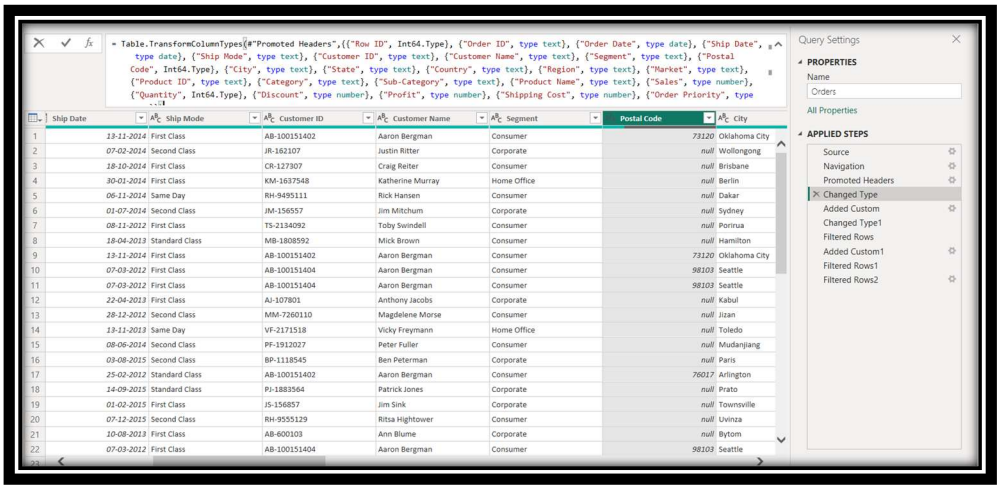
### #3. CREATING NEW COLOUMNS

Several new columns were created for more detailed analysis and to enhance the insights extracted from the dataset:

## #1. HANDLING MISSING VALUES




## #2. DATA TYPE STANDARDIZATION




## #3.CREATING NEW COLUMNS:

```
= Table.AddColumn(#"Changed Type", "Delivery Date", each ([Ship Date]-[Order Date]))
```

```
= Table.AddColumn(#"Filtered Rows", "Year", each Date.Year([Order Date]))
```

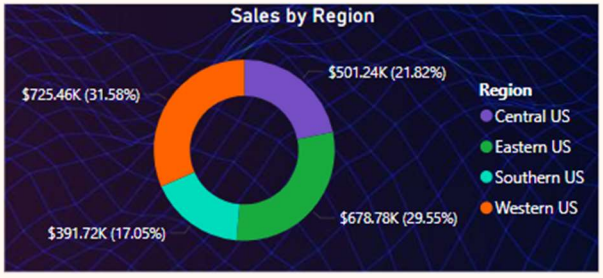
# VISUAL DATA

### 1. Stacked Column Chart: Returns and Sales by Region

This visualization compares the total sales and returns across different regions. By stacking the sales and returns data, users can quickly identify which regions have higher sales and which have higher return rates. Insights from this chart can reveal potential issues with product satisfaction in certain regions or highlight high-performing areas. For instance, if a region shows significant returns, it may warrant further investigation into the reasons behind this trend.

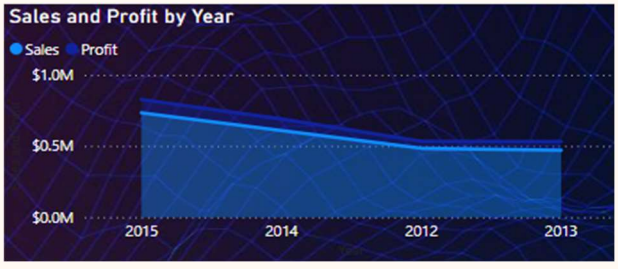
## 2. Pie Chart: Sales Distribution by Region.

The pie chart displays the proportion of total sales contributed by each regin. This visualization helps users understand which categories dominate sales, indicating customer preferences. Insights drawn from this chart can guide inventory decisions and marketing strategies. If a particular category is significantly larger, efforts could be made to enhance product offerings in that area or address potential gaps in another region.



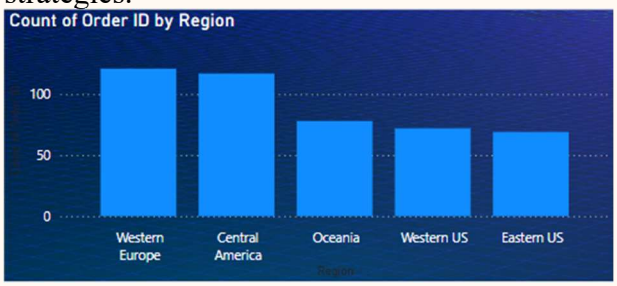

## 3. Line Chart: Sales Trend Over Time

This line chart visualizes sales trends over a specified time period. It can help users identify seasonal patterns, growth trajectories, or declines in sales. Insights from the line chart can inform forecasting and planning, allowing stakeholders to make data-driven decisions about inventory and marketing efforts during peak seasons.



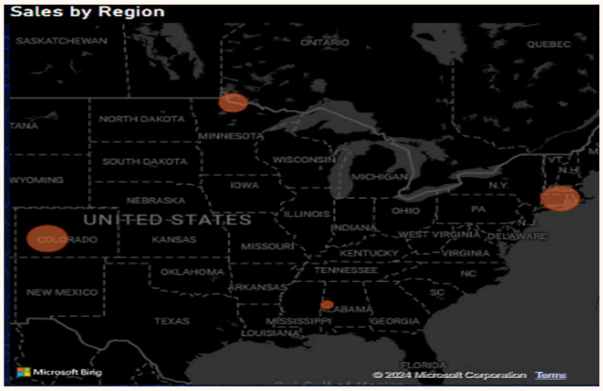
## 4. Bar Chart: Average Return Rate by Product

The bar chart represents the average return rate for each product. This visualization is valuable for identifying products that may be problematic or underperforming. If certain products consistently show high return rates, it can trigger quality checks or product improvements. Additionally, it can influence future product development and marketing strategies.




## 6. Map Visualization: Sales by Region

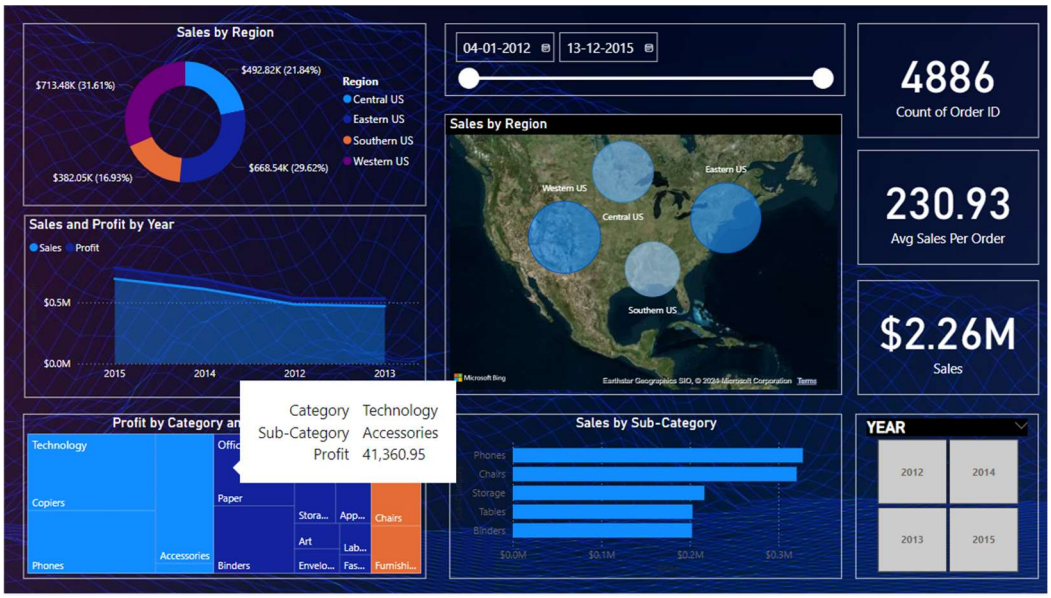
The map visualization shows sales distribution geographically. This visualization provides a spatial perspective on sales data, allowing users to identify regional performance differences visually. Insights can reveal geographic trends and help optimize distribution strategies or targeted marketing campaigns based on regional preferences and behaviours.



## 7. Card Visualization: Key Performance Indicators (KPIs)

The card visualizations display key metrics such as total sales, total returns, and average profit. These KPIs provide at-a-glance information for quick assessments of business performance. Insights can guide high-level decision-making and inform strategic planning discussions.

# DASHBOARD:


Sales by Region
$492.82K (21.84%)
$713.48K (31.61%)
$382.05K (16.93%)
$668.54K (29.62%)
Region
Central US
Eastern US
Southern US
Western US
Sales and Profit by Year
Sales
Profit
$0.5M
$0.0M
2015
2014
2012
2013
Profit by Category an
Technology
Copiers
Phones
Accessories
Paper
Binders
Art
Envelo...
Stora...
App...
Lab...
Fas...
Chairs
Furnishi...
Category Technology
Sub-Category Accessories
Profit 41,360.95
04-01-2012
13-12-2015
Sales by Region
Western US
Eastern US
Central US
Southern US
Microsoft Bing
Earthstar Geographics SIO, © 2024 Microsoft Corporation Terms
Sales by Sub-Category
Phones
Chairs
Storage
Tables
Binders
$0.0M
$0.1M
$0.2M
$0.3M
4886
Count of Order ID
230.93
Avg Sales Per Order
$2.26M
Sales
YEAR
2012
2014
2013
2015


Western Europe
0.22
Return Rate
1079
Total Returns
Count of Order ID by Region
100
50
0
Western Europe
Central America
Oceania
Western US
Eastern US
Total Sales and Total_Returns by Sub-Category
Total Sales
Total_Returns
0.4M
0.3M
0.2M
0.1M
0.0M
Phones
Chairs
Storage
Tables
Binders
Machines
Accessories
Count of Order ID by Region
69 (15.1%)
121 (26.48%)
72 (15.75%)
78 (17.07%)
117 (25.6%)
Region
Western Europe
Central America
Oceania
Western US
Eastern US
Count of Order ID by Region
Western Europe
Oceania
Southeastern ...
Southern Eu...
South...
North...
Centr...
Western US
South America
Eastern Asia
Caribbean
East...
Central America
Eastern US
Southern Asia
Western Asia
Western Afri...
North Africa
Sout...
Cent...


YEAR
2012
2013
2014
2015
Profit by Product Name
Canon imageCLAS...
Hewlett Packard L...
GBC DocuBind TL3...
Fellowes PB300 Pla...
Canon Image Class...
Canon Imageclass ...
Hewlett-Packard D...
Samsung Galaxy ...
0K
5K
10K
15K
20K
Product Name
Product Name Canon imageCLASS 2200 Advanced Copier
Profit 15,679.96
Sales by Segment
$159.46K (21.73%)
$332.47K (45.3%)
$242.01K (32.97%)
Segment
Consumer
Corporate
Home Office
4
Average of Delivery Date
24
Count of Person
Profit by Product Name
Epson TM-T88V Di...
BoxOffice By Desig...
Chromcraft Bull-N...
GBC Ibimaster 500...
Bush Advantage C...
Martin Yale Chadle...
Fellowes PB500 Ele...
Lexmark MX611dh...
-4K
-3K
-2K
-1K
0K
Profit by Customer Name
6K
4K
2K
0K
Raymond Buch
Hunter Lopez
Tom Ashbrook
Andy Reiter
Jane Waco
Helen Wasserm...
13K
Quantity
23
Average of Shipping Cost

# DATA MODELING

Time to wrap it up. What is your conclusion? How would you synthesize all the information into something even the busiest CEO wants to read? What are the key takeaways? How does your product/service/methodology uniquely address the issues raised by your study?

## 1. RELATIONSHIP BETWEEN ORDERS AND PEOPLE TABLES

The relationship is built using the Person column from the **People** table and the Person field in the **Orders** table. The **People** table serves as a lookup table for customer demographics, such as their respective regions. he relationship between the **Orders** and **People** tables is **one-to-many**, meaning that one person can have multiple orders, but each order belongs to only one person.

## 2. RELATIONSHIP BETWEEN ORDERS AND RETURNS TABLES

The relationship is built using the Order ID column from both the **Orders** and **Returns** tables. This allows for easy tracking of orders that were returned and the analysis of return reasons. The relationship between the **Orders** and **Returns** tables is **one-to-one**, meaning that each order can be linked to a corresponding return record, if applicable.

## 3. CROSS-TABLE RELATIONSHIPS

The **People** table is linked to the **Orders** table, and the **Orders** table is linked to the **Returns** table, forming a chain of relationships that enables analysis across all three tables. The filter direction is **single**, meaning that filters applied to the **People** table will propagate to the **Orders** and **Returns** tables.

# USER EXPERIENCE INTERACTIVITY :

The user experience and interactivity of the dashboard are fundamental to making the analysis insightful, intuitive, and actionable. By focusing on the interaction features like slicers, drill-downs, and cross-filtering, the dashboard becomes an efficient tool for exploring data and uncovering patterns.

The user experience and interactivity of the dashboard are designed to facilitate an intuitive and insightful data exploration process. By incorporating features such as slicers, drill-downs, and cross-filtering, users can interact with the data in a dynamic and meaningful way. Slicers enable users to filter data by key categories like regions and product categories, allowing them to focus on specific segments of interest. Drill-down functionality offers deeper insights by enabling users to explore high-level data, such as sales and returns by region, and then dive into more granular details like specific products or orders. Cross-filtering between visuals enhances this interactivity further, where selecting data in one visual automatically updates the others, helping users to identify correlations and trends across different data points. The dashboard's layout is thoughtfully divided into pages to prevent clutter, with each page focused on distinct insights like sales performance, returns analysis, and customer behavior. This structure enhances the overall user experience by providing clarity and ease of navigation. Throughout the development, challenges like balancing data richness with usability and ensuring smooth performance with large datasets were addressed by optimizing interactions and maintaining a clear, user-centered design. In summary, the dashboard offers a seamless interactive experience that enhances data understanding and enables users to derive actionable insights efficiently.