**Power BI report on Super Stores Sales:**

1. **Data Cleaning and Pre-Processing:**

First we need to load the given .xlsx file into Power BI desktop. Here one thing to notice the given file is a workbook consisting of 4 worksheets. Each contains data regarding different matter but each worksheet have “Order Id” column in common. Worksheet1 has data pertaining to Order Details, Worksheet2 has data pertaining to Product details , Worksheet3 has data pertaining to Customer details and the last worksheet has data pertaining to which order was returned or not.

**DELETING USELESS COLUMNS:**

Columns such as Customer ID, Customer Name, Country, Postal Code, Product ID, Product Name as they won’t produce any insights for the data even when modeled.

**PROMPTED THE HEADER:**

Using the first row as the column names in the worksheet4 for the returned and order id column.

**MERGE Worksheets:**

The first task was to merge all the worksheets into a single worksheet to be loaded into our model but there was one issue the number of column in Worksheet 4 was around 268 whereas rest of the worksheets had around 9668 rows thus when merged without transforming the data then most of the columns in the rest of the worksheets became null. Thus we need to transform them. This is done by the selecting the merge queries option where we merge 2 different queries based on a similar column here which is Order Id. At first we try to merge worksheet 1 and worksheet4 on the basis of “order id” then with this newly created table merge the rest one at a time, thus creating a finally merged table.

**EXPANDING THE MERGED COLUMNS:**

The merged columns appear as table thus we have to expand them to view them separately.

**CHANGED DATATYPE:**

Data type of each column was detected and changed where we felt necessary .One such place was where we replaced all the null values of the returned column with 0 and all the yes values with 1. And changed its data type to whole number in place of text

**REMOVED DUPLICATES, Blank Rows and Errors:**

Removing all the rows with a similar Order Id(as it should be a unique value).

1. **INSIGHTS OBTAINED:**

**Sales& Profit By region:**

Central has 23% of the total sales, South has 26%, west has 25% and east has 26% of the total sales. Now when comparing it with the profit of each region we get Central has 14%, West has 38%, South has 16% and East has 32%. With this data obtained from 2 visuals we have noticed an interesting feature

1. Though South has one of the highest sales of 26% but the profit earned is very low compared to other higher sales region like East.
2. Central has the lowest profit and sales percent of all the regions.
3. West though a comparative lower sales but has the highest profit which implies the people in west are buying costly products and the population of West is low compared to other regions.

**Sales& Profit By Product Category:**

Office Supplies have profit of 43% and sales of 13%, Technology have profit of 51% and sales of 49% Furniture have profit of 6% and sales of 38%. With this data obtained from 2 visuals we have noticed an interesting feature

1. Furnitures though have very high sales compared to office supplies but has the least profit percent.
2. Office supplies have least sales but have very high profit percent of the total profit
3. Technology has both highest sales as well profit percent.

**Top 5 Product sub category by Profit and Sales:**

In term of sales the top 5 are phones and chairs with 0.33M and then comes Storage with 0.22M and then Tables with 0.21M and then Binders with 0.2M whereas in terms of profit we have copiers on top with 56K, phones with 45K then comes Accessories with 42K then paper with 34K and Binders with 30K. With this data obtained from 2 visuals we have noticed an interesting feature.

1. Though Storage items are in 3rd place in terms of Sales but they don’t appear in the top 5 in terms of their profit
2. Though Tables are in 4th  place in terms of Sales but they don’t appear in the top 5 in terms of their profit
3. Though Chairs are in 2rd place in terms of Sales but they don’t appear in the top 5 in terms of their profit
4. Copiers have the highest profit percent yet they don’t appear in the top 5 in sales
5. Accessories and Papers with 3rd and 4th place in terms of profit don’t appear in terms of list of top 5 sales.
6. Phones with both highest sales and profit appear in both the lists.

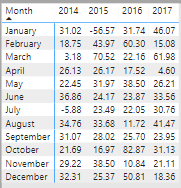
**Top 5 States with Sales and Profit:**

In term of sales the top 5 are California with 0.46M and then comes New York with 0.31M and then Texas with 0.17M and then Washington with 0.14M and Pennsylvenia with 0.12M whereas in terms of profit we have Indiana on top with 18K, Minnesota with 11K then comes Rhode Island with 7K then Vermont with 2K and Montana with 2K. With this data obtained from 2 visuals we have noticed an interesting feature

1. the list of top 5 sales and top 5 profit for states don’t match which is the result of the following Though California with highest sales don’t appear in the list of highest profit.
2. In the states of high profit their sales are subpar which means they are buying items like Copiers, Accessories and Paper who have a high profit though not very high sales.
3. In the sates of high sales like California they are buying stuff like Chairs Storage Tables which have a high sales but not high profit.

**Comparing Average Profit per Month for 4 years:**

Our Data set has orders of 4 years 2014 to 2017. Here we have usedArea chart to plot the average profit per month for the 4 years.

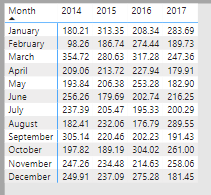


Some interesting features have been noticed from the plot:

* 2017 had max profit in January and min profit in April.
* 2016 had max profit in February and min profit in November
* 2015 had max profit in March and loss in January
* 2014 had max profit in August and loss in July.

**Comparing Average Sales per Month for 4 years:**

Our Data set has orders of 4 years 2014 to 2017. Here we have usedArea chart to plot the average sales per month for the 4 years.



Some interesting features have been noticed from the plot:

* 2017 has max sales in August and min sales in April
* 2016 has max sales in March and min sales in August
* 2015 has max sales in January and min sales in February
* 2014 has max sales in March and min sales in February

1. ***RECOMMENDATIONS AND KPIS:***

The KPIs which can used are

1. Total Product Sales (aim to keep it high)
2. Total Product Profit (aim to keep it high)
3. Total number of Products ordered
4. Total discount offered
5. Average Delivery time (aim to keep it low)
6. Number of Orders Returned (aim to keep it low)

Key features derived from the insights (using Power BI slicers) and their respective recommendations:

West region has the maximum number of returned products thus we recommend to do a thorough product quality check in that region. West region has the maximum profit over other regions and the maximum profit comes from Office supplies but their sales are the least thus we should promote items related to office supplies

Central region has received the max amount of discount thus being the region with the least profit thus we should lessen the discount given to them moreover all the discounts seem to be given on furniture items as though they have sales of 39% they have 0 profit thus we advise to increase the price of these furniture based items.

South region has the least sales and earn the max profit from office supplies yet the sales of office supplies are minimum thus we should promote items related to office supplies and give discounts on them to increase our sales in that sector. Furniture sales are huge yet the profit earned from them is minimum thus we should increase the price of them.

East region has a higher sales than south but it faces similar problems like profit of furniture is minimum yet sales are high and profit of office supplies are huge yet sales are low thus we will take similar steps as in South region.

East and South has similar Sales percent yet South has 50% profit of East thus we should focus our resources of promoting on South region.

For Home Office segment the highest profit comes from Rhodes Island thus should promote our store their as they have comparatively lower sales same goes for Missouri, Nevada and Montana. In general the east region where high profit, low sales we should open our outlets in these region, give discounts to increase our sales. In the south region the sales are high yet the profit is low thus we should increase our price in that region. We should increase the price of furniture as sales are high but profit is low.

For Corporate segment we should focus on increasing the sales of office supplies as the profit from them is maximum even the profit from accessories is more than that of phones thus promote them, as sales are equally distributed among regions we can promote items with lesser sales(office supplies) and increase the price of items with less profit but higher sales(furniture).From Indiana we earn the max profit yet its sales are subpar as compared to California . We should increase the price at California as it has the highest sales. In general increase price in South region as it has least profit but ok sales.

In Consumer segment we should increase the price in Central region as Sales 23% but profit only 6%, promote Office supplies(profit high, sales low) and increase the price of Furniture (profit low, sales high) Increase our Store outlets, give discounts in Michigan then followed by Minnesota and Delaware. Increase the price in states with high sales like California, New York, Texas. The number of returned products in this segment are maximum compared to others thus establish sound quality checking of the shipped products, have a talk with the manufacturers, establish a sound refund and return policy.

1. **OVERALL SUMMARY :**

Minimise the number of orders returned by ensuring good product quality check up. Give discounts to increase the sales, increase the price where sales are high yet profit are low. Primarily focus South and Central regions due to their low profit, reduce discounts in the area of low profit yet high sales. For consecutive 2 years 2014-2015 there was a minimum sale in February and for 2016-17 min sales in August. Thus we will recommend the sales team to have a look at the issue if it is a problem of our company or a market issue. January, March and August have maximum profit in 4 years along with maximum sales thus the strategy followed in these months we will apply them to rest. In July 2014 though having great sales we suffered loss we should look at the issue and prevent it in the future. Furnitures though have very high sales compared to office supplies but has the least profit percent. Office supplies have least sales but have very high profit percent of the total profit. The West region has the highest number of returned products, suggesting a need for a thorough product quality check. Although the region has the highest profit, sales of office supplies are low. Promoting office supplies in this region is recommended. The Central region has the lowest profit due to high discounts, particularly on furniture items. Increasing the price of furniture is advised. The South region earns maximum profit from office supplies but has low sales. Promoting office supplies and offering discounts can boost sales. The East region faces similar challenges. Focus on promoting and increasing prices in the South region. In the Home Office segment, Rhodes Island has the highest profit, so promotion there is recommended. For the Corporate segment, increase sales of office supplies and accessories, and adjust prices accordingly. In the Consumer segment, increase prices in the Central region, promote office supplies, and adjust furniture prices. Establish quality checks and a refund policy to address high returns.

1. **Academic Framework/Theory of Analysis:**

Customer Segmentation: Customer segmentation involves dividing customers into distinct groups based on characteristics such as demographics, purchasing behavior, or preferences

KPIs and Balanced Scorecard: The Balanced Scorecard framework enables the identification and tracking of key performance indicators (KPIs) across different dimensions

Data Visualization: Using appropriate Charts, graphs to convey information clearly.