Data Analysis of Global Superstore data using Power BI

1. Title slide

A PowerBi Project Presentation by Phani Pavani Srirangam

2. Dataset used

Global Superstore Dataset

3. Introduction:

This presentation will provide an overview of the key insights gained from analyzing the Global Superstore dataset. It will look at the top 10 highlights from this analysis, considering key trends as well as other interesting facts.

4. Technical Aspects of the project:

- Cleaning and basic Analysis of Data Using Excel
- Creating PowerBi dashboards to present the data

5. Description of dataset

Column name	Description
1. Order ID	A unique identifier for each sales order
2. Order Date	The date the order was placed
3. Ship Date	The date the order was shipped
4. Ship Mode	The method of shipping for the order
5. Customer ID	A unique identifier for each customer
6. Customer Name	The name of the customer who placed the order
7. Segment	The market segment the customer belongs to (Corporate, Home Office, or Consumer)
8. Country	The country where the customer is located
9. City	The city where the customer is located
10. State	The state where the customer is located
11. Postal Code	The postal code where the customer is located
12. Region	The region where the customer is located
13. Product ID	A unique identifier for each product
14. Category	The category of the product (Furniture, Office Supplies, or Technology)
15. Sub-Category	The sub-category of the product
16. Product Name	The name of the product
17. Sales	The number of sales for each product
18. Quantity	The quantity of each product sold
19. Discount	The discount applied to each product
20. Profit	The profit generated from each sale

6. Problem statement derived from dataset

- What are the total sales by region?
- Profitability by Category
- Product performance Tracking
- Insights on Seasonal Shifts

7. Excel analysis of Global Superstore data

- **Total sales by region:**

- Open the Global Superstore dataset in Excel.
- Select the columns you want to analyze. In this case, you'll want to select the "Region" column and the "Sales" column.
- Click the "Insert" tab and then click the "PivotTable" button. This will open the "Create PivotTable" dialog box.

- In the "Create PivotTable" dialog box, make sure that "Select a table or range" is selected, and that the range includes all of your selected columns.
- Select the location for your PivotTable. You can either create a new worksheet or place the PivotTable in an existing worksheet.
- Click "OK" to create your PivotTable.
- In the "PivotTable Fields" pane on the right side of the screen, drag the "Region" field to the "Rows" area and the "Sales" field to the "Values" area.
- Your PivotTable should now display the sales data by region. You can further customize the table by adding additional fields to the "Rows" or "Values" areas, or by applying filters, sorting, or formatting options.
- To create a chart of your PivotTable data, select the table and then click the "Insert" tab. Click the "Recommended Charts" button to see a selection of chart types that are appropriate for your data. Select the chart type that you prefer, and then customize the chart as needed.

- **Profitability By category:**

- Open the Excel sheet containing the Global Superstore dataset.
- Select a blank cell where you want to display the result.
- Enter the following formula: =SUMIF(range, criteria, sum_range)
    - "range" refers to the column containing the category names.
    - "criteria" refers to the specific category you want to calculate the profit for.
    - "sum_range" refers to the column containing the profit values.
- Press Enter to display the result.
- For example, if you want to calculate the profit for the "Furniture" category, and the category column is in column B and the profit column is in column H, you can use the following formula:
  =SUMIF(B2:B999, "Furniture", H2:H999).
  This will give you the total profit for the Furniture category.
- To create a pie chart based on this data, follow these steps:
- Select the cells containing the category names and their corresponding profit values.
- Click on the "Insert" tab in the ribbon at the top of the Excel window.
- Click on the "Recommended Charts" button in the "Charts" group.
- Select the "Pie" chart type from the options displayed.
- Choose a specific design that you like and then click "OK".
- A chart will appear on the sheet, which shows the profit distribution by category in a pie chart format. You can customize the chart by clicking on

it and using the options in the "Chart Design" and "Format" tabs in the ribbon.

8. **PowerBi Dashboard**

Power BI Dashboard is a data visualization tool developed by Microsoft that allows users to create interactive and customizable dashboards for data analysis. It provides a comprehensive platform for connecting to various data sources, transforming and modeling data, and creating interactive reports and visualizations.

A Power BI dashboard consists of a collection of visualizations, tables, and charts that provide a high-level overview of key performance indicators (KPIs) and metrics for a business or organization. It can be easily customized based on the needs of the user, and it allows for real-time data analysis and monitoring.

Power BI dashboards are used by businesses and organizations to monitor and analyze data in real-time, enabling them to make informed decisions based on up-to-date information. It is a powerful tool for data-driven decision making, and it is widely used in industries such as finance, healthcare, retail, and manufacturing, among others.

Building a Power BI Dashboard for Global Superstore Dataset:

- **Connect to Data Sources:**

  The first step in building a Power BI dashboard is to connect to the Global Superstore dataset. You can import the dataset in Excel or CSV format.
- **Import Data:**

  Once you have connected to the data source, you can import the required data into Power BI. You will need the following tables:
  - Orders: Contains information about orders, including order ID, order date, and customer details.
  - Products: Contains information about products, including product ID, product name, and category.
  - Sales: Contains information about sales, including sales ID, product ID, order ID, and sales amount.
  - Customers: Contains information about customers, including customer ID, name, and location.
  - Regions: Contains information about regions, including region ID and region name.

- **To create a date table**

  - Open Power BI and click on "Transform Data" in the home tab.
  - In the Power Query Editor, select the Orders table from the left navigation pane.
  - Click on the "Add Column" tab in the ribbon and select "Date" from the drop-down menu.
  - In the "Date" sub-menu, select "From Date/Time" and choose the "Order Date" column from the drop-down menu.
  - Power BI will automatically detect the date format in the Order Date column. Click on "OK" to create the new date column.
  - Now, with the new date column selected, click on the "Modeling" tab in the ribbon and select "New Table".
  - In the "New Table" dialog box, enter a name for the table, such as "Date" or "Calendar".
  - In the "Formula" field, enter the following DAX formula:
    Date = CALENDARAUTO()
  - This will create a date table with a range of dates based on the date values in the Order Date column.
  - Click on "OK" to create the new date table.
  - To customize the date table, you can add additional columns such as month, quarter, and year. You can do this by clicking on the "New Column" tab in the ribbon and using DAX formulas to extract the necessary information from the date column.
  - Once you have customized the date table, click on "Close & Apply" in the home tab to save the changes and close the Power Query Editor.
  - The date table will now be available in the Fields pane under the "Date" or "Calendar" name, and you can use it in your Power BI reports and visualizations to group and filter data by date

- **To add a year slicer:**

  - Open the Power BI report that includes the date table you created in the previous steps.
  - Click on the "Visualizations" icon on the right-hand side of the screen.
  - In the Visualizations pane, select "Slicer" from the list of available visuals.
  - Drag and drop the "Year" column from the date table into the "Values" field of the new slicer visual.
  - Customize the appearance of the slicer by adjusting the font, color, and size as desired.

- Click on the "Format" tab in the Visualizations pane to access additional settings for the slicer.
- Under the "General" section, adjust the "Title" and "Header" settings to provide more descriptive labels for the slicer.
- Under the "Data" section, enable the "Include null" option to ensure that all years are included in the slicer, even if there are no sales or profits for a particular year.
- Once you have customized the slicer to your satisfaction, click on the "View" tab to preview the changes.
- Save the report and close the Power BI window.
- The year slicer will now be available in the report, allowing users to filter the data by year and gain insights into sales and profitability trends over time.

- **To add a Quarter Slicer**

  - Open the Power BI report that includes the date table you created in the previous steps.
  - Click on the "Visualizations" icon on the right-hand side of the screen.
  - In the Visualizations pane, select "Slicer" from the list of available visuals.
  - Drag and drop the "Quarter" column from the date table into the "Values" field of the new slicer visual.
  - Customize the appearance of the slicer by adjusting the font, color, and size as desired.
  - Click on the "Format" tab in the Visualizations pane to access additional settings for the slicer.
  - Under the "General" section, adjust the "Title" and "Header" settings to provide more descriptive labels for the slicer.
  - Under the "Data" section, enable the "Include null" option to ensure that all quarters are included in the slicer, even if there are no sales or profits for a particular quarter.
  - Once you have customized the slicer to your satisfaction, click on the "View" tab to preview the changes.
  - Save the report and close the Power BI window.
  - The quarter slicer will now be available in the report, allowing users to filter the data by quarter and gain insights into sales and profitability trends over time.

- **To add a Region Slicer**

    - Open your Power BI Desktop file and ensure that the Global Superstore dataset is loaded.
    - In the "Fields" pane, select the "Region" field. Drag and drop the "Region" field onto the canvas to create a slicer visual.
    - From the "Visualizations" pane, select the "Dropdown" option under the "Slicer" section to change the slicer type.
    - Now, we need to connect the slicer to other visuals on the dashboard. Select the visual you want to connect the slicer to, and then open the "Visualizations" pane.
    - In the "Visualizations" pane, find the "Filters" section and select "Add".
    - In the "Filters" section, select the "Sales" table and the "Region" field. Choose "is any of" as the operator, and then select "OK".
    - You can now test the slicer by selecting different regions, and you should see the other visuals on the dashboard update accordingly.

- **To add card to display Sum of Sales**

    - Open the Power BI desktop file that contains your dashboard.
    - From the Fields pane, select and drag the "Sales" field to the canvas.
    - From the Visualizations pane, select the "Card" visual and drag it onto the canvas.
    - In the Visualizations pane, select the "Data" field well for the Card visual, and then drag and drop the "Sales" field from the "Sales" table.
    - By default, the Card visual will display the sum of sales for all rows in the Sales table. To display the total sales value in the card, go to the formatting pane and choose "Sum" from the dropdown list under "Values".
    - You can now format the Card visual as desired by changing its size, font, color, and other properties.
    - To add additional information to the Card visual, you can drag and drop fields from other tables in the Global Superstore dataset into the "Tooltip" field well for the Card visual.
    - Once you have completed these steps, you will have a Card visual on your dashboard that displays the sum of sales for the Global Superstore dataset. This will update automatically as you interact with other visuals on the dashboard.

- **To add a card to display sum of profits:**
  - Open the Power BI desktop file that contains your dashboard.
  - From the Fields pane, select and drag the "Profit" field to the canvas.
  - From the Visualizations pane, select the "Card" visual and drag it onto the canvas.
  - In the Visualizations pane, select the "Data" field well for the Card visual, and then drag and drop the "Profit" field from the "Sales" table.
  - By default, the Card visual will display the sum of profit for all rows in the Sales table. To display the total profit value in the card, go to the formatting pane and choose "Sum" from the dropdown list under "Values".
  - You can now format the Card visual as desired by changing its size, font, color, and other properties.
  - To add additional information to the Card visual, you can drag and drop fields from other tables in the Global Superstore dataset into the "Tooltip" field well for the Card visual.
  - Once you have completed these steps, you will have a Card visual on your dashboard that displays the sum of profit for the Global Superstore dataset. This will update automatically as you interact with other visuals on the dashboard.

- **To Calculate % change of sales using DAX formulas:**
  - Open the Power BI Desktop file that contains the Global Superstore table.
  - Select the "New Measure" option from the "Modeling" tab at the top of the screen.
  - In the "Formula Bar," enter the following DAX formula to calculate the total sales for the current period:
  - Current Period Sales = SUM(Global Superstore[Sales])
  - Next, create a new measure to calculate the total sales for the previous period. Use the same DAX formula as above, but with the dates adjusted to reference the previous period:
  - Previous Period Sales = CALCULATE(SUM(Global Superstore[Sales]), DATEADD(Global Superstore[Order Date], -1, MONTH))
  - Finally, create a new measure to calculate the percentage sales change between the current and previous periods. Use the following DAX formula:
  - % Sales Change = DIVIDE([Current Period Sales] - [Previous Period Sales], [Previous Period Sales], 0)

- The % Sales Change measure will now display the percentage change in sales between the current and previous periods.

- **To add a card to display % sales change**
  - Open the Power BI Desktop file that contains the Global Superstore table.
  - From the "Fields" pane, select the "% Sales Change" measure that you created in the previous steps.
  - Drag and drop the "% Sales Change" measure onto the canvas to create a card visual.
  - Once the card visual is created, you can adjust its appearance by going to the "Visualizations" pane.
  - In the "Visualizations" pane, you can change the card's title, font size, color, and other formatting options as needed.
  - You can also adjust the value displayed on the card by going to the "Data" field well for the card visual.
  - In the "Data" field well, select the "% Sales Change" measure that you created in the previous steps.
  - By default, the card visual will display the sum of % Sales Change for all rows in the Global Superstore table. If you want to filter the card to display % Sales Change for a specific region or category, you can use the slicer in the dashboard and connect it to the card visual.

- **To add a filled map visual to display the Sum of sales by region:**
  - Open the Power BI Desktop file that contains the Global Superstore table.
  - From the "Fields" pane, select the "Region" and "Sales" columns.
  - Click on the "Filled map" icon in the "Visualizations" pane.
  - Drag and drop the "Region" column into the "Location" field well, and the "Sales" column into the "Values" field well in the "Visualizations" pane.
  - The map will now display the total sales by region in the Global Superstore table.
  - You can adjust the map's appearance by going to the "Visualizations" pane. For example, you can change the map's color scheme, add a legend, or adjust the zoom level.
  - If you want to filter the map by a specific time period or product category, you can use the slicer in the dashboard and connect it to the map visual.

- **To add a pie chart visual to display the profit by category:**
  - Open the Power BI Desktop file that contains the Global Superstore table.
  - From the "Fields" pane, select the "Category" and "Profit" columns.
  - Click on the "Pie chart" icon in the "Visualizations" pane.
  - Drag and drop the "Category" column into the "Legend" field well, and the "Profit" column into the "Values" field well in the "Visualizations" pane.
  - The pie chart will now display the profit by category in the Global Superstore table.
  - You can adjust the pie chart's appearance by going to the "Visualizations" pane. For example, you can change the chart's color scheme, add data labels, or adjust the slice size.
  - If you want to filter the pie chart by a specific time period or region, you can use the slicer in the dashboard and connect them to the pie chart visual.

- **To add line charts describing the % sales change in different years**
  - Open the Power BI Desktop file that contains the Global Superstore table.
  - From the "Fields" pane, select the "Order Date (Year)" and "% Sales Change" columns.
  - Click on the "Line chart" icon in the "Visualizations" pane.
  - Drag and drop the "Order Date (Year)" column into the "Legend" field well, and the "% Sales Change" column into the "Values" field well in the "Visualizations" pane.
  - The line chart will now display the % sales change over time for all years in the Global Superstore table, with each year represented by a different line color in the legend.
  - If you want to filter the line chart by a specific time period or region, you can use the slicer in the dashboard and connect them to the pie chart visual.

9. Insights

- The majority of sales come from the Central region
- There is a clear seasonal variation in sales, with the peak months being November and December.
- The most profitable category is Technology, followed by and office supplies and Furniture.

- We found that certain products sell better in certain seasons.
- By tracking these seasonal shifts, we can make sure we have the right products in stock at the right time.

10.Conclusion

These insights can help inform strategic decisions on where to focus resources and marketing efforts.