Data Warehouse

Experiment No.: 8

Design, generate reports and perform data visualization on the data warehouse data.

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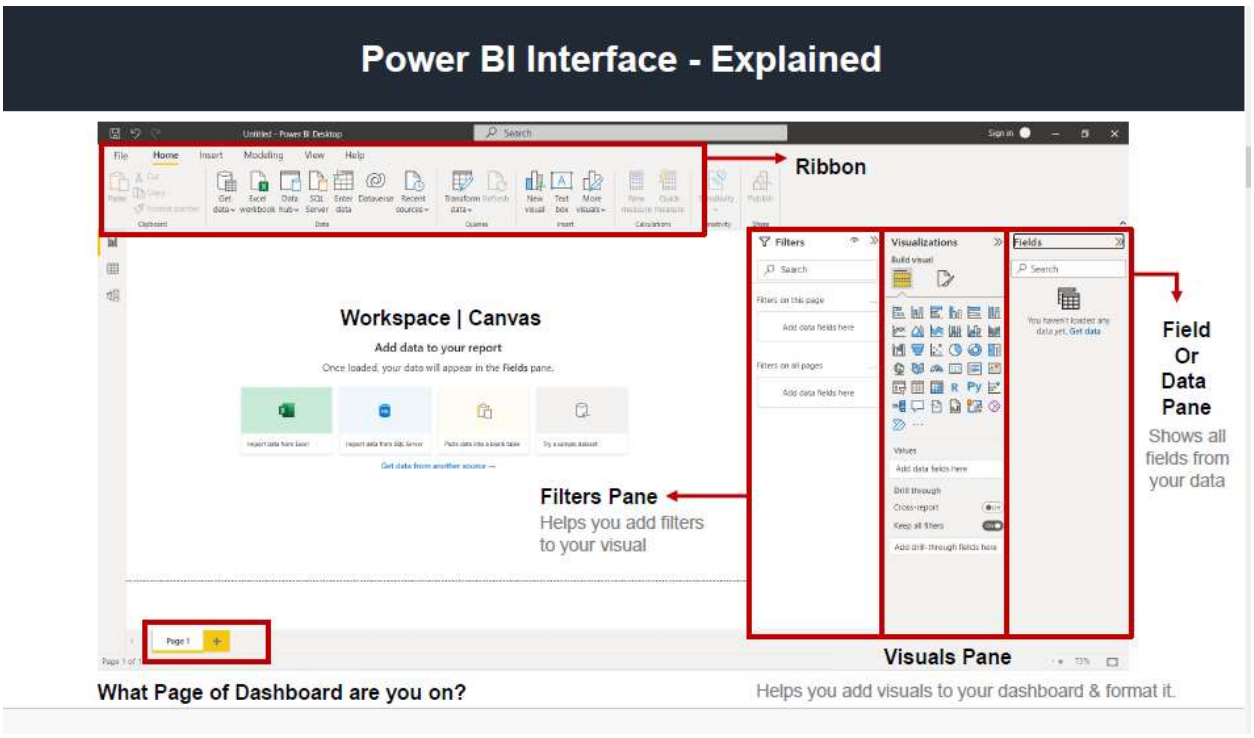
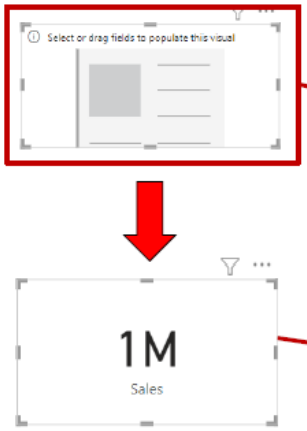
1. **Aim:** Design, generate reports and perform data visualization on the data warehouse data.
2. **Objectives:** To perform the data visualization on the data warehouse data
3. **Course Outcomes:** uncovering trends, patterns, and correlations within the large datasets stored in a data warehouse, aiding better decision-making.
4. **Hardware / Software Required:** Power BI tool to extract and load data into the staging area.
5. **Theory:** Follow the below steps in power BI to create a dashboard to present the interactive reports to visualize the data in the data warehouse.



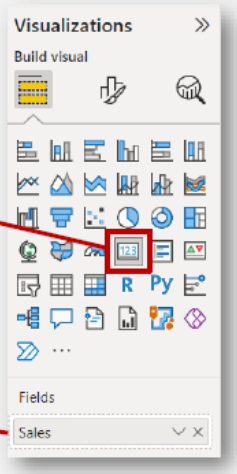
Creating a Card

Click on the card visual to add it on your canvas. Once added, drag a numerical field you want to visualize in the fields box.



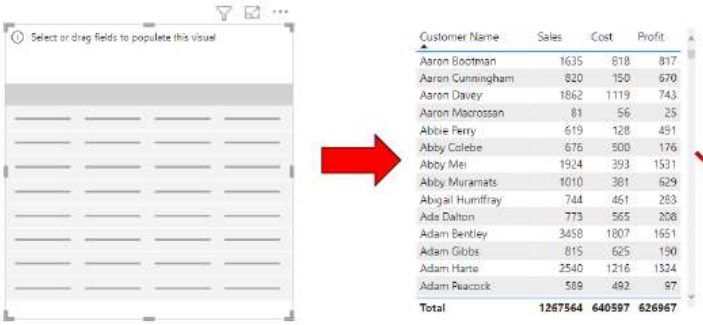
After adding Sales to card

Add numerical field in fields as shown below.

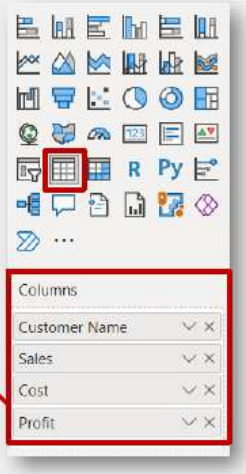


Creating a Table

Click on the table visual to add it on your canvas. Once added, drag any field you want to visualize in the columns box.



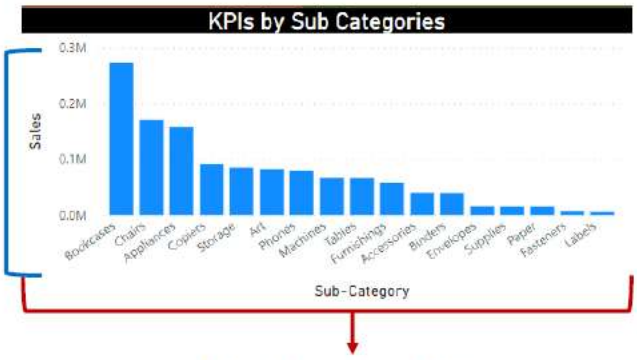
Add any field in columns as shown below.



Creating a Column Chart – X-axis & Y-axis

Sales is your Y-axis

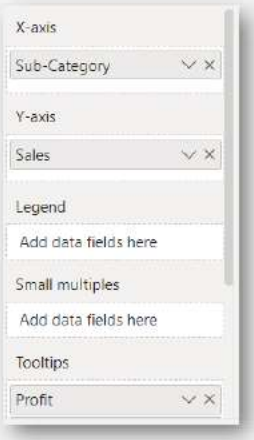
Adding numerical metric as Y-axis helps the user understand the extent of it by the column height.



Sub-Category is your X-axis

Add the text based field that you want to see in the X-axis. As we are using a column chart, numerical metrics like sales, profit etc will become Y-axis as we want the column HEIGHT to show the extent of that metric.

Add fields in X & Y Axis as shown below.

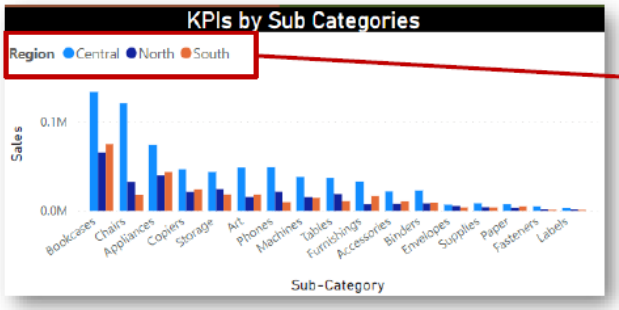


Creating a Column Chart – Legend

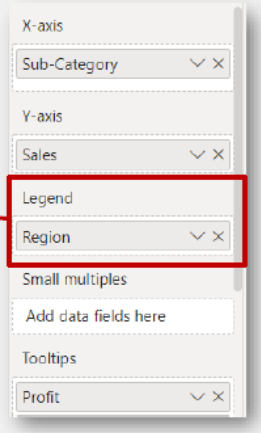
Legend further divides your visual into different colors by adding a second level of breakdown.

Adding Region to legend breaks all our subcategories from 1 column for each subcategory to 3 columns for each sub-category, all having different colors.

For ex – 1 Column of bookcases becomes 3 columns of Bookcases from Central, Bookcases from North & Bookcases from South.



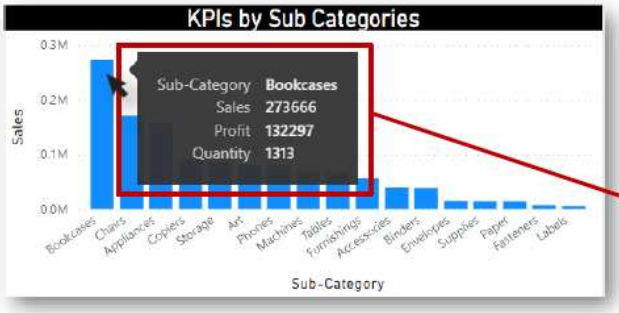
Add fields in Legend as shown below.



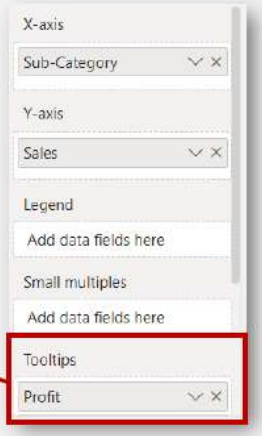
Creating a Column Chart – Tooltips

Any metric (numerical field) that you add in Tooltips will be visible to you when you hover over different elements of the visual.

For ex – After adding Profit to tooltips, whenever user hovers over ANY column of the column chart, they will see profit of that subcategory along with the Sales amount as well. Profit amount will only be visible as a value in the hover box and not as an additional column in the chart.

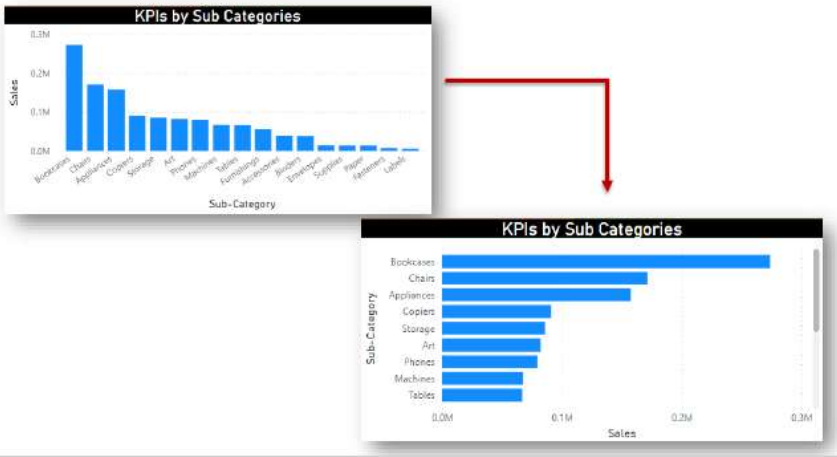


Add fields in Tooltips as shown below.

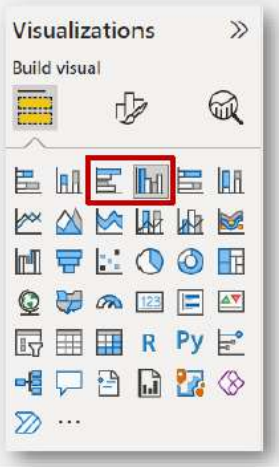


Creating a Bar Chart from a Column Chart

To create a Bar Chart, all you have to do is create a Column Chart & then click on Bar Chart icon in Visualization Pane to convert it to a Bar Chart.



Switch from right icon to left icon.

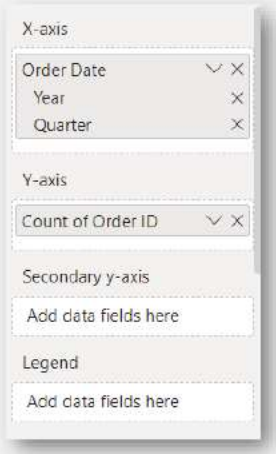


Creating a Line Chart

To create a Line Chart, all you have to do is add your date field in X-axis & the numerical field you want to see the trend of in Y-axis.

By doing the above you will get one line showing trend of the numerical field over your date range.

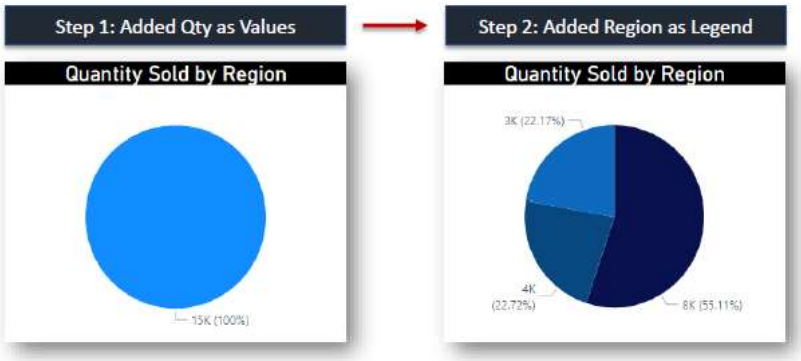
Once completed, this is how your inputs will look like.



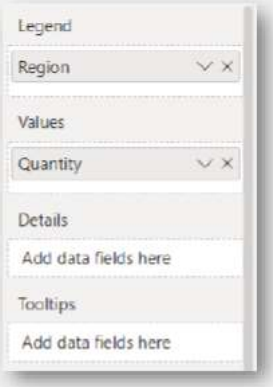
Creating a Pie Chart

To create a Pie Chart, add your numerical field in values & the field by which you want to see a breakdown of your values in legend.

By doing the above you will get one line showing trend of the numerical field over your date range. If you want to break it into multiple lines based on another field, such as Shipping Mode, add it to the legend as shown below.



Once completed, this is how your inputs will look like.



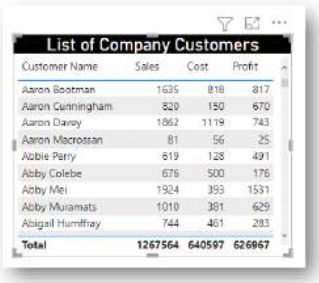
Creating a Map Chart

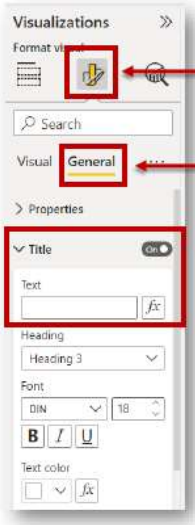
To enable it, go to **File -> Options and Settings -> Options -> Global -> Security** and enable: **"Use Map and Filled Map Visuals."**

Once completed, this is how your inputs will look like.

FAQ: How to add / change title of a visual

1. Select the visual by clicking on it.





2. Click on the Format Visual icon under the Visualizations Pane.

3. Click on the General Tab

4. Enable title & add your title under "Text"

Tip: You can further format title by adding background, changing font style, etc by using the options below "text".

6. Results

Power BI dashboards allow for real-time tracking of key performance indicators (KPIs) by connecting to live data sources, helping users stay updated on critical business metrics. Visualizing data in an interactive format helps identify patterns, trends, and anomalies, allowing users to take proactive actions based on the insights generated.

7. **Conclusions:** data visualization provides a more intuitive way to explore, understand, and communicate insights drawn from the complex data stored in data warehouses.

8. **Viva Questions:** A list of potential questions related to the data visualization operations can be expected.

9. References:

1. Kimball Group: Kimball Group's Website offers articles and resources on dimensional modeling and data warehousing.
2. "The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling" by Ralph Kimball and Margy Ross
3. Building the Data Warehouse" by William H. Inmon
4. https://learn.microsoft.com/en-us/training/powerplatform/power-bi