PL-300 Microsoft PowerBI Data Analyst

Module 1 – Overview of Data Analysis

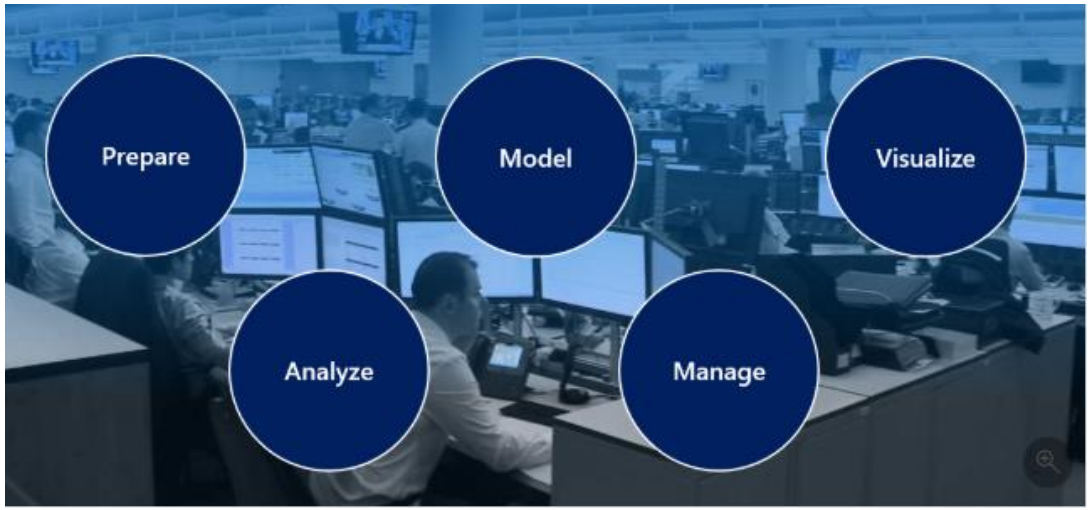
Data Analysis Types

To analyze data, core components of analytics are divided into the following categories:

- Descriptive
- Diagnostic
- Predictive
- Prescriptive
- Cognitive

Data Analysis Workflow

- Data preparation is the process of profiling, cleaning, and transforming your data to get it ready to model and visualize.
- This process is done by defining and creating relationships between the tables. From that point, you can enhance the model by defining metrics and adding custom calculations to enrich your data.
- The ultimate goal of the visualize task is to solve business problems.
- The analyze task is the important step of understanding and interpreting the information that is displayed on the report.
- The management of your content helps to foster collaboration between teams and individuals.



The PowerBI Workflow

The flow of Power BI is:

1. Connect to data with Power BI Desktop.

2. Transform and model data with Power BI Desktop.

3. Create visualizations and reports with Power BI Desktop.

4. Publish report to Power BI service.

5. Distribute and manage reports in the Power BI service.

Building Blocks of PowerBI

Semantic Model

A **semantic model** consists of all connected data, transformations, relationships, and calculations. To follow the flow of Power BI, you first connect to data, transform data, and create relationships and calculations to create a semantic model.

Visualizations

Power BI is a low-code solution, which means that you can "*drag and drop*" data field directly onto the canvas. Power BI will choose a visual for your data field. You can easily change between visuals for the same fields and add or remove data fields to the visual.

Interactive Reports with PowerBI

Microsoft Power BI enables you to develop interactive reports within a single tool. Typical report development consists of the following steps:

- Prepare and model data
- Visualize and analyze data
- Secure and distribute reports

Data Quality

Data quality is crucial when creating a Power BI report because it directly affects the accuracy and reliability of the insights you can derive from your data.

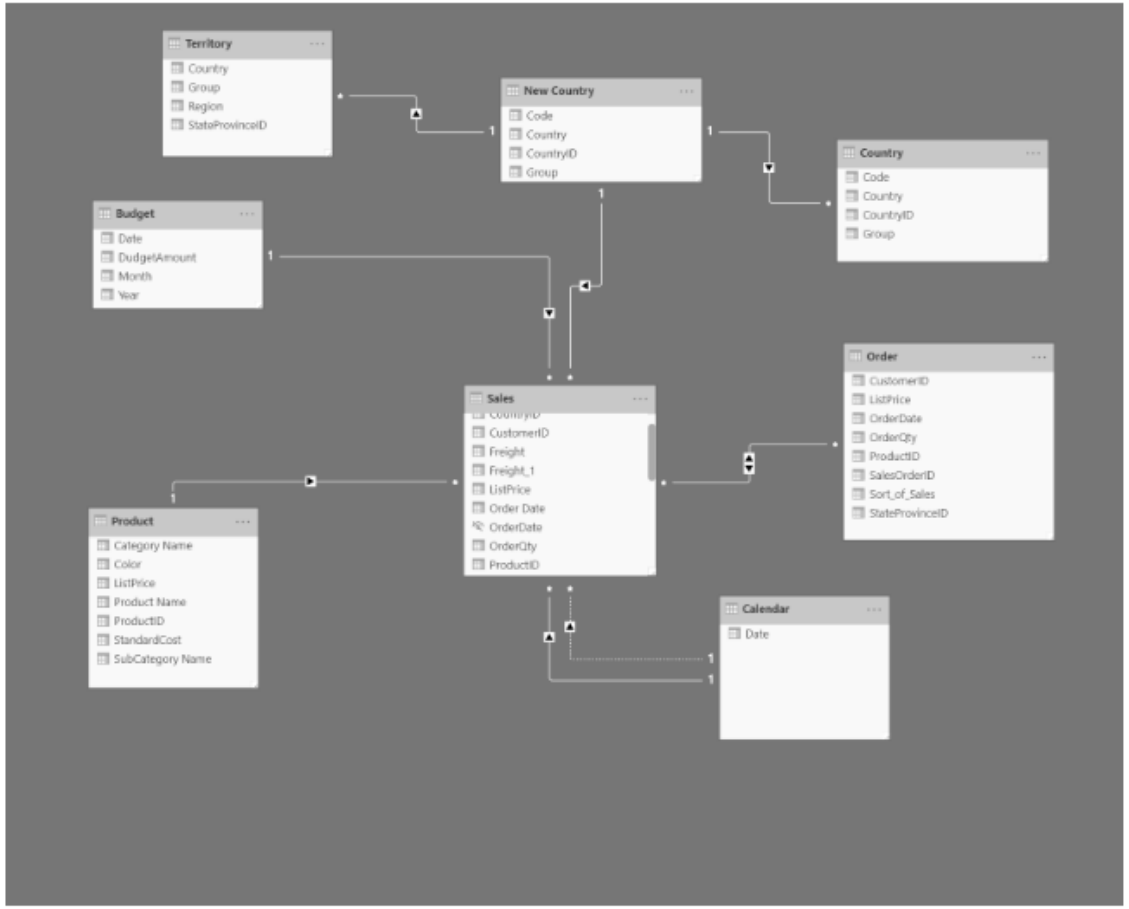
- **Completeness**: Missing values can cause gaps.
- **Validity**: Out-of-range data values can skew visuals and results.
- **Consistency**: Inconsistent data can affect date-related visuals.
- **Uniqueness**: Duplicates can affect data accuracy.
- **Data Relationships**: Cross-table visuals might not be possible without relationships.
- **DAX Calculations**: Limited calculations can result in fewer possible insights.

Prepare data with PowerQuery

Power Query is a key feature of Power BI Desktop to prepare your semantic model. It's the initial step in creating a Power BI report and is indispensable when using Copilot.

- **Profile your data** by assessing column quality, distribution, and profile.
- **Clean your data** by resolving inconsistencies, unexpected or null values, and other data quality concerns.
- **Transform your data** by implementing user-friendly naming conventions for columns and queries, altering column data types, and applying data shape transformations.

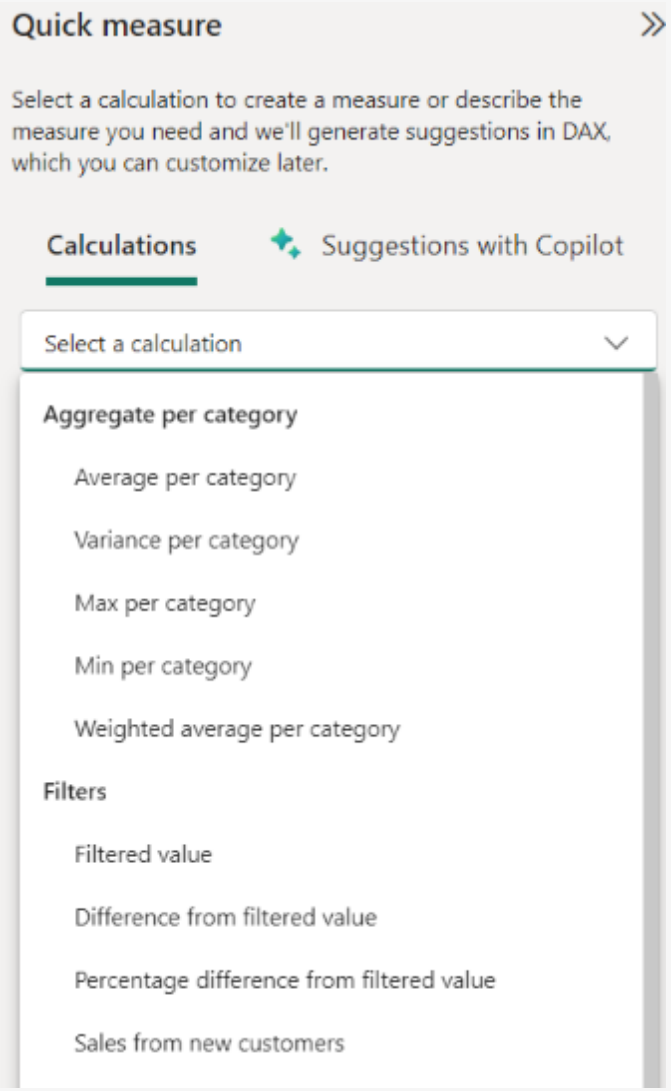
Semantic Models in PowerBI



Measures in PowerBI

- you can create measures using DAX (Data Analysis Expressions) to create new data calculations to solve your requirements.

- DAX is versatile and powerful, but also daunting when getting started with Power BI. DAX is described as a functional language.



DAX Queries in PowerBI

- There are four views in Power BI Desktop: Report, Table, Model, and DAX Query.

- // DAX query generated by Fabric Copilot with "total sales for all salespeople individually for all items in the accessories category"
- // Total sales for each salesperson for items in the accessories category
- EVALUATE
- SUMMARIZECOLUMNS(
- 'Salesperson'[Salesperson],
- FILTER('Product', 'Product'[Category] == "Accessories"),
- "Total Sales", [Total Sales]
-)

Reports with PowerBI

Power BI Desktop is the primary report development tool. You can connect to, transform, model, and visualize data all from this application.

- When you create reports in Power BI Desktop, you can publish them to the Power BI or Fabric service for collaboration and distribution. When you publish the report, two items are created within a workspace: **a semantic model** and **the report**.
- The report is the visual representation you created in the Report view in Power BI Desktop.
- The semantic model is the underlying data, including relationships and measures.