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Power BI Training (1-Day)

Instructor:
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Before we start . . .

1. Please download training material.

2. Please make sure that you have **Power BI Desktop** installed on your computer.

Training Outline

- Chapter 1: Introduction to Power BI
- Chapter 2: Power BI User Interface
- Chapter 3: Working with Data Sources
- Chapter 4: Data Shaping & Data Modeling
- Chapter 5: Data Visualization
- Chapter 6: Publish to Power BI Service

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Chapter 1 : Introduction to Power BI

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Objectives

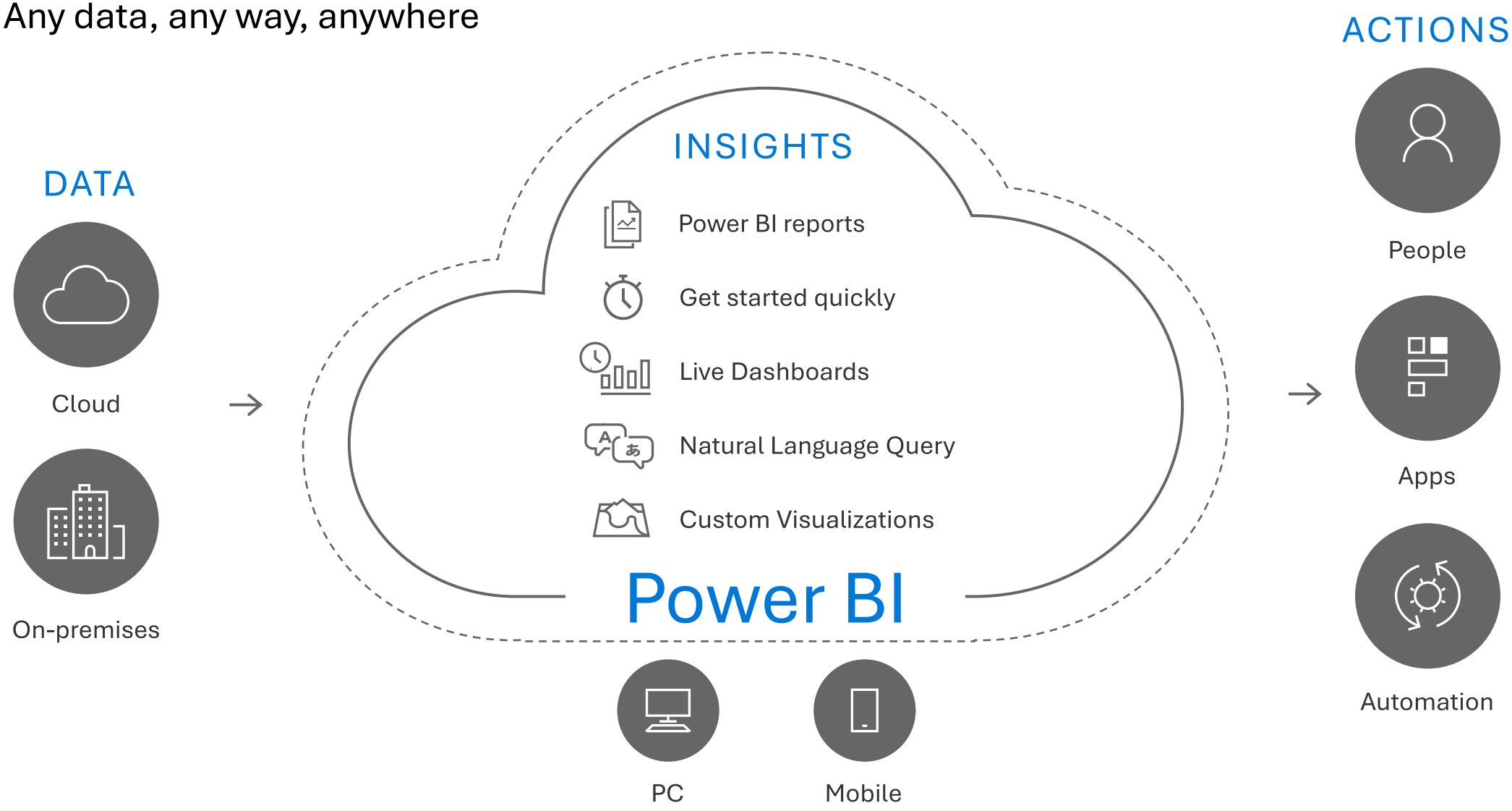
- Power BI Introduction
- Why Power BI ?
- Why new generation of BI ?
- Power BI Platform
- The way to consume Power BI data
- Overview of Power BI Implementation

What is Power BI?

- **Power BI** is a Business Analytics tools that enables you to analyze data and share insights throughout your organization.
- **Everyone** can easily create and explore the data through dashboard by using intuitive tools to find the answers with just a few clicks.

Power BI: Experience your data

Any data, any way, anywhere



A new generation of BI

Today, BI extends to everyone

3rd wave
End user BI

Everyone

2nd wave
Self-service BI

Analyst to end user

1st wave
Technical BI

IT to end user

Why should we use Power BI?

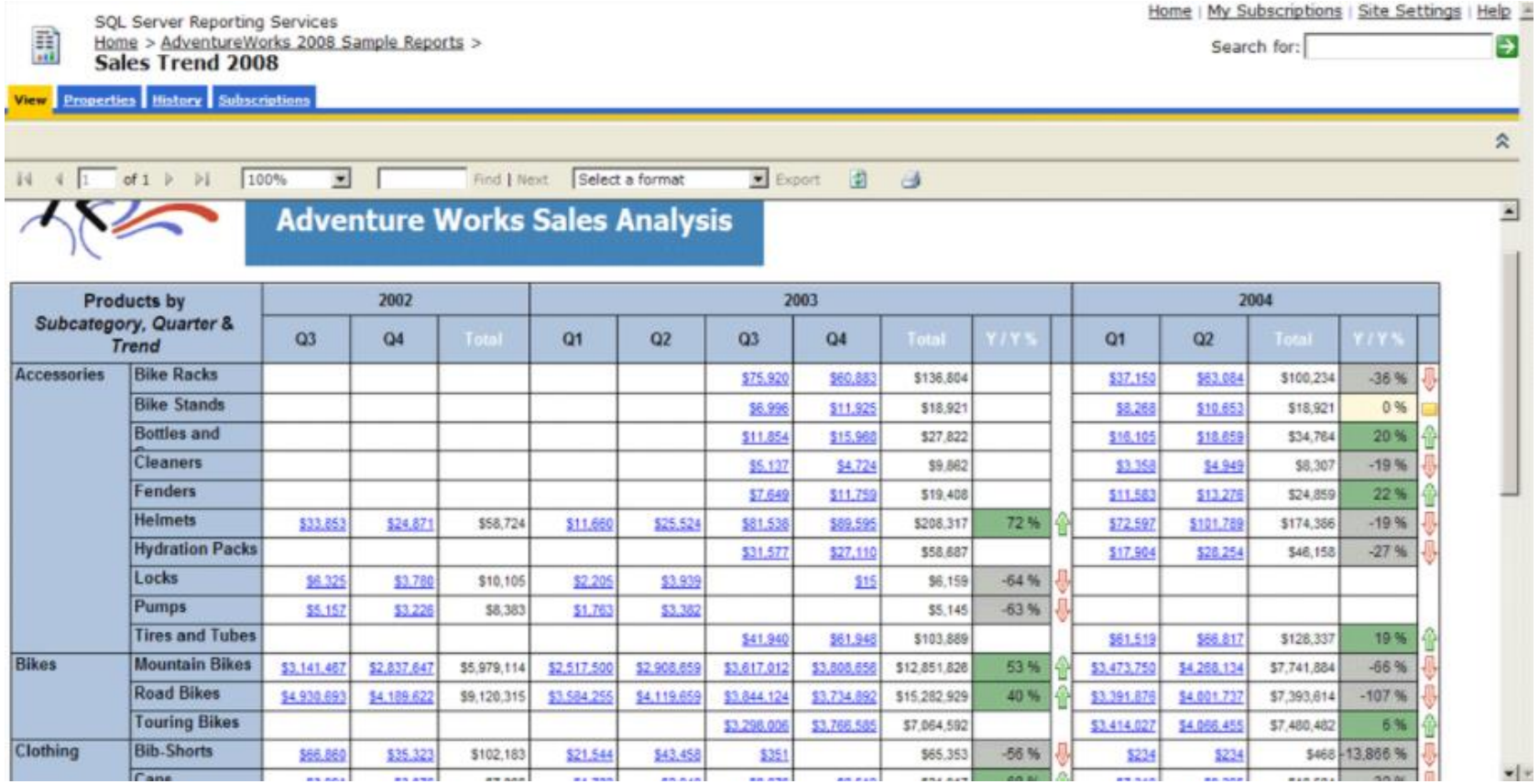
- **Ease of use** - Power BI is easy to use and learning curve is short
- **Great for Excel users** - Power BI basic function is very similar to excel
- **Blend multiple data sources** - Power BI allows you to connect data from many different sources.
- **Visualization capabilities** - If you want to analyze and represent data in various formats and visualization, Power BI have many bundled visualization available and can be extended.

Why should we use Power BI ?

- **Easy publishing and sharing** - After analyzing the data. The reports or dashboards can be published to share it live on web.
- **Mobile friendly** - Create visualization and then publish, now you're ready for mobile
- **Cutting edge features** – Power BI have many preview functions, which received from community ideas / recommendation, some of the most interesting features are Power BI Q&A, Natural Language Processing, Machine Learning and AI
- **Deep integration with Microsoft Product** - If you are using Office 365, Microsoft Azure, Power BI can be integrated with them all

Why any organization need new generation of BI

- Reporting is slow and don't help business as much as business dashboard or analytics



SQL Server Reporting Services
Home > AdventureWorks 2008 Sample Reports >
Sales Trend 2008

Home | My Subscriptions | Site Settings | Help
Search for:

View | Properties | History | Subscriptions

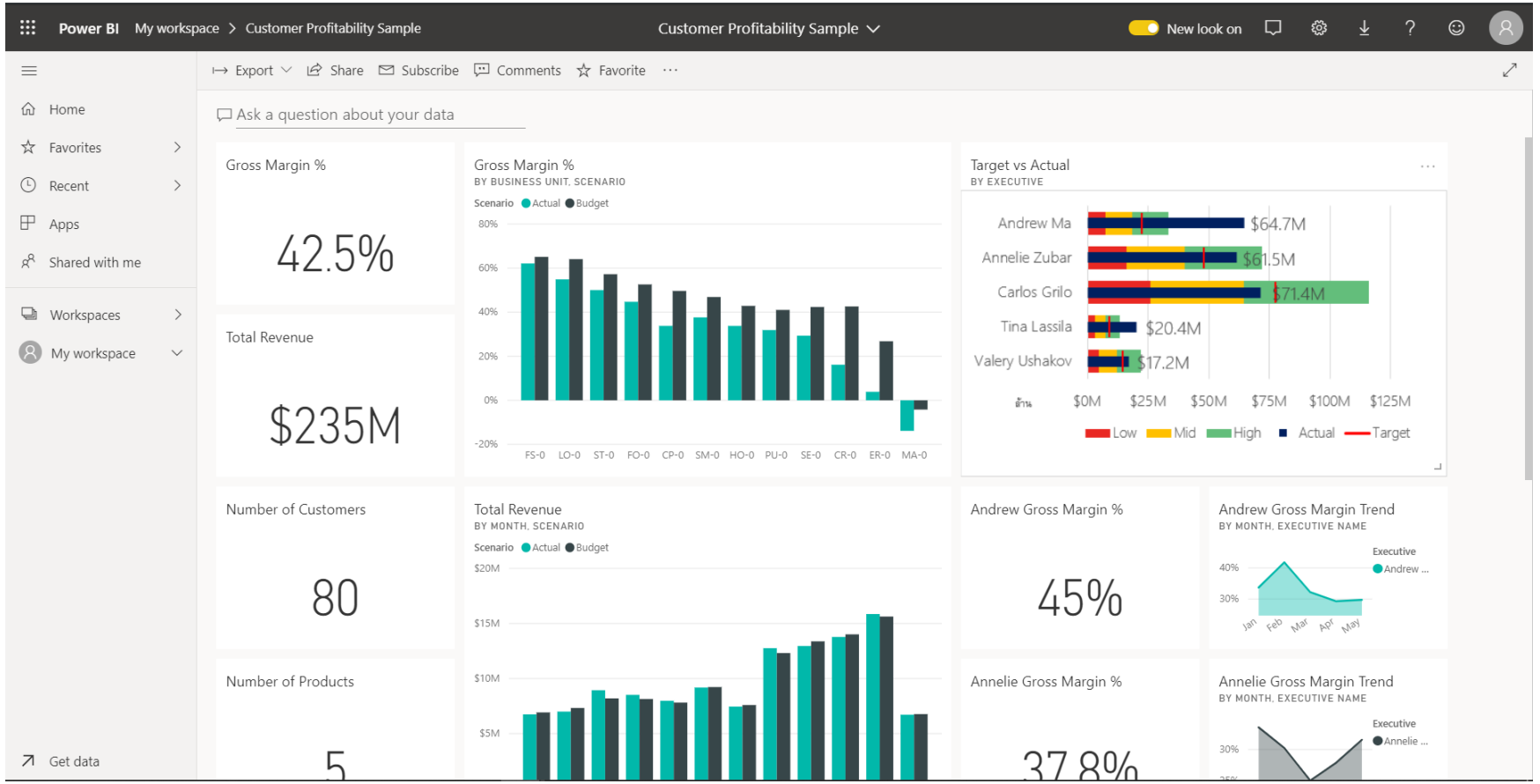
1 of 1 | 100% | Find | Next | Select a format | Export

Adventure Works Sales Analysis

Products by Subcategory, Quarter & Trend		2002			2003						2004			
		Q3	Q4	Total	Q1	Q2	Q3	Q4	Total	Y / Y %	Q1	Q2	Total	Y / Y %
Accessories	Bike Racks						$75,920	$60,883	$136,804		$37,150	$63,084	$100,234	-36 %
	Bike Stands						$6,996	$11,925	$18,921		$8,268	$10,653	$18,921	0 %
	Bottles and						$11,854	$15,968	$27,822		$16,105	$18,659	$34,764	20 %
	Cleaners						$5,137	$4,724	$9,862		$3,358	$4,949	$8,307	-19 %
	Fenders						$7,649	$11,759	$19,408		$11,583	$13,276	$24,859	22 %
	Helmets	$33,853	$24,871	$58,724	$11,660	$25,524	$81,536	$89,595	$208,317	72 %	$72,597	$101,789	$174,386	-19 %
	Hydration Packs						$31,577	$27,110	$58,687		$17,504	$28,254	$46,158	-27 %
	Locks	$8,325	$3,780	$10,105	$2,205	$3,939		$15	$6,159	-64 %				
	Pumps	$5,157	$3,226	$8,383	$1,763	$3,382			$5,145	-63 %				
	Tires and Tubes						$41,940	$61,948	$103,889		$61,519	$66,817	$128,337	19 %
Bikes	Mountain Bikes	$3,141,467	$2,837,647	$5,979,114	$2,517,500	$2,908,659	$3,617,012	$3,808,656	$12,851,826	53 %	$3,473,750	$4,268,134	$7,741,884	-66 %
	Road Bikes	$4,930,693	$4,189,622	$9,120,315	$3,584,255	$4,119,659	$3,844,124	$3,734,892	$15,282,929	40 %	$3,391,876	$4,001,737	$7,393,614	-107 %
	Touring Bikes						$3,298,006	$3,766,586	$7,064,592		$3,414,027	$4,066,455	$7,480,482	6 %
Clothing	Bib-Shorts	$66,869	$35,323	$102,183	$21,544	$43,458	$351		$65,353	-56 %	$234	$234	$468	-13,866 %
	Caps													

New generation of BI concept

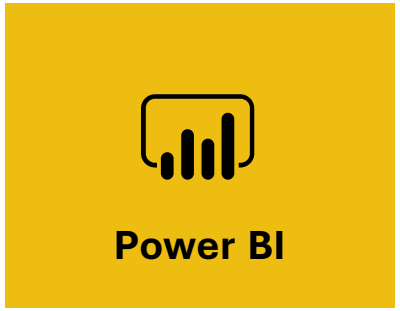
- Create a dashboard with impactful information, visualization will greatly help business users to understand their business more



The parts of Power BI

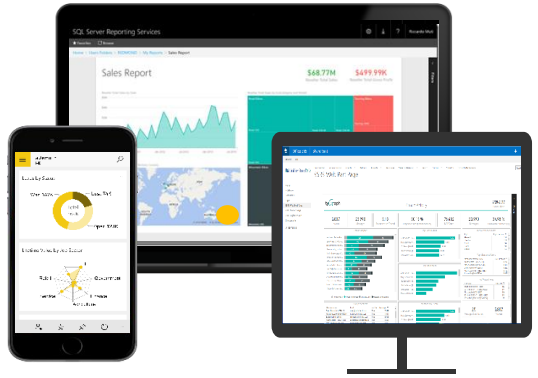
- Power BI consists of elements that all work together

Power BI Desktop



Use to create dashboard, visualization, perform data blending, connect to Power BI Service to publish content to the web

Power BI Service (Cloud)



Power BI Service is a Cloud SaaS Service, once setting it up, start collaboration in under 10 minutes, use to share and collaborate Power BI content

The way to consume Power BI Content

Mobile Apps

Android App

iOS App

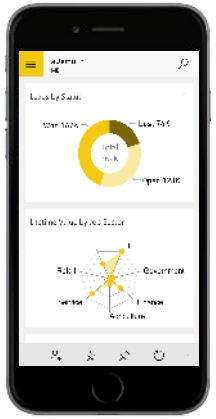
Web Portal

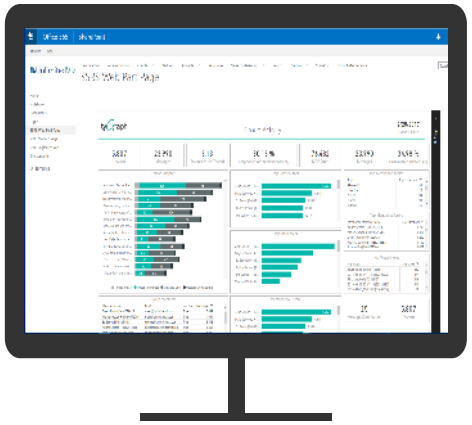
Consume with ease via Power BI Report Server web portal

Embedded In Your Apps

Easy to embed into apps

</>

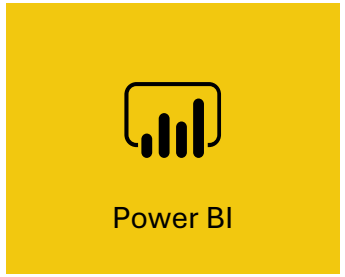




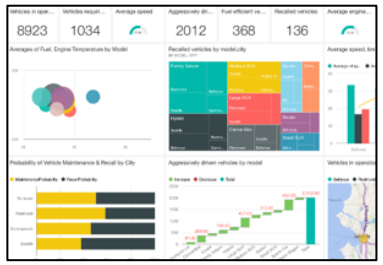
Important Slide

Overview of Power BI Implementation

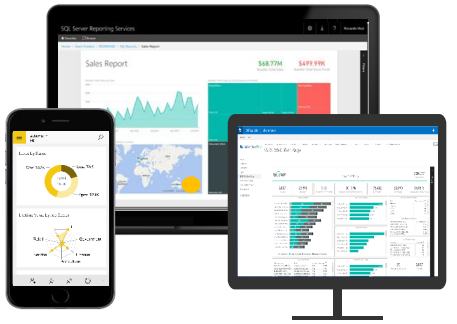
Select Your Data



Shape Your Data, Create Data Model in Power BI



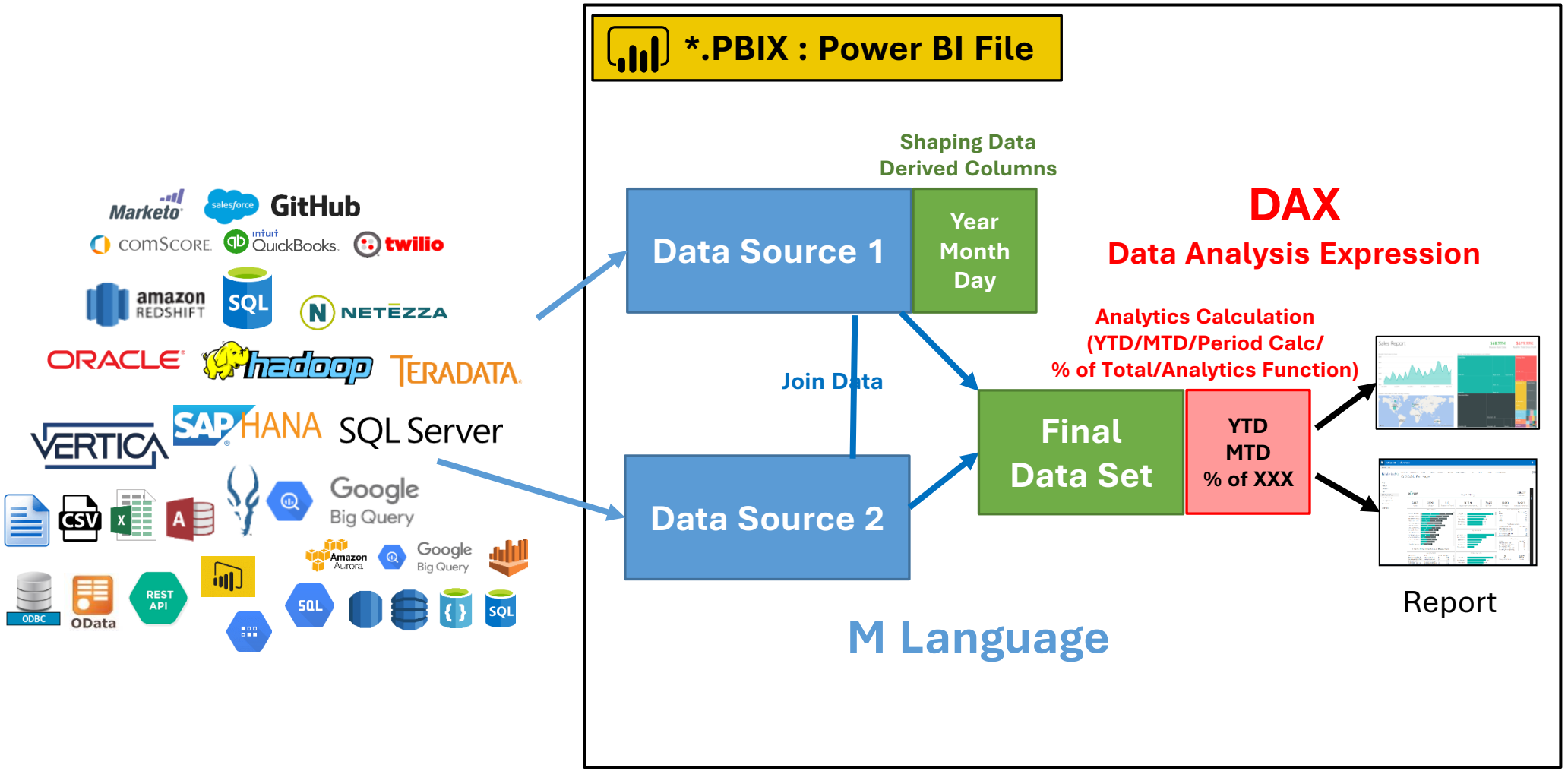
Create Visualization and Report



Publish to Power BI Service

Important Slide

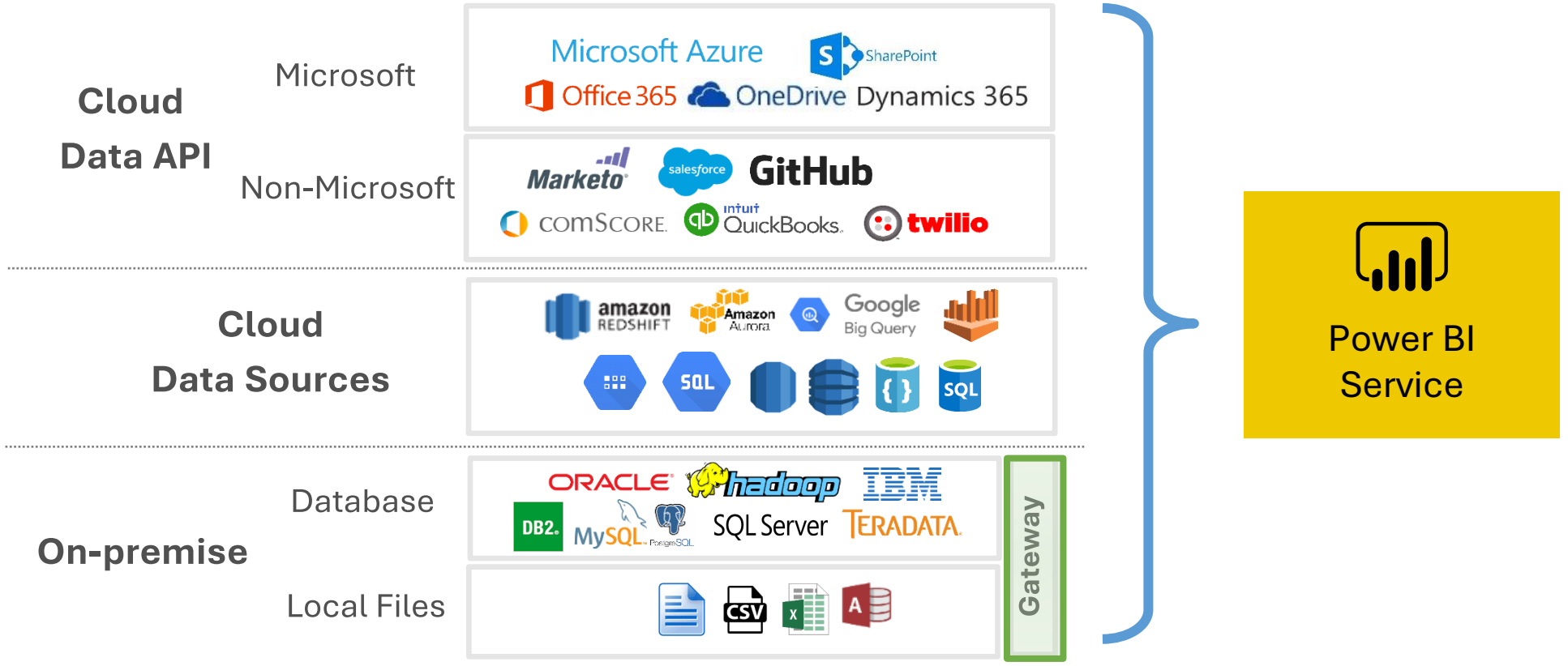
Overview of Power BI Implementation (Cont.)



Note: This class will cover Basic M / DAX generated from Power BI Desktop user interface only

Overview of Power BI Implementation (Cont.)

- Because Power BI Service is a SaaS Service (Cloud-Based) only
- All of data sources must be Cloud-Compatible to make it able to be automated and scheduled



To bridge on premise data sources to cloud, we need Power BI Data Gateway to make it cloud-compatible

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Chapter 2 : Power BI User Interface

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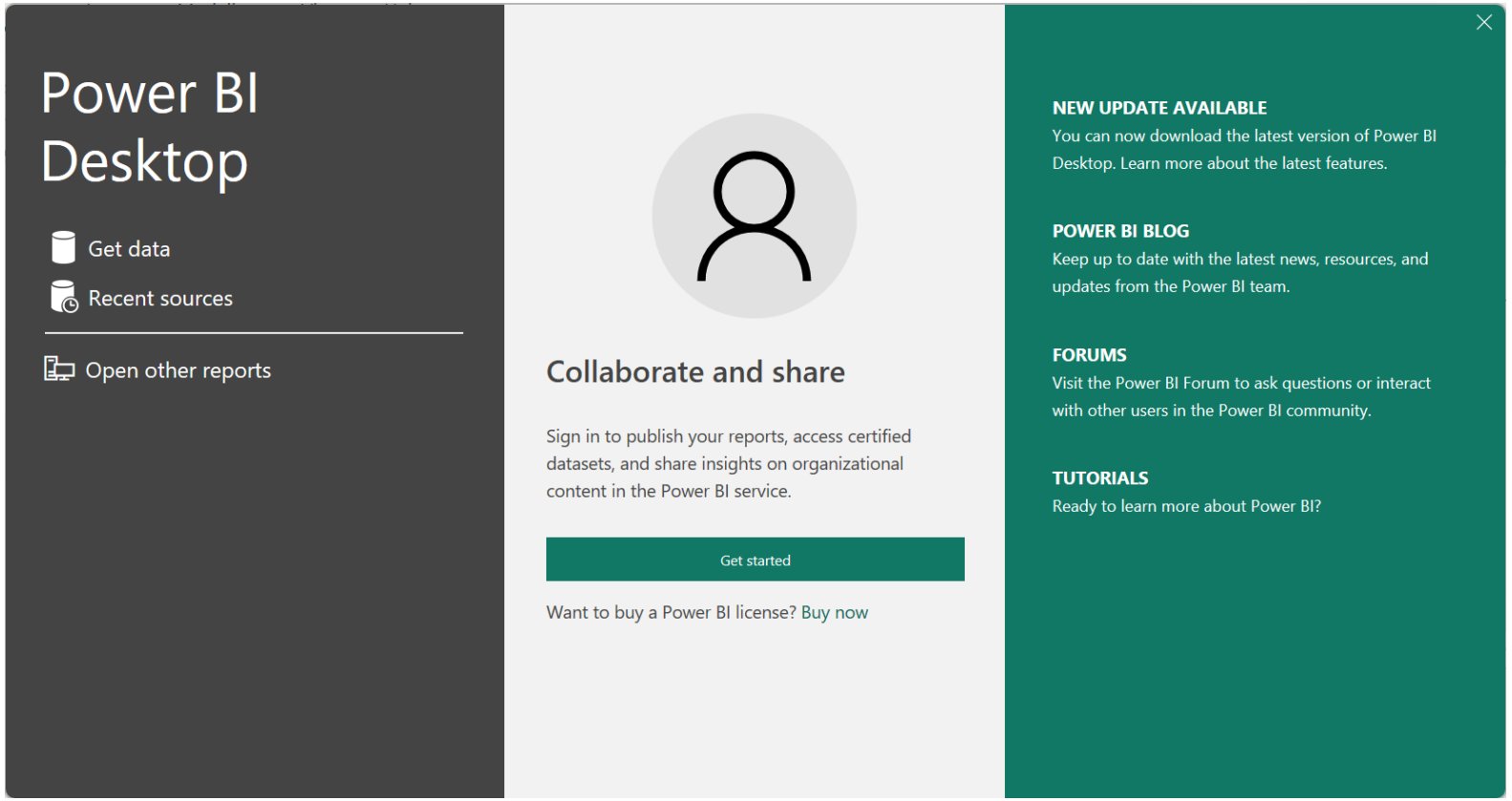
Objectives

- Getting used with Power BI Interface
- Options / Preview Features Enablement

Power BI Desktop User Interface

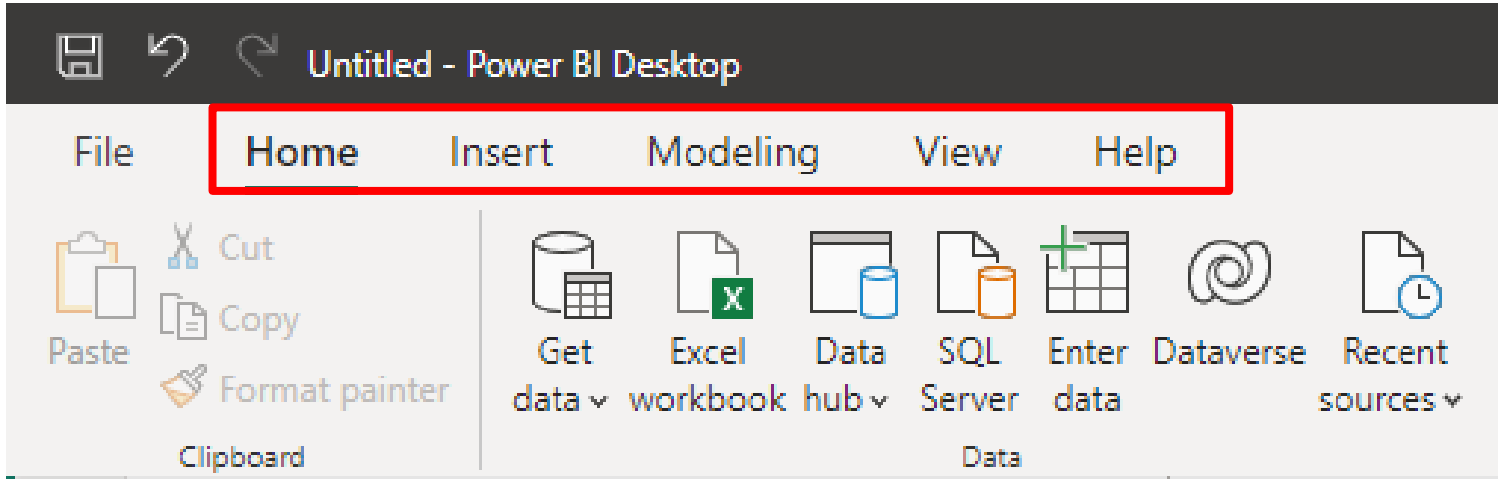
On a Welcome screen, There are three options that you can get :

- Get data
- Recent Sources
- Open Other Reports



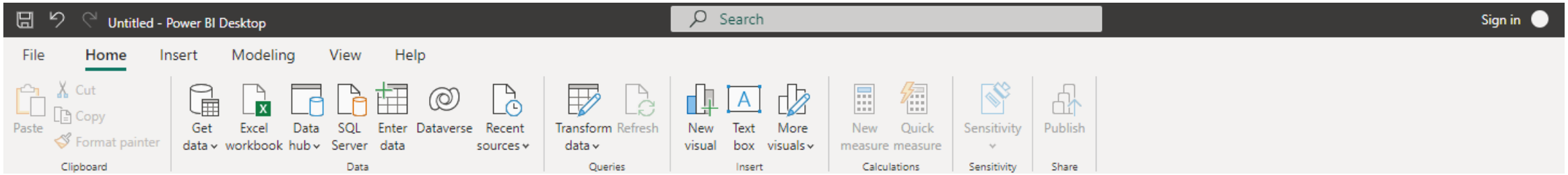
Power BI Desktop User Interface

- Power BI Desktop breaks into 4 menus using Ribbon interface

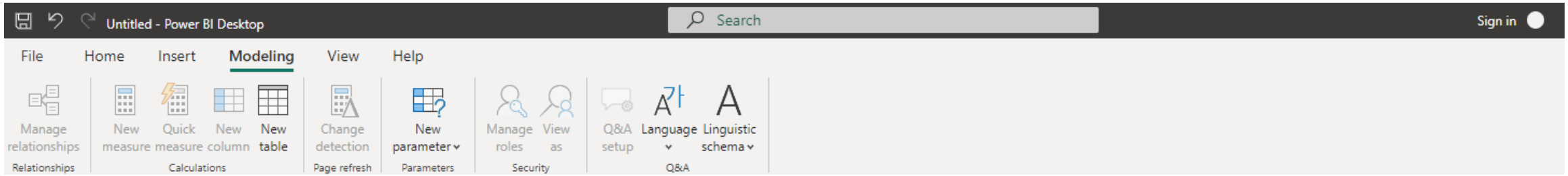


Power BI Desktop User Interface

- Home Interface (Business Users will use this the most)

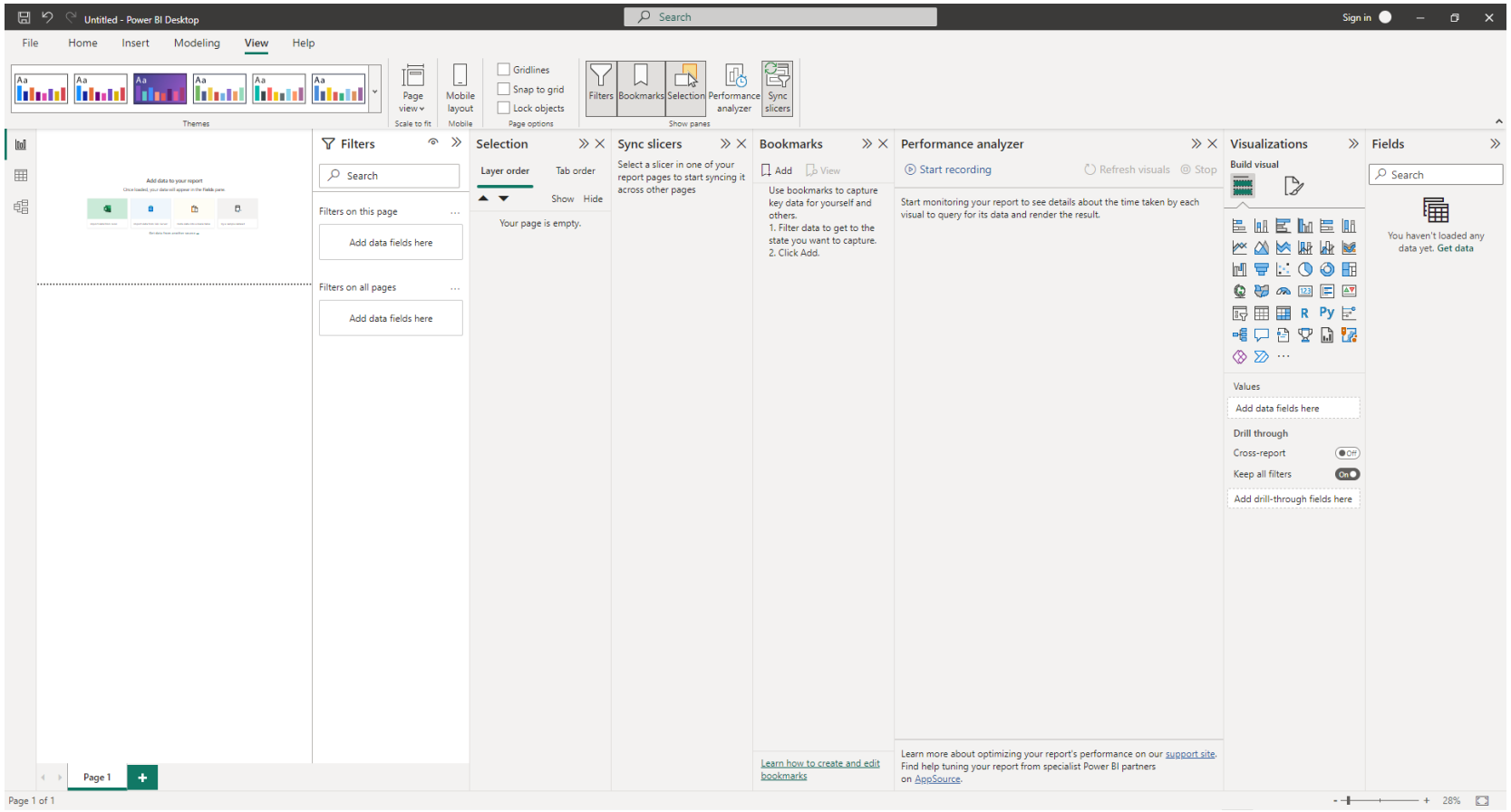


- Modeling Interface (Data Modelers will use this the most)



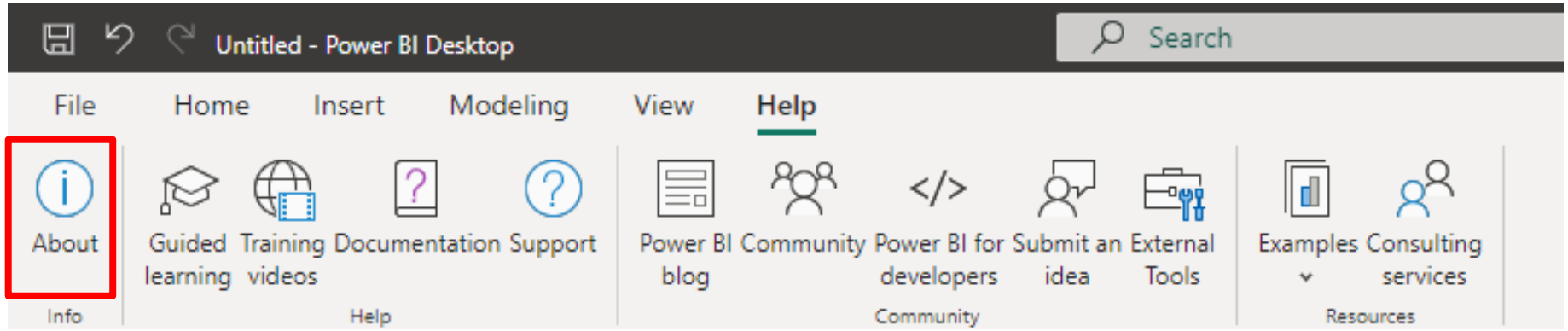
Power BI Desktop User Interface

- View Interface - Use to customize view and layout of Power BI Desktop and manage view for Mobile Devices

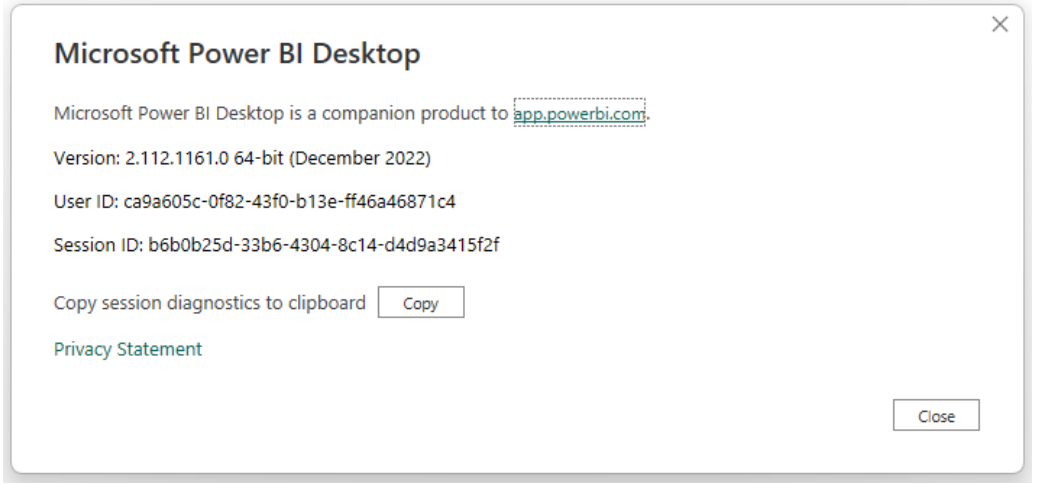


Power BI Desktop User Interface

- Help Interface - The most important feature is to check current version :)

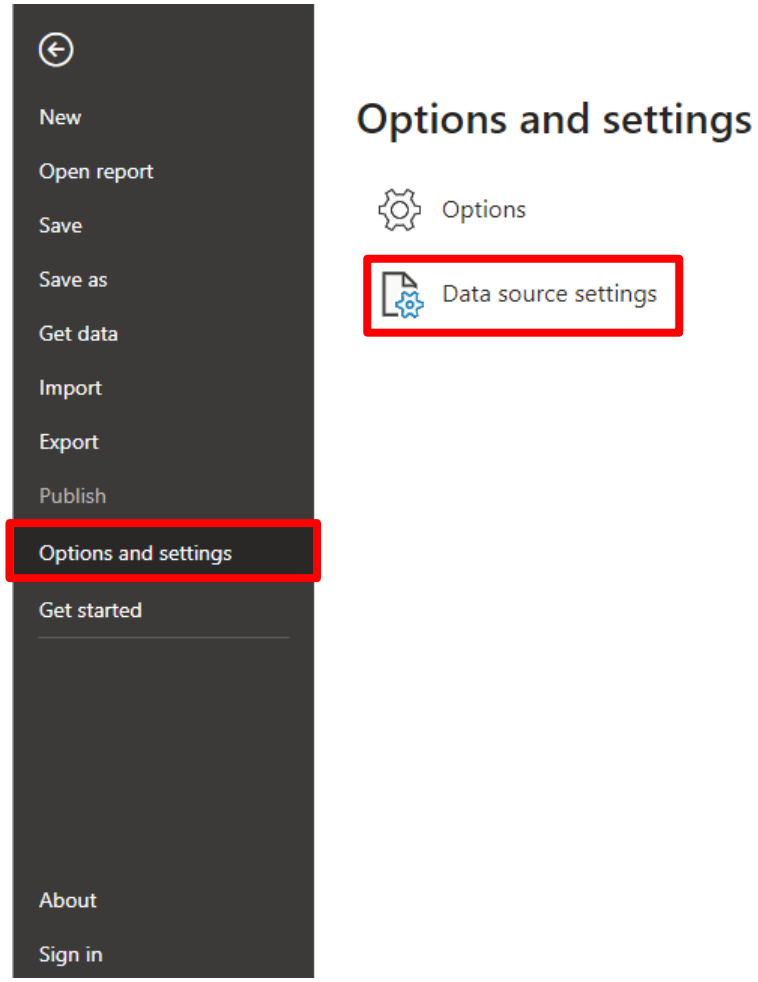


- Because Power BI update monthly, it is important to know current version to get correct support procedure and know compatibility with Power BI Service



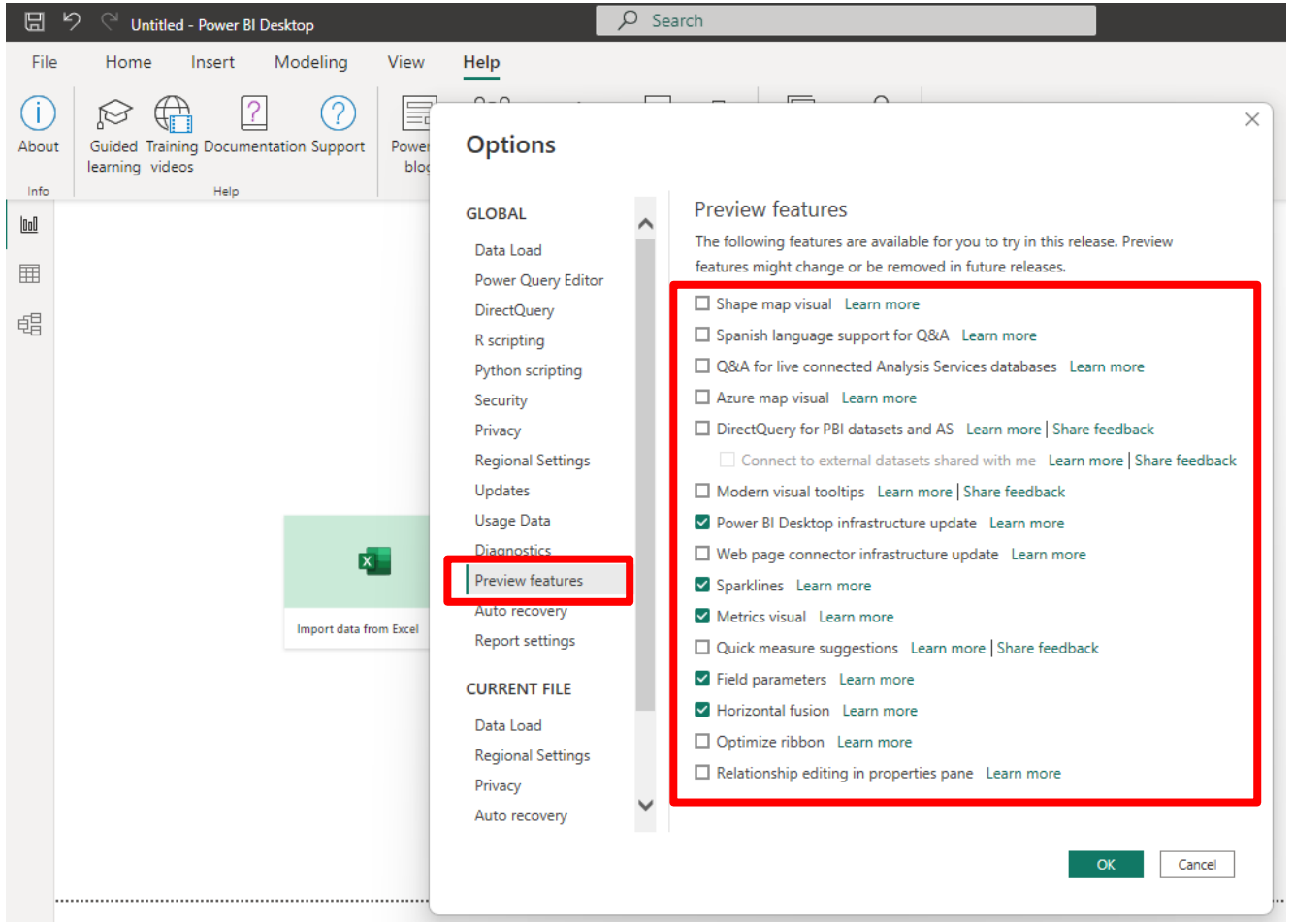
Power BI Desktop Options

- One of the most important option for Users is Options (many hidden configuration is in here !)



Preview Features

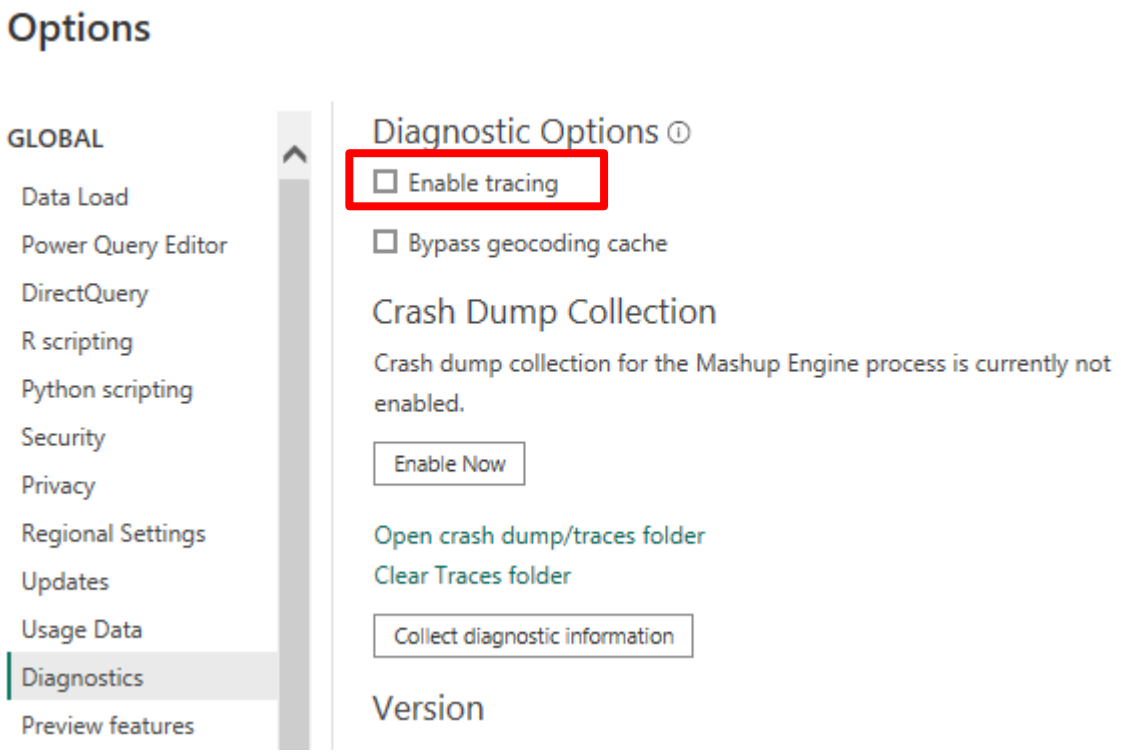
- Power BI Desktop cutting-edge features come disabled; we need to enable the features to test its functionality



Important Slide

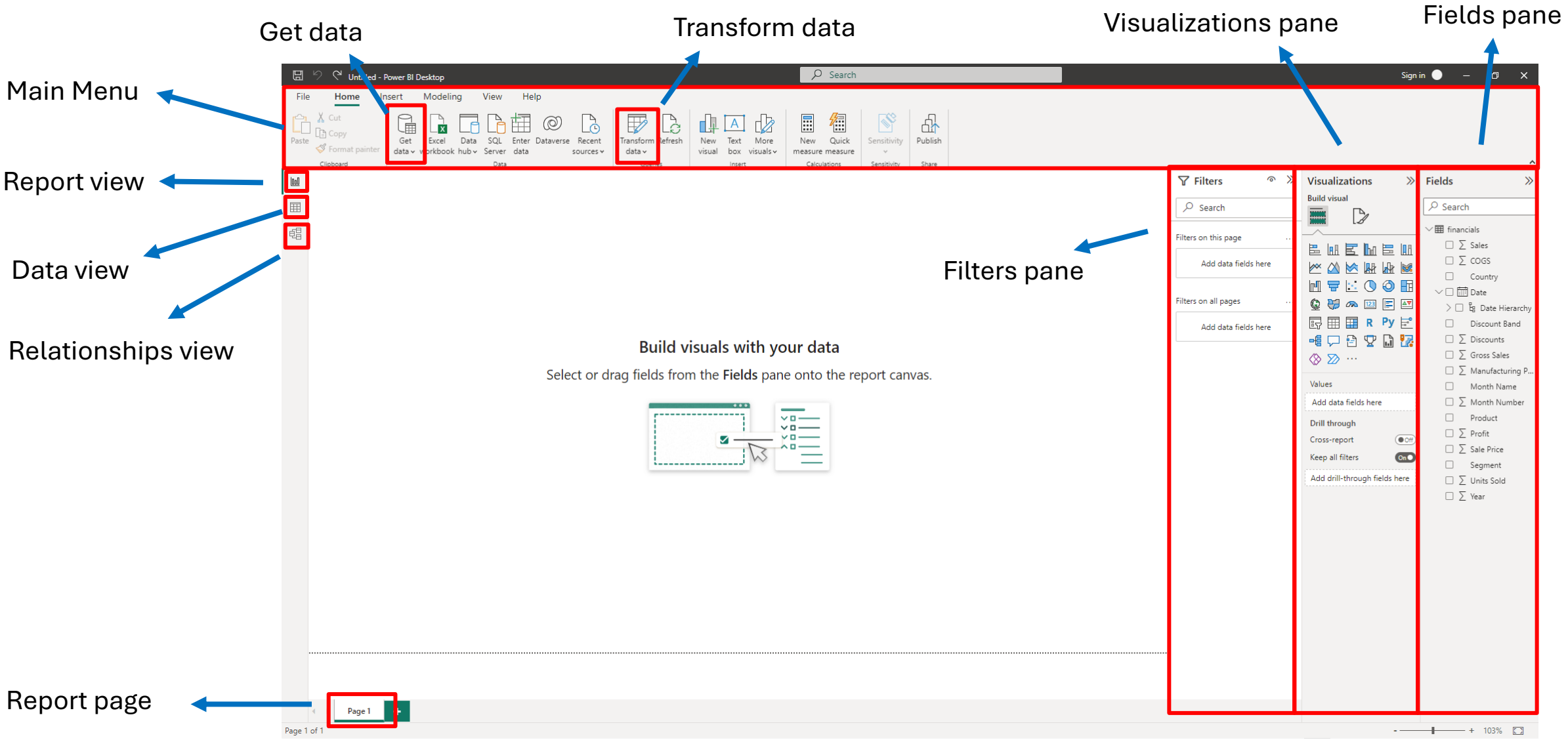
Collecting Log for Support

- By Default, Tracing is not enabled (Enabled this may cause performance drop) but it is needed for troubleshooting process



Default Path : C:\Users\<User>\AppData\Local\Microsoft\Power BI Desktop\Traces

Power BI Desktop Home Menu Components



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Chapter 3 : Working with Data Sources

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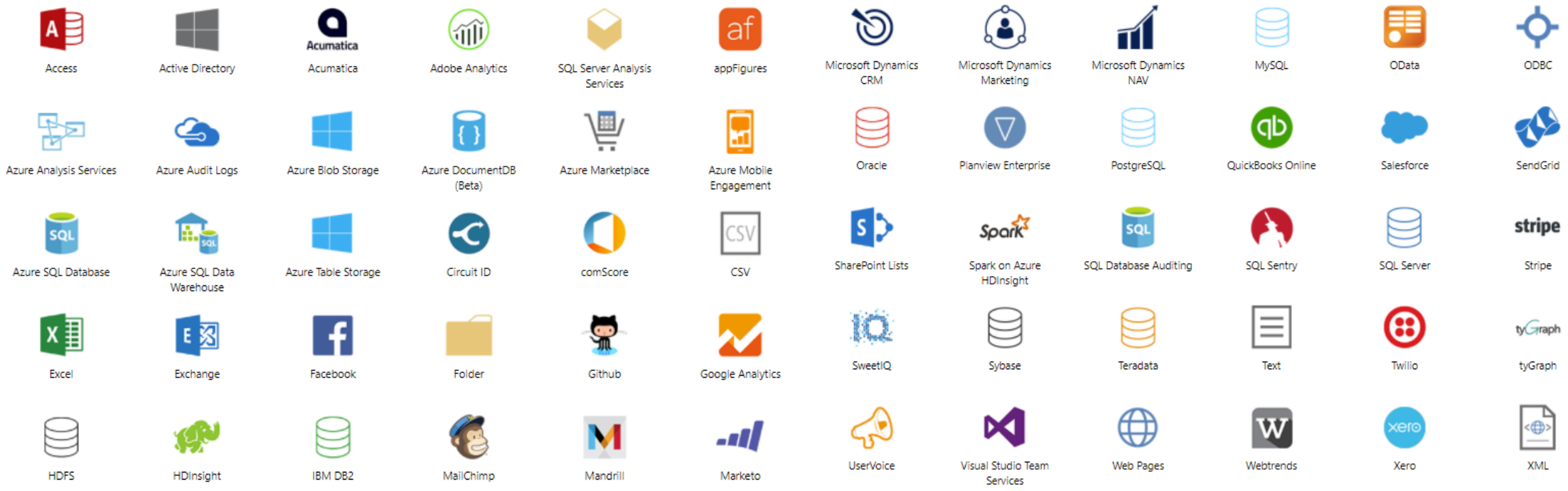
Objectives

- Getting used to data source connection method in Power BI
- Understand DirectQuery and Imported Data Mode

Power BI : Data Sources Support

- Business users can connect multiple data sources and use them in Power BI



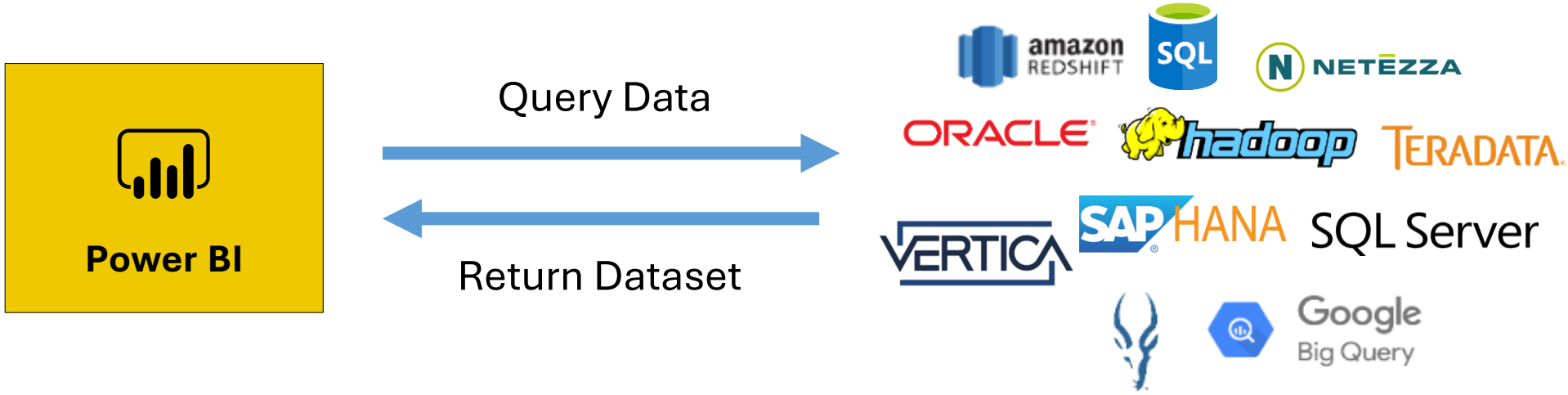
Connecting to various data sources

- Use cases for connecting Data Sources using Power BI Desktop can be categorized as
  - Files
  - Databases
  - Cloud Databases
  - Cloud API / Online Services
  - Azure Platform

Important Slide

Power BI : Data Connection

Live : DirectQuery

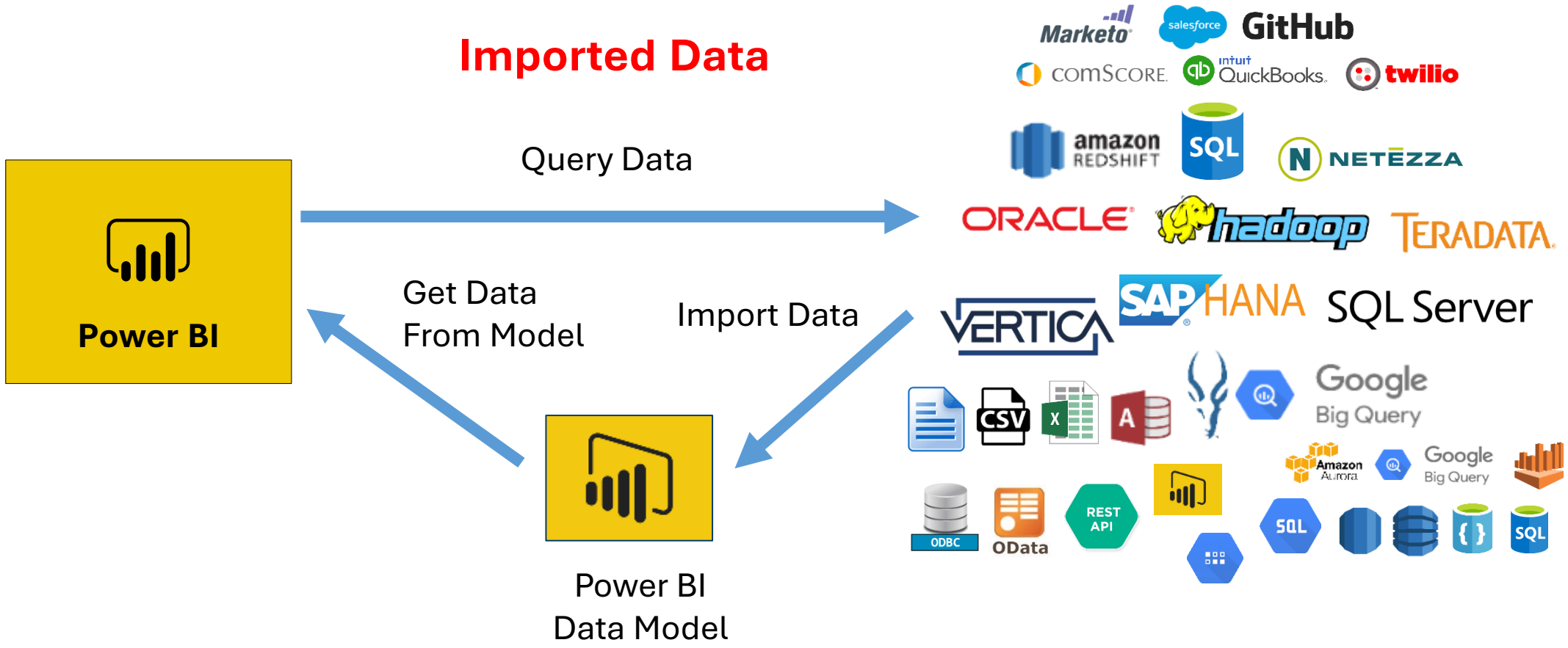


Live Data, Live Query, performance is up to data source connectivity

https://docs.microsoft.com/en-us/power-bi/desktop-directquery-data-sources

Important Slide

Power BI : Data Connection



Performance will be improved a lot using Power BI in-memory engine

https://docs.microsoft.com/en-us/power-bi/desktop-data-sources

Demo 3-1 : Connecting to Local Files

- Working with Text/CSV file

Demo 3-2 : Working with Multiple files in folder

- Use case for Combining all of text files in folder into one dataset

Demo 3-3 : Connecting to Database (Instructor Demo)

- Working with Database, view Native SQL command

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Chapter 4 : Data Shaping & Data Modeling

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Objectives

- Understanding Data shaping concept
- Basic Data shaping Techniques
- Understanding Data Modeling Concept
- Create and manage the relationships

Data Shaping Concept

- Data Shaping in Power BI is the technique to make a data transformation to target dataset to make it easier to use and understand by business users.
- There are more than 100 ways to transform the data in Power BI
- For example, renaming columns or Tables, removing Rows, data type transformation, split, concatenate, replace, fill forward and so on.
- Use Query Editor in Power BI Desktop for shaping data.

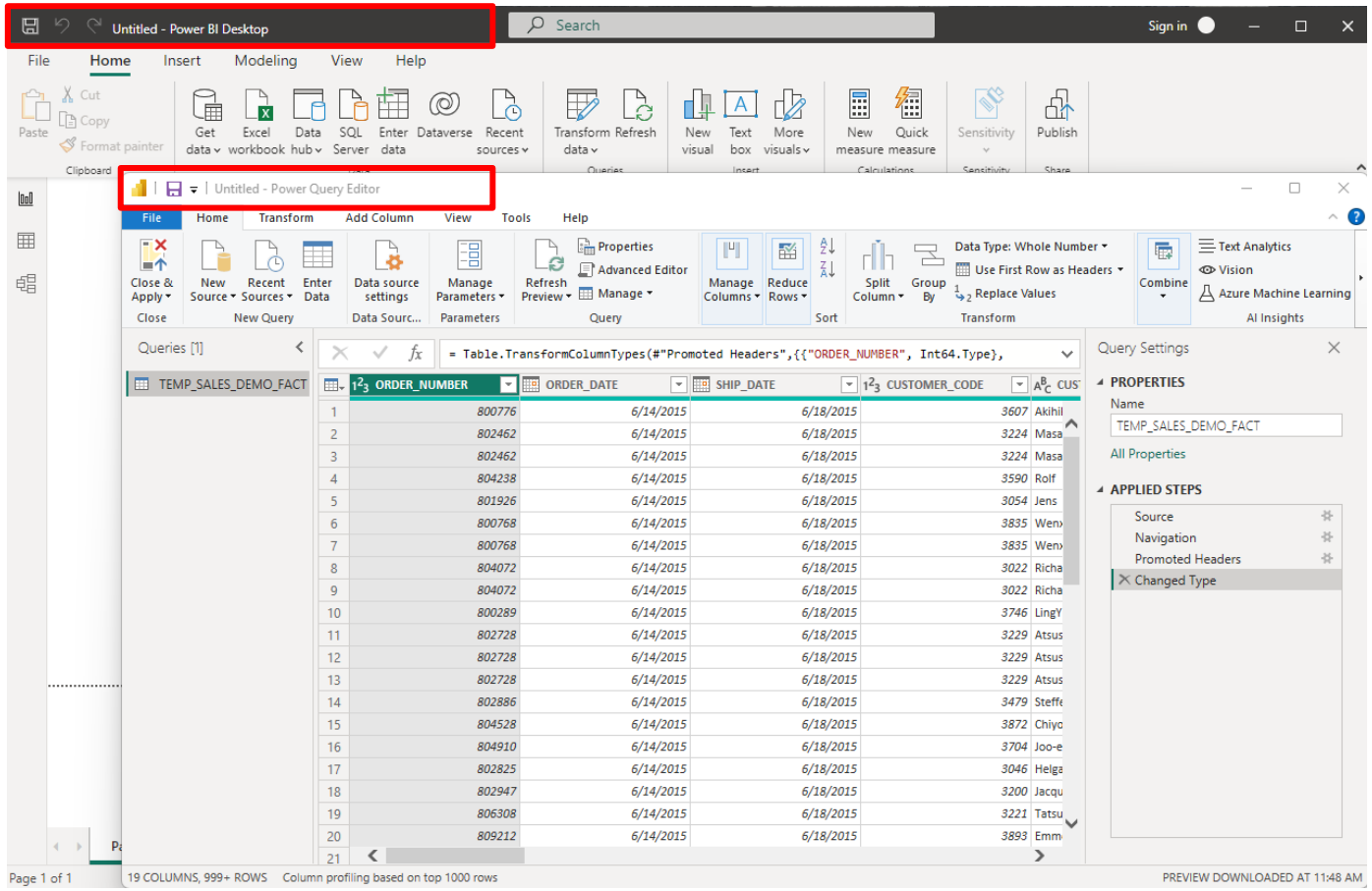
https://docs.microsoft.com/en-us/power-bi/desktop-shape-and-combine-data

Data Shaping Concept (Cont.)

- When you shaped data, The original data source is **NOT** changed (only shown in Power BI)
- Data Shaping in Power BI concept is the same as Data Preparation concept of many other Tools
- Goal for Data Shaping is to **make the data ready to use** to create report / visualization as much as possible.

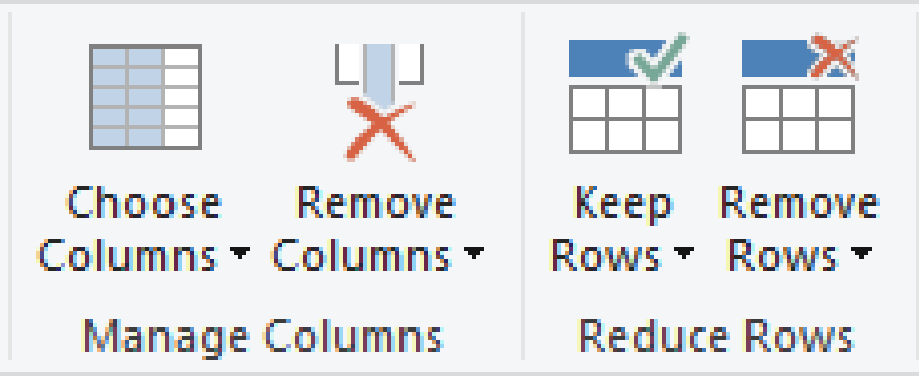
Power BI Interface and Query Editor Interface

- When we perform Data Modeling / Data Shaping, we usually use two windows together.

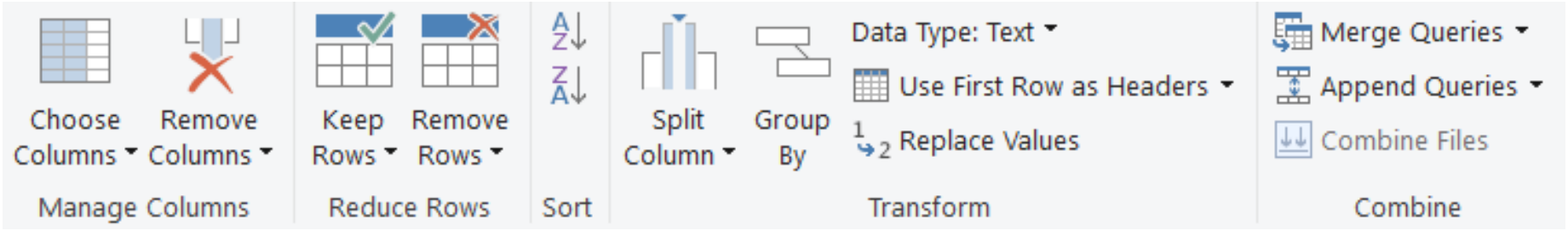


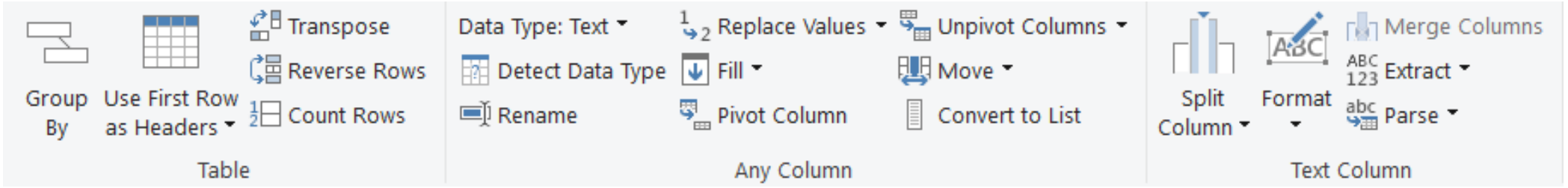
Data Shaping : Columns and Rows Operation (The most used)

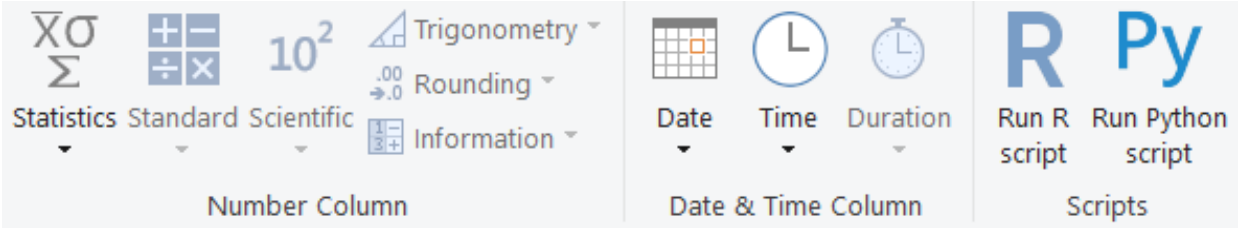
- We can select / remove columns from dataset using Power BI Query Editor
- If data sources come from Structured Databases / Structured Excel Files we will not use rows operation much.

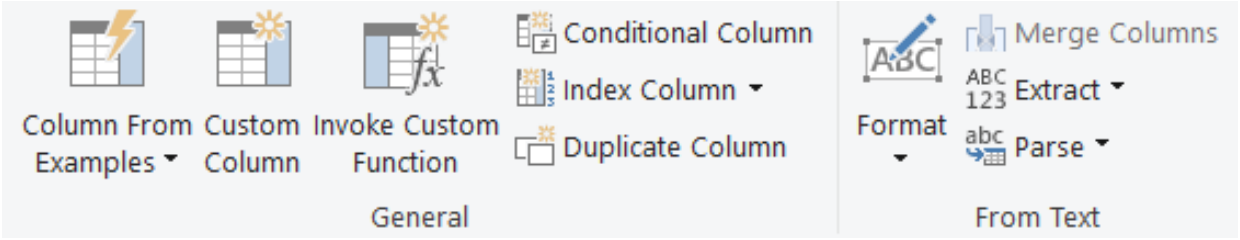


More Data Shaping Functions









Specific Use Cases for Data Shaping

- **Merge / Append**

  Solving Multi-Level of detail (Ex: Sales / Target comparison)

- **Pivot / Transpose / Unpivot**

  Changing Row-Based Value to Column-Based Value and vise-versa

- **Fill**

  Solve problem with Merged Row in Excel

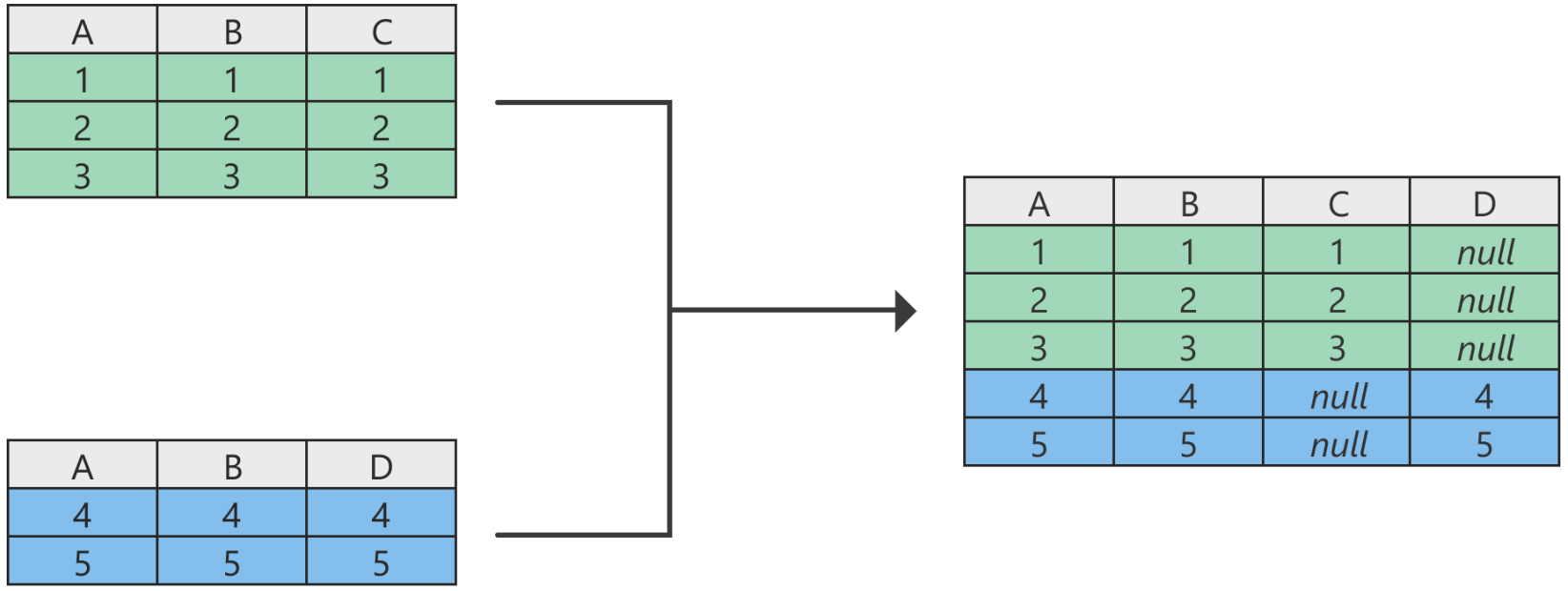
- **Date/Time**

  Get Date/Time part from Date / Date-Time column for multiple time level comparison

Data Shaping Technique

- **Append (Union)**

  The append operation creates a single table by adding the contents of one or more tables to another and aggregates the column headers from the tables to create the schema for the new table.



A	B	C
1	1	1
2	2	2
3	3	3

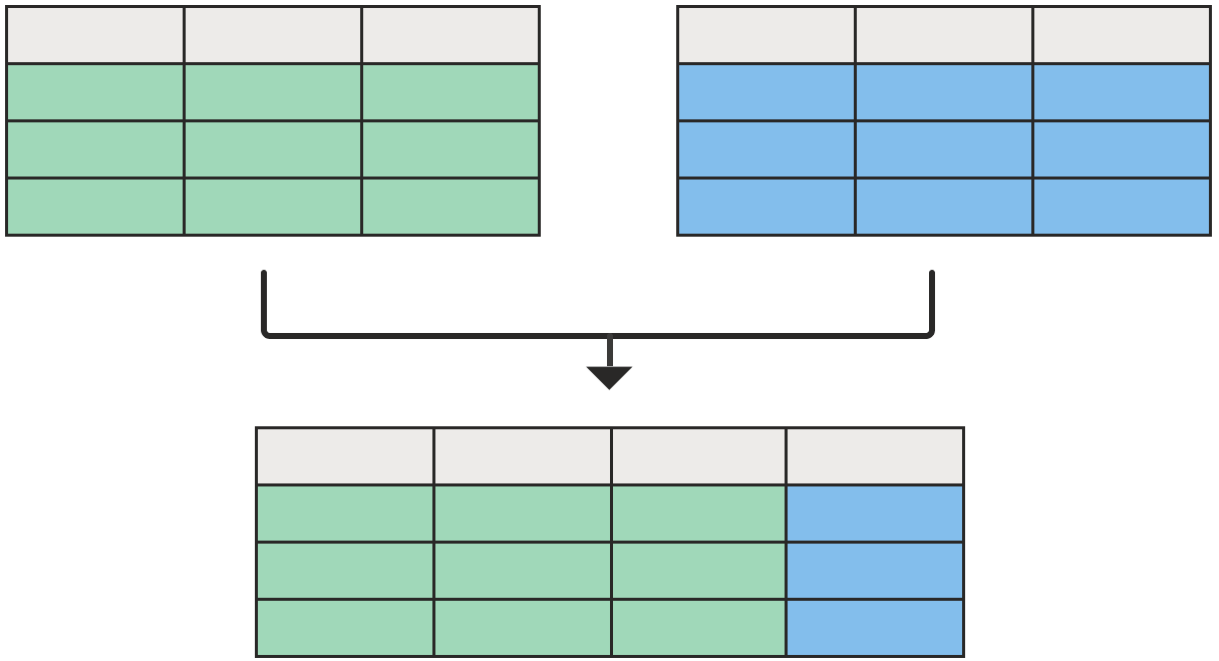
A	B	D
4	4	4
5	5	5

A	B	C	D
1	1	1	*null*
2	2	2	*null*
3	3	3	*null*
4	4	*null*	4
5	5	*null*	5

Data Shaping Technique

- **Merge (Join)**

  A merge queries operation joins two existing tables together based on matching values from one or multiple columns. You can choose to use different types ofjoins, depending on the output you want.



Join Kinds

Join kind	Icon	Description
Left outer		All rows from the left table, matching rows from the right table
Right outer		All rows from the right table, matching rows from the left table
Full outer		All rows from both tables
Inner		Only matching rows from both tables

Join Kinds

Join kind	Icon	Description
Left anti		Only rows from the left table
Right anti		Only rows from the right table

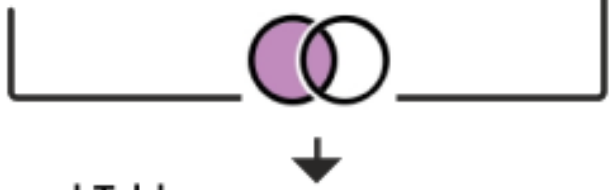
Join Kind - Left Outer Join

Left Table

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	4	35

Right Table

ID	Country
1	USA
2	Canada
3	Panama



Merged Table

Date	CountryID	Units	Country
1/1/2020	1	40	USA
1/2/2020	1	25	USA
1/3/2020	3	30	Panama
1/4/2020	4	35	*null*

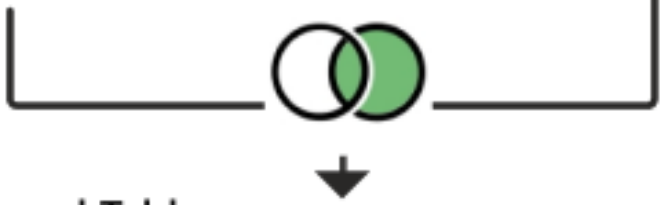
Join Kind - Right Outer Join

Left Table

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	4	35

Right Table

ID	Country
3	Panama



Merged Table

Date	CountryID	Units	Country
1/3/2020	3	30	Panama

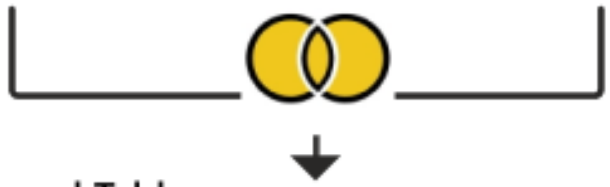
Join Kind - Full Outer Join

Left Table

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	2	35

Right Table

ID	Country
1	USA
2	Canada
3	Panama
4	Spain



Merged Table

Date	CountryID	Units	Country
1/1/2020	1	40	USA
1/2/2020	1	25	USA
1/4/2020	2	35	Canada
1/3/2020	3	30	Panama
null	*null*	*null*	Spain

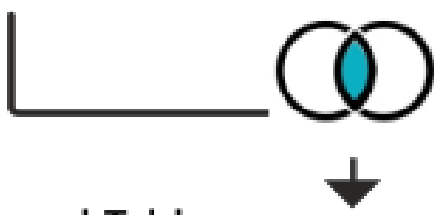
Join Kind - Inner Join

Left Table

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	2	35

Right Table

ID	Country
3	Panama
4	Spain



Merged Table

Date	CountryID	Units	Country
1/3/2020	3	30	Panama

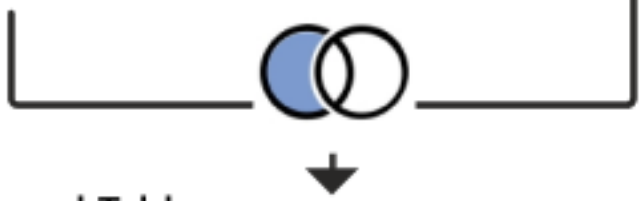
Join Kind - Left Anti Join

Left Table

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	2	35

Right Table

ID	Country
3	Panama
4	Spain



Merged Table

Date	CountryID	Units	Country
1/1/2020	1	40	*null*
1/2/2020	1	25	*null*
1/4/2020	2	35	*null*

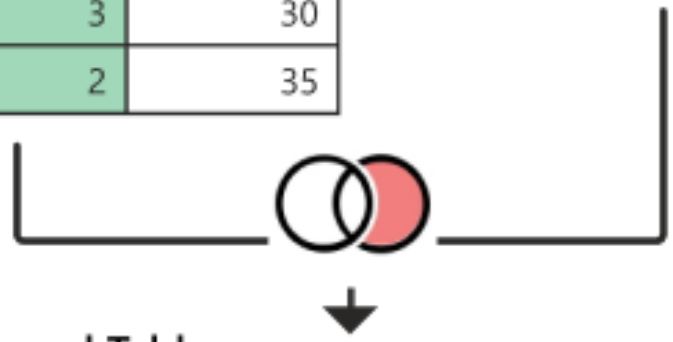
Join Kind - Right Anti Join

Left Table

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	2	35

Right Table

ID	Country
3	Panama
4	Spain

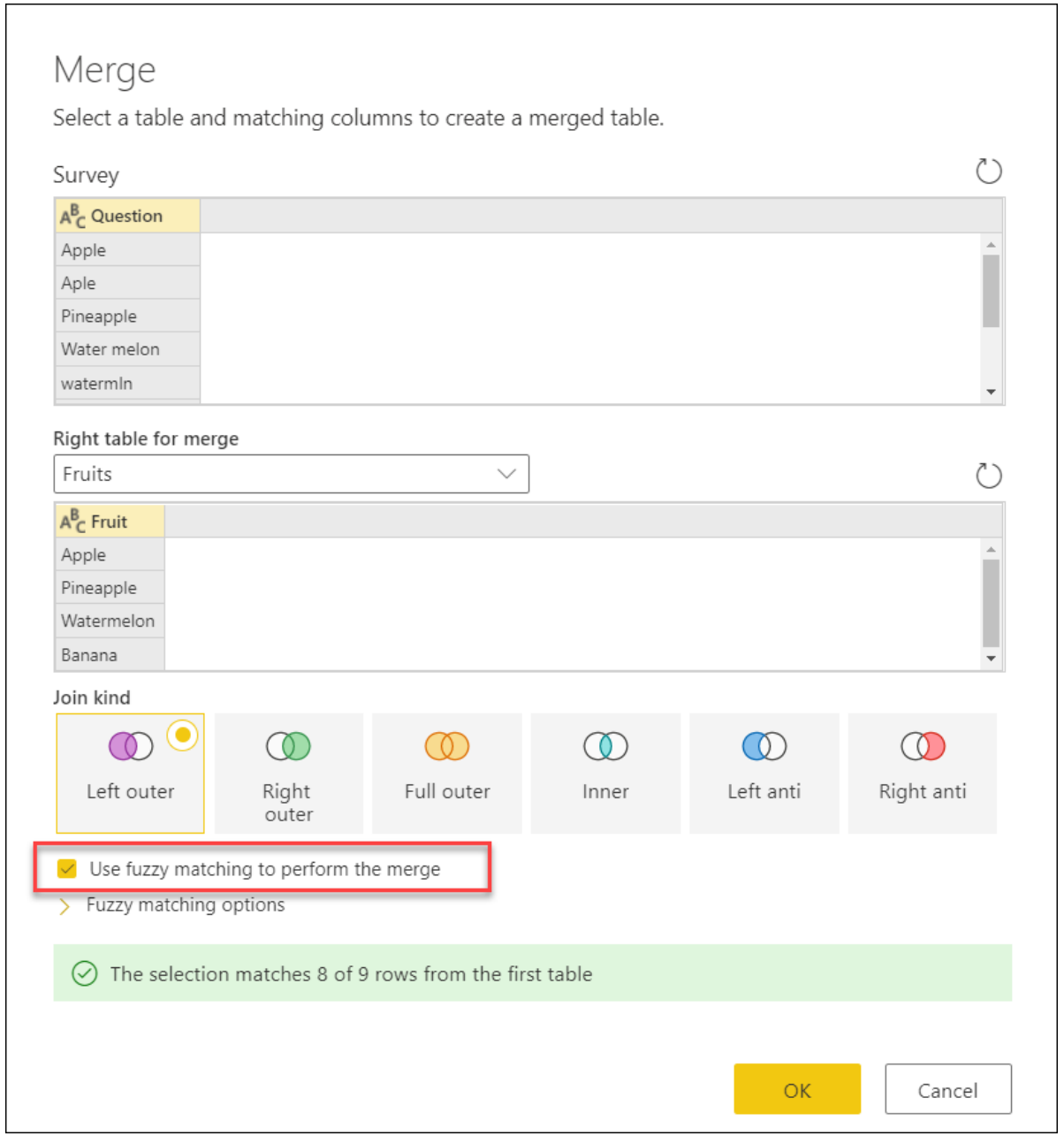


Merged Table

Date	CountryID	Units	Country
null	*null*	*null*	Spain

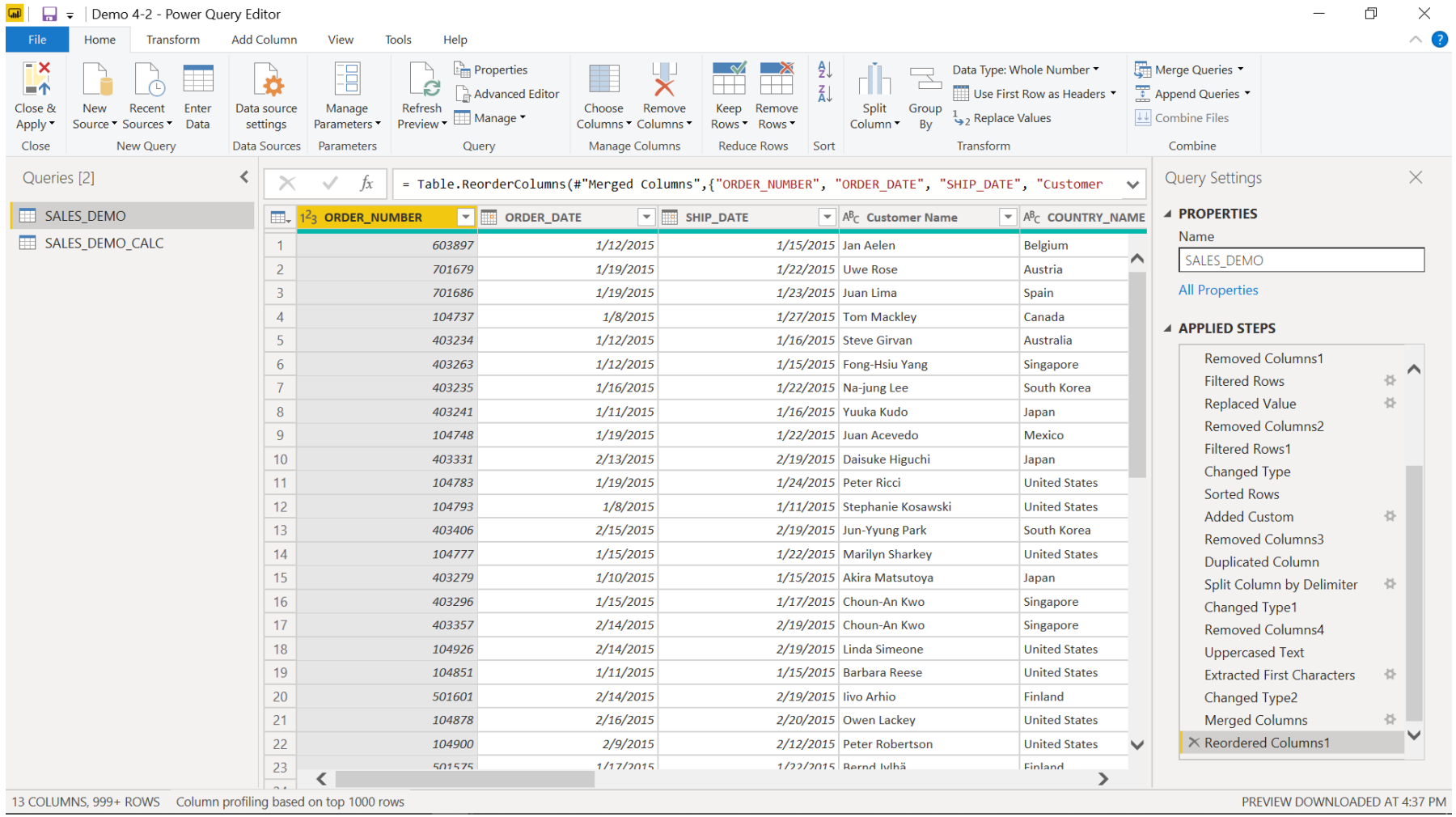
Fuzzy Merge

is a smart data preparation feature you can use to apply fuzzy matching algorithms when comparing columns, to try to find matches across the tables that are being merged.



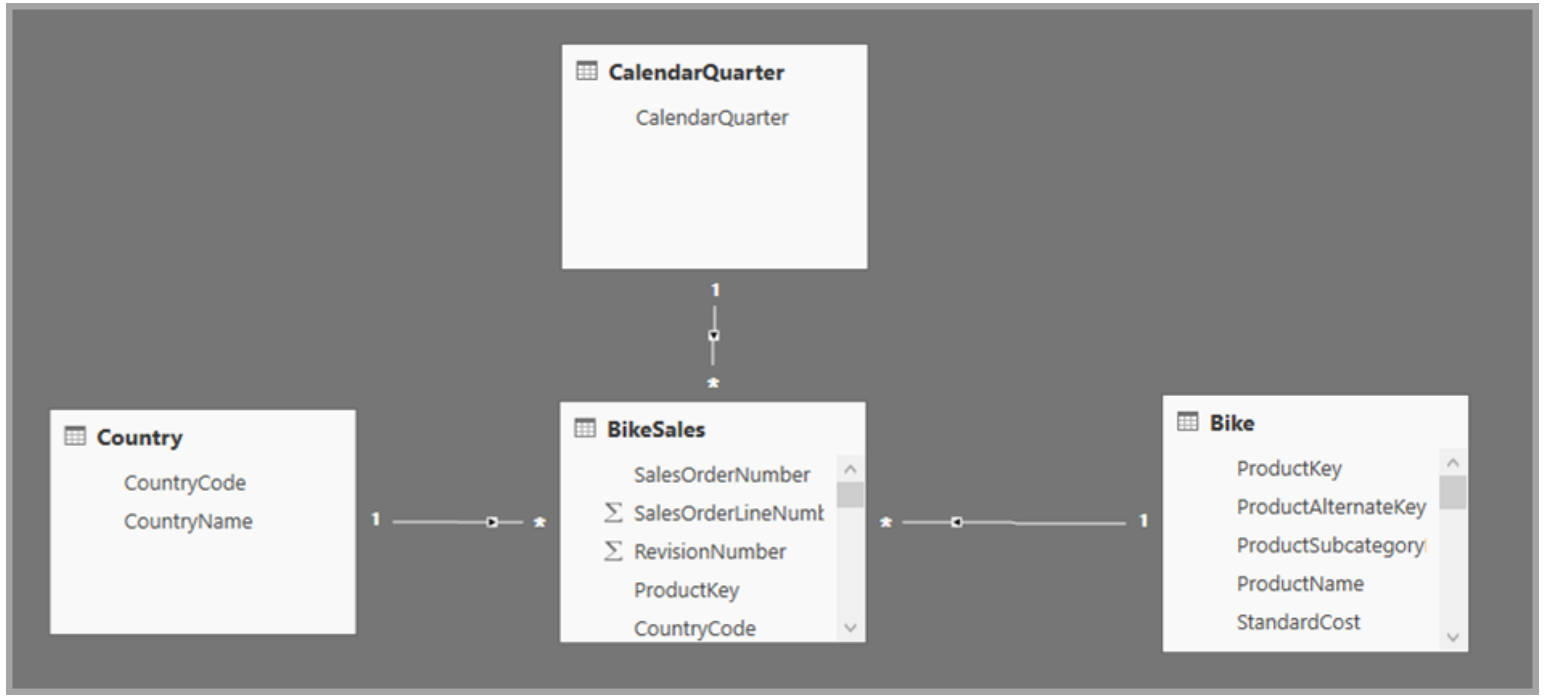
Demo 4-1 : Data Shaping Technique

- Walkthrough about Data Shaping Feature of Power BI



Power BI Data Modeling Concept

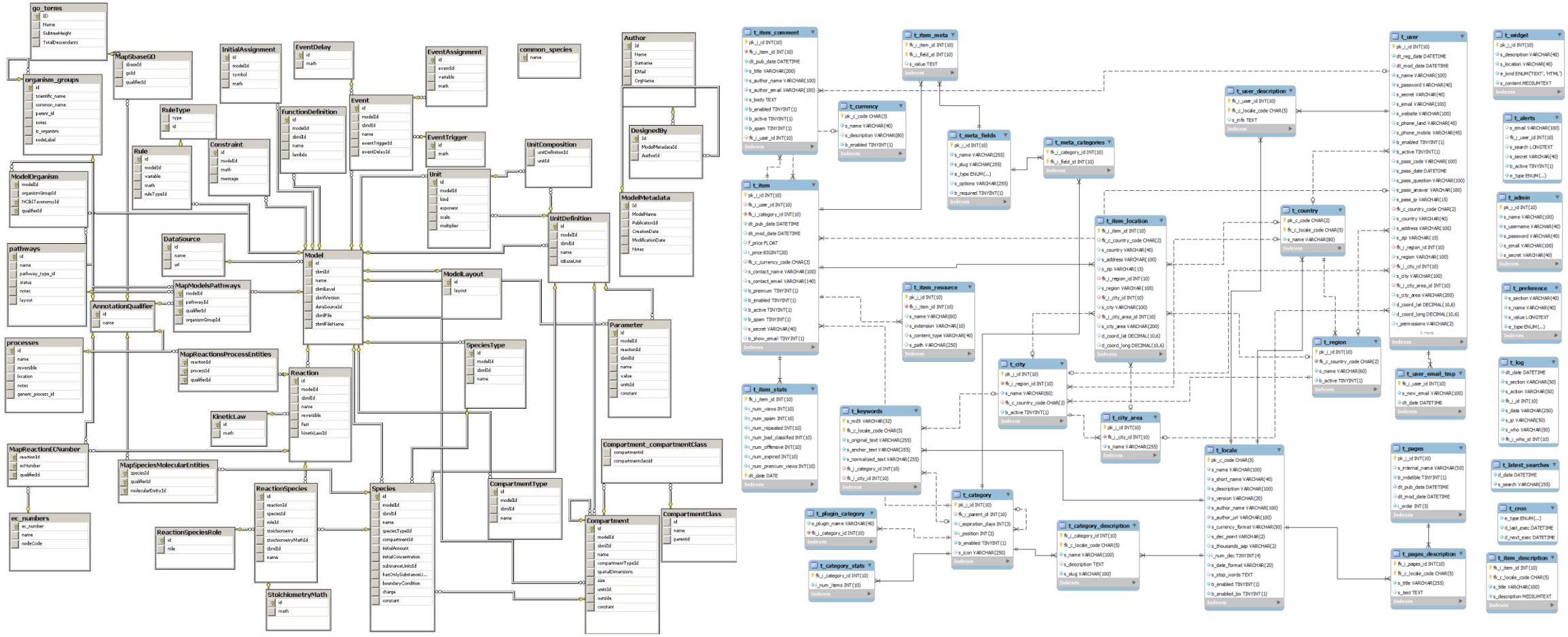
- Data Modeling is one of the features used to connect multiple data sources in BI tool using a relationship. A relationship defines how data sources are connected with each other and you can create interesting data visualizations on multiple data sources.



Important Slide

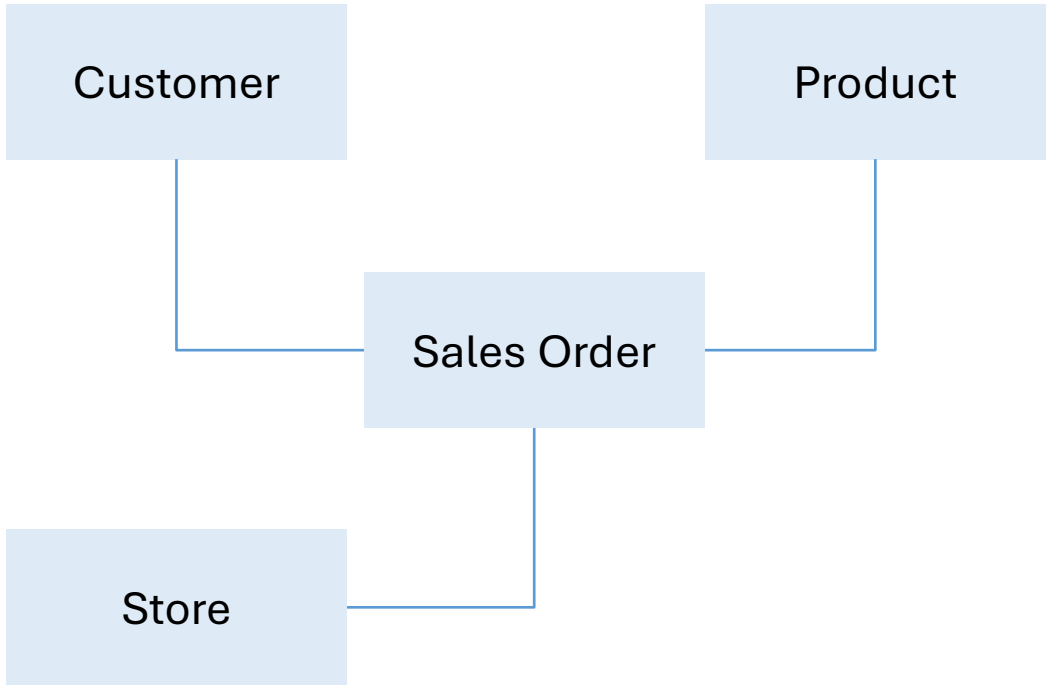
But don't do this in Power BI ...

- Even though Power BI can handle complex data model, but we should know that



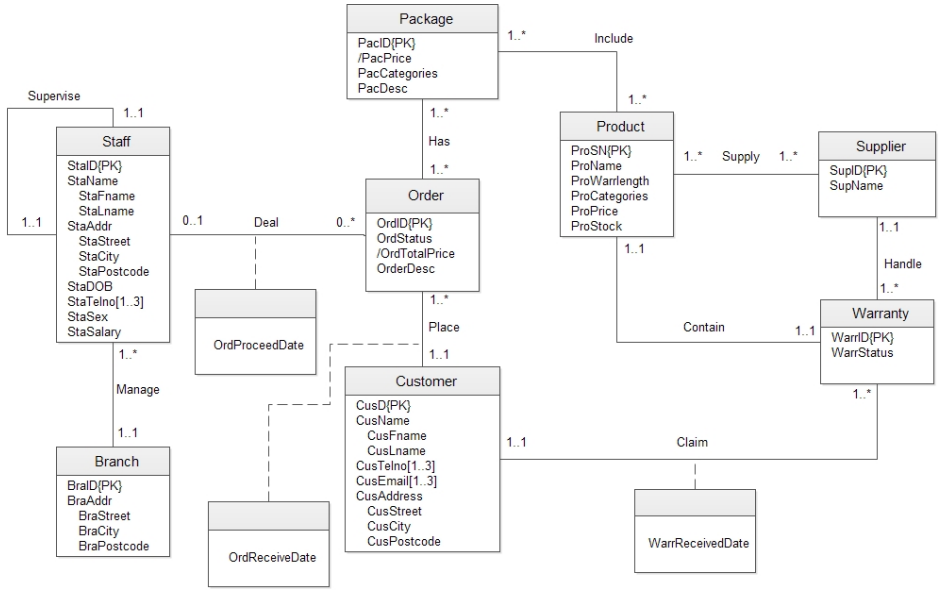
Relationship

- In Power BI we will most of the time work with data models that contain data from multiple tables that must be connected through relationships. Well prepared and thought through tables that are connected by relationships are required between these tables to function together to allow visualizations to be sliced and diced by data from different tables.

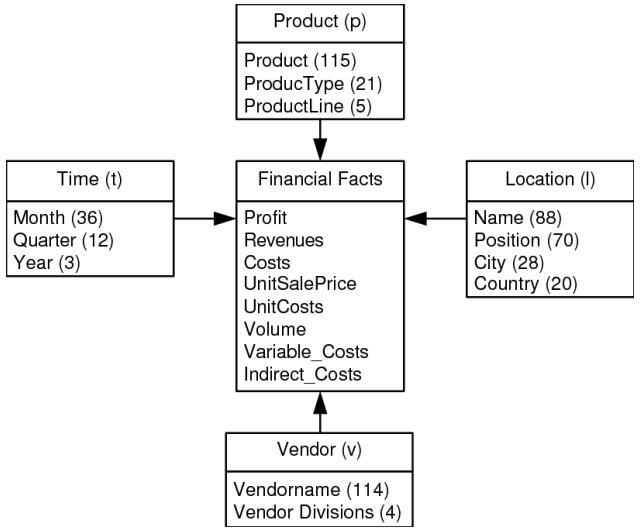


Star Schema

A star schema is a database organizational structure optimized for use in a data warehouse or business intelligence that uses a single large fact table to store transactional or measured data, and one or more smaller dimensional tables that store attributes about the data.



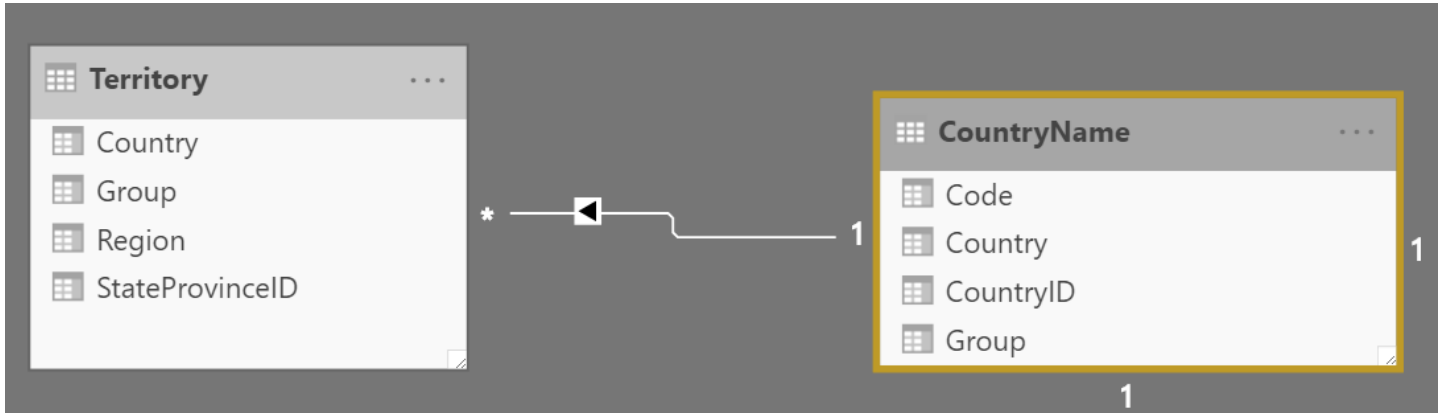
Normalization



Denormalization

Cardinality

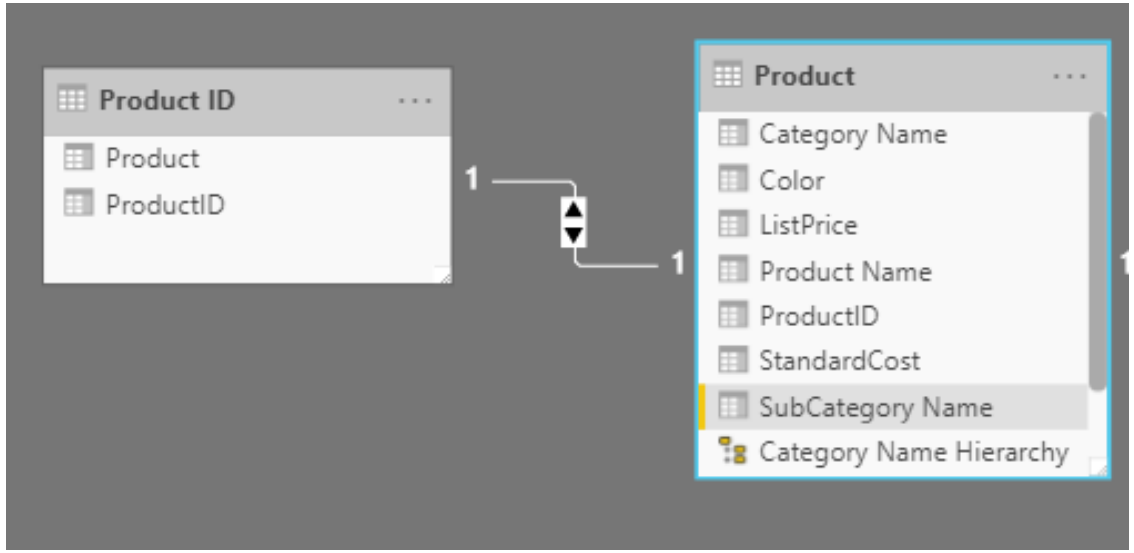
- Many-to-one (*:1) or one-to-many (1: *)
  - Describes a relationship in which you have many instances of a value in one column that are related to only one unique corresponding instance in another column.
  - Describes the directionality between fact and dimension tables.
  - Is the most common type of directionality and is the Power BI default when you are automatically creating relationships.



https://docs.microsoft.com/en-us/learn/modules/design-model-power-bi/6-relationships-cardinality

Cardinality

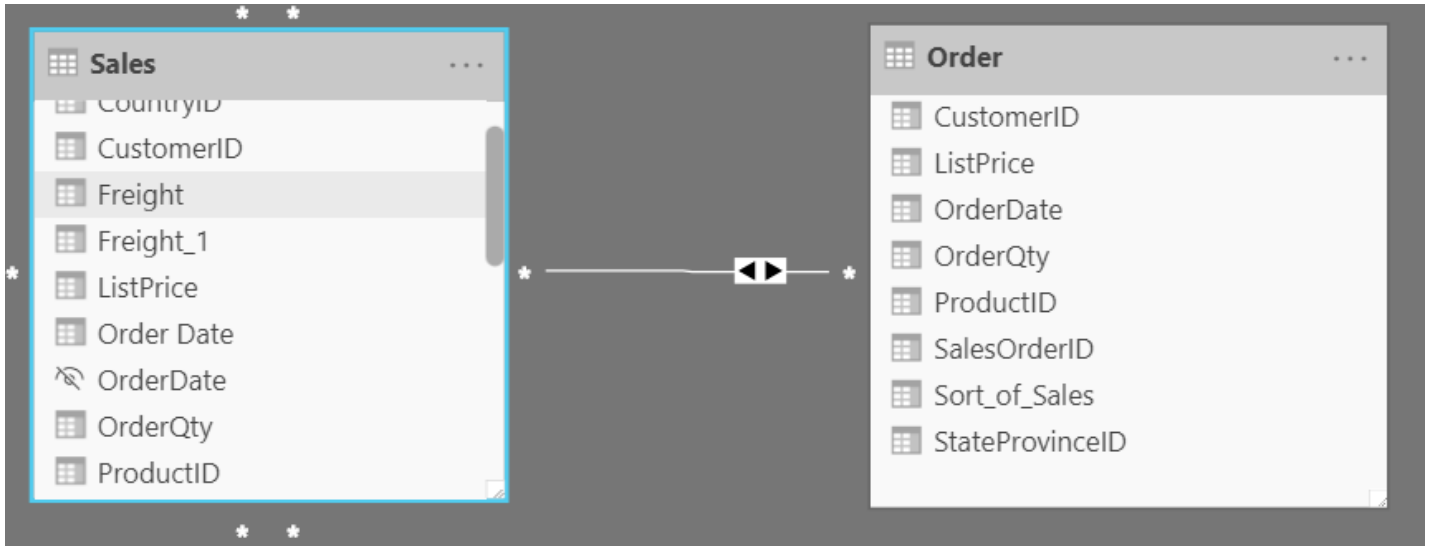
- One-to-one (1:1)
  - Describes a relationship in which only one instance of a value is common between two tables.
  - Requires unique values in both tables.
  - Is not recommended because this relationship stores redundant information and suggests that the model is not designed correctly. It is better practice to combine the tables.



https://docs.microsoft.com/en-us/learn/modules/design-model-power-bi/6-relationships-cardinality

Cardinality

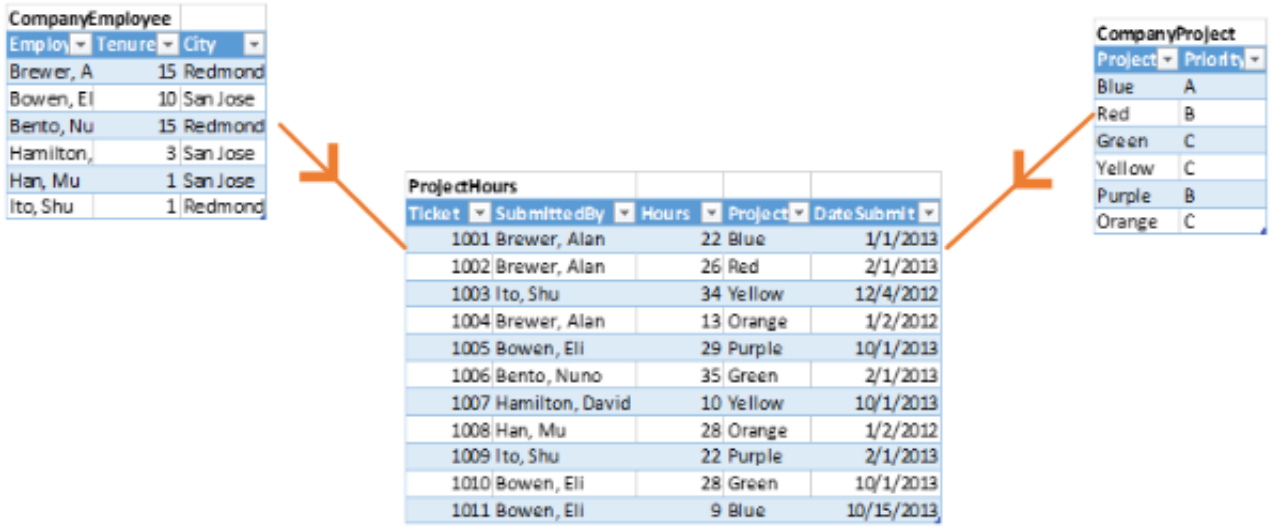
- Many-to-many (*:*)
  - Describes a relationship where many values are in common between two tables.
  - Does not require unique values in either table in a relationship.
  - Is not recommended; a lack of unique values introduces ambiguity and your users might not know which column of values is referring to what.



https://docs.microsoft.com/en-us/learn/modules/design-model-power-bi/6-relationships-cardinality

Cross Filter Direction

- Single



CompanyEmployee

Employ	Tenure	City
Brewer, A	15	Redmond
Bowen, El	10	San Jose
Bento, Nu	15	Redmond
Hamilton,	3	San Jose
Han, Mu	1	San Jose
Ito, Shu	1	Redmond

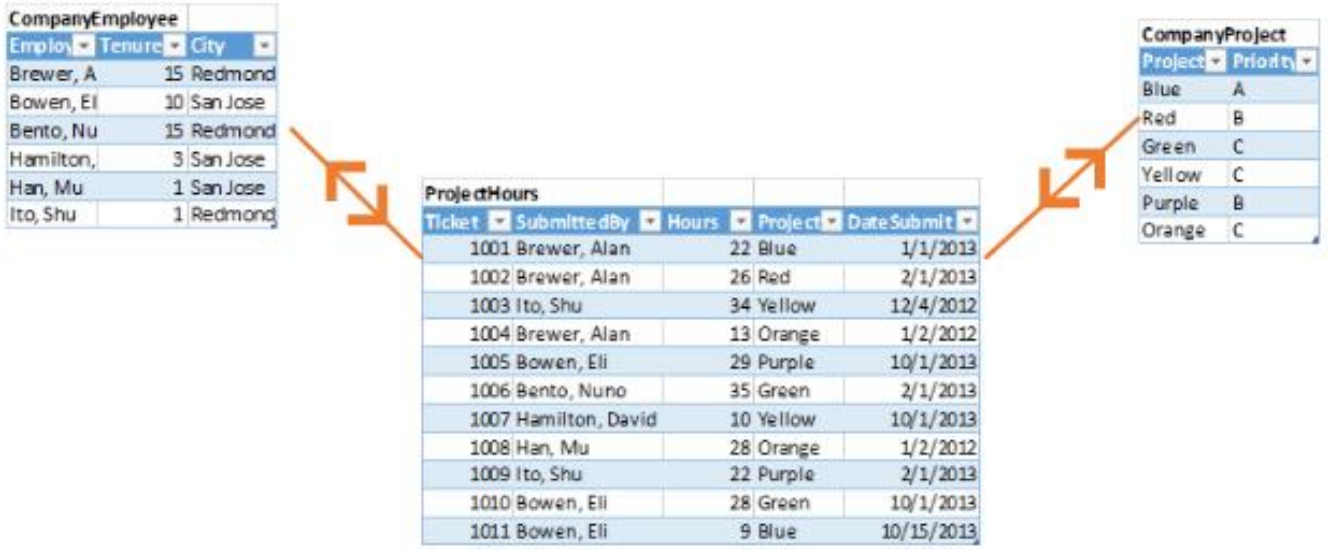
ProjectHours

Ticket	SubmittedBy	Hours	Project	DateSubmit
1001	Brewer, Alan	22	Blue	1/1/2013
1002	Brewer, Alan	26	Red	2/1/2013
1003	Ito, Shu	34	Yellow	12/4/2012
1004	Brewer, Alan	13	Orange	1/2/2012
1005	Bowen, Eli	29	Purple	10/1/2013
1006	Bento, Nuno	35	Green	2/1/2013
1007	Hamilton, David	10	Yellow	10/1/2013
1008	Han, Mu	28	Orange	1/2/2012
1009	Ito, Shu	22	Purple	2/1/2013
1010	Bowen, Eli	28	Green	10/1/2013
1011	Bowen, Eli	9	Blue	10/15/2013

CompanyProject

Project	Priority
Blue	A
Red	B
Green	C
Yellow	C
Purple	B
Orange	C

- Both



CompanyEmployee

Employ	Tenure	City
Brewer, A	15	Redmond
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Hamilton,	3	San Jose
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Ito, Shu	1	Redmond

ProjectHours

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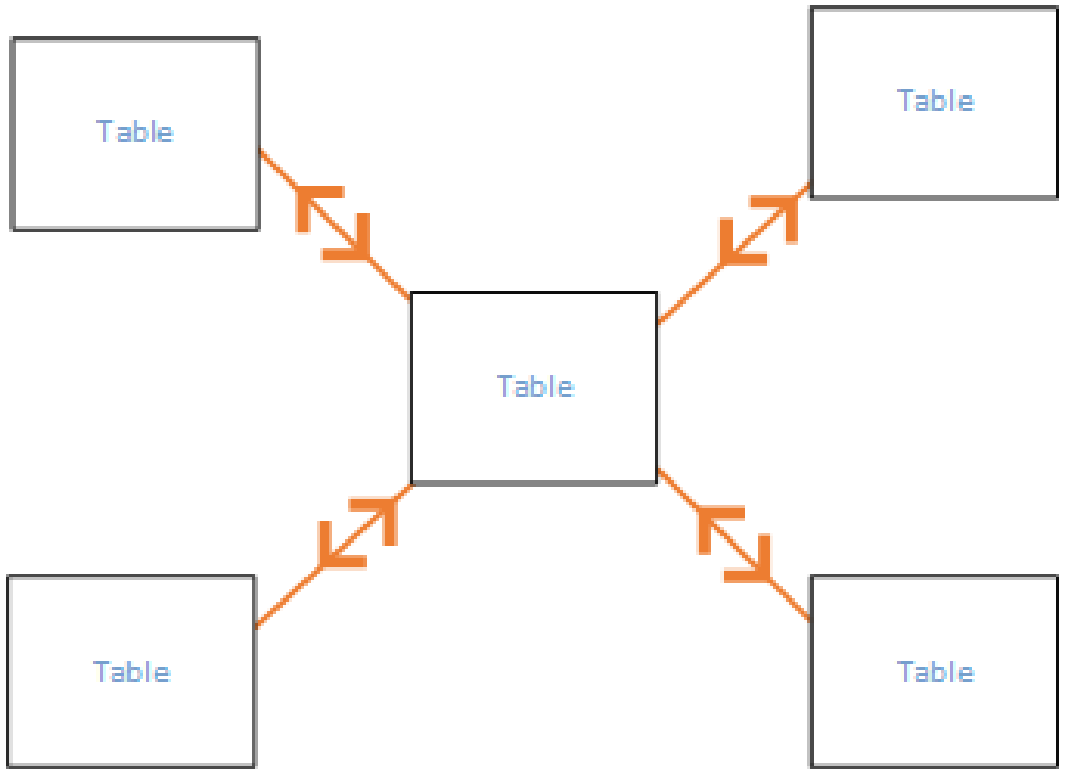
1005	Bowen, Eli	29	Purple	10/1/2013
1006	Bento, Nuno	35	Green	2/1/2013
1007	Hamilton, David	10	Yellow	10/1/2013
1008	Han, Mu	28	Orange	1/2/2012
1009	Ito, Shu	22	Purple	2/1/2013
1010	Bowen, Eli	28	Green	10/1/2013
1011	Bowen, Eli	9	Blue	10/15/2013

CompanyProject

Project	Priority
Blue	A
Red	B
Green	C
Yellow	C
Purple	B
Orange	C

Cross Filter Direction

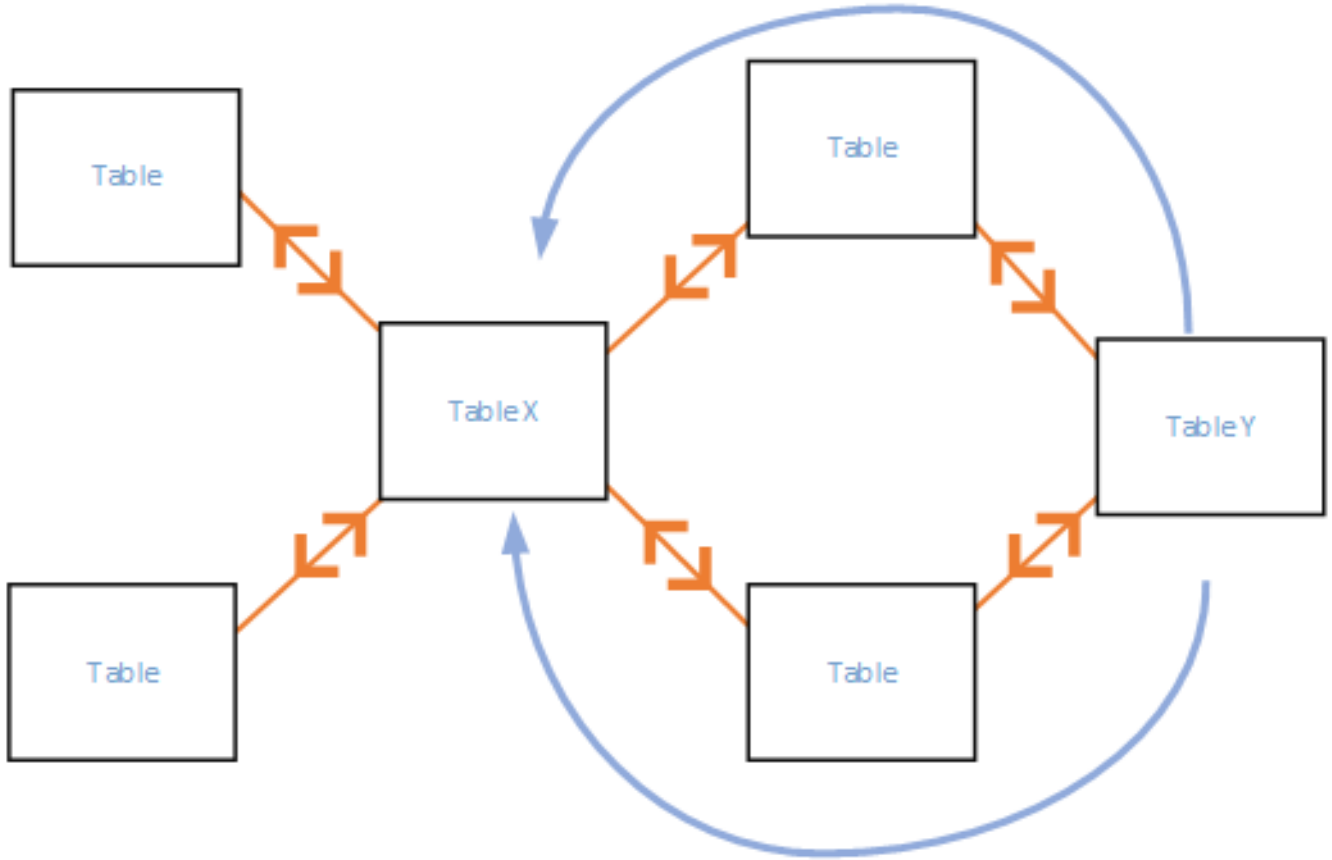
- Cross filtering both directions works well for a pattern of table relationships such as the pattern above. This schema is most commonly called a star schema, like this:



Important Slide

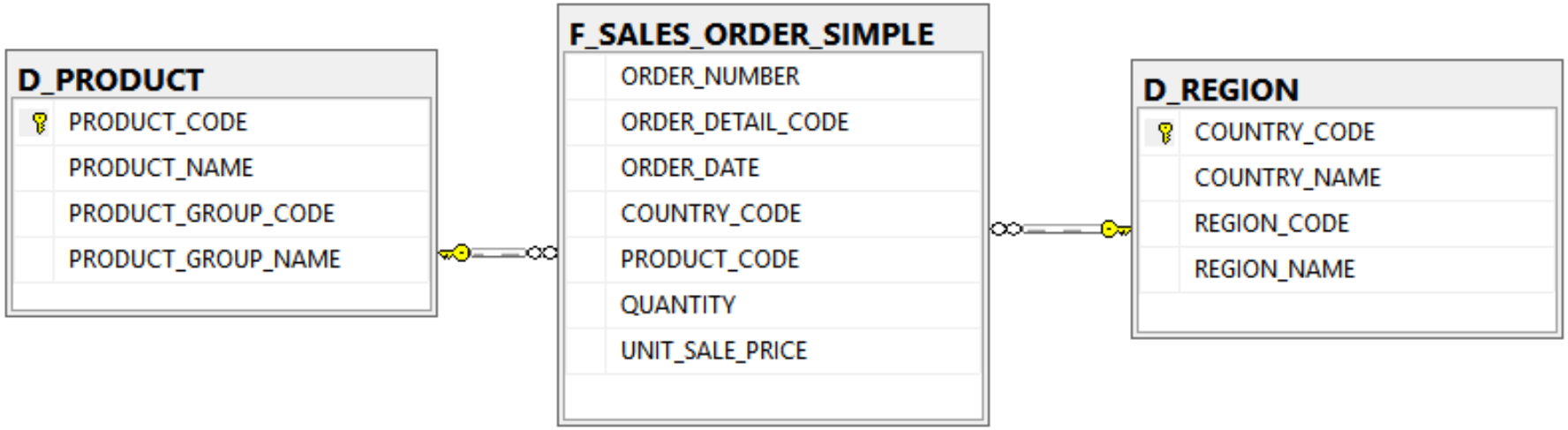
Cross Filter Direction

- Cross filtering direction does not work well with a more general pattern often found in databases, like in this diagram:



Demo 4-2 : Basic Data Modeling

- The use case when you need information from more than 2 tables



Important Slide

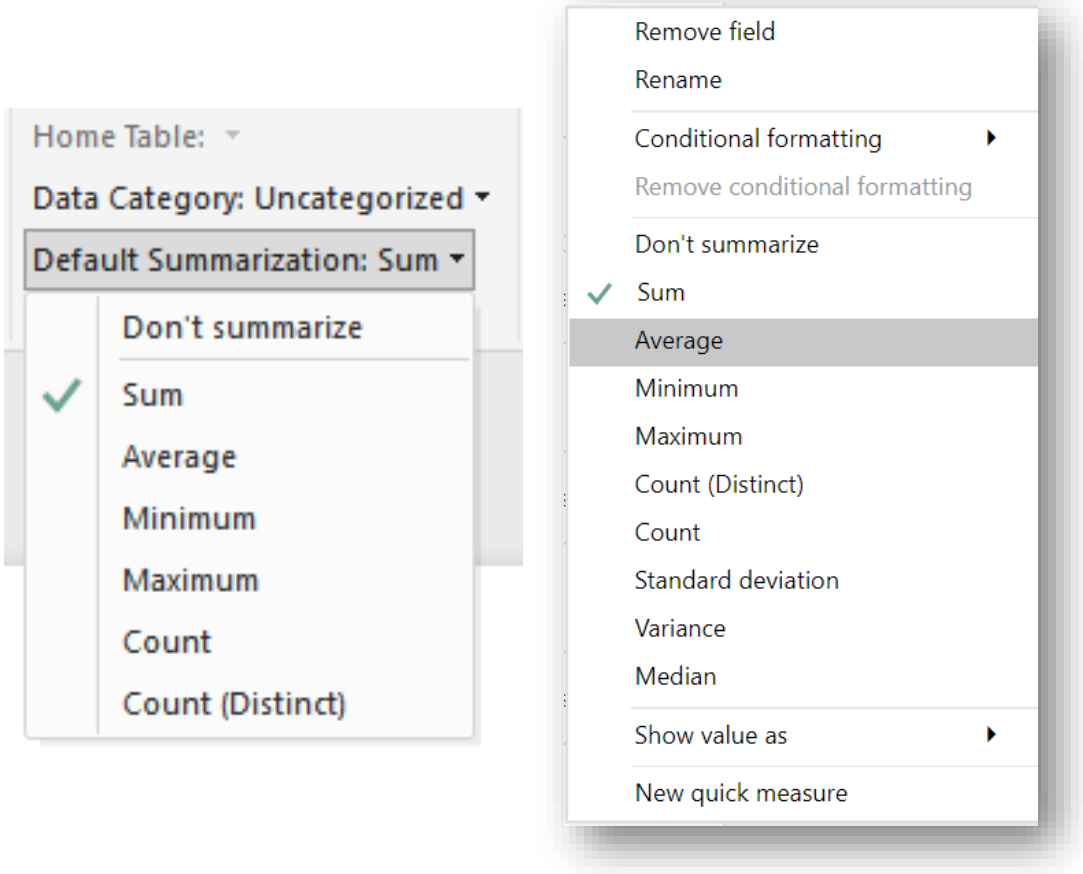
Data Categorization

- One of Data Modeling Technique (After we got data from IT/Developer already)
- Goal is to define Data Formatting, Data Usage (Fact / Dimension), Default Aggregation for each column defined to make it appropriate for data analysis

Data Categorization = To set up how Power BI know what columns are Fact or Dimension

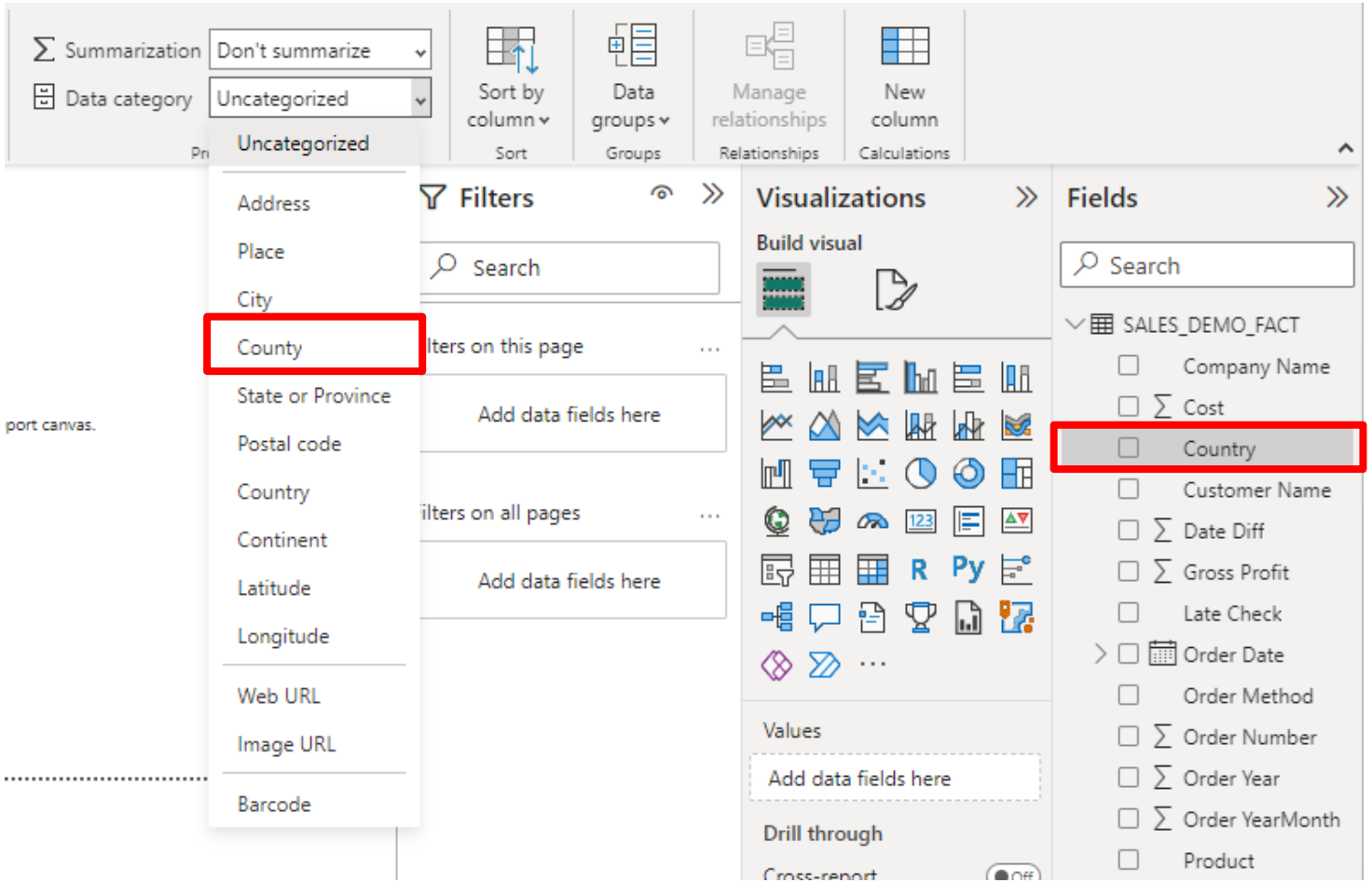
Data Aggregation

- What is an aggregation ?
- The mathematical operation use to combine values from **measure** columns in your data.
- For example, sum, average, maximum, count, count (distinct) and etc.
- Changing Aggregation to **Do Not Summarize** will change column type from **measure** to **dimension**.



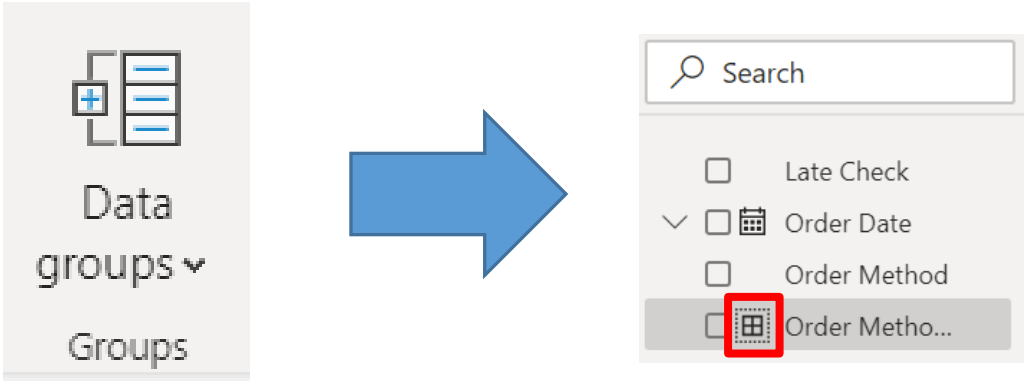
Demo 4-3 : Data Categorization

- Correctly set up Dimension / Measure / Summarization behavior of your data



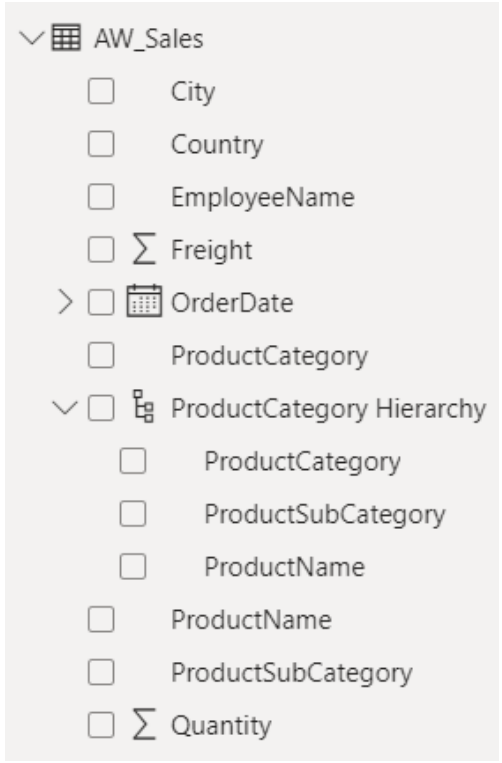
User-Defined Grouping

- In Power BI, users can manually group dimensions further in Analysis Layer in addition to data preparation layer
- User-defined grouping are more flexible, trade-off with some performance
- We must use groups function to define custom groups (which users can change this without affecting data layer)



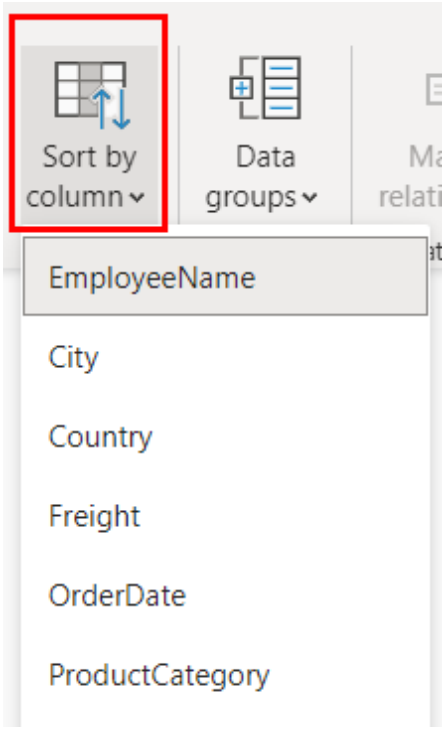
User-Defined Hierarchy

- To make your visualization able to Drill-Up / Drill-Down (in visualization) or Expand / Collapse (in crosstab), we must set up logical hierarchy in the data set
- Hierarchy will be a logical layer on top of your data set



Custom Sorting

- We can change default sorting for each column using sort feature
- When we use the sorted column in visualization, default sorting for that column will be set by referenced column



Demo 4-4 : Hierarchy and Custom Group

- Using Power BI modeling functionality to perform user-customized presentation layer

Introduction to DAX

- DAX (Data Analysis eXpression) is a functional language using in Power BI and Microsoft Excel / Power Pivot
- Provides plenty of functions, operators and constants which is can be used in formula which aims to help users analyze the data
- There are two main calculations you can create by using DAX including calculated columns and calculated measures.

Category of DAX Functions

- Aggregation functions
- Counting functions
- Logical functions
- Information functions
- Text functions
- Date functions

We highly recommend to learn from Power BI UI and then use it as foundation, not authoring it from start !

Sample DAX function

Syntax - The arrangement of how to build up a formula

For example, DAX formula for a measure named **Sales**

```
Sales = SUM(SALES_DEMO_FACT[Sales Amount])
```

Almost all of DAX consist of FUNCTION(ARG1 , ARG2 , ARG 3 …)

Knowing how to use each function is the heart of DAX authoring

Sample DAX CALCULATE function

CALCULATE is one of the most used DAX function because of it can make measures calculable across many visualization

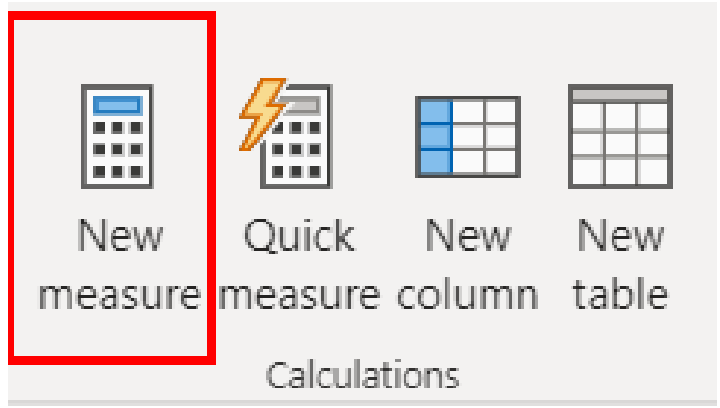
```
Web Sales = CALCULATE( SALES_DEMO_FACT[Sales] , SALES_DEMO_FACT[Order Method] = "Web")
```

Its formula is very looked like Excel Formula, but with more strict validation

Important Slide

Authoring DAX

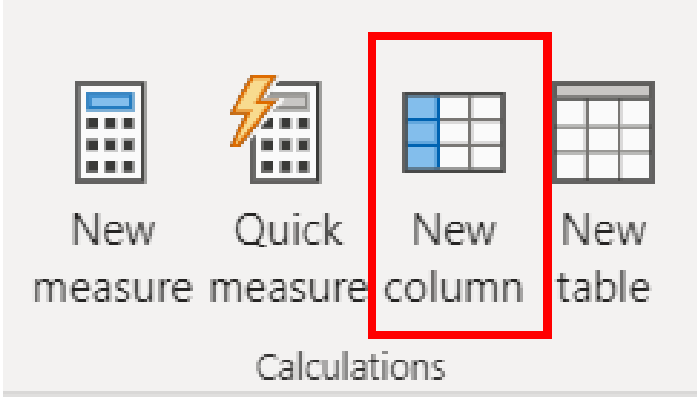
- To start authoring DAX, please start by using **New Measure** button
- Measure are the values that you can use to aggregate.
- Measure has Sum as a default aggregation but you can change later using Data Categorization



Important Slide

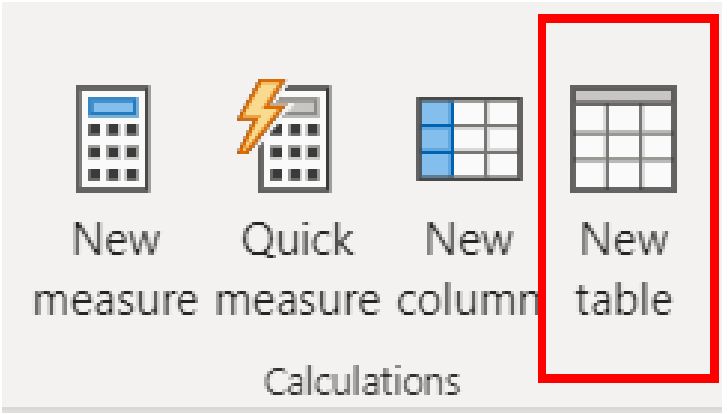
Calculated Column

- DAX can also calculate column like the way M Scripting did
- But it is **highly NOT recommended** to use as measure
- The use case is to calculate specific data label / data format / current month / current year calculation
- Calculated Columns using DAX do not need to reload in Power BI Data Model (Because the calculation takes place on the fly)



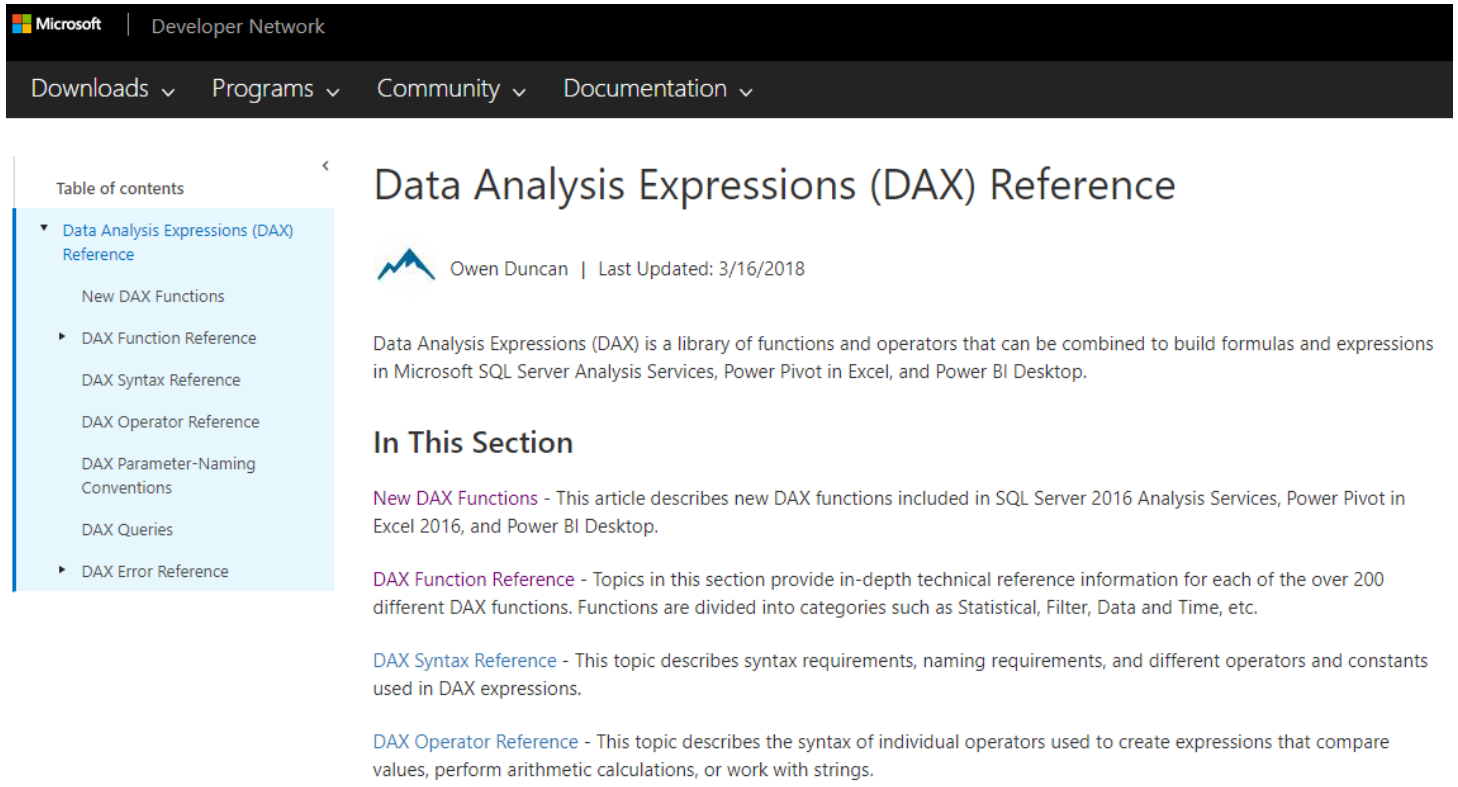
Calculated Table

- Use case for Calculated Table for DAX are UNION / CROSS join on the fly without using M Scripting / Data Shaping technique
- Not recommended to use instead of M Scripting / Data Shaping



DAX Reference

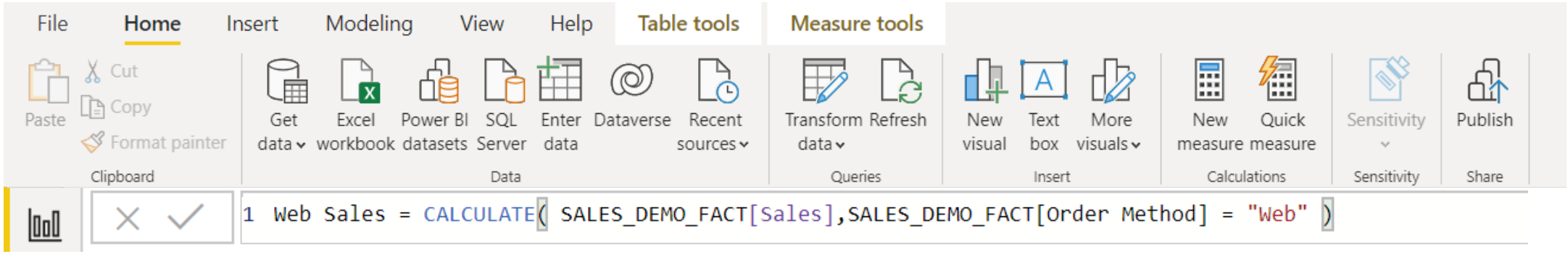
- DAX can be used in Power BI Desktop and also SQL Server Analysis Service (SSAS) and Microsoft PowerPivot in Excel



https://msdn.microsoft.com/en-us/query-bi/dax/data-analysis-expressions-dax-reference

Demo 4-5 : CALCULATE function in Power BI

- Using CALCULATE to SUM and filter data



Most frequently used DAX

- % of Measure and Measure

  Ex: `% Gross Profit =`

  - `Gross Profit/Sales Amount`
  - `DIVIDE(Gross Profit,Sales Amount)`

- Count Distinct of Customer

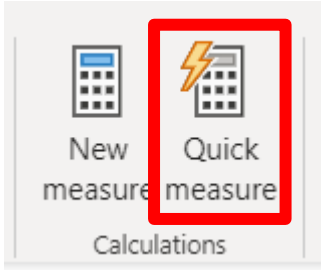
  Ex: `Count Customer = DISTINCTCOUNT(Customer)`

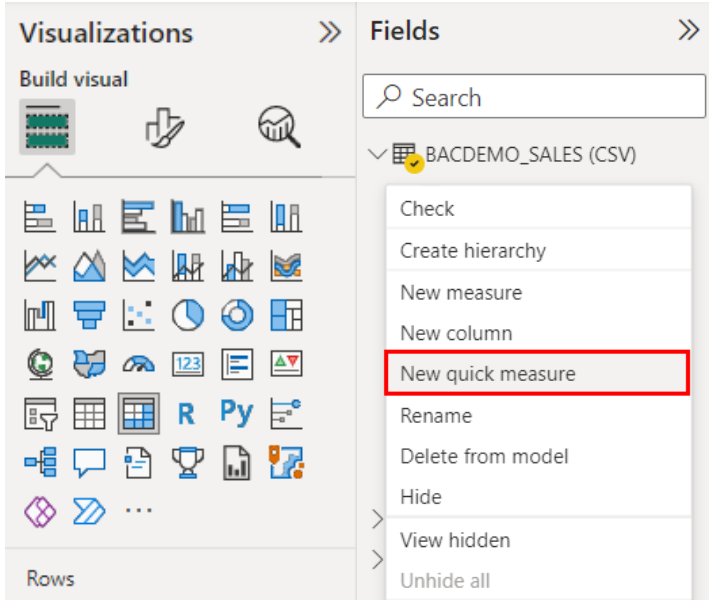
- Time Intelligence Measure

  Ex: `TOTALYTD, TOTALMTD`

Quick Measure

- Authoring DAX is quite hard for beginners or people who doesn't familiar with DAX authoring
- Power BI has many templates for DAX authoring and for learn using example by using **Quick Measure** function of Power BI





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Chapter 5 : Power BI Visualization

Business Applications Co., Ltd.

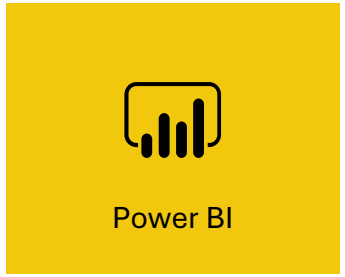
Objectives

- Know how to create Power BI reports
- Power BI visualization options
- Customizing visualization in the report
- Customizing visualization interaction

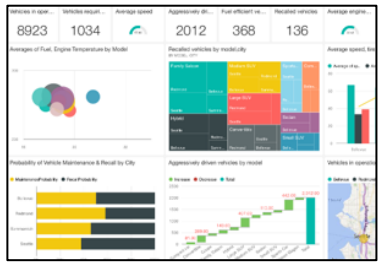
Important Slide

Overview of Power BI Implementation

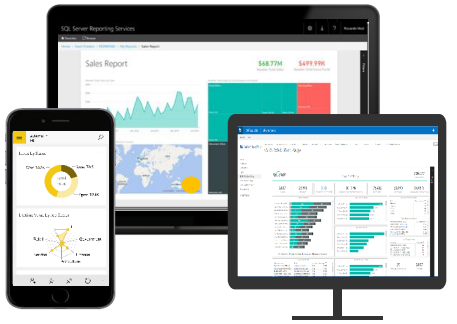
Select Your Data



Shape Your Data, Create Data Model in Power BI



Create Visualization and Report

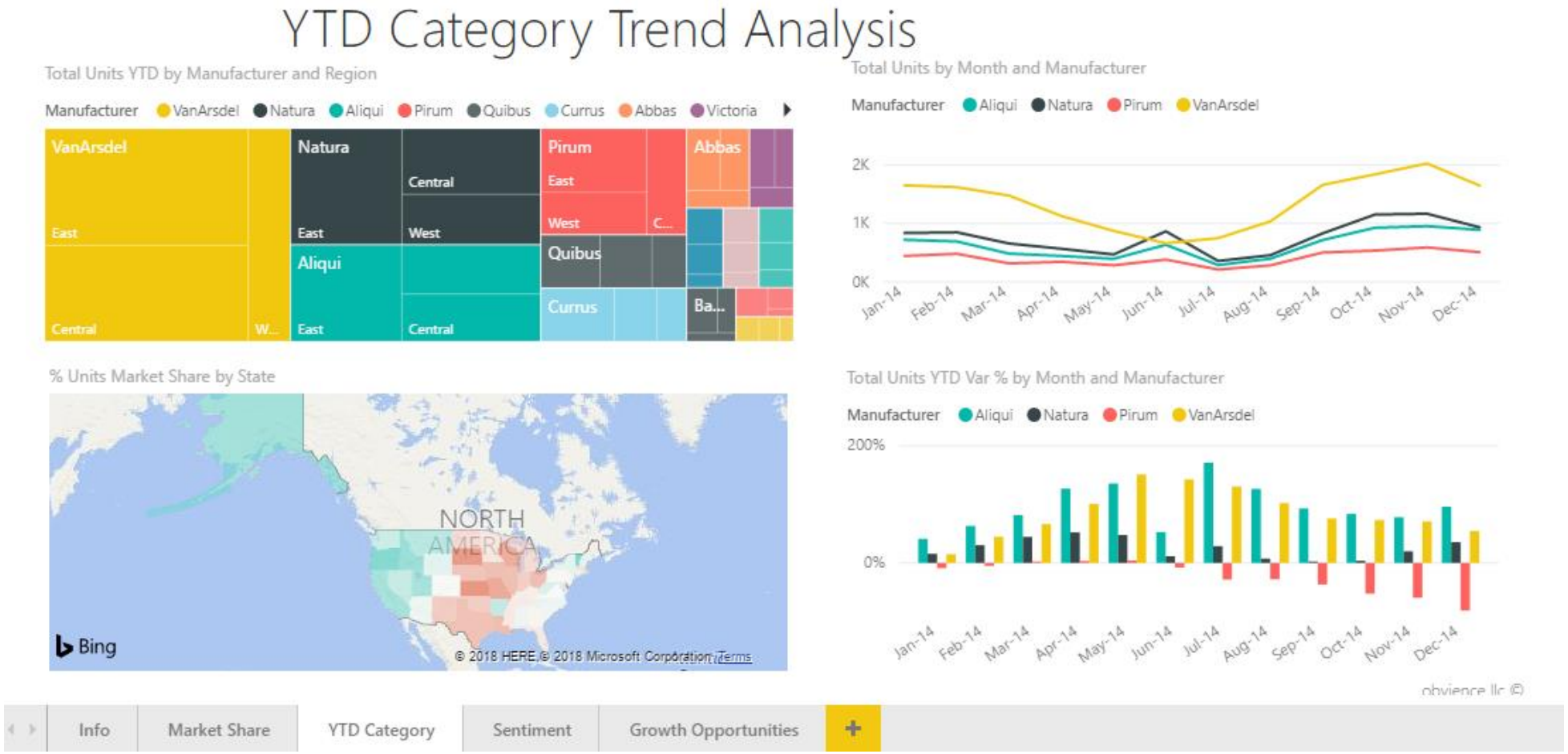


Publish to Power BI Service

What is a Power BI report?

- A report consist of many visualizations.
- Power BI Visualizations are highly interactive and customizable.
- Visualization help you to explore and analyze data than the table format.
- Reports have implicit interactions by default, but we can customize them
- Power BI Report will be a part of Power BI Dashboard on Power BI Service

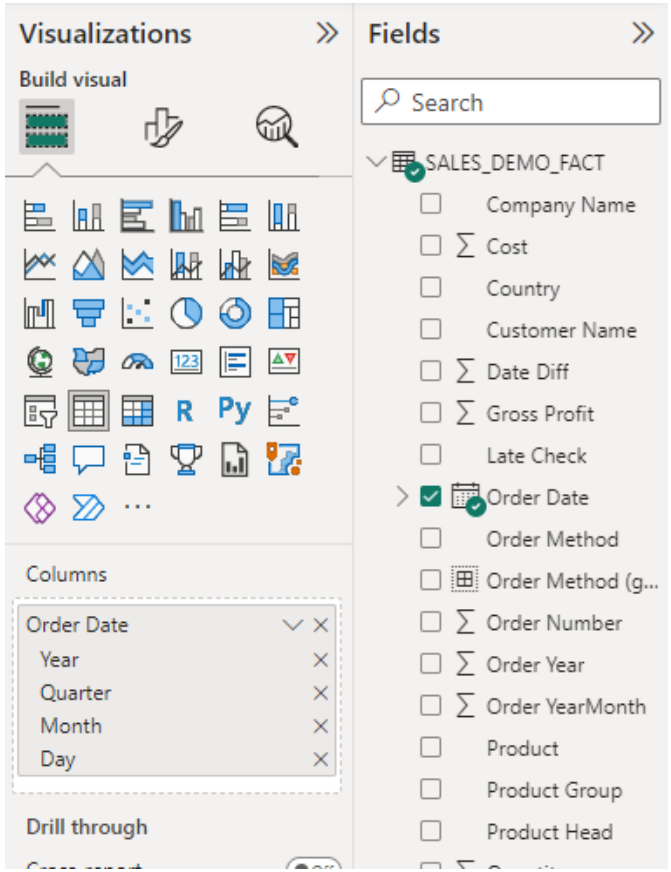
Example Power BI Report (Which we usually called Dashboard)



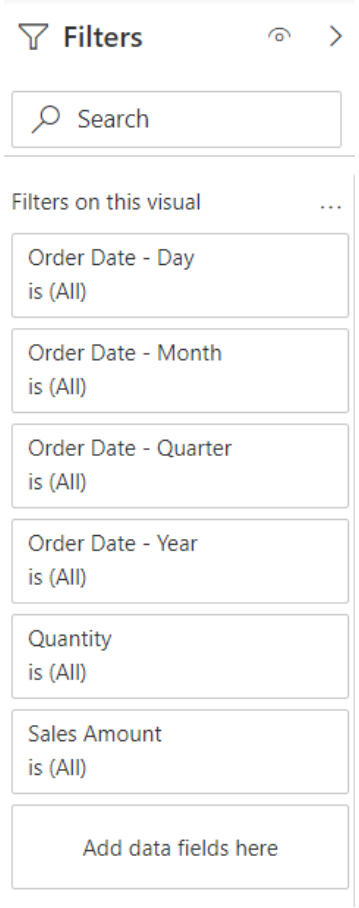
Power BI Visualization Components

- Each of Power BI Visualization contains

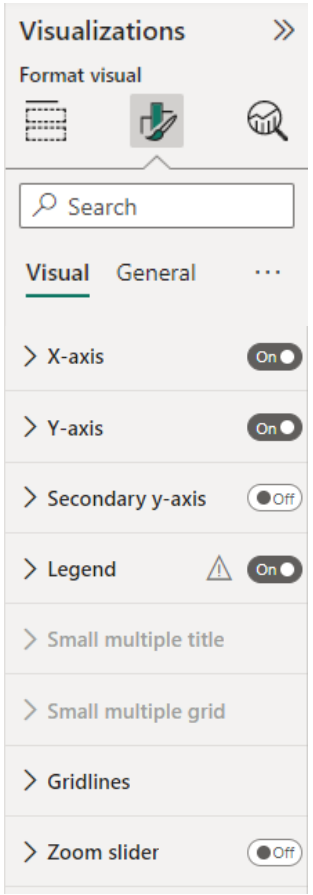
FIELDS



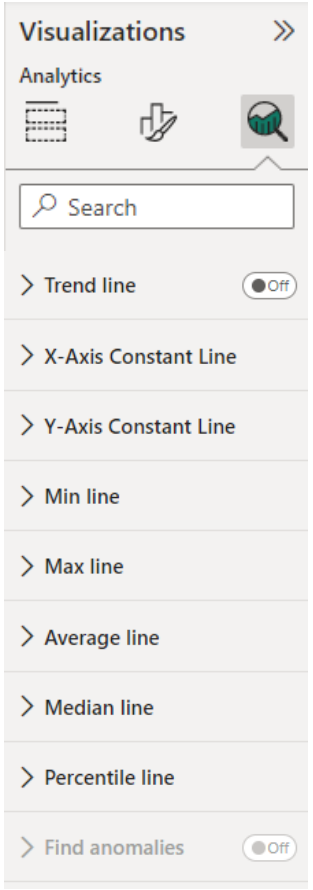
FILTER



FORMAT



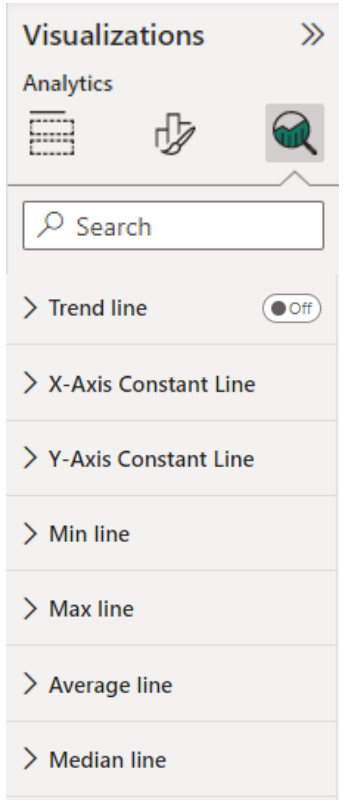
ANALYTICS



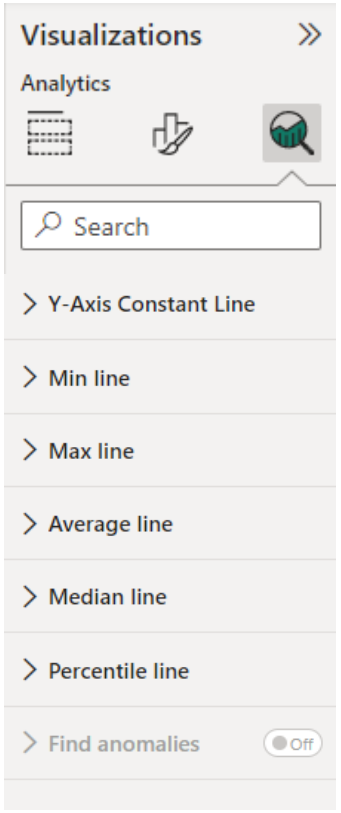
Power BI Visualization Components (Cont.)

- Each of Power BI Visualization contains different customizable elements

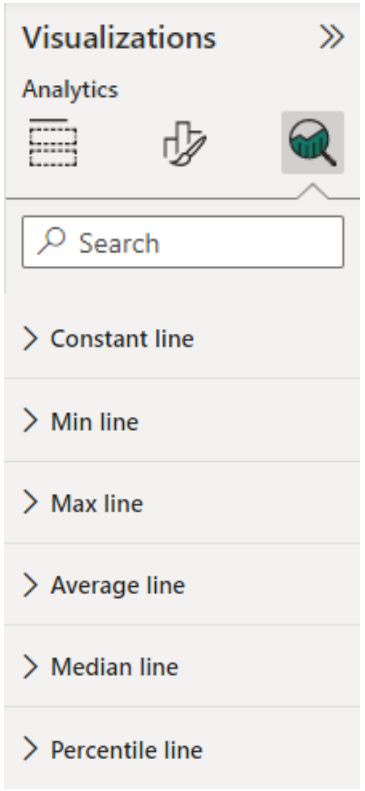
Scatterplot : usually the first choice visualization for analytics Has many analytics option



Line Chart : Many analytics are related to time series, also has many analytics option

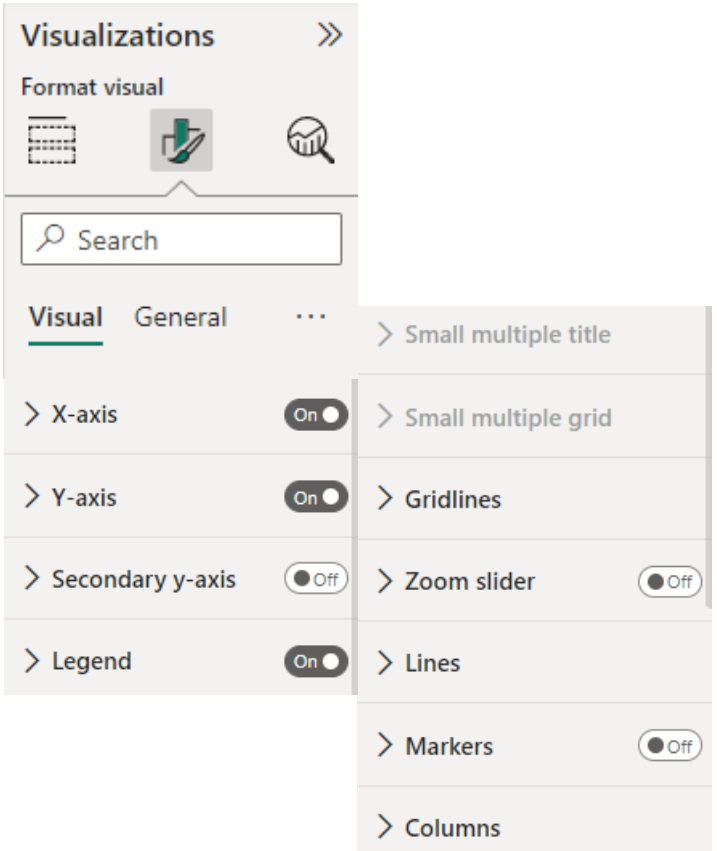


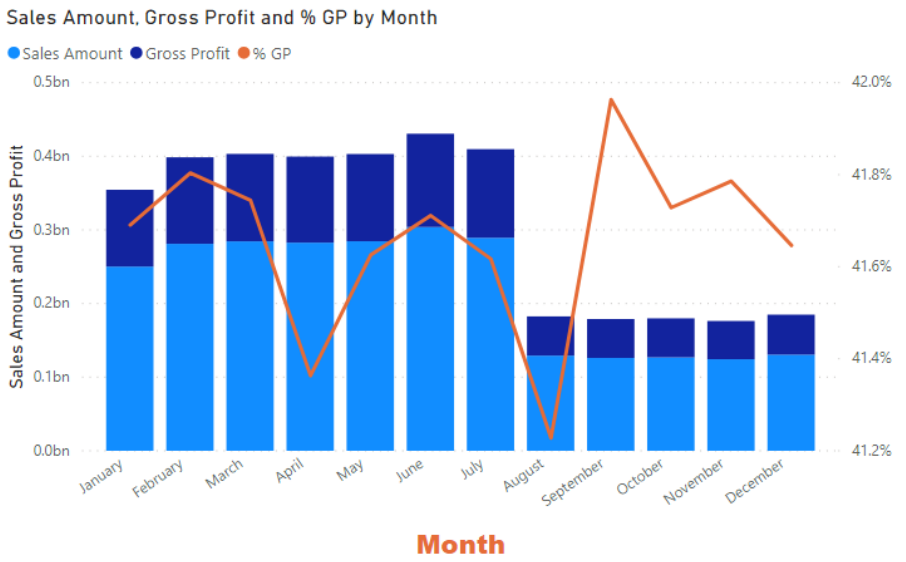
Bar Chart : Use for descriptive explanation, not much analytics function to explore

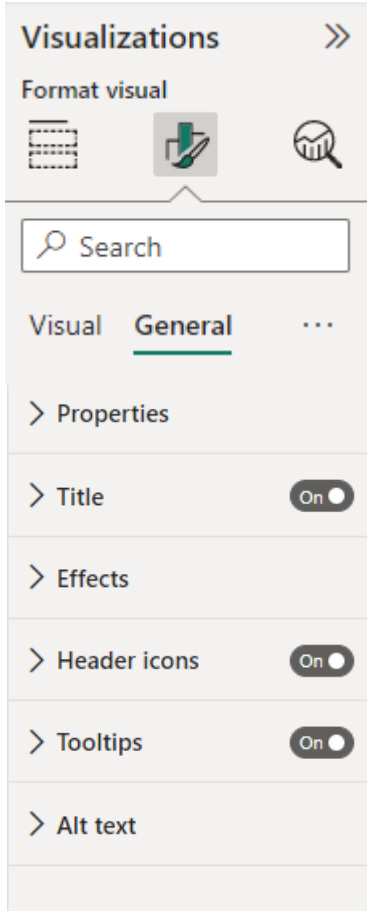


Option for customization

- Each Visualization has options, each options has detail options to customize many things such as style / color / fonts

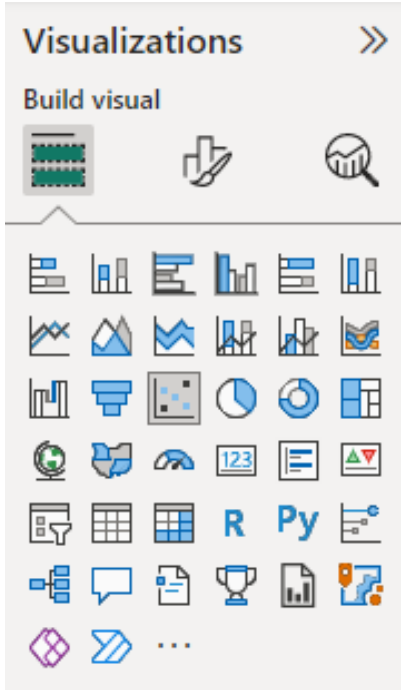


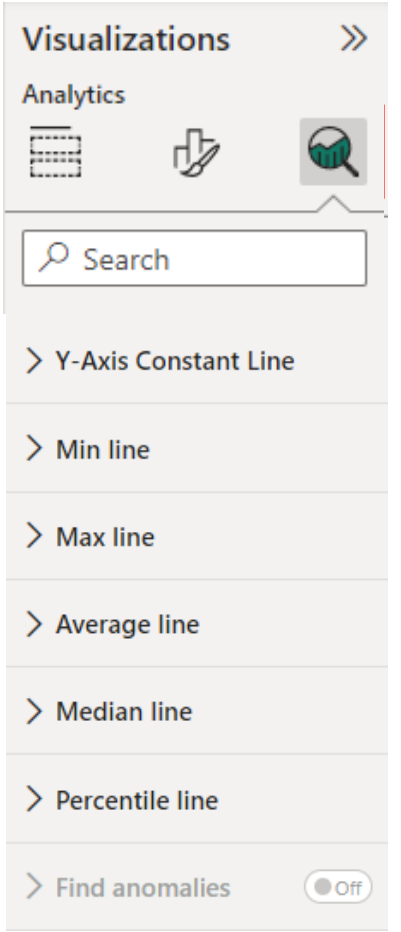




Analytics pane in Power BI Desktop

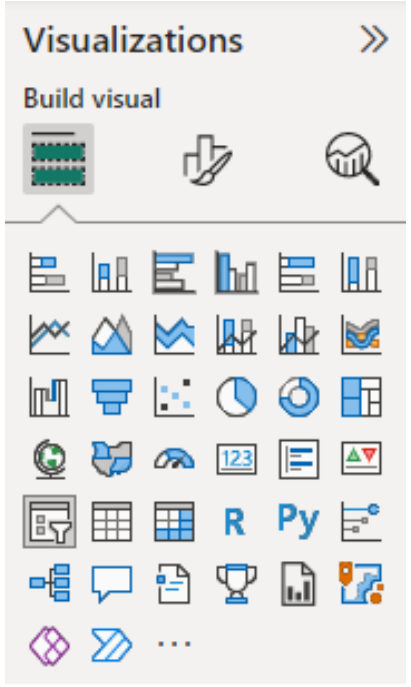
- Analytics pane in Power BI Desktop help users to focus for the important value/threshold in the visualization
- Dynamic reference line are available for some visualizations only

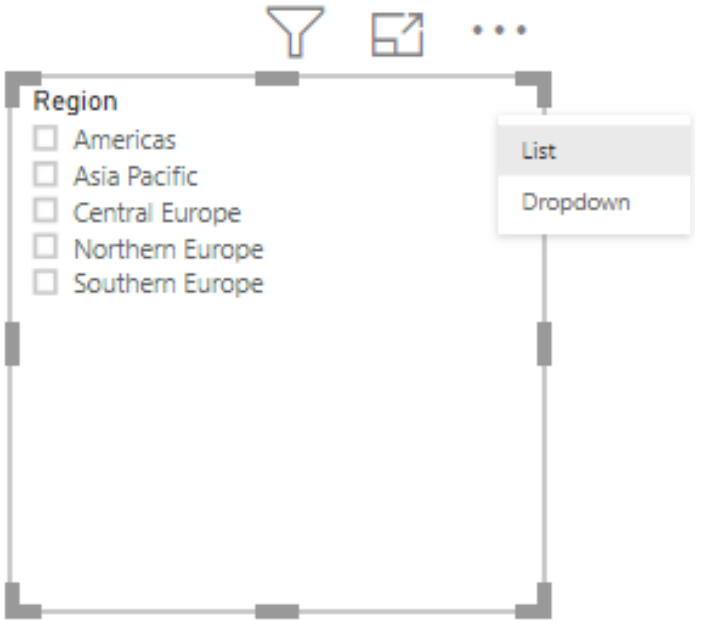




Slicer in Power BI

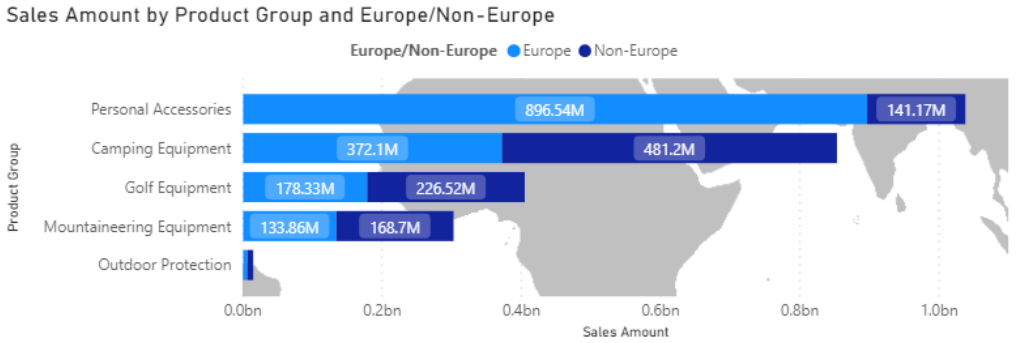
- Power BI called Filter / Prompt as a Slicer
- Slicer can be used and configured as standard visualization

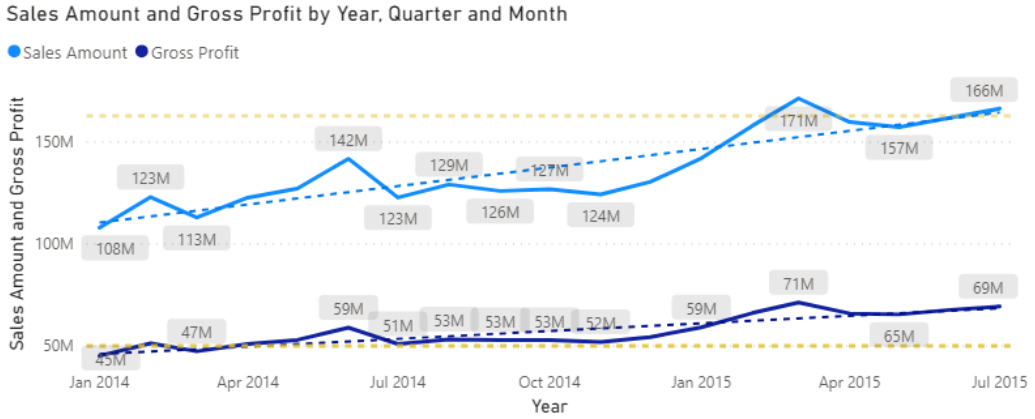


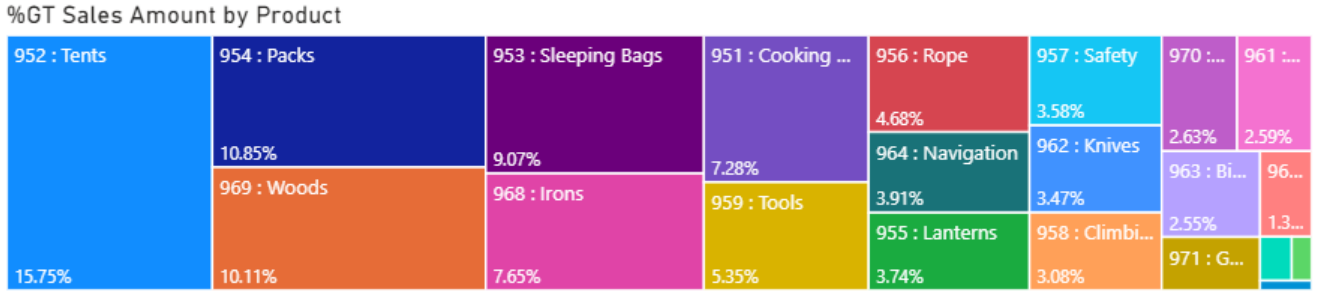


Demo 5-1 : Power BI Visualization

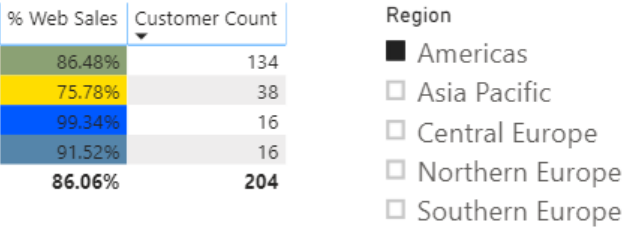
- Explore almost standard Power BI visualizations in this demo





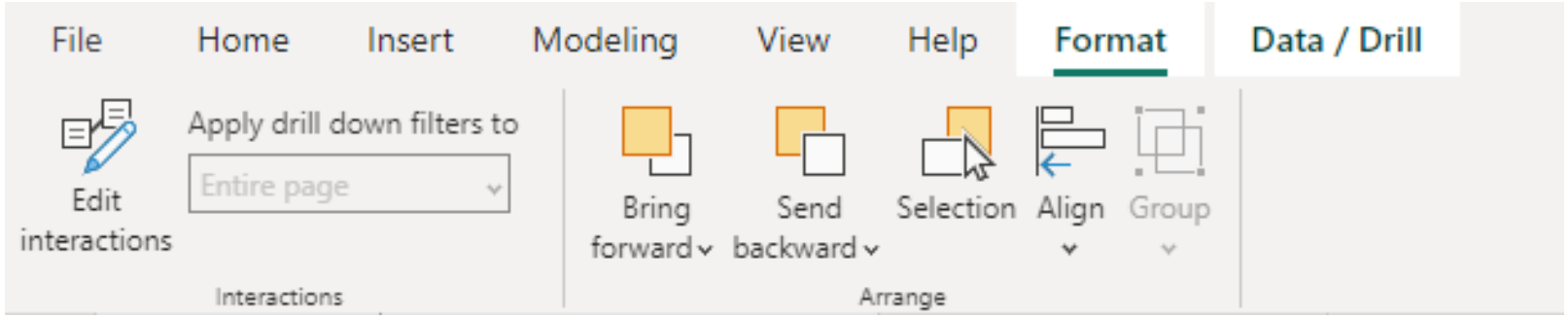


Country	Sales Amount	% GP	% Web Sales	Customer Count
United States	291.29M	41.26%	86.48%	134
Canada	120.85M	41.39%	75.78%	38
Brazil	50.39M	41.36%	99.34%	16
Mexico	83.11M	41.34%	91.52%	16
Total	**545.64M**	**41.31%**	**86.06%**	**204**



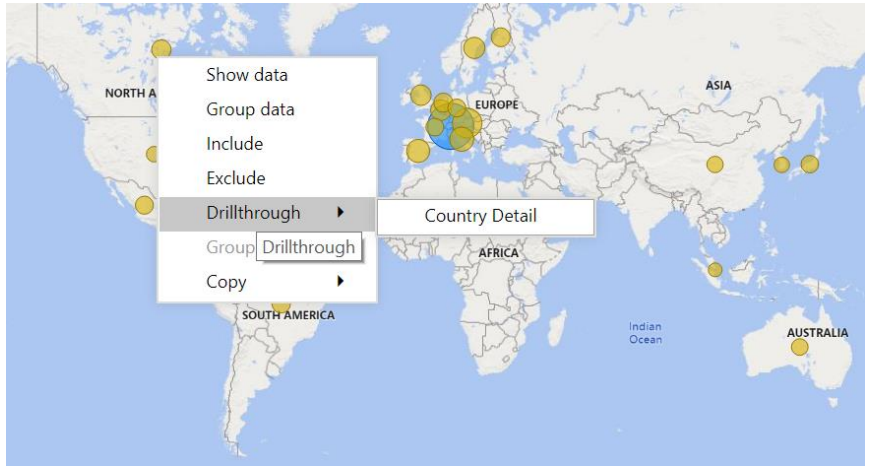
Interaction in Power BI Report

- By Default, Power BI reports are designed to interact each other
- We can override this behavior by setting interaction for **Source** Visualization



Drill Through in Power BI

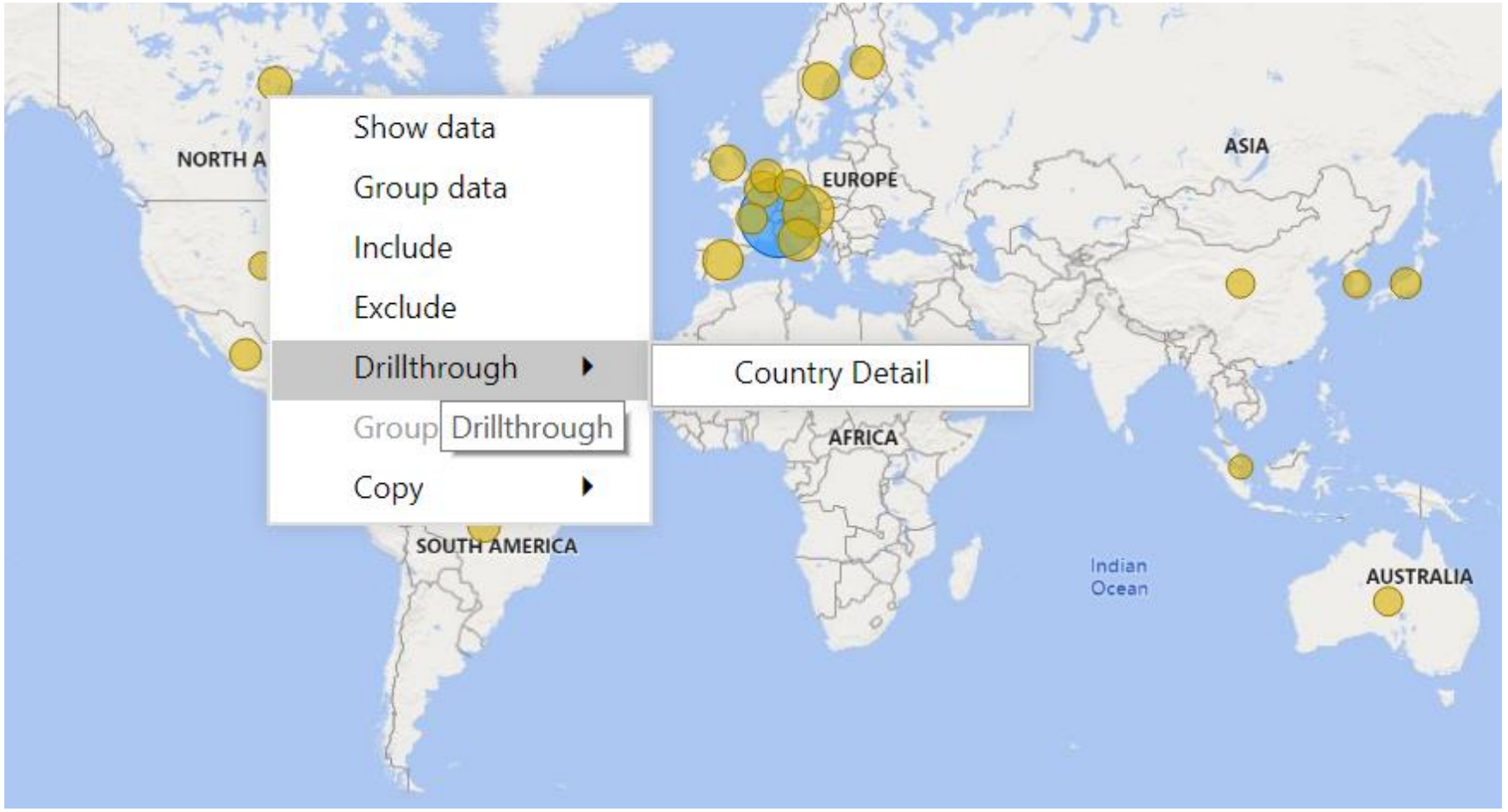
- In order to make report interactive and reduce clutter in Report, we generally use Drill Through Technique to navigate from Summary page to Detail page
- The most use case is to see the detail of data in List/Crosstab format after seeing main visualization



Product Group	Product	Sales Amount	% GP	% Web Sales
Camping Equipment	951 : Cooking Gear	8,887,793.42	39.82%	73.74%
Camping Equipment	952 : Tents	18,999,256.58	32.17%	69.06%
Camping Equipment	953 : Sleeping Bags	10,959,062.69	40.38%	74.57%
Camping Equipment	954 : Packs	12,995,159.46	39.76%	80.73%
Camping Equipment	955 : Lanterns	4,657,714.96	44.65%	76.24%
Golf Equipment	968 : Irons	9,101,115.92	48.67%	95.81%
Golf Equipment	969 : Woods	11,955,458.87	49.99%	94.12%
Total		**120,852,135.68**	**41.39%**	**75.78%**

Demo 5-2 : Power BI Report Interaction

- Customize Power BI Visual Interaction in Report



Power BI Slicer and Filter

- **Slicer** act as a value-list to select other part of report and usually use to create report for **other users** to navigate
- **Report / Page Filter** act as a mechanism to filter out irrelevant data in current report / page as a global filter
- **Visual Level filter** usually use for **self-service** analytics to focus something, some value and perform data discovery

Power BI : Filter

Filter Type	Effectiveness
Report Level Filter	All objects in report
Page Level Filter	All objects in specific page
Visual Level Filter	Only selected visualization
Drill-Through Filter	All objects in specific page, but only activated by source visualization

Data Type will determine the behavior of Filter (and also slicer)

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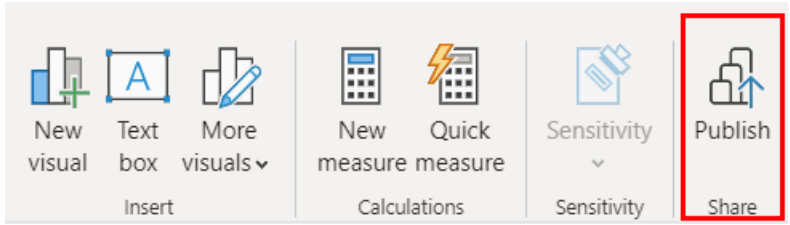
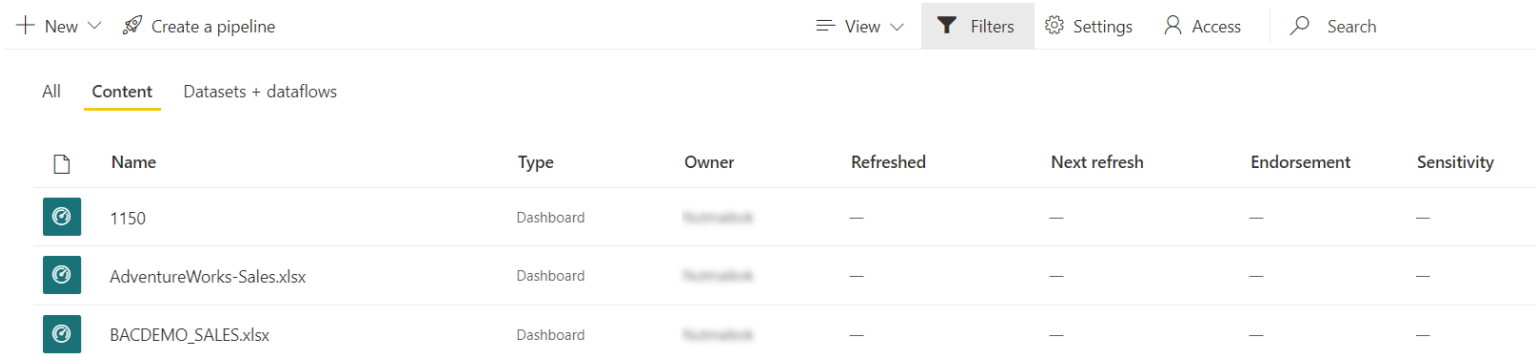
Chapter 6 : Publish to Power BI Service

Business Applications Co., Ltd.

Publish Power BI Desktop reports

- Using Publish button, you can easily publish to Power BI Service
- By Default, for Office 365 Users / Non-Pro Power BI users, will see only Dashboards, Reports and Datasets in **My Workspace.**

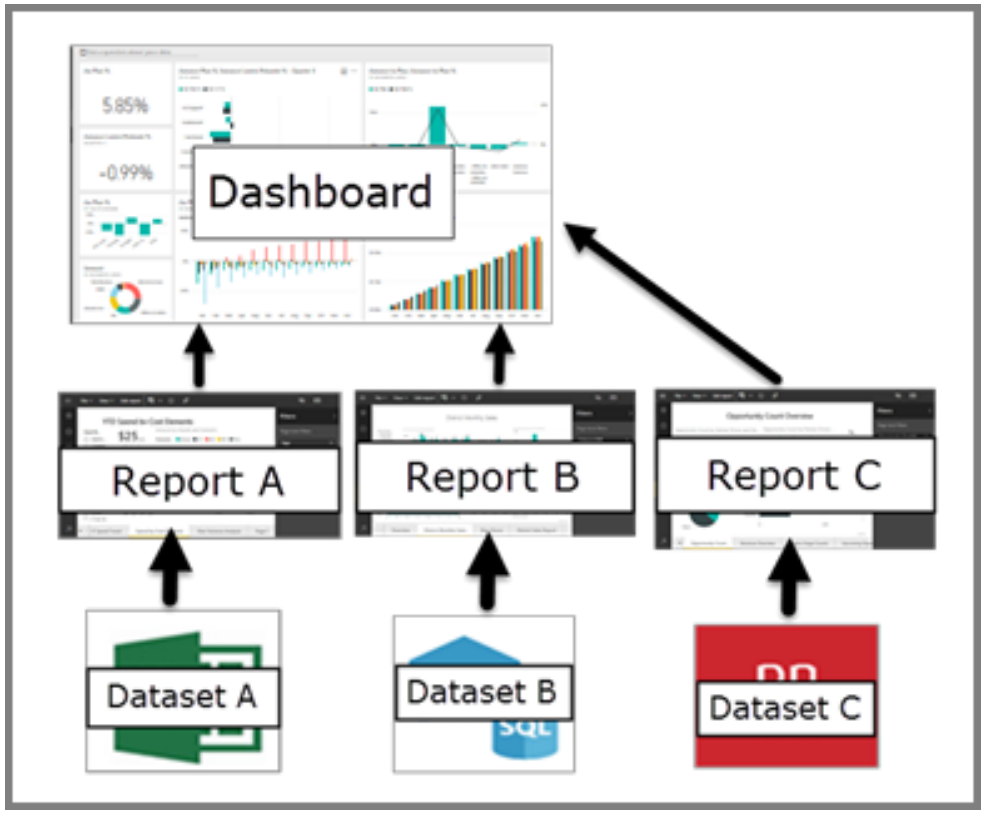




Important Slide

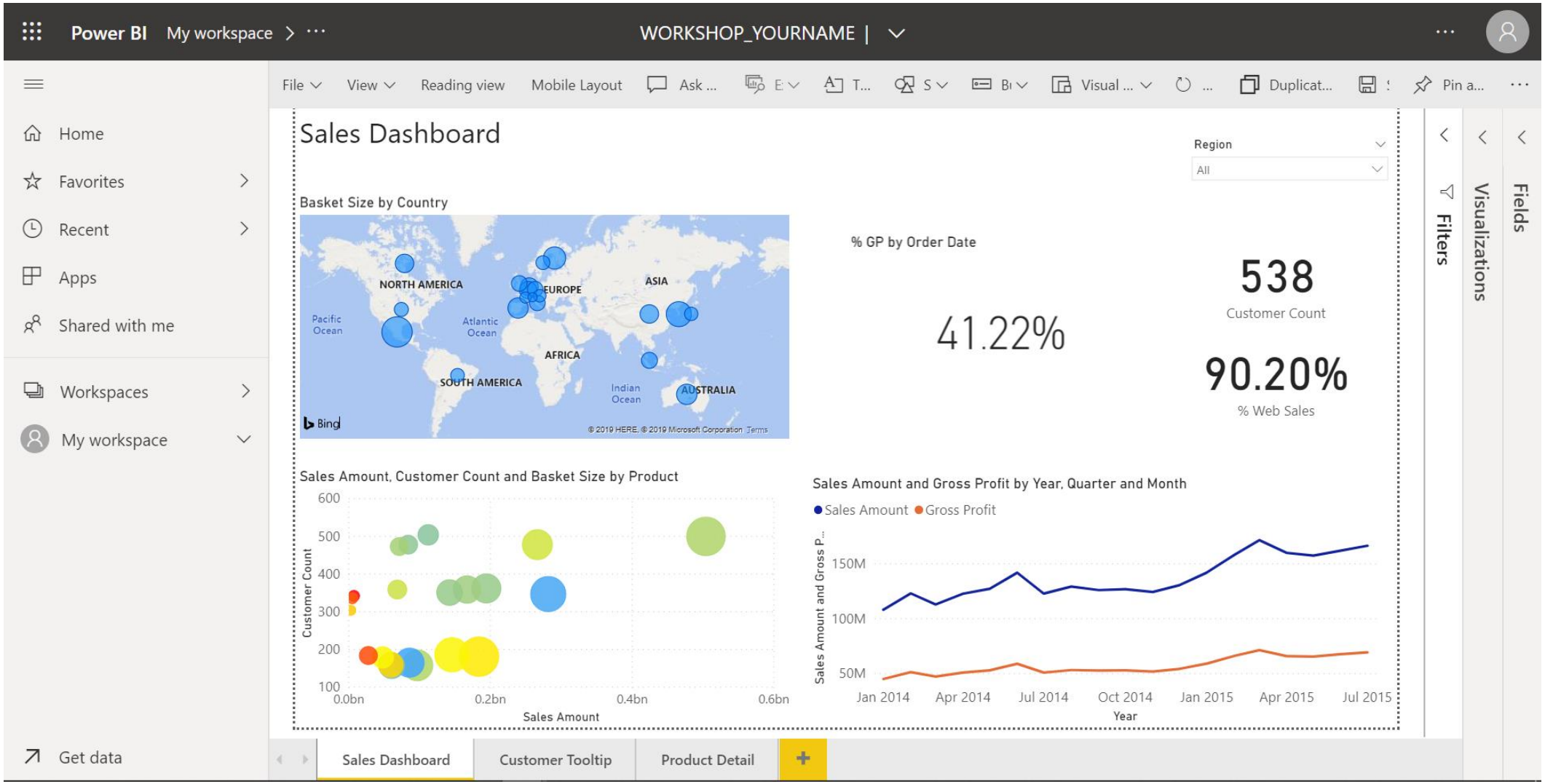
Dashboard in Power BI

- Power BI Dashboard is a single canvas to tell your story from many reports
- One dashboard includes many tiles which is pinned from visualization from reports.
- Dashboard can be only created in **Power BI Service**.



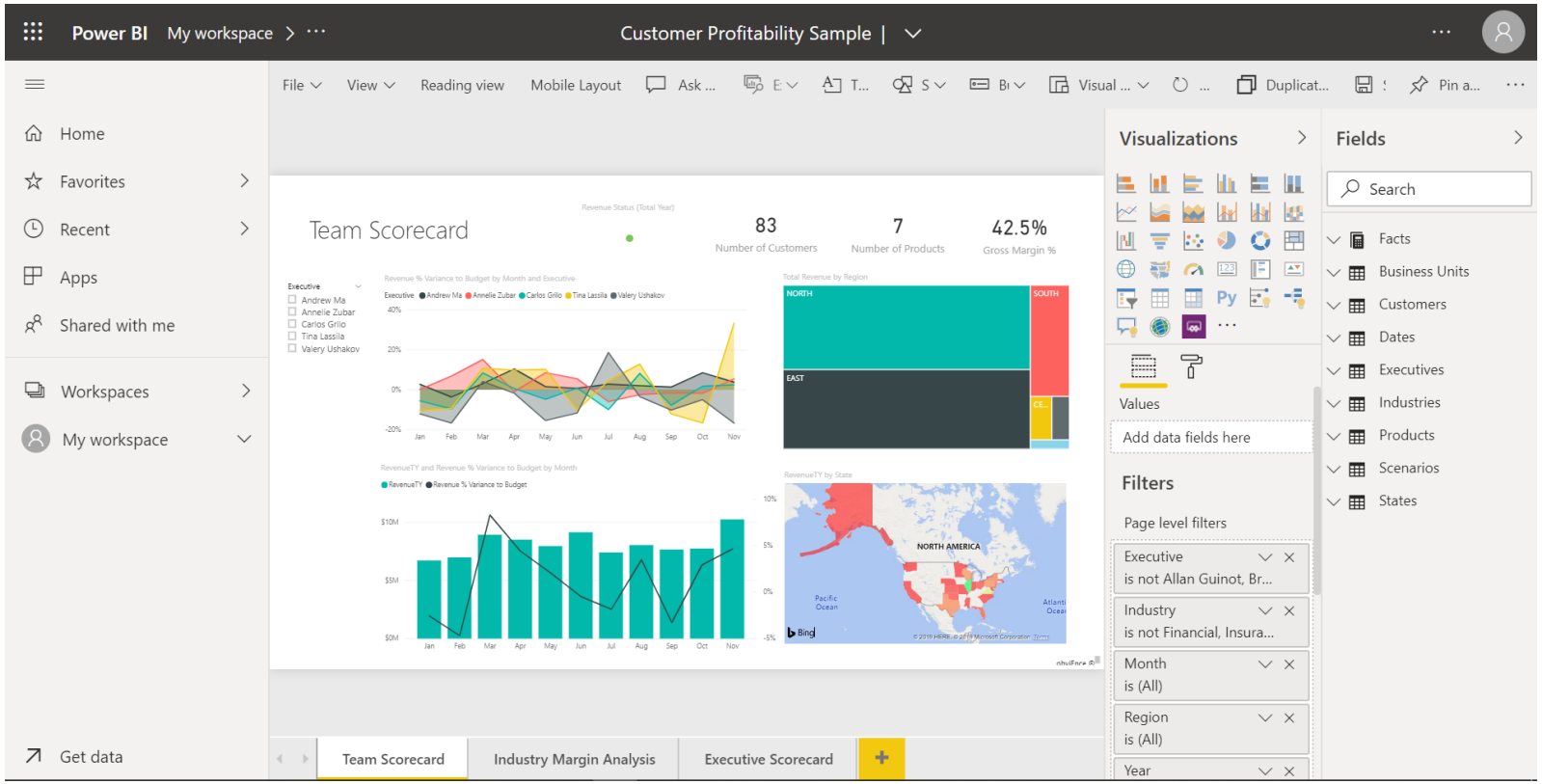
https://docs.microsoft.com/en-us/power-bi/service-dashboards

Demo 6-1 : Publish Data to Power BI Service



Power BI Web Authoring

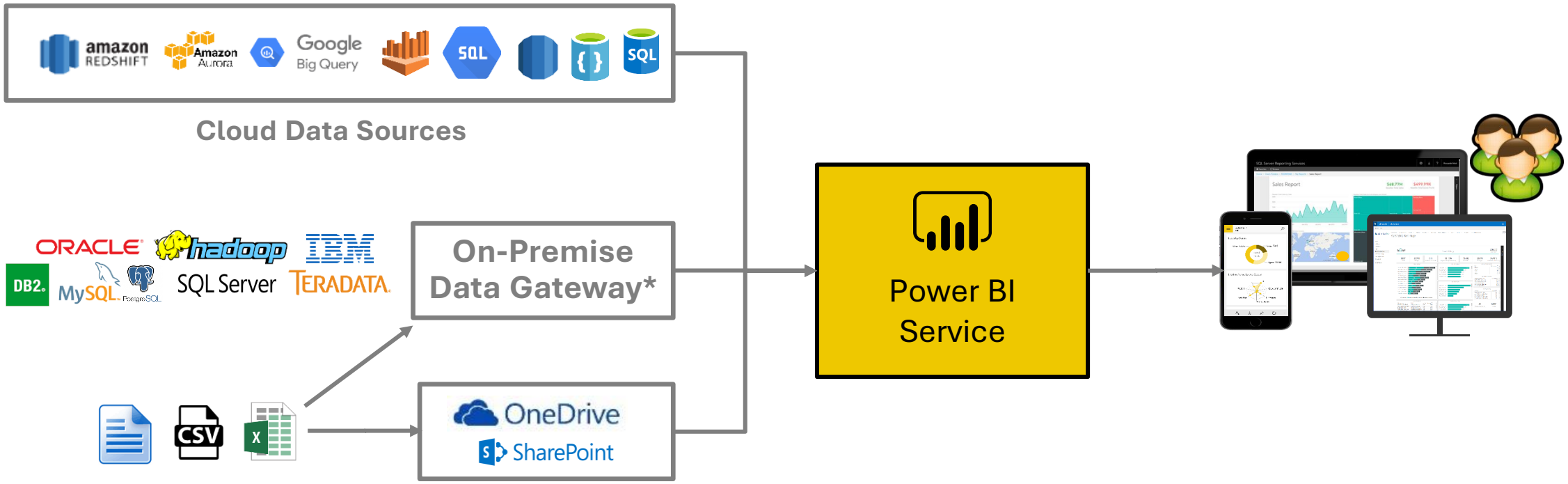
- For published reports in Power BI, we can edit reports in Power BI Service though some features will be missed from Power BI Desktop
- We can edit the layout only / No DAX & No M Scripting on Power BI Service



Important Slide

Data Management in Power BI Service

- To make data sources be able to automatically update / refreshable we have made all the data sources used cloud-compatible and let Power BI Service manage the schedule



* Need separate machine which can access every data sources in organization

Power BI Gateway

- Power BI Gateway is a tool to Keep your dashboards and reports up-to-date with your on-premises data sources
- Power BI Gateway performs as a bridge between on premise and Power BI Service data sources

https://docs.microsoft.com/en-us/power-bi/service-gateway-onprem

Quiz

https://forms.office.com/r/G6SbWTCTVW

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Thank You