Aalto University
School of Business

Power BI

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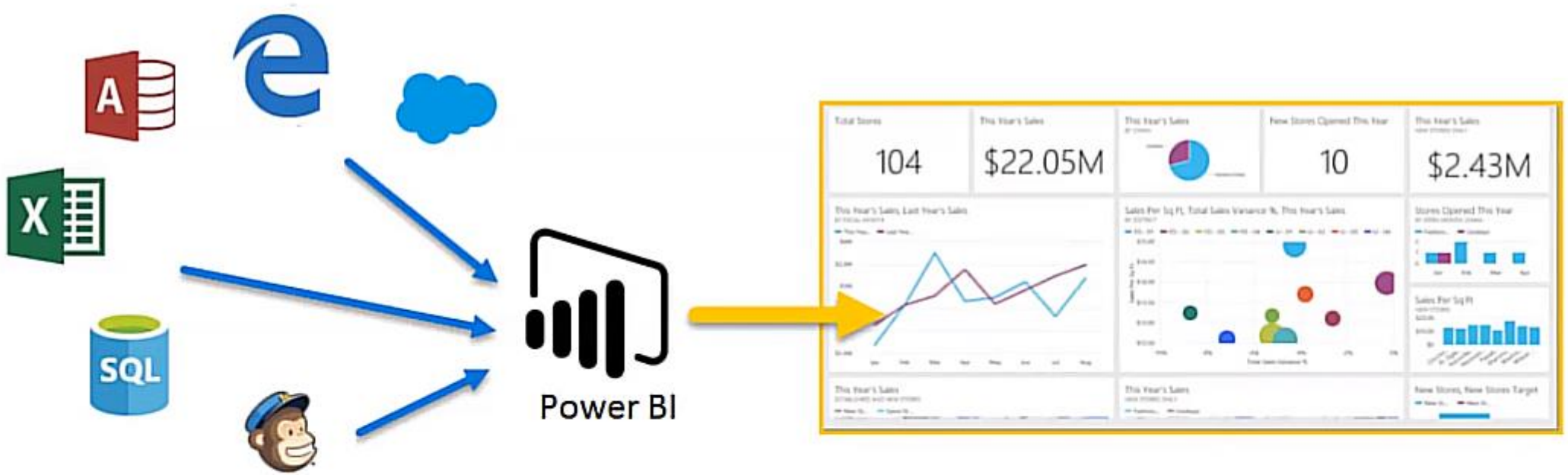
Power BI

Power BI is a cloud-based business analysis and intelligence service by Microsoft. It is a collection of business intelligence and data visualization tools such as software services, apps and data connectors.



https://data-flair.training/blogs/power-bi-tutorial/
Image Source: https://docs.microsoft.com/en-us/learn/modules/introduction-power-bi/media/pbi-intro-01.png

Power BI: History

- **Originally designed and created by Ron George in 2010.**
- **Released by Microsoft in July 2011.**
- **September of 2013, Microsoft released as Power BI.**
- **One of the Leading BI tools.**
- **Platforms:**
  - Power BI Desktop (A desktop application).
  - Power BI Service (SaaS i.e., Software as a Service).
  - Power BI Mobile (For iOS and Android devices).

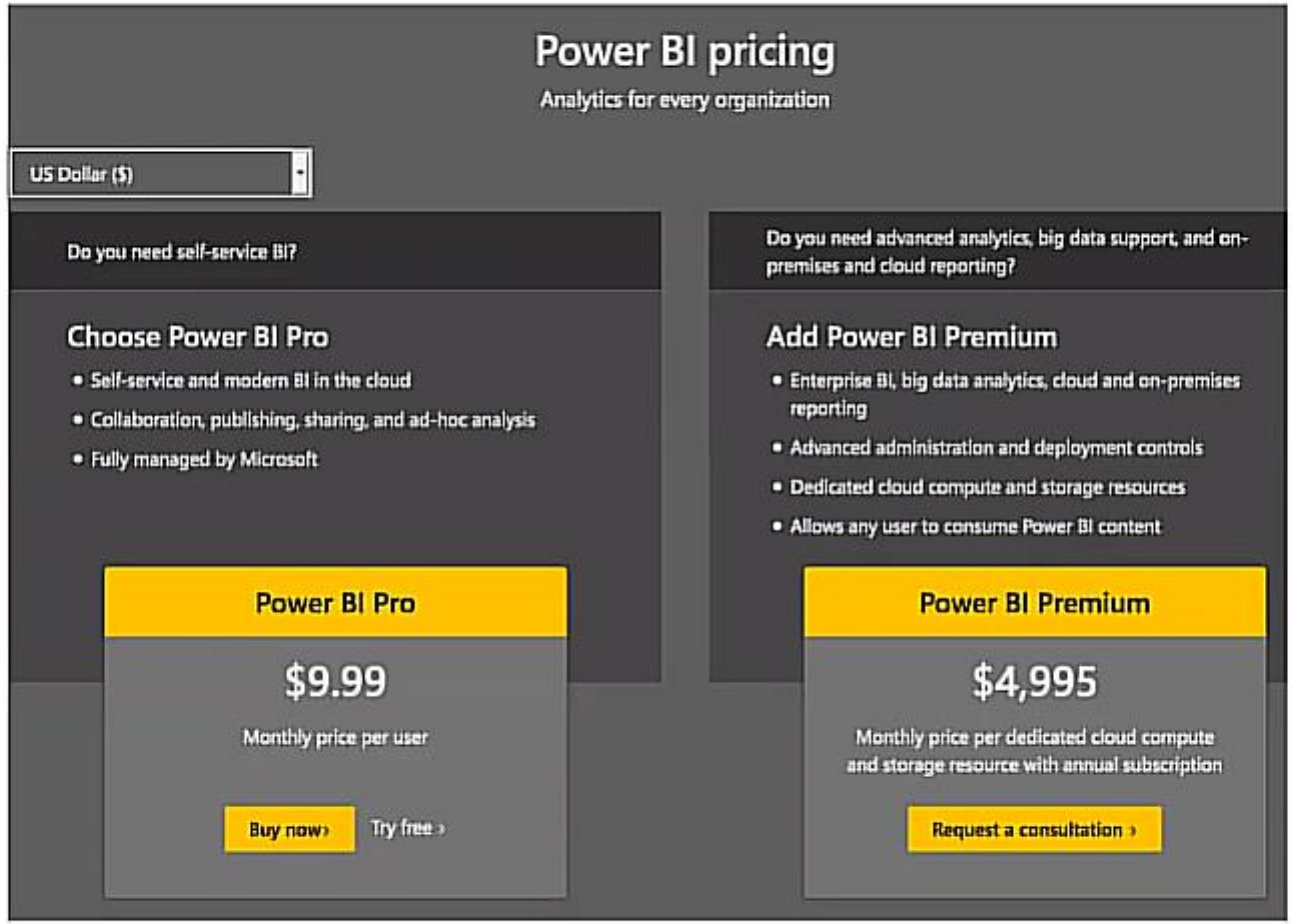
Image Source: https://powerbi.microsoft.com/en-us/

Comparison of BI Tools

Feature	SSRS	Tableau	Power BI
Data Visualization	High resolution reporting and average dash-boarding features.	Strong data visualization.	Strong backend data manipulation and access to simple visualizations.
Size of Dataset	No data size limit.	Larger dataset.	1GB data in free version.
Data Sources	A vast range of data sources.	A vast range of data sources, select dataset and create visuals quickly.	Covers large data sources and is closely integrated with Office 365 connectivity to SharePoint.
Implementation	SSRS implementation is complex.	Different implementation types as per organizational needs.	Cloud storage and simple implementation process.

Source: https://www.tutorialspoint.com/power_bi/power_bi_comparison_other_bi_tools.htm

Power BI: Pricing



Source: https://powerbi.microsoft.com/en-us/pricing/#powerbi-comparison-table

	Power BI Pro	Power BI Premium
Licensing differences		
Included with Office 365 Enterprise E5	●	$ ⓘ
Licensed per user	●	
Licensed by dedicated cloud compute and storage resources		●
Deployment and administration		
Maximum size of individual dataset	1 G	10 G
Maximum storage	10 G per user	100 TB
Maximum number of automatic refreshes per day	8	48

Source: https://powerbi.microsoft.com/en-us/pricing/#powerbi-comparison-table

Power BI Platforms

- **Power BI Desktop**
  - Windows-only app
- **Power BI Service**
  - web-based service
  - an online SaaS (Software as a Service) service
  - https://powerbi.microsoft.com/en-us/landing/signin/
- **Power BI mobile**

Image sources: https://docs.microsoft.com/en-us/learn/modules/introduction-power-bi/media/pbi-intro-02.png

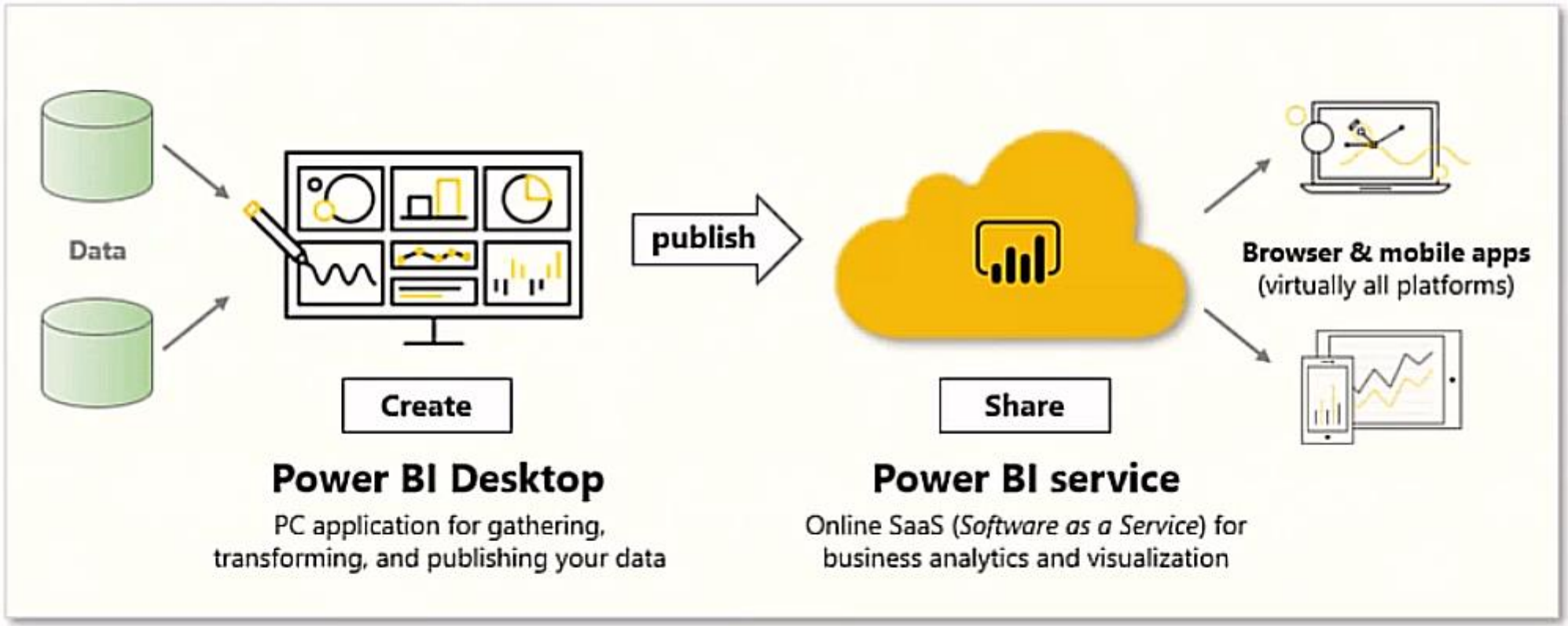
For MAC users

- Please use Aalto VDI to access Power BI.
- Power BI desktop has been implemented at VDI.
- Please install the client for a better usage experience.

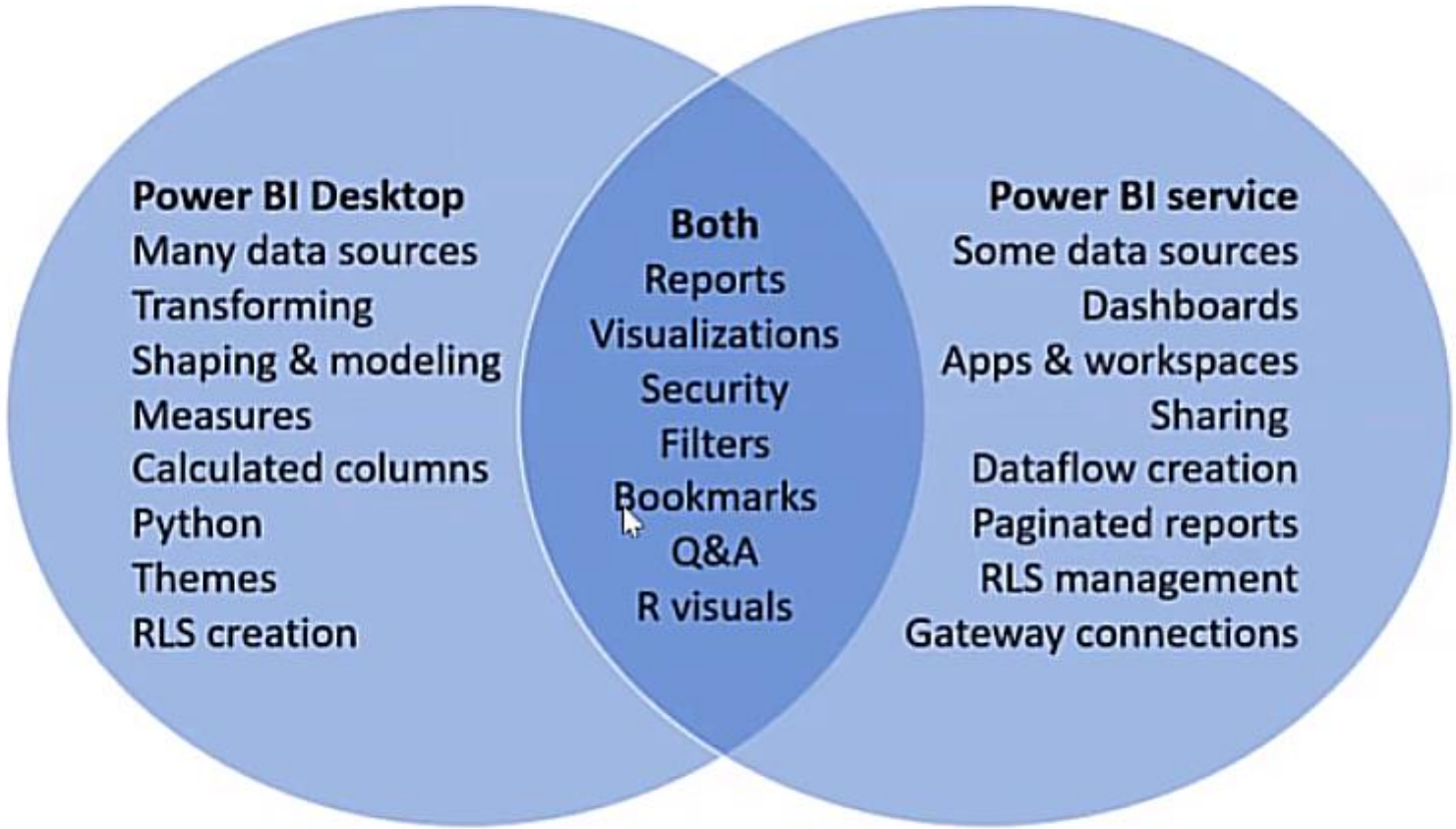
  - It is difficult to type “Ctrl+Alt+Delete” at MAC after VDI screen is locked.

https://vdi.aalto.fi/

Power BI: Work-flow



Power BI Desktop vs. Service



Source: https://docs.microsoft.com/en-us/power-bi/fundamentals/service-service-vs-desktop

Power BI: Building Blocks

Datasets – A collection of data that Power BI uses to create visualizations
Visualizations – A visual representation of data, sometimes just called visuals
Reports – A collection of visuals from a dataset, spanning one or more pages
Dashboards – A single-page collection of visuals built from a report

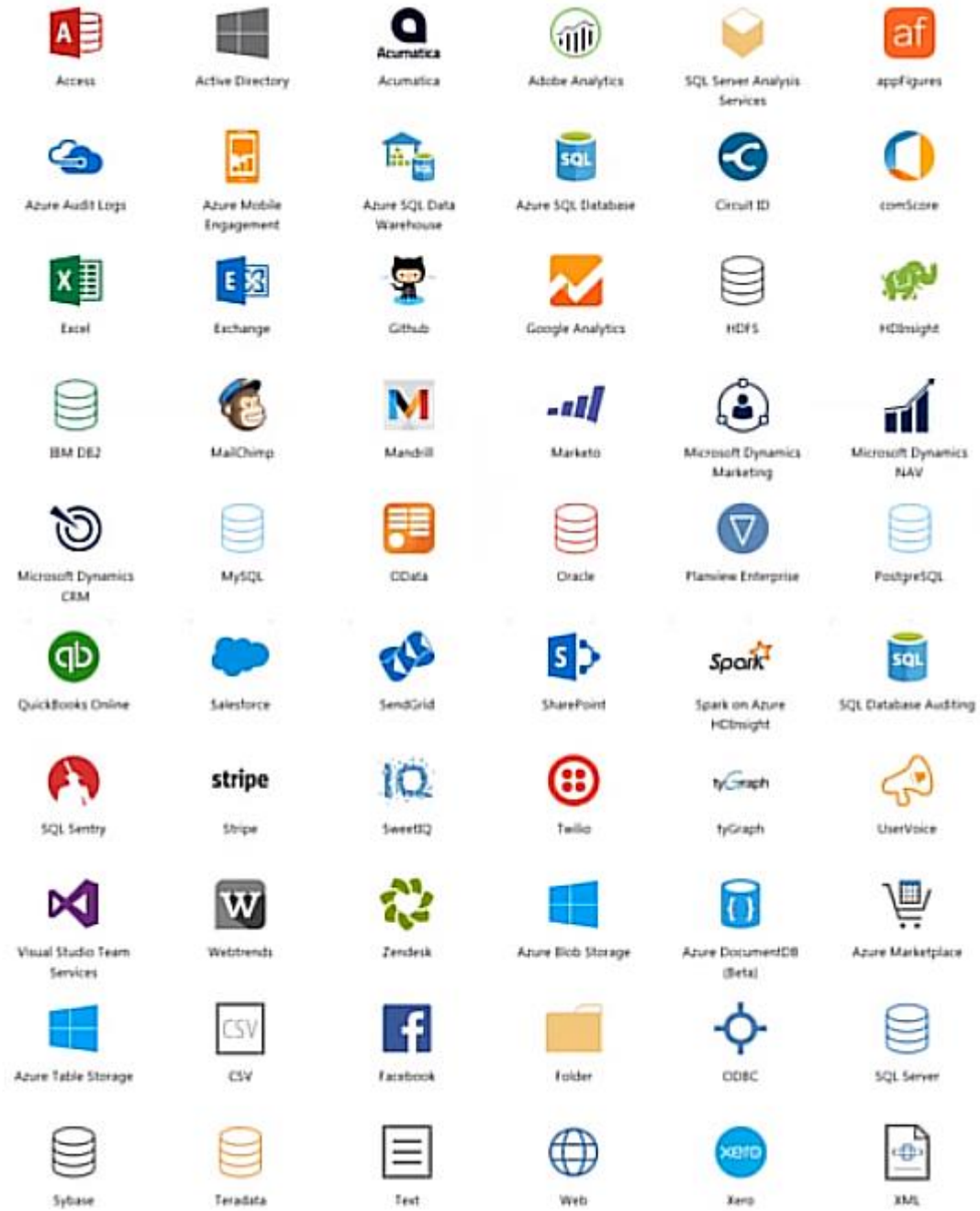
Datasets

A **dataset** is a collection of data that Power BI uses to create its visualizations.

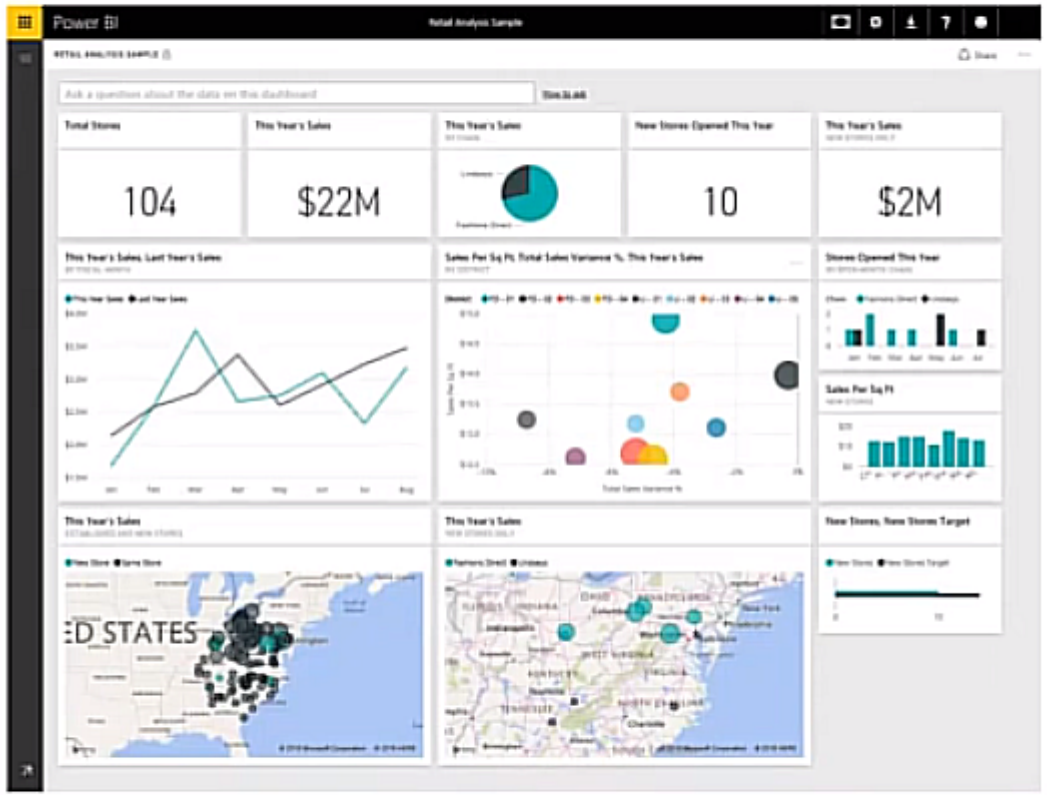
Datasets can also be a combination of many different sources.

See the list of possible data sources of Power BI at: https://docs.microsoft.com/en-us/power-bi/connect-data/power-bi-data-sources

Image source: https://convverge.com/2018/01/31/power-bi-whats-big-deal/



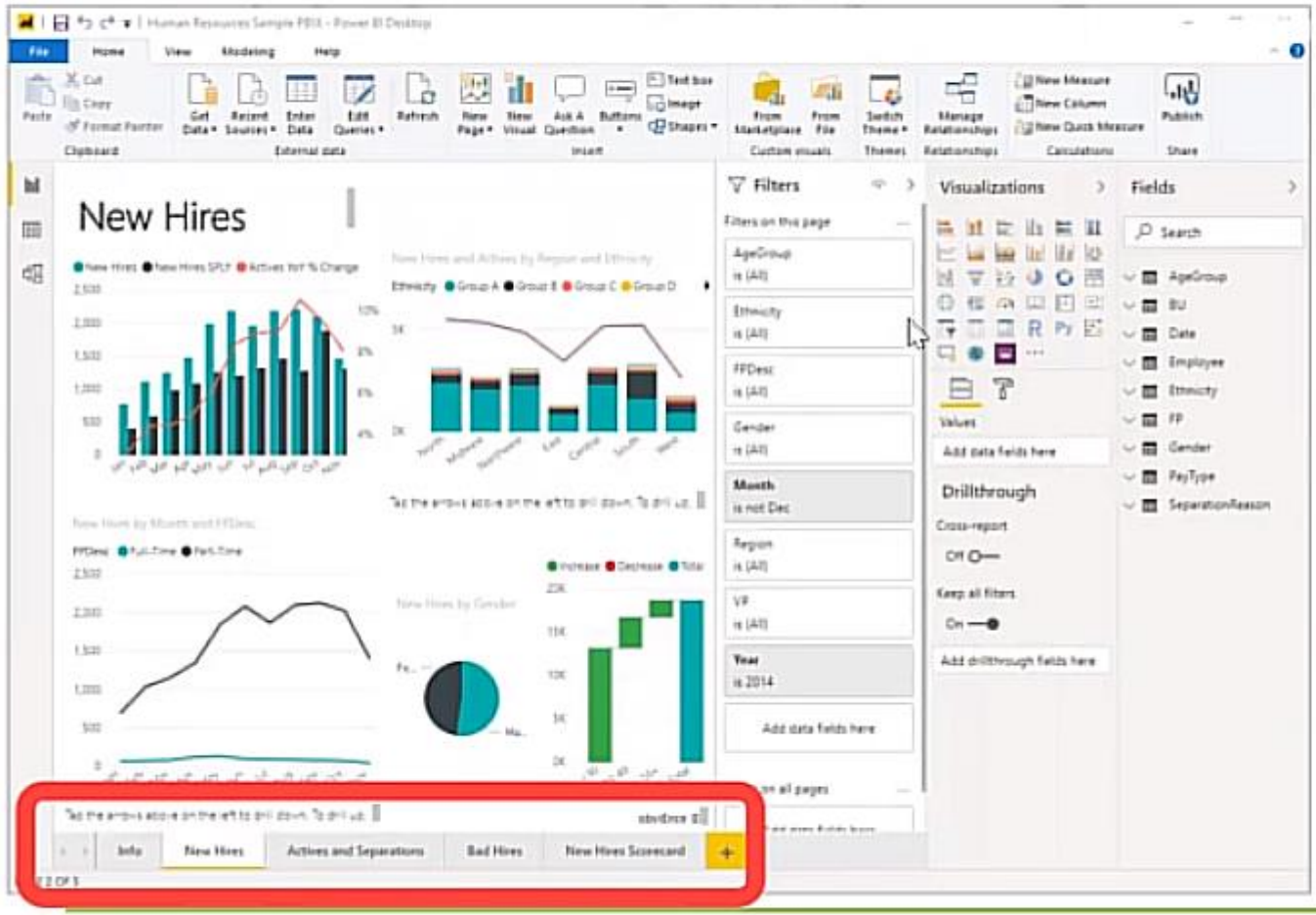
Visualizations



A visualization (sometimes also referred to as a **visual**) is a visual representation of data, like a chart, a color-coded map, or other interesting things you can create to represent your data visually.

Image source: https://docs.microsoft.com/en-us/learn/modules/get-started-with-power-bi/3-building-blocks-of-power-bi

Reports



A **report** is a collection of visualizations that appear together on one or more pages.

Image source: https://docs.microsoft.com/en-us/learn/modules/get-started-with-power-bi/3-building-blocks-of-power-bi

Dashboards

A Power BI dashboard is a collection of visuals from **a single page** that you can **share** with other.

A dashboard must fit **on a single page**.

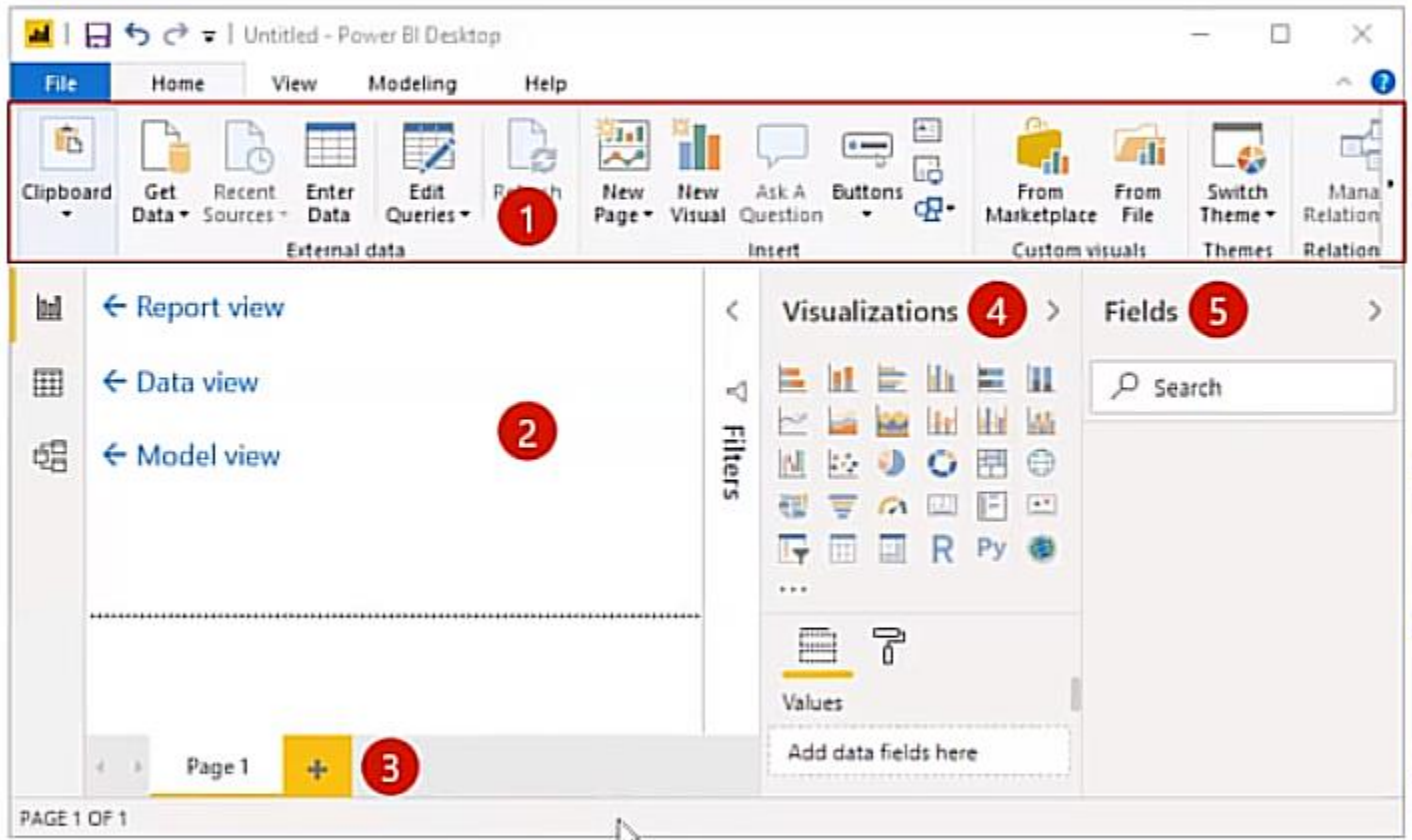
Image source: https://docs.microsoft.com/en-us/learn/modules/get-started-with-power-bi/3-building-blocks-of-power-bi

Dashboards vs. reports

- **Dashboards** can be created from multiple datasets or **reports**.
- **Dashboards** do not have the ***Filter***, ***Visualization***, and ***Fields*** panes that are in Power BI Desktop.
- **Dashboards** can only be a single page, whereas **reports** can be multiple pages.
- You can't see the underlying dataset directly in a **dashboard**.
- **Both** dashboards and reports can be refreshed to show the latest data.

Source: https://docs.microsoft.com/en-us/learn/modules/create-dashboards-power-bi/1-introduction

Power BI Desktop Interface



1. Ribbon
2. Report view
   Data view
   Model view
3. Pages tab
4. Visualizations pane
5. Fields pane

Source: https://docs.microsoft.com/en-gb/learn/modules/get-data-power-bi/2-getting-started-power-bi-desktop

Power BI data modelling- Star Schema

In computing, the **star schema** is the simplest style of mart schema and is the approach most widely used to develop data warehouses and interdimensional data marts. The star schema consists of one or more **fact** tables referencing any number of **dimension** tables. – Wikipedia

Star schema is a mature modeling approach widely adopted by relational data warehouses. It requires modelers to classify their model tables as either **dimension** or **fact**. - Microsoft

Further reading: https://radacad.com/power-bi-basics-of-modeling-star-schema-and-how-to-build-it

https://docs.microsoft.com/en-us/power-bi/guidance/star-schema
https://en.wikipedia.org/wiki/Star_schema

Dimension and fact tables

Dimensions can be thought as **noun**, such as **things** or **objects.**

Facts, are the **verb**. An entry in a fact table marks a discrete event **that happens to something from the dimension table**.

For instance, a product sale would be recorded in a fact table, but product information and salesperson's information are saved at different dimension tables.

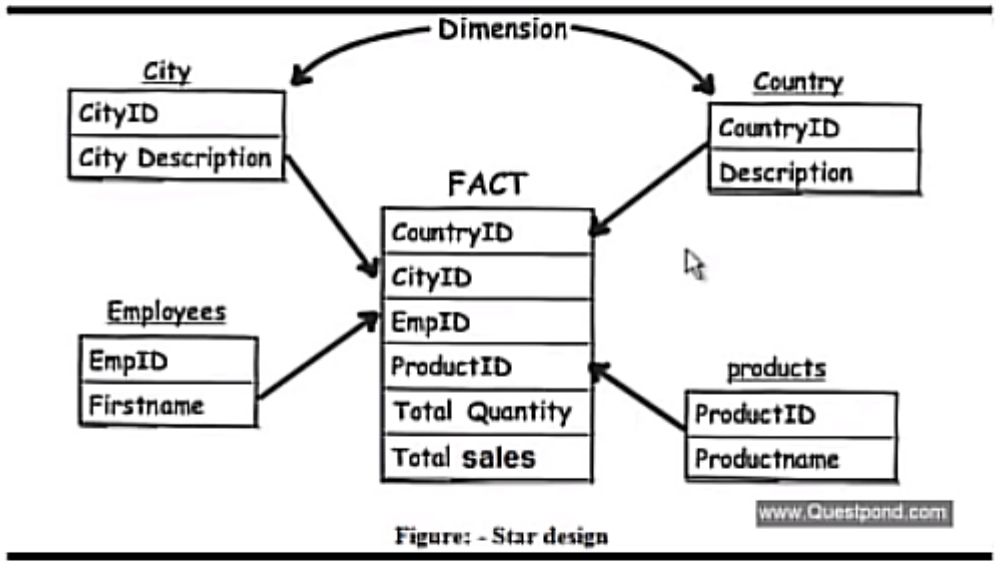


Figure: - Star design

https://arcanecode.com/2007/07/23/dimensions-versus-facts-in-data-warehousing/
https://en.wikipedia.org/wiki/Star_schema
https://www.youtube.com/watch?v=KUwOcip7Zzc

Why is table connection important?

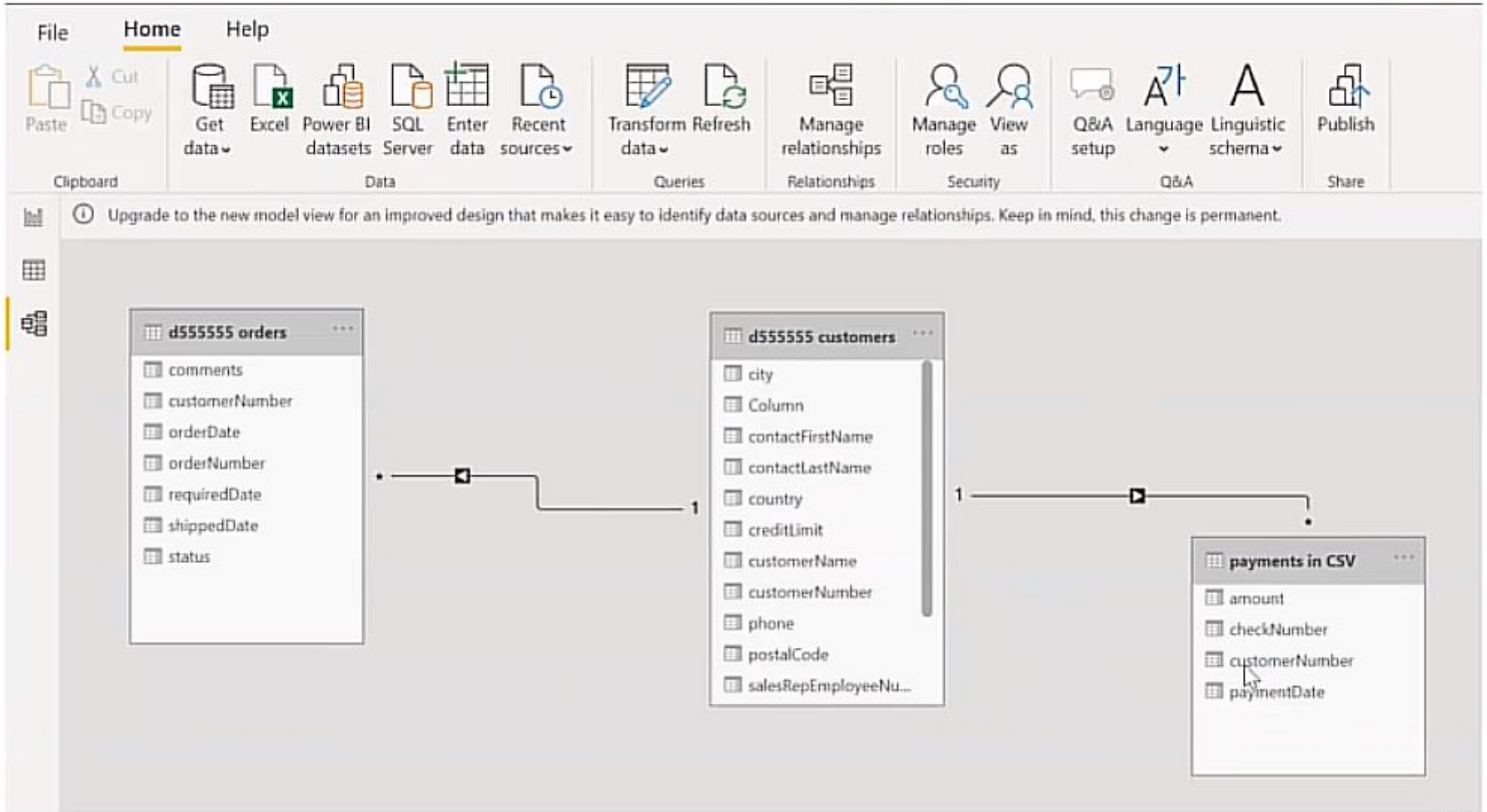
customerNumber	customerName	country	city
103	Atelier graphique	France	Nantes
112	Signal Gift Stores	USA	Las Vegas
114	Australian Collectors, Co.	Australia	Melbourne
119	La Rochelle Gifts	France	Nantes
121	Baane Mini Imports	Norway	Stavern
124	Mini Gifts Distributors Ltd.	USA	San Rafael
125	Havel & Zbyszek Co	Poland	Warszawa
128	Blauer See Auto, Co.	Germany	Frankfurt
129	Mini Wheels Co.	USA	San Francisco
131	Land of Toys Inc.	USA	NYC
141	Euro+ Shopping Channel	Spain	Madrid
144	Volvo Model Replicas, Co	Sweden	Luleå
145	Danish Wholesale Imports	Denmark	Kobenhavn
146	Saveley & Henriot, Co.	France	Lyon
148	Dragon Souveniers, Ltd.	Singapore	Singapore
151	Muscle Machine Inc	USA	NYC
157	Diecast Classics Inc.	USA	Allentown
161	Technics Stores Inc.	USA	Burlingame
166	Handji Gifts& Co	Singapore	Singapore
167	Herkku Gifts	Norway	Bergen
168	American Souvenirs Inc	USA	New Haven
169	Porto Imports Co.	Portugal	Lisboa
171	Daedalus Designs Imports	France	Lille
172	La Corne D'abondance, Co.	France	Paris
173	Cambridge Collectables Co.	USA	Cambridge
175	Gift Depot Inc.	USA	Bridgewater
177	Osaka Souveniers Co.	Japan	Kita-ku
181	Vitachrome Inc.	USA	NYC
186	Toys of Finland, Co.	Finland	Helsinki

Customer table

customerNumber	checkNumber	paymentDate	amount
103	HQ336336	2004-10-19	6,066.78
103	JM555205	2003-06-05	14,571.44
103	OM314933	2004-12-18	1,676.14
112	BO864823	2004-12-17	14,191.12
112	HQ55022	2003-06-06	32,641.98
112	ND748579	2004-08-20	33,347.88
114	GG31455	2003-05-20	45,864.03
114	MA765515	2004-12-15	82,261.22
114	NP603840	2003-05-31	7,565.08
114	NR27552	2004-03-10	44,894.74
119	DB933704	2004-11-14	19,501.82
119	LN373447	2004-08-08	47,924.19
119	NG94694	2005-02-22	49,523.67
121	DB889831	2003-02-16	50,218.95
121	FD317790	2003-10-28	1,491.38
121	KI831359	2004-11-04	17,876.32
121	MA302151	2004-11-28	34,638.14
124	AE215433	2005-03-05	101,244.59
124	BG255406	2004-08-28	85,410.87
124	CQ287967	2003-04-11	11,044.3
124	ET64396	2005-04-16	83,598.04
124	HI366474	2004-12-27	47,142.7
124	HR86578	2004-11-02	55,639.66
124	KI131716	2003-08-15	111,654.4
124	LF217299	2004-03-26	43,369.3

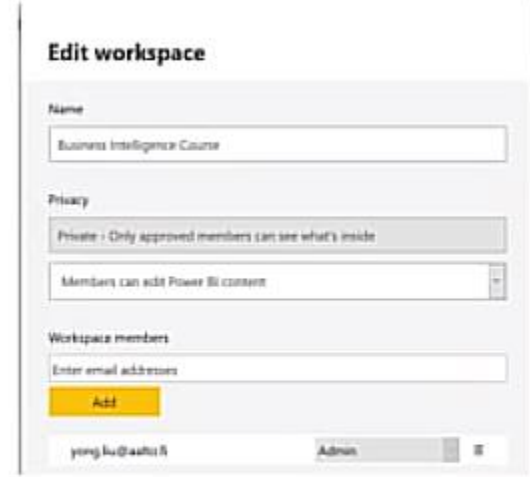
Payment table

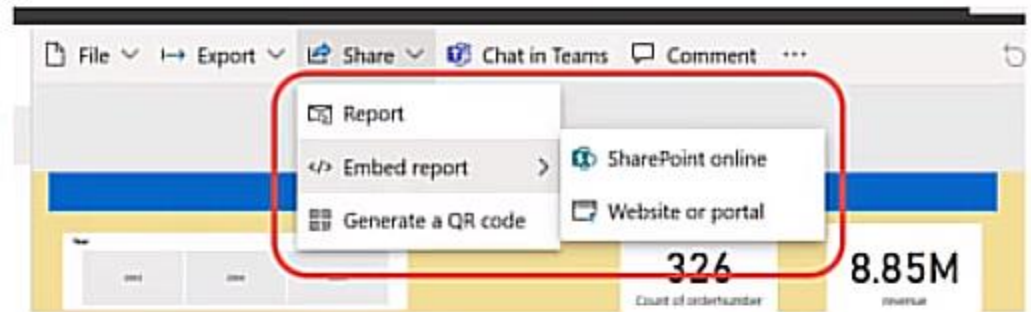
Power BI Data Modeling (Relationship)

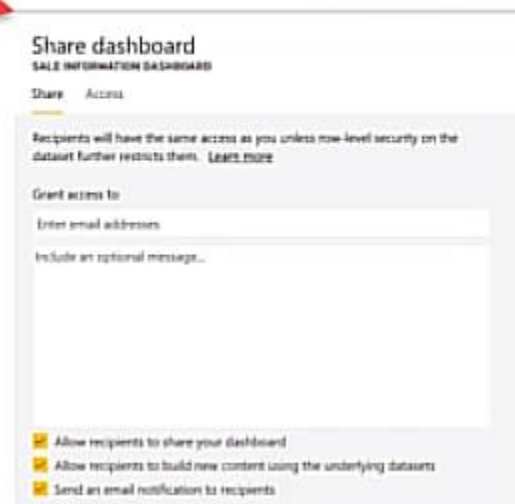


Collaboration and Share

- **Workspace**
  - Including both dataset and report
  - Supporting the creation of reports
- **Reports**
  - Including multiple pages
- **Dashboard**
  - A one-page report







Thank you!

Please continue your learning by watching other videos about Power BI.