



Part of the Power BI
Bootcamp Series

Microsoft Power BI Bootcamp

— — — —
Introduction to Business Intelligence & PBI

Instructors:

Nicolás Lagreste Zucchini

Maria Florencia Hourcouri



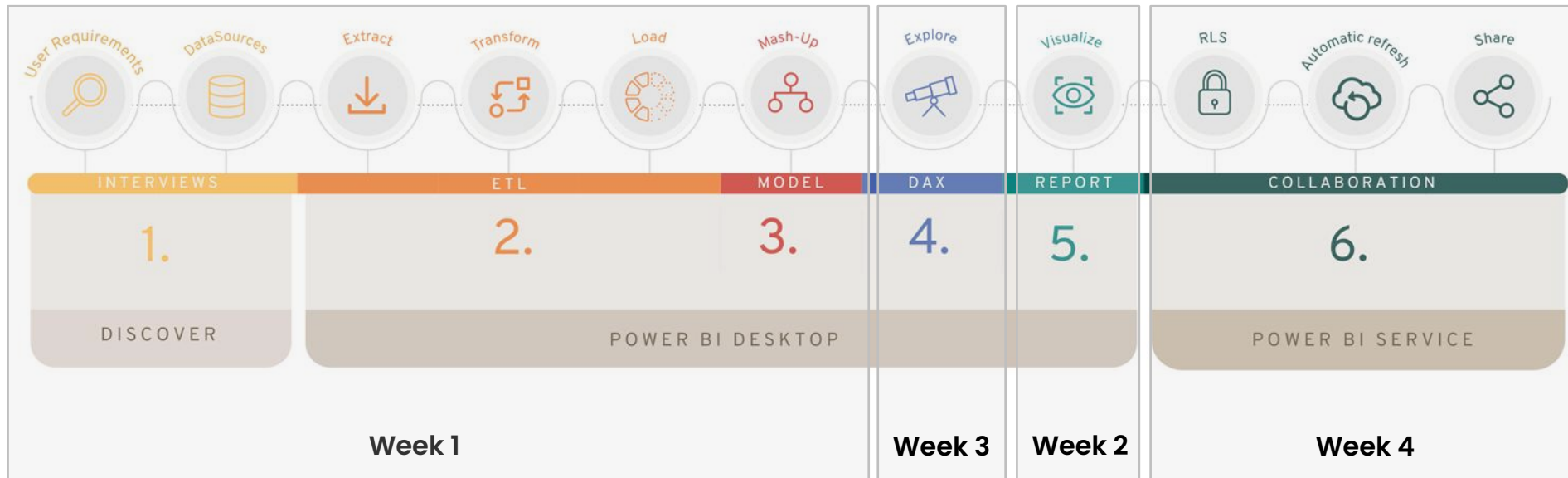


Course Agenda

- **Week 1:** Introduction to Business Intelligence, Power BI and Power Query.
- **Week 2:** Advanced and Interactive Visuals.
- **Week 3:** Calculated measures, columns & custom tables with Power BI Programming Language (DAX).
- **Week 4:** Ways to collaborate and share in Power BI.



Our Method: Flow of Report Development

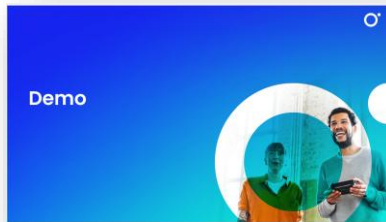




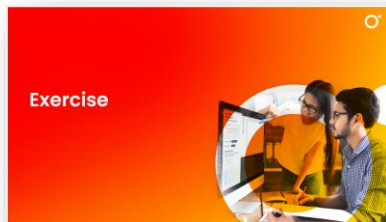
Our Method on each topic:

Demo example, followed by exercises to practice!

- DEMO – Flor & Nico



- EXERCISE – Your turn!



*Students should have the latest version of **Power BI Desktop** installed.





Instructors

Follow us on LinkedIn:



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Let's Collaborate: Interested in a personalized mentorship or consulting session? Contact us:

- nico@analyticmood.com
- flor@analyticmood.com

Visit Our Website:

- www.analyticmood.com for resources, upcoming events, and blog articles.

analytic mood

Exercise 0.0 – Initial set up

- ✓ To get started, download all the files from:
www.analyticmood.com/resources
- ✓ Ensure all files are downloaded before proceeding.



NOTE: use the latest version of Power BI Desktop.



O'REILLY®

WEEK 01

Introduction to
Business Intelligence,
Power BI and Power
Query



Week 1: Introduction to Business Intelligence, Power BI and Power Query

- What is Business Intelligence and Power BI; What do we mean by Business Intelligence? A brief explanation of what is the maturity cycle of Business Intelligence & Data Science. Understanding that Power BI is a collection of software, services, apps, and connectors.
- What is an ETL and how to build a powerful ETL solution with no code. Defining and creating a Star Schema Model, and translation of all this into visual graphics.
- Brief explanation of the difference between Power BI Desktop and Service. Understand what the main features of each tool or service are.



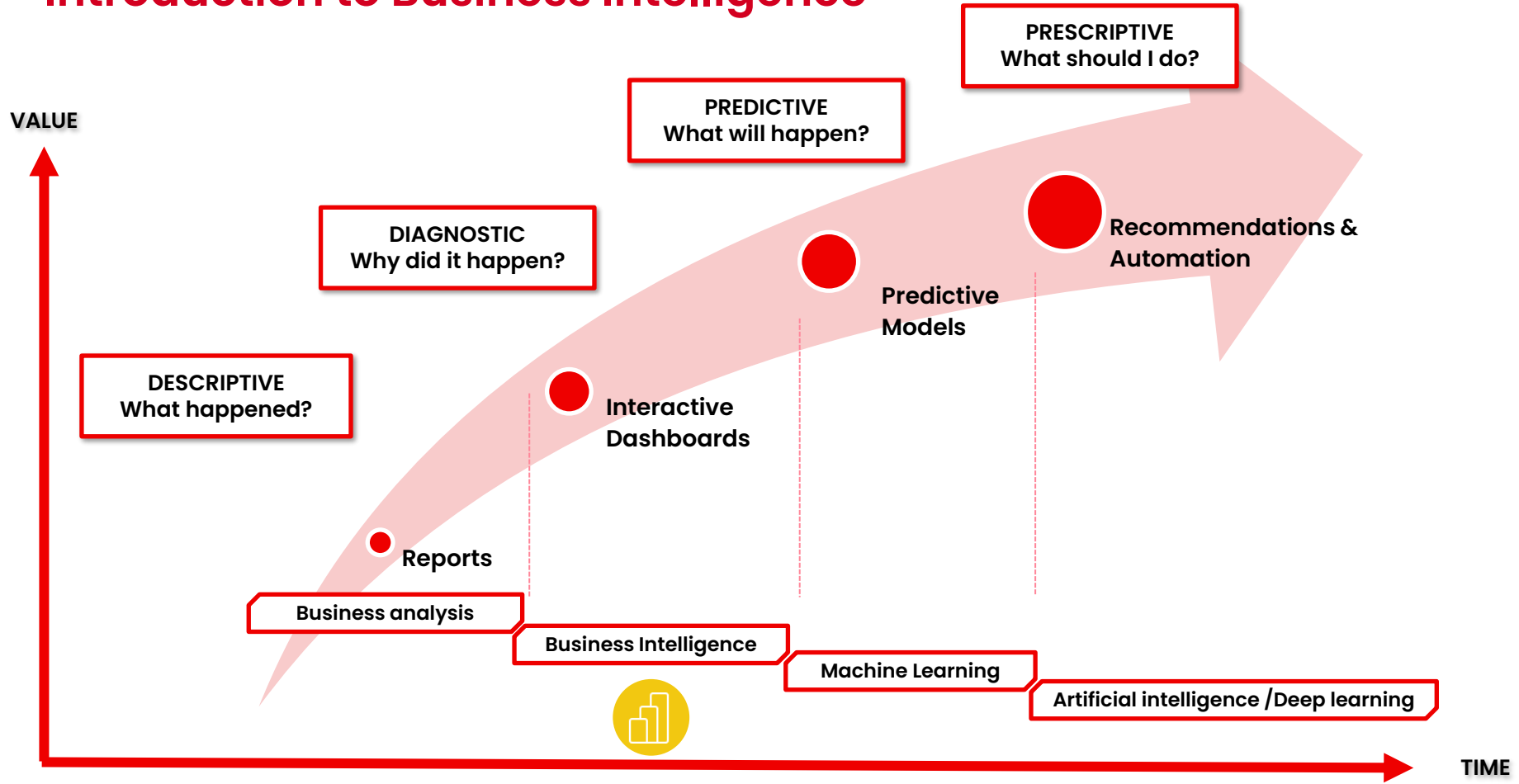


Introduction to Business Intelligence and Power BI

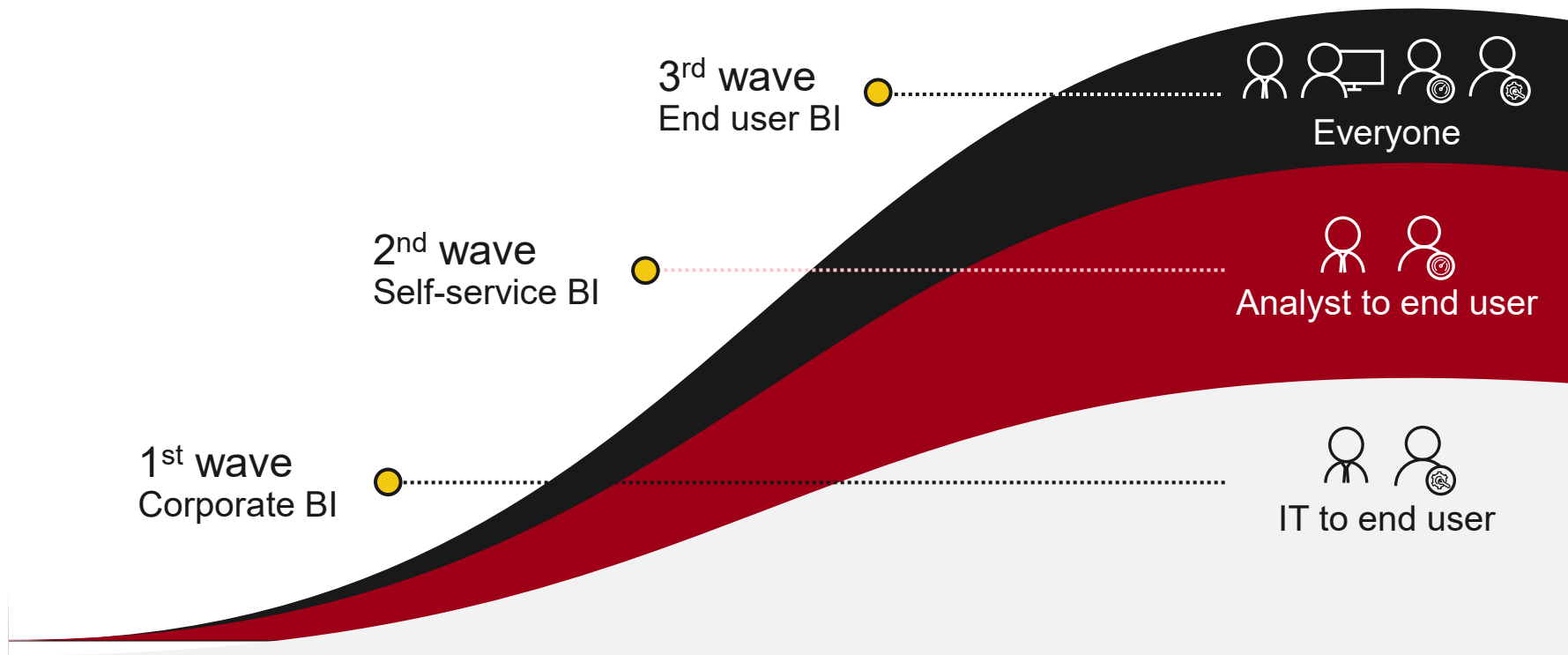
- Introduction to Business Intelligence and Power BI Platform.
- Maturity cycle of Business Intelligence & Data Science.
- Working with Power BI projects step by step – Full architecture.
- Exercise: Setting Up Power BI Desktop
- Q&A



Introduction to Business Intelligence



Evolution of BI



Microsoft Power Platform



Give everyone the power to innovate:

Empower everyone at your organization with an intuitive, collaborative, and extensible platform of low-code tools that makes it easy to create efficient and flexible solutions.

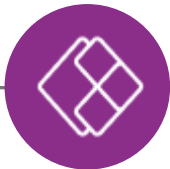
Power BI



Analyze:

Discover intelligent insights in diverse data

Power Apps



Act:

Build low-code solutions to business challenges.

Power Automate



Automate

Streamline processes with no-code automation.

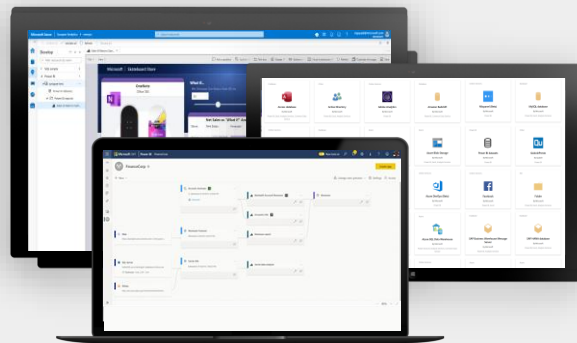
Power Virtual Agents



Assist

Handle routine inquiries at scale with conversational AI.

Microsoft Power BI



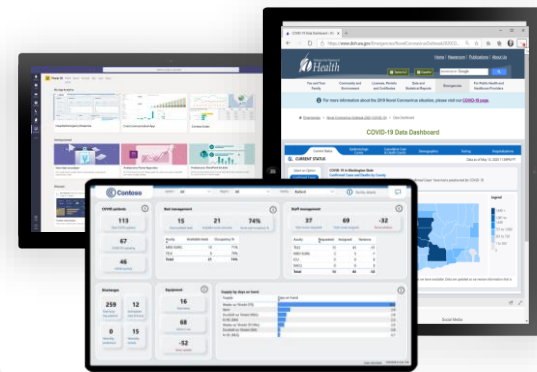
All Data

Break down data silos and
enrich your data with
intelligence



For Everyone

Create rich-interactive
data experiences with
AI infused insights

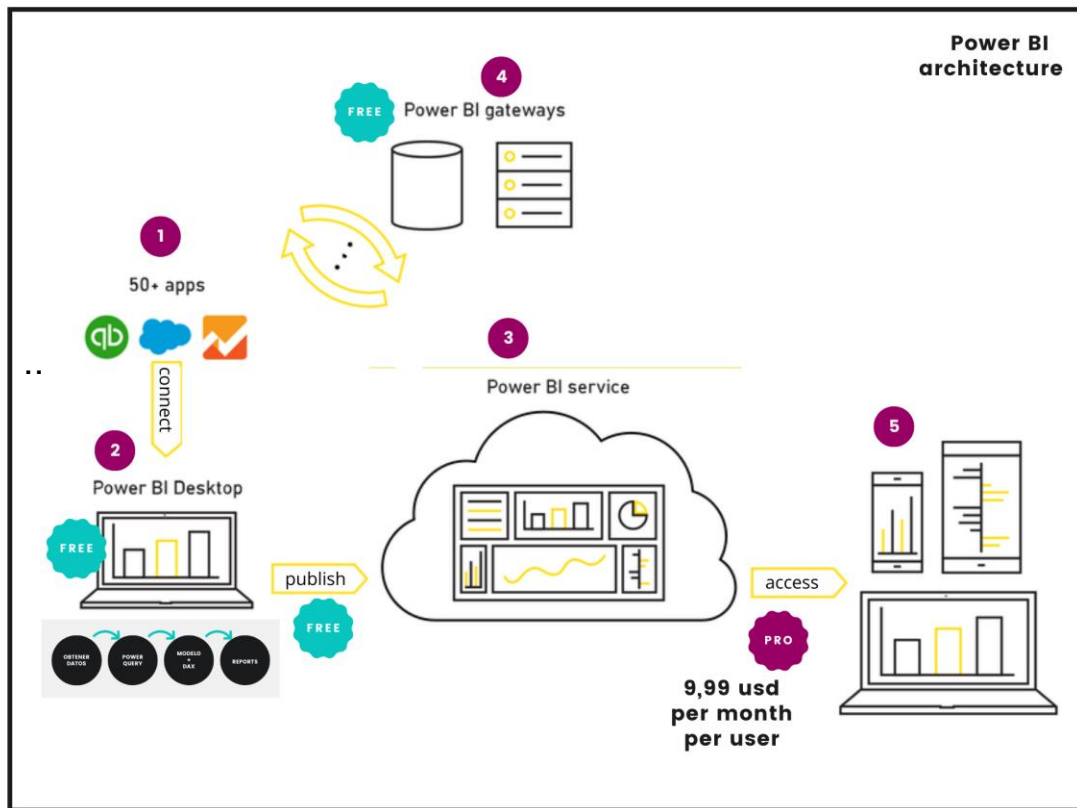


For Every Decision

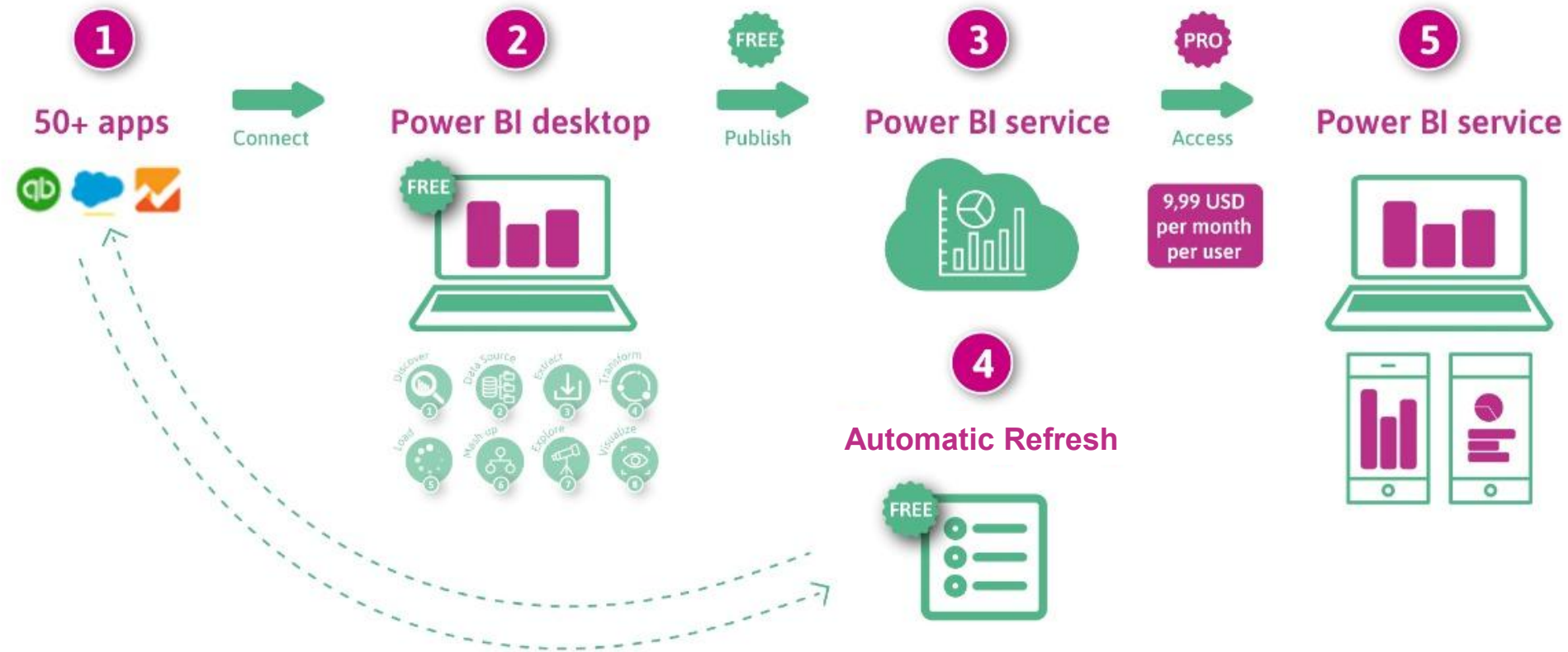
Integrate trusted and secure BI
into the fabric of your
organization and apps

Power BI drives a data culture for everyone and every decision

Full Architecture

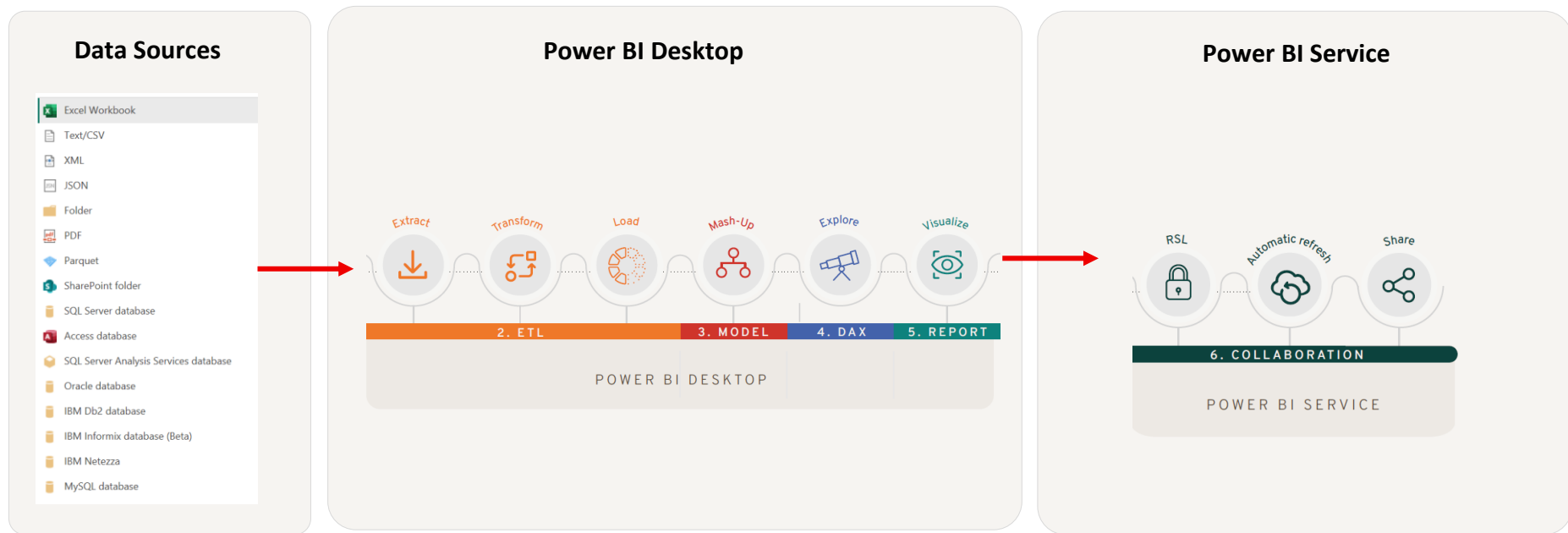


Power BI architecture



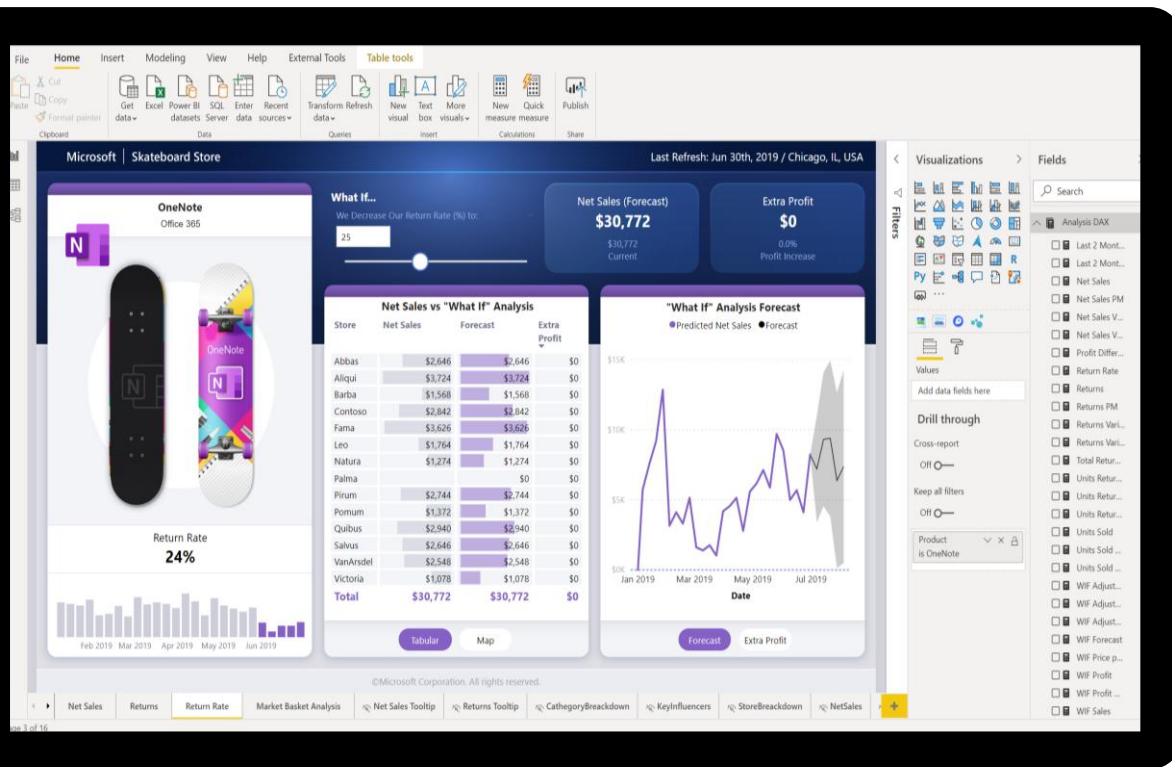


Full Architecture





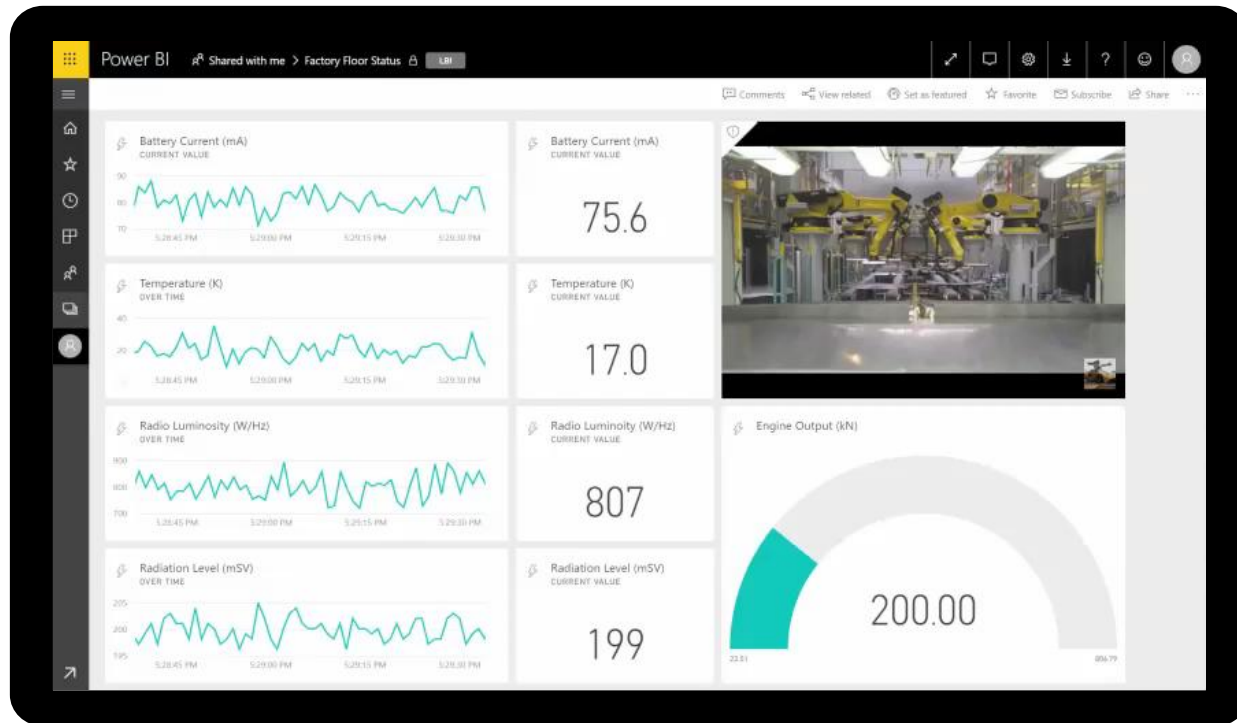
Why use Power BI?



Power BI
Desktop is free



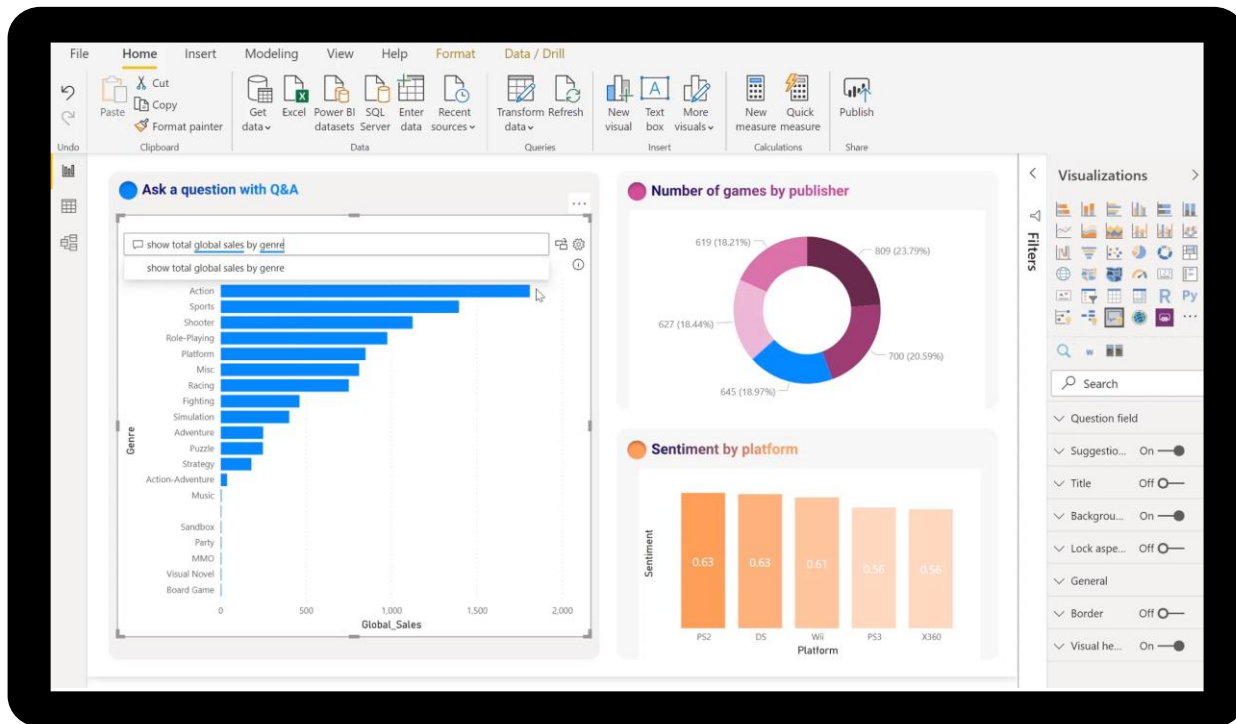
Why use Power BI?



Real time
dashboards
and interactive
reports



Why use Power BI?

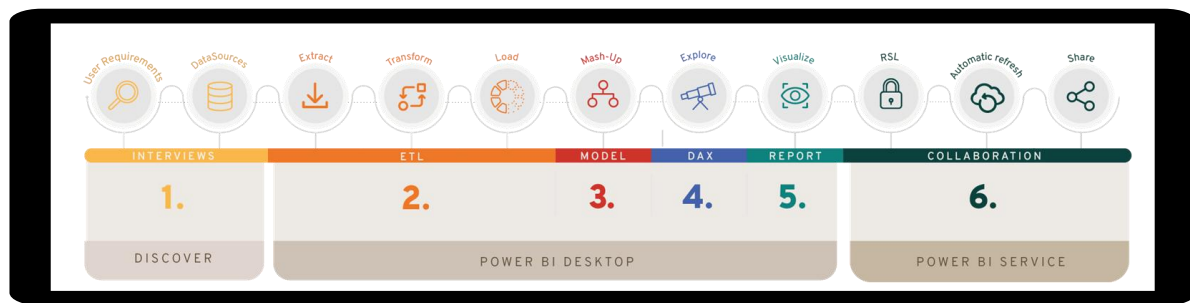


Natural
Language
query & AI
insights

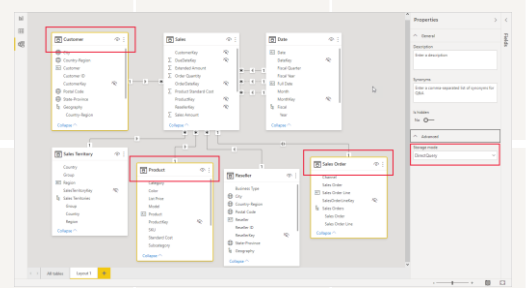
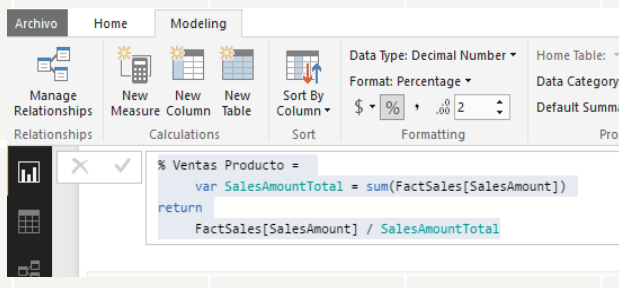
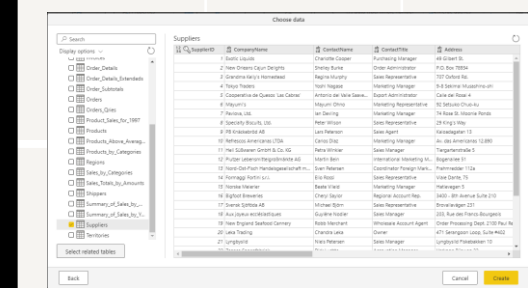




Why use Power BI?



All Business Intelligence process in one



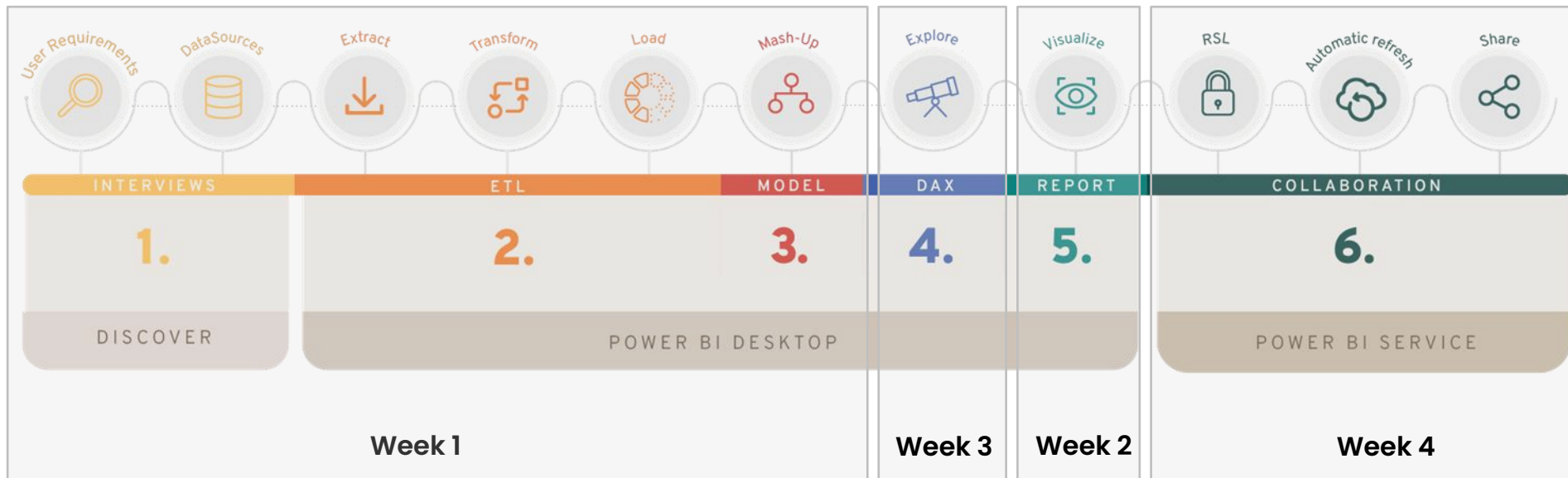
Why use Power BI?



Gartner Magic Quadrant
for “Analytics and
Business Intelligence
Platforms”

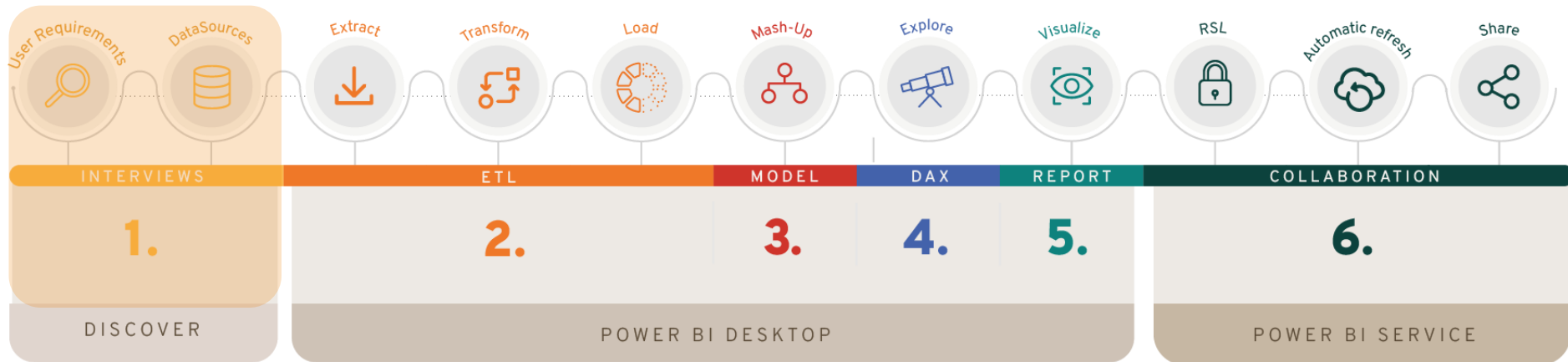


Our Method: Flow of Report Development





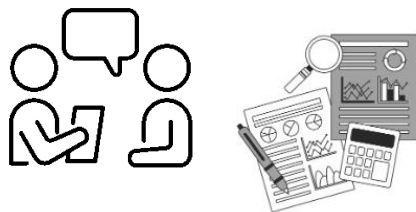
Our Method: Flow of Report Development





Interviews

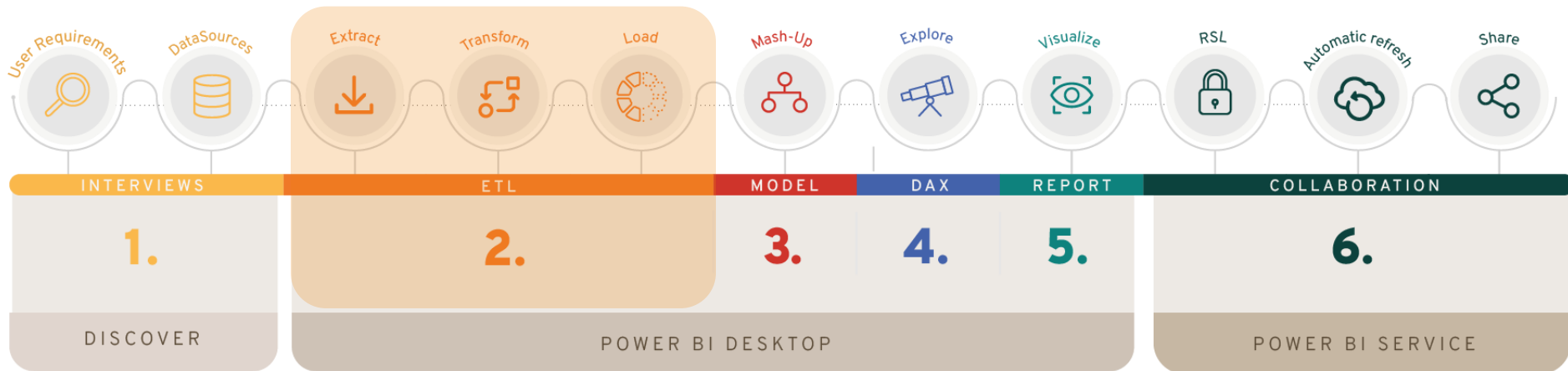
Understand processes, needs and data sources



- Excel Workbook
- Text/CSV
- XML
- JSON
- Folder
- PDF
- Parquet
- SharePoint folder
- SQL Server database
- Access database
- SQL Server Analysis Services database
- Oracle database
- IBM Db2 database
- IBM Informix database (Beta)
- IBM Netezza
- MySQL database



Our Method: Flow of Report Development





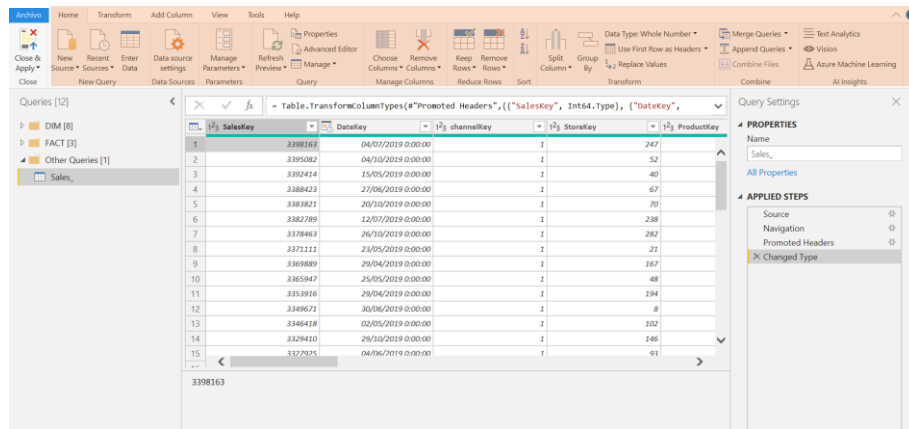
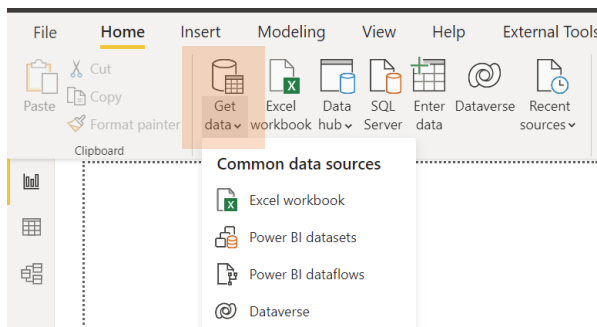
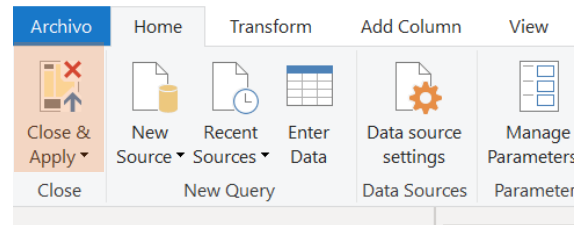
Power BI Desktop: Power Query

Clean and transform data sources

Extract



Load





What is Power Query?

A powerful tool for **data connection, cleaning, and transformation.**

- Built-in interface with advanced capabilities using M language.
- Works seamlessly with multiple data sources.
- Ideal for automating repetitive data tasks.

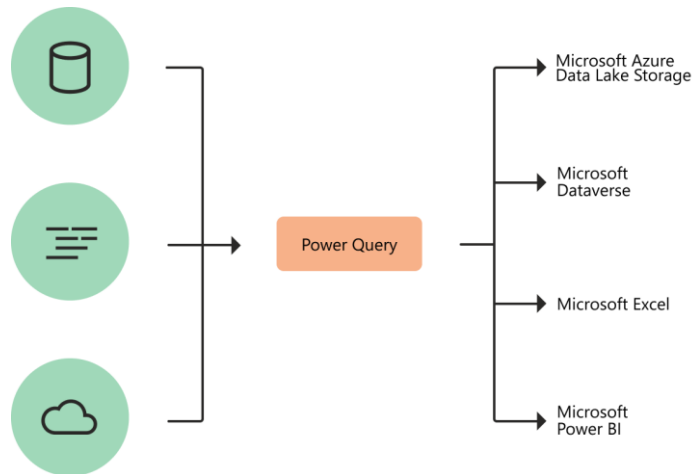




How Power Query helps with data acquisition

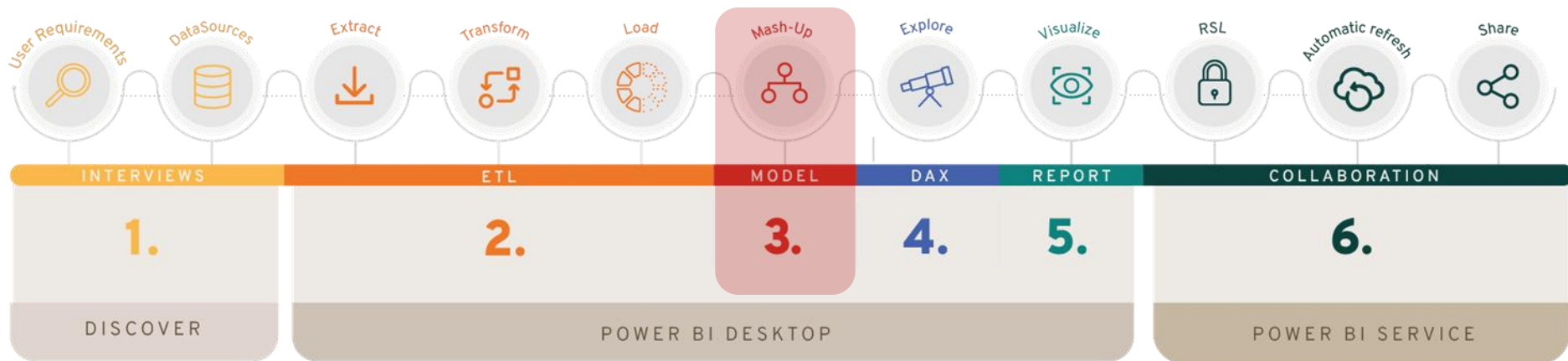
Business users spend up to **80%** of their time preparing data, which slows down analysis and decision-making.

Power Query **streamlines this process**, making it easier to connect, transform, and update data efficiently for faster insights.





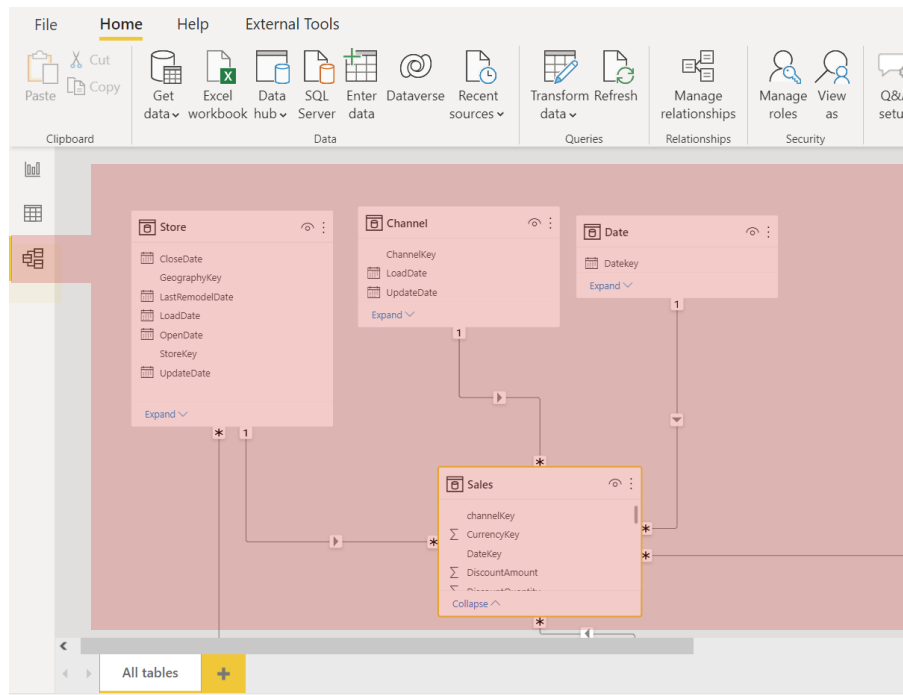
Our Method: Flow of Report Development





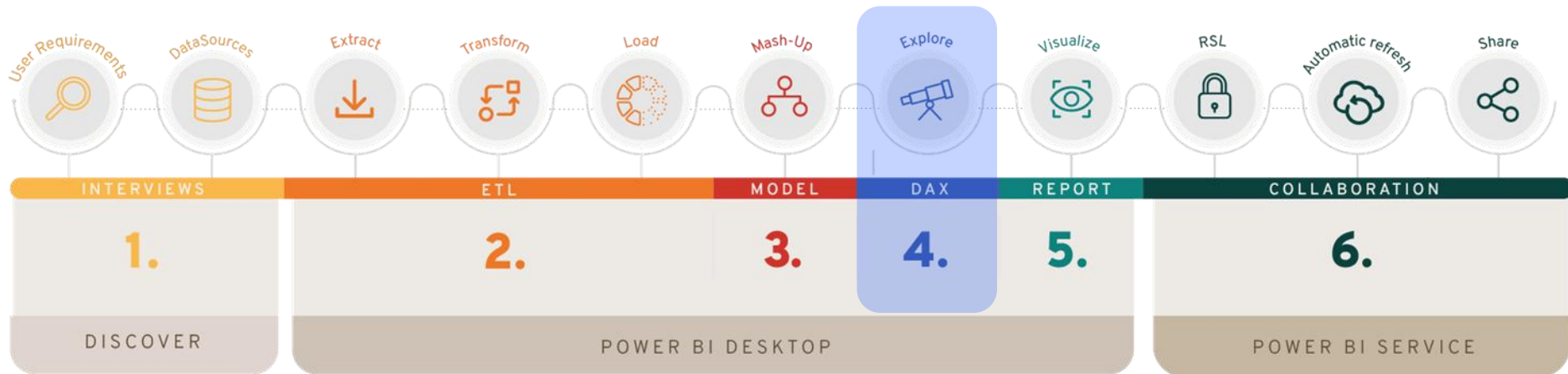
Power BI Desktop: Model

Mash-Up tables to create a model that allows different analysis





Our Method: Flow of Report Development





Power BI Desktop: DAX

KPIs to answer business questions

Explore



Structure

Formatting

Properties

Sort

Groups

Relationships

Calculations

1 Kind of purchase =

2 SWITCH(TRUE(),

3 Sales[SalesQuantity] < 20, "Retail",

4 "WholeSale")

Quantity

ReturnAmount

DiscountQuantity

DiscountAmount

TotalCost

SalesAmount

ETLLoadID

LoadDate

UpdateDate

Year

Kind of purchase

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2007

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2009

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2009

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2008

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2009

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2008

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

01/01/2010 0:00:00

2008

Retail

0

S/0

0

S/0

S/.3.214,4

6.990,00 €

1

01/01/2010 0:00:00

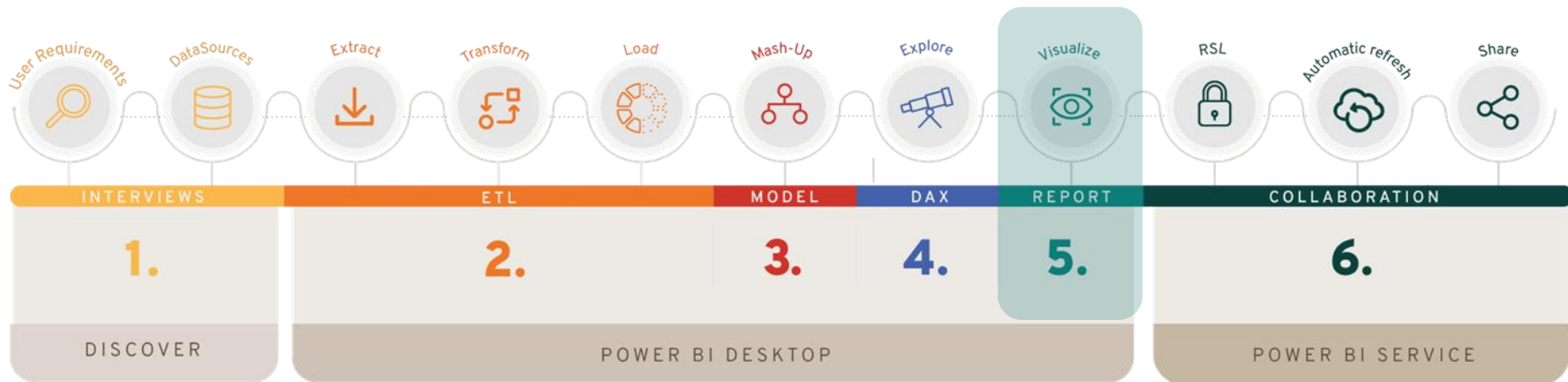
01/01/2010 0:00:00

2009

Retail



Our Method: Flow of Report Development

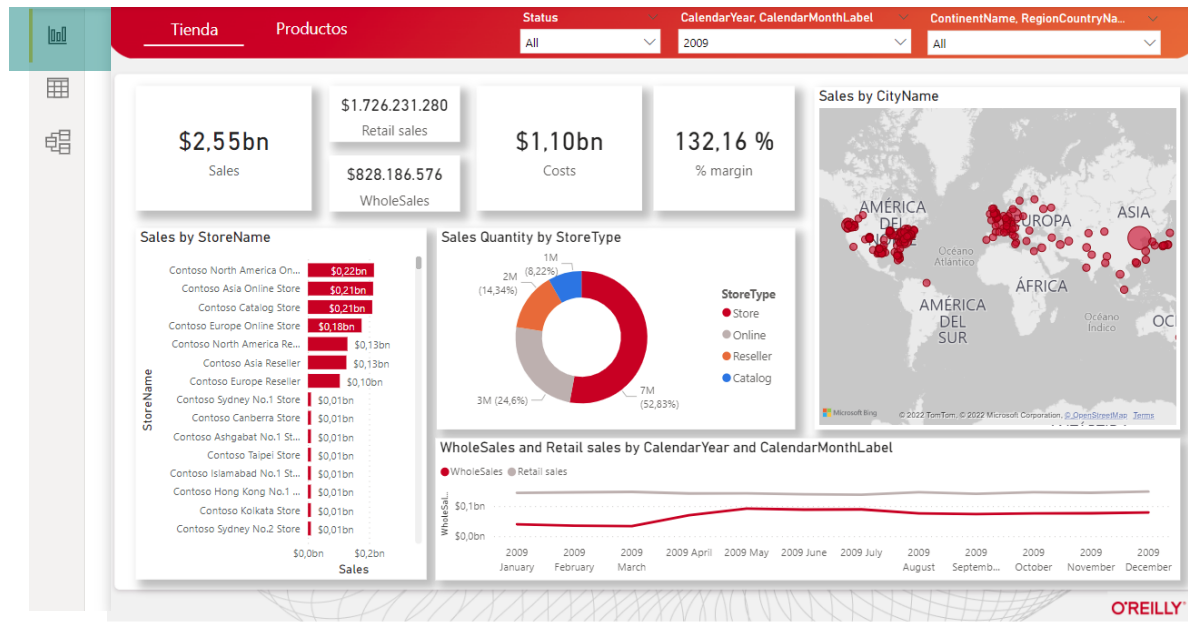




Power BI Desktop: Report

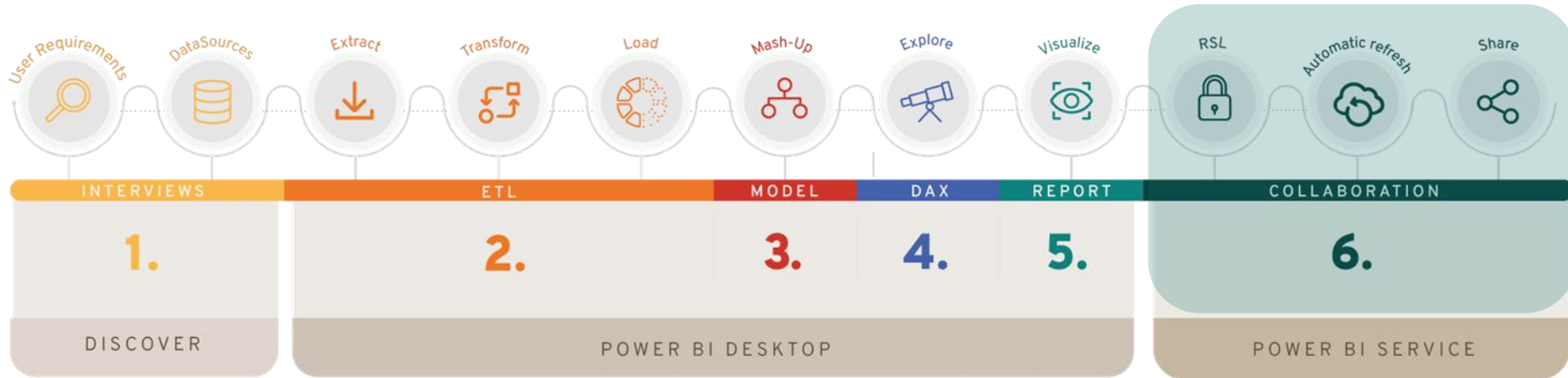
Create visuals for business users to understand their business

Visualize





Our Method: Flow of Report Development





Power BI Service

Share reports with colleagues

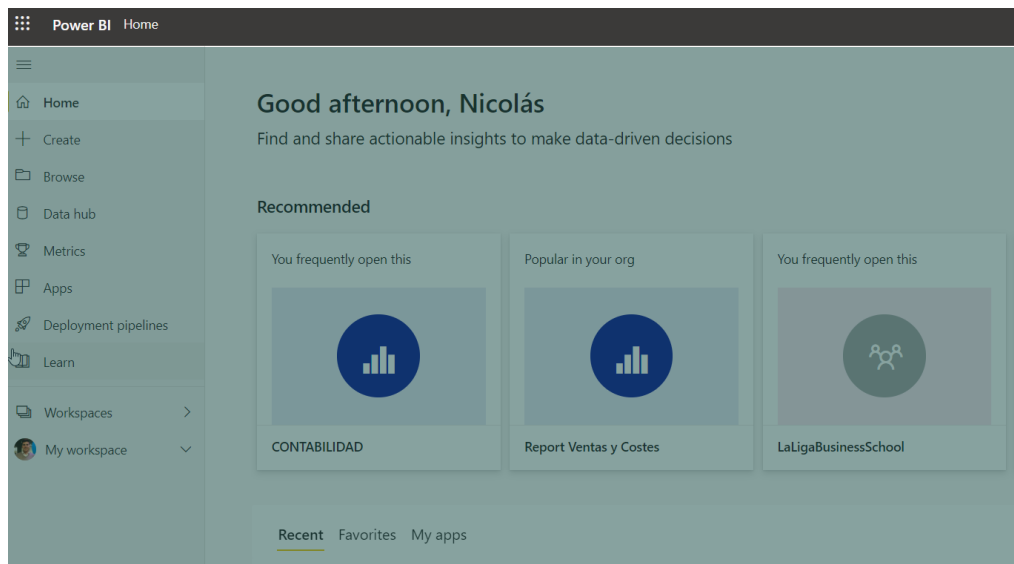
RSL



Automatic refresh



Share





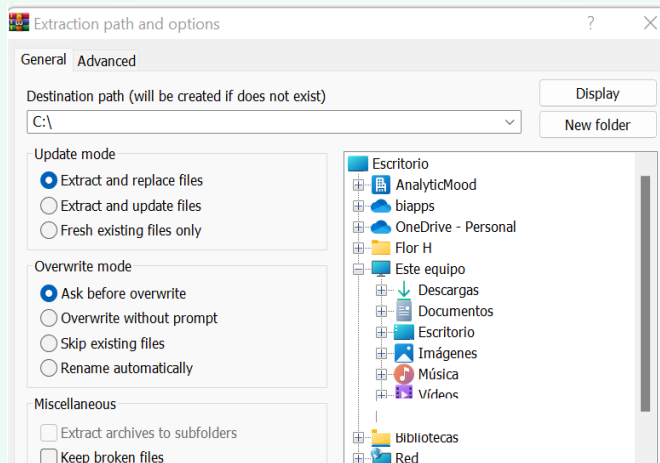
Exercise 0.0



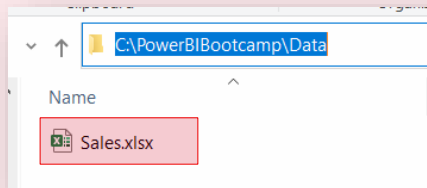
Exercise 0.0 – Initial set up

1 First you must **download** the shared .ZIP and extract it to the Local **C:** path.

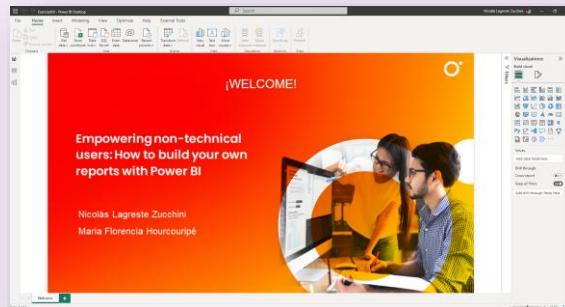
- **Option 01 - AnalyticMood Web**
- **Option 02 - SharePoint**



2 Make sure the path to the **data sources (Sales.xlsx file)** is as follows: **C:\PowerBIBootcamp\Data**



3 Lets test Power BI Desktop by opening **Exercise0.0** that is located in **C:\PowerBIBootcamp\Week01\Exercises\Exercise0.0.pbix**



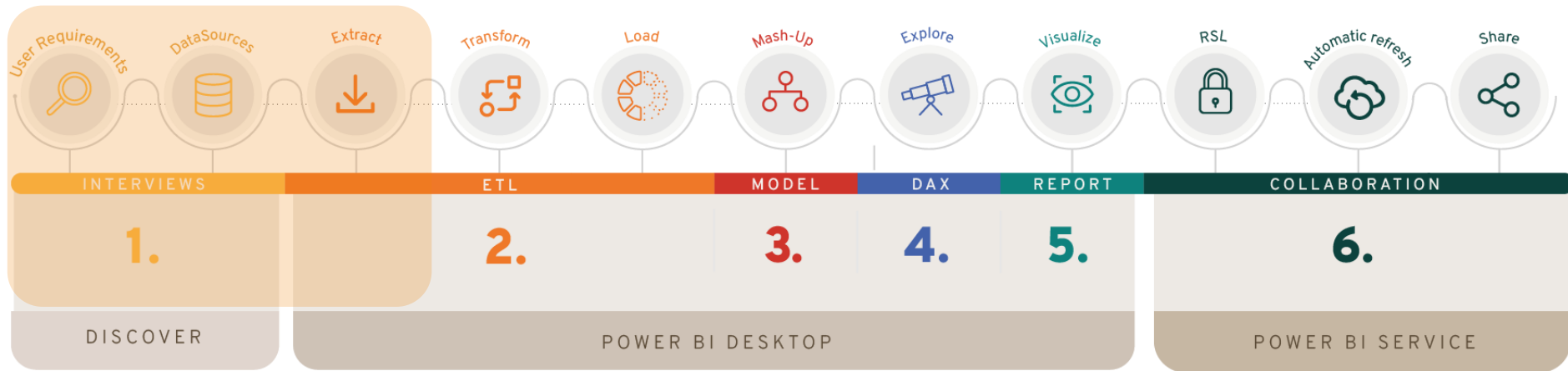


Basic Transformation in Power Query

- Demo 1.1: Connect to 3 Excel Sheets and do basic transformation in Power Query (delete columns, filter rows, change names, add calculated columns, change data types).
- Load transform data to Power BI.
- Exercise 1.1: Basic Transformation in Power Query.
- Q&A



Our Method: Flow of Report Development





Demo 1.0





Interviews

Understand processes, needs and data sources



You are not the user

- Who is the audience?
- What do they need?

How do you know your audience?

- Observing
- Listening
- Interviewing
- Understand the business.
- What are our user's goals?
- What is the objective of this dashboard?

Try to understand what they need, not what they want.



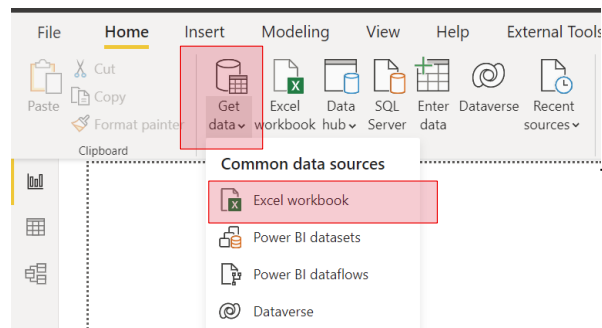
Interviews

Understand processes, needs and data sources

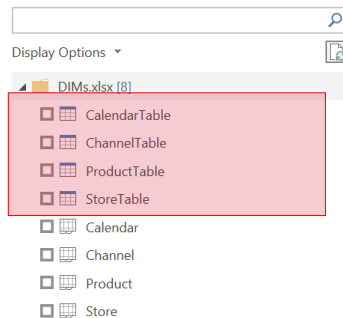


- Excel Workbook
- Text/CSV
- XML
- JSON
- Folder
- PDF
- Parquet
- SharePoint folder
- SQL Server database
- Access database
- SQL Server Analysis Services database
- Oracle database
- IBM Db2 database
- IBM Informix database (Beta)
- IBM Netezza
- MySQL database

Power BI Desktop: Power Query: Extract



Navigator



Product

Load Transform Data Cancel



Exercise 1.0



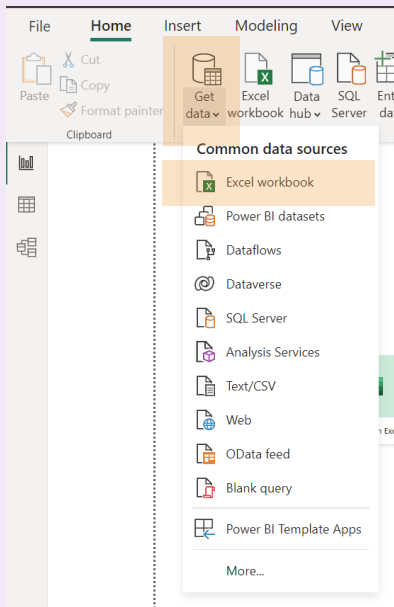
Exercise 1.0.

Goal: Become familiar with the different data sources.

In order to do it, open a new **Power BI Desktop** and connect it to the following data sources. Just select *transform* option before *loading* them.

1 Source: **Excel**

File: **Sales.xlsx** (Location: "C:\PowerBIBootcamp\Data\Sales.xlsx")



2 Tables:

- a **Sales**
- b **Customer**
- c **Date**
- d **Product**

A screenshot of the Power BI Desktop 'Navigator' window. The 'Sales' table is selected and highlighted in orange. The table preview shows columns for Invoice, OrderLineNumber, Quantity, Unit Price, Date, and IDProduct. The 'Load' button is highlighted in orange.

Invoice	OrderLineNumber	Quantity	Unit Price	Date	IDProduct
10452	12	2	70	03/01/2020	X1
10452	4	1	70	03/01/2020	X1
10453	18	2	70	03/01/2020	X1
10454	7	2	70	03/01/2020	X1
10934	18	2	49	03/01/2020	X10
10935	11	1	49	03/01/2020	X10
10535	1	1	82	03/01/2020	X2
11004	4	2	82	03/01/2020	X2
11140	5	1	82	03/01/2020	X2
10536	17	2	77	03/01/2020	X3
11005	15	1	77	03/01/2020	X3
10580	13	1	65	03/01/2020	X4
10582	24	2	65	03/01/2020	X4
11006	6	1	65	03/01/2020	X4
10630	10	1	58	03/01/2020	X5
10631	2	1	58	03/01/2020	X5
10741	3	3	29	03/01/2020	X7
10794	9	1	29	03/01/2020	X7
10403	9	1	70	04/01/2020	X1
10402	1	3	70	04/01/2020	X1
10899	4	1	49	04/01/2020	X10
10900	7	3	49	04/01/2020	X10

*Note: these data are different from those of the demo



Demo 1.1





Presentation:

Parts of Power query (report, data, relations)

Transform columns

Add new column to table

Queries

Data

Steps to transform data

	SalesKey	DateKey	channelKey	StoreKey	ProductKey
1	3398163	04/07/2019	1	247	201
2	3395082	04/10/2019	1	52	565
3	3392414	15/05/2019	1	40	397
4	3388423	27/06/2019	1	67	391
5	3383821	20/10/2019	1	70	369
6	3382789				403
7	3378463				345
8	3371111				345
9	3369889	29/04/2019	1	167	201
10	3365947	25/05/2019	1	48	403
11	3353916	29/04/2019	1	194	635
12	3349671	30/06/2019	1	8	391
13	3346418	02/05/2019	1	102	397
14	3329410	29/10/2019	1	146	397
15	3327925	04/06/2019	1	93	613



Use first Row as Headers

Archivo Home Transform Add Column View Tools Help

Close & Apply New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Properties Advanced Editor Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Any Use First Row as Headers Replace Values

Queries [10]

- Transform File from Facts [2]
- Other Queries [6]
 - Channel
 - Calendar
 - Product
 - Sales
 - Store
 - Measure

= Source{[Item="Product",Kind="Sheet"]}[Data]

	Column1	Column2	Column3	Column4
1	ProductKey	ProductLabel	ProductName	ProductDescription
2	873		Mouse E50 Grey	Advanced 2.4 GHz
3	874		Book Optical Mouse X205 Black	Wireless notebook
4	875		Book Optical Mouse X205 White	Wireless notebook
5	880	0308138	Contoso Optical Wheel OEM PS/2 Mouse E60 Black	PS/2 mouse, 6 feet
6	884	0308142	Contoso Bluetooth Notebook Mouse X305 White	Transceiver-free
7	886	0308144	Contoso Bluetooth Notebook Mouse X305 Grey	Transceiver-free
8	889	0308147	Contoso Bluetooth Notebook Mouse E70 Silver	Transceiver-free
9	891	0308149	SV Rechargeable Bluetooth Notebook Mouse E80 Silver	33 ft range, rechargeable
10	893	0308151	SV Rechargeable Bluetooth Notebook Mouse E80 White	33 ft range, rechargeable

If column's names appear in the first row, you should use this transformation

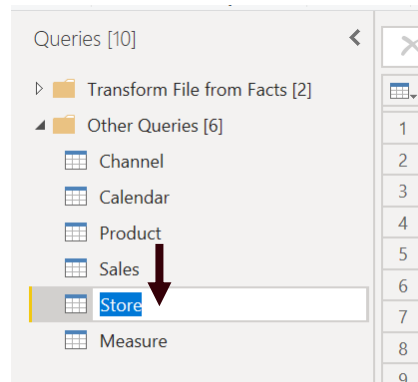


Change names

fx = Table.SelectRows("#Changed Type", each ([StoreKey] <> null))

		ContinentName	CityName	StateProvinceName	RegionCountryName
1	17/06/2009	North America	Renton	Washington	United States
2	16/06/2009	North America	Albany	New York	United States
3	17/06/2009	North America			United States
4	17/06/2009	North America			United States
5	18/06/2009	North America			United States
6	16/06/2009	North America			United States
7	17/06/2009	North America	Greeley	Colorado	United States
8	16/06/2009	North America	Greeley	Colorado	United States
9	18/06/2009	North America	Appleton	Wisconsin	United States
10	17/06/2009	North America	Lafayette	Colorado	United States
11	18/06/2009	North America	Arlington	Texas	United States

Doble click in the column name if you want to change the name.





INTERVIEWS



Filter Rows

If you filter one value in one specific column, that full row will be deleted from the query.

The screenshot shows the Power BI Desktop interface. The ribbon includes tabs for Archivo, Home, Transform, Add Column, View, Tools, and Help. The Transform tab is active, showing options like Close & Apply, New Source, Recent Sources, Enter Data, Data source settings, Manage Parameters, Refresh Preview, Advanced Editor, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Sort, Split Column, Group By, Data Type, Use First Row as Headers, and Replace Values. The Queries list on the left shows 'Transform File from Facts [2]' and 'Other Queries'. The main area displays a table with columns: StoreKey, GeographyKey, StoreManager, StoreType, and StoreName. The StoreKey column is filtered, showing a dropdown menu with options: (Select All), (null), 1, 2, 3, 4, 5, 6, and 7. The table data is as follows:

StoreKey	GeographyKey	StoreManager	StoreType	StoreName
1	null	null	null	null
2	null	null	null	null
3	null	null	null	null
4	null	null	null	null
5	null	null	null	null
6	null	null	null	null
7	null	null	null	null

Note: this does not affect the data source



Split Column

You can separate columns delimited by comma or other separator using this option.

The screenshot shows the 'Transform' ribbon in Power Query. The 'Split Column' button is highlighted with a red box. A red arrow points from the text box above to this button. The 'Split Column' dropdown menu is open, showing options: 'By Delimiter', 'By Number of Characters', 'By Positions', 'By Lowercase to Uppercase', 'By Uppercase to Lowercase', 'By Digit to Non-Digit', and 'By Non-Digit to Digit'. The 'By Delimiter' option is selected and highlighted with a red box. Below the menu, a table of data is visible with columns 'IdProduct' and 'Category'.

	IdProduct	Category
1	X1	
2	X2	
3	X4	
4	X9	
5	X10	
6	X11	
7	X13	
8	X12	
9	X7	
10	X3	
11	X8	
12	X5	
13	X6	

Split Column by Delimiter

Specify the delimiter used to split the text column.

Select or enter delimiter

--Custom--

,

Split at

☐ Left-most delimiter

☐ Right-most delimiter

☒ Each occurrence of the delimiter

Advanced options

Quote Character

"

☐ Split using special characters

Insert special character

OK

Cancel



Remove Other Columns

The screenshot shows the Power BI Desktop interface. The 'Remove Columns' dropdown menu is open, and the 'Remove Other Columns' option is highlighted with a red box. A red arrow points from a text box below to this option. A tooltip is visible over the option, stating: 'Remove all columns from this table, except the currently selected ones.'

	Invoice	Quantity	Unit Price	Amount	Date	Product
1	10451	1	70	70	03/01/2020	X1
2	10452	1	70	70	03/01/2020	X1
3	10453	2	70	140	03/01/2020	X1
4	10454	2	70	140	03/01/2020	X1
5	10934	2	49	98	03/01/2020	X10
6	10935	1	49	49	03/01/2020	X10
7	10535	1	82	82	03/01/2020	X2

It is a good practice to remove all unnecessary columns.

This option leaves only the necessary columns of the model.



Extract

Return the text that occurs before a delimiter.

ABC 123	Date	ABC 123	Year
1	01.01.2020-		
2	02.01.2020-		
3	03.01.2020-	2020	1 Jan
4	04.01.2020-	2020	1 Jan
5	05.01.2020-	2020	1 Jan

Characters can be extracted from the different values in order to clean the data.

Return a specified number of characters from the start of each value in this column.

ABC 123	Date	ABC 123	Year
1	01.01.2020		
2	02.01.2020		
3	03.01.2020	2020	1 Jan
4	04.01.2020	2020	1 Jan

Extract First Characters

Enter how many starting characters to keep.

Count

OK Cancel

It is also possible to extract the first characters only.



Change Data Types

ABC 123	Customer	ABC 123	City	ABC 123
1.2	Decimal Number		ouse	Frar
\$	Fixed decimal number		h Sydney	Aus
1 ² / ₃	Whole Number		es	Frar
%	Percentage		Waverly	Aus
📅	Date/Time		ourne	Aus
📅	Date		h Brisbane	Aus
🕒	Time			Frar
🌐	Date/Time/Timezone		haven	USA
🕒	Duration		chest	UK
ABC	Text		ern	Nor
✓	True/False		kfurt	Ger
☑	Binary		dale	USA
	Using Locale...		rid	Spai
			ouwer	Can

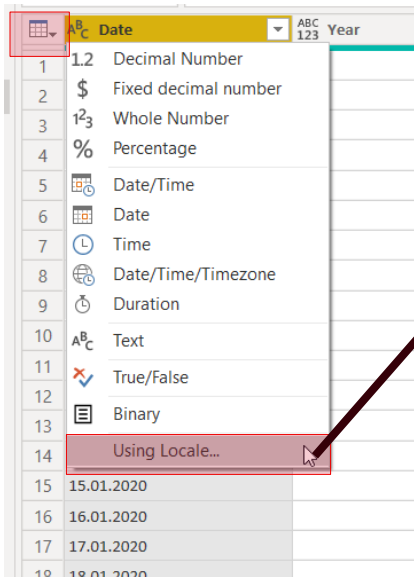
It is important that each column has the correct data type for better compression.

1 ² / ₃	Total Sales	1 ² / ₃	Total Cost
1.2	Decimal Number		63
\$	Fixed decimal number		63
1 ² / ₃	Whole Number		126
%	Percentage		126
📅	Date/Time		70
📅	Date		35
🕒	Time		
🌐	Date/Time/Timezone		
🕒	Duration		
ABC	Text		130
✓	True/False		65
☑	Binary		52
	Using Locale...		104
			52
			56

It is also important for correct calculations that the numerical columns are well categorized.



Change Data Types (cont.)



Sometimes it is necessary to change using the locale of the source file.

Change Type with Locale

Change the data type and select the locale of origin.

Data Type

Date

Locale

Spanish (Spain, International Sort)

Sample input values:

29/03/2016

martes, 29 de marzo de 2016

29 de marzo

marzo de 2016

You must select the data type and its locale

OK

Cancel



Detect Data Type

Home Transform Add Column View Tools Help

Transpose Reverse Rows First Row leaders Count Rows

Data Type: Any

Detect Data Type

Replace Values Fill Pivot Column Rename Move Convert to List

Unpivot Columns Split Column Format Merge Columns Extract Parse

Statistics Standard Scientific

Table

Any Column

Text Column

Number Column

4]

mer

ct

1 01/01/2020 2020 1 Jan

2 02/01/2020 2020 1 Jan

3 03/01/2020 2020 1 Jan

4 04/01/2020 2020 1 Jan

Tip: Ctrl + A to select all columns at the same time

To detect all types of data automatically it is very useful to use this functionality.

Select the required columns and click Detect Data Type in the Transform tab.



Detect Data Type

Home Transform Add Column View Tools Help

Transpose Reverse Rows First Row leaders Count Rows

Data Type: Any

Detect Data Type

Replace Values Fill Pivot Column Rename Move Convert to List

Unpivot Columns Split Column Format Merge Columns Extract Parse

Statistics Standard Scientific

Table

Any Column

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4]

mer

ct

1 01/01/2020 2020 1 Jan

2 02/01/2020 2020 1 Jan

3 03/01/2020 2020 1 Jan

4 04/01/2020 2020 1 Jan

Tip: Ctrl + A to select all columns at the same time

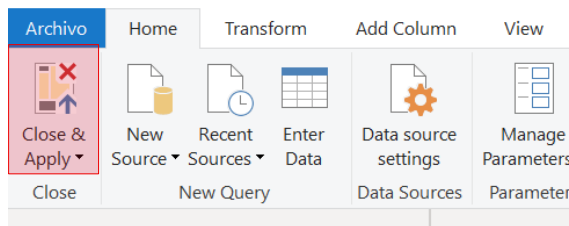
To detect all types of data automatically it is very useful to use this functionality.

Select the required columns and click Detect Data Type in the Transform tab.



Load data to model

- Once all changes have been made, close and apply the changes to view them and generate a data model.



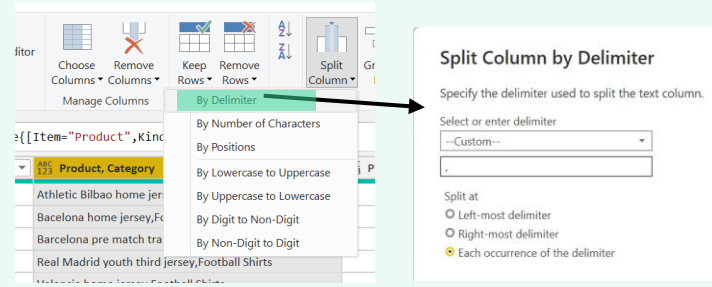


Exercise 1.1



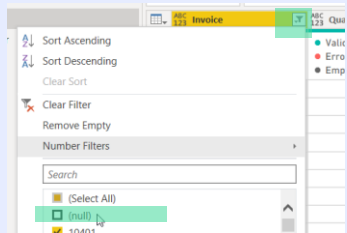
Exercise 1.1. Open the file **Exercise1.1.pbix** (Location: C:\PowerBIBootcamp\Week01\Exercises\Exercise1.1.pbix) and then open **Power Query**

1 In **Product table** separate the product from the category. Rename columns.



2 In **Sales table:**

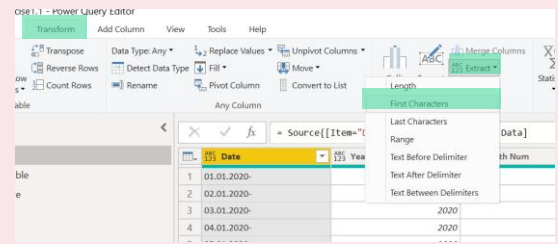
a Filter out null records.



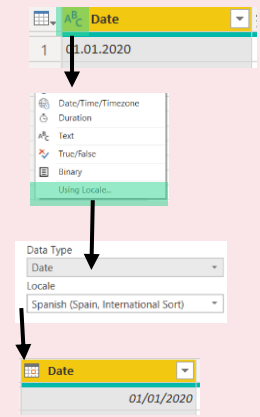
b Remove the OrderLineNumber column.

3 In **Date table:**

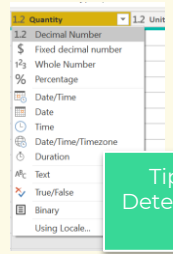
a Extract first 10 characters from date column.



b Change Type with Date Locale.

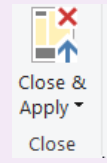


4 Check the data types for each column.



Tip: Press Ctrl + A and use Detect Data Type in Transform tab.

5 Load the tables into the data model.



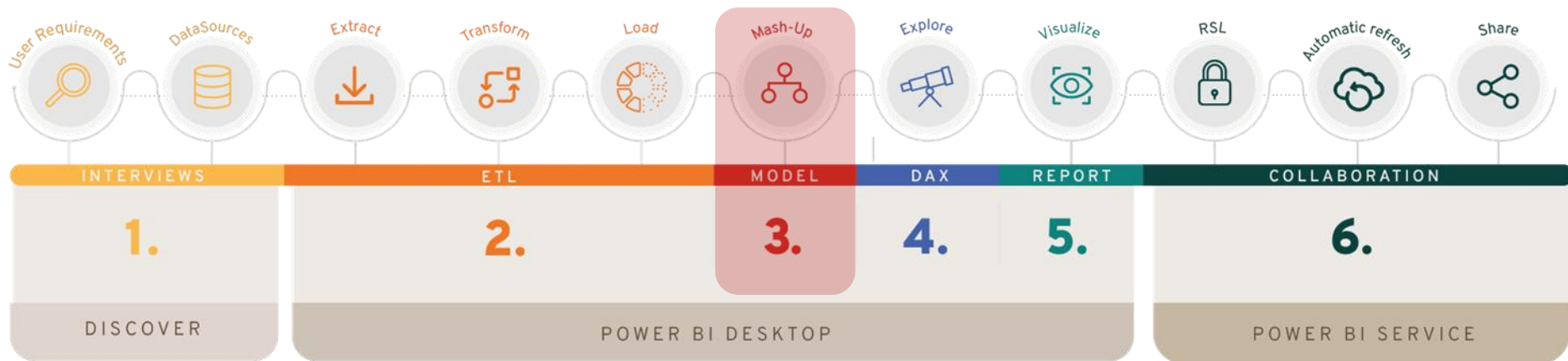


Why build star schema models in Power BI

- What is a Star Schema Model?
- Facts and dimensions of star schema models.
- What do we mean with relationships between tables.



Our Method: Flow of Report Development



What type of models are better suited for data analysis?

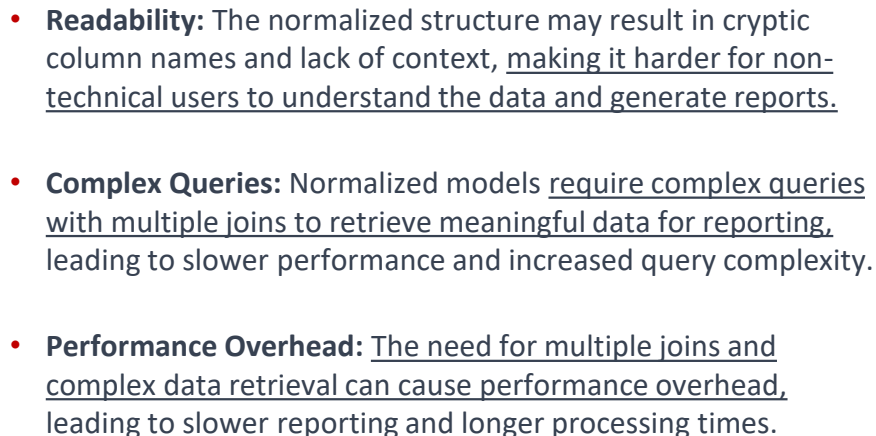




Denormalized models in Excel

ID	ProductID	Product	Date	CustomerID	Email	Last Name	First Name	Full Name	CampaignID	Units	CostID
1	574	Maximus UC-50	5/25/2011	70282	Farrah.Rent@kya.com	Rent	Farrah	Farrah Rent	22	1	10
2	585	Maximus UC-50	5/24/2014	70282	Farrah.Rent@kya.com	Rent	Farrah	Farrah Rent	18	1	10
3	585	Maximus UC-50	11/30/2014	138314	Martha.McIntosh@kya...	McIntosh	Martha	Martha McIntosh	8	1	10
4	585	Maximus UC-50	6/21/2015	27193	Wendy.McIntosh@kya...	McIntosh	Wendy	Wendy McIntosh	22	1	10
5	585	Maximus UC-50	1/6/2013	238970	Lunea.Walker@kya.com	Walker	Lunea	Lunea Walker	21	1	10
6	585	Maximus UC-50	3/22/2013	182241	Opton.Page@kya.com	Page	Opton	Opton Page	17	1	10
7	449	Maximus UM-54	8/25/2011	195385	Crake.Wallis@kya.com	Wallis	Crake	Crake Wallis	20	1	4
8	449	Maximus UM-54	8/30/2014	168039	Wallace.Bender@kya...	Bender	Wallace	Wallace Bender	17	1	4
9	449	Maximus UM-54	6/12/2014	110391	Attra.Erickson@kya...	Erickson	Attra	Attra Erickson	20	1	4
10	449	Maximus UM-54	6/16/2014	68327	Echo.Bradley@kya.com	Bradley	Echo	Echo Bradley	7	1	4
11	449	Maximus UM-54	2/28/2013	65982	Yoko.Gross@kya.com	Gross	Yoko	Yoko Gross	17	1	4
12	449	Maximus UM-54	6/6/2013	87	Toshi.Gross@kya.com	Gross	Toshi	Toshi Gross	10	1	4
13	449	Maximus UM-54	5/14/2013	56787	Brian.Carrillo@kya...	Carrillo	Brian	Brian Carrillo	10	1	4
14	449	Maximus UM-54	4/8/2015	248715	Mark.Hewitt@kya.com	Hewitt	Mark	Mark Hewitt	19	1	4
15	449	Maximus UM-54	4/28/2013	248715	Mark.Hewitt@kya.com	Hewitt	Mark	Mark Hewitt	8	1	4
16	449	Maximus UM-54	3/28/2014	248821	Oscar.Avila@kya.com	Avila	Oscar	Oscar Avila	18	1	4
17	449	Maximus UM-54	2/16/2014	21004	Duncan.McIntosh@kya...	McIntosh	Duncan	Duncan McIntosh	19	1	4
18	615	Maximus UC-80	5/14/2012	212445	Jacob.Santiago@kya...	Santiago	Jacob	Jacob Santiago	22	1	10
19	615	Maximus UC-80	5/14/2012	70846	Wilary.Collins@kya...	Collins	Wilary	Wilary Collins	22	1	10
20	615	Maximus UC-80	5/14/2012	114489	Chester.Mitchell@kya...	Mitchell	Chester	Chester Mitche...	22	1	10
21	615	Maximus UC-80	5/14/2012	221770	Paga.Tang@kya.com	Tang	Paga	Paga Tang	22	1	10
22	615	Maximus UC-80	6/19/2012	168039	Wallace.Bender@kya...	Bender	Wallace	Wallace Bender	22	1	10
23	615	Maximus UC-80	6/19/2012	154439	Illiana.Dunlap@kya.C...	Dunlap	Illiana	Illiana Dunlap	22	1	10
24	615	Maximus UC-80	8/4/2012	181391	Joelle.Lee@kya.com	Lee	Joelle	Joelle Lee	22	1	10

- **Data Duplication:** Excel often leads to data duplication as different sheets or workbooks may contain similar data, increasing the risk of inconsistencies and errors.
- **Performance Issues:** As the data grows, Excel's performance can degrade, leading to slow calculations and analysis, especially when using complex formulas or functions.
- **Lack of Data Integrity:** Excel lacks strict data integrity controls, making it easier for users to input incorrect or inconsistent data, impacting the accuracy of analysis and reporting.

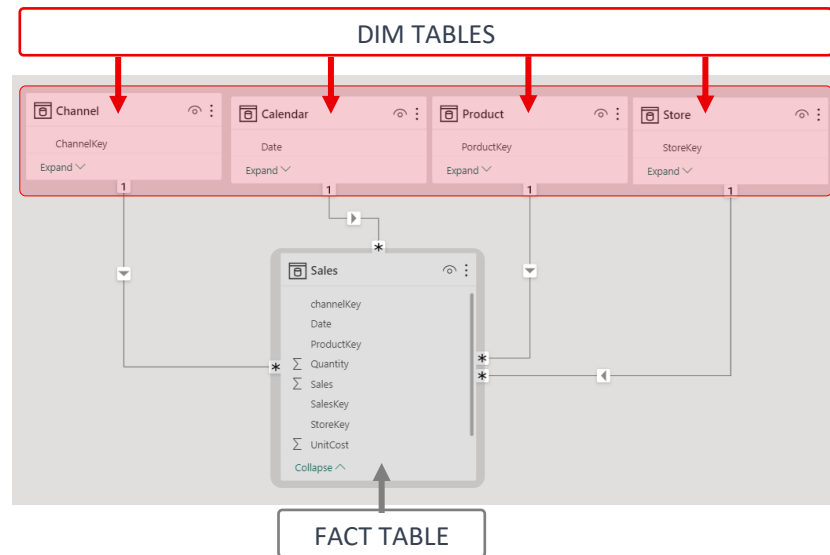




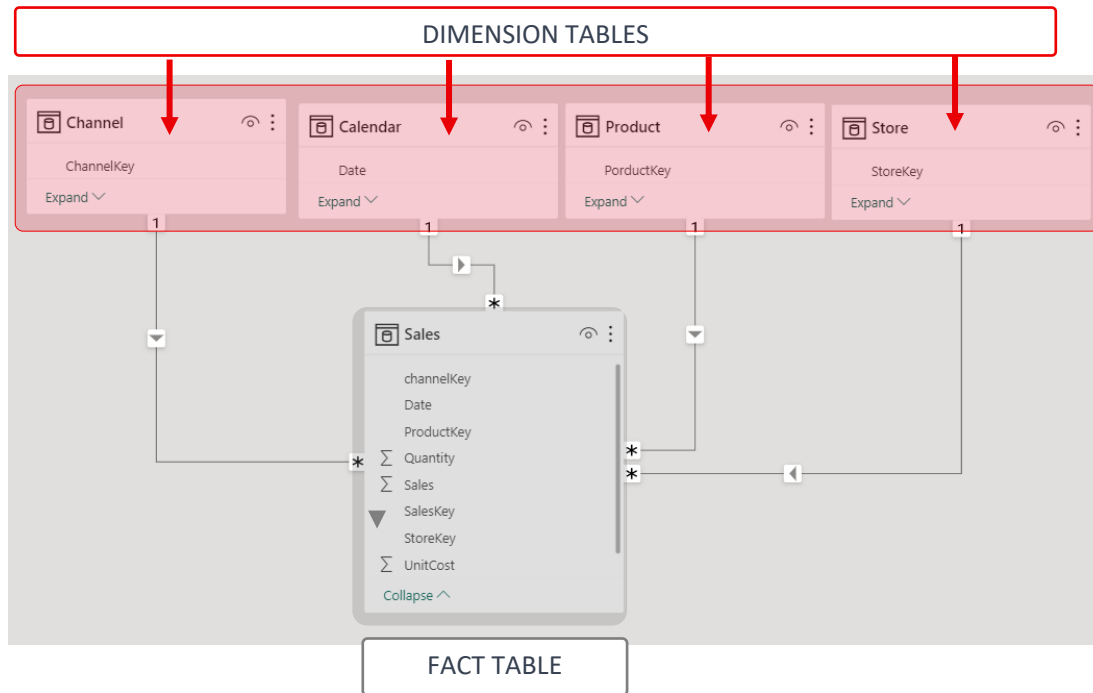
Star Schema Overview

A star schema is a type of data modeling approach used in data warehouses and business intelligence systems.

It is designed for efficient data analysis and reporting.



Dim & Facts



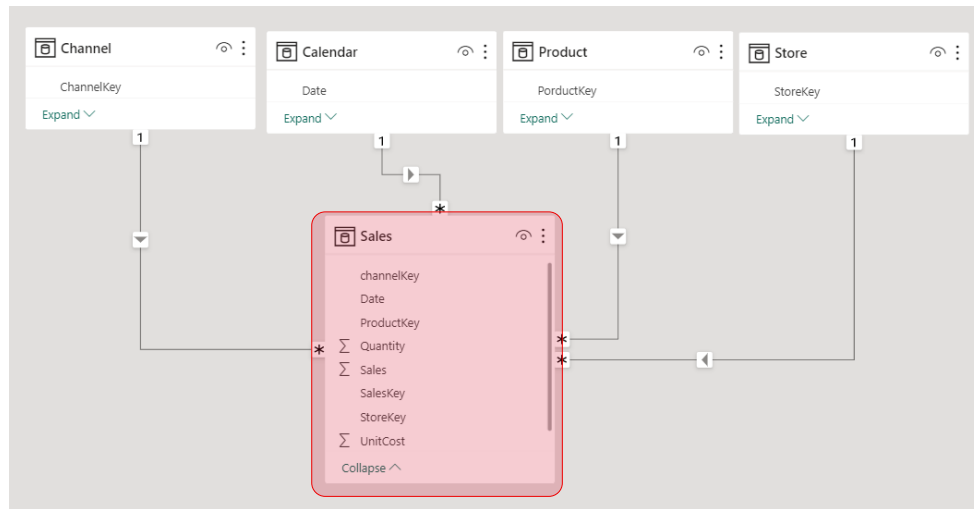


Facts

A **fact table** represents individual transactions or events.

Each row contains numerical data to be aggregated.

Examples include sales, units sold, and costs.

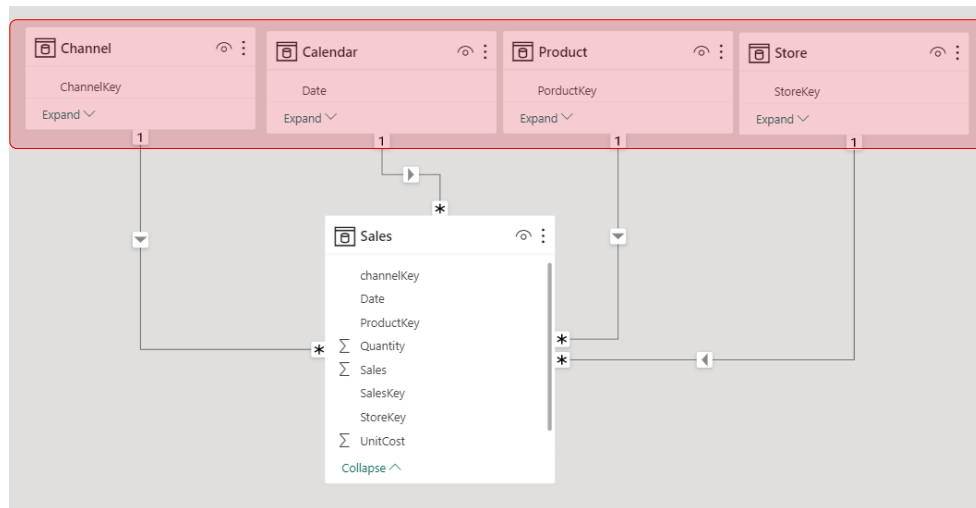




Dimensions

A **Dim** (or Dimension) table contains descriptive attributes that define how a fact should roll up.

- Sales by customer
- Quantity by Product



Facts & Dim



The **fact table** stores two types of information:

- Numeric values
- Dimensions ID

VALUE DATA

ORDER ID	SALES AMOUNT	QUANTITY
101	150	2
102	210	3
103	250	1
104	350	5
105	70	1

DIMENSION ID

PRODUCT_ID	EMPLOYEE_ID	DATE_ID
22	12225	20230501
17	12588	20230505
12	14558	20230509
16	13225	20230512
16	16442	20230515

The **dim table** stores two types of information:

- Dimensions ID
- Descriptive columns

DIMENSION ID

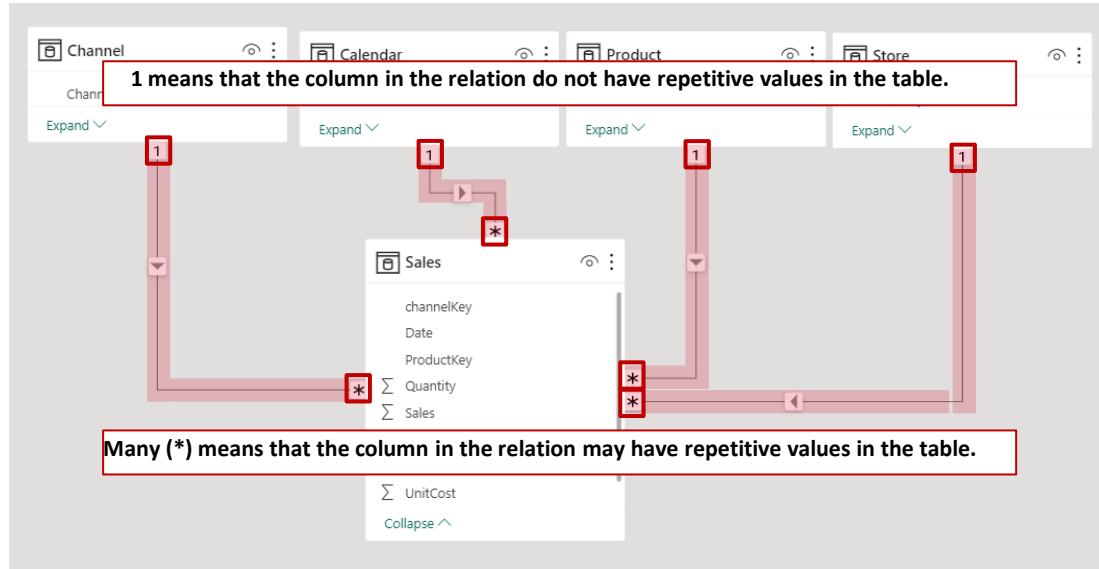
DESCRIPTIVE COLUMNS

PRODUCT_ID	PRODUCT NAME	MANUFACTURER	RANGE	TYPE
1	Apple Watch Series 7	Apple Inc.	Very Light	Smartwatch
2	Lenovo IdeaCentre AIO 520	Lenovo	Light	All-in-One PC
3	LG UltraGear 27GL850	LG	Very Light	Gaming Monitor
4	ASUS RT-AX82U	ASUS	Medium	Wi-Fi Router
5	Dell XPS 13	Dell	Light	Laptop
6	TP-Link Kasa Smart Plug	TP-Link	Light	Smart Plug
7	Sony PlayStation 5	Sony	Light	Gaming Console
8	Epson Perfection V600	Epson	Very Light	Flatbed Scanner
9	iPad Pro 12.9-inch	Apple Inc.	Medium	Tablet
10	Philips Hue White & Color	Signify	Light	Smart Bulb
11	Samsung Galaxy S22	Samsung	Very Light	Smartphone

Cardinality



A relationship in Power BI establishes a connection between two tables (typically a fact table and a dimension table) using a column from each table.

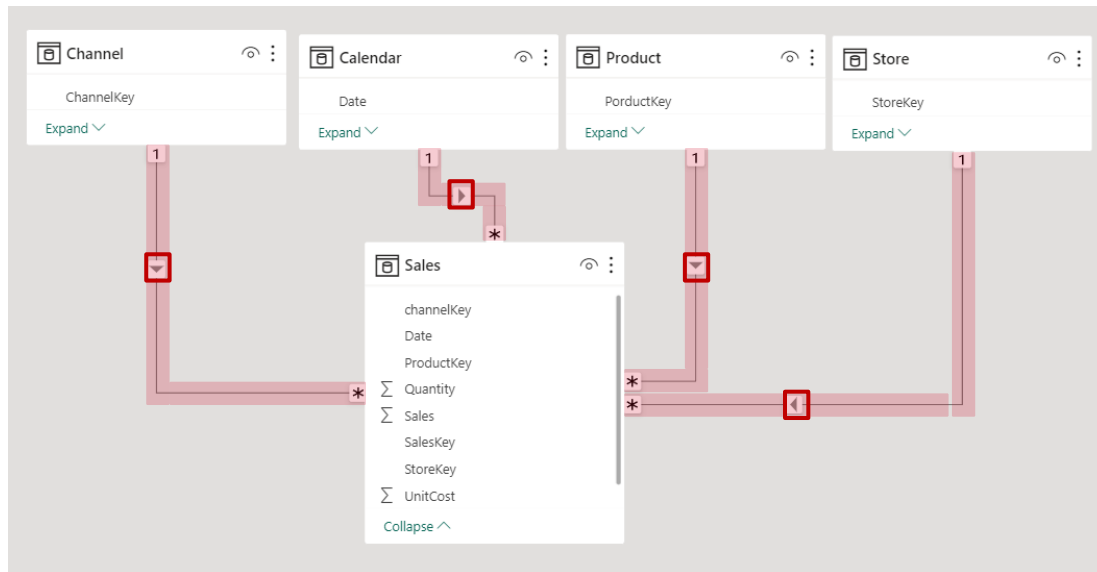


Direction



The direction in a relationship determines how data flows between tables.

In a traditional Star model (image), **dimensions filter the facts** through the field that is part of the relationship.





Building the model

- Presentation: Parts of Power BI (report, data, relations)
- Demo1.2: Create relations between 3 tables (products, sales & calendar) and draw a table in Power BI. The difference between number, text, and date columns is explained in order to validate and assign the correct data type to create the correct visualization.
- Exercise 1.2: Building a model
- Q&A



Demo 1.2





Presentation: Parts of Power BI (report, data, relations)

The image shows the Power BI desktop application interface with three main views highlighted by red boxes and arrows:

- Report View:** Indicated by an arrow from the top-left icon. A red box contains the text: "Click here to design your report".
- Data View:** Indicated by an arrow from the middle-left icon. A red box contains the text: "Click here to see data in your tables".
- Model View:** Indicated by an arrow from the bottom-left icon. A red box contains the text: "Click here to design the data model".

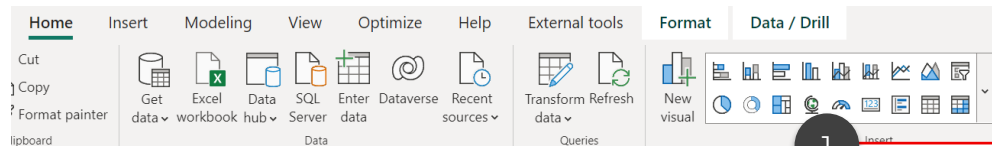
On the right side, the **Filters** and **Data** panes are visible. A red box next to the **Data** pane contains the text: "Tables and fields in your model, to use them in your report".

At the bottom, a **Build a visual** pane is shown, displaying a "Stacked column chart" and a "Select or drag data to populate this visual" dialog. A red box below this pane contains the text: "Visuals that you can use in your report".

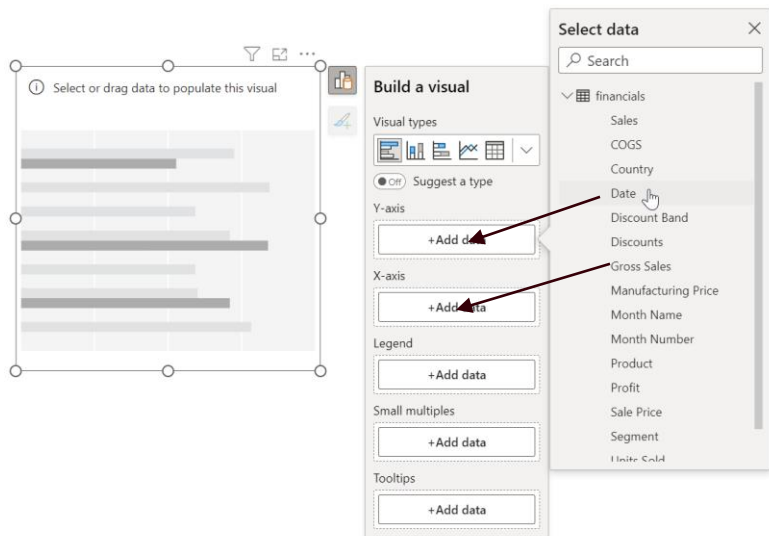
The bottom navigation bar includes the following tabs: **INTERVIEWS**, **ETL**, **MODEL**, **DAX**, **REPORT** (highlighted), and **COLLABORATION**.



Your first visual in Power BI



1
First select the visual you want to create



2
Then select the fields you want to visualize.



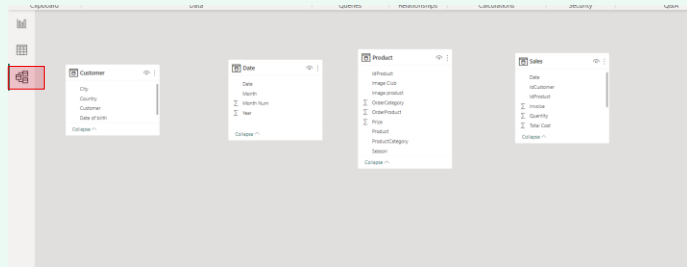
Exercise 1.2



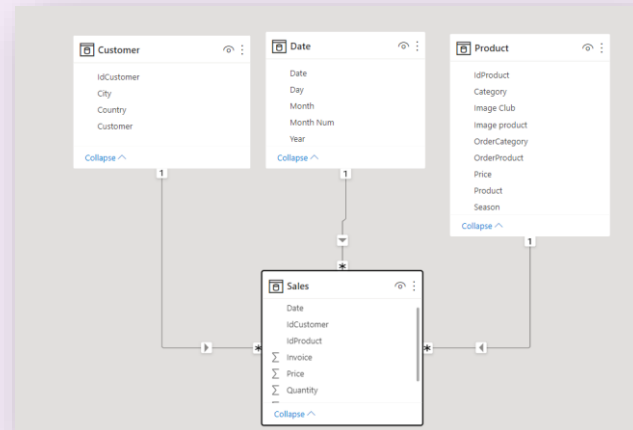
Exercise 1.2.

Open the file **Exercise1.2.pbix** (Location: C:\PowerBIBootcamp\Week01\Exercises\Exercise1.2.pbix)

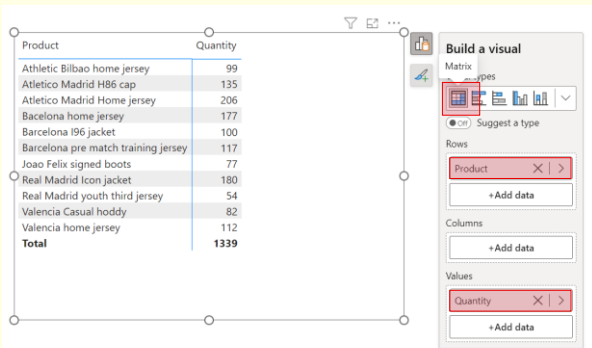
1 Check that the tables are properly loaded.



2 Create the relationships between the **Sales** table and the rest of the tables through their main keys. For the relationship with the **Date** table, create an active relationship with the column date.



3 Insert a matrix to visualize the quantity sold per product.



***HINT:** You may need to preview some of the tables to see what is in them.

Think about: What sort of data model are you creating?

Poll

What type of model is recommended to use in Power BI?

- ✓ Star schema Model
- ✓ Denormalized
- ✓ Single table repeating data
- ✓ Normalized
- ✓ None of them





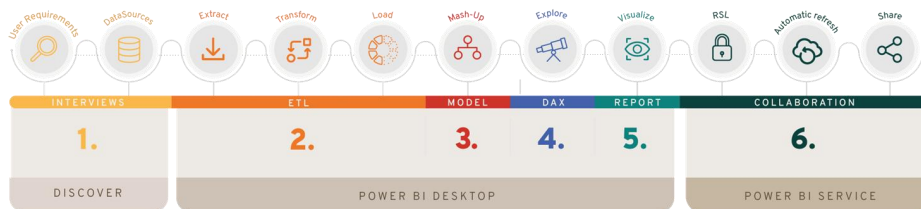
Recommendations for Next Steps

Part of the Power BI
Bootcamp Series

Advanced Learning Path:

- 1) Power BI Bootcamp: Building the Foundations for Power BI
- 2) Power Query: Data Connections and Transformations
- 3) Data Modeling for optimal structure & DAX for calculations
- 4) Visualizations for impactful reporting & Power BI Service

This Bootcamp



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Q&A



- Write your questions in the chat so that we can answer them and discuss them together.



The background is a gradient from red-orange on the left to yellow on the right. There are three large, semi-transparent circles of varying shades of orange and red. The text "O'REILLY" is centered in white, with a registered trademark symbol (®) at the end.

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