Microsoft | Power BI

Introduction 1-Day

Alpesh Tailor

Power BI
What is It?

Power BI is a unified, scalable platform for self-service and enterprise business intelligence (BI).

Connect to, **Transform**, **Model** and **Visualize** any data, and seamlessly infuse the visuals into the apps you use every day.

Power BI
Pocket History

Microsoft unveiled in 2013 **– Data Transformation**

Lacked **Data Modelling** and **Design** (so not a complete A-Z solution)

Competitors *: Tableau, Click Sense ThoughtSpot* – also lacked A-Z solution

Microsoft acquired DataZen – solving the Data Modelling and Design

Power BI Service released as a Cloud BI tool – access via the web (Share)

2019 Power BI Desktop local development tool(No Sharing)

Power BI Desktop – two components

- **Power Query** – **Data Transformation**
- **Report Builder** – **Data Modelling and Report Design**

Complete A-Z solution!

Power BI Competitors

- A-Z Solution (Transformation + Modelling + Design)
- Cost
- Familiarity
- Office 365 Family – SharePoint / Teams / PowerPoint

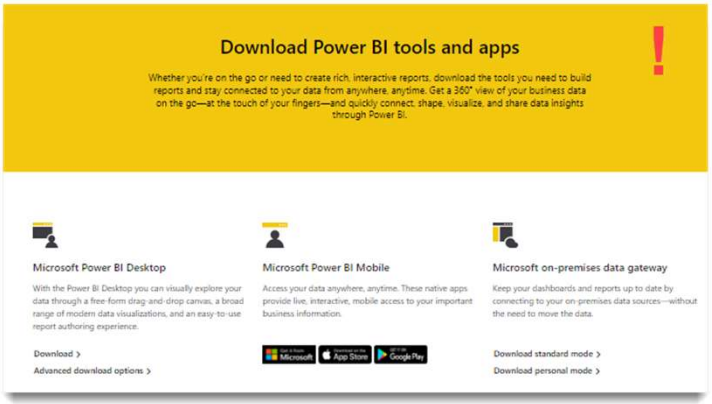
Features	Power-bi	Tableau	Qlik Sense	ThoughtSpot	Looker
Free plan	✓	✗	✗	✗	✗
Individual paid plan	£8-16u/mth	£54/u/mth	£85/u/mth	£210/u/mth	£230/u/mth
Embedded analytics	✓	✓	✓	✓	✓
AI Enabled Analytics	✓	✓	✓	✓	✗
Dynamic cross filtering	✓	✓	✓	✗	✗
Search with NLP	✓	✗	✓	✓	✗
Data Prep tools	✓	?	✓	✓	✗
Data Modelling Tools	✓	?	✓	✓	✓
Database Independent	✓	✓	✓	✓	✗
Mixed model types	✓	✗	✗	✓	✗
Third party data model access	✓	✗	✗	✗	✗
Commenting & collaboration	✓	✓	✓	✓	✗
Open-source custom visualizations	✓	✗	✓	✗	✓
Third party MS SharePoint PowerPoint Teams	✓	✗	✗	✗	✗

Power BI Desktop vs Service

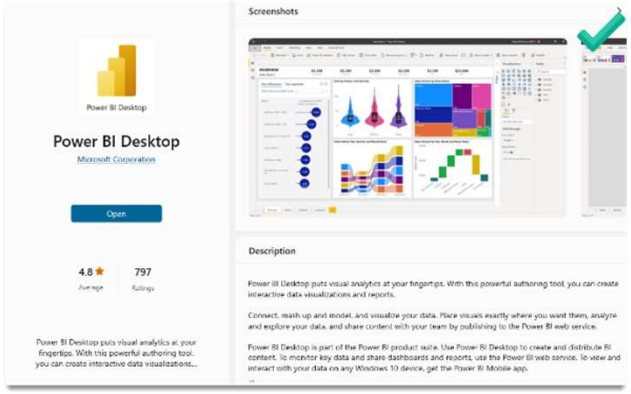
FUNCTIONALITY	POWER BI DESKTOP	POWER BI CLOUD SERVICE
DESKTOP or CLOUD	Desktop (Windows Only)	Cloud (Any Browser)
ORGANIZE DATA	Yes	Yes
DATA TRANSFORMATION	Yes	With Dataflows
COMBINE DATA	Yes	Yes
ADD OR DELETE COLUMNS	Yes	Yes
MODIFY TABLES	Yes	Yes
CREATE VISUALS	Yes	Yes
CREATE REPORTS	Yes	Yes
CREATE DASHBOARDS	No	Yes
SHARING	No	Yes

Power BI
Auto-Updates

Website

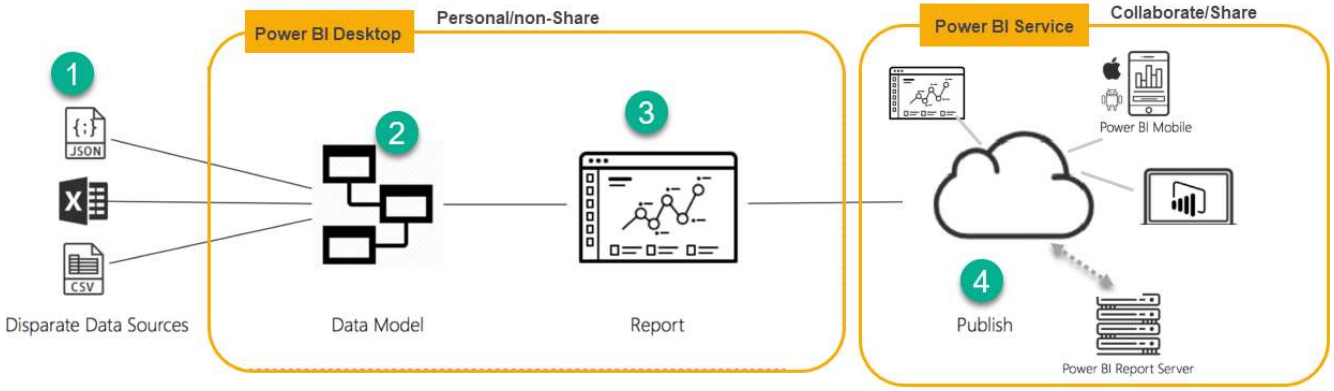


Windows App Store



Power BI Architecture & Workflow

Power BI Desktop and the **Power BI Service** work together.



Desktop
Cannot Share

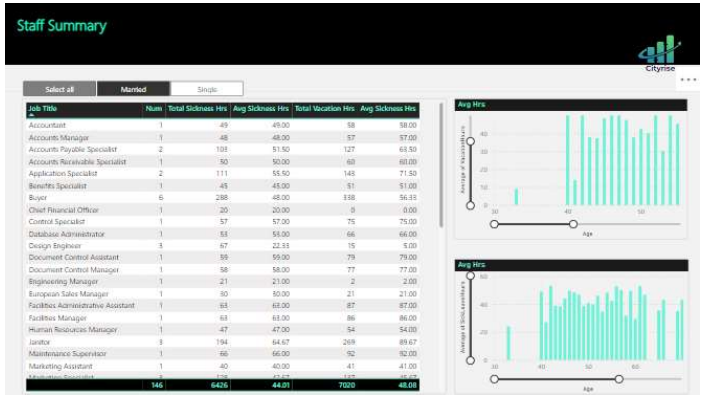
Service
Can Share

Power BI Report vs Dashboard?

Reports
Create reports in Desktop (cannot share)
Publish and amend reports in Service

Dashboards
Create Dashboards in Service

Reports
Multi Page – usually interactive



Data analysts/ Business Managers

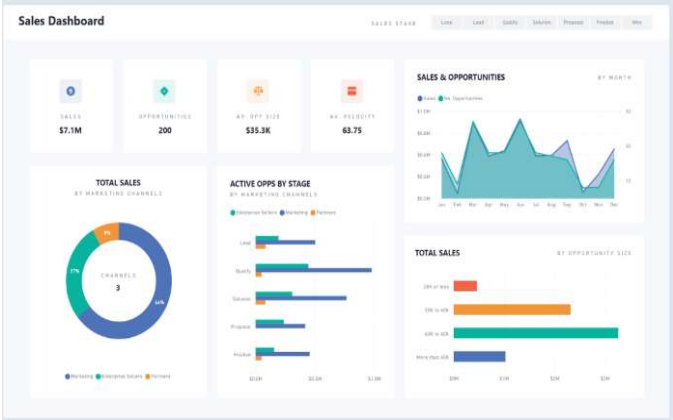
Analyse data in different ways

Can filter and slice data

Can export data

Supports data refreshing

Dashboards
Single Page with 'Tiles'



CEO/ CFO etc

High level overview

Not for filtering / slicing data

Cannot export data

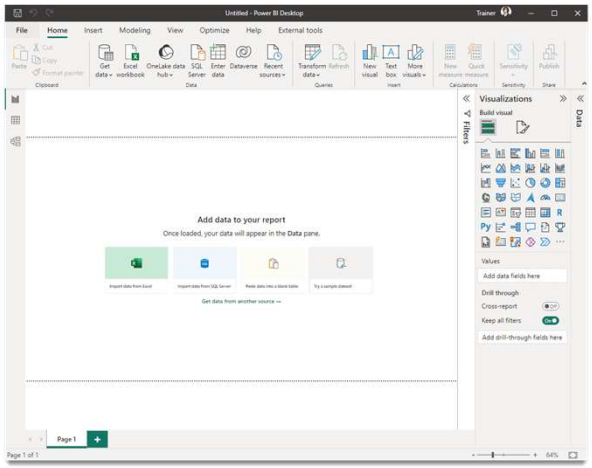
Supports data refreshing

Can support many reports

Power BI

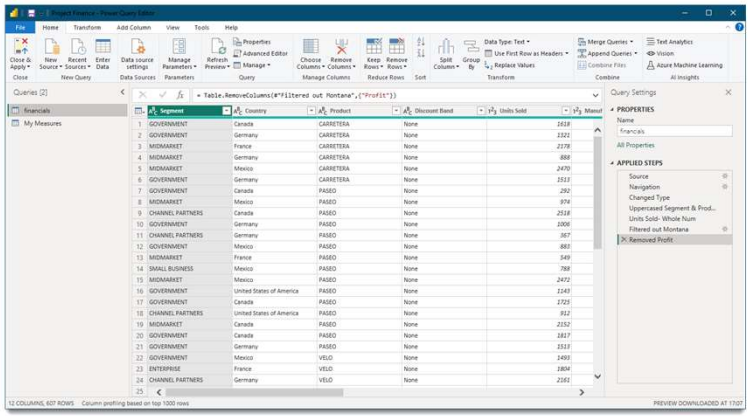
Report Builder
&
Power Query

Report Builder



Importing, managing your Data sources, **Data Modelling** and Building/**Design** your reports, with **DAX** formula language to leverage the real power of analysing your data.

Power Query Editor

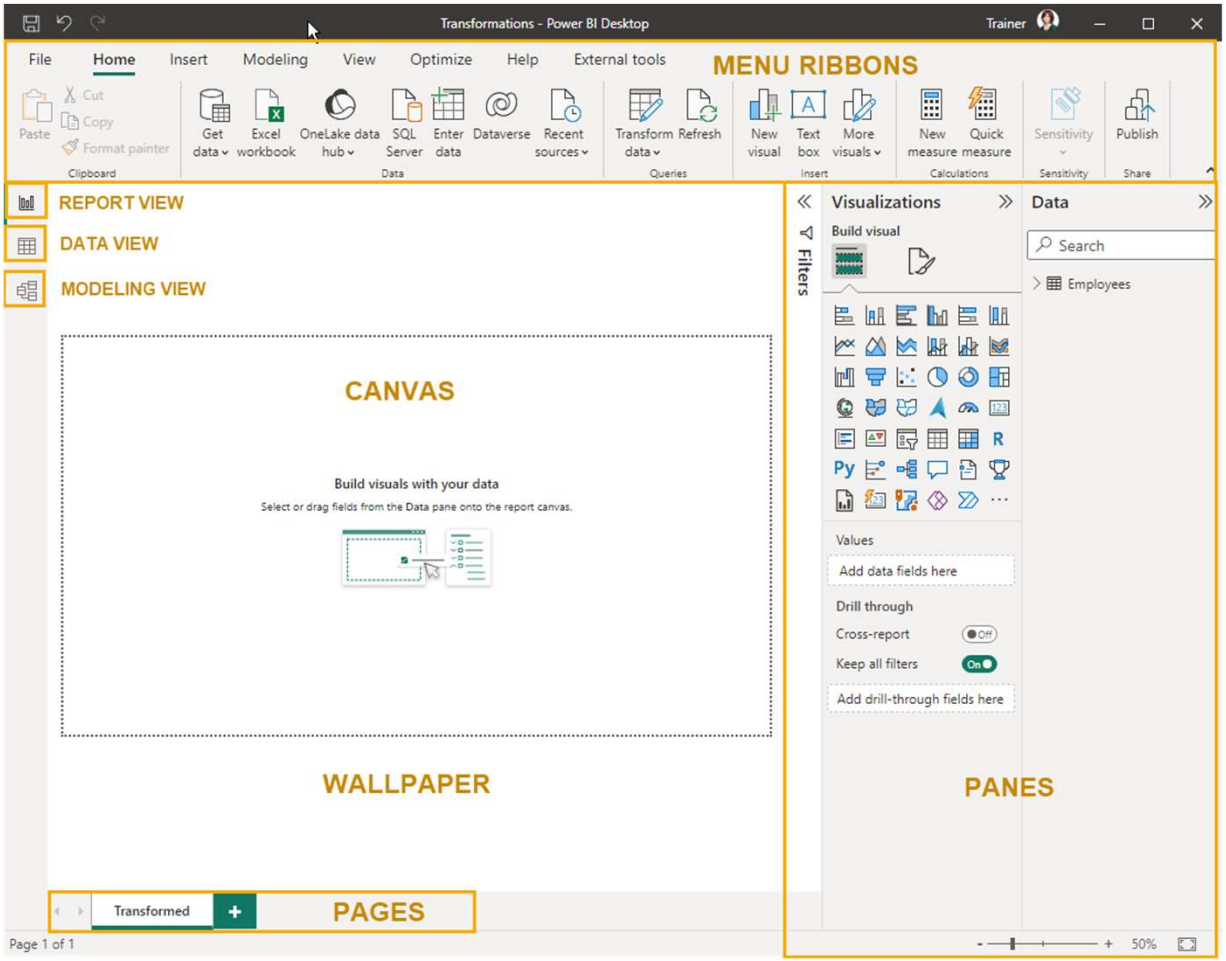


Managing data **transformation** with **Power Query M** macro language (M Code)

Power BI
Report Builder

Report Builder

Importing , **Data Modelling** and Building/**Design** writing **DAX**.

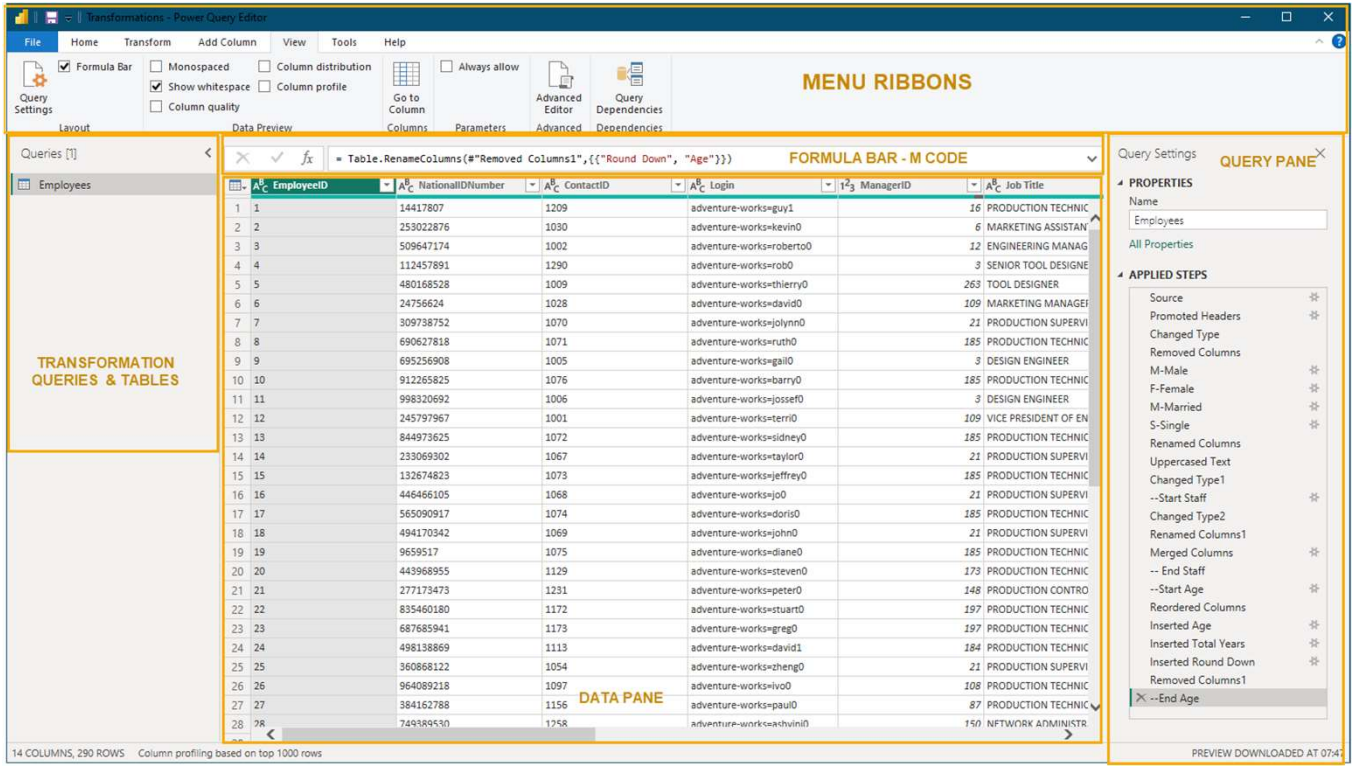


Power BI
Power Query

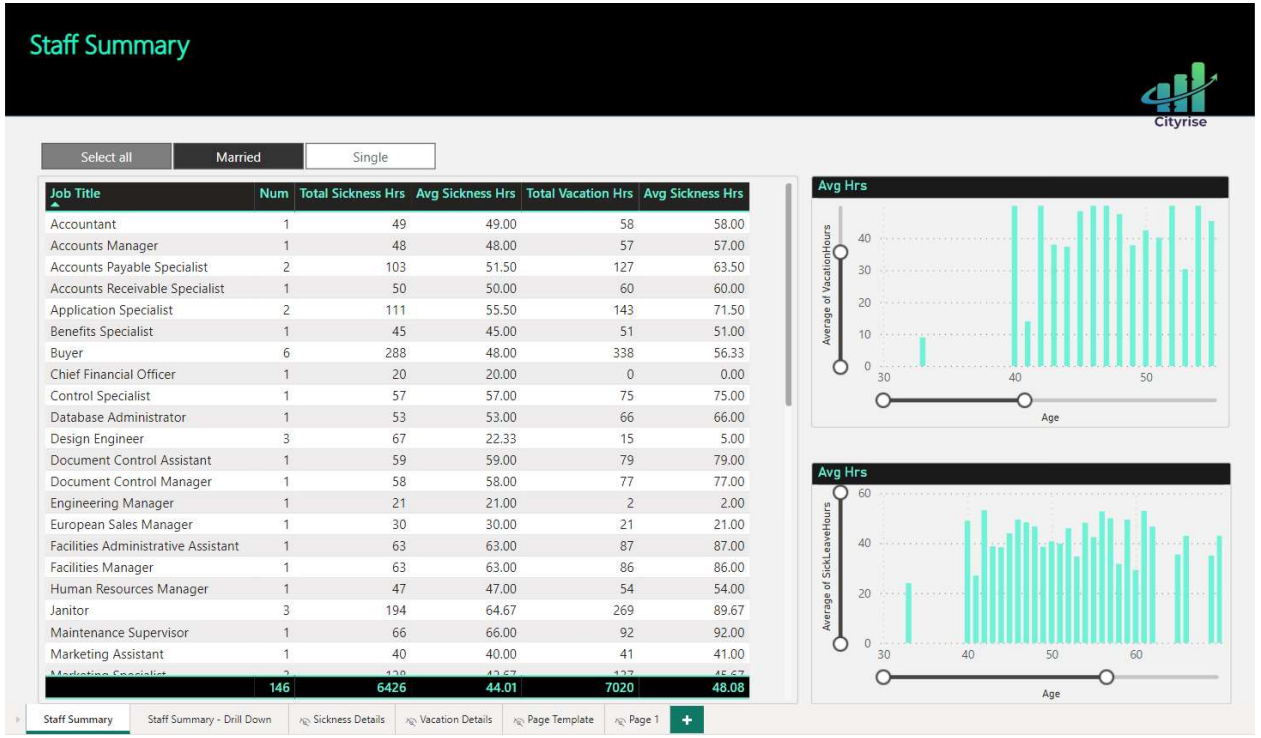
Power Query

Data transformation with **Power Query M (M Code)**

Home > Transform data



Power BI
Our Goal



Power BI Our Workflow

Power BI Desktop

Transform

Design Report

Data Transform
Report set up
Visuals
Drill-down
Drill-through
Pre-publish

Power BI Service

Service

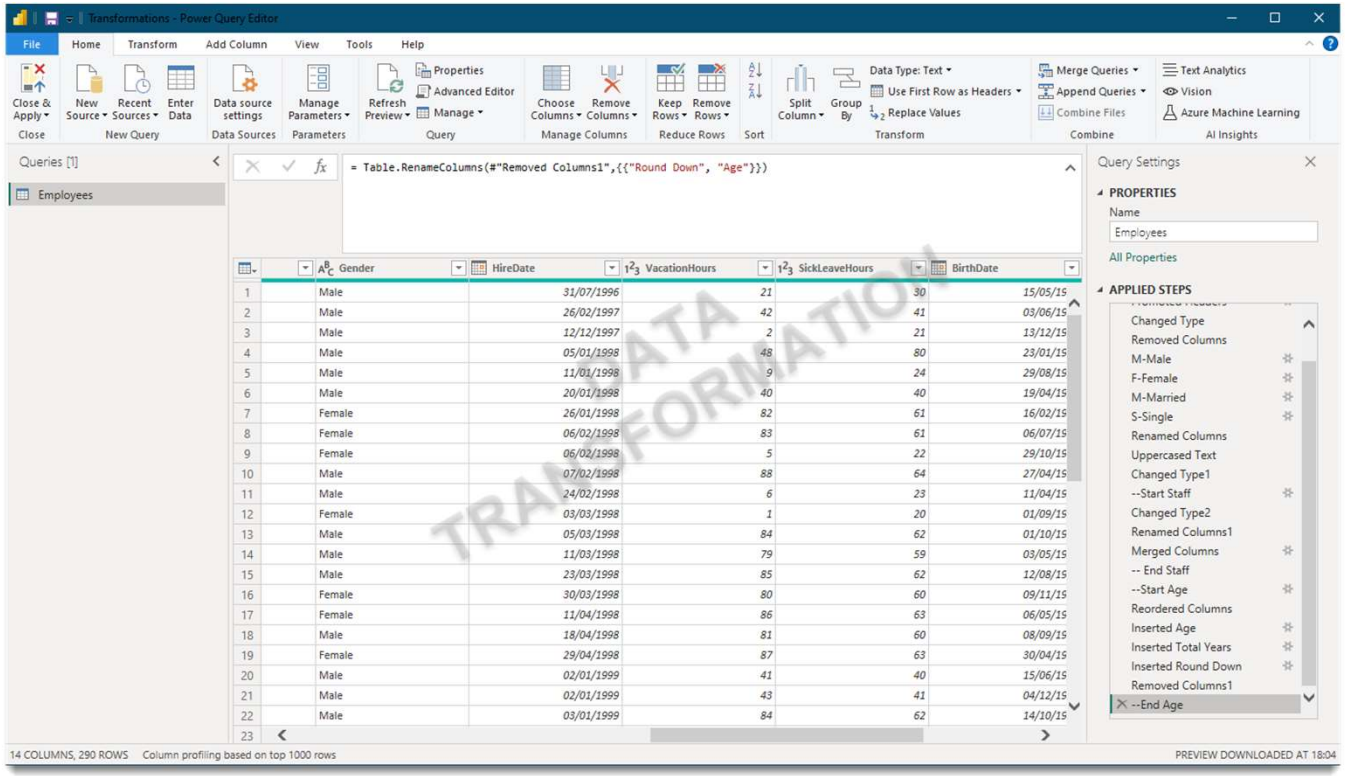
Workspaces
Reports & datasets
Sharing
Dashboards
Alerts
Refreshing data

Data Transformation

Hands on

Note:

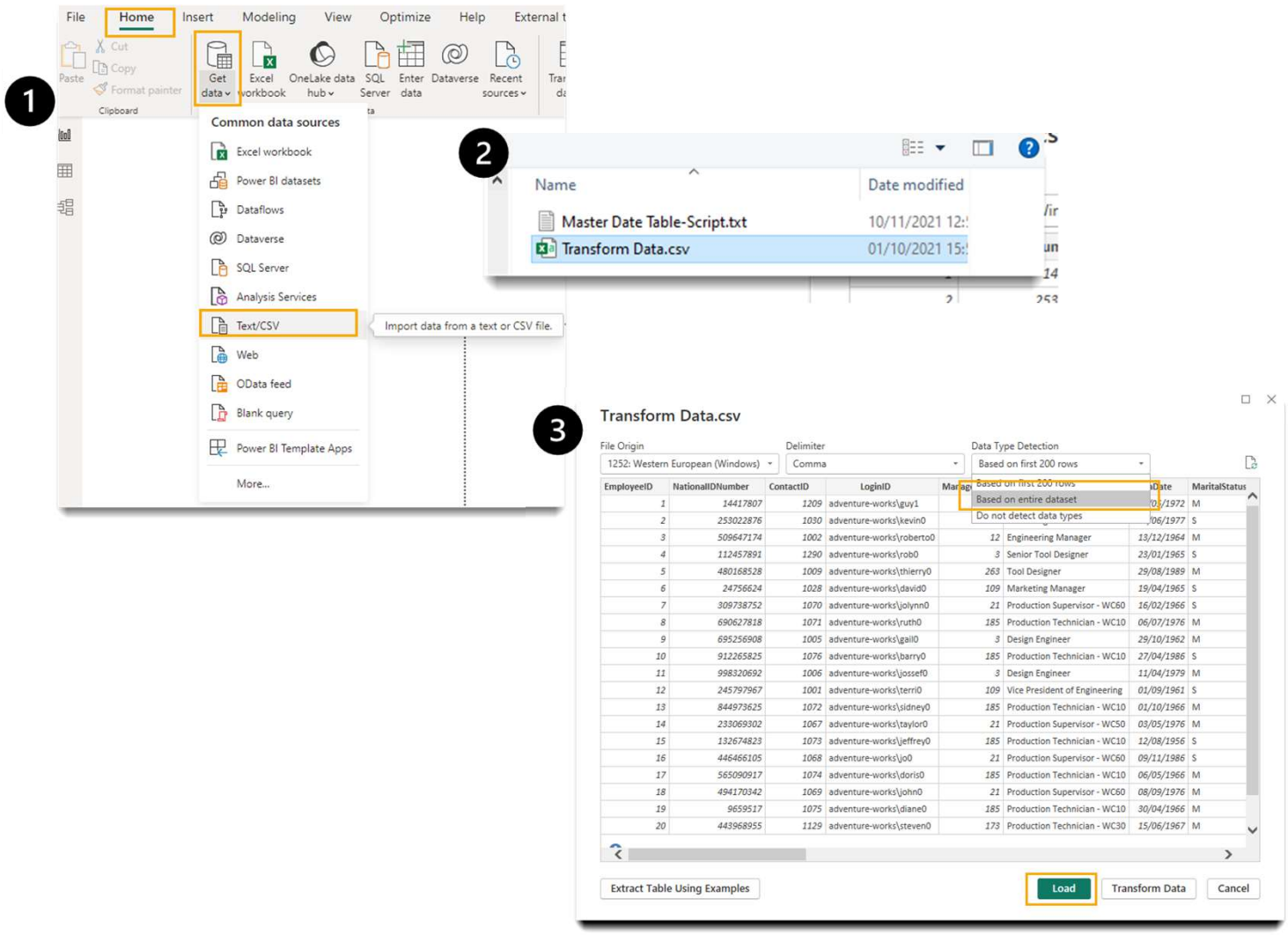
Correct **transformation** of your reporting data will enhance the speed and efficiency of your reports



Data Transformation

Importing Data

Import Text/CSV

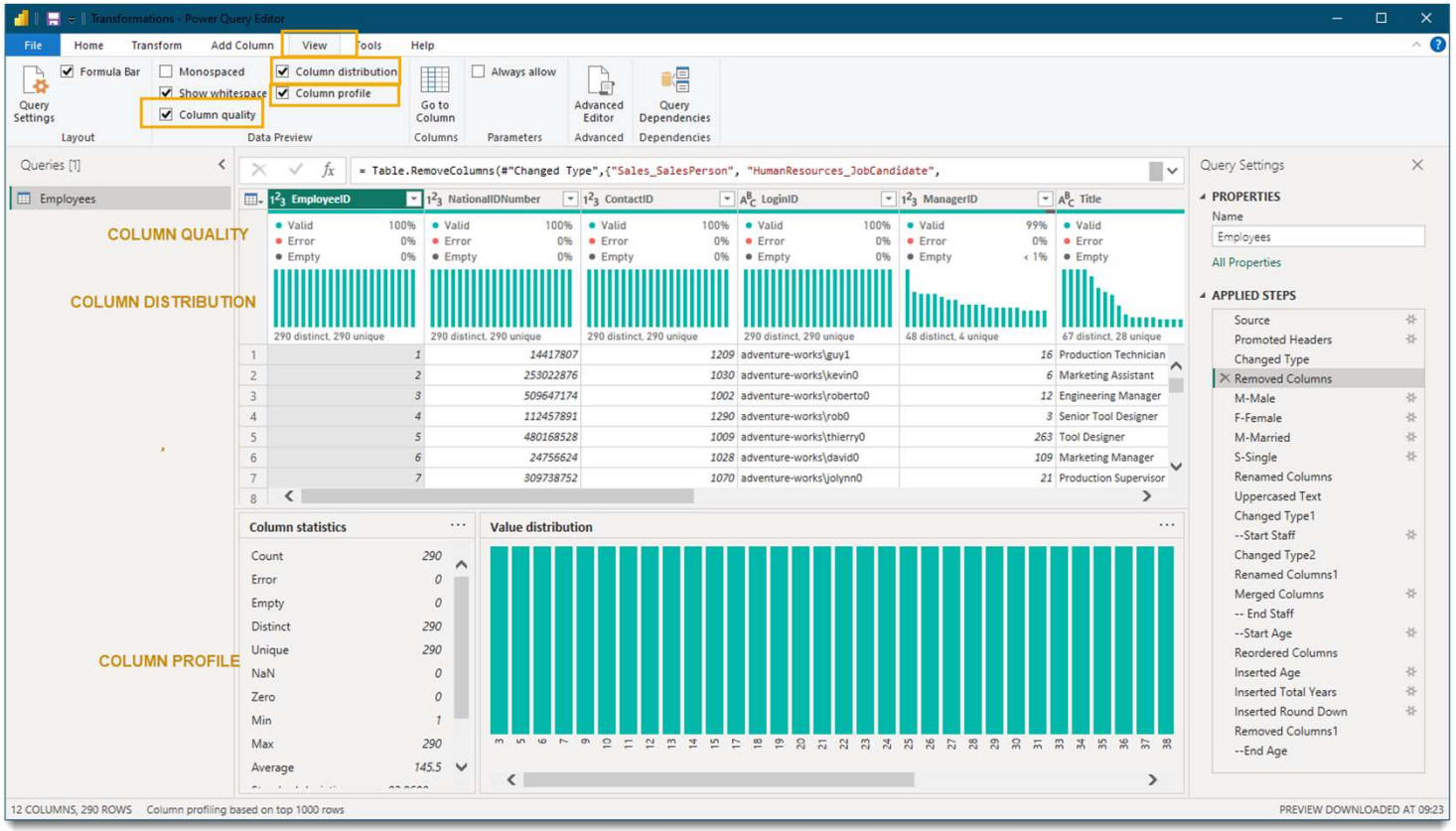


Data Transformation

Data Checking

Checking the data quality

We can use the Column quality | Column distribution | Column profile tools to check the data for validity, errors and empty values.

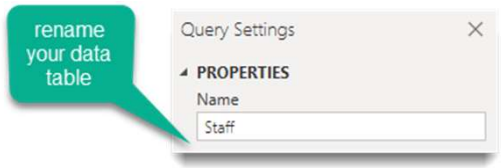


Data Transformation

Renaming Data Tables

Renaming Data Tables

It is good practice at the start, to name your tables to suit your data model needs



Note:

Re-Naming tables to suit your data **at the start** of transforming your data is good practice.

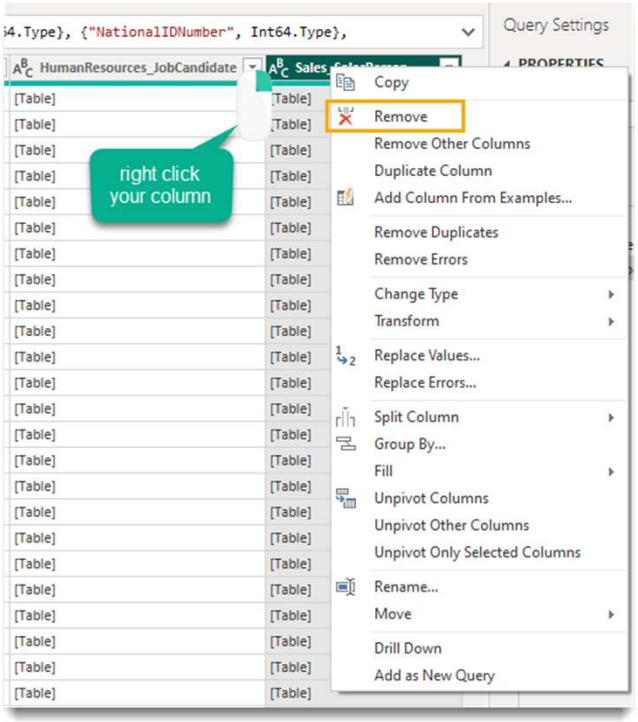
These names will be **used by DAX**

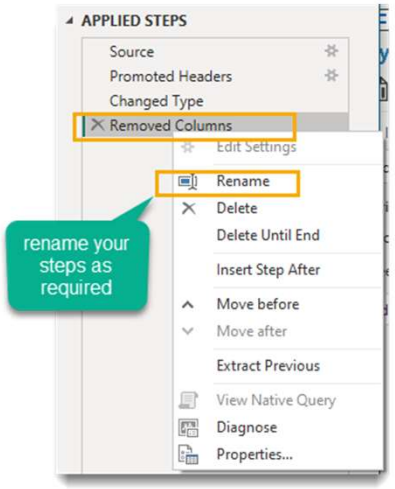
Data Transformation

Removing Columns

Removing unwanted columns

Remove unwanted columns with right click and also rename steps as required



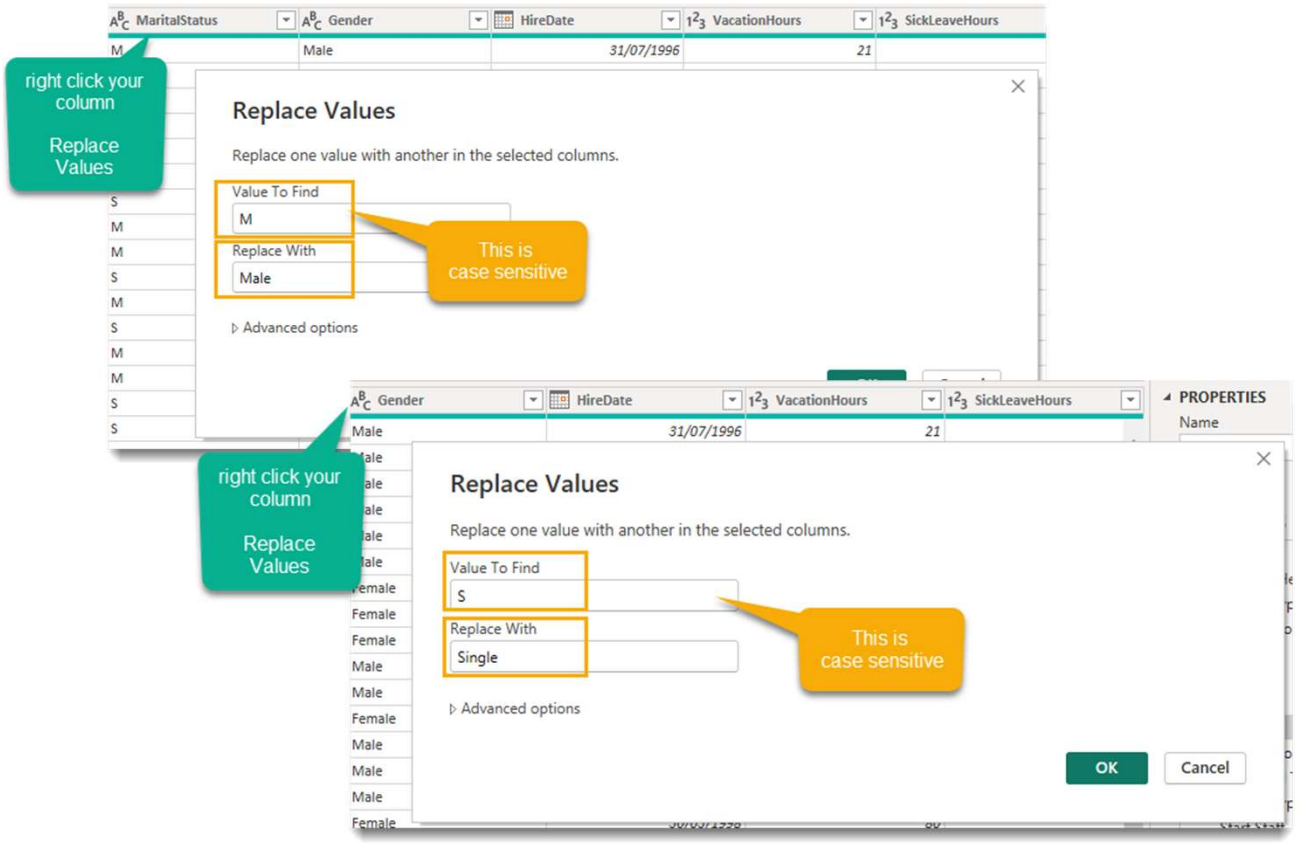


Data Transformation

Replacing Values

Replacing values

Replace current values with your required values.

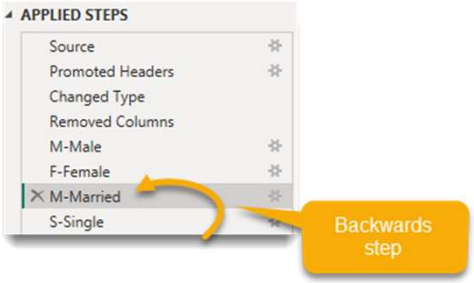


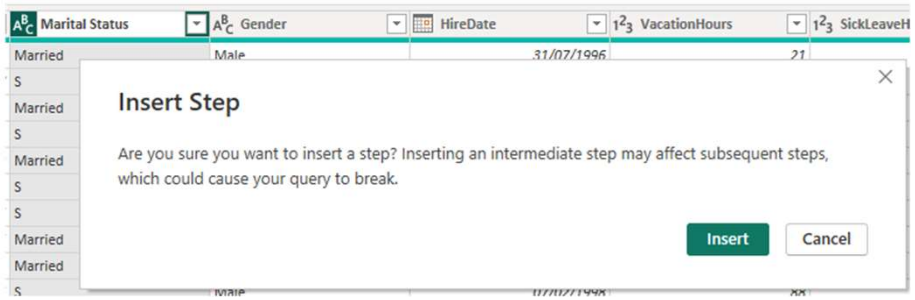
Data Transformation

Step History
Renaming Columns

Backwards Step

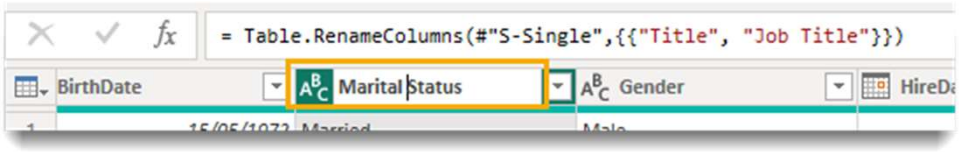
If you go backwards Power Query will warn you that some 'future' steps *may be* affected





Rename columns

Rename columns to suit

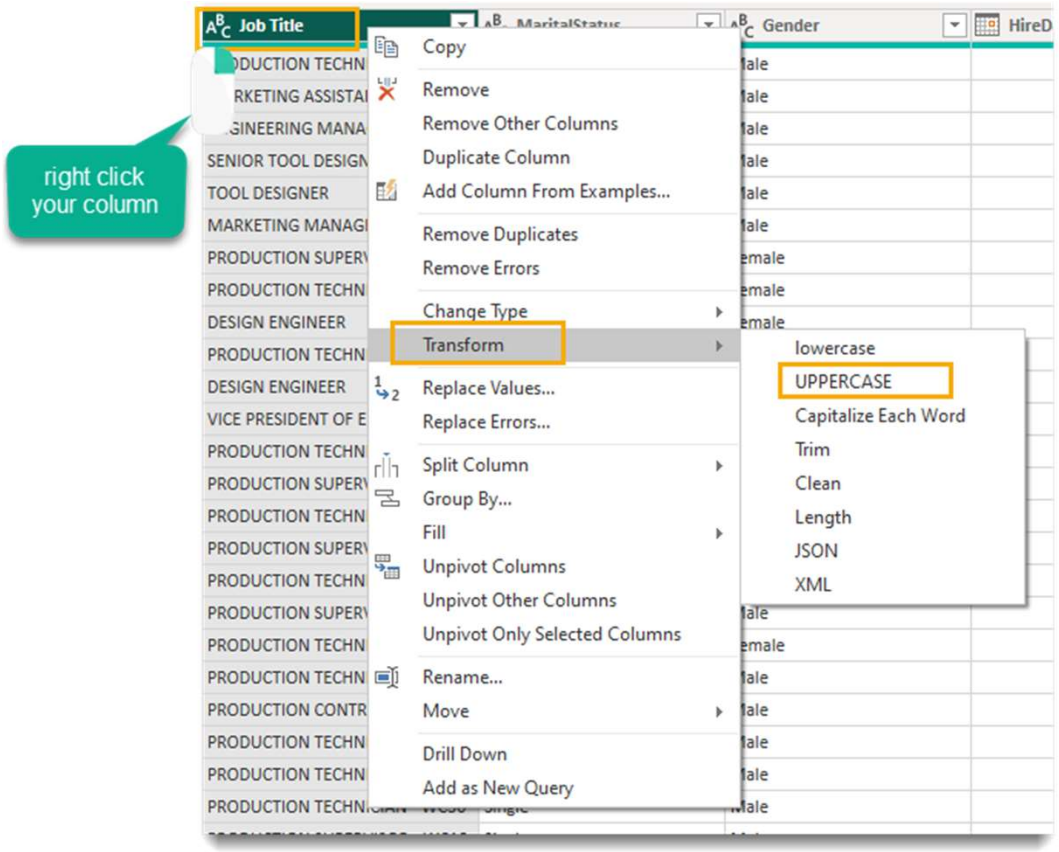


Data Transformation

Transforming Values

Transforming Values

It is possible to perform some very useful transformations



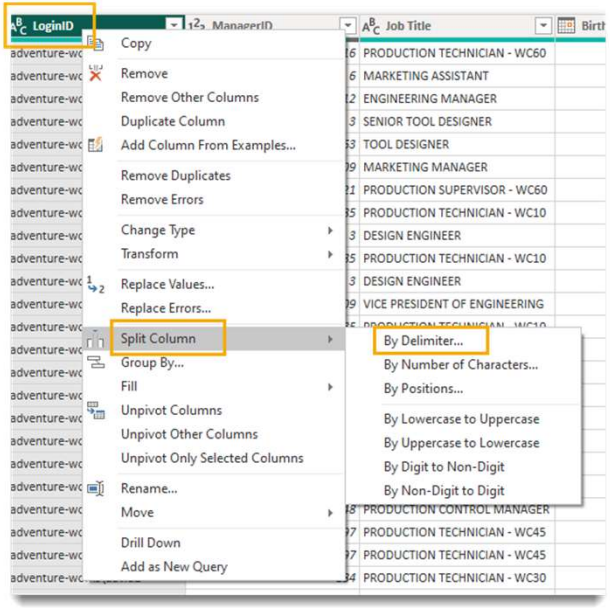
Data Transformation

Splitting Columns

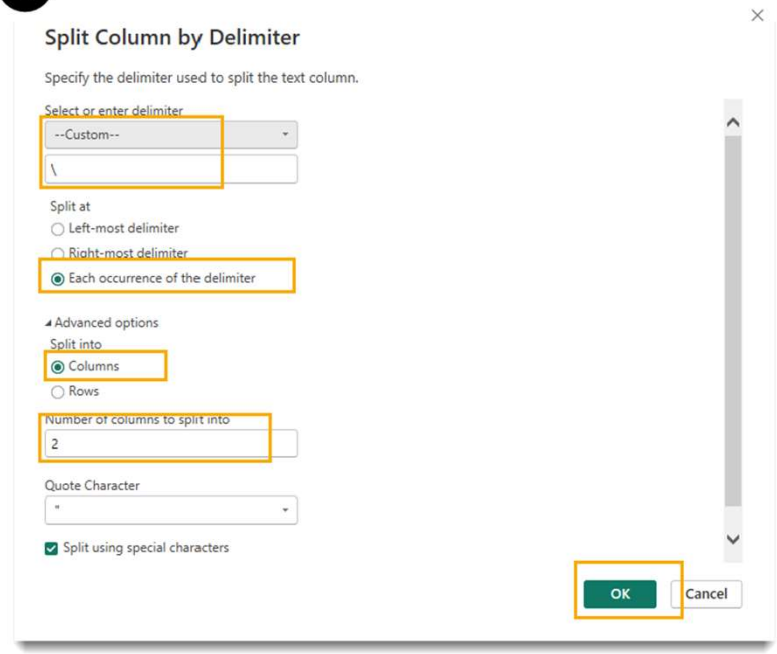
Splitting Columns

It is possible to split values into separate rows OR columns also, based on various options

1



2



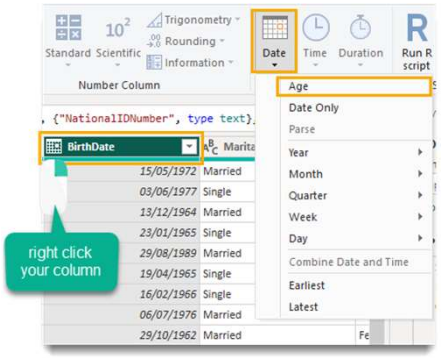
Data Transformation

Age Calculation

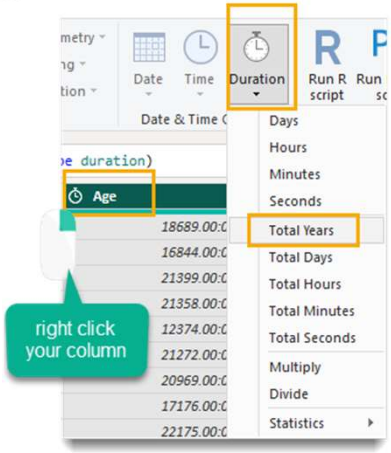
Advanced Age Calculations

Ensure you are either on the **Add Column** ribbon

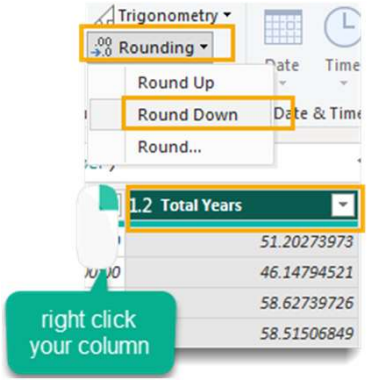
1



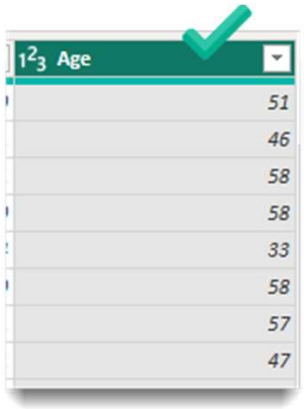
2



3



4



Note:
Please ensure you are in the correct ribbon menu **Add Column or Transform**

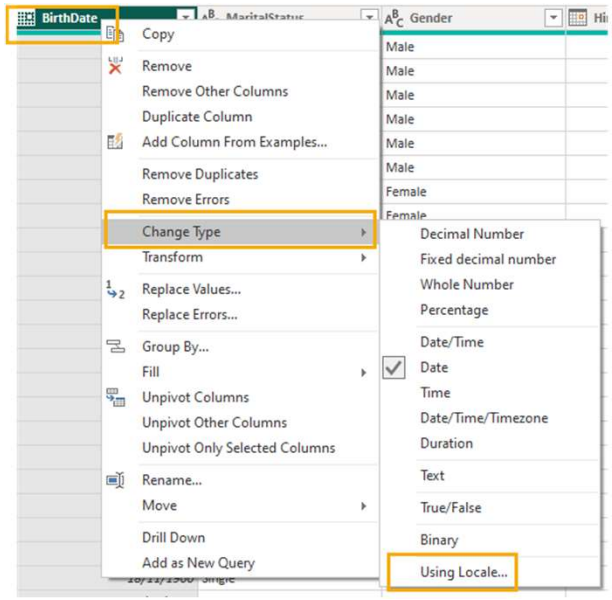
Data Transformation

Changing Date (Locales)

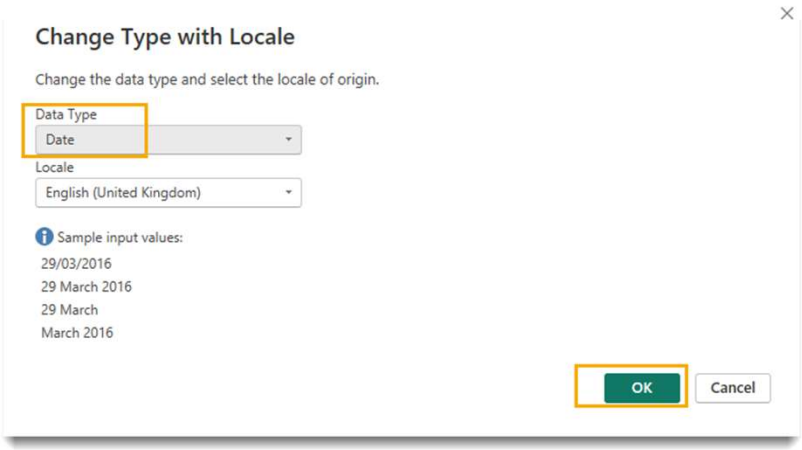
Changing Data Types

It is good practice to set any dates to the correct **Locale** as there may be UK | US | Euro etc. issues.

1



2



Note:
Dates *may* not be the correct for your location – so adjust the **Locale ..** to **English United Kingdom**

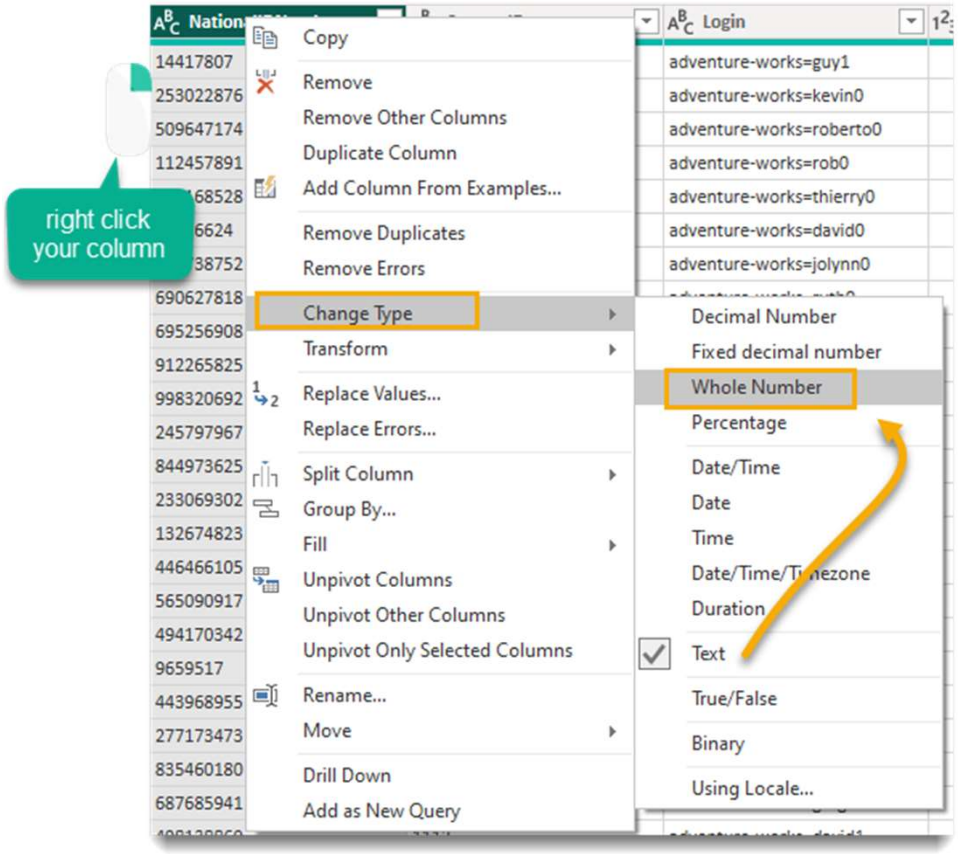
Data Transformation

Data Type Changes

Changing Data Types

Sometimes Power Query may have converted a column to the wrong data type – you can amend these

1



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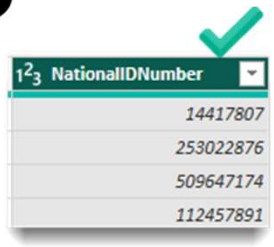


Note:

Not all Numbers are **number** data types they *may* be **text** data

Data Transformation

Re-using M Code

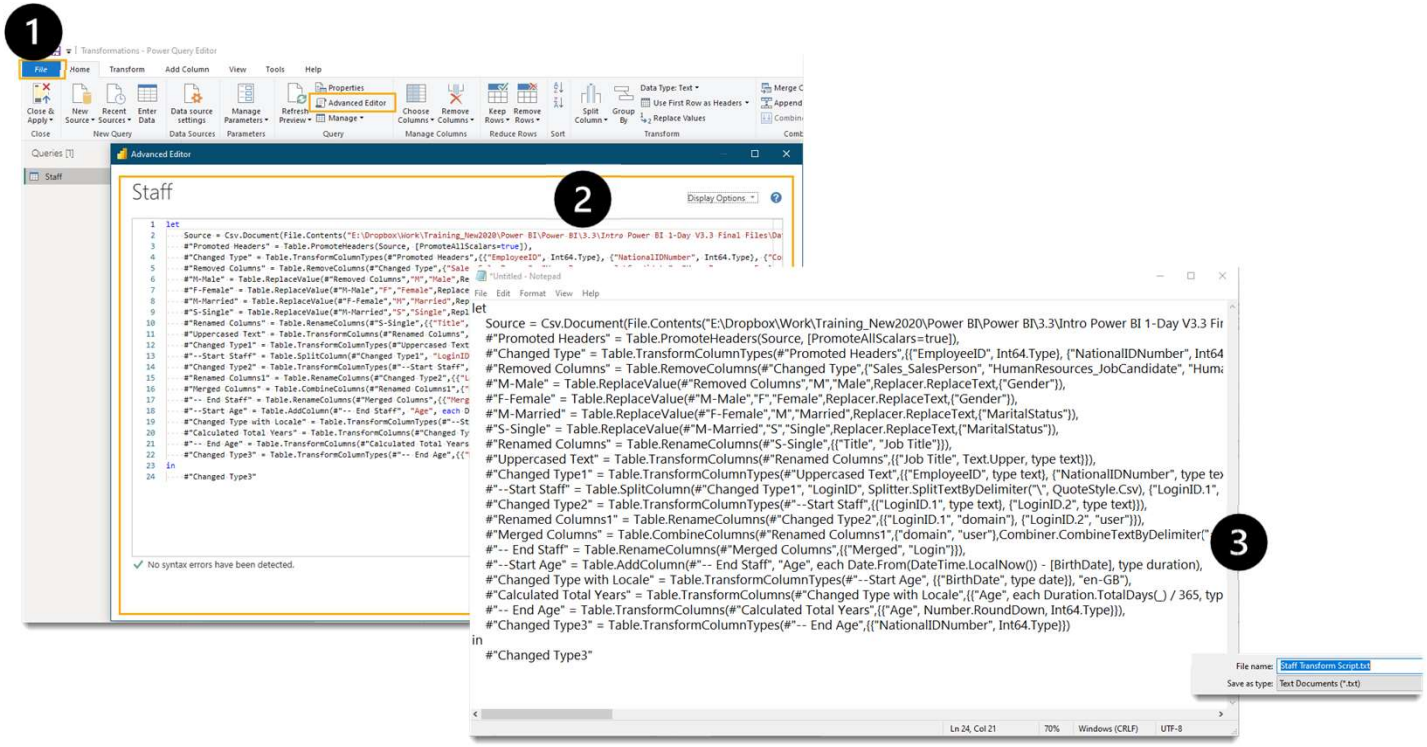
Note:

M code can be copied, saved and re-used.

Re-using M Code

If you need to repeat any steps in say another Power BI project you can copy and store this code as text (.txt) and re-use later.

File > Advanced Editor



Power BI
Initial Transformation Complete

Power BI Desktop

Transform

Design Report

Data Transform
Report set up
Visuals
Drill-down
Drill-through
Pre-publish

Power BI Service

Service

Workspaces
Reports & datasets
Sharing
Dashboards
Alerts
Refreshing data

Our Project

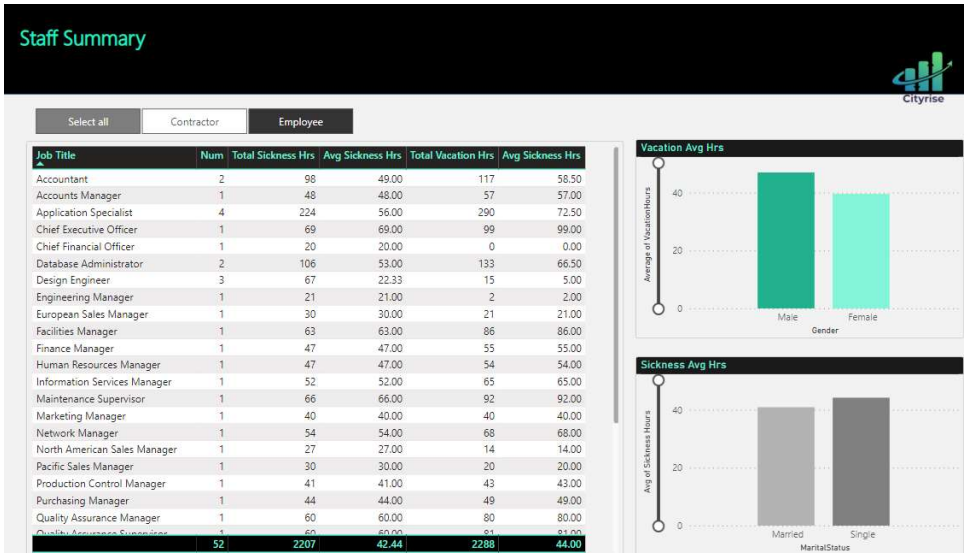
Project Staff

Note:

We will use best practice

We will learn to use:

- Design | Themes
- Re-using M Code
- Data Aggregation with Implicit Measures
- Fields /Formatting /Analytics
- Table and Matrix
- Line | Bar | Pie Charts
- Filtering Visuals
- Drill Downs
- Drill Through
- Slicers



Job Title	Num	Total Sickness Hrs	Avg Sickness Hrs	Total Vacation Hrs	Avg Sickness Hrs
Accountant	2	98	49.00	117	58.50
Accounts Manager	1	48	48.00	57	57.00
Application Specialist	4	224	56.00	290	72.50
Chief Executive Officer	1	69	69.00	99	99.00
Chief Financial Officer	1	20	20.00	0	0.00
Database Administrator	2	106	53.00	133	66.50
Design Engineer	3	67	22.33	15	5.00
Engineering Manager	1	21	21.00	2	2.00
European Sales Manager	1	30	30.00	21	21.00
Facilities Manager	1	63	63.00	86	86.00
Finance Manager	1	47	47.00	55	55.00
Human Resources Manager	1	47	47.00	54	54.00
Information Services Manager	1	52	52.00	65	65.00
Maintenance Supervisor	1	66	66.00	92	92.00
Marketing Manager	1	40	40.00	40	40.00
Network Manager	1	54	54.00	68	68.00
North American Sales Manager	1	27	27.00	14	14.00
Pacific Sales Manager	1	30	30.00	20	20.00
Production Control Manager	1	41	41.00	43	43.00
Purchasing Manager	1	44	44.00	49	49.00
Quality Assurance Manager	1	60	60.00	80	80.00
	52	2207	42.44	2288	44.00

Design Report

Steps

Note:

These are not all in a specific order
They are good practice

Steps involved when designing a report

If you need to repeat any steps in say another Power BI project, you can copy and store this code as text (.txt) and re-use later.

- ❑ Plan your report page needs – Summary / Detailed & Interactions
- ❑ Set up your theme – Customise or Import as needed
- ❑ Set up your Canvas | Wallpaper | Filter pane
- ❑ Set up your Page Template(s)
- ❑ Design each page adding visuals as needed
  - Format and Style as required
  - Drill Downs
  - Drill Throughs (detailed pages)
- ❑ Prepare to Publish

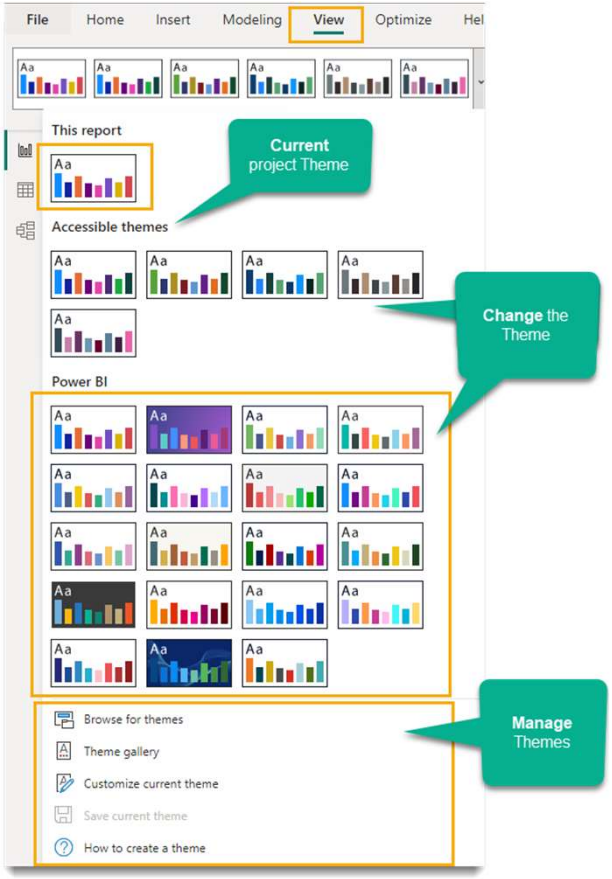
Design Report

Themes

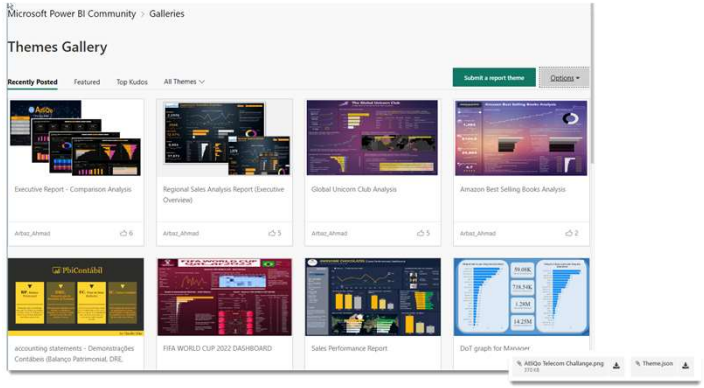
Managing Themes

Themes can be set / customised/ imported and exported from the View menu

View



Themes gallery



Note:

Good source for ideas and theme building is:

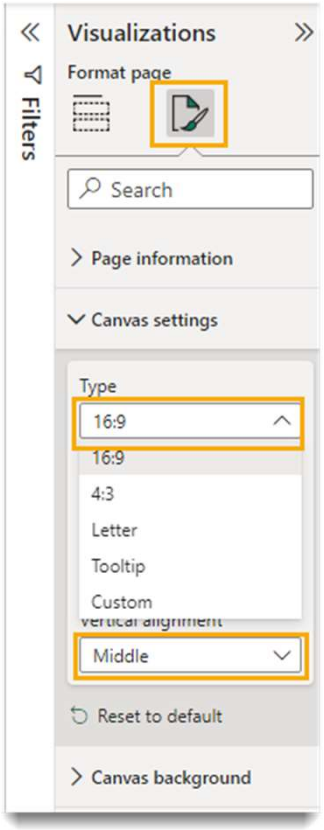
https://powerbi.tips/

Design Report

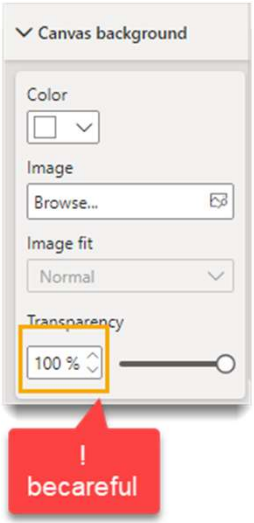
Canvas Set up

Setting up your canvas

Size type for the Canvas 16:9 is most common



Background can be colours / Images



Note:

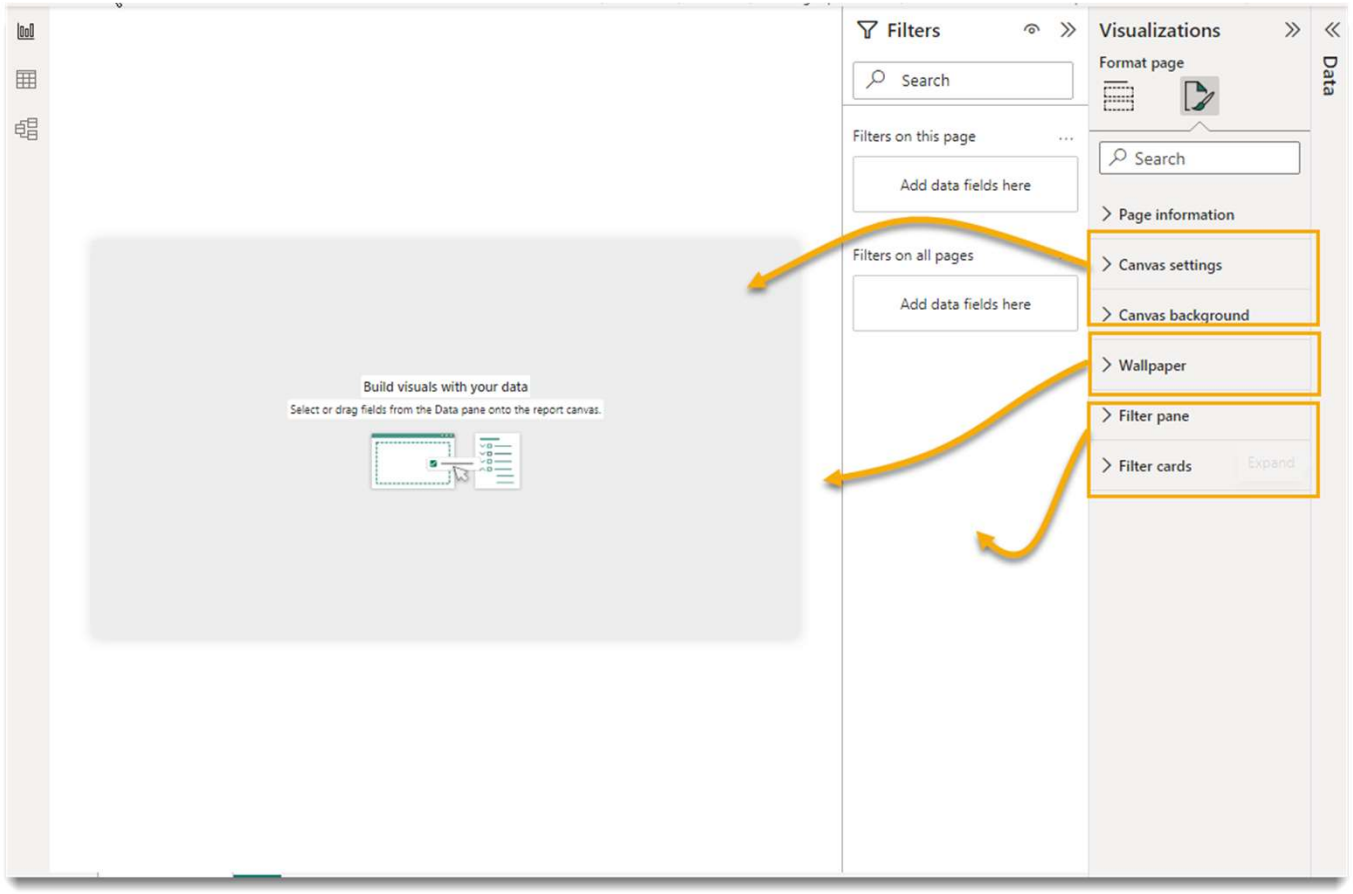
The type 16:9 is the common widescreen, other sizes can be used for other end deliveries

Background is often 100% transparent so adjust as needed

Design Report

Wallpaper & Filter

Setting up your Wallpaper and Filter



Note:

Aside from the canvas, the wallpaper and filter pane are also published

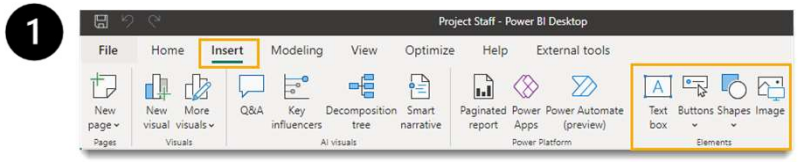
Design Report

Creating a Page ‘Template’

Creating a page ‘Template’

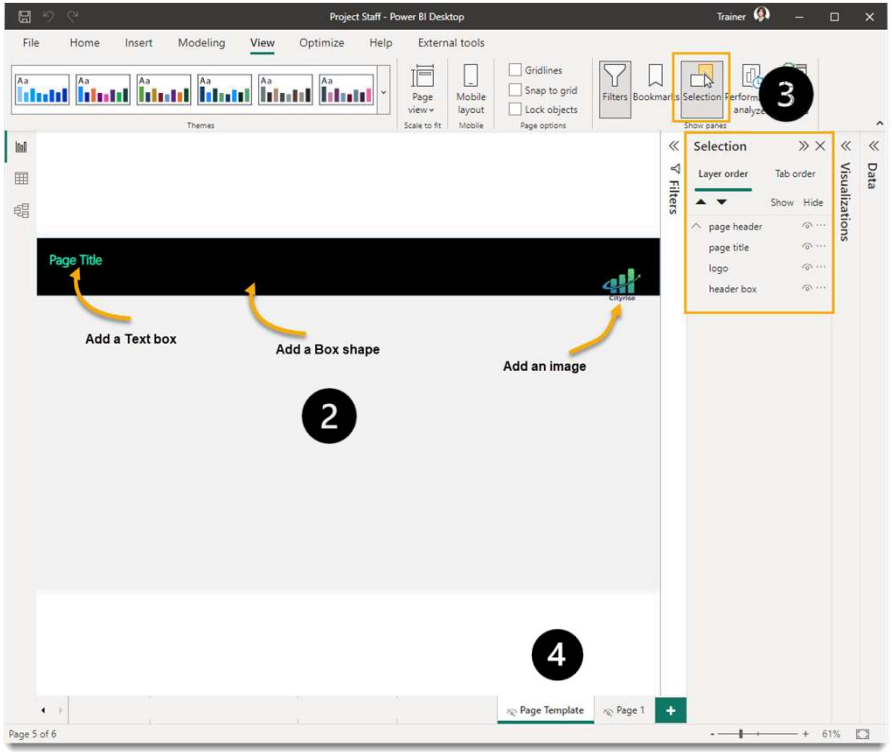
Adding Text boxes, Shapes and Images

File > Insert



Labelling and grouping page elements

File > View > Selection



Note:

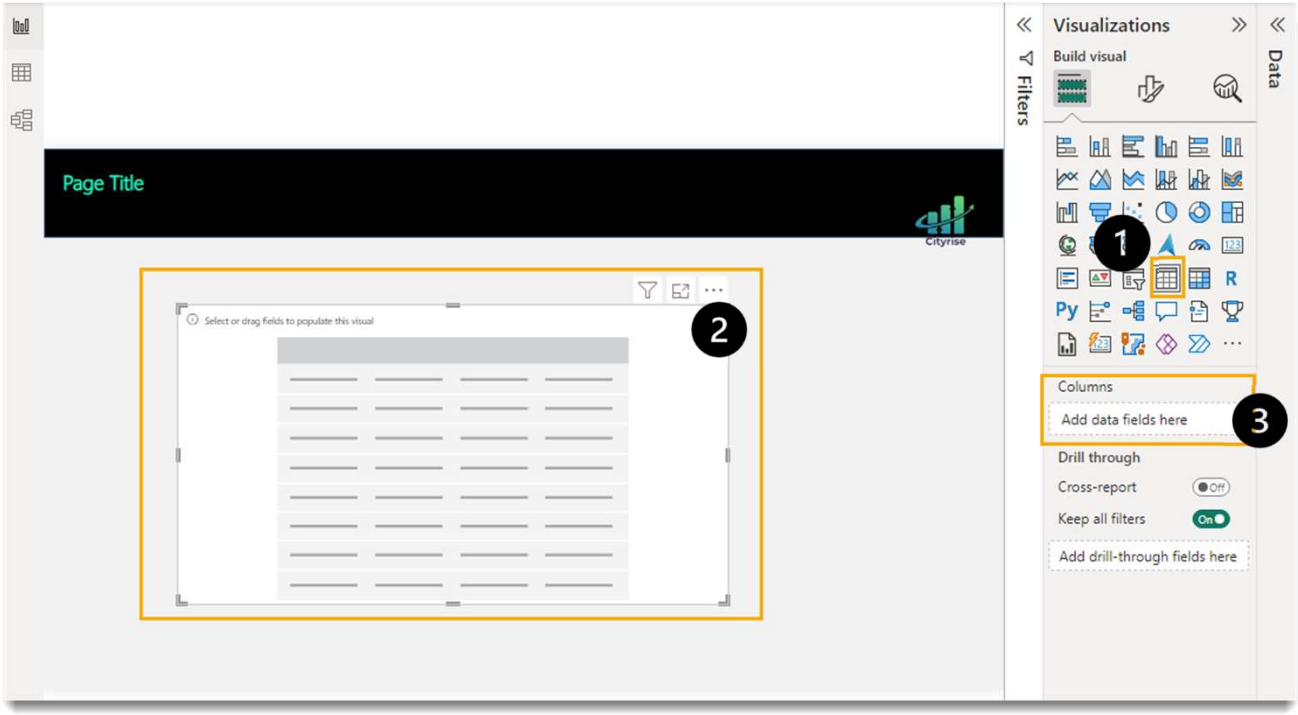
It is good practice to label / group elements on you pages for ease of design and access

Design Report

Managing Visuals

Adding visuals

Click on your required visual



Note:

1. Adding visuals is a ‘click’ NOT ‘drag and drop’

2. Then adjust size and position to your requirement

3. See the Columns dialog for adding data

Design Report

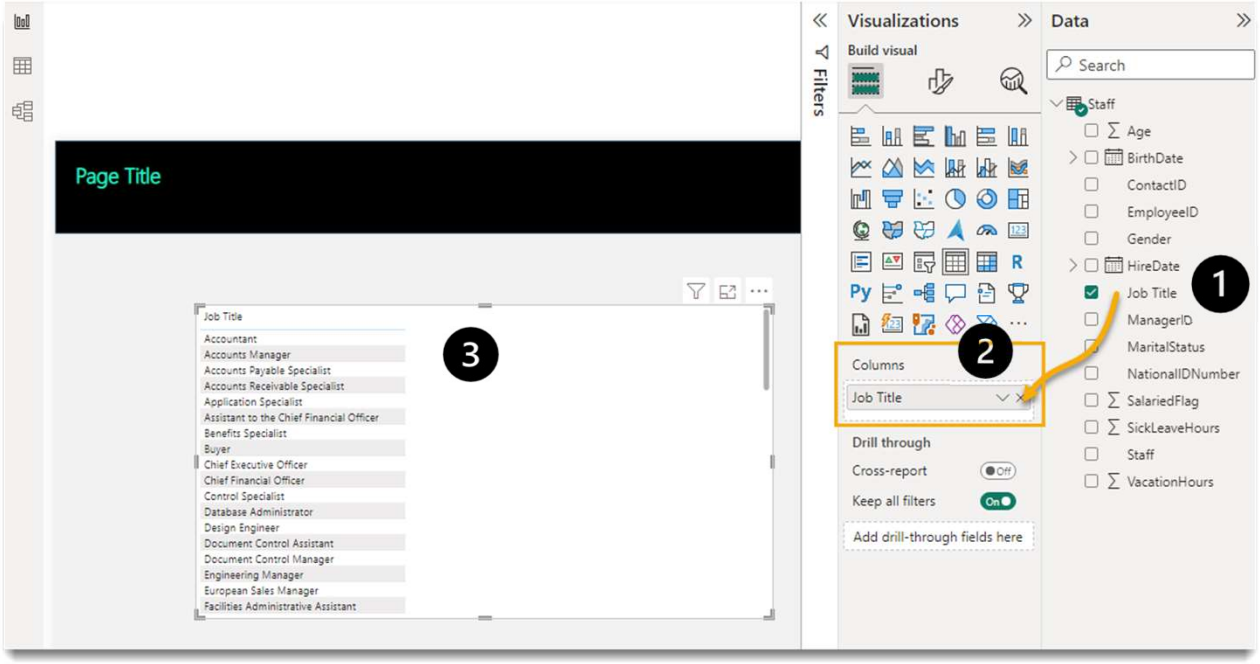
Adding data to Visuals

Note:

'Drag and drop' your data to the data panel

Adding data to visuals

Add data to the visuals data panel



Design Report

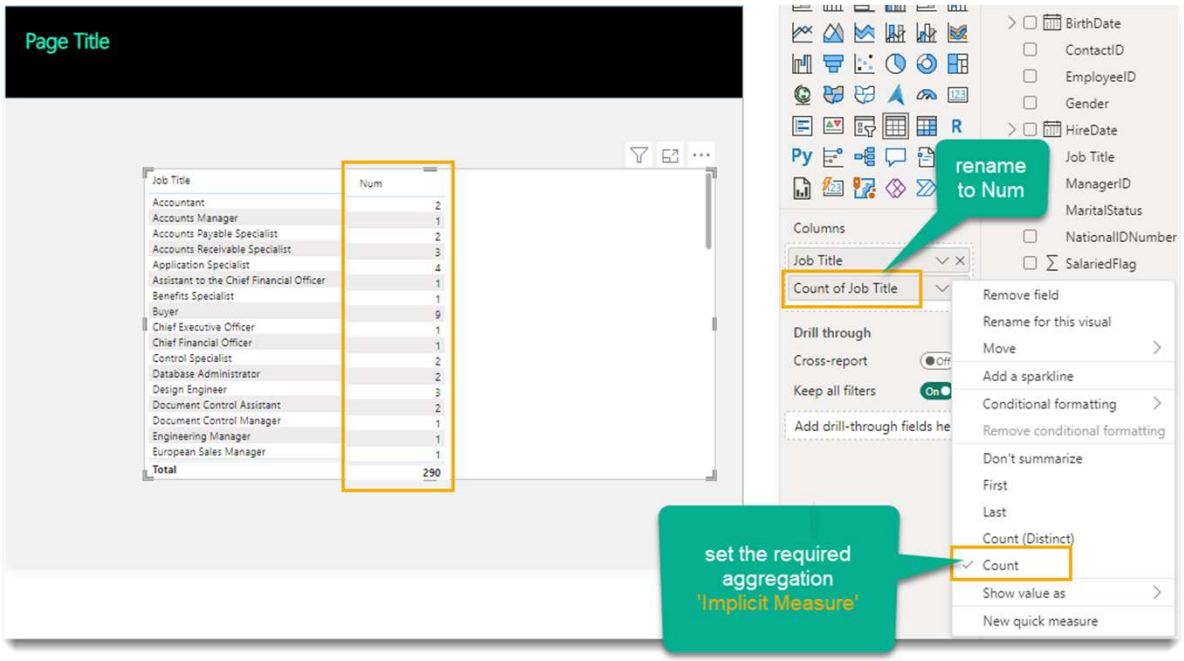
Adding data to Visuals

Note:

'Drag and drop' your data to the data panel

Renaming and aggregating data in visuals

Handling field naming, aggregation and moving is handled in the data panel

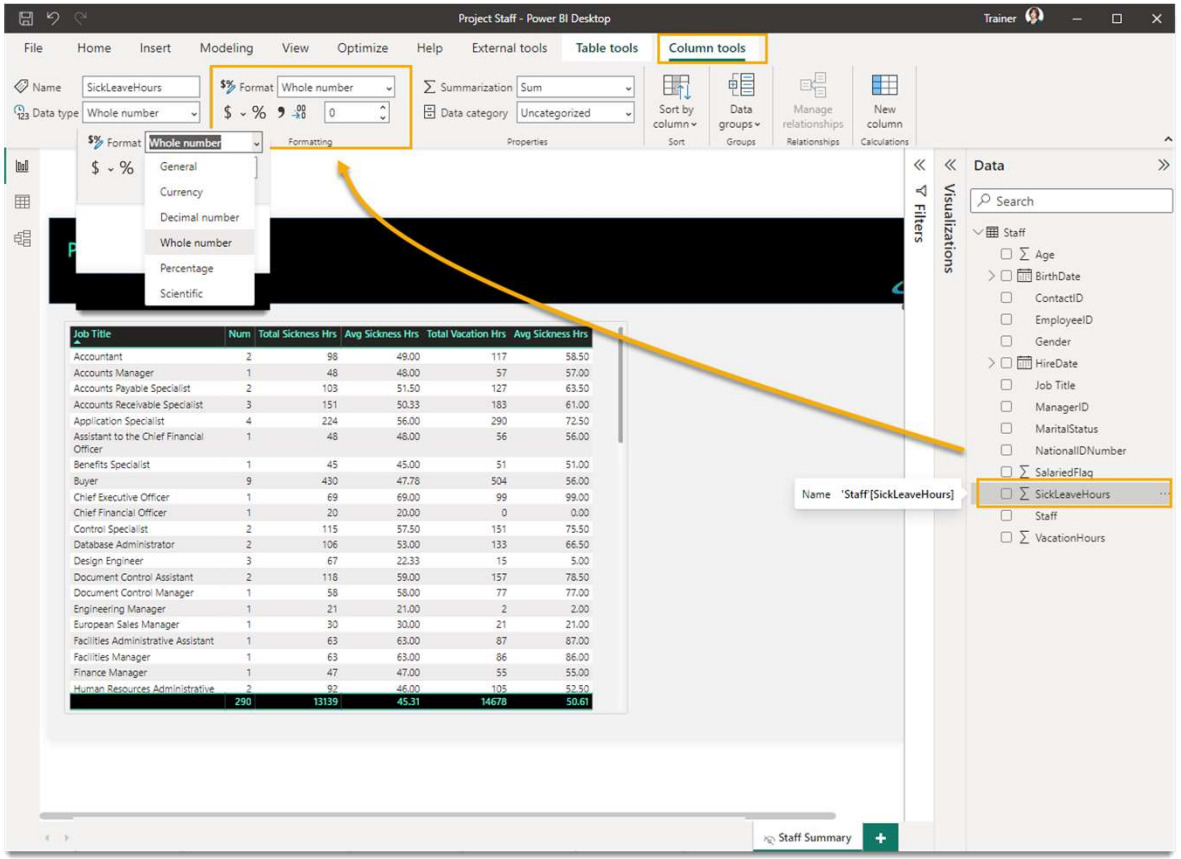


Design Report

Formatting Data

Formatting data

Handling field naming, aggregation and moving is handled in the data panel



Job Title	Num	Total Sickness Hrs	Avg Sickness Hrs	Total Vacation Hrs	Avg Sickness Hrs
Accountant	2	98	49.00	117	58.50
Accounts Manager	1	48	48.00	57	57.00
Accounts Payable Specialist	2	103	51.50	127	63.50
Accounts Receivable Specialist	3	151	50.33	183	61.00
Application Specialist	4	224	56.00	290	72.50
Assistant to the Chief Financial Officer	1	48	48.00	56	56.00
Benefits Specialist	1	45	45.00	51	51.00
Buyer	9	430	47.78	504	56.00
Chief Executive Officer	1	69	69.00	99	99.00
Chief Financial Officer	1	20	20.00	0	0.00
Control Specialist	2	115	57.50	151	75.50
Database Administrator	2	106	53.00	133	66.50
Design Engineer	3	67	22.33	15	5.00
Document Control Assistant	2	118	59.00	157	78.50
Document Control Manager	1	58	58.00	77	77.00
Engineering Manager	1	21	21.00	2	2.00
European Sales Manager	1	30	30.00	21	21.00
Facilities Administrative Assistant	1	63	63.00	87	87.00
Facilities Manager	1	63	63.00	86	86.00
Finance Manager	1	47	47.00	55	55.00
Human Resources Administrative	2	92	46.00	105	52.50
	290	13139	45.31	14678	50.61

Note:

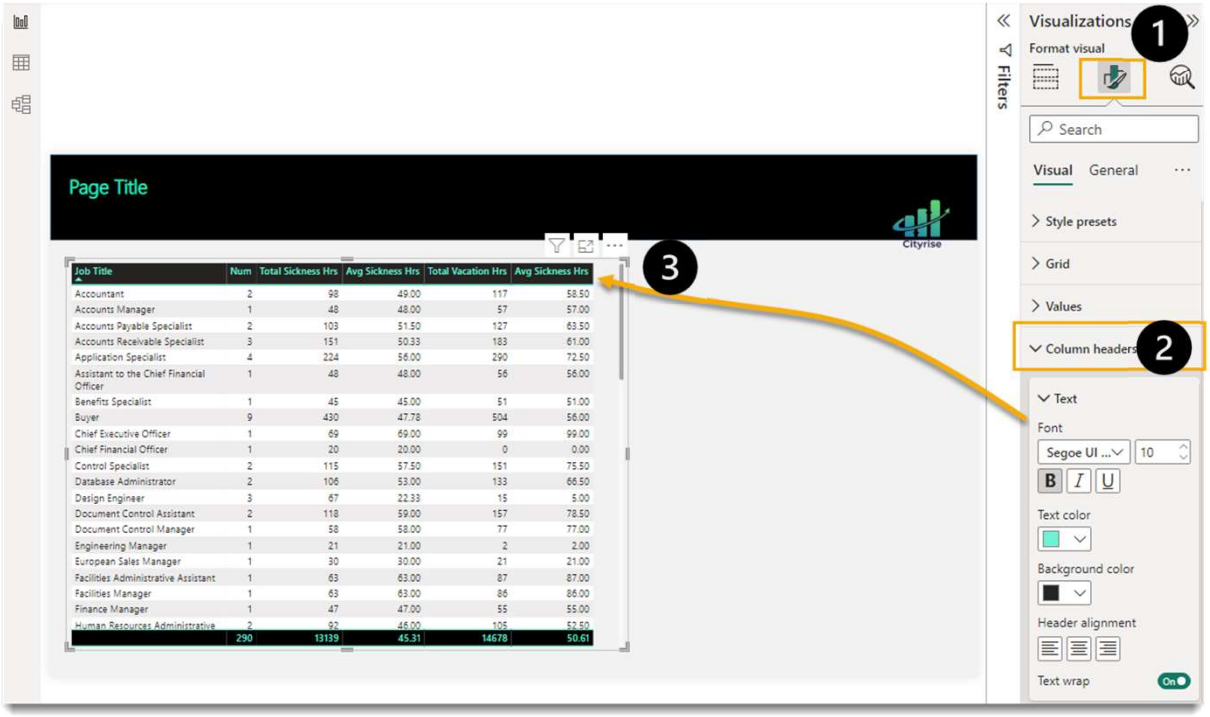
Data formats such as Money, Decimals, Dates etc,, **are handled at the data source** not the Individual visuals

Design Report

Styling Visuals

Styling your visuals

Styling options will vary based on the selected visual



Note:

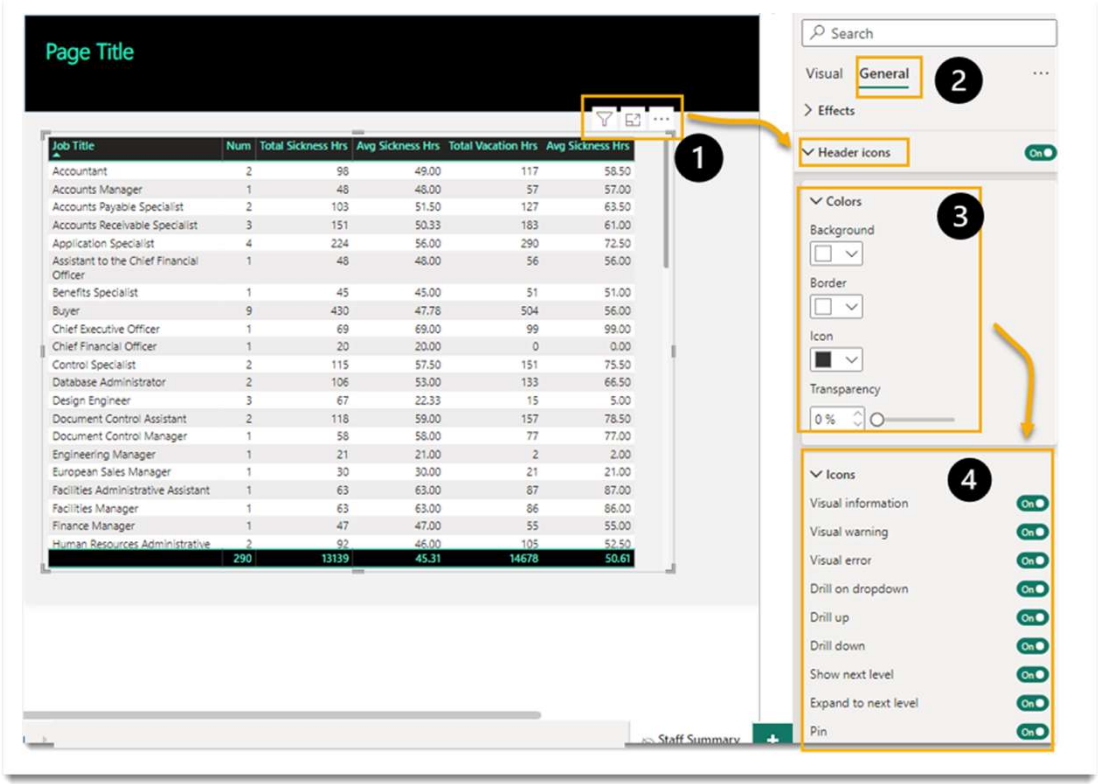
The Format visual options will vary based on the chosen visual

Design Report

Header Icons

Setting up Header Icons

Customising Header Icons



Note:

Header Icons can enhance the user experience with visuals

- Focus
- Sorting
- Data
- Export

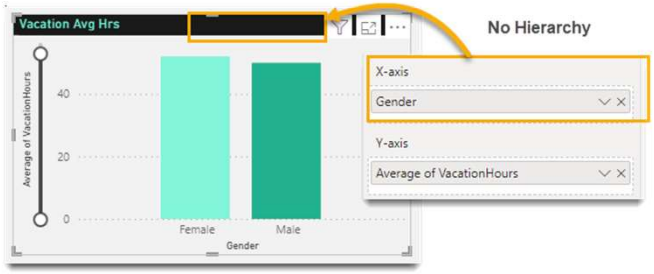
Design Report

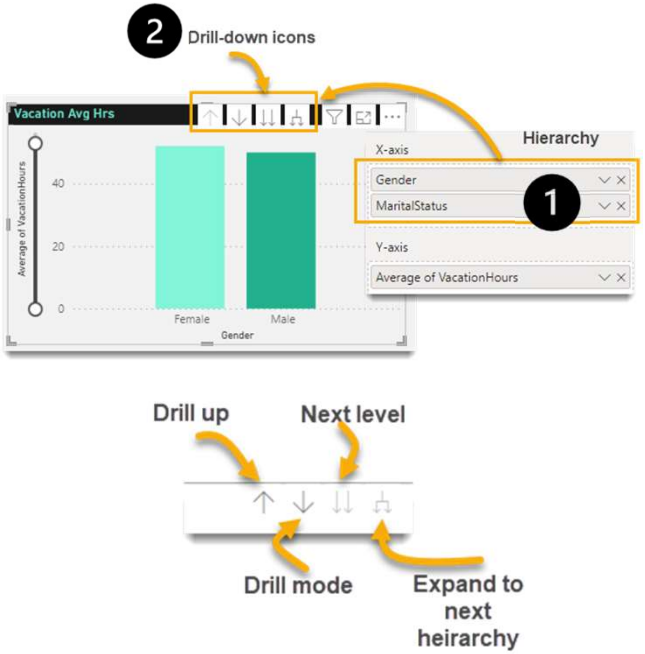
Drill-down

Setting up a Drill-down

The first priority is to consider the **hierarchy** that you are looking to build.

Then adding these to the relevant hierarchy field for your chosen visual





Note:

Not all visuals will offer drill-downs

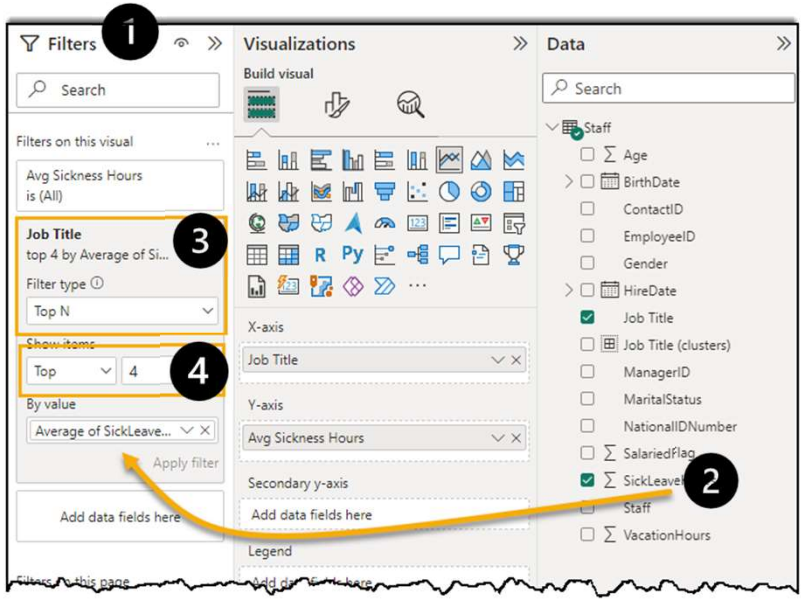
If they don't offer a hierarchy then it's no possible to create a drill-down

Design Report

Top N

Setting Top N

Top N is a useful metric that can be applied to all visuals.



Note:

Open the Filter pane

Open/add the relevant Top N field you require

Change **filter type** to Top (how many)

Set the **By value** metric

Design Report

Drill-through

Note:

We focus on creating a ‘detailed’ page

Setting up a Drill-through

The principle here is that the user can ***drill-through*** for more detailed information

Design Report

Detailed Page

Drill-through

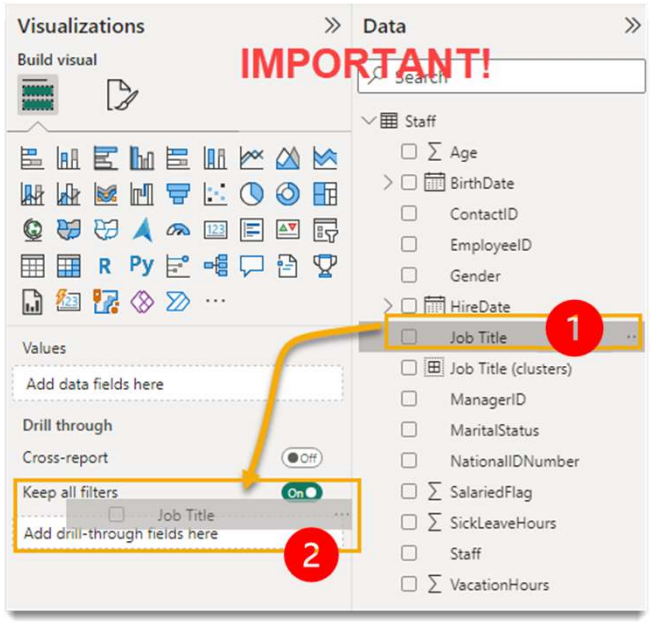
Note:

We focus on creating a 'detailed' page

Must add the correct **Drill-through field**

Setting up the Detailed page

You must drag the Job title field into the **'Add drill-through fields'**



Design Report

Detailed Page

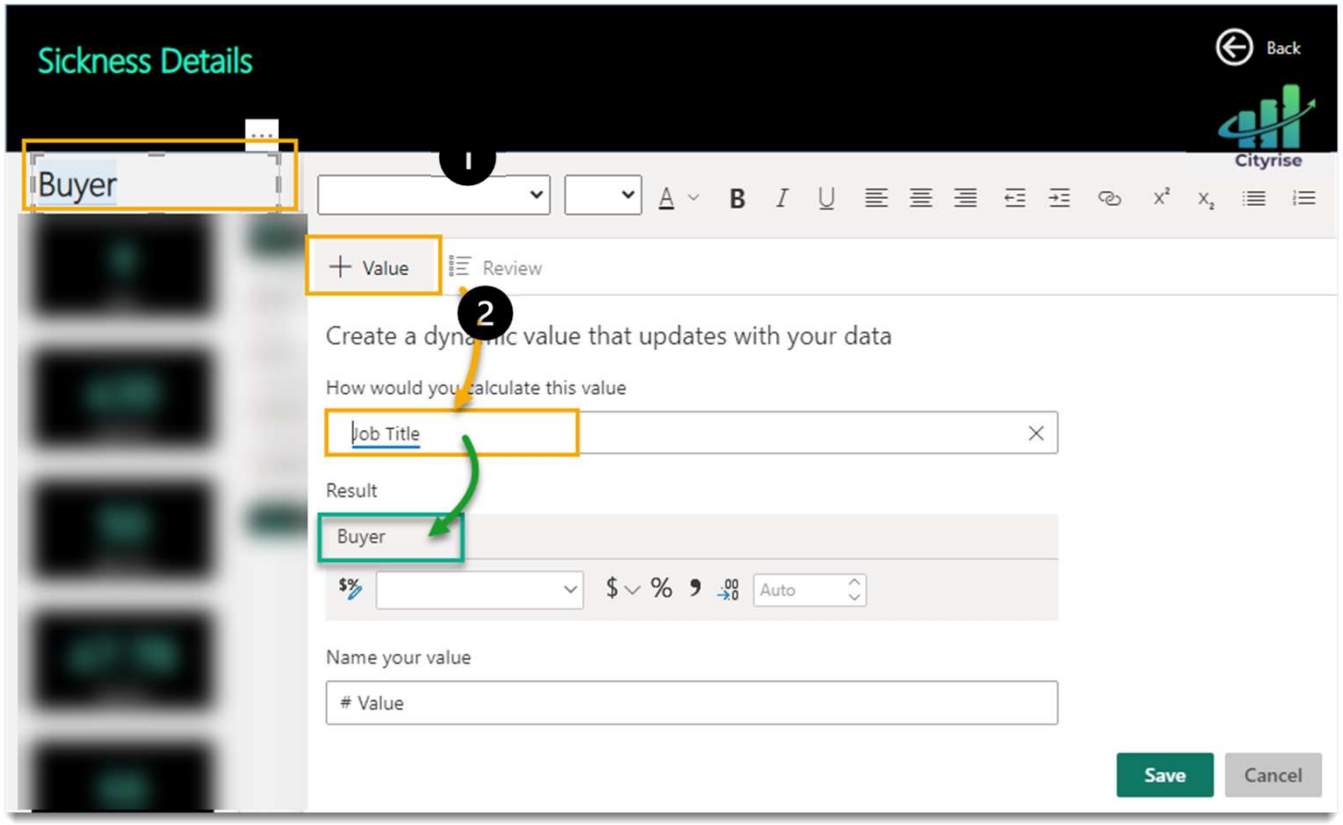
Dynamic Text

Note:

A **dynamic text** box is simply a regular text box that has the value calculated by a data field you specify

Adding Dynamic Text Boxes

Add a normal text box then select the '**+ Value**' button to make it dynamic text
Type in the name of the required data field e.g. **Job Title**



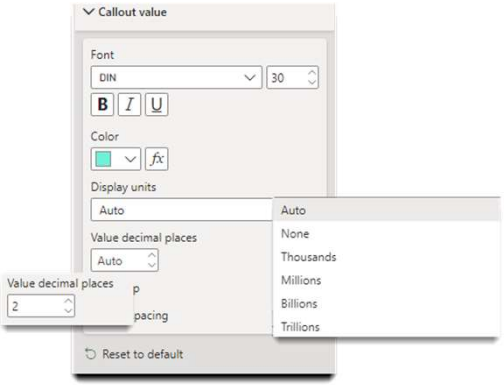
Design Report

Detailed Page

Dynamic Text

Adding Card Visuals

Card visual can be styled in several ways and they have their own display units' formats for high-level values **K, M ,B ,T**



Note:

A Card is a simple visual that shows a ‘single metric’

They can be styled in various way

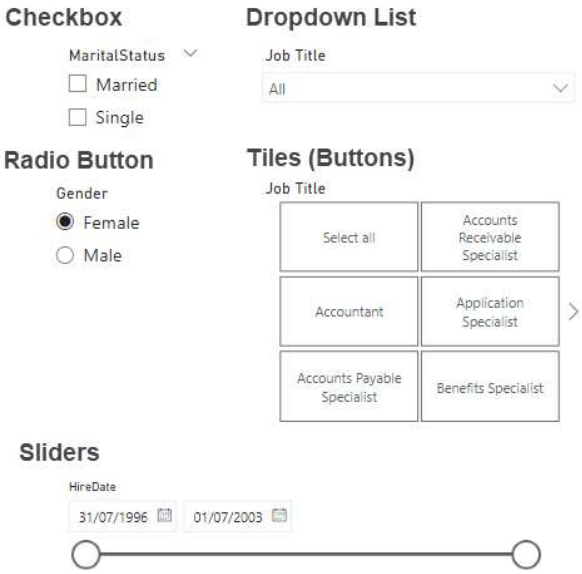
Design Report

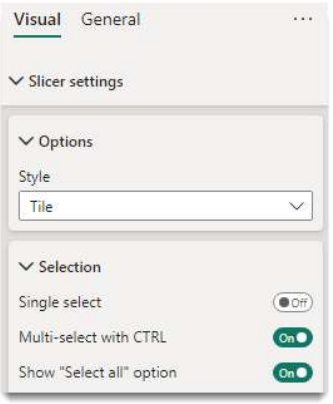
Slicers

Slicer Types

Slicer Types

Slicers operate *on canvas* as Checkboxes | Radio Buttons | Dropdown lists | Buttons | Sliders





Note:

Slicers can be used by clients to filter the visuals to analyse as needed

They are styled with the Slicer settings
Pptions and Selection

Design Report

Publishing

Pre-Publishing

Note:

This list is not exhaustive, but a guidance on the key points to check before publishing

Publishing your Report

Once a report is completed it is best practice to run through a pre-publish checklist

- ❑ Check the project name
- ❑ Check the page names
- ❑ Check the header icons (for every visual)
- ❑ Navigation - hide the pages you do not want in your navigation

  detail pages & tooltips
- ❑ Filters pane (on/off)

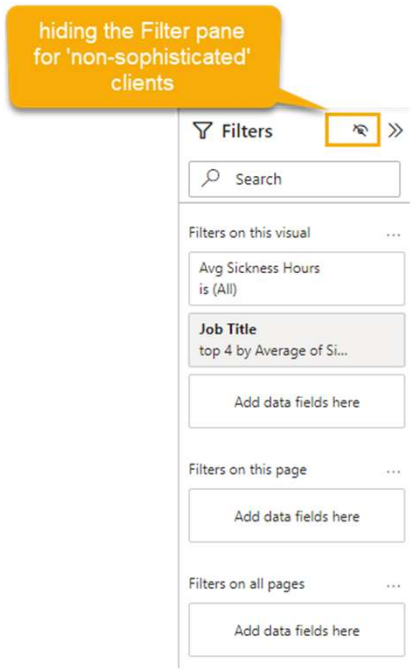
Design Report

Publishing

Hiding Filter pane and Pages

Hiding Filter pane and Pages

Choose elements to hide from your clients



Note:

Hide the **Filter pane** if you believe that your clients may not understand how to use this effectively

Choose **pages you wish to hide** from the auto-report navigation

Power BI
Report Design
Completed

Power BI Desktop

Transform

Design Report

Data Transform
Report set up
Visuals
Drill-down
Drill-through
Pre-publish

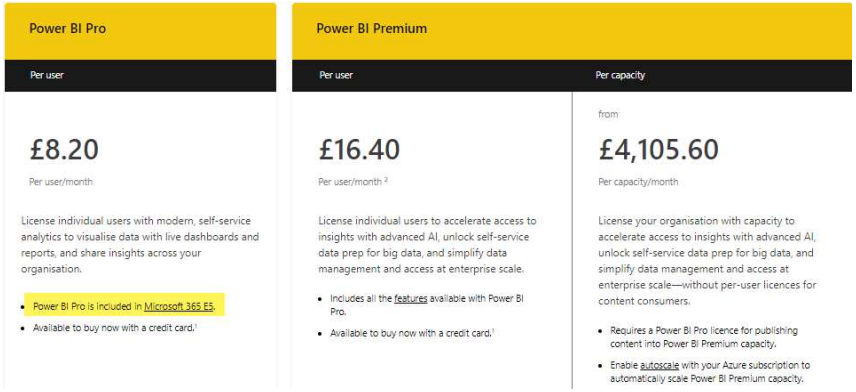
Power BI Service

Service

Workspaces
Reports & datasets
Sharing
Dashboards
Alerts
Refreshing data

Licenses Types and Costs

POWER BI LICENCE	FREE	PRO	PREMIUM
Cost	Free	£8.20/u/m	> £16.20/m/Licenced by Capacity £4,106 unlimited
Data Capacity Limit	10GB	10GB	100TB (102,400GB)
Maximum size of a DataModel	1GB	1GB	10GB
Create and View Dashboards & Reports	Y	Y	Y
Share Dashboards & reports with other BI Users	N	Y	Y
Power BI Desktop	Y	Y	Y
Access via mobile Devices	Y	Y	
Publish to Web	Y	Y	Y
Export to PowerPoint/CSV	N	Y	
Publish to Sharepoint	N	Y	
Data Scheduled Refresh	8 per day	8 Per Day	48 Per Day
Minimum Time Between Refreshes	30min	30min	1min
Live Data Sources	N	Y	



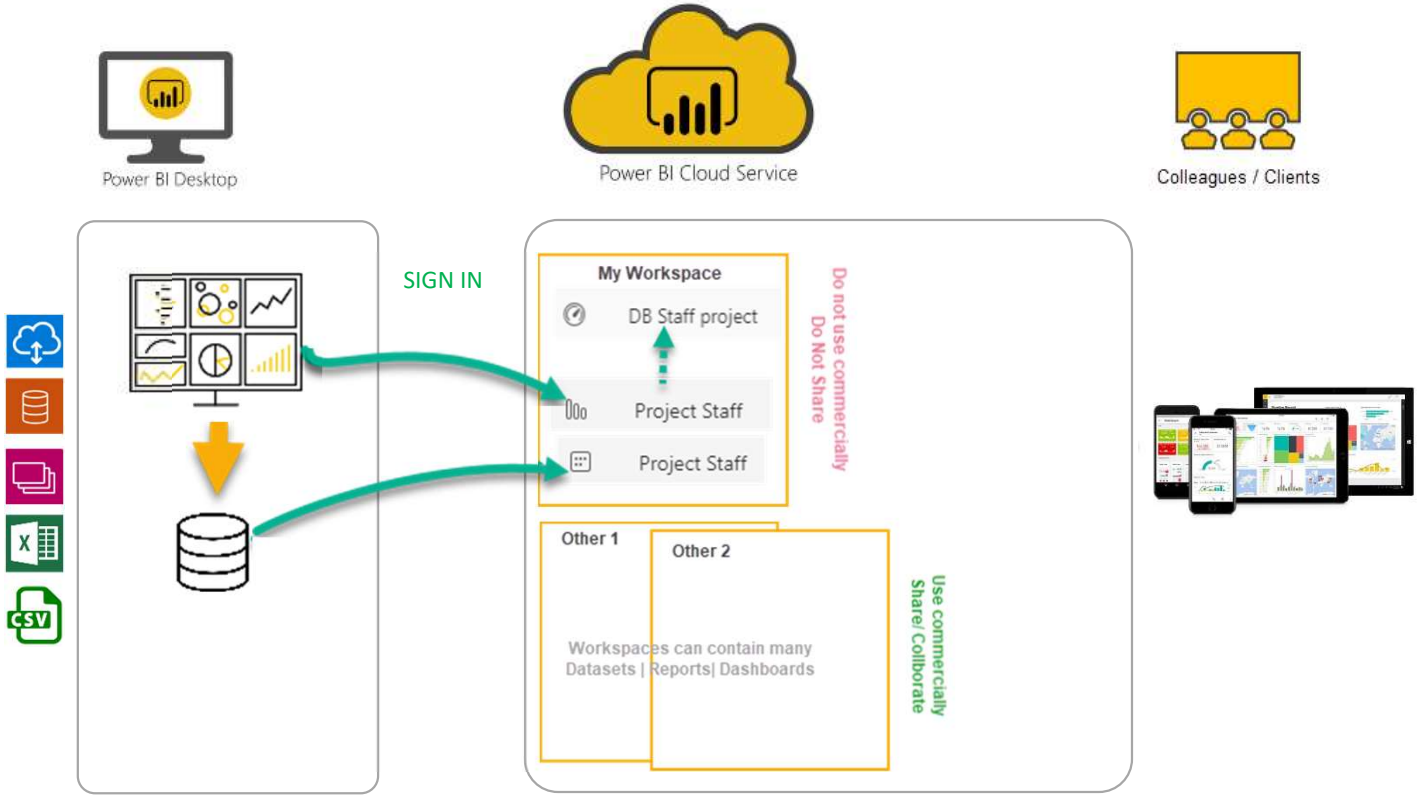
Publishing Workspaces

What are Workspaces?

Workspaces are places to collaborate with colleagues on specific content.

Every licence Free | Pro | Premium will be provided with '**My Workspace**' use for personal (non-commercial use)

Pro | Premium will enable you to create additional workspaces as needed for sharing/collaboration



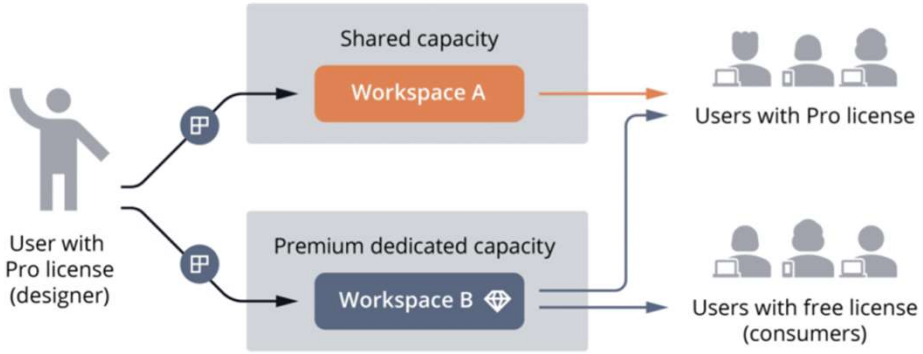
Licenses
Clients

Do clients need licences?

Clients *may* require licences subject to how the report /dashboard is shared and also subject to your licence;

Pro & **Premium PU** (user will need pro licences)

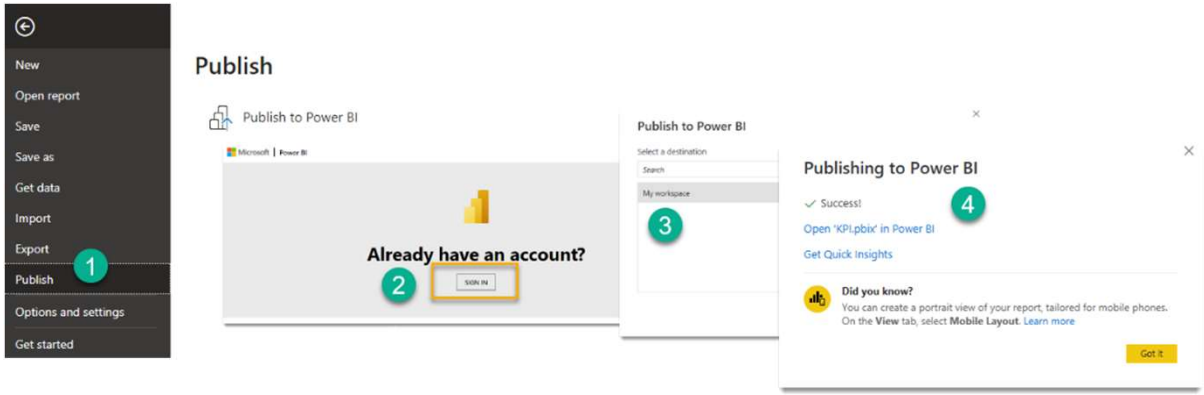
Premium Capacity (users will not need licences – just to sign-in)



Publishing Report & Dataset

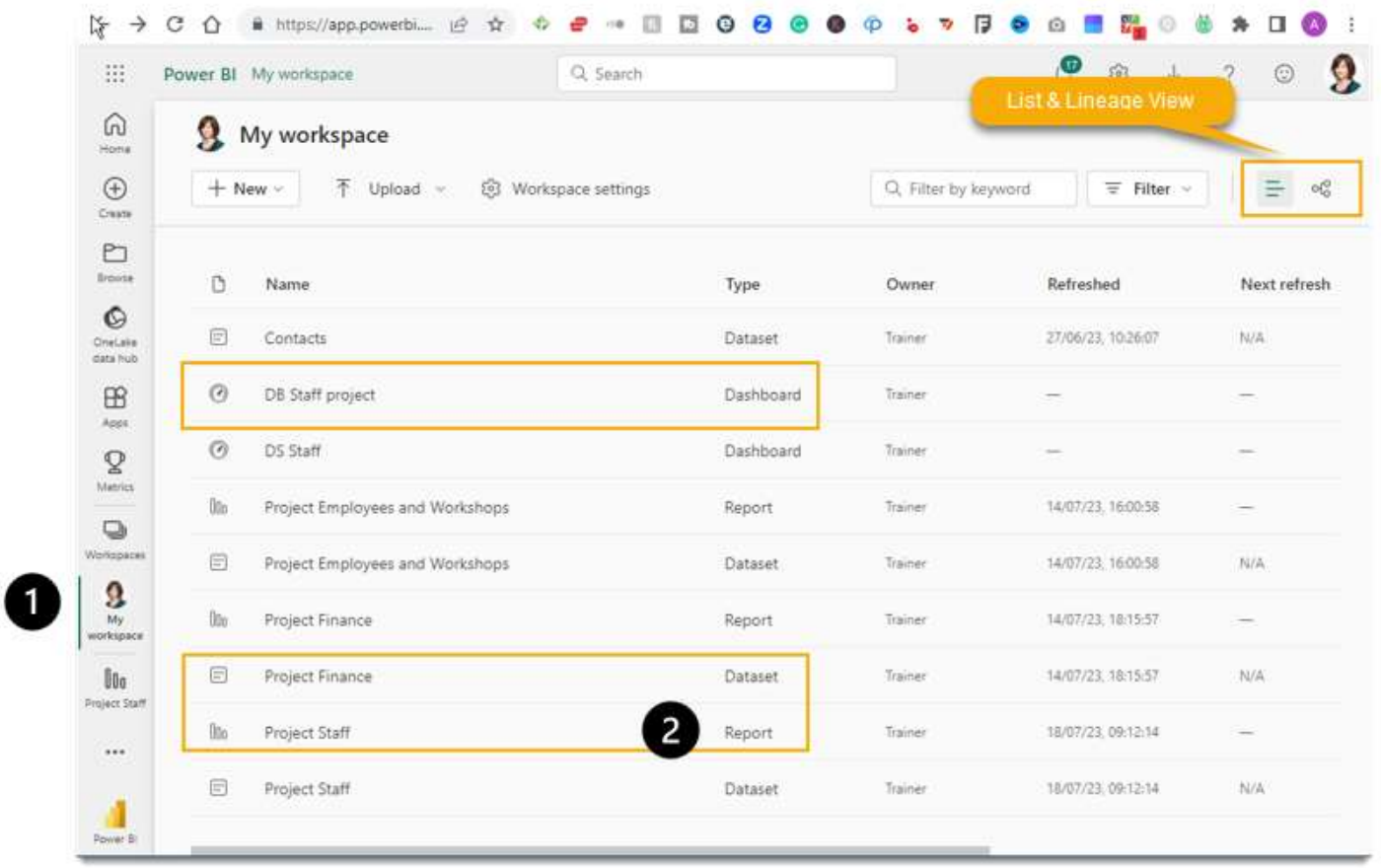
Publish

1. File > Publish
2. Sign-in to your Power BI service account & choose **Publish > My Workspace**
3. if you are using the Free Power BI account then you only have ONE workspace 'My Workspace' (Premium or Pro gives you many workspaces & share)
4. Go to your Power BI Service - See **Reports (not dashboard)**



Power BI Service Workspace

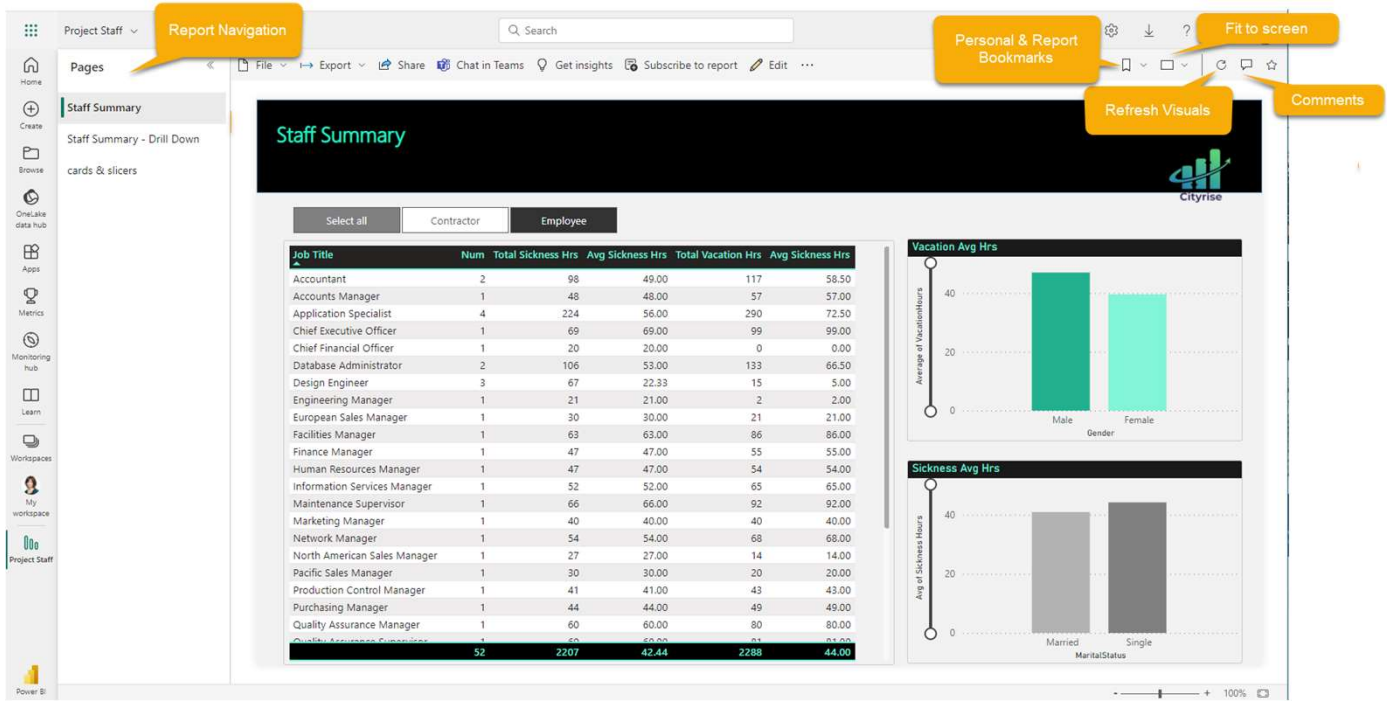
Workspaces



Power BI Service Report

Report Options

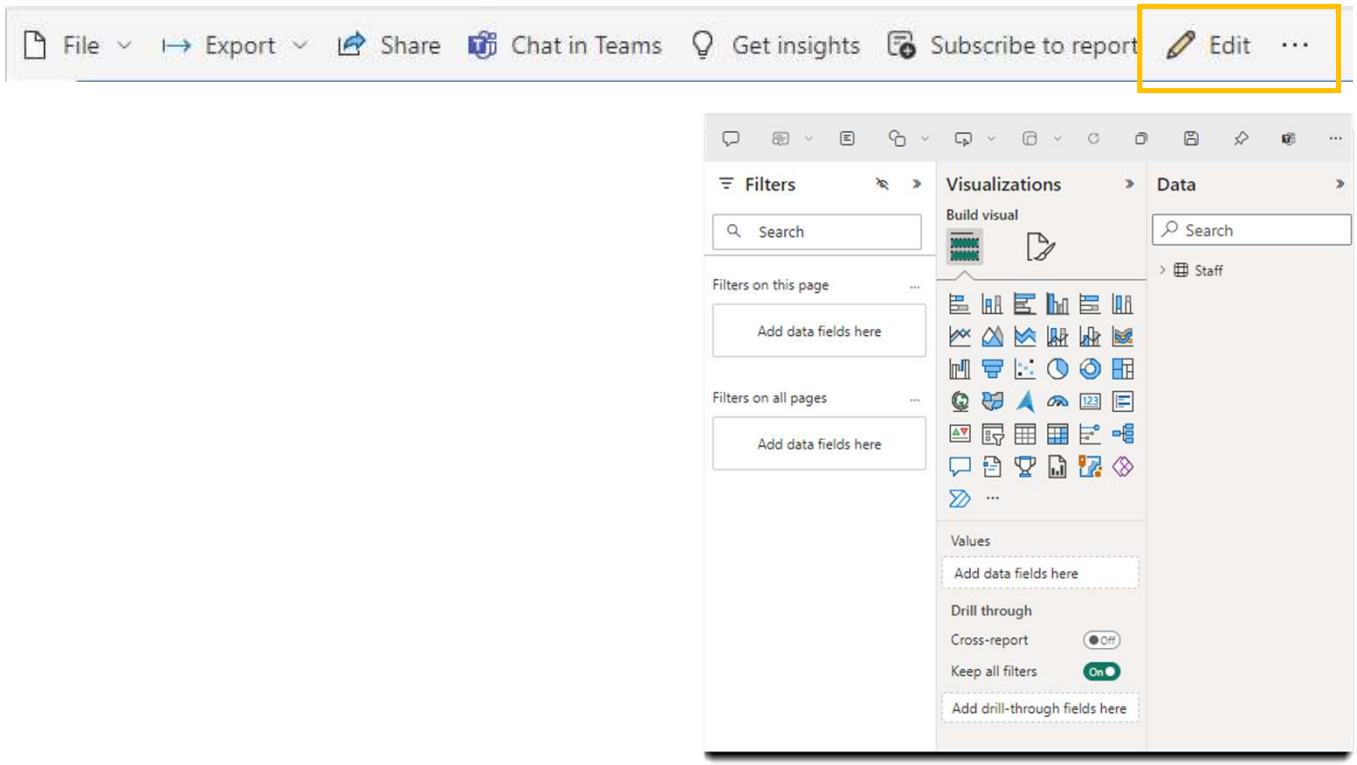
Each client / user will have certain report option for them to use



Power BI Service Edit

Report Edit

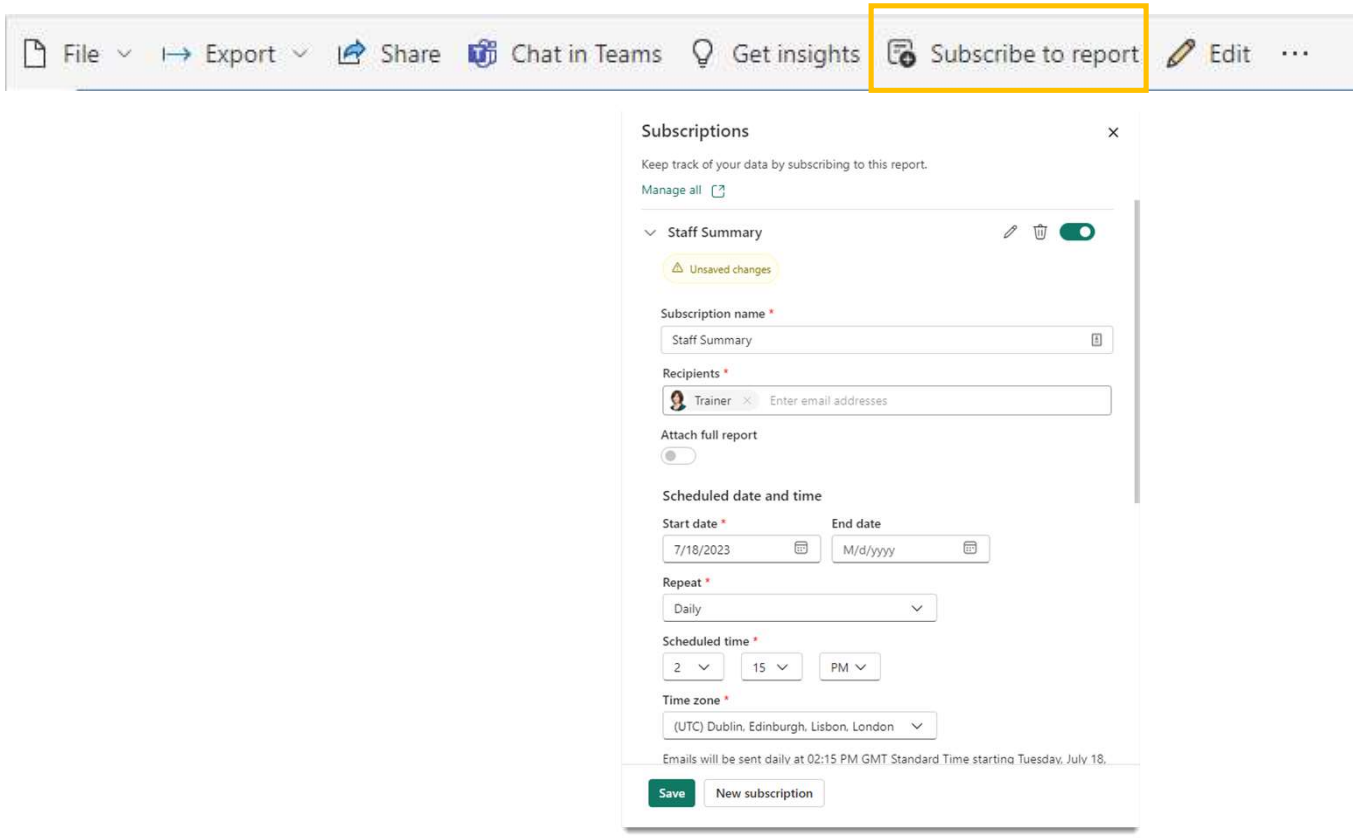
You can continue to edit your report (like Power BI Desktop)



Power BI Service Subscribe

Subscribe to a Report

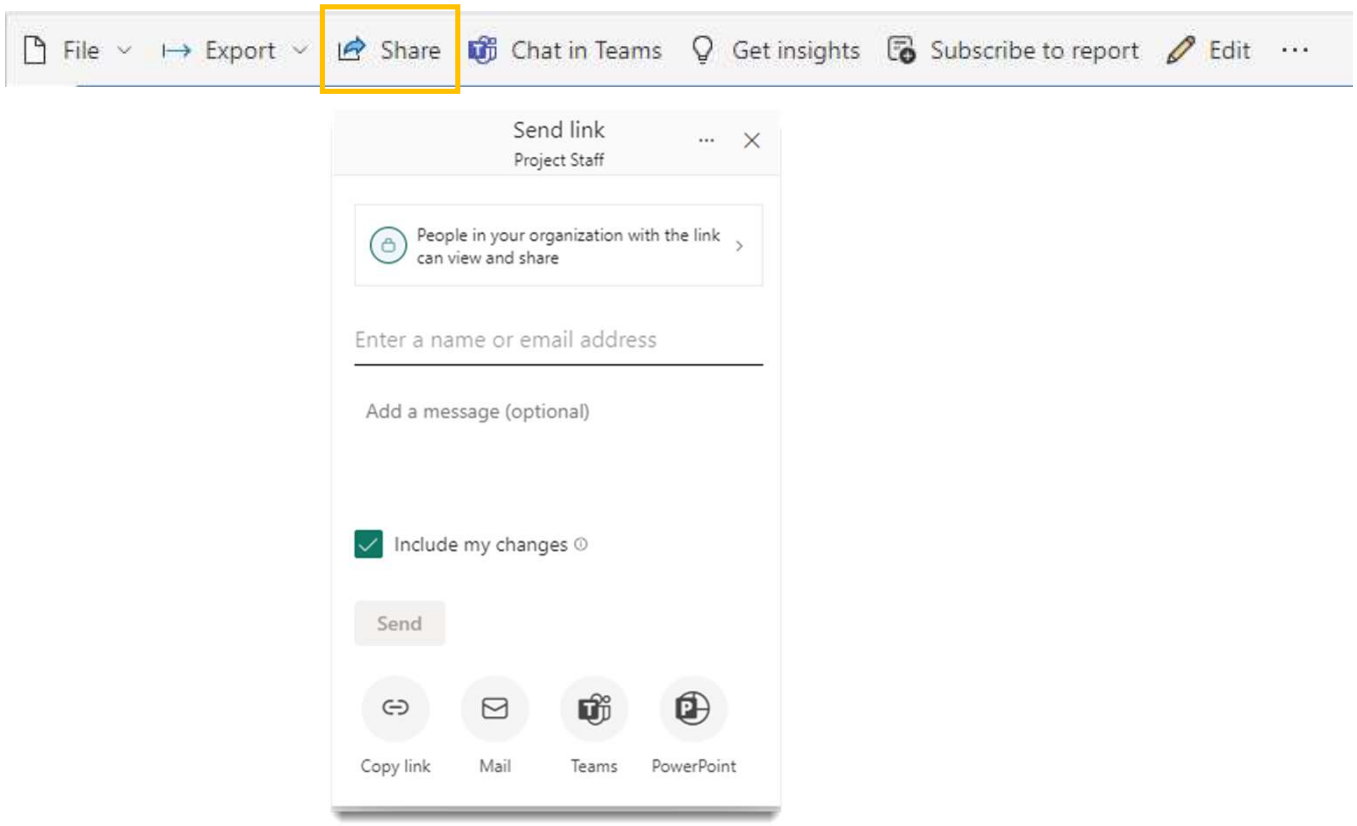
You can continue subscribe clients/colleagues to receive scheduled screens of the report pages by email



Power BI Service Sharing

Share your Report

You can obtain and pass on the sharing URL for your report by Copy link |Email | Teams | PowerPoint

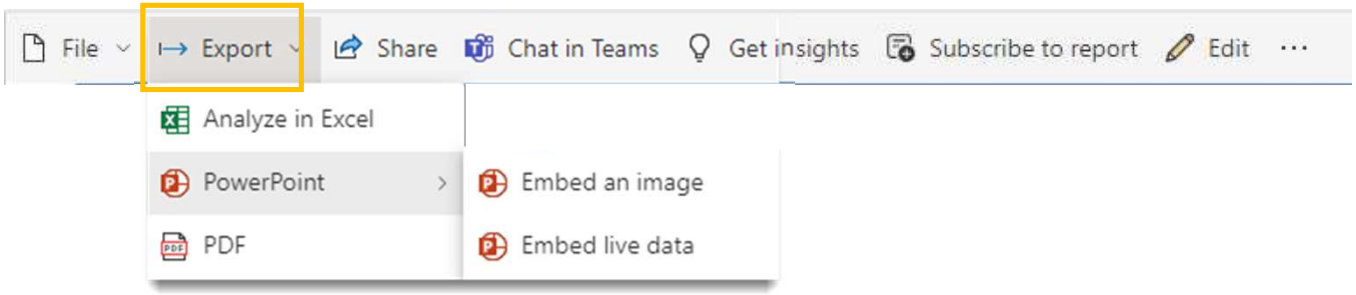


Power BI Service Exporting

Exporting your Report

You can obtain export your report as:

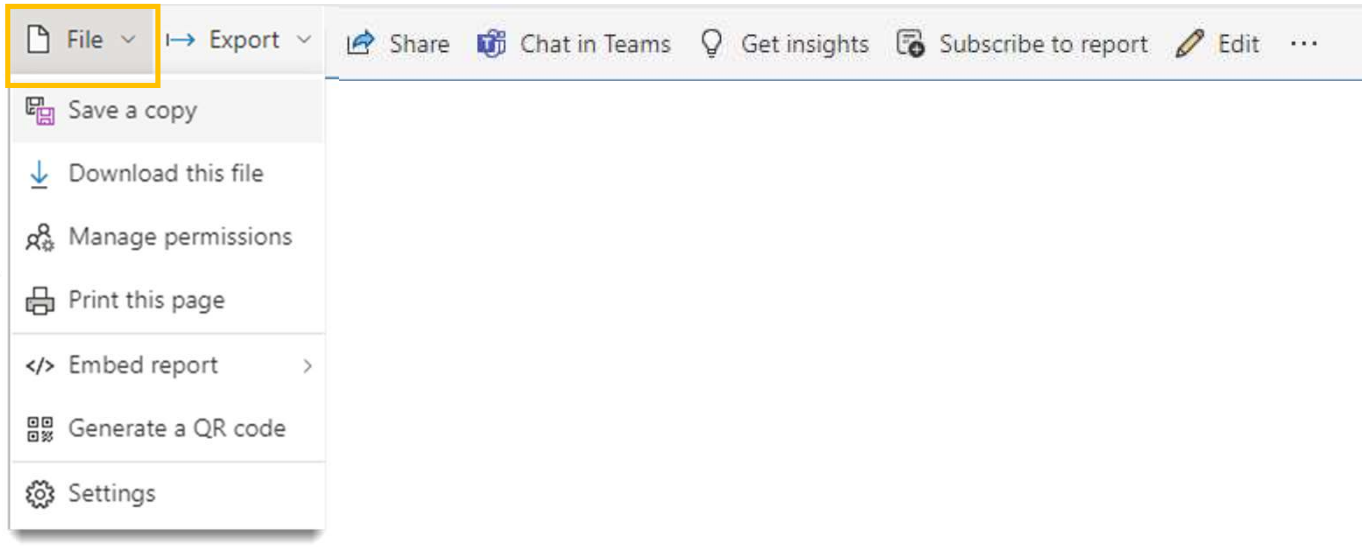
- **Excel** Power Pivot data set
- Embed static or live report in **PowerPoint**
- **PDF** pages



Power BI Service
File Options

File Options

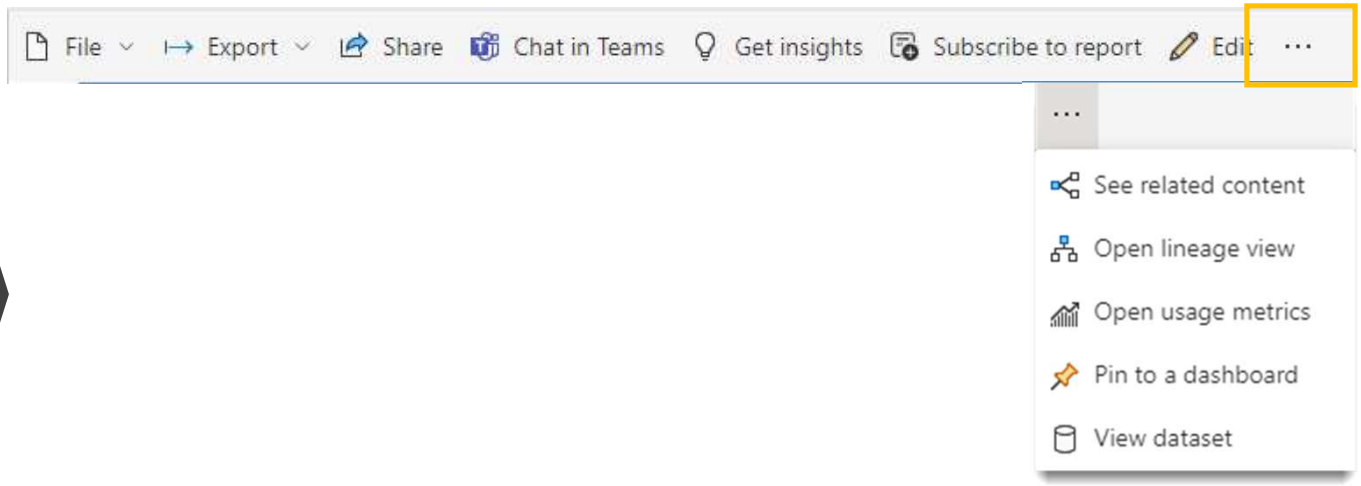
You can **Manage | Embed | Download | Save** your Power BI report in a number of useful additional ways



Power BI Service More …

More Options

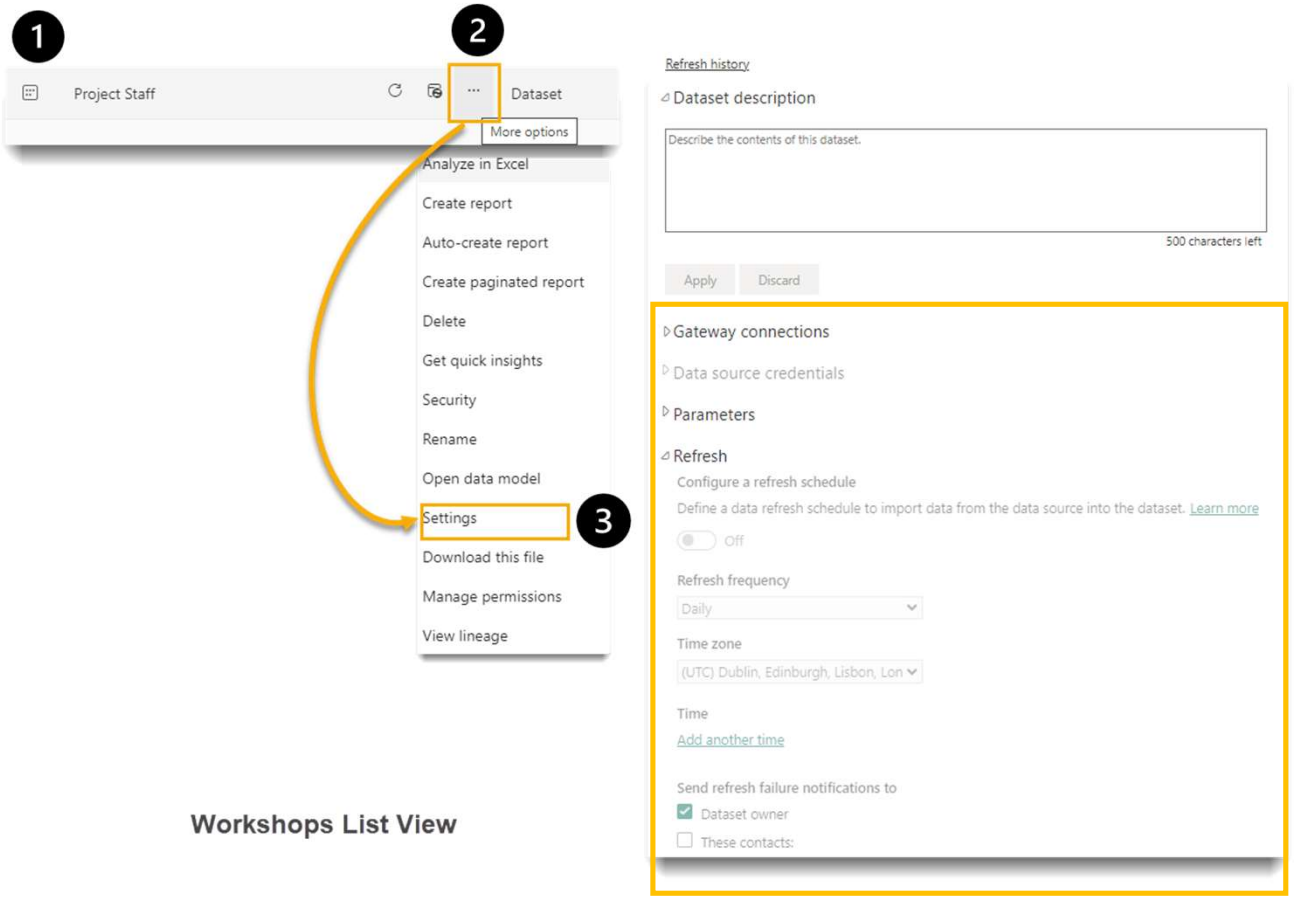
You can manage additional report features also.



Power BI Service
Data Refresh

Managing Data Refreshes

To refresh your report data you will need to refresh the underlying **dataset**



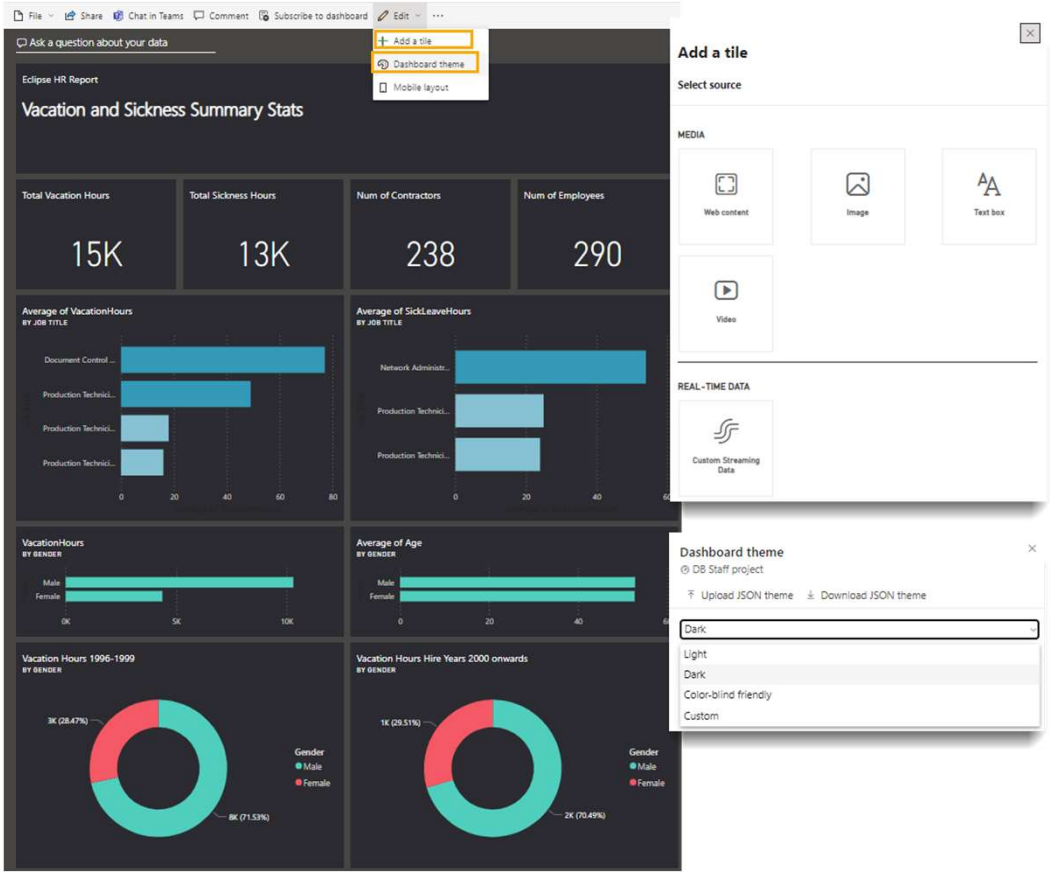
Workshops List View

Power BI Service Dashboards

Dashboards

A dashboard can be created from Report Visuals or from scratch

Dashboards can share visuals from **more than one report**



Power BI Completed

Power BI Desktop

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Power BI Service

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END