



## Power Platform Finance – Row Level Security and Hierarchies

This document was produced on the 3<sup>rd</sup> April by Power Platform Finance.

For more information and future events, please visit <https://www.powerplatformfinance.com/>

### Files and attachments

The files for this session:

<b>Source</b>	<b>Information</b>
Salaries and Commission Data	Excel file containing the data you will need to build out the report
Salaries and Commission Data – Worked Example	Power BI file containing a worked example
Power Platform Finance Background Image	Background image for your report
Theme	File with sets the Power Platform Theme for your report

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# 1) Enabling the new ribbon experience and customisable theme

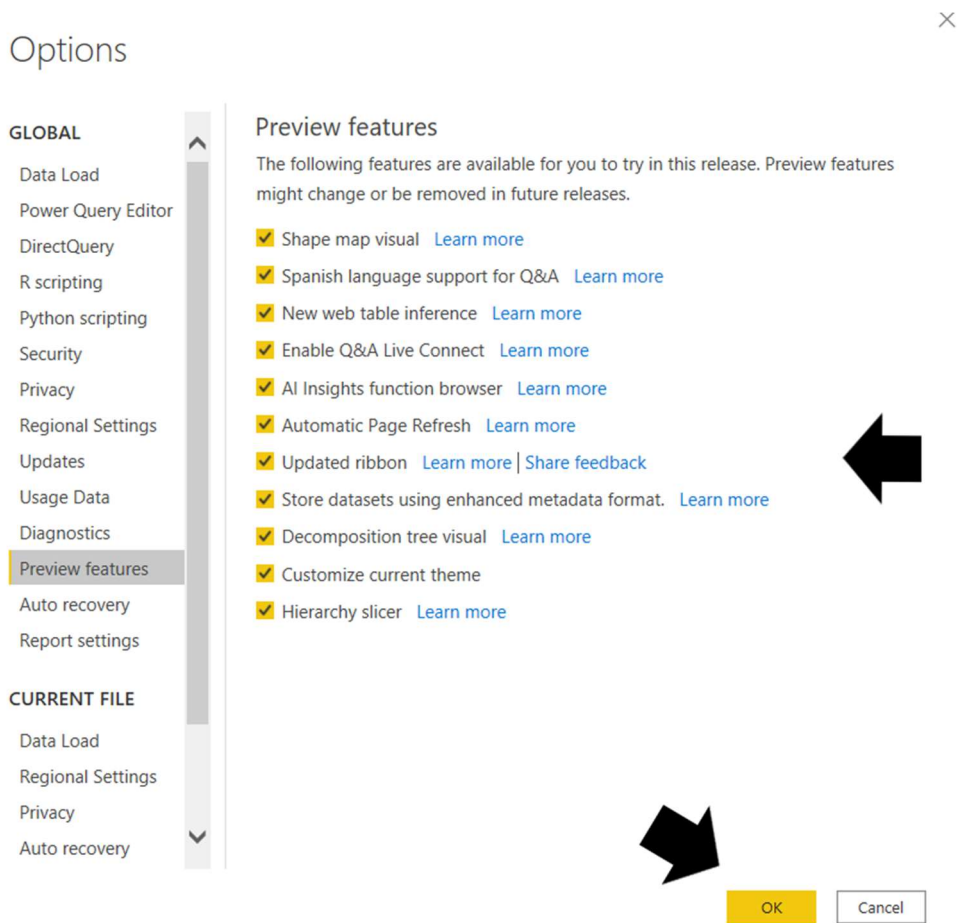
1.1) Open Power BI Desktop

1.2) Turn on the preview feature for “Updated Ribbon”

1.3) Go to: File → Options and Settings → Options → Preview Features

1.4) Tick: “Updated ribbon” & “Customize Current Theme”

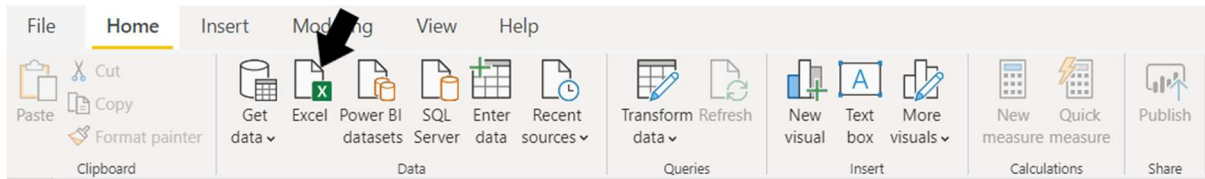
1.5) Select: “Ok” & restart as prompted





## 2) Importing and transforming the data

2.1) On the “Home” tab, select “Excel”



2.2) Navigate to where you saved the “Salaries and Commission Data.xlsx” and select the tables “Accounts”, “Date”, “Employee”, “FTSE100 Companies”, “Revenue” & “Target” then select “Transform Data”

### Navigator

Display Options ▾

- Salaries and Commission Data.xlsx [12]
  - Accounts
  - Date
  - Employees
  - FTSE100Companies
  - Revenue
  - Target
  - Dates
  - EmployeesHierarchy
  - FTSE100 Companies
  - Responsible
  - Revenue by company
  - Target by company

Target

Ticker	Jan-2019	Feb-2019	Mar-2019	Apr-2019	May-2019	Jun
III	66000	66000	66000	66000	66000	66000
ADM	143000	143000	143000	143000	143000	143000
AAL	63000	63000	63000	63000	63000	63000
ANTO	93000	93000	93000	93000	93000	93000
AHT	52000	52000	52000	52000	52000	52000
ABF	112000	112000	112000	112000	112000	112000
AZN	110000	110000	110000	110000	110000	110000
AUTO	100000	100000	100000	100000	100000	100000
AVV	79000	79000	79000	79000	79000	79000
AV.	63000	63000	63000	63000	63000	63000
BA.	81000	81000	81000	81000	81000	81000
BARC	78000	78000	78000	78000	78000	78000
BDEV	75000	75000	75000	75000	75000	75000
BKG	44000	44000	44000	44000	44000	44000
BHP	95000	95000	95000	95000	95000	95000
BP.	90000	90000	90000	90000	90000	90000
BATS	57000	57000	57000	57000	57000	57000
BLND	84000	84000	84000	84000	84000	84000
BT.A	97000	97000	97000	97000	97000	97000
BNZL	48000	48000	48000	48000	48000	48000
BRBY	80000	80000	80000	80000	80000	80000
CCL	97000	97000	97000	97000	97000	97000
CNA	63000	63000	63000	63000	63000	63000

Load
Transform Data
Cancel

Note: You are connecting to the “Tables” within excel, not the excel sheet.

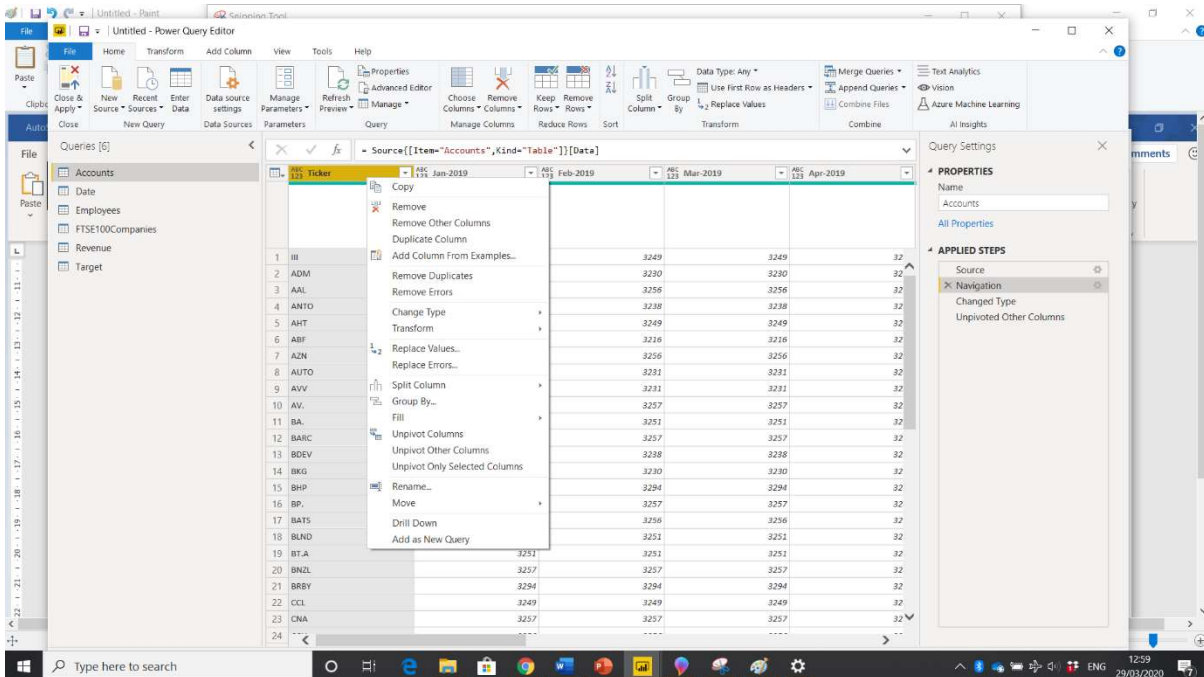
You can see the difference in the symbol of the ticked tables compared to the unticked tabs.

It is advisable to use tables when connecting with Excel, when you change your excel table (in either width or length) Power BI will automatically recognise the changes

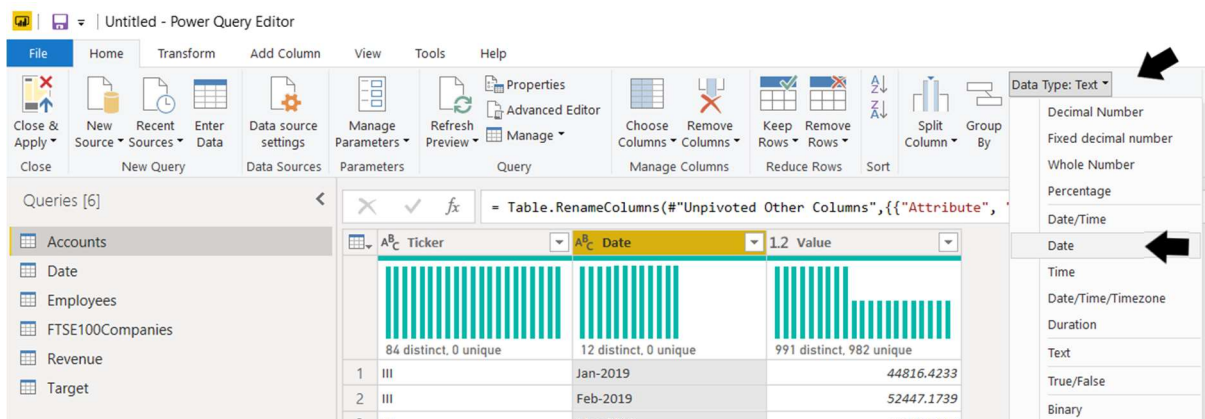


2.3) When in query editor, select the “Accounts” table then:

- Right click on the “Ticker” and select “Unpivot Other Columns”



- Right click on the “Attribute” column and select “Rename” then rename as “Date”
- Right click on the “Values” column and rename as “Employee Responsible”
- With “Date” column selected, choose “Date Type” > “Date”



2.4) Repeat step 2.3 for the “Revenue” and “Target” tables except when renaming “Values” rename correspondingly as “Revenue” or “Target”

2.5) Click “Close & Apply” to apply the changes



### 3) Assigning individuals to revenue and targets

#### 3.1) Assign the revenue and target to an employee

- In the “Data” view (left hand side) navigate to the “Revenue” table (right hand side)
- Add a “New Column” for the Employee ID using the DAX below:

```
Employee Responsible =  
LOOKUPVALUE (  
    Accounts[Employee Responsible],  
    Accounts[Date], Revenue[Date],  
    Accounts[Ticker], Revenue[Ticker]  
)
```

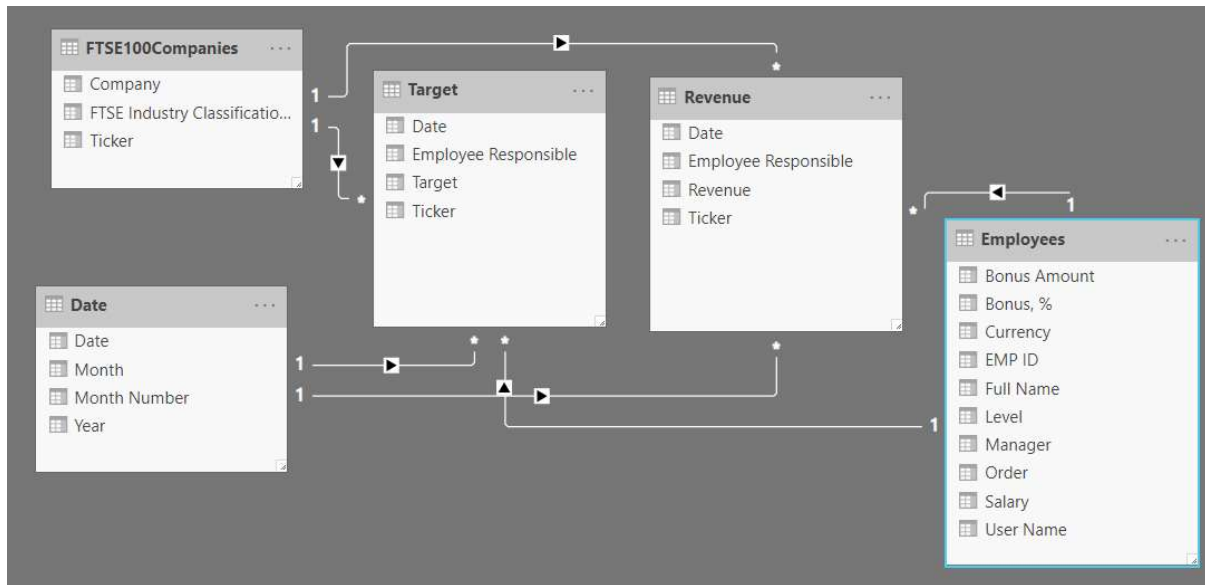
- Repeat but for the “Targets” table use the DAX below when adding a new column:

```
Employee Responsible =  
LOOKUPVALUE (  
    Accounts[Employee Responsible],  
    Accounts[Date], Target[Date],  
    Accounts[Ticker], Target[Ticker]  
)
```



## 4) Building the data model

- In the model view, create a diagram as per the below:



- You can either drag the relationships from one table to the next or go to “Manage Relationship” (1) -> “New” (2) then create each relationship by selecting the Table from (3) and Column from (4) with the Table To (5) and Column (6)

- List of relationships below:

**Active Relationships:**

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	Revenue (Date)	Date (Date)
<input checked="" type="checkbox"/>	Revenue (Employee Responsible)	Employees (EMP ID)
<input checked="" type="checkbox"/>	Revenue (Ticker)	FTSE100Companies (Ticker)
<input checked="" type="checkbox"/>	Target (Date)	Date (Date)
<input checked="" type="checkbox"/>	Target (Employee Responsible)	Employees (EMP ID)
<input checked="" type="checkbox"/>	Target (Ticker)	FTSE100Companies (Ticker)

**Edit relationship configuration:**

Select tables and columns that are related.

From: Target (Date) [3]

Ticker	Date	Target	Employee Responsible
III	01 January 2019	6000	3249
ADM	01 January 2019	14000	3230
AAL	01 January 2019	63000	3256

To: FTSE100Companies (Ticker) [5]

Company	Ticker	FTSE Industry Classification Benchmark sector[12]
3i	III	Financial Services
Admiral Group	ADM	Life Insurance [6]
Anglo American plc	AAL	Mining

Cardinality: Many to one (\*:1) | Cross filter direction: Single

Make this relationship active |  Apply security filter in both directions

Assume referential integrity

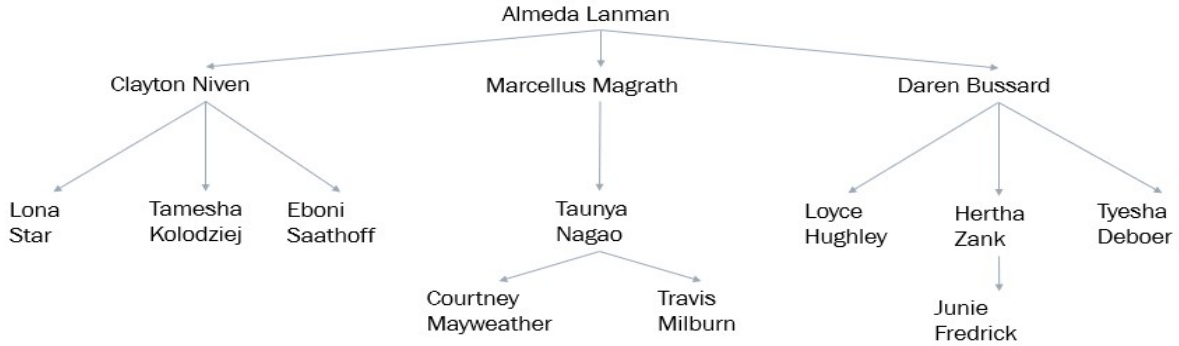
Buttons: New..., Autodetect..., Edit..., Delete, OK, Cancel



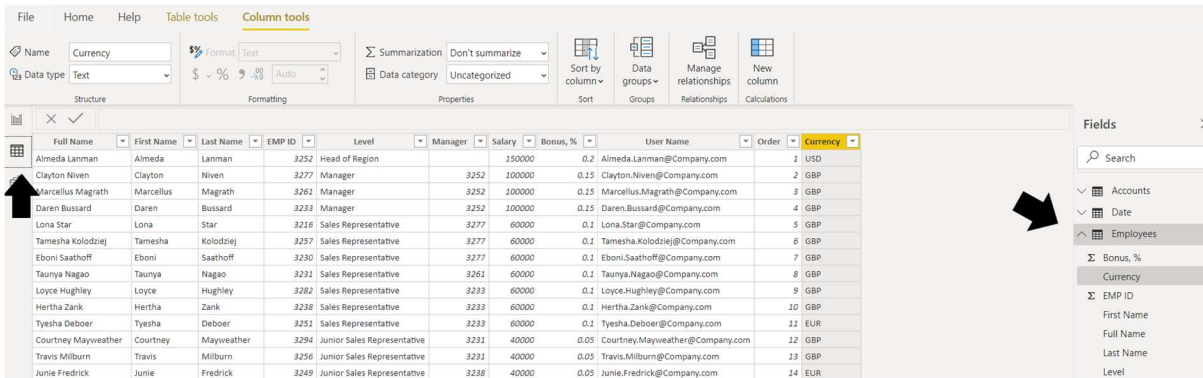
## 5) Setting up the Parent Child Hierarchy

For further reading on setting up Parent Child Hierarchies see Dax Patterns - <https://www.daxpatterns.com/parent-child-hierarchies/>

### Hierarchy



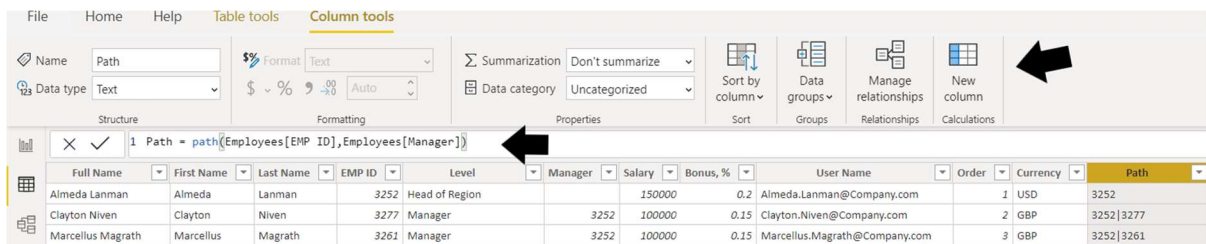
4.1) In the "Data" view (select on left hand side) navigate to the "Employees" table (right hand side)



4.2) Defining the hierarchical path from:

- There is a roll up from "Employee" to "Manager"
- Using the "Path" function you can specify the hierarchical roll up for each employeee
- Select "New Column" then use the below DAX formula:

Path = "|" & PATH (Employees[EMP ID], Employees[Manager] ) & "|"







## 6) Setting up the security

### 5.1) Apply the security

- For each individual level, we need to be able to use their user name so when they log in we can apply the appropriate security
- In the “report” view go to the “Modelling” tab then “Manage roles” (1) → “Create” (2)
- Name the role “All Users”
- Selected “Employees” (3) and in the white space add the DAX below

The screenshot shows the 'Manage roles' dialog box in Power BI. The 'Modelling' tab is active, and the 'Manage roles' button is highlighted with a blue '1' and an arrow. The 'Create' button is highlighted with a blue '2' and an arrow. The 'Employees' table is selected in the 'Tables' list with a blue '3' and an arrow. The 'Table filter DAX expression' field is highlighted with a blue '4' and an arrow, containing the following DAX code:

```
VAR UserID =
    "&quot;|" &
    LOOKUPVALUE (
        Employees[EMP ID],
        Employees[User Name],
        USERPRINCIPALNAME ()
    )
    & "&quot;|"
RETURN
ISERROR (
    FIND ( userid, Employees[Path] )
) = FALSE ()
```

```
VAR UserID = "&quot;|" & LOOKUPVALUE ( Employees[EMP ID], Employees[User Name],
    USERPRINCIPALNAME ()
)
    & "&quot;|"
RETURN
ISERROR ( FIND ( userid, Employees[Path] ) ) = FALSE ()
```





## 7) Testing the security

- On the “Data” tab (1) → “View as” (2) → tick both “Other User” and “All Users” & type in “clayton.niven@company.com” (3)
- Select the “Employees” table (4) and you should see only Clayton and his direct reports.

The screenshot shows the Power BI Desktop interface. The 'Data' tab is active, and the 'View as roles' dialog box is open. The dialog box has the following options:

- None
- Other user: clayton.niven@company.com
- All Users

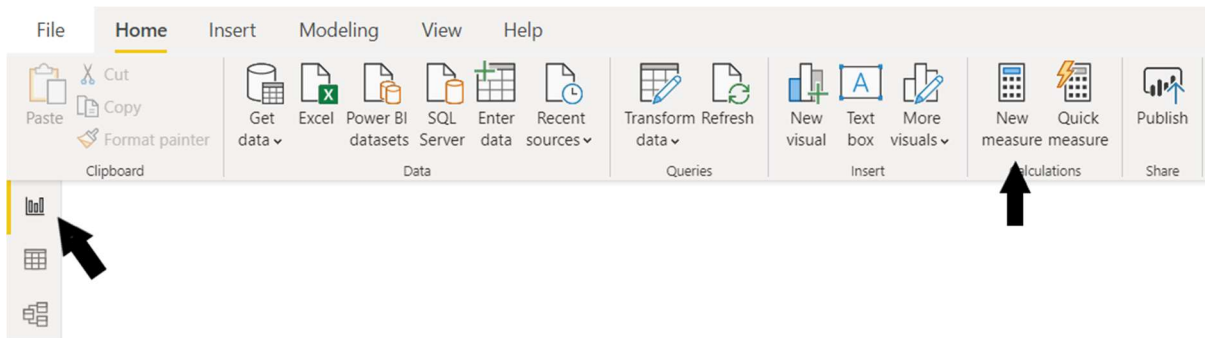
The 'Fields' pane on the right shows the 'Employees' table selected. The main report area displays a table with the following data:

Full Name	Level	EMP ID	Manager	Salary	Bonus, %	Bonus Amount	User Name
Eboni Saathoff	Sales Representative	3230	3277	60000	0.1	6000	Eboni.Saathoff@Company.com
Tamesha Kolodziej	Sales Representative	3257	3277	60000	0.1	6000	Tamesha.Kolodziej@Company.com
Lona Star	Sales Representative	3216	3277	60000	0.1	6000	Lona.Star@Company.com
Clayton Niven	Manager	3277	3252	100000	0.15	15000	Clayton.Niven@Company.com



## 8) Creating the DAX Measures

- On the left hand side, go the "Report" view then select "New Measure"



- Then create each of the following DAX measures in turn first deleting "measure =" if it appears

```
Revenue Amt := SUM ( Revenue[Revenue] )
```

```
Target Amt := SUM ( Target[Target] )
```

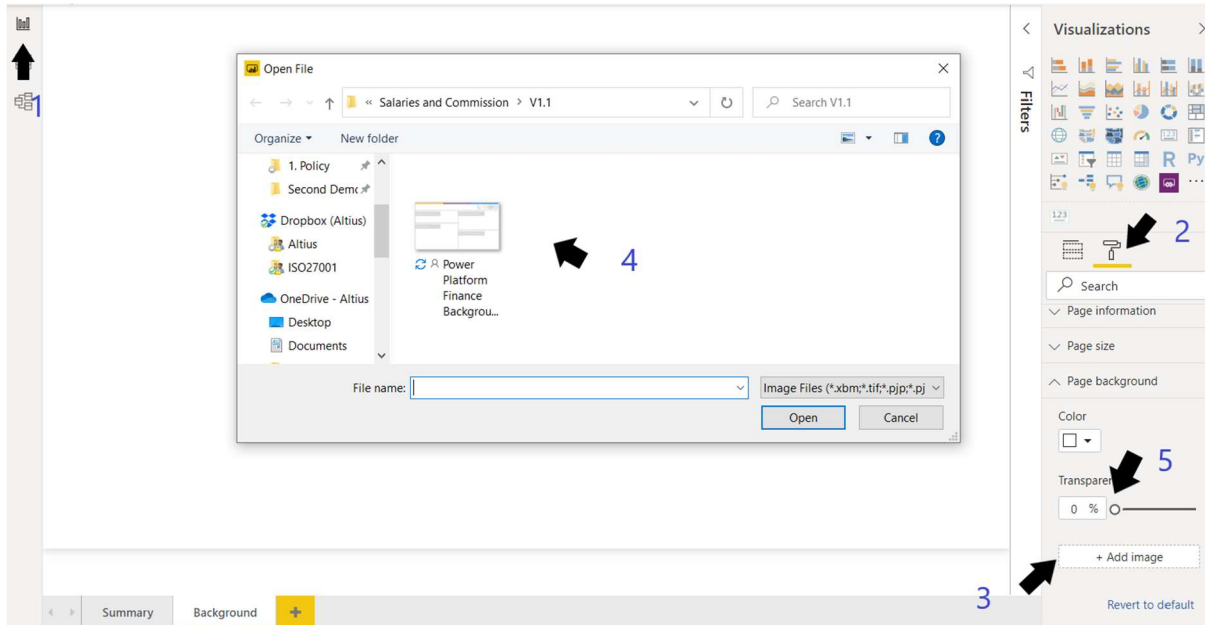
```
Achievement Amt := [Revenue Amt] - [Target Amt]
```

```
Hello :=
"Hello "
&
    LOOKUPVALUE (
        Employees[Full Name],
        Employees[User Name],
        USERPRINCIPALNAME ()
    )
```

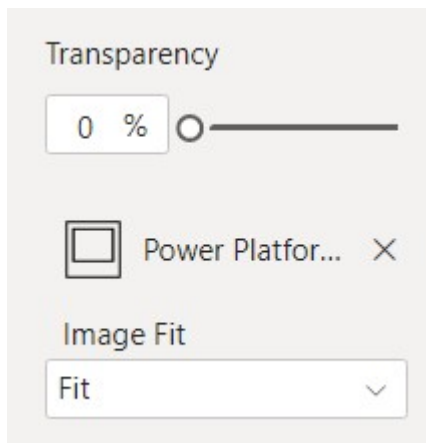


## 9) Add background

- Select the “Report” page (1) → “Format” for the page (2) → “Add Image” (3) → “Select Image” - in files and attachments (4) → change “Transparency” to 0%



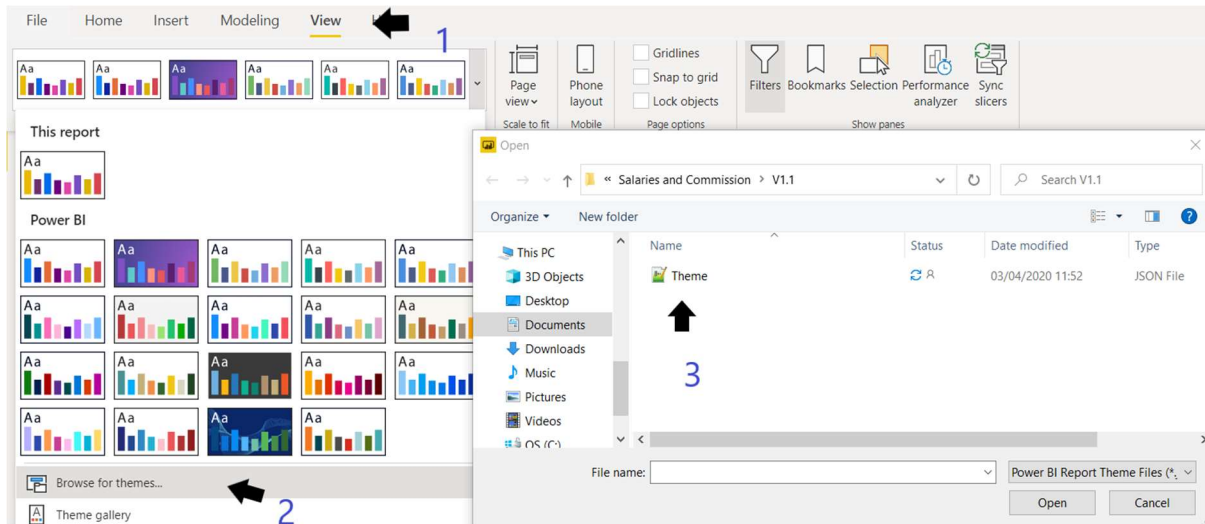
- Change “Image Fit” to “Fit”





## 10) Add theme

- Select “View” (1) → “Browse for themes” (2) → select the “Theme” (3) that is in the files and attachments





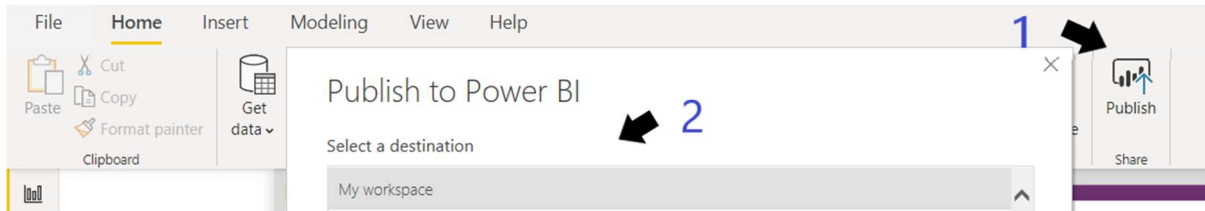
## 11) Design your report

- Design your report as usual by adding visuals
- For an example, you can see the “Salaries and Commission Data – Worked Example “



## 12) Publish to the service

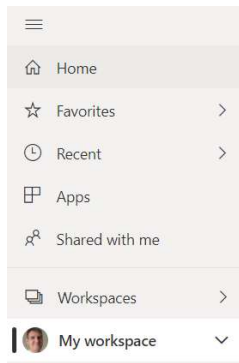
- Select “Home” tab then “Publish” (1)
- Select “My workspace”



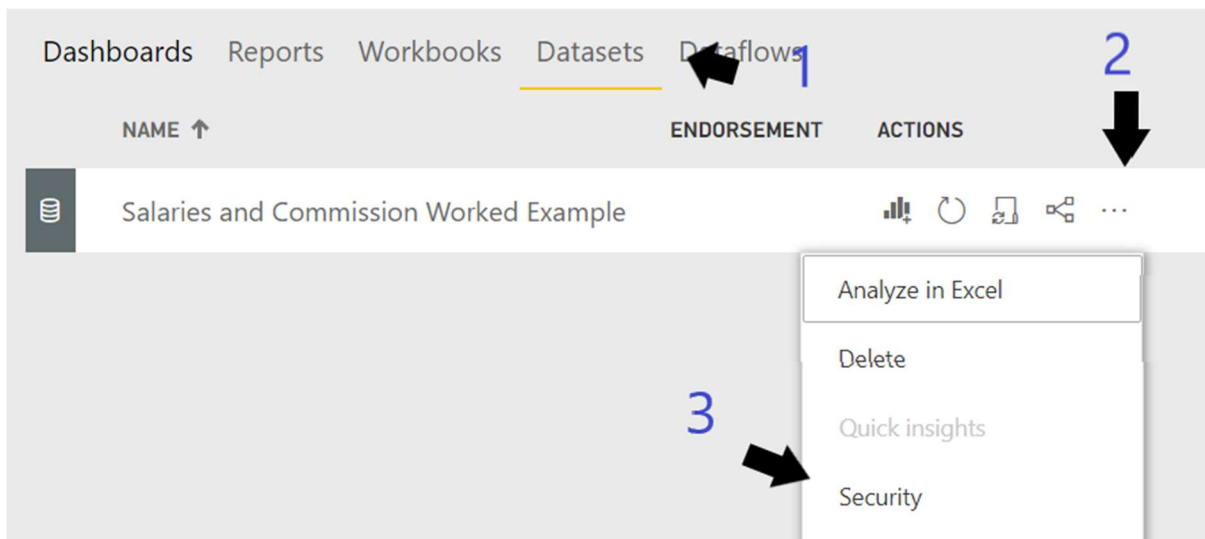


### 13) Set security in the service

- On "Power BI" [website](#) sign in & select "My Workspace"

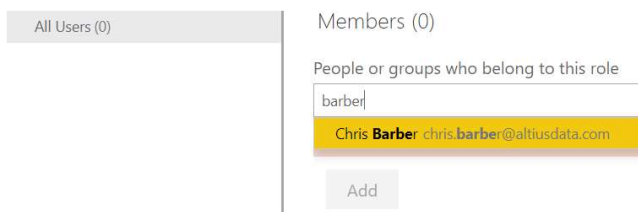


- On "My Workspace", select "Dataset" (1) then "..." (2) then "security"



- On the security tab, you can type in all the users by putting in their name
- Alternatively, you can have an active directory group (i.e., All Sales) and you can put use this. That way, when new salespeople get added, they automatically appear

#### Row-Level Security





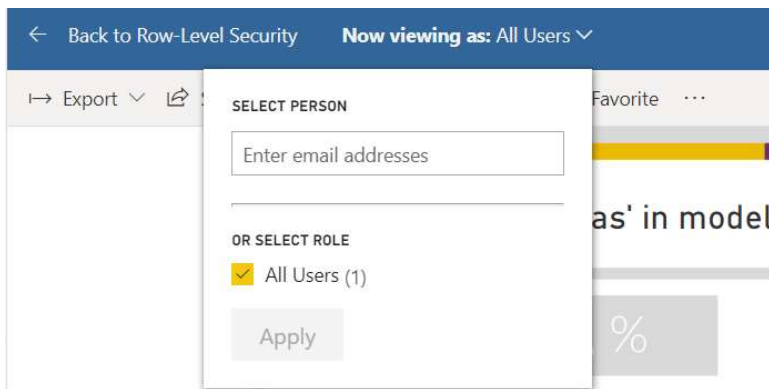


## 14) Testing security in the service

- In the “Security” tab, if you hover your cursor over “All Users” you will see “...”
- Left click on “...” and you will see “Test as role” which you can left click on



- This navigates you to the below screen & you can type each users name and the report will update as if you were the user you have selected





## References and further reading

Star Schema - <https://docs.microsoft.com/en-us/power-bi/guidance/star-schema>

Dax Patterns - <https://www.daxpatterns.com/parent-child-hierarchies/>

RLS - <https://docs.microsoft.com/en-us/power-bi/service-admin-rls>

DAX formatter is used throughout this document - <https://www.daxformatter.com/>

DAX Studio download - <https://daxstudio.org/>

Data protection in power bi (preview) - <https://docs.microsoft.com/en-us/power-bi/admin/service-security-data-protection-overview>