

Model Documenter for Power BI



DaxStudio - 2.5.0

File Home Help

Run Cancel Clear Cache Output Query Edit Format Query To Upper To Lower Comment Uncomment Merge XML Find Query Plan Server Timings Scan Cache Right Layout Bottom Layout Connect Refresh Metadata

Query1.dax* X

```
10 EVALUATE
11 ADDCOLUMNS (
12     SUMMARIZE (
13         Sales,
14         Date, [Calendar Year],
15         Product, [Category Name] ),
16     "Sales", [Sales Amount],
17     "Margin", [Margin]
18 )
```

181 %

Total	SE CPU	Line	Subclass	Duration	CPU	Rows	KB	Query
550 ms	0 ms	1	SQL	301	0			SELECT TOP (1000001) [
	x0.0	2	SQL	231	0			SELECT TOP (1000001) [

FE SE

Contoso DirectQuery

Model

- Currency
- Date
- Product
- Promotion
- Sales
- Store

C:\Projects\AdventureWorks\Model.bim - Tabular Editor 2.1

File Edit View Model

Perspective: (All objects) Translation: (No translation)

Filter

Model

- Data Sources
- Perspectives
- Relationships
- Roles
- Tables
- Date

DAX Editor Advanced Scripting

```
[Reseller Current Quarter Sales] :=
TOTALQTD([Reseller Total Sales], 'Date'[Date])
```

Basic

Description	
Display Folder	Sales
Hidden	False
Name	Reseller Current Quarter Sales
Object Type	Measure

Metadata

DAX identifier	
Format String	[Reseller Current Quarter Sales]
	\\$#.00;(\\$#.00);\\$#.00

Options

Other

Translations and Perspectives

Captions	
Descriptions	0 empty, 0 translated, 0 default
Display Folders	0 empty, 0 translated, 0 default
Perspectives	Shown in 1 out of 3 perspectives

Internet Operation False

Inventory False

Reseller Operation True

Metadata

ALM Toolkit for Power BI

File Home Help

Compare Select Actions Validate Update Generate Script Options Report Differences

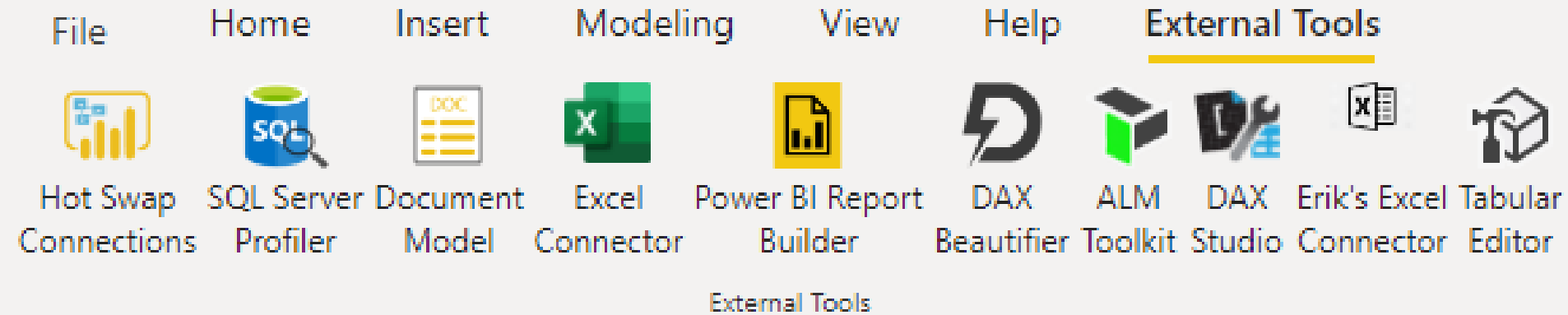
Source [azure://southcentralus.azure.windows.net/chwade003.AdventureWorks2] Target [azure://southcentralus.azure.windows.net/chwade003.AdventureWorks3]

Type	Source Name	Status	Target Name	Action
Data Source	SQL/localhost/SPT/AdventureWorksDW	Different Definitions	SQL/localhost/SPT/AdventureWorksDW	Update
Expression	RangeEnd	Missing in Target		Skip
Expression	RangeStart	Missing in Target		Skip
Table	DimCustomer	Same Definition	DimCustomer	Skip
Relationship	'DimCustomer'[GeographyKey] -> 'DimGeography'[GeographyKey]	Same Definition	'DimCustomer'[GeographyKey] -> 'DimGeography'[GeographyKey]	Skip
Table	DimDate	Different Definitions	DimDate	Update
Measure	DaysCurrentQuarterToDate	Same Definition	DaysCurrentQuarterToDate	Skip
Measure	DaysInCurrentQuarter	Same Definition	DaysInCurrentQuarter	Skip
Table	DimEmployee	Different Definitions	DimEmployee	Update
Table	DimGeography	Same Definition	DimGeography	Skip
Table	DimProduct	Same Definition	DimProduct	Skip
Relationship	'DimProduct'[ProductSubcategoryKey] -> 'DimProductSubcategory'[ProductSubcategoryKey]	Same Definition	'DimProduct'[ProductSubcategoryKey] -> 'DimProductSubcategory'[ProductSubcategoryKey]	Skip
Table	DimProductCategory	Missing in Source	DimProductCategory	Delete
Table	DimProductSubcategory	Same Definition	DimProductSubcategory	Skip
Relationship	'DimProductSubcategory'[ProductCategoryKey] -> 'DimProductCategory'[ProductCategoryKey]	Same Definition	'DimProductSubcategory'[ProductCategoryKey] -> 'DimProductCategory'[ProductCategoryKey]	Skip
Table	FactInternetSales	Missing in Target		Skip
Relationship	FactInternetSales[CustomerKey] -> DimCustomer[CustomerKey]	Missing in Target		Skip
Relationship	FactInternetSales[DueDateKey] -> DimDate[DateKey]	Missing in Target		Skip
Relationship	FactInternetSales[OrderDateKey] -> DimDate[DateKey]	Missing in Target		Skip
Relationship	FactInternetSales[ProductKey] -> DimProduct[ProductKey]	Missing in Target		Skip
Measure	FactInternetSales[ShipDateKey] -> DimDate[DateKey]	Missing in Target		Skip
Measure	InternetCurrentQuarterMargin	Missing in Target		Skip
Measure	InternetCurrentQuarterSales	Missing in Target		Skip
Measure	InternetDistinctCountSalesOrder	Missing in Target		Skip
Measure	InternetOrderLinesCount	Missing in Target		Skip
Measure	InternetPreviousQuarterMargin	Missing in Target		Skip

```
1 {
2   "name": "DimProduct",
3   "columns": [
4     {
5       "name": "Class",
6       "dataType": "string",
7       "sourceColumn": "Class"
8     }
9   ]
10 }
```

```
1 {
2   "name": "DimProduct",
3   "columns": [
4     {
5       "name": "Class",
6       "dataType": "string",
7       "sourceColumn": "Class"
8     }
9   ]
10 }
```

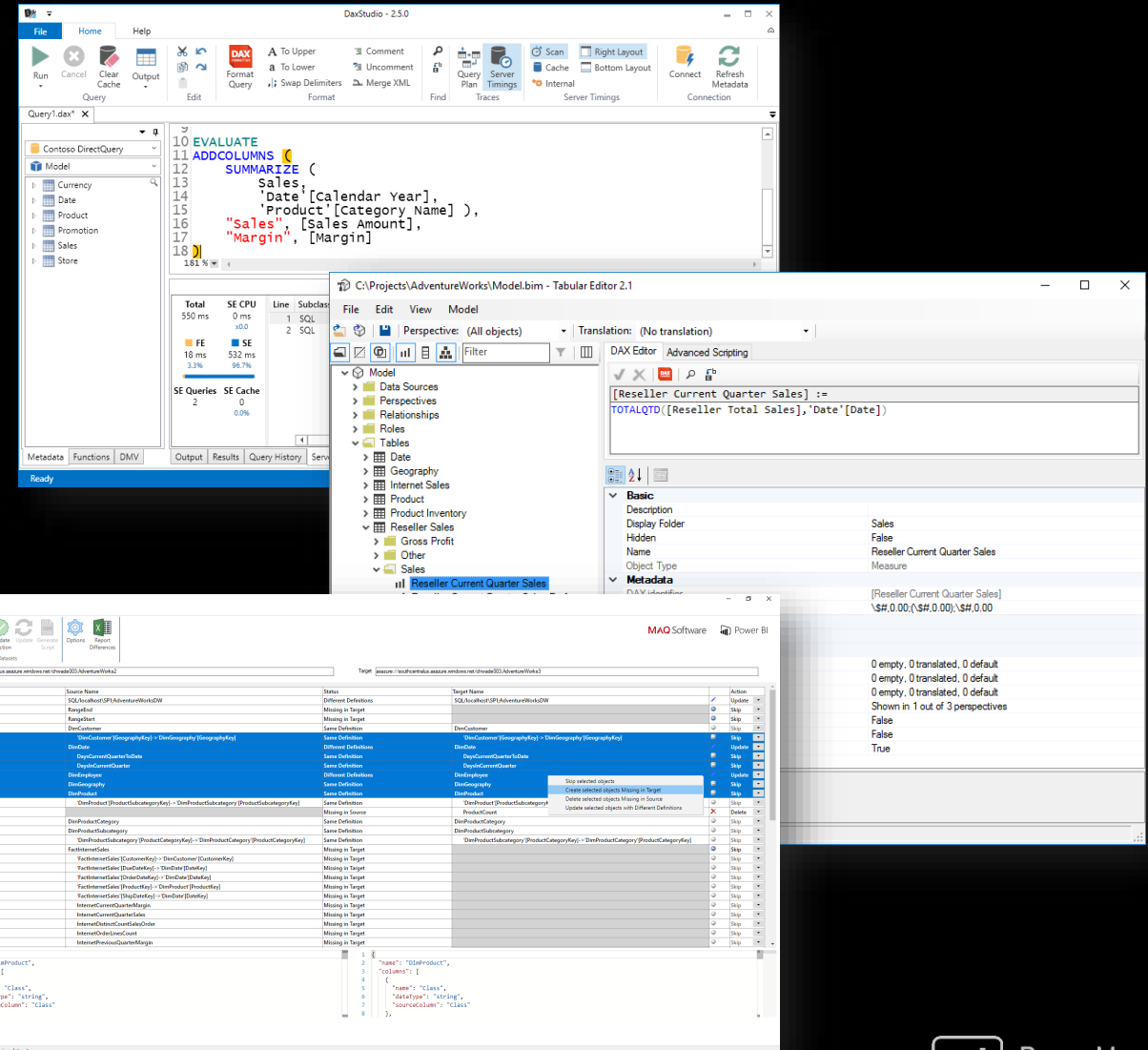
ALM Toolkit - finished comparing datasets



External Tools, what is it?

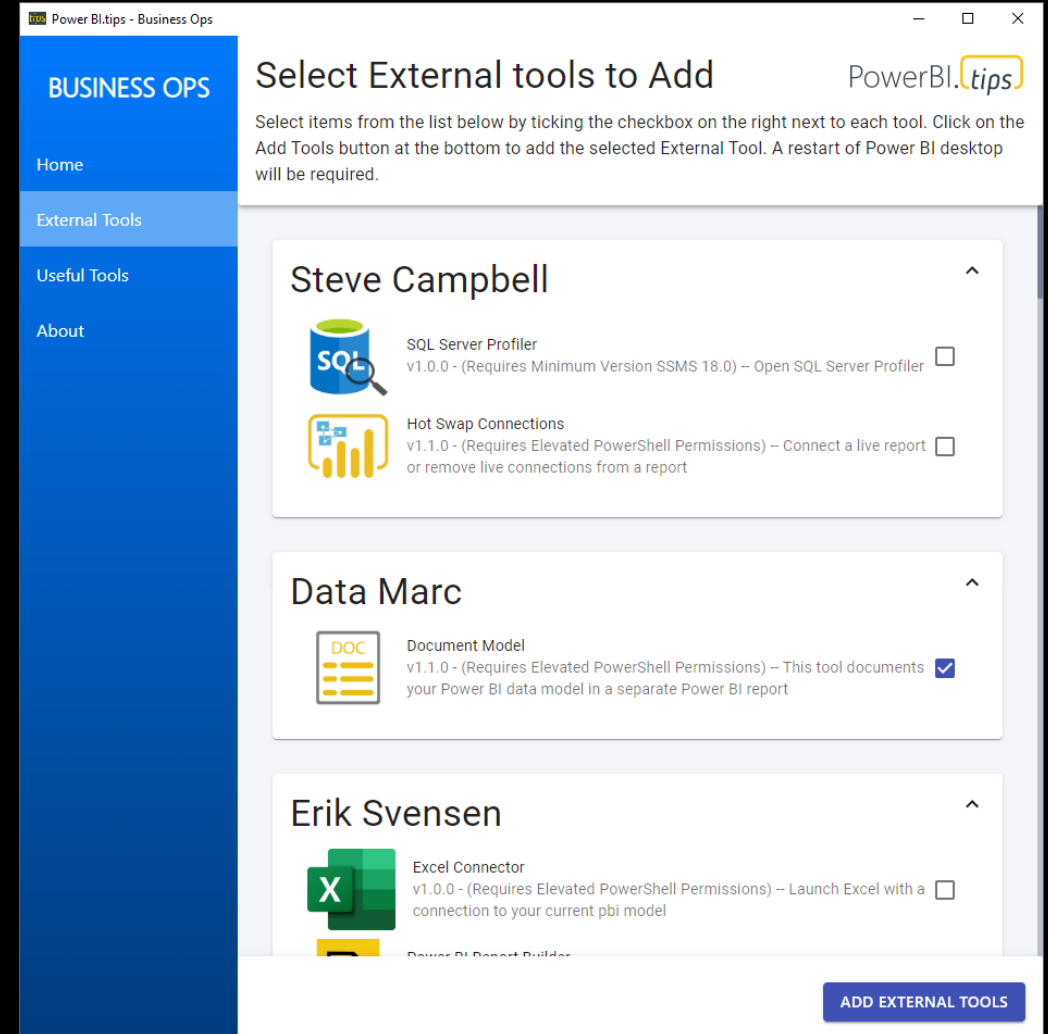
Connect with 3rd party tools

- DAX Studio
- Tabular Editor
- ALM Toolkit
- ...
- Your tool?



Install additional External Tools?

- Requires Admin permissions
- Download them 1-by-1
- Use BusinessOps by PowerBI.tips



What is out there now?

Erik Svensen



Excel Connector

v1.0.0 - (Requires Elevated PowerShell Permissions) -- Launch Excel with a connection to your current pbi model ☐



Power BI Report Builder

v1.0.0 - (Requires Install of Power BI Report Builder) -- Open a template report in Power BI Report Builder



Open In Tableau

v1.0.0 - (Requires Tableau Desktop) -- Open a report in Tableau Desktop

PBI.tips - Themes Gallery



Themes Gallery

v1.0.0 - (Opens in Google Chrome) Pick colors from palettes



Themes Gallery

v1.0.0 - (Opens in Edge) Pick colors from thousands of color palettes

David Eldersveld



Open Python

v1.0.0 - (Requires Python3 All Users Install) -- Opens a connection to a Python Script ☐

Steve Campbell



SQL Server Profiler

v1.0.0 - (Requires Minimum Version SSMS 18.0) -- Open SQL Server Profiler ☐



Hot Swap Connections

v1.1.0 - (Requires Elevated PowerShell Permissions) -- Connect a live report or remove live connections from a report ☐

Davis Zhang



DAX Beautifier

v1.0.2 - (Requires install of AMO library) -- Use this tool to format all DAX code with one click! ☐

SQL BI



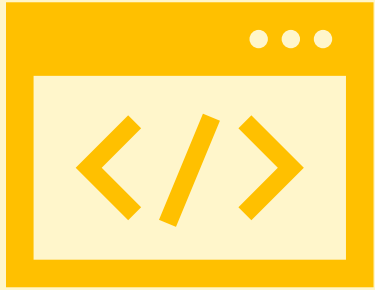
Analyze in Excel

v1.1.2 - Analyze in Excel for Power BI Desktop ☐

```
1
2
3
4
5 = {
6     "version": "1.1.0",
7     "name": "Document Model",
8     "description": "This tool documents your Power BI data model in a separate Power BI report",
9     "path": "C:\\Windows\\System32\\WindowsPowerShell\\v1.0\\powershell.exe",
10    "arguments": "C:\\temp\\Data-Marc_WriteConnectionDetailsToFile.ps1 \"%server%\" \"%database%\"",
11    "iconData": "data:image/png;base64,iVBORw0KGgoAAAANSUHEUgAAANUAAAD7CMAAADK0CH3AAAAAXNSR0
12 }
13
14
15
16
```

Building External Tools

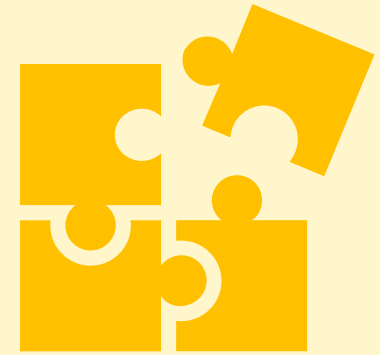
How to setup your own External Tool?



**Build your
application**

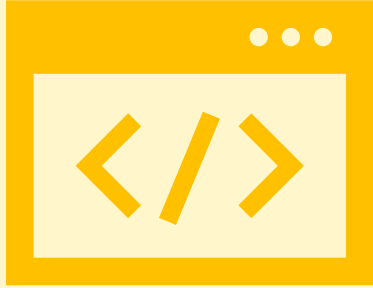


Create your icon



**Integrate in
Power BI Desktop**

How to setup your own External Tool?



Build your
application


```
Windows PowerShell ISE
File Edit View Tools Debug Add-ons Help
Data-Marc_WriteConnectionDetailsToFile.ps1 X
10 # Below you can define your personal preference for file saving and reading.
11 # The default location can be changed and will be leverages throughout the entire script.
12 # InstallerLocation only applies to installation via PowerBI.tips Business Ops.
13 $InstallerLocation = 'TOOL_INSTALL_DIR\'
14 $DefaultLocation = 'C:\BusinessOpsTemp\'
15 $FinalLocation = if($InstallerLocation -like '*TOOL_INSTALL_DIR*')
16 { $DefaultLocation } else { $InstallerLocation }
17
18 # Write out file locations
19 Write-Host 'installer location ' + $InstallerLocation
20 Write-Host 'default location ' + $DefaultLocation
21 Write-Host 'final location ' + $FinalLocation
22
23 #This part starts tracing to catch unfortunate errors and defines where to write the file.
24 $LogFile = $FinalLocation + 'PBI_DocumentModel_LogFile.txt'
25 Start-Transcript -Path $LogFile
26
27 # Function to automatically download the pbit file if it cannot be found on the defined location.
28 # Function based on https://gist.github.com/chrisbrownie/f20cb4508975fb7fb5da145d3d38024a
29 function DownloadFilesFromRepo {
30 Param(
31     $Owner = 'marcelelijveld',
32     $Repository = 'External-Tools-Model-Documentation',
33     $Path = 'ModelDocumentationTemplate.pbit',
34     $DestinationPath = 'C:\BusinessOpsTemp'
35 )
36
37     $baseUri = "https://api.github.com/"
38     $uriPath = "repos/$Owner/$Repository/contents/$Path"
39     $swr = Invoke-WebRequest -Uri $($baseUri+$uriPath)
40     $objects = $swr.Content | ConvertFrom-Json
41     $files = $objects | Where-Object {$_.type -eq "file"} | Select-Object -exp download_url
42     $directories = $objects | Where-Object {$_.type -eq "dir"}
43
44     $directories | ForEach-Object {
45         DownloadFilesFromRepo -Owner $Owner -Repository $Repository -Path $_.path -DestinationPath $($DestinationPath)
46     }
47
48     if (-not (Test-Path $DestinationPath)) {
49         # Destination path does not exist, create it
50     }
51 }
```

PS D:\OneDrive Macaw\OneDrive - Macaw\External Tools - Model Documentation>

How to setup your own External Tool?



Create your icon



MR
BASE

CONVERT YOUR IMAGES TO BASE64

DRAG & DROP IMAGES ANYWHERE

OR CLICK HERE

File Formats

You can upload up to 20 images (max. 1.00 MB each) as JPG, PNG, GIF, WebP, SVG or BMP.

Please note that Internet Explorer 8 has a limit of 32 KB for [data URI](#). Versions below have no support.

Image optimization


We can optimize your JPEG & PNG images, using [jpegoptim](#) and [optipng](#). This will reduce the file without any visible impact (in most cases).


Optimization status:


disabled


Browser Support


The **encoded results** are **compatible** with all of the following browsers and versions. Please send me a note if there are issues.


 Chrome 4+

 Safari 3.1+

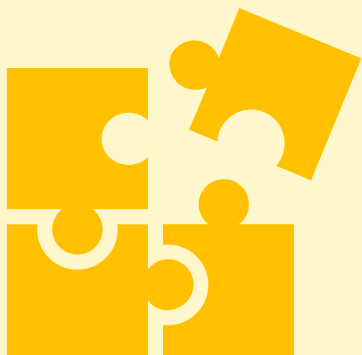
 Firefox 2+

 Opera 9+

 Edge

 IE 8+

How to setup your own External Tool?



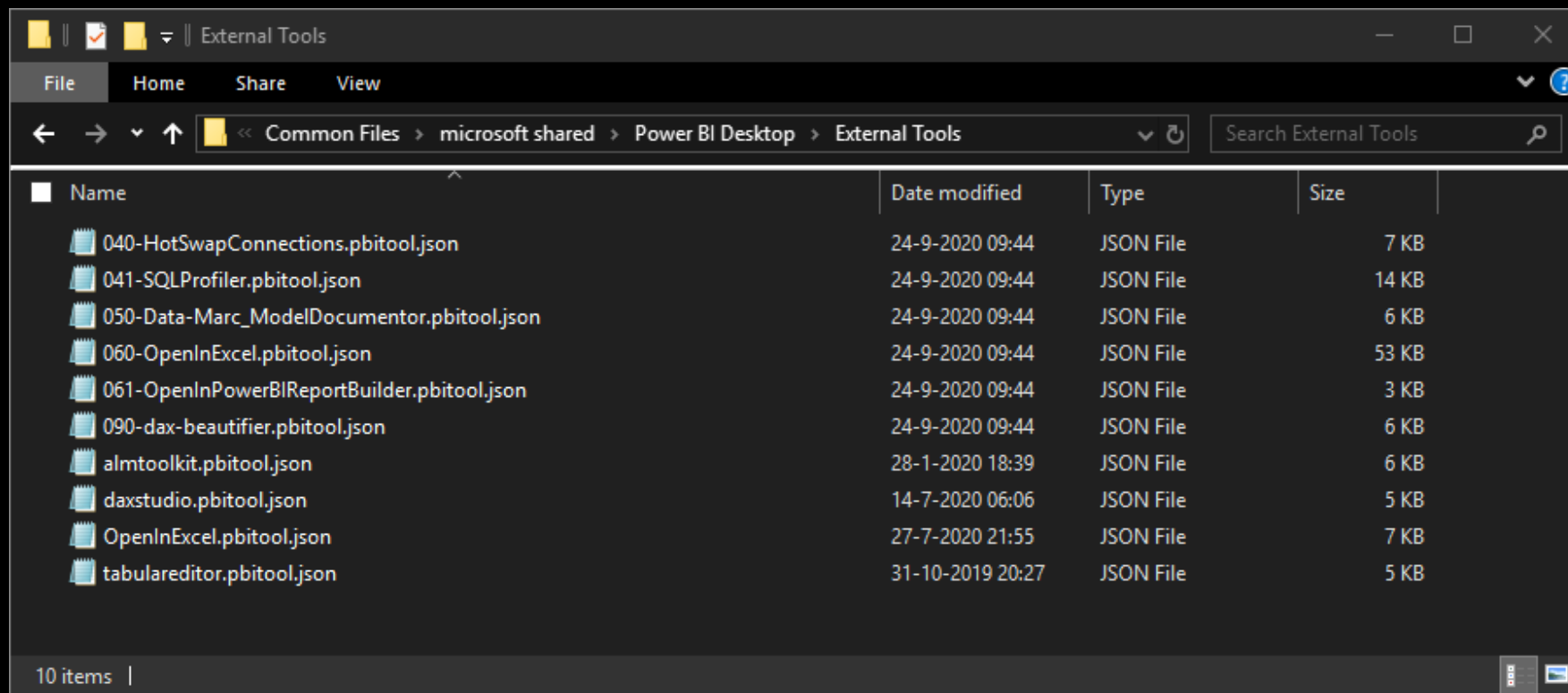
**Integrate in
Power BI Desktop**

- *.pbitool.json file
- \%server%\
- \%database%\

```
{  
  "version": "1.1.0",  
  "name": "Document Model",  
  "description": "This tool documents your Power BI data model in a separate Power BI report",  
  "path": "C:\\Windows\\System32\\WindowsPowerShell\\v1.0\\powershell.exe",  
  "arguments": "C:\\temp\\Data-Marc_WriteConnectionDetailsToFile.ps1 \"%server%\" \"%database%\"",  
  "iconData": "data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAANUAAAD7CMAAADKOCH3AAAAAXNSR0:"  
}
```

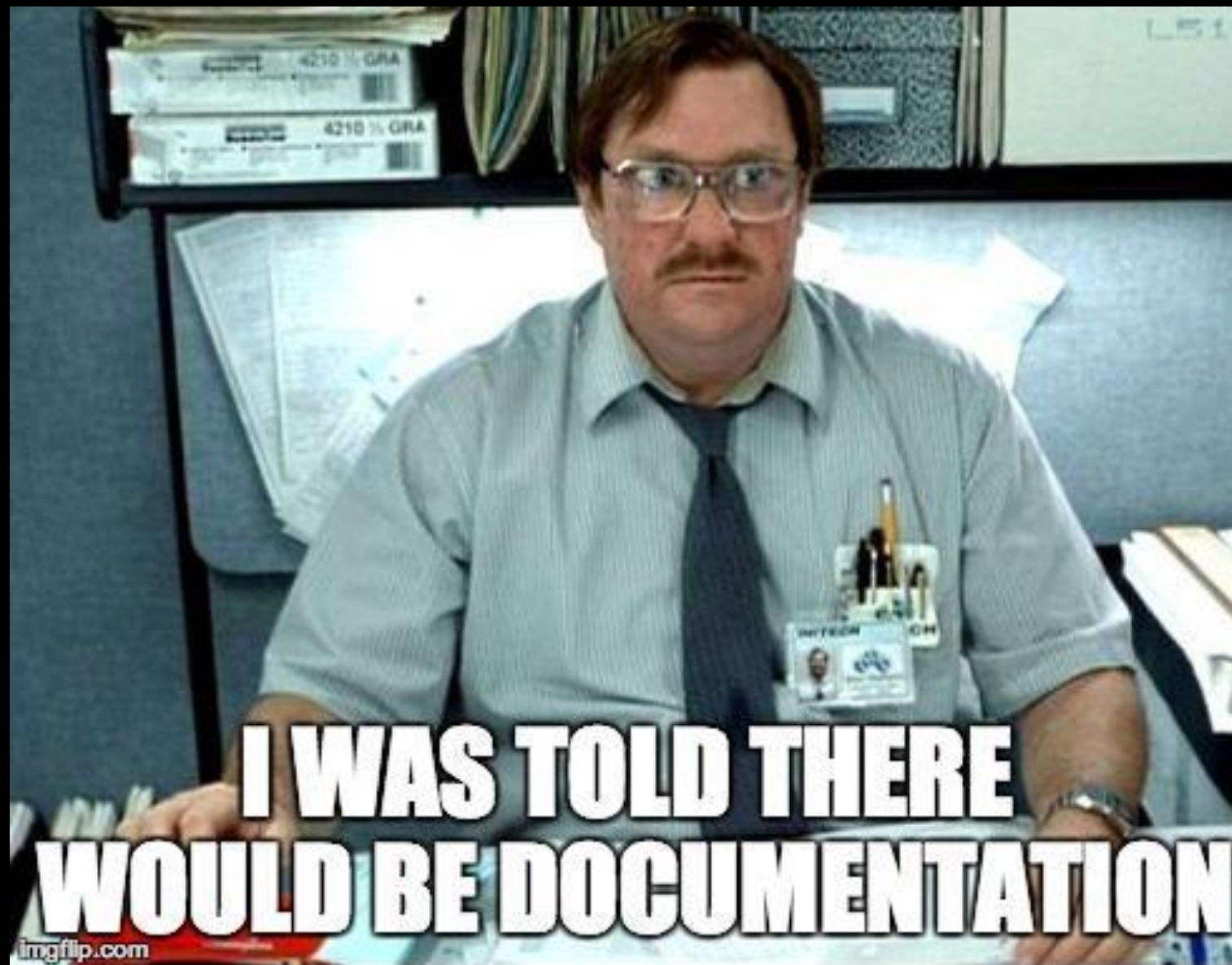
Drop the file in the right location

C:\Program Files (x86)\Common Files\Microsoft Shared\Power BI Desktop\External Tools





Documentation



**I WAS TOLD THERE
WOULD BE DOCUMENTATION**

imgflip.com

Documentation?



Marc Lelijveld
@MarcLelijveld

If you deliver or use a [#PowerBI](#) solution which results in a shared dataset. Does it come with proper documentation?

Yes, nicely shared in PBI

18.3%

Yes, but too much text!

5%

If I've time left

30%

No, what is documentation

46.7%



Ásgeir Gunnarsson
@bidgeir

Als antwoord op [@MarcLelijveld](#)

You're missing an option. If it's prioritised. I always ask for it to be part of the task but too often it's not prioritised. Even though clients pay me for advice, documentation is sadly one of those they most often ignore

What does it do?

Describe the model metadata about:

- The model in general
- PQ parameters + queries
- Tables
- Partitions & refresh policies
- Columns
- Calculation groups
- Field parameters
- Measures
- Relationships
- Security

The screenshot displays the Data-Marc application interface for a table named 'fact_ecommerce_budget'. The 'Partitions & policies' tab is active, showing a table of partitions with columns: Table Name, Partition Name, Start, and End. The 'fact_ecommerce_budget' table has partitions for quarters from 2019Q309 to 2020Q103. The 'Partitions & policies' tab is selected, and the 'Expression' field shows a SQL query for incremental refresh. A 'Relationships' tab is also visible, showing a diagram of relationships between tables like 'Reseller', 'Product', 'Customer', 'Product Sub Category', 'Reseller Sales', and 'Internet Sales'.

Partitions & policies

Table Name: type: 36 month Rolling window

11 # Partitions (Blank) # Partitions Incremental

Table Name	Partition Name	Start	End
dim_store_type	dim_store_type-74c907d6-6fb1-4a80-8506-6983eaa467f5		
fact_ecommerce_budget	2019Q309	1 september 2019	1 oktober 2019
	2019Q410	1 oktober 2019	1 november 2019
	2019Q411	1 november 2019	1 december 2019
	2019Q412	1 december 2019	1 januari 2020
	2020Q101	1 januari 2020	1 februari 2020
	2020Q102	1 februari 2020	1 maart 2020
	2020Q103	1 maart 2020	1 april 2020

Expression

```
let
    Source = AmazonRedshift.Database(SourceServer.SourceDatabase,
    [BatchSize=Number.FromText(SourceBatchSize)]),
    cons_sales = Source[Name="cons_sales"][Data],
    fact_ecommerce_budget1 = cons_sales[Name="fact_ecommerce_budget"][Data],
    #"Incremental refresh filter" = Table.SelectRows(fact_ecommerce_budget1, each
    DateTime.From([calendar_day]) >= RangeStart and DateTime.From([calendar_day]) <
    RangeEnd),
    #"Kept First Rows" = if(Environment = "DEV") then Table.FirstN(#"Incremental
    refresh filter",Number.OfRows) else #"Incremental refresh filter"
in
    #"Kept First Rows"
```

Relationships

12 (Blank) # Relationships # Many-to-Many

8 # Active 4 # Inactive

Cross Filtering Behavior

Security Filtering Beha...

Is Active

Rely On Ref. Integrity

Relationships

Left side Cardinality Right side # Invalid rows

Left side	Cardinality	Right side	# Invalid rows
'Product Sub Category'(ProductSubCategoryKey)	1 -----> M	'Product'(ProductSubCategoryKey)	
'Product Category'(ProductCategoryKey)	1 -----> M	'Product Sub Category'(ProductCategoryKey)	
'Customer'(CustomerKey)	1 -----> M	'Internet Sales'(CustomerKey)	
'Date'(DateKey)	1 -----> M	'Internet Sales'(DueDateKey)	
'Date'(DateKey)	1 -----> M	'Internet Sales'(ShipDateKey)	
'Date'(DateKey)	1 -----> M	'Internet Sales'(OrderDateKey)	
'Product'(ProductKey)	1 -----> M	'Internet Sales'(ProductKey)	
'Date'(DateKey)	1 -----> M	'Reseller Sales'(DueDateKey)	
'Date'(DateKey)	1 -----> M	'Reseller Sales'(OrderDateKey)	
'Date'(DateKey)	1 -----> M	'Reseller Sales'(ShipDateKey)	
'Product'(ProductKey)	1 -----> M	'Reseller Sales'(ProductKey)	
'Reseller'(ResellerKey)	1 -----> M	'Reseller Sales'(ResellerKey)	

Diagram showing relationships between tables: Reseller, Product, Customer, Product Sub Category, Reseller Sales, Internet Sales.

Powered by Data-Marc.com

What does it not?

- Include any details about the visuals
- Bookmarks
- Any other visual elements
- ... you tell me?





ALM
Toolkit



Document
Model



DAX
Studio

External Tools



Document your
model

Evaluation of the Power BI Model Documenter

Dynamic Management Views

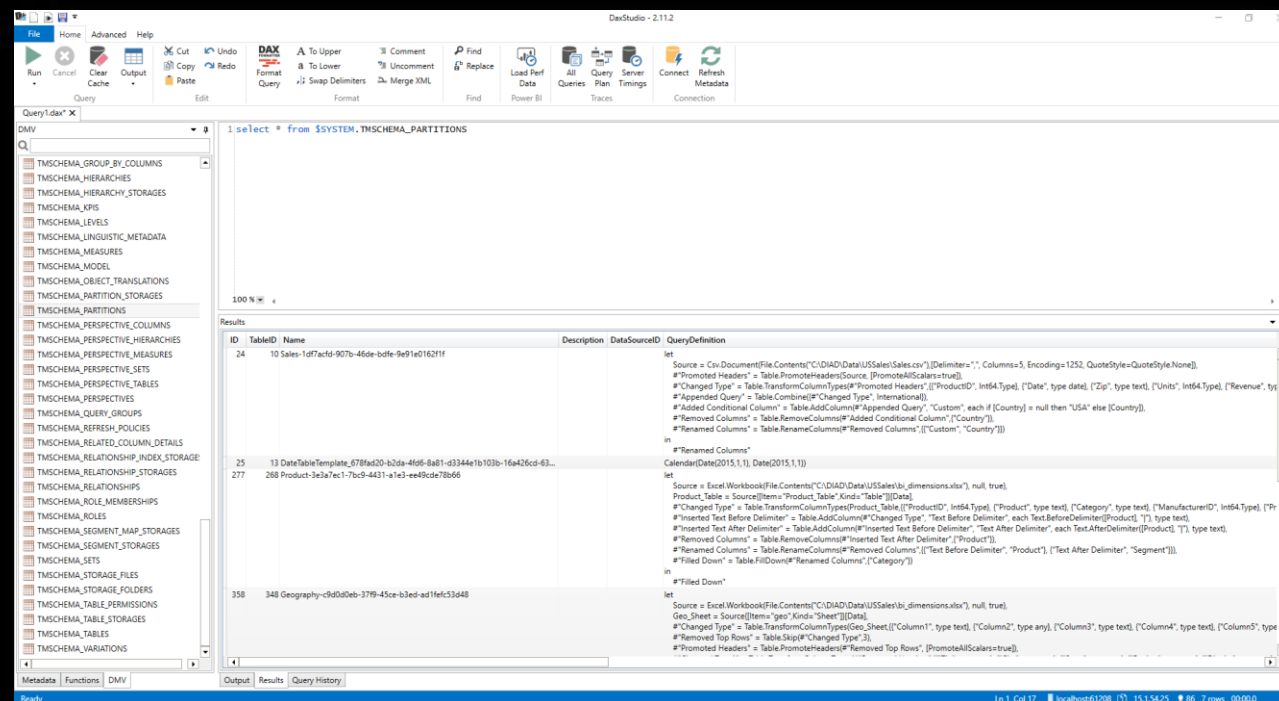
In the previous versions:

Analysis Services Dynamic Management Views (DMVs) are queries that return information about model objects, server operations, and server health.

- DB Schema = Database model
- DISCOVER = Operations & Sessions
- TM Schema = Tabular = Power BI / AAS
- MD Schema = MDX = Multidimensional

Dynamic Management Views

- Analysis Services metadata
 - Tables
 - Columns
 - Measures
 - Perspectives
 - Partitions
 - ...
- Query via DAX Studio / VS Studio



Nuget package to generate VPAX

In the current version:

Vpax generation, just like DAX Studio can do, using the open-source Dax.Vpax nuget package. The package contains:

- Dax.Metadata = representation of model metadata
- Dax.Model.Extractor = populates above model
- Dax.ViewModel = provides a view over metadata
- Dax.ViewVpaExport = exports the Dax.Model file
- Dax.Vpax = supports the VPAX format

VPAX files

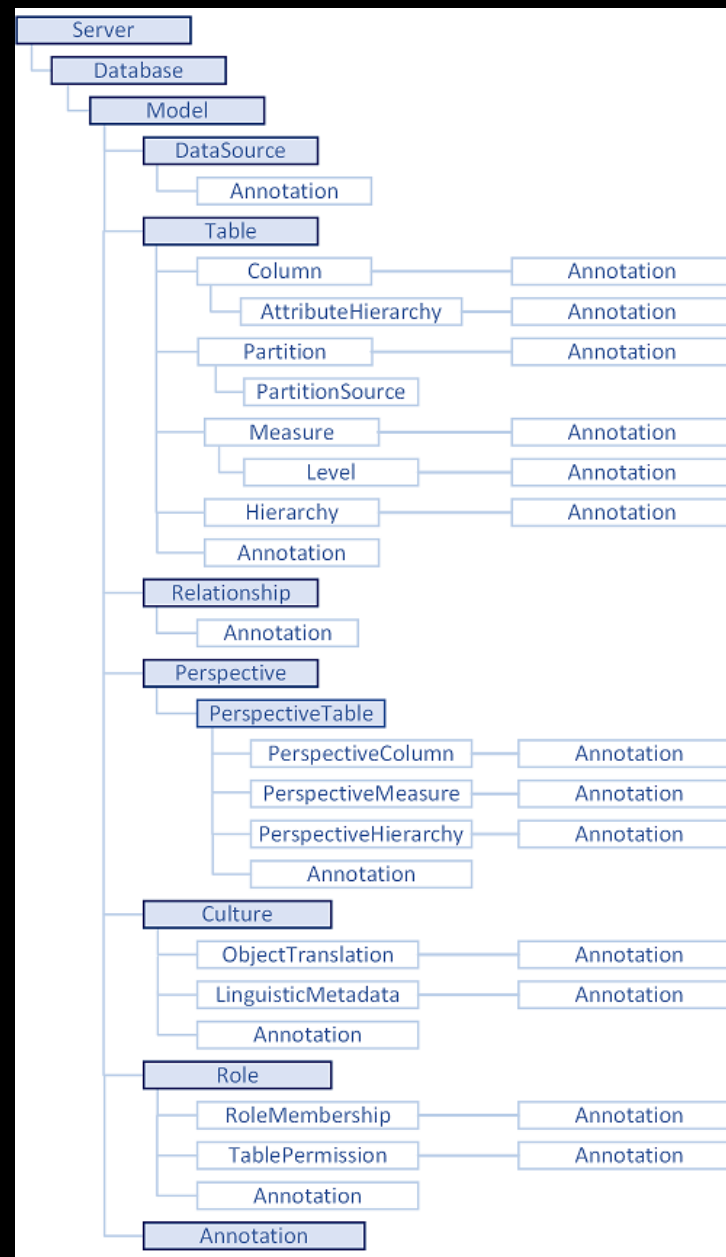
In the current version:

In the VPAX file, we will find:

- DaxModel.json = serialization of the Dax.Metadata.model
- DaxVpaView.json = specifically used to import data in the vpax analyzer 2.0 excel version
- Model.bim = is an optional file (but crucial for model documenter) that exports the complete Tabular Object Model format.

Data model metadata

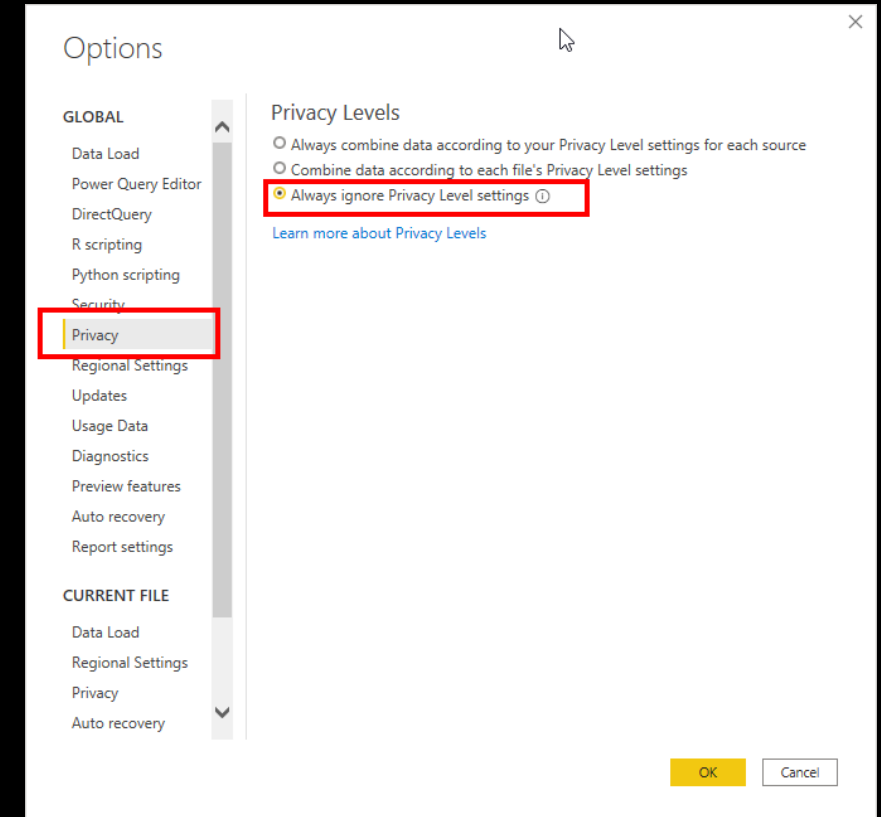
- General Available since September 2020 release!
- Matches Analysis Services metadata
- Model.bim
- Tabular Object Model (TOM)
- Open format (json)



Why this change?

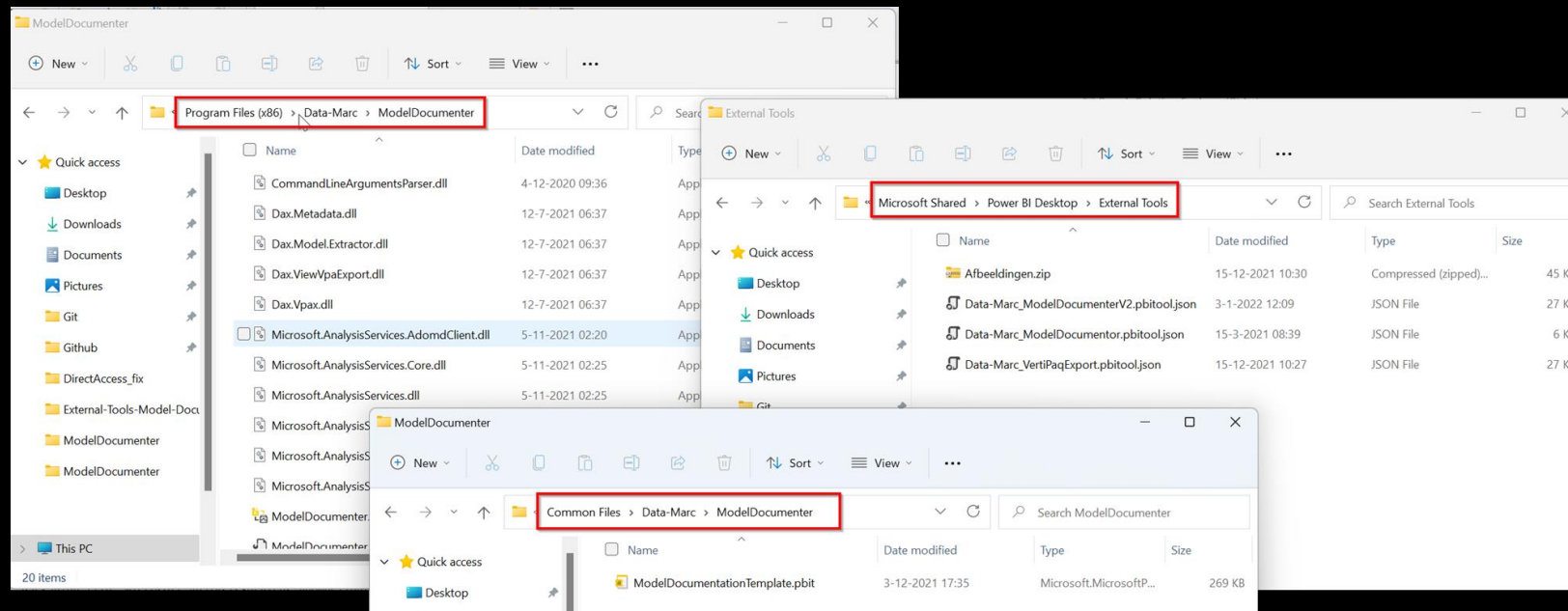
Prior version required

- Native database query execution to be allowed in PBI Desktop
- Requires MSOLAP.8 Provider to be installed on the machine



What changes does the Model Documenter make to my machine?

- Program Files (x86) – where the tool is installed
- The external tools directory – to locate the external tool connection file
- Common files folder – Where the Model Documenter template is located



What's next?

Small enhancements:

- Indicating which partitions were never refreshed
- Ordinal position of calculation items in calculation groups

Big workloads:

- Maybe a portable version that can connect to any model without installation?

So, from now on...



For resources

<https://data-marc.com/model-documenter/>



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[Data-Marc.com](https://data-marc.com)

