Model Documenter for Power BI

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DaxStudio - 2.5.0

File   Home   Help

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

Query   Edit   Format   Find   Traces   Server Timings   Connection

Query1.dax*

Contoso DirectQuery
Model
- Currency
- Date
- Product
- Promotion
- Sales
- Store

```
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 x0.0	1	SQL	301	0			SELECT TOP (1000001) [
		2	SQL	231	0			SELECT TOP (1000001) [

SELECT TOP (1000001) [t0].[Calendar Year Name],SUM([t1].[Line Margin])

Metadata   Functions

Ready

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

File   Edit   View   Model

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

DAX Editor   Advanced Scripting

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

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

Filter

Basic
Description
Display Folder   Sales
Hidden   False
Name   Reseller Current Quarter Sales
Object Type   Measure
Metadata
DAX identifier   [Reseller Current Quarter Sales]
Format String   \$#,0.00;(\$#,0.00);\$#,0.00
Options
Other
Translations and Perspectives
Captions   0 empty, 0 translated, 0 default
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 Selection   Update   Generate Script   Options   Report Differences

MAQ Software   Power BI

Compare Datasets

Source asazure://southcentralus.asazure.windows.net/chwade003;AdventureWorks2
Target asazure://southcentralus.asazure.windows.net/chwade003;AdventureWorks3

Type	Source Name	Status	Target Name		Action
Data Source	SQL/localhost\SP1;AdventureWorksDW	Different Definitions	SQL/localhost\SP1;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]	●	Skip
Measure	ProductCount	Missing in Source	ProductCount	✖	Delete
Table	DimProductCategory	Same Definition	DimProductCategory	●	Skip
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
Relationship	'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

Skip selected objects
Create selected objects Missing in Target
Delete selected objects Missing in Source
Update selected objects with Different Definitions

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

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

ALM Toolkit - finished comparing datasets

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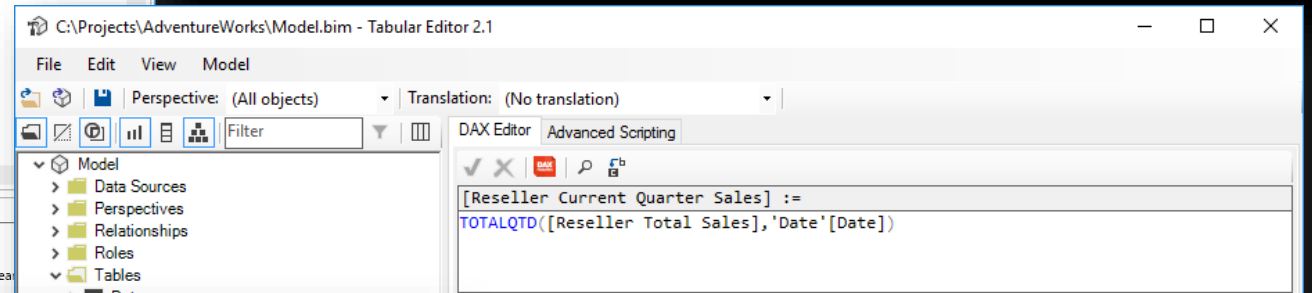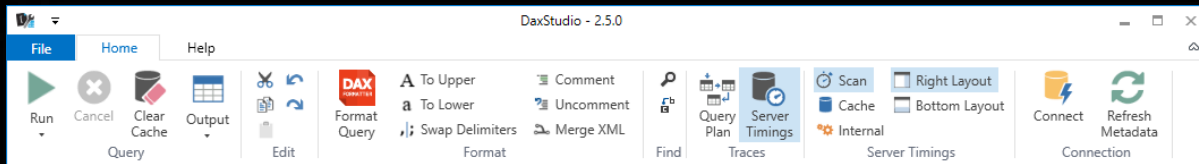
Marc Lelijveld

Technical Evangelist | Solution Architect
Macaw Netherlands

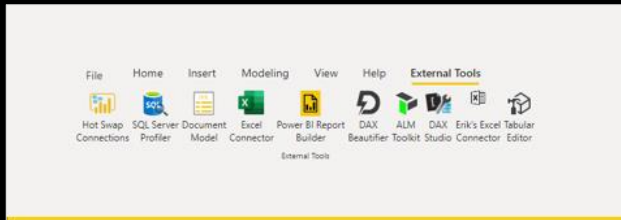🐦 @MarcLelijveld

in linkedin.com/in/MarcLelijveld

🌐 Data-Marc.com
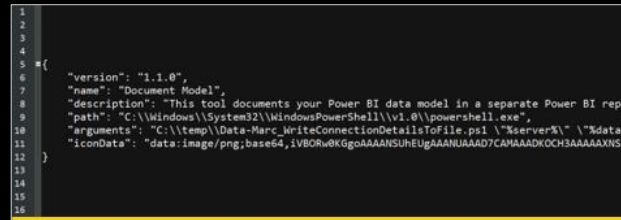
DutchFabricUsergroup.com

FAVORITE STUFF:

Agenda for today

External Tools, what is it?

Building External Tools

Documentation

Evaluation of the Power BI Model Documenter

Roadmap

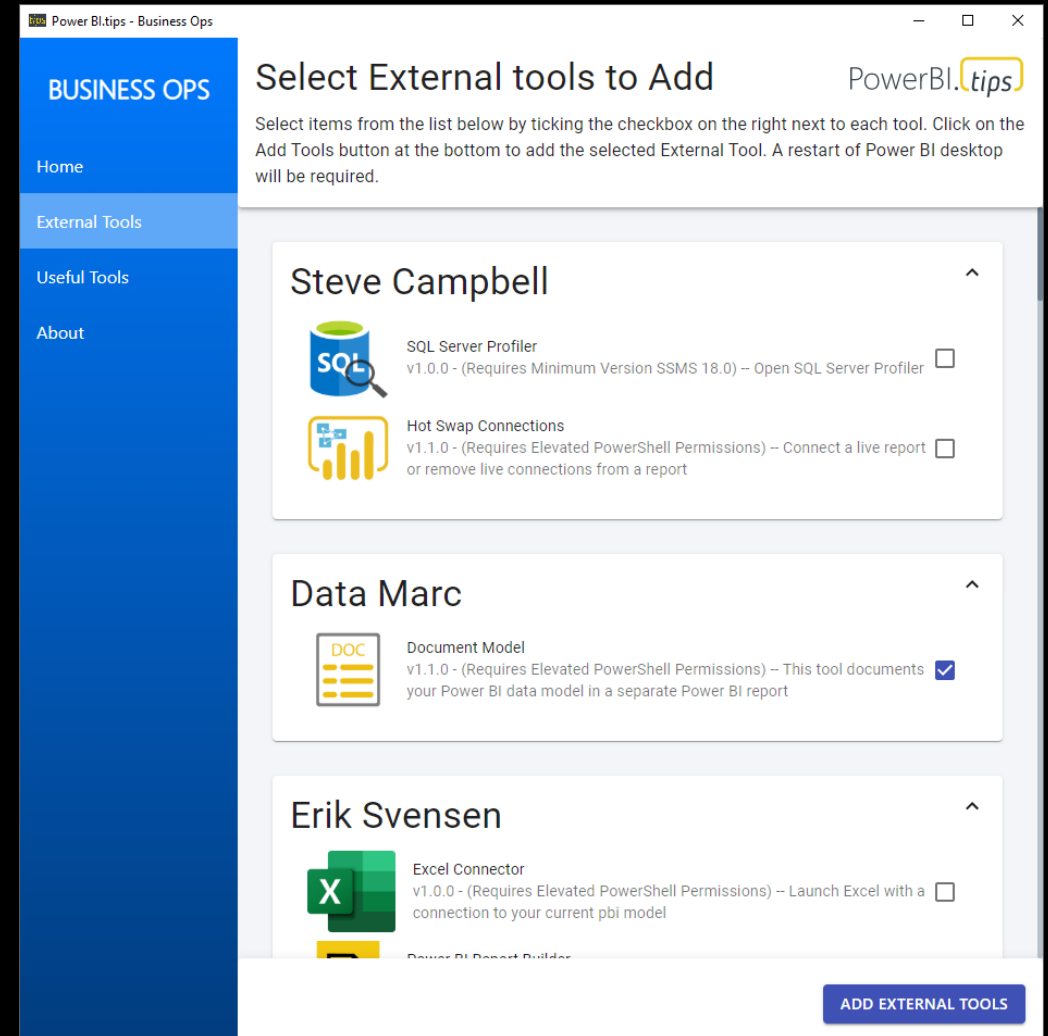Wrap-up and resources

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External Tools, what is it?

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Connect with 3ʳᵈ party tools

- DAX Studio

- Tabular Editor

- ALM Toolkit

- ...

- Your tool?
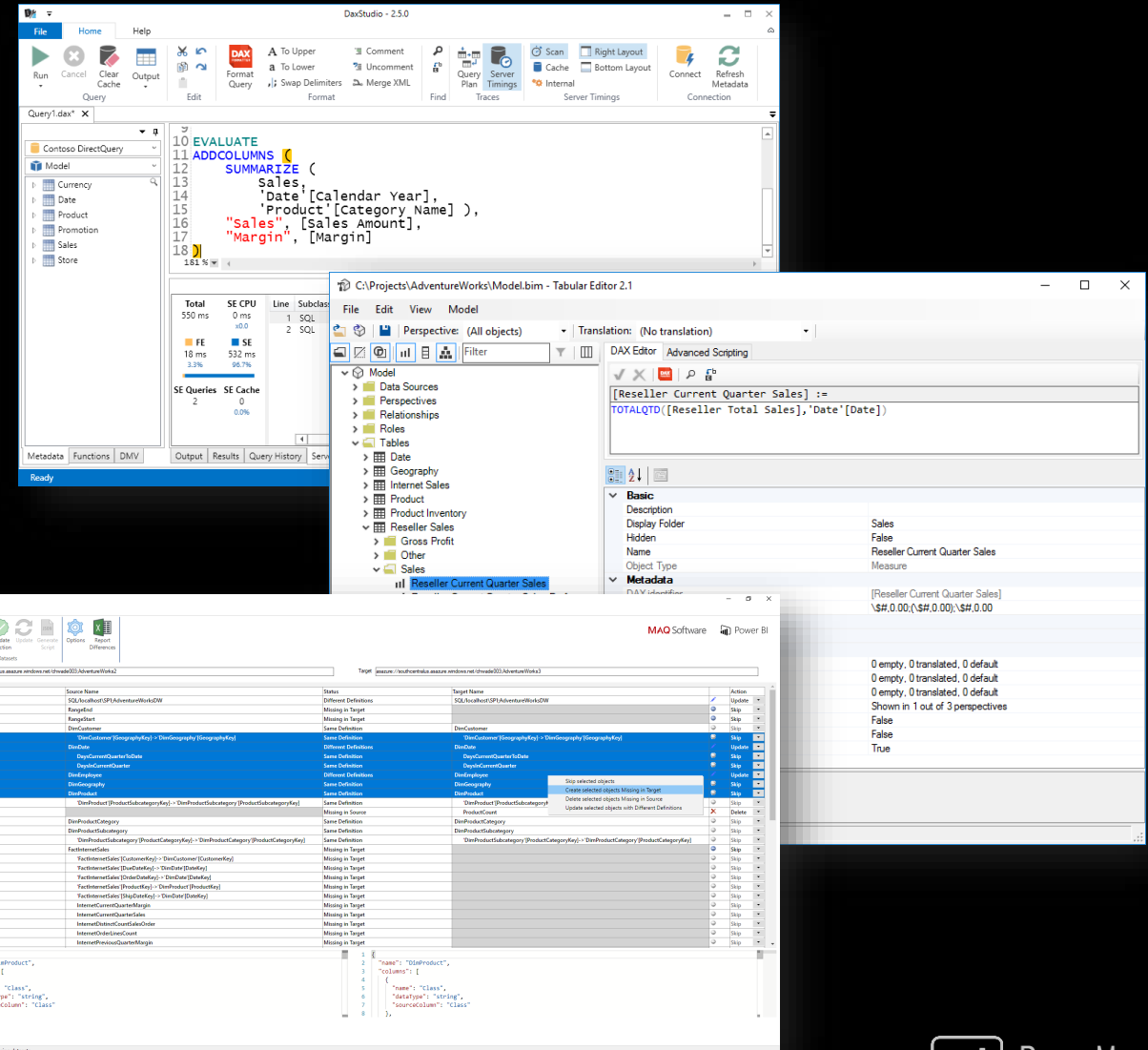
Install additional External Tools?

- 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 Latest Version of Tableau) -- Open connection to desktop
model i

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 ☐

PBI.tips - Themes Gallery

Themes Gallery
v1.0.0 - (Opens in Google Chrome) Pick colors from
paletts

Themes Gallery
v1.0.0 - (Opens in Edge) Pick colors from thousands of color pa

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 ☐

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```
 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 repor
 9      "path": "C:\\Windows\\System32\\WindowsPowerShell\\v1.0\\powershell.exe",
10      "arguments": "C:\\temp\\Data-Marc_WriteConnectionDetailsToFile.ps1 \"%server%\" \"%databa
11      "iconData": "data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAANUAAAD7CAMAAADKOCH3AAAAXNSR0
12  }
13
14
15
16
```

Building External Tools

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How to setup your own External Tool?
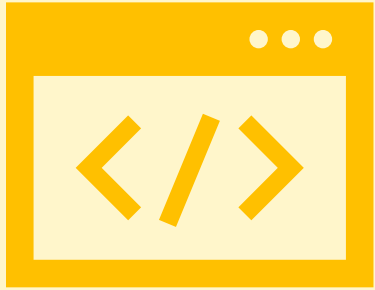
Build your application

Create your icon

Integrate in Power BI Desktop

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How to setup your own External Tool?

Build your application

How to setup your own External Tool?

Create your icon
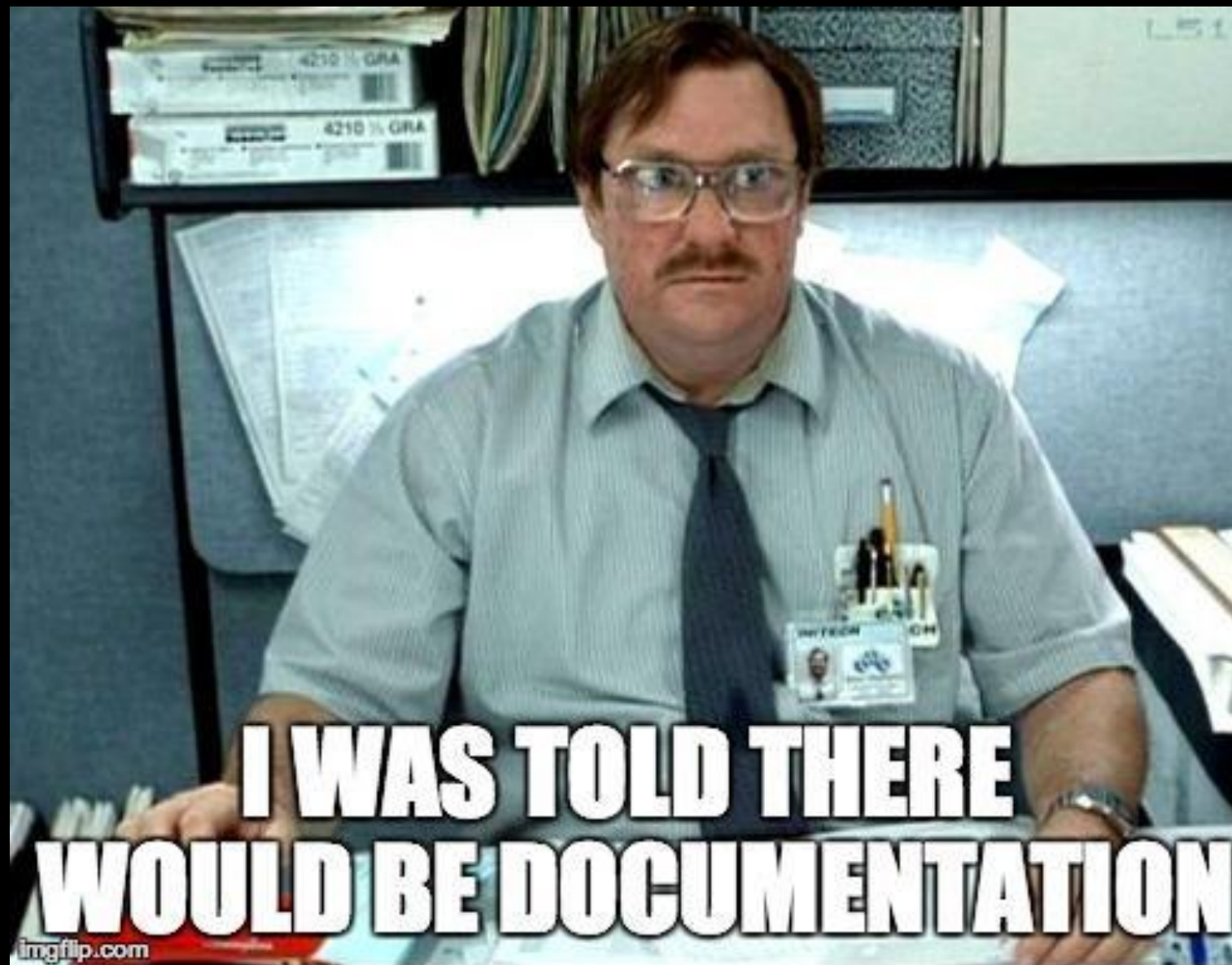
How to setup your own External Tool?

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%\" \"%databas
    "iconData": "data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAANUAAAD7CAMAAADKOCH3AAAAAXNSR0"
}
```

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Drop the file in the right location

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

Documentation

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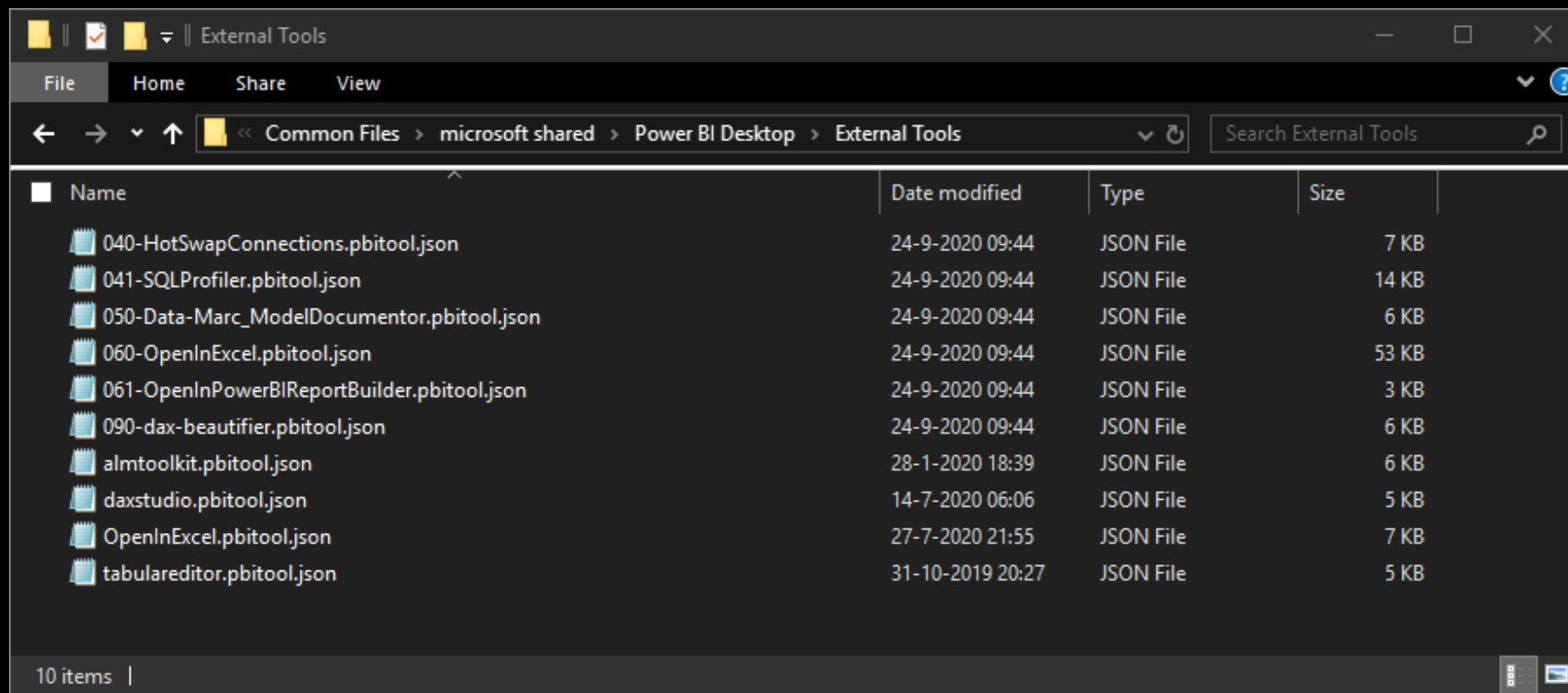
I WAS TOLD THERE WOULD BE DOCUMENTATION

Documentation?

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

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%**

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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

What does it not?

- Include any details about the visuals

- Bookmarks

- Any other visual elements

- … you tell me?

Demo – Model Documenter

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Evaluation of the Power BI Model Documenter

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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

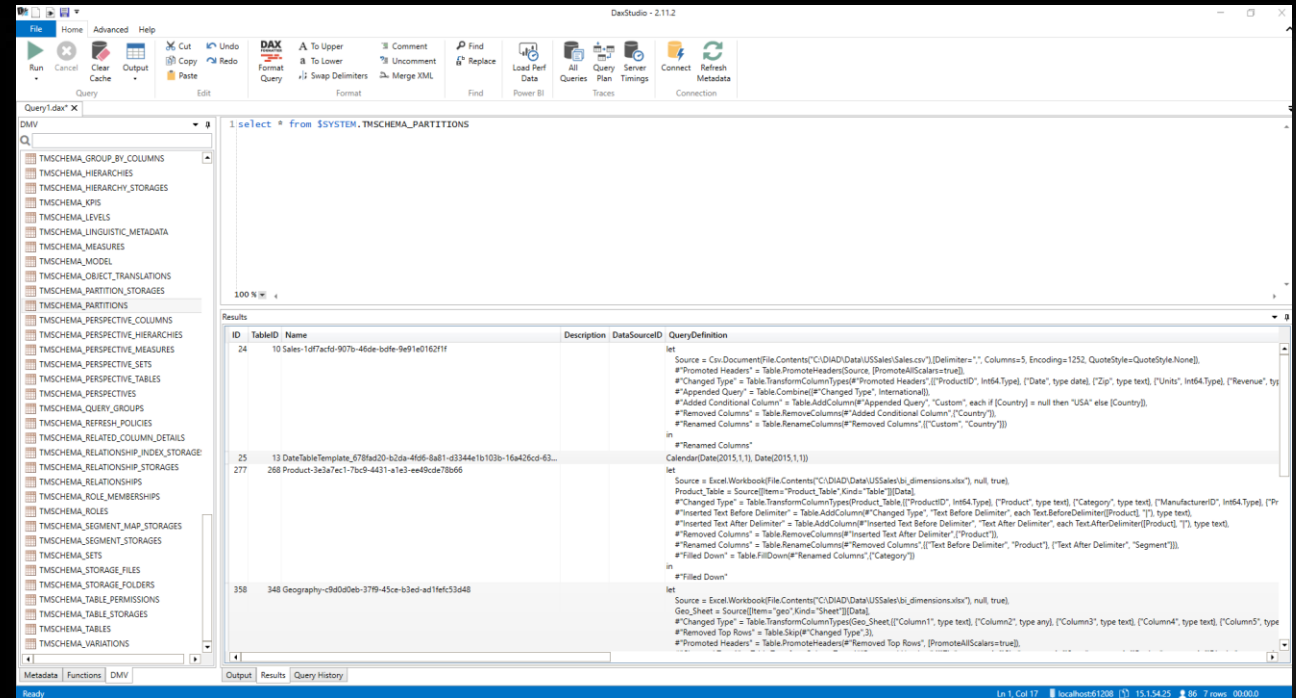- MD Schema = MDX = Multidimensional

Data model metadata

- Matches Analysis Services metadata

- Model.bim

- Tabular Object Model (TOM)

- Open format (json)

- Now, also TMDL (February 2024 update)

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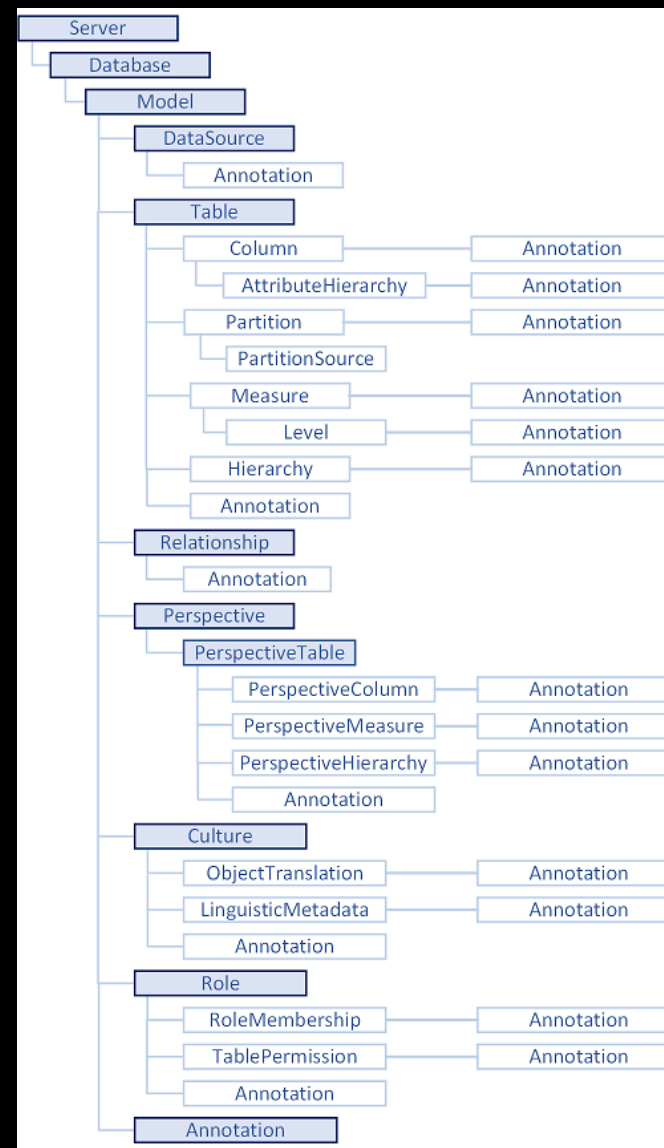
Dynamic Management Views

- Analysis Services metadata

    - Tables

    - Columns

    - Measures

    - Perspectives

    - Partitions

    - …

- Query via DAX Studio / VS Studio

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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

https://www.nuget.org/packages/Dax.Vpax/

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# 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.
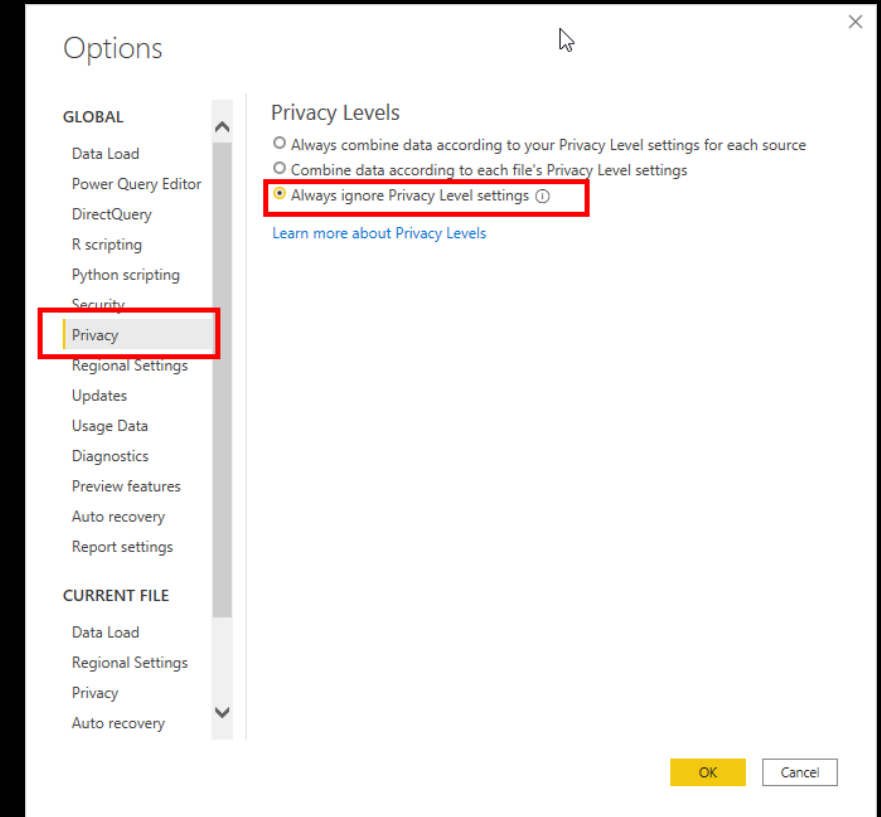
Data model metadata

- General Available since September 2020 release!

- Matches Analysis Services metadata

- Model.bim

- Tabular Object Model (TOM)

- Open format (json)
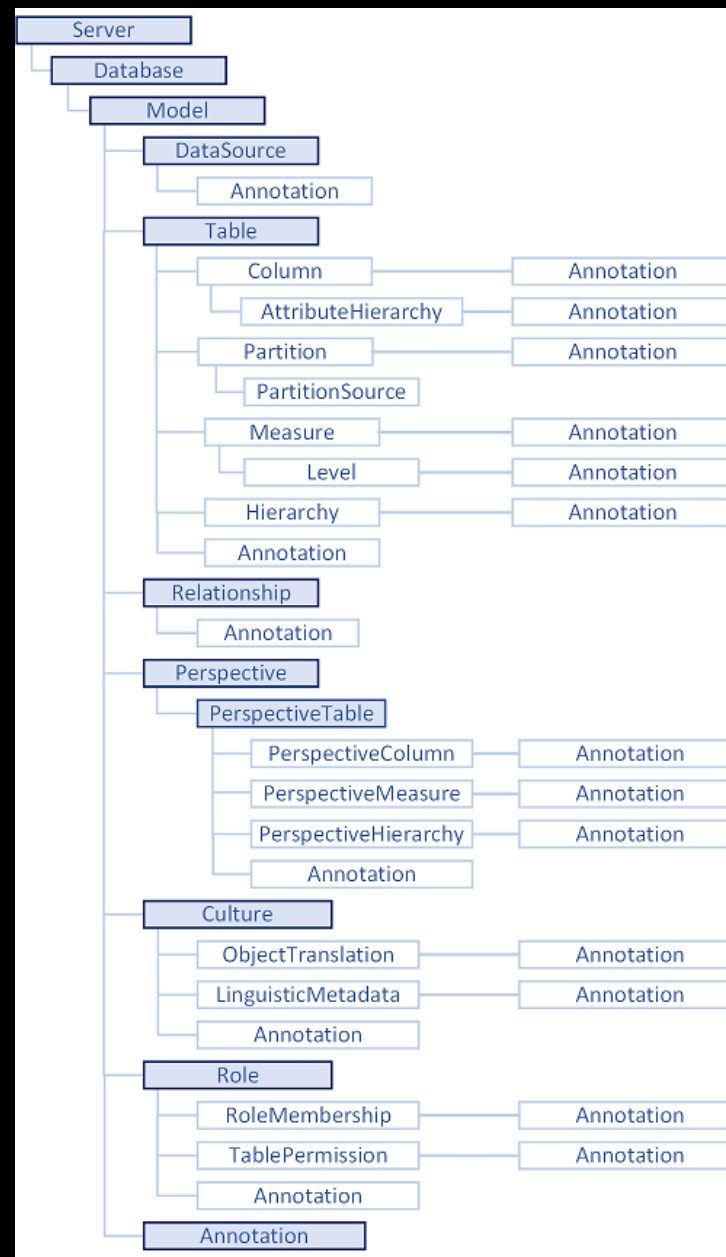
Why this change?

Prior version required

- Native database query execution to be allowed in PBI Desktop

- Requires MSOLAP.8 Provider to be installed on the machine

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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

Roadmap

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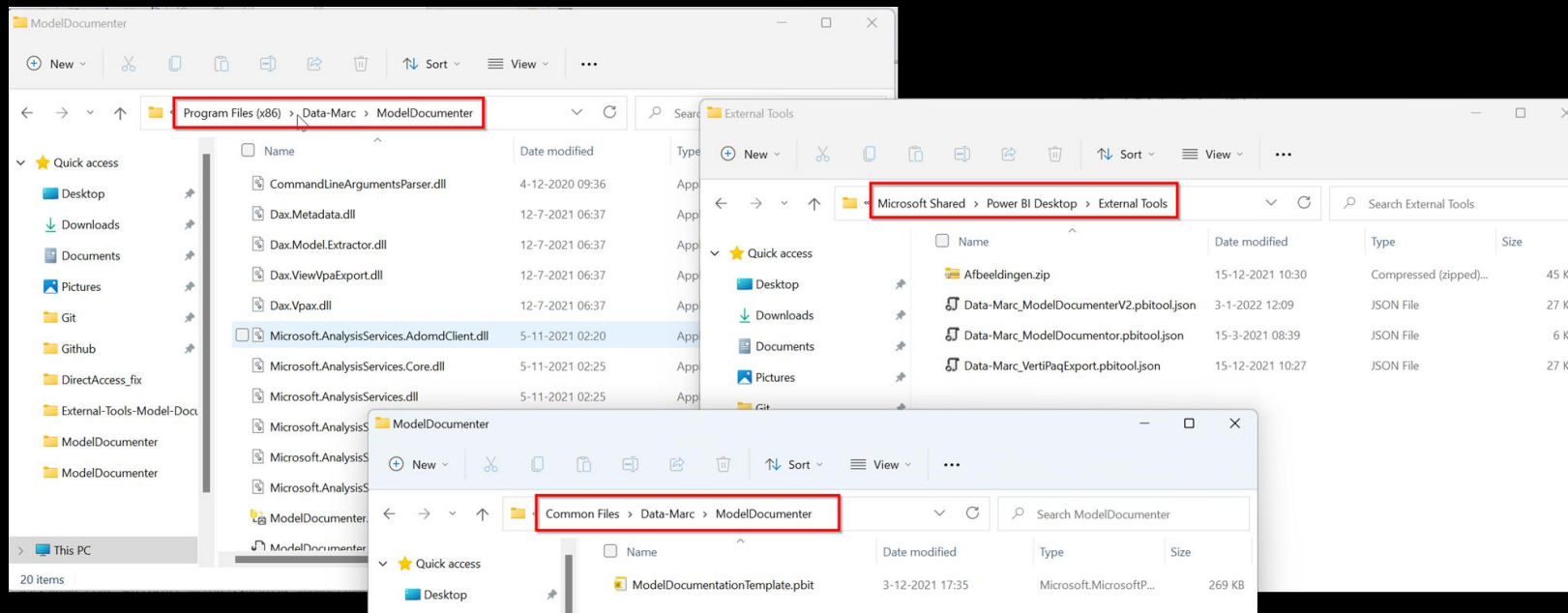
What will be next for Model Documenter?

- Fabric flavored Model Documenter

- Makes use of Fabric Semantic Link

- Does require Premium/Fabric capacity to run (no PPU)

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What is Semantic Link exactly?

Semantic Link is a feature in Microsoft
Fabric that allows you to connect from
~~Synapse~~ Data Science Notebooks to Power
BI Semantic Models.

This feature only exists and works in
Microsoft Fabric.

Power BI

Semantic Link

Synapse Data Science

Apache Spark

Direct Lake

OneLake

Data-Marc.com
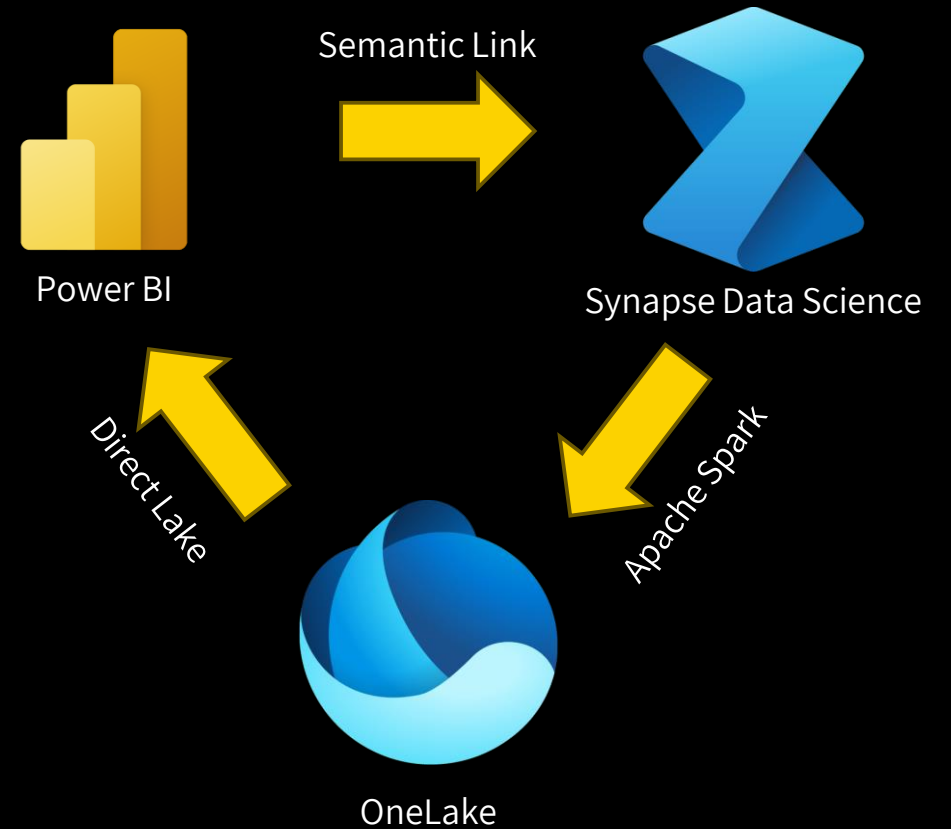
Connectivity

Default uses the Power BI REST API.
For certain operations, the XMLA
endpoint might be more useful. With
use_xmla=True you can direct the
connection of XMLA.

Power BI REST API
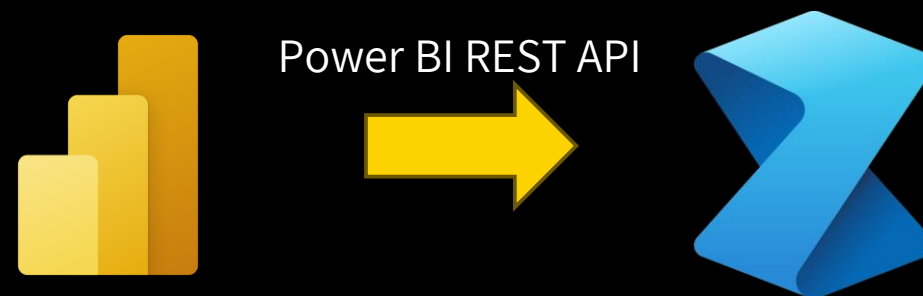
```Python
fabric.evaluate_measure(dataset, \
                measure=["Average Selling Area Size", "Total Stores"], \
                groupby_columns=["Store[Chain]", "Store[DistrictName]"], \
                filters={"Store[Territory]": ["PA", "TN", "VA"], "Store[Chain]": ["Lindseys"]}, \
                use_xmla=True)
```

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Conceptual overview

Using Semantic-Link to read Meta Data from an existing Sematic Model, which is saved in a Lake House, with a Semantic Model and Report on top to visualize the output.
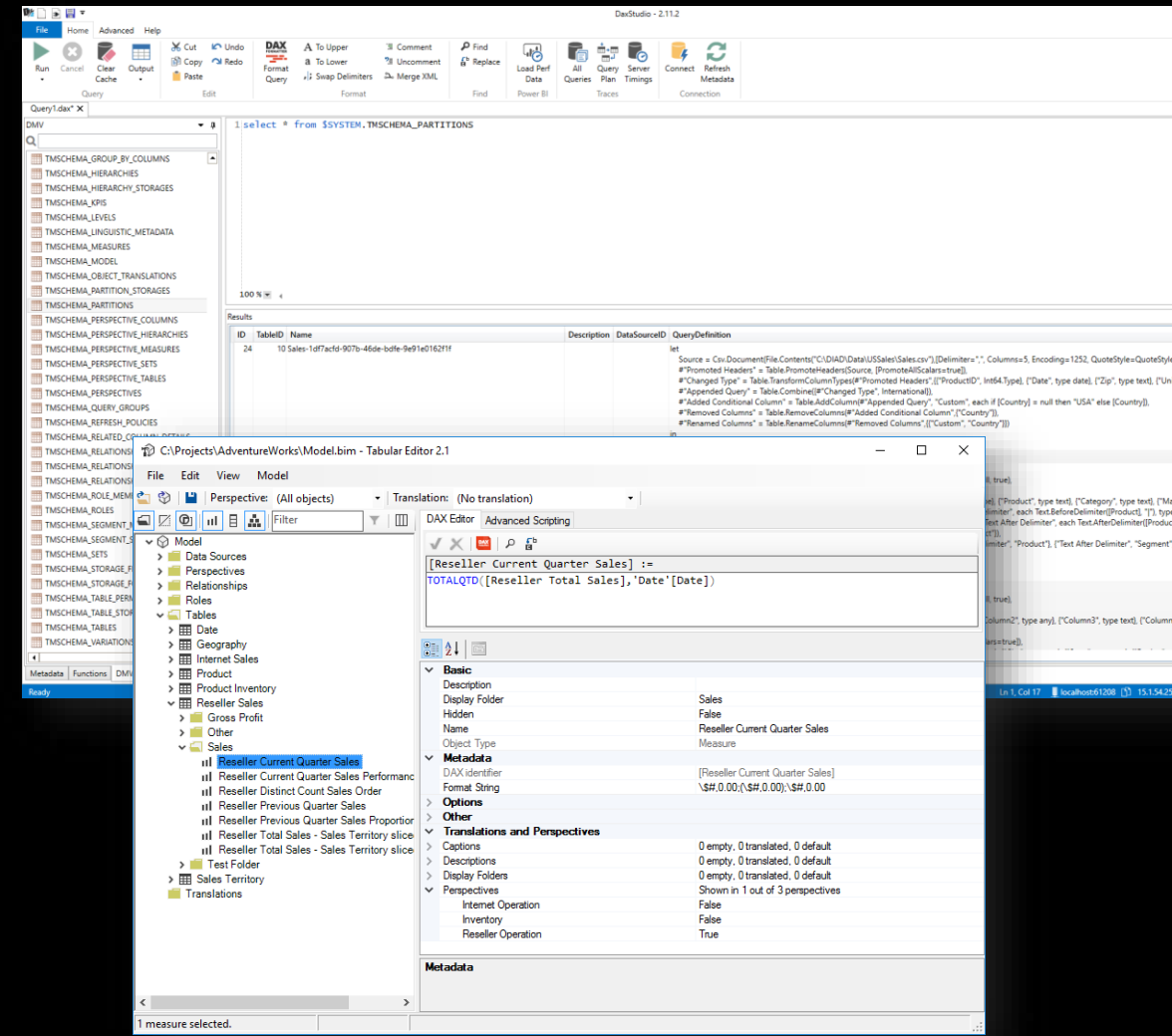
IT'S DEMO TIME!
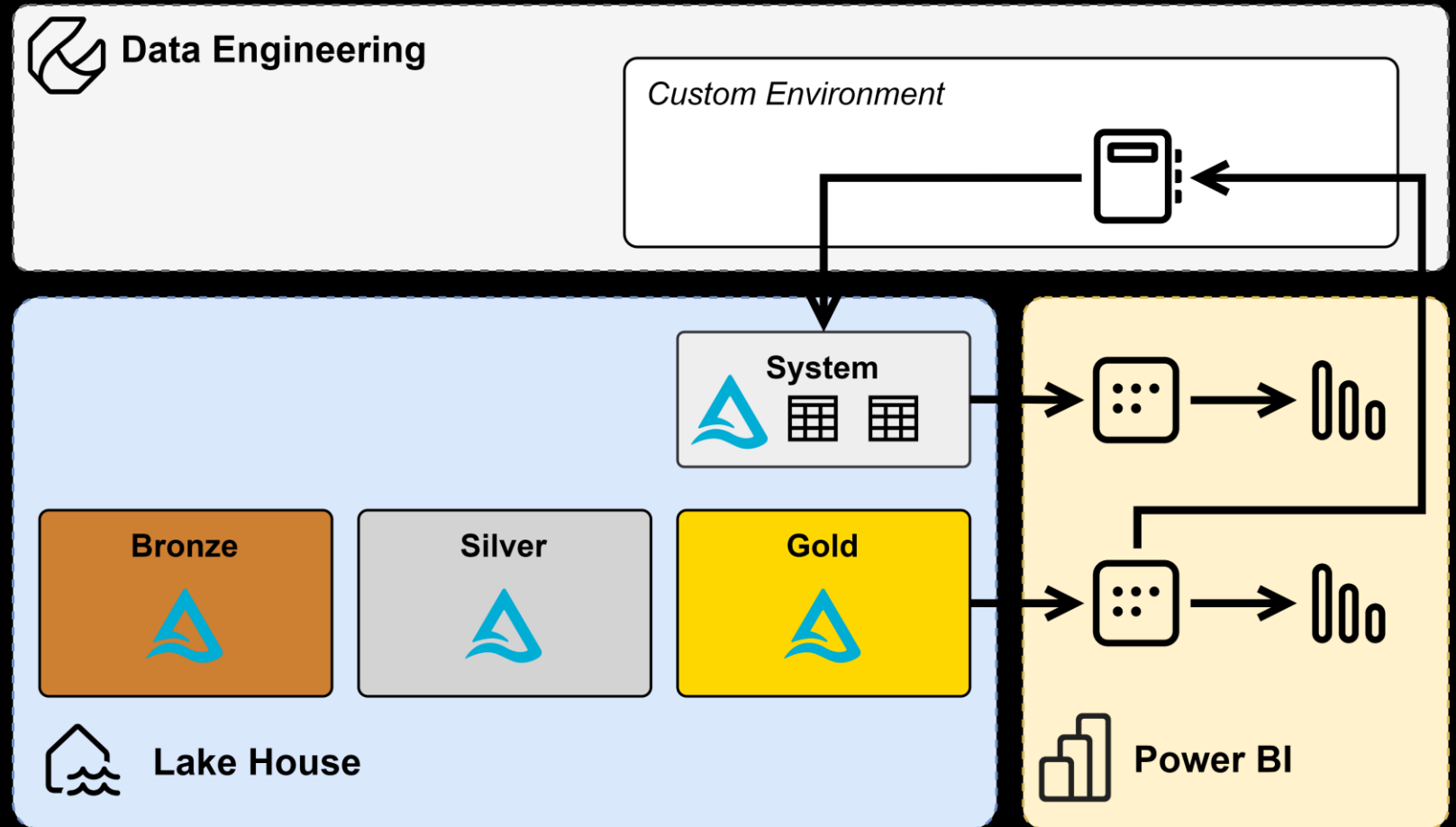
Demo – Document your solution using Semantic Link

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Sounds familiar?

We could already do a lot using Tabular Editor / DAX Studio and **XMLA endpoints** for Semantic Model quality checks, but requires user input.

Executing DMVs and model documentation can be done using **External Tools** in PBI Desktop, but cannot be refreshed/updated easily.

What's next?

Main focus:

- Fabric-flavored Model Documenter that can:
    - Automatically refresh/update the documentation on daily bases
    - A single report that documents multiple semantic models in the same workspace
    - Documents changes made in the past (history of meta data)
    - … more to be defined

Though… it will no longer be an external tool to Power BI Desktop.

Will the existing Model Documenter disappear?

No!

The current version will stay, but likely will not be further enhanced and only contain bug fixes.

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Wrap-up and resources

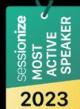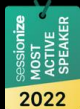Data-Marc.com

So, from now on…

Thanks for attending!

Marc Lelijveld
Technical Evangelist | Architect
Macaw Netherlands

@MarcLelijveld

linkedin.com/in/MarcLelijveld

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Resources:

Https://data-marc.com/model-documenter/

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