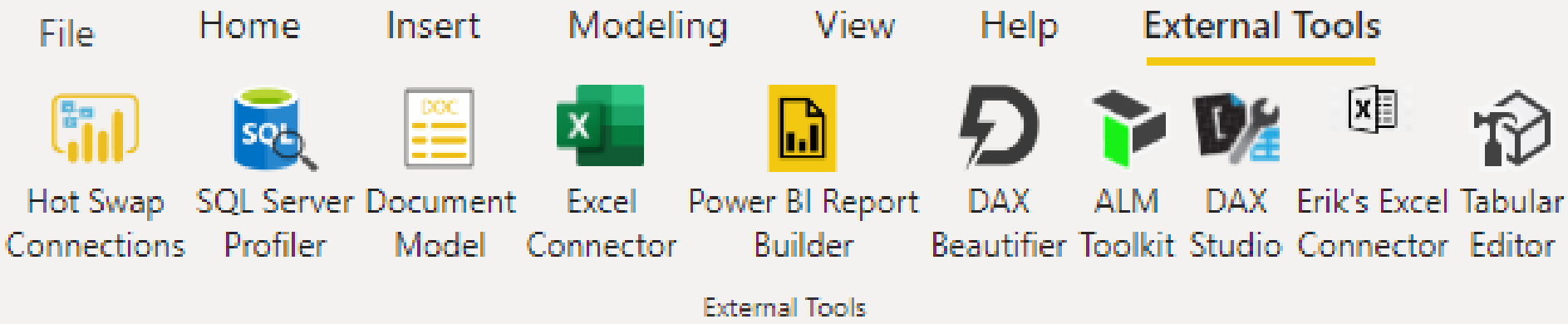
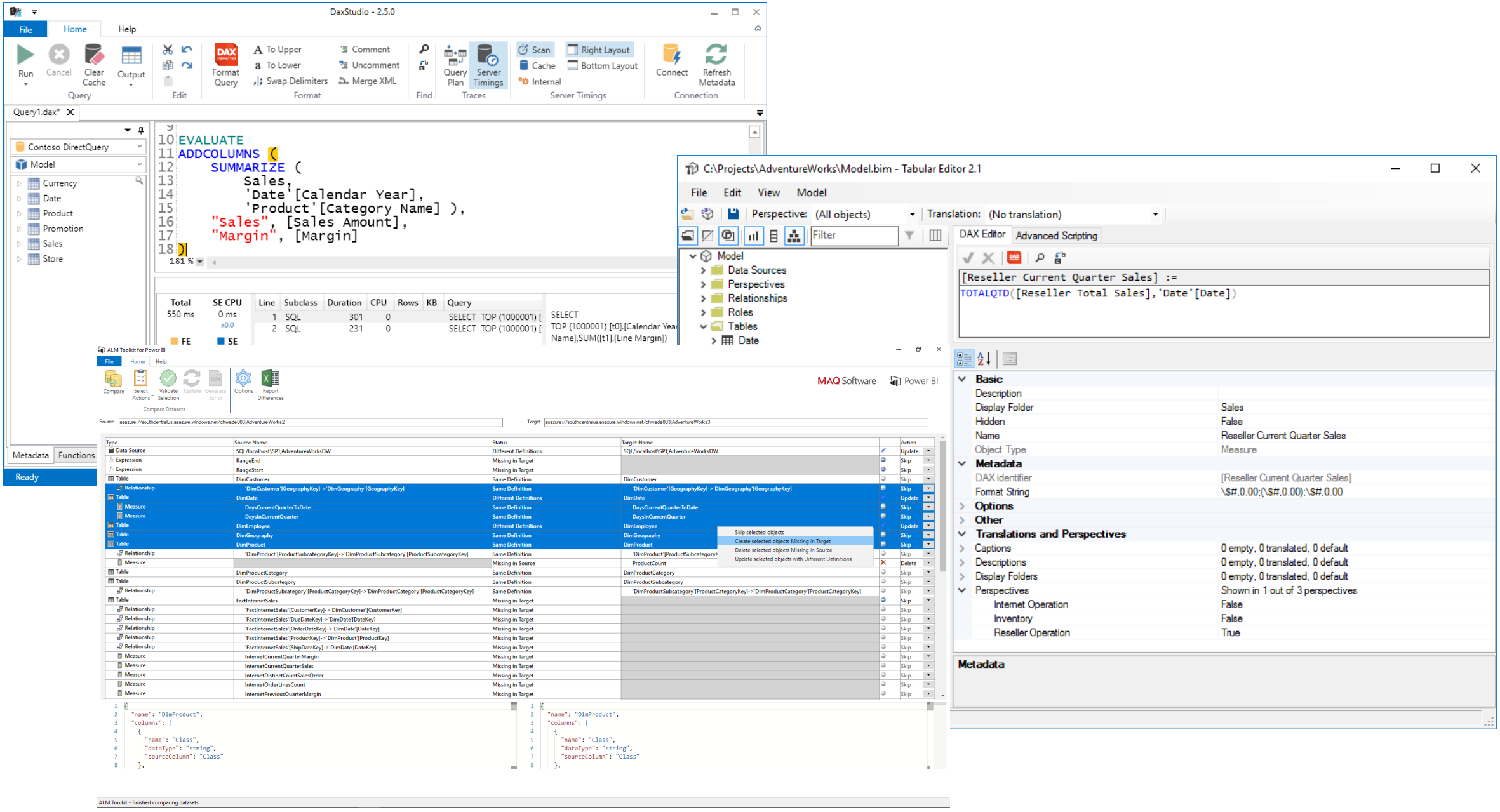


Power BI – External Tools

#PowerBIer



Marc Lelijveld

Data & Analytics consultant
Macaw Netherlands

Microsoft® MVP Most Valuable Professional

Microsoft Power Platform
FASTTRACK RECOGNIZED SOLUTION ARCHITECT
2021

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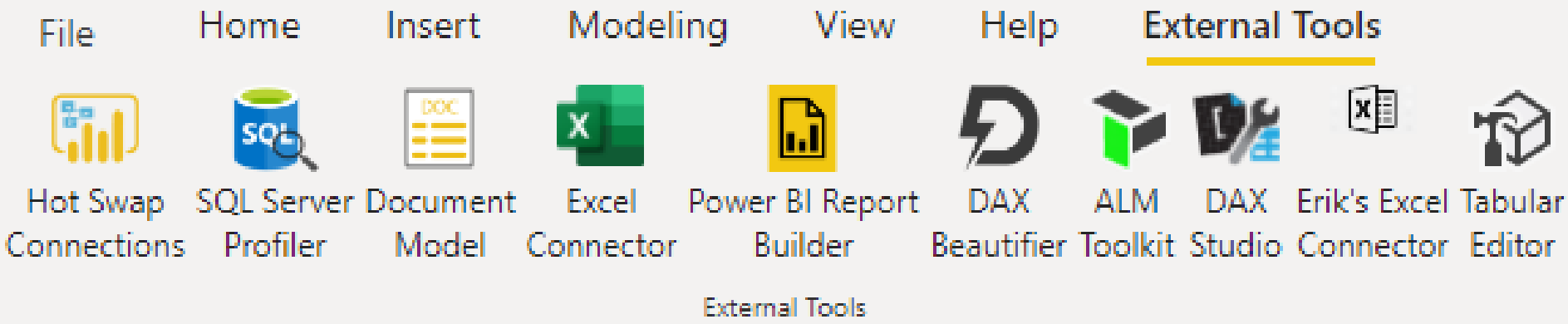
Today’s agenda

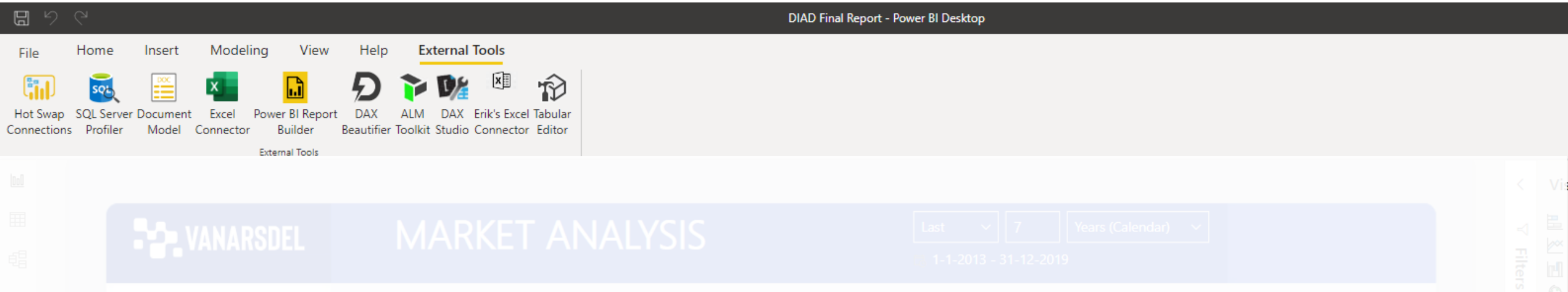
- External Tools, what is it?
- Analysis Services in memory
- Building External Tools
- Documentation of solutions
- Model Documenter external tool



External Tools, what is it?

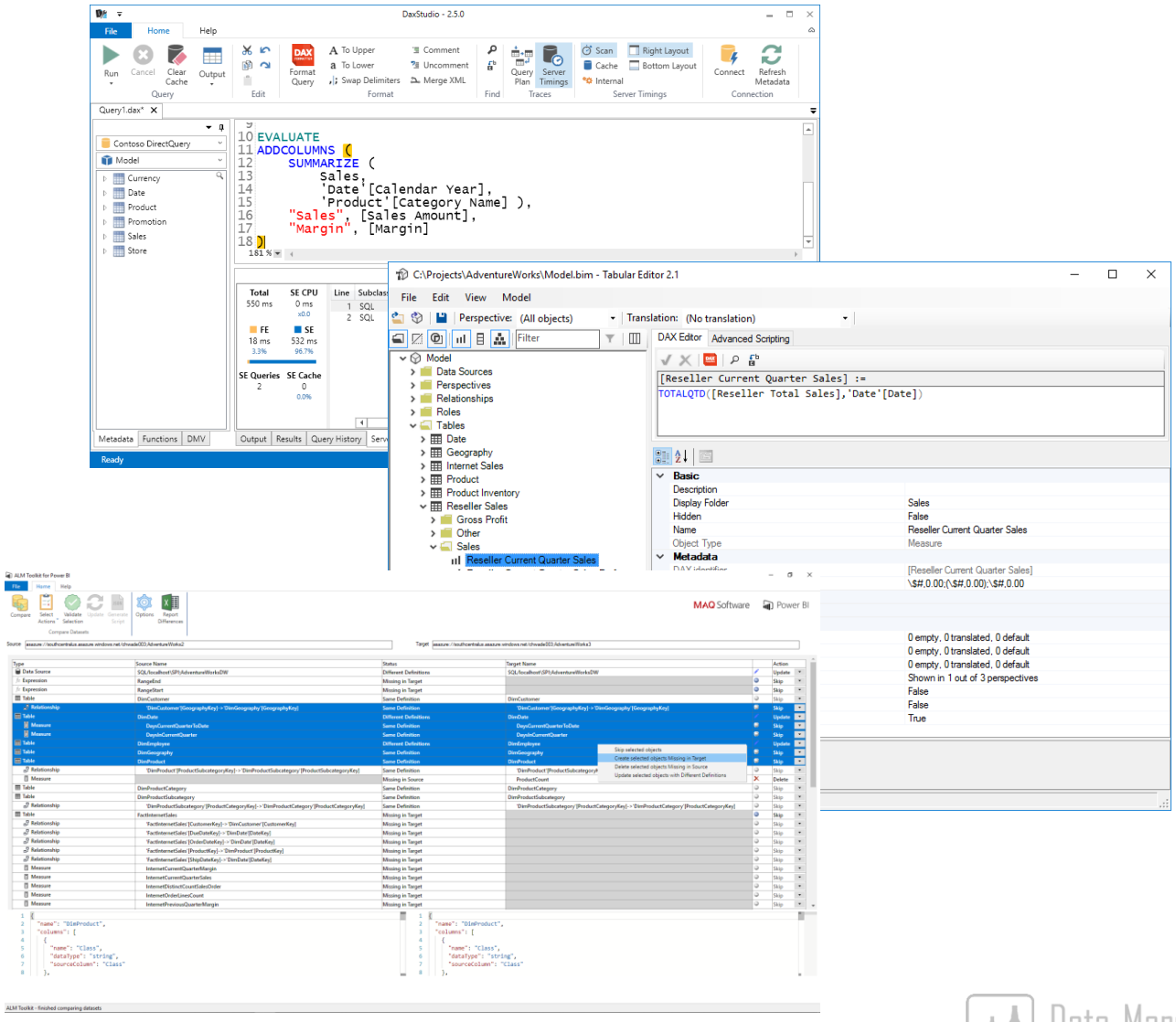
What are external tools in Power BI?

- Connect to the data model
- 3rd party tooling
- Depending on new metadata
- Read + Write to TOM



Connect with 3rd party tools

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

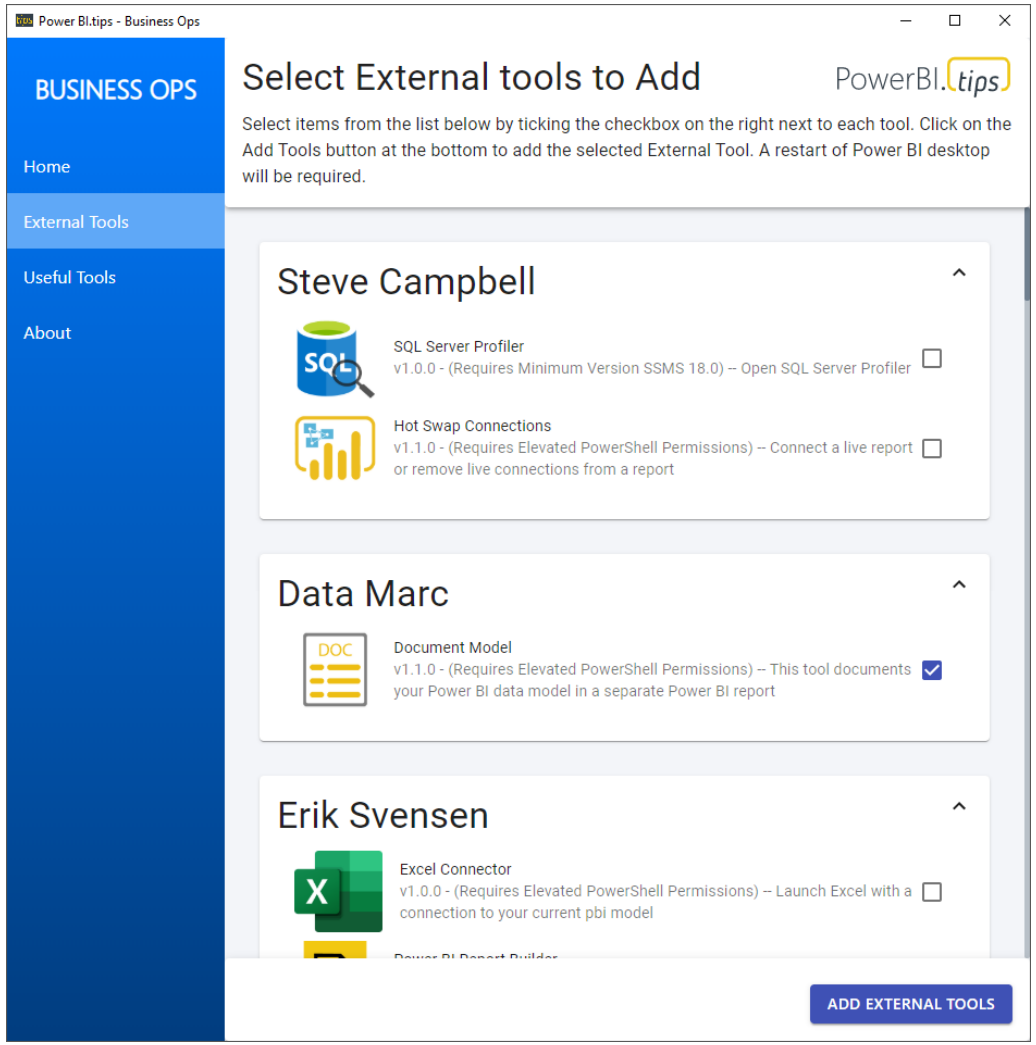


DEMO!

- Connect External Tool to Power BI
- Write new measure to Power BI with External Tools
- Push measure to PBI Service
- Publish content using XMLA and ALM Toolkit

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 - model i

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

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

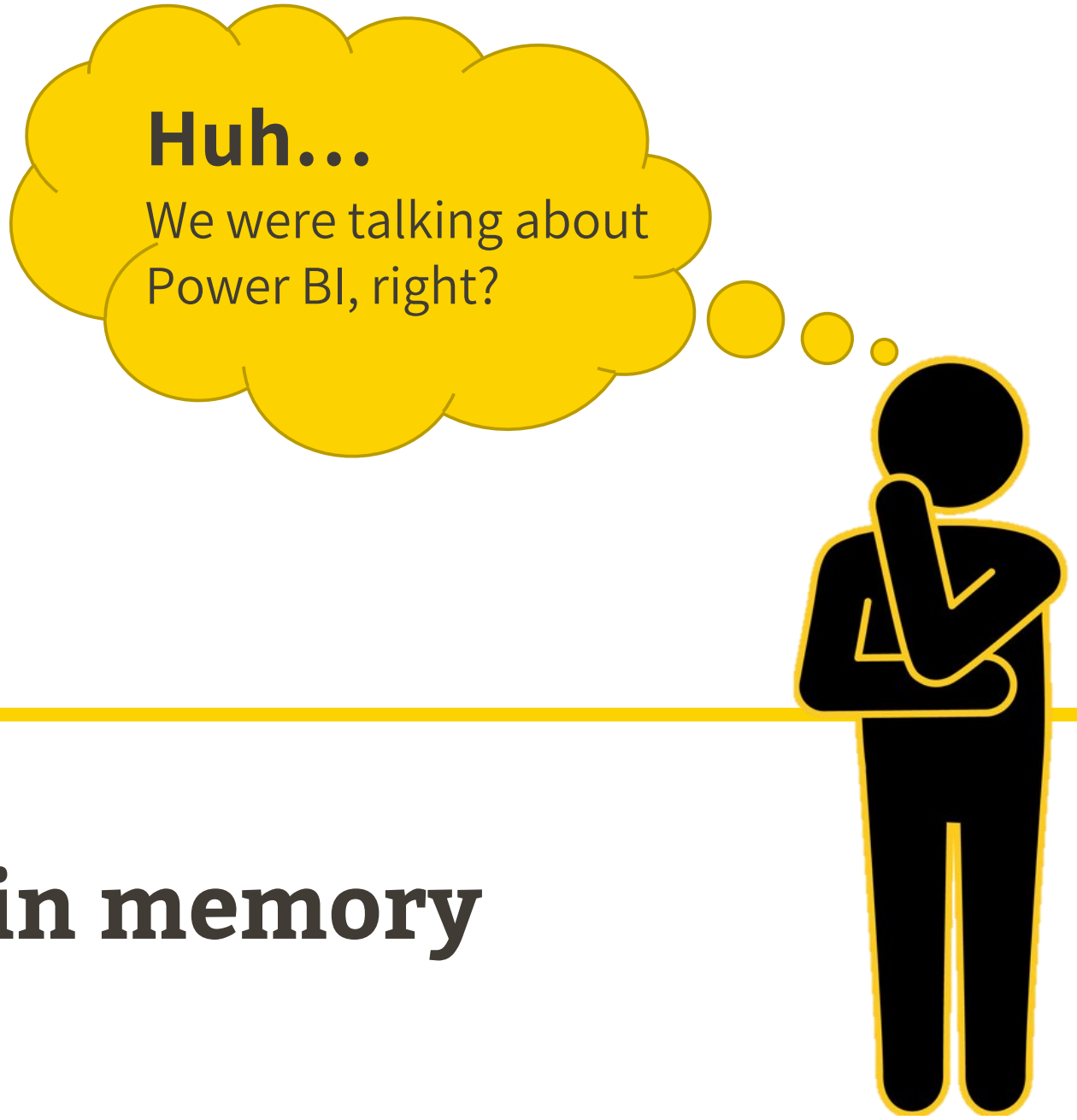
Hot Swap Connections
v1.1.0 - (Requires Elevated PowerShell Permissions) -- Connect a live report or remove live connections from a report

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



Analysis Services in memory

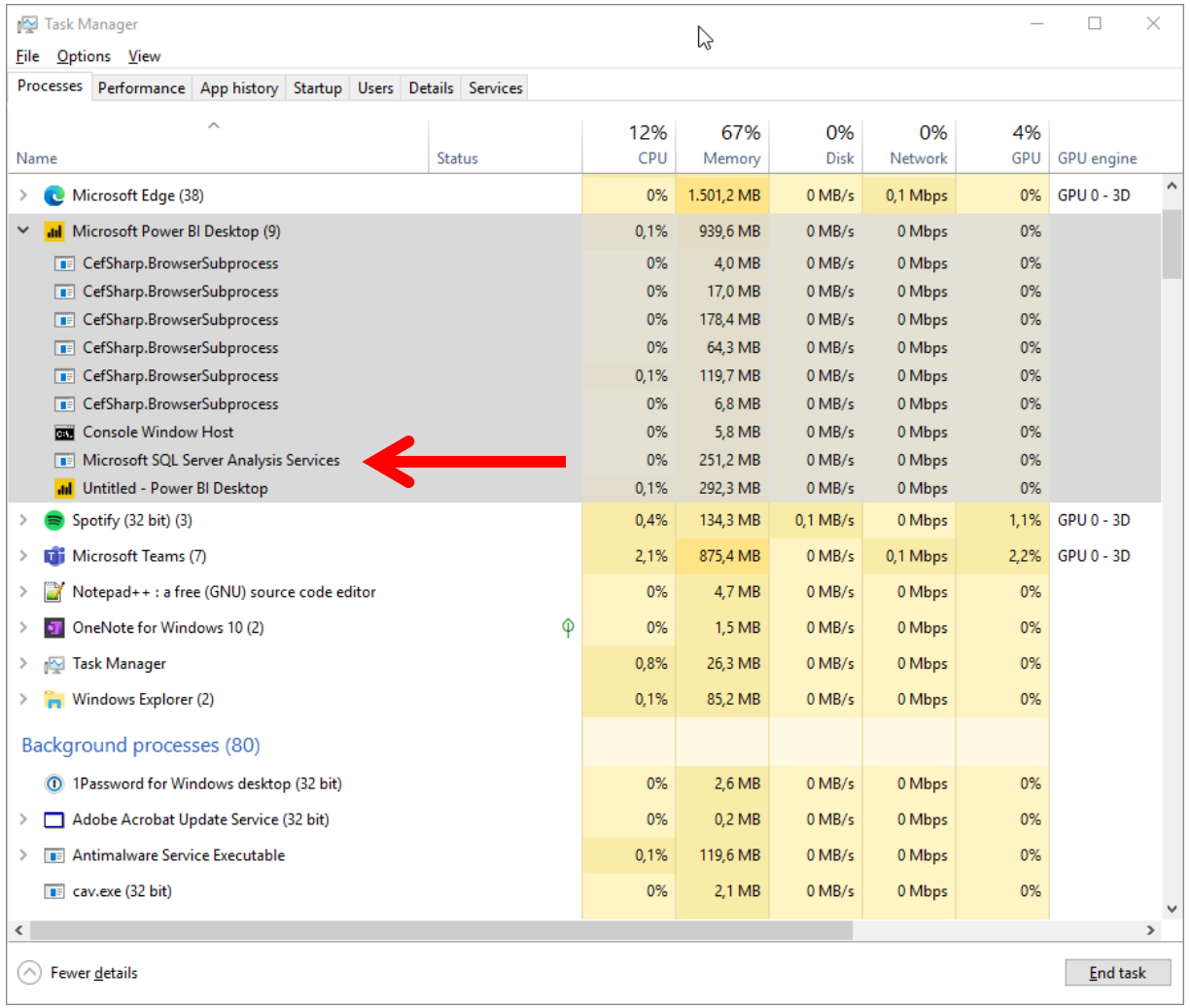
Analysis services in memory

Power BI

=

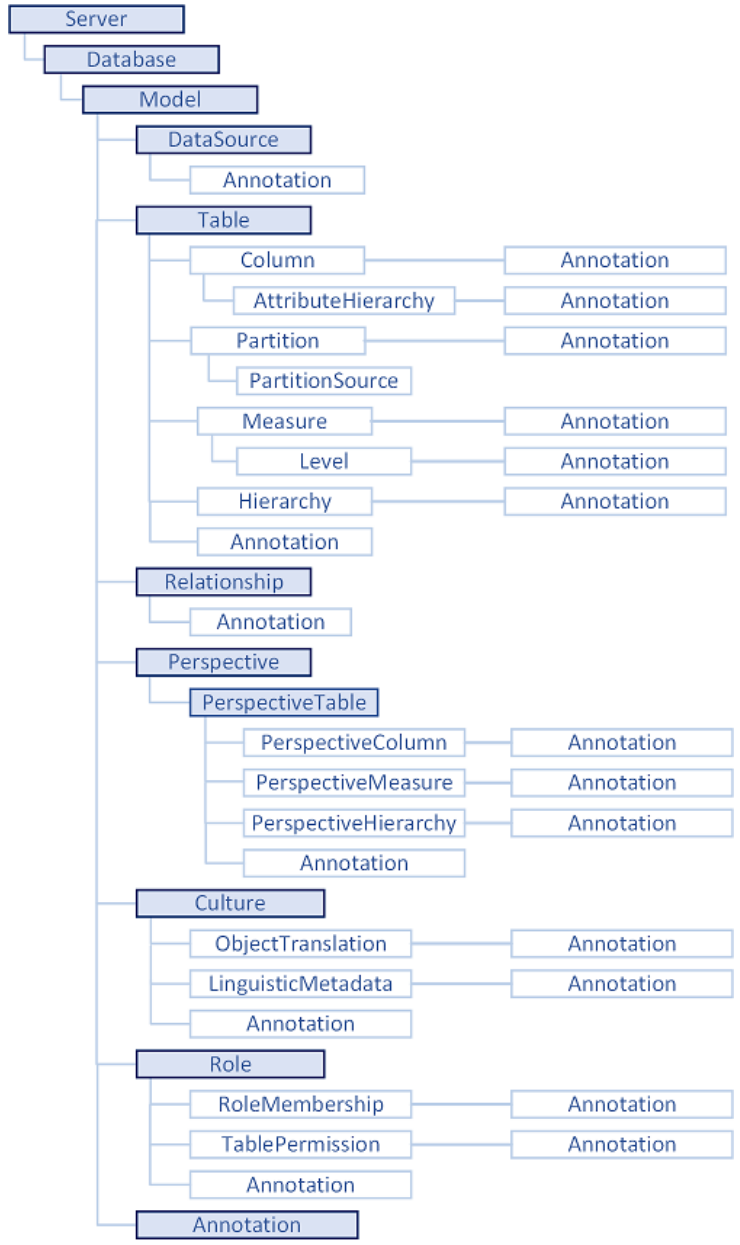
Analysis Services

under the hood



New metadata

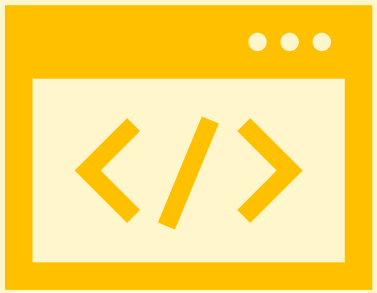
- General Available since September 2020 release!
- Matches Analysis Services metadata
- Model.bim
- Tabular Object Model (TOM)
- Open format (json)



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

Building External Tools

How to setup your own External Tool?



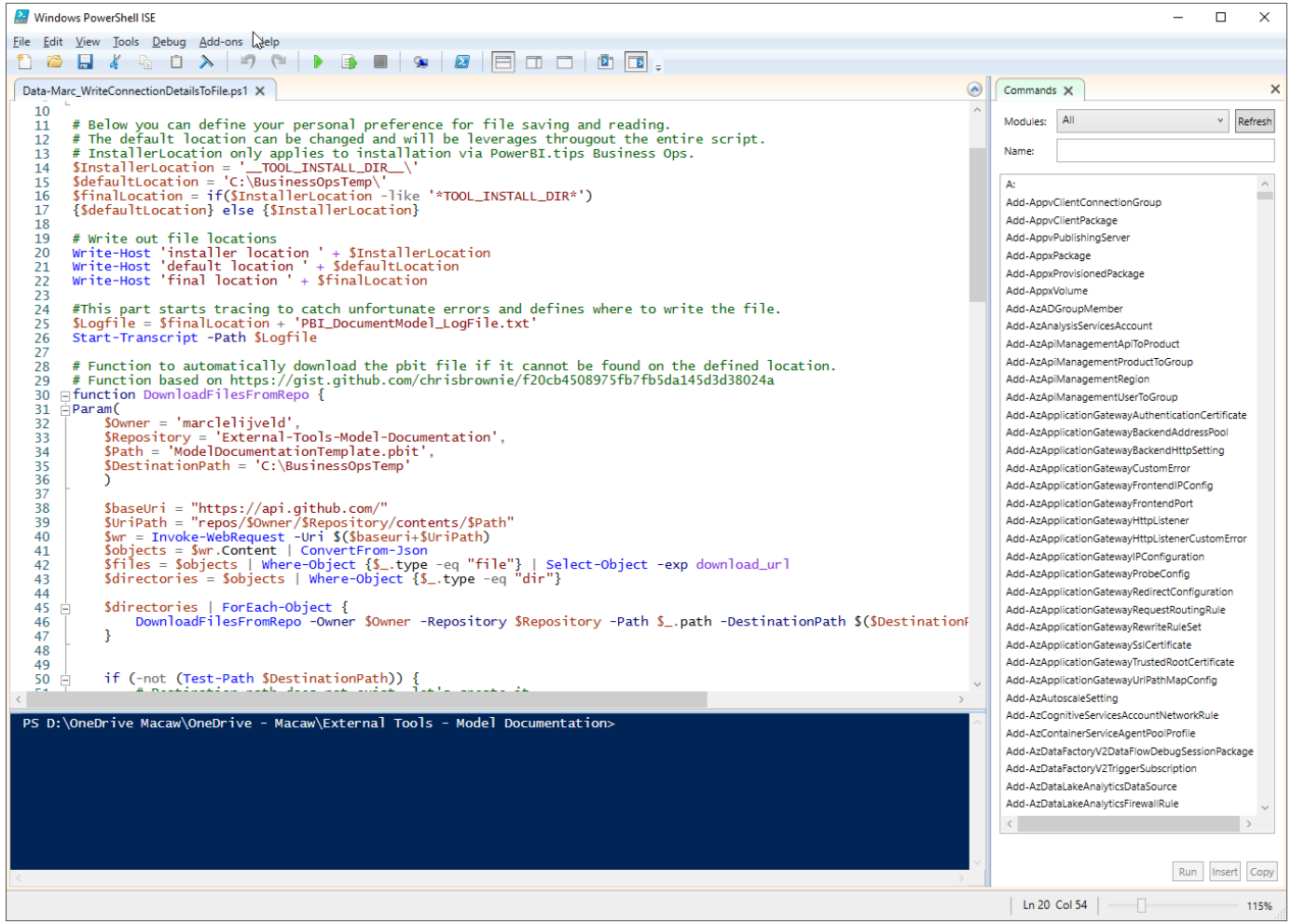
Build your application

Create your icon

Integrate in Power BI Desktop

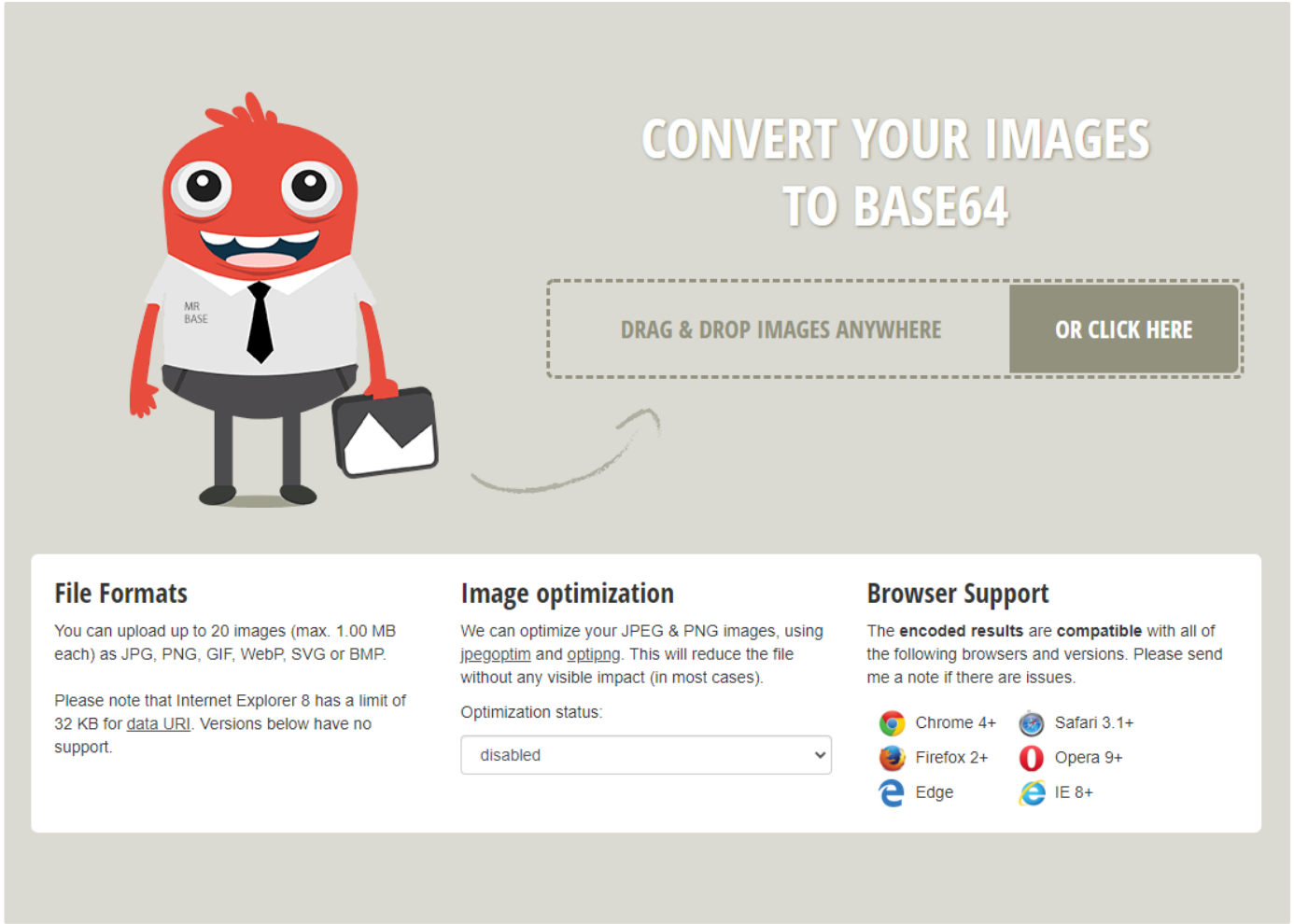
How to setup your own External Tool?

Build your application



How to setup your own External Tool?

Create your icon



How to setup your own External Tool?

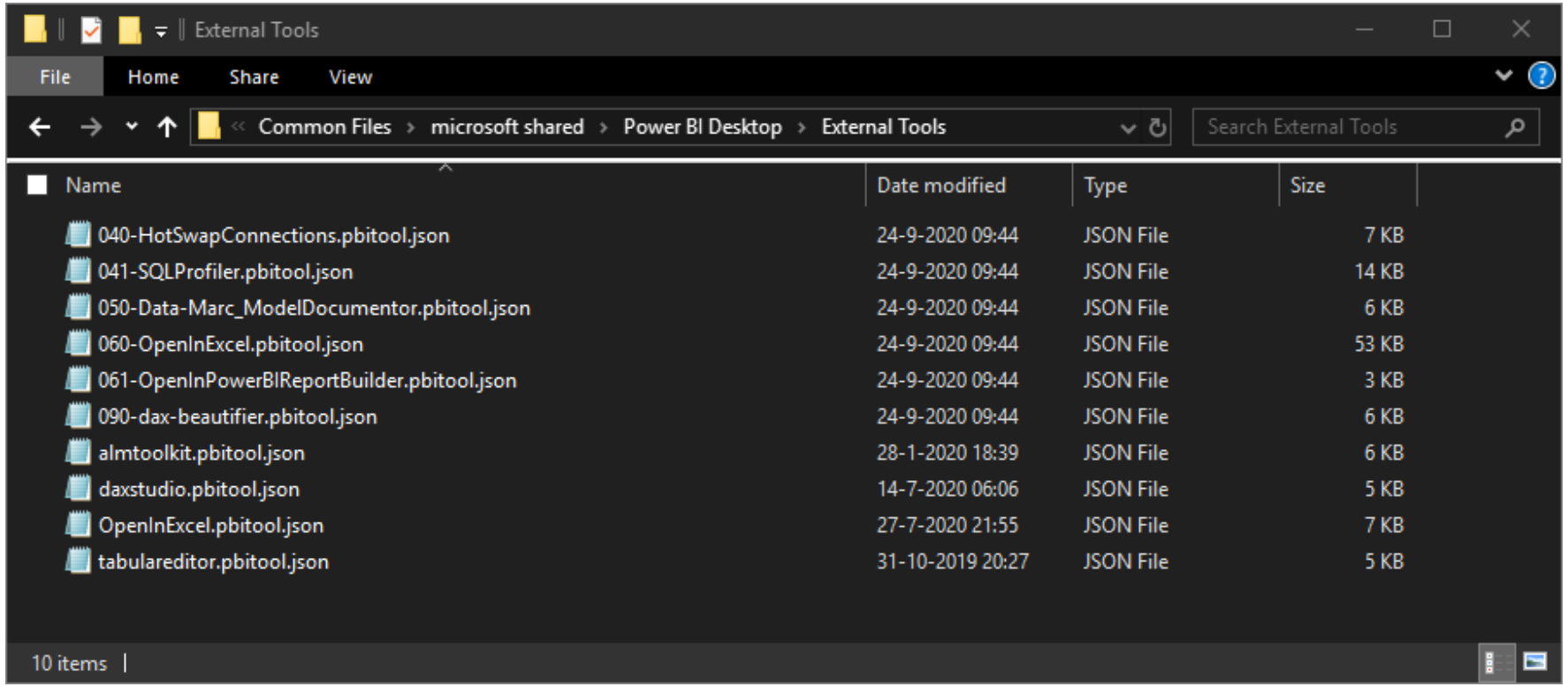
Integrate in
Power BI Desktop

- *.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": "
}
```

Drop the file in the right location

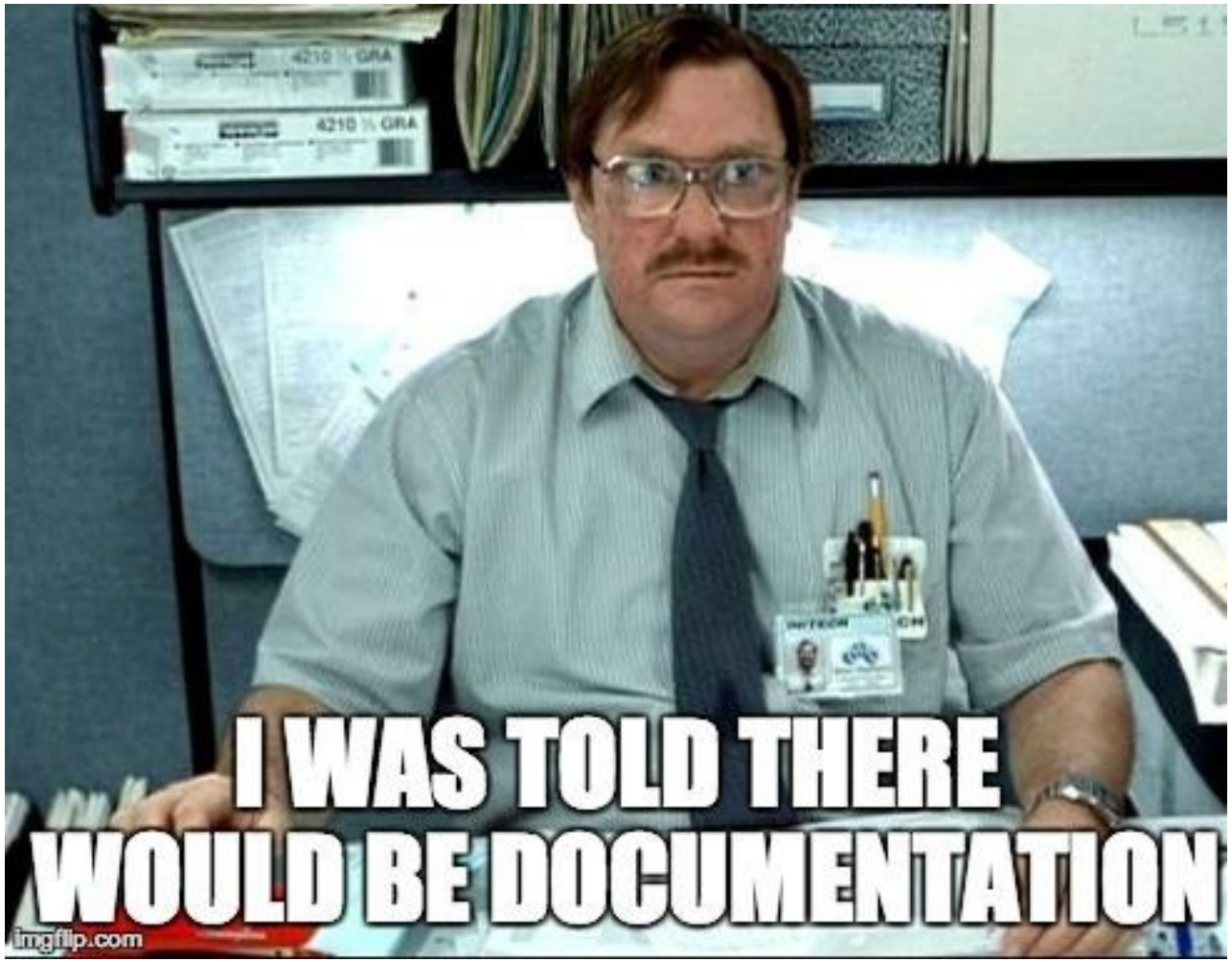
C:\Program Files (x86)\Common Files\Microsoft Shared\Power BI Desktop\External Tools



Documentation

Documentation is overrated?

- ▲ Yes!
- ◆ No



Documentation?

Marc Lelijveld
@MarcLelijveld

If you deliver or use a #PowerBI solution whic
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%**

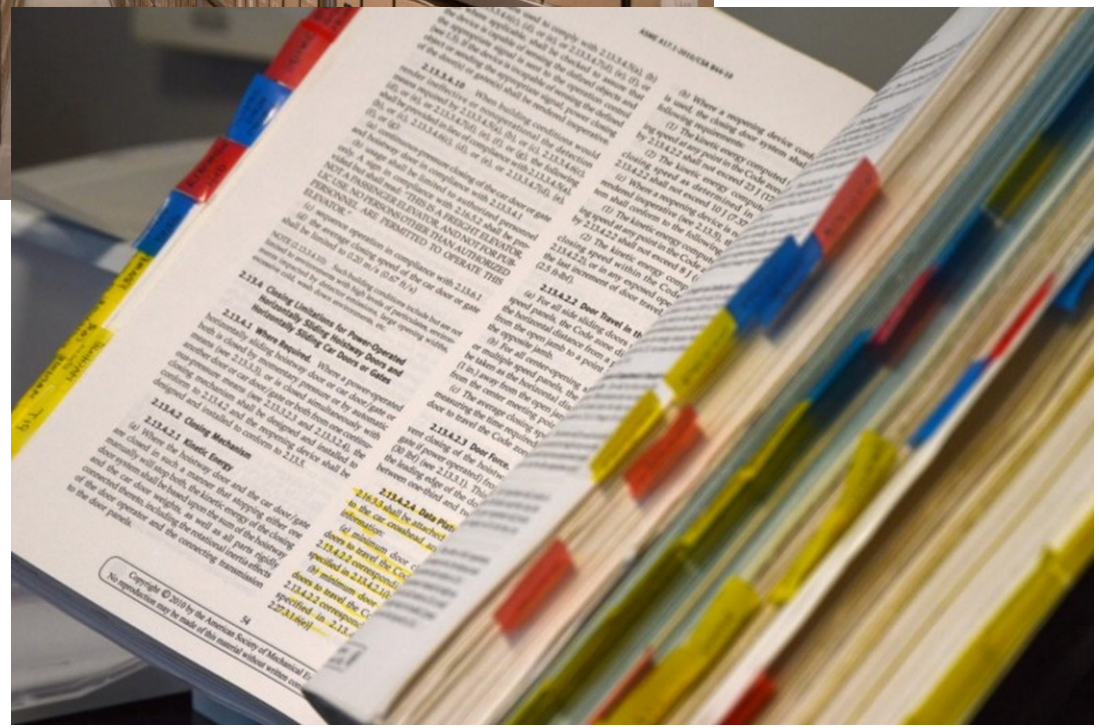
Ásgeir Gunnarsson
@bidgeir

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

Do you currently document your Power BI solutions?

- ▲ Always! I describe every detail!
- ● I manually put something together
- ◆ I generate something and that's it
- ■ Documentation? What's that?



Handover projects

Success

what people think
it looks like

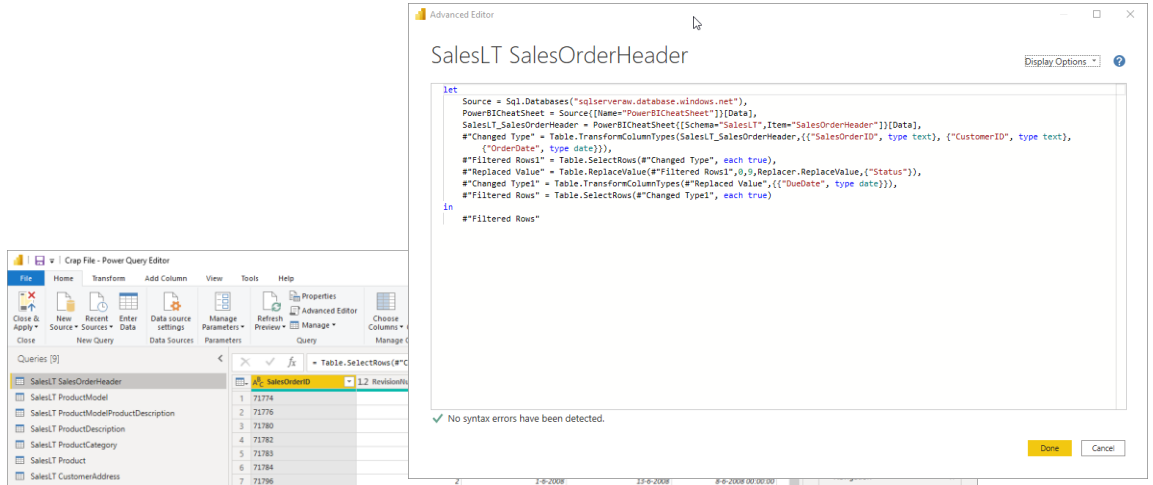
Success

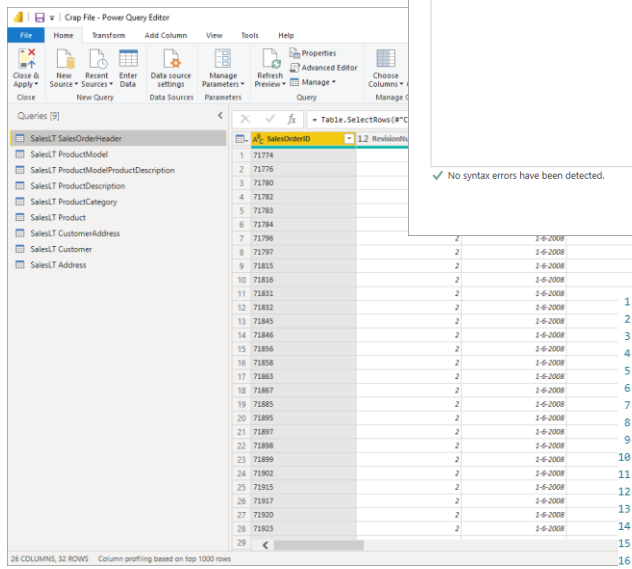
what it really
looks like

What do you want to document?

I want to document the following items:

- ▲ Power Query
- ● Relationships and model
- ◆ DAX expressions
- ■ Column and table properties



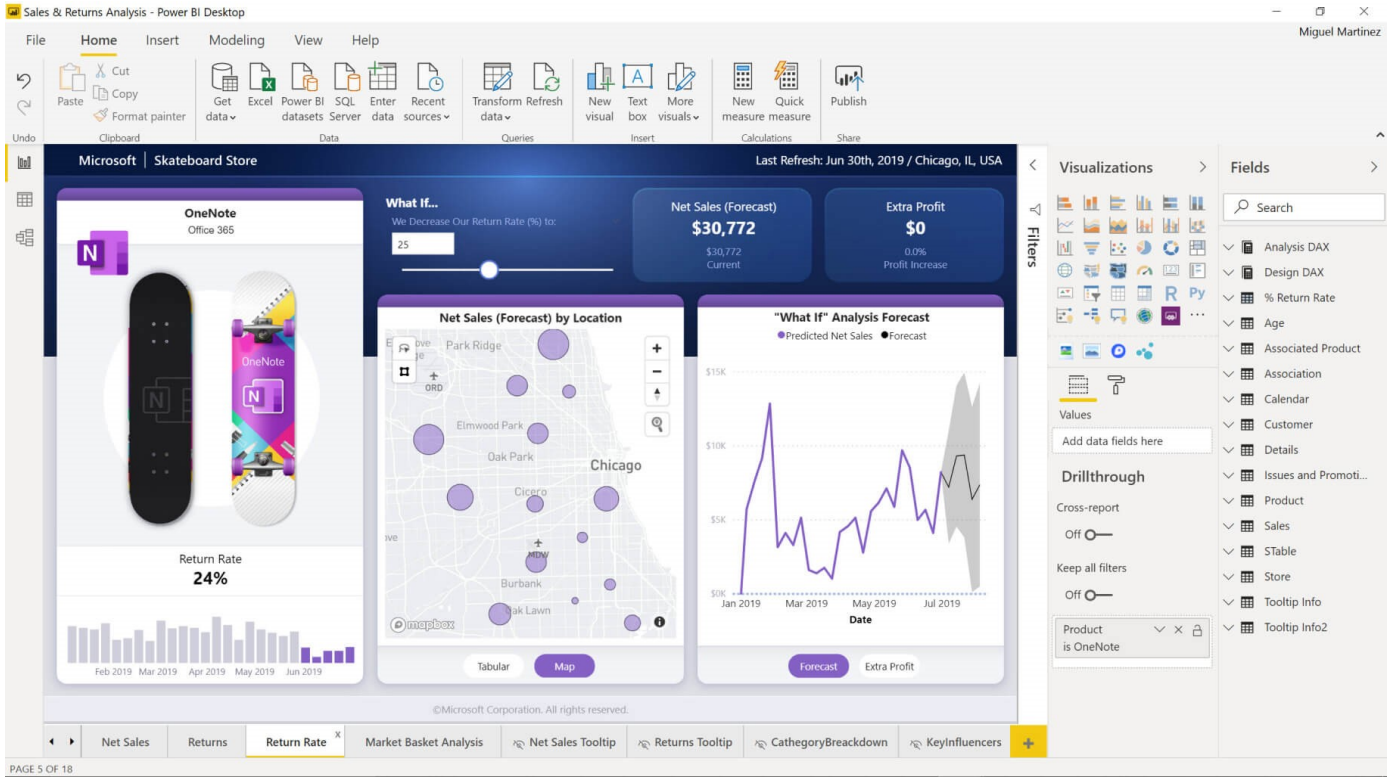



```
Date DAX =
ADDCOLUMNS (
CALENDAR ("2015-01-01", "2025-12-31"),
"Date Int", FORMAT ( [Date], "YYYYMMDD" ),
"Year", YEAR ( [Date] ),
"Month Nr", FORMAT ( [Date], "MM" ),
"Month Name Short", FORMAT ( [Date], "mmm" ),
"Month Name", FORMAT ( [Date], "mmmm" ),
"Week Nr", WEEKNUM ( [Date], 2 ),
"Day Of Week Nr", WEEKDAY ( [Date] ),
"Day Of Week Short", FORMAT ( [Date], "ddd" ),
"Day Of Week", FORMAT ( [Date], "dddd" ),
"Quarter", "Q" & FORMAT ( [Date], "Q" ),
"Year Quarter", FORMAT ( [Date], "YYYY" ) & "Q" & FORMAT ( [Date], "Q" ),
"Year Month Nr", FORMAT ( [Date], "YYYY" ) & FORMAT ( [Date], "MM" ),
"Year Month Short", FORMAT ( [Date], "YYYY" ) & " " & FORMAT ( [Date], "mmm" ),
"Year Month", FORMAT ( [Date], "YYYY" ) & " " & FORMAT ( [Date], "mmmm" ),
"Is Current Year", YEAR( TODAY() ) = YEAR( [Date] ),
"Is Current Month", AND( YEAR( TODAY() ) = YEAR( [Date] ), MONTH( TODAY() ) = MONTH( [Date] ) ),
"Is Current Week", WEEKNUM ( TODAY(), 2 ) = WEEKNUM ( [Date], 2 ) ,
"Is Current Day", TODAY() = [Date],
"Is Previous Year", YEAR( TODAY() ) -1 = YEAR( [Date] ),
"Is Previous Month", AND( YEAR( TODAY() ) = YEAR( [Date] ), MONTH( TODAY() ) -1 = MONTH( [Date] ) ),
"Is Previous Week", WEEKNUM ( TODAY(), 2 ) - 1 = WEEKNUM ( [Date], 2 ),
"Is Previous Day", TODAY() -1 = [Date],
"Is Workday", AND( WEEKDAY( [Date] ) <> 1., WEEKDAY( [Date] ) <> 7 ),
"Is Future", [Date] > TODAY(),
"Is Today", [Date] = TODAY(),
"Is History", [Date] < TODAY()
)
```

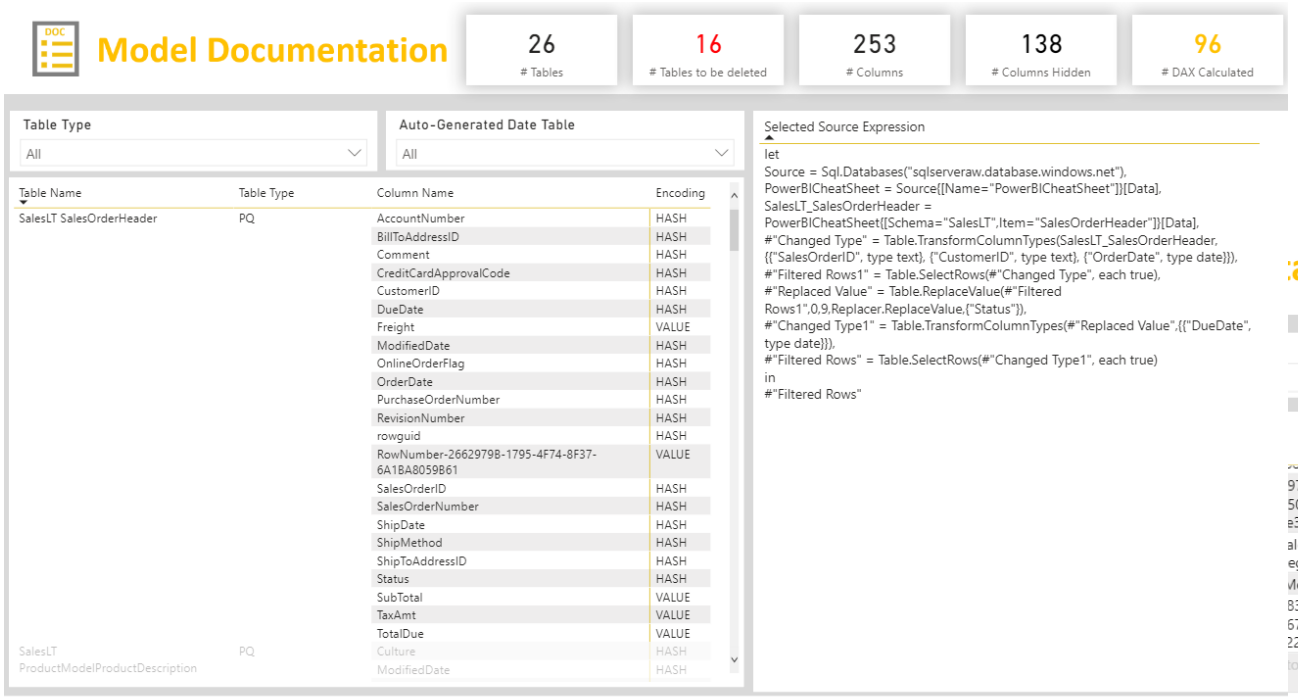
But what about the rest?

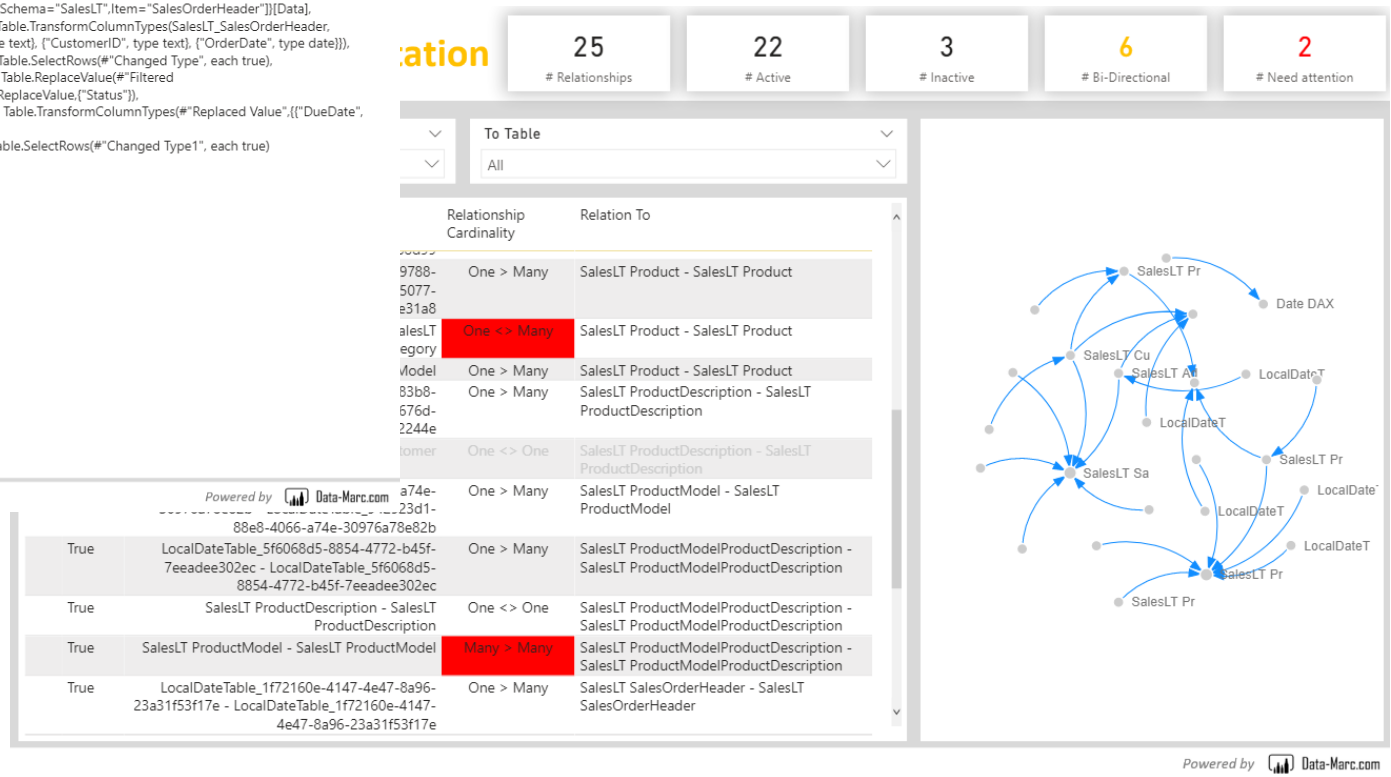
- Visuals
- Bookmarks
- Page navigation

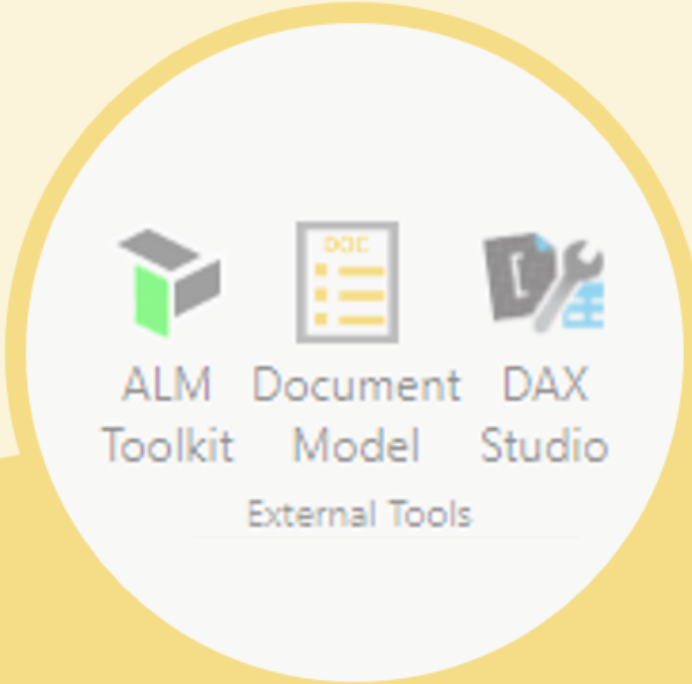
The report in general…



Documentation







Power BI Model Documenter

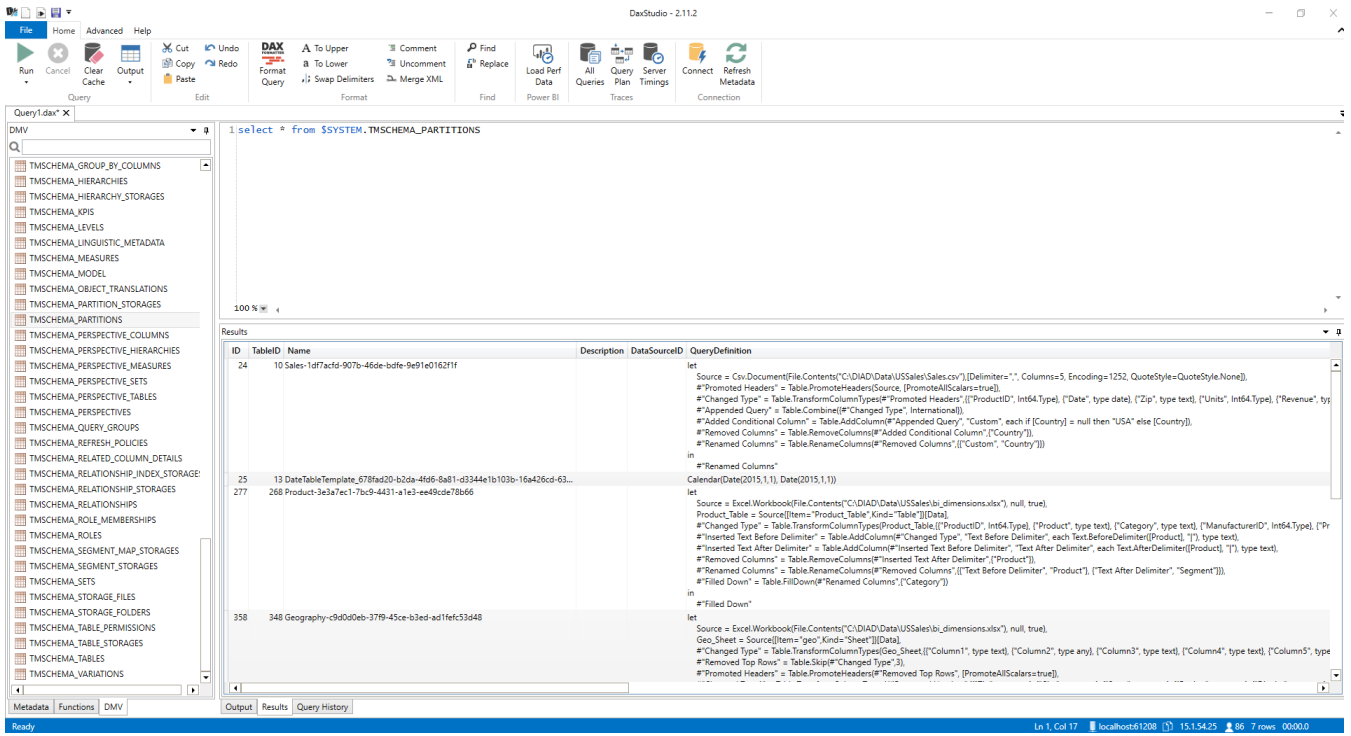
Dynamic Management Views

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

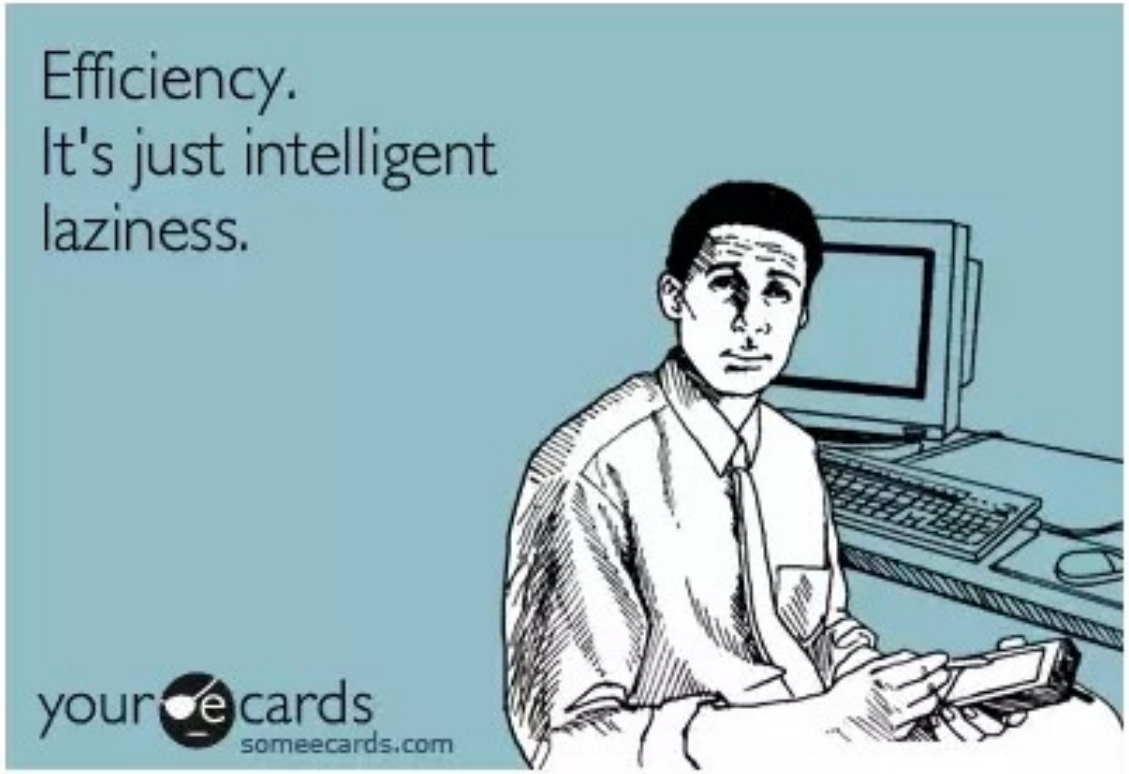


DEMO!

- Show all tables in model
  - Table Expressions
- Show all measures
- Show Perspectives
  - Measures in perspectives
  - Columns in perspectives
- Show columns
- Roles
  - Role expressions

Automation of documentation

- Need for something to execute tasks automatically.
- Something that runs on every computer



PowerShell

- Retrieve Server and Database information
- Dump connection file in json format
- Download template from GitHub
- Opens Power BI template

Data-Marc_WriteConnectionDetailsToFile.ps1

```powershell
<#
    External Tools Power BI model documentor script version 1.1.0
    New in this version:
        - Support for installation via PowerBI.tips Business Ops.
        - Automatic detection of installer location vs default location.
        - Automatic download of the pbit file if it cannot be found.

    Full change log can be found here: https://data-marc.com/model-documenter/
#>

# Below you can define your personal preference for file saving and reading.
# The default location can be changed and will be leverages througout the entire script.
# InstallerLocation only applies to installation via PowerBI.tips Business Ops.
$InstallerLocation = '__TOOL_INSTALL_DIR__\'
$defaultLocation = 'C:\BusinessOpsTemp\'
$finalLocation = if($InstallerLocation -like '*TOOL_INSTALL_DIR*')
{$defaultLocation} else {$InstallerLocation}

# Write out file locations
Write-Host 'installer location ' + $InstallerLocation
Write-Host 'default location ' + $defaultLocation
Write-Host 'final location ' + $finalLocation

#This part starts tracing to catch unfortunate errors and defines where to write the file.
$Logfile = $finalLocation + 'PBI_DocumentModel_LogFile.txt'
Start-Transcript -Path $Logfile

# Function to automatically download the pbit file if it cannot be found on the defined location.
# Function based on https://gist.github.com/chrisbrownie/f20cb4508975fb7fb5da145d3d38024a
function DownloadFilesFromRepo {
Param(
    $Owner = 'marclelijveld',
    $Repository = 'External-Tools-Model-Documentation',
    $Path = 'ModelDocumentationTemplate.pbit',
    $DestinationPath = 'C:\BusinessOpsTemp'
    )

    $baseUri = "https://api.github.com/"
    $UriPath = "repos/$Owner/$Repository/contents/$Path"
    $wr = Invoke-WebRequest -Uri $($baseuri+$UriPath)
    $objects = $wr.Content | ConvertFrom-Json
```

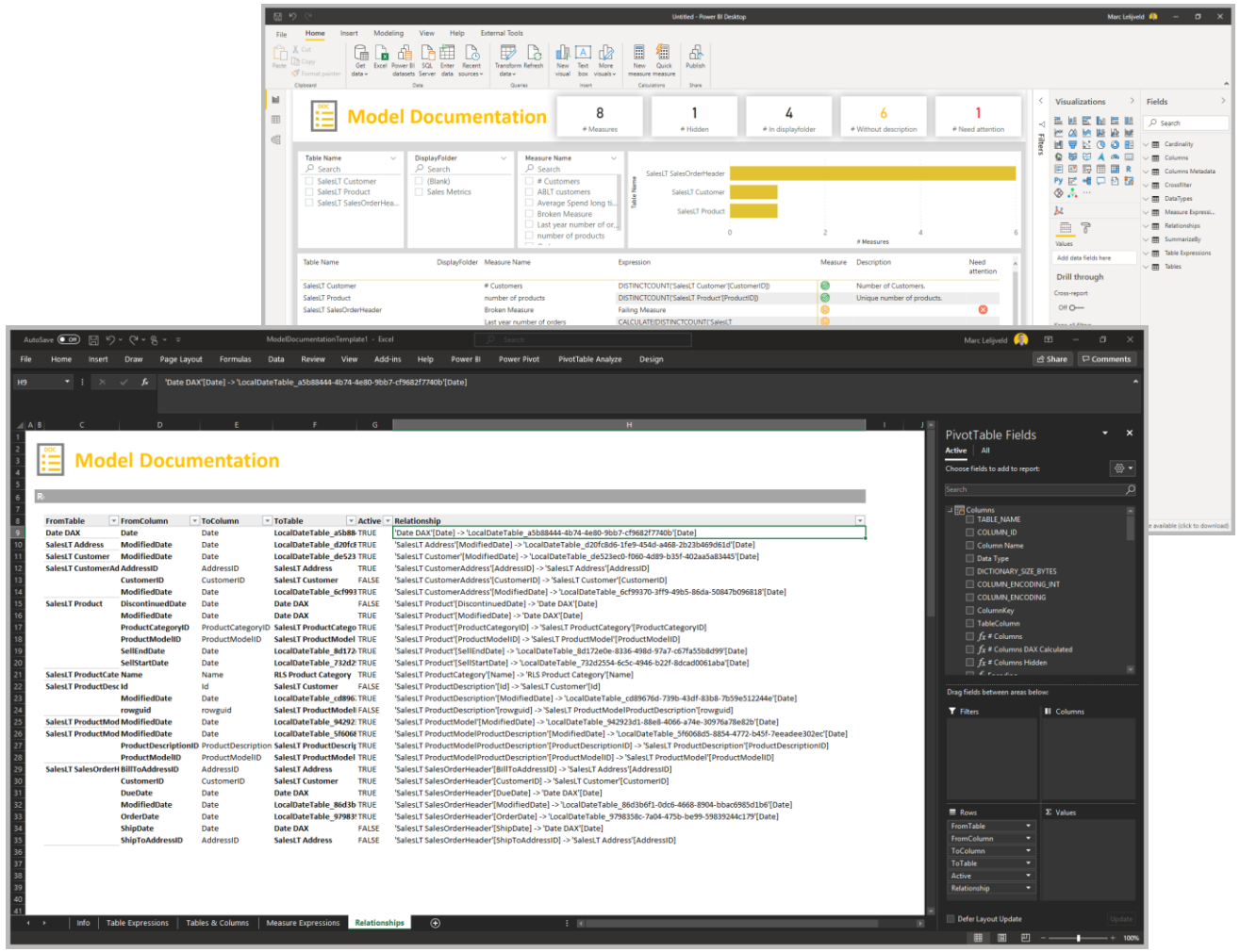
Learnings

- Capturing server and database parameters
- Double \\ in path took a while to figure out
- PowerShell in general + debugging
- On-demand editing *.pbit file not possible
- Dump connection json file as “workaround”

Learn from others!

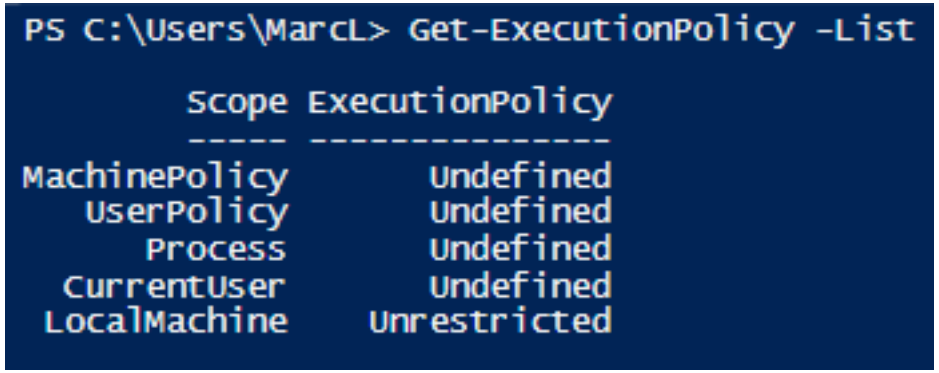
What's new in v1.2.0

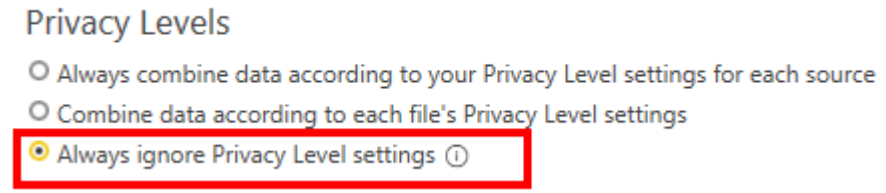
- Better error handling
- Folder creation if not exist yet
- Menu at startup
- Support two export types
  - Power BI Template
  - Excel Template

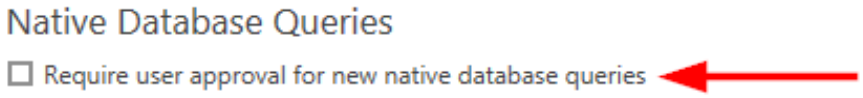


Known limitations (or irritations)

- PowerShell Execution Policies
- Power BI Privacy levels might block loading
- Native database queries
- Requires admin approval for installation
- Requires MSOLAP.8 Provider to be installed
- Excel template requires manual download
- No support for live connections





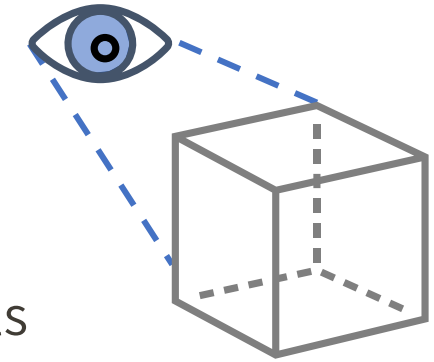


Planned enhancements

What is currently missing and do you want to add?

Soon

- Adding Roles + expressions
- Perspectives
- Auto download Excel template



Later

- Support for live connected models
- Next-next-finish installer

So, from now on...

Wrap up

External Tools…

…are depending on Analysis Service **metadata** format.

…allow you to develop with **3rd party tools**.

…opens tons op **opportunities to contribute** to Power BI.

Model Documenter…

… allows me to be lazy (or efficient) by **generating** documentation.

… opens new opportunities to **hand-over** your solutions.

… is super powerful for **self-service purposes** and end-users.

For resources

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

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