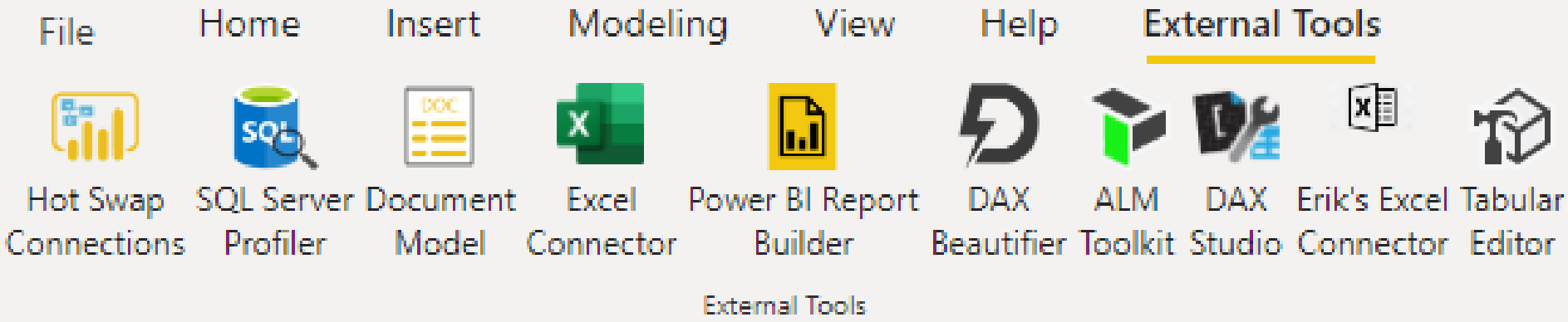

Power BI – Model Documenter

#PowerBIer

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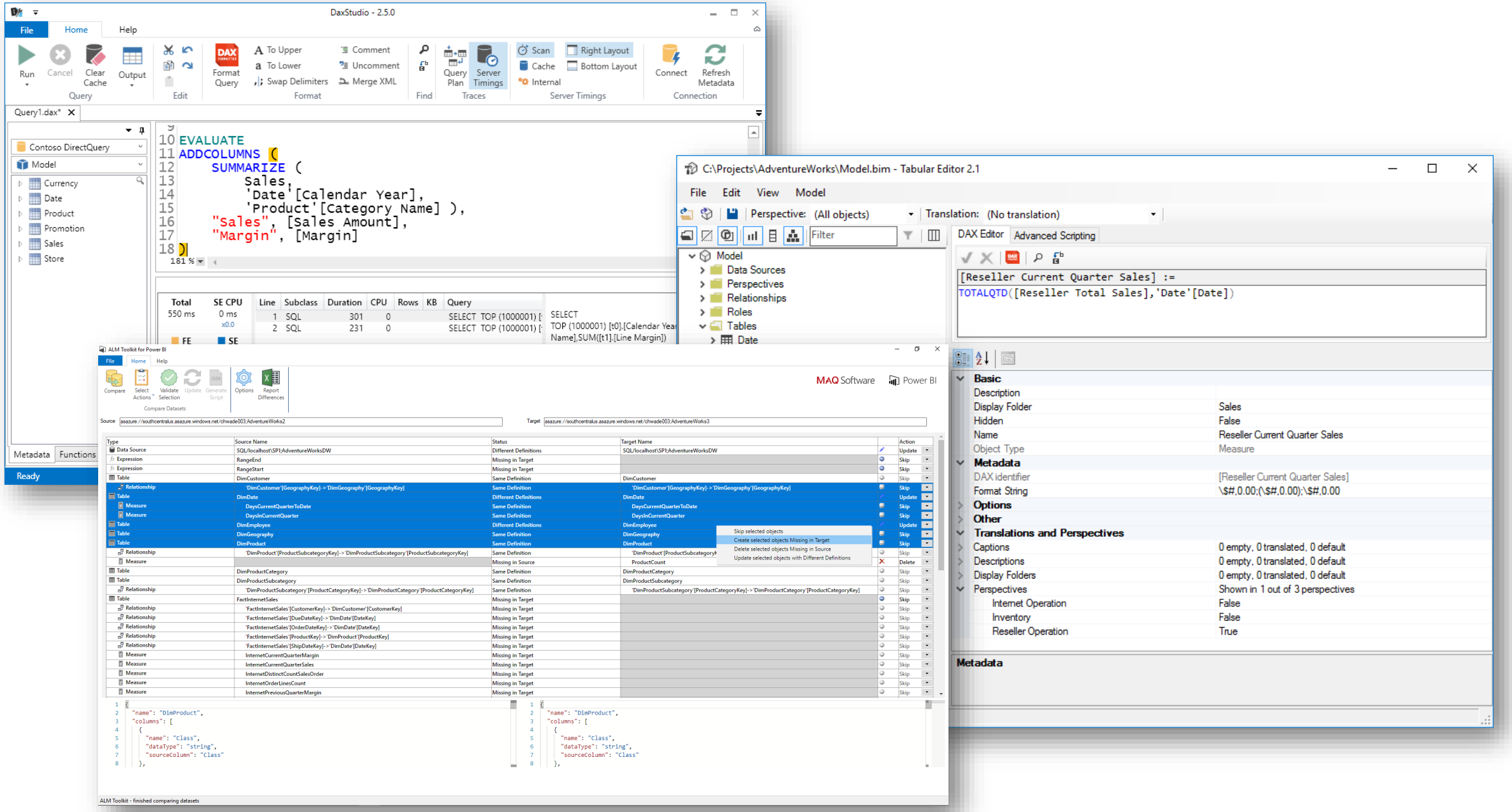

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Marc Lelijveld

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Macaw Netherlands

Microsoft® MVP Most Valuable Professional

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@MarcLelijveld
linkedin.com/in/MarcLelijveld
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Our agenda for today

- External Tools, what is it?
- Analysis Services in memory
- Building External Tools
- I want to hear from you!

Documentation

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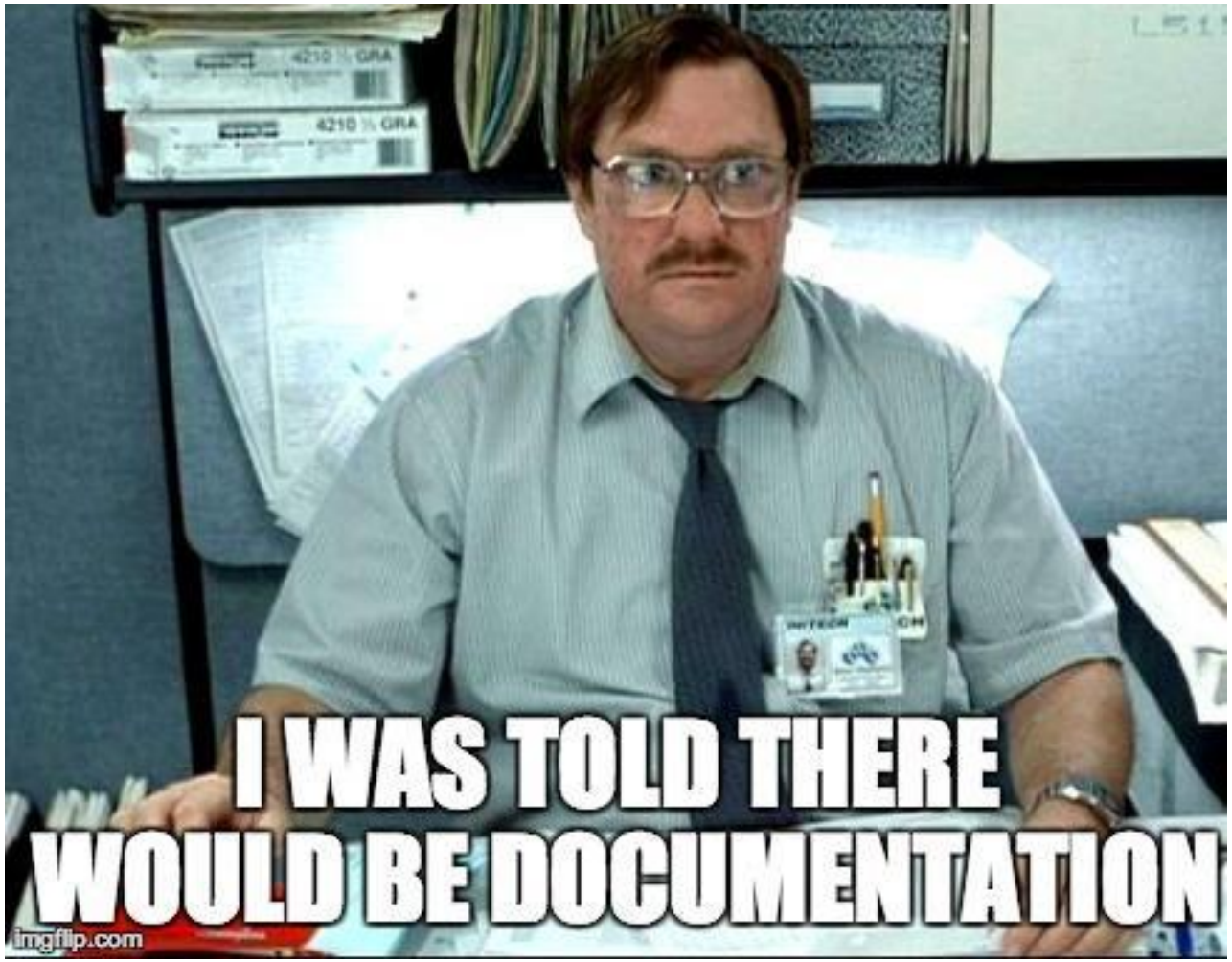
Documentation is overrated?

▲ Yes!

◆ No



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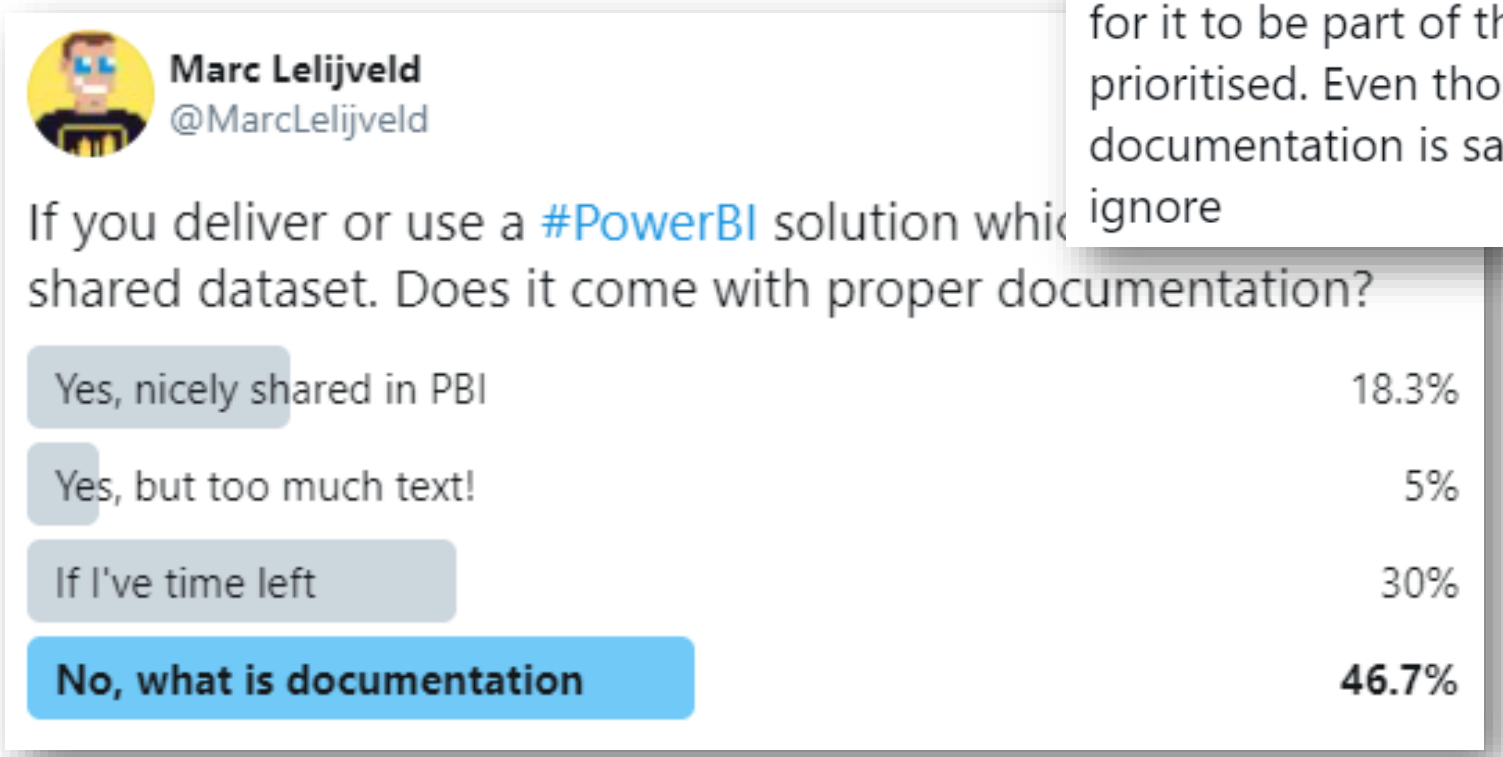
Documentation?



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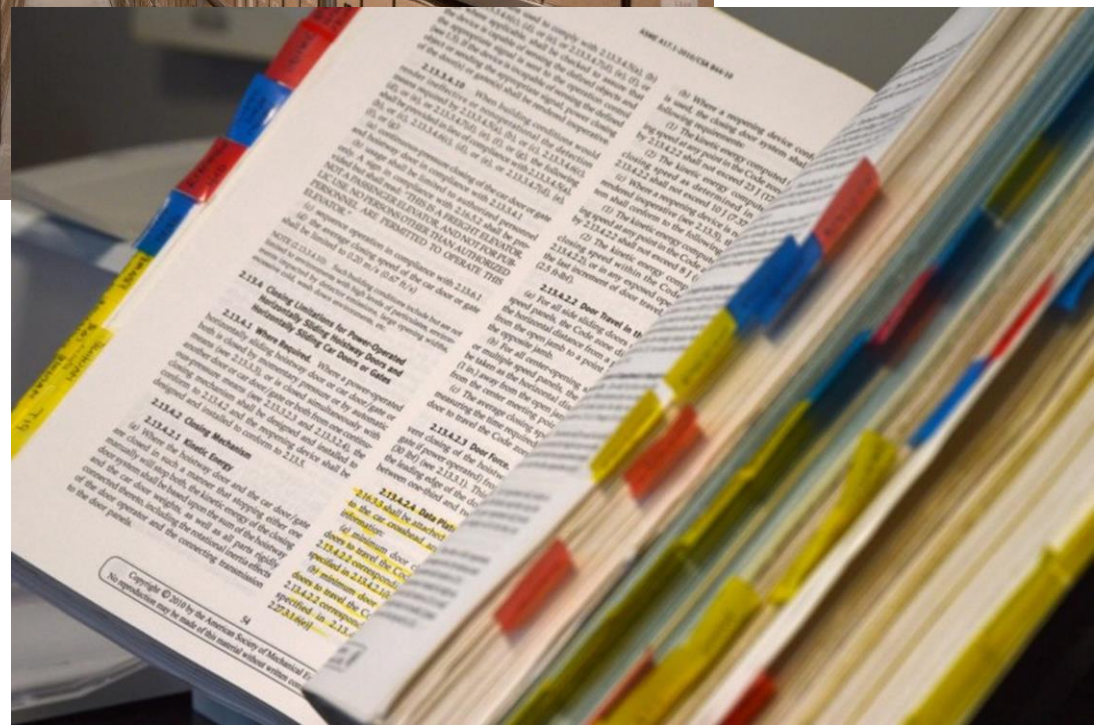
Do you currently document your Power BI solutions?

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



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Handover projects

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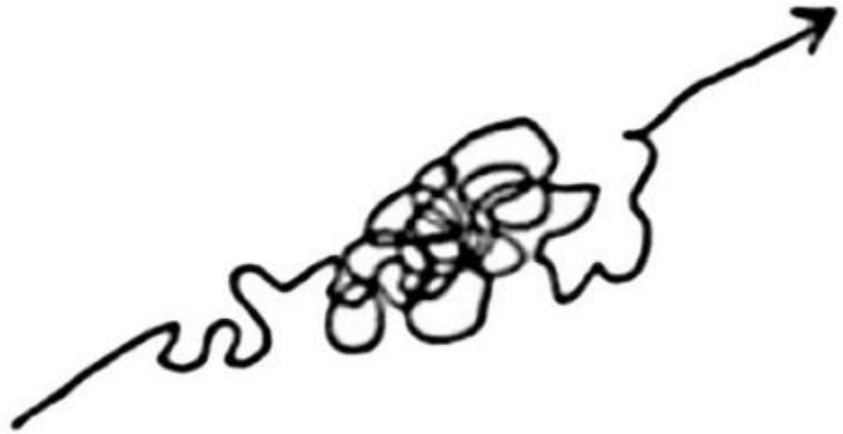
Success

what people think
it looks like

Success



what it really
looks like

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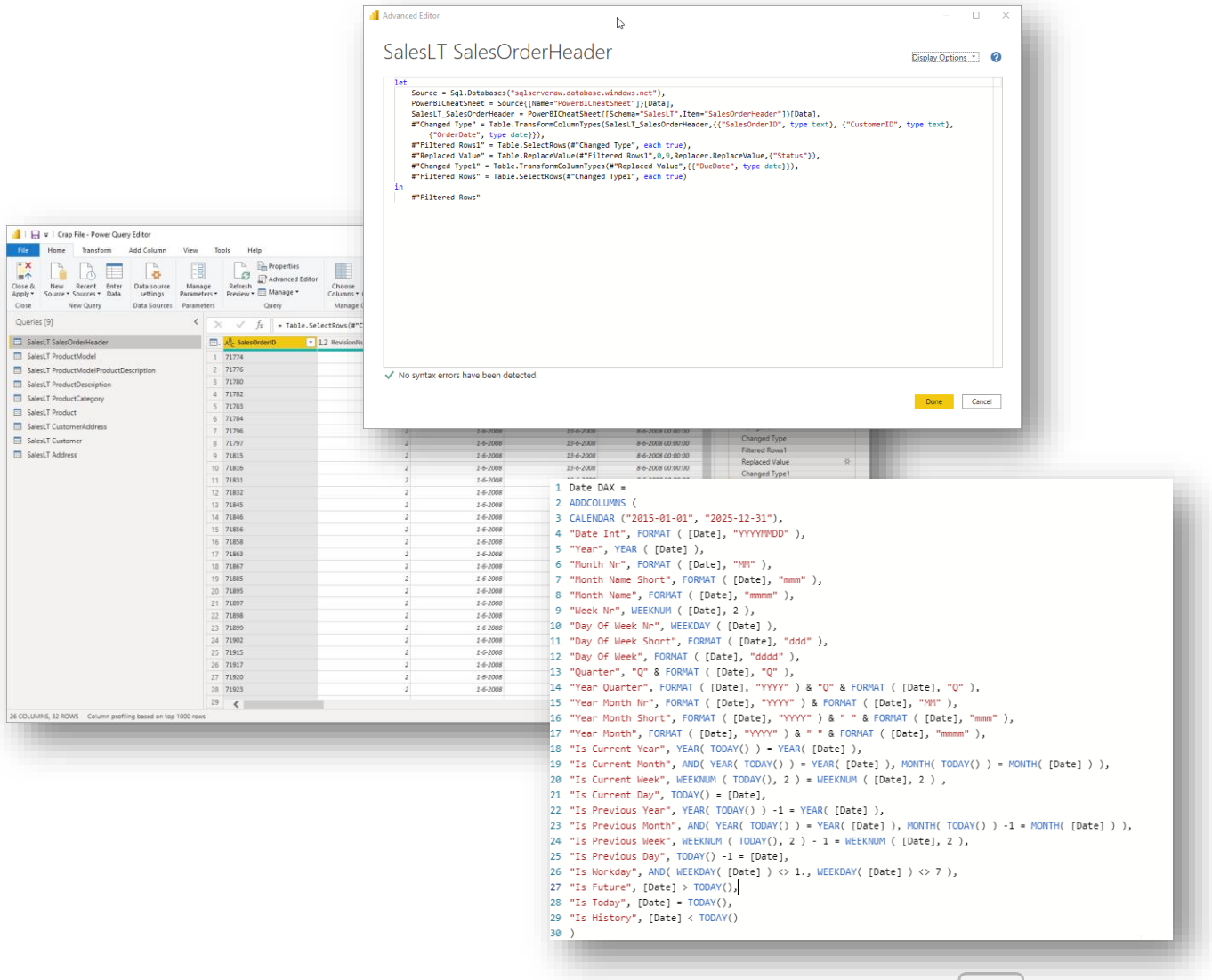
What do you want to document?

I want to document the following items:

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



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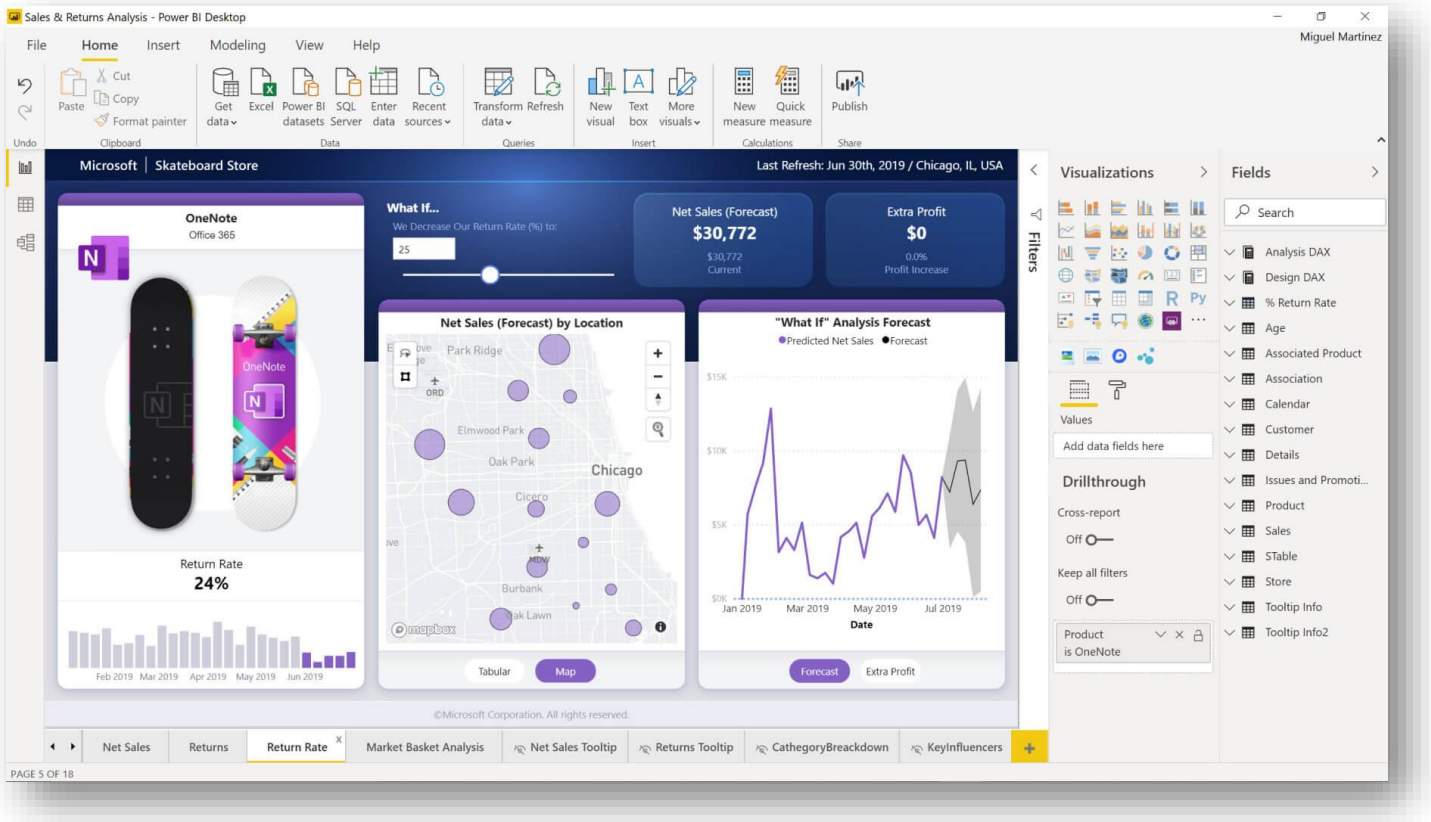
But what about the rest?

- Visuals
- Bookmarks
- Page navigation

The report in general…



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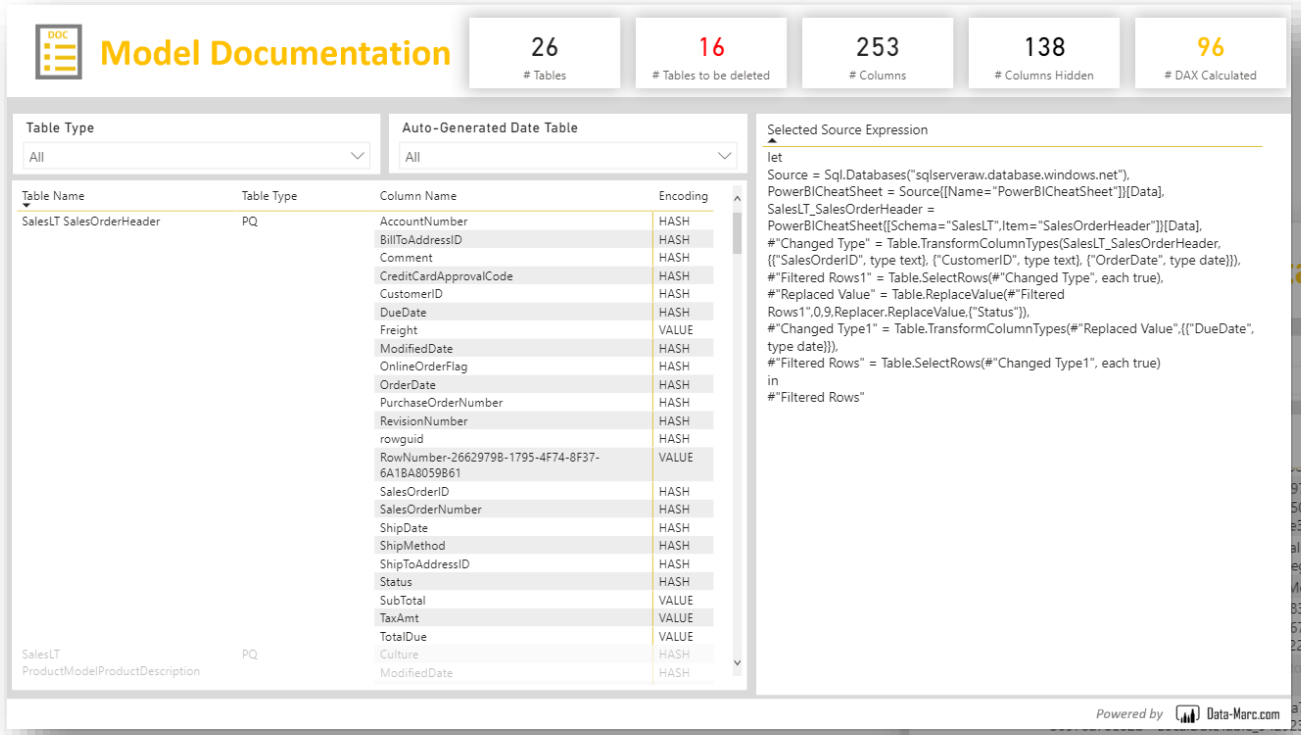
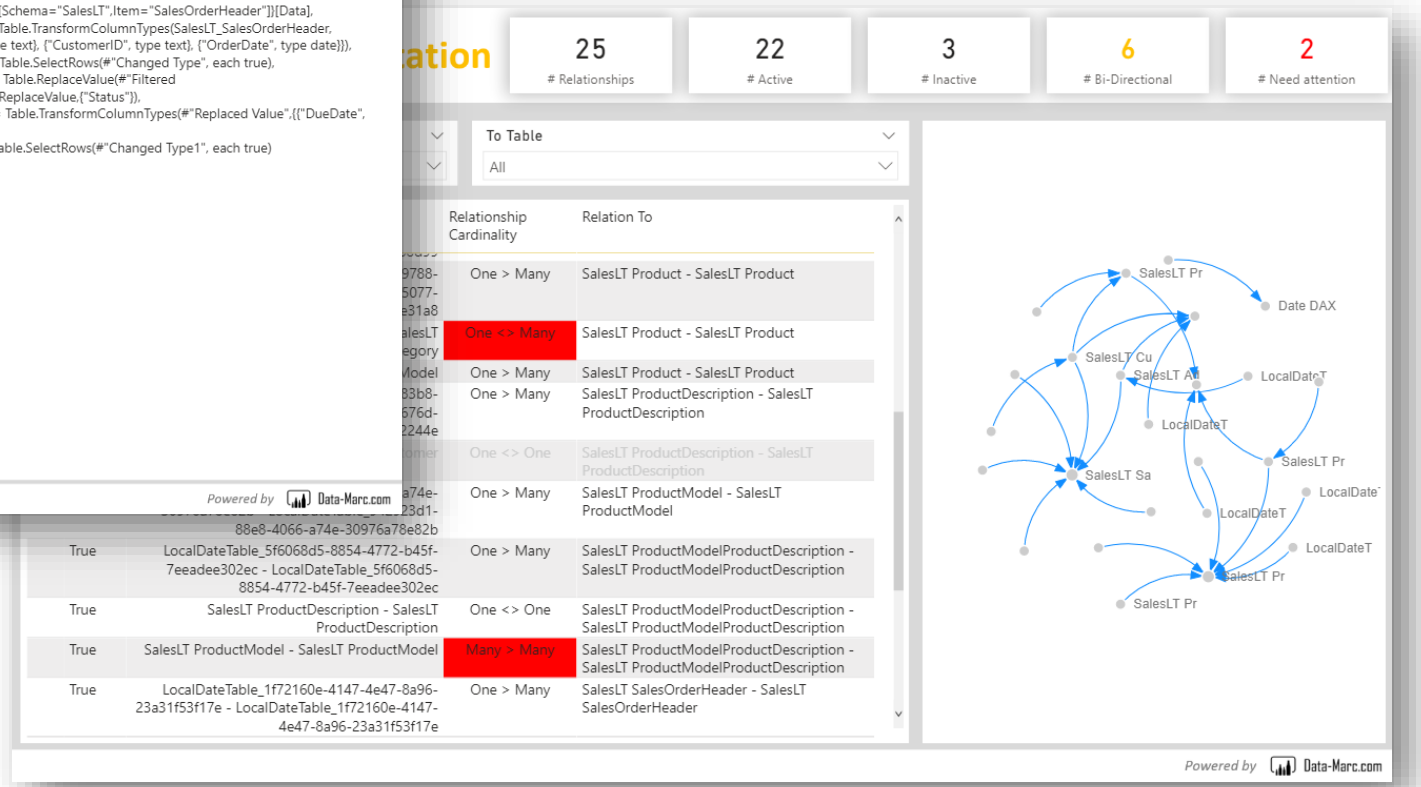
Documentation





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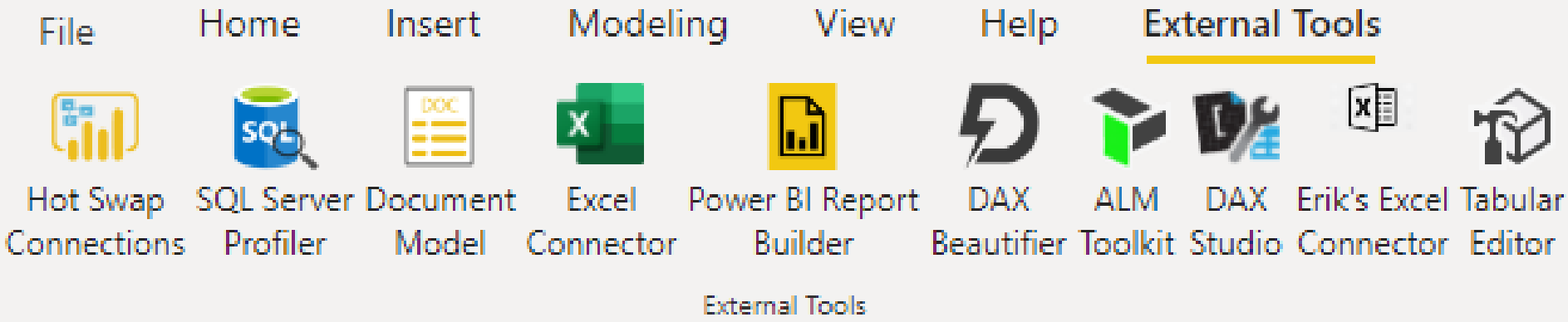

External Tools, what is it?

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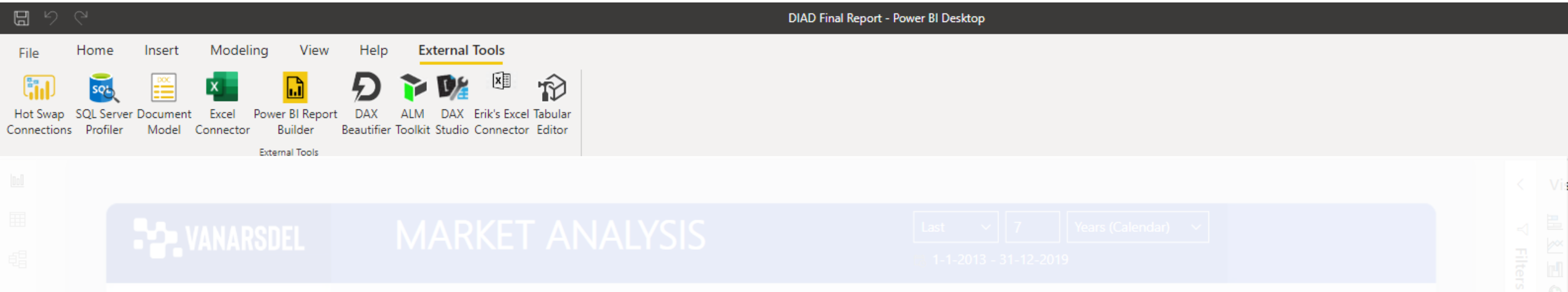
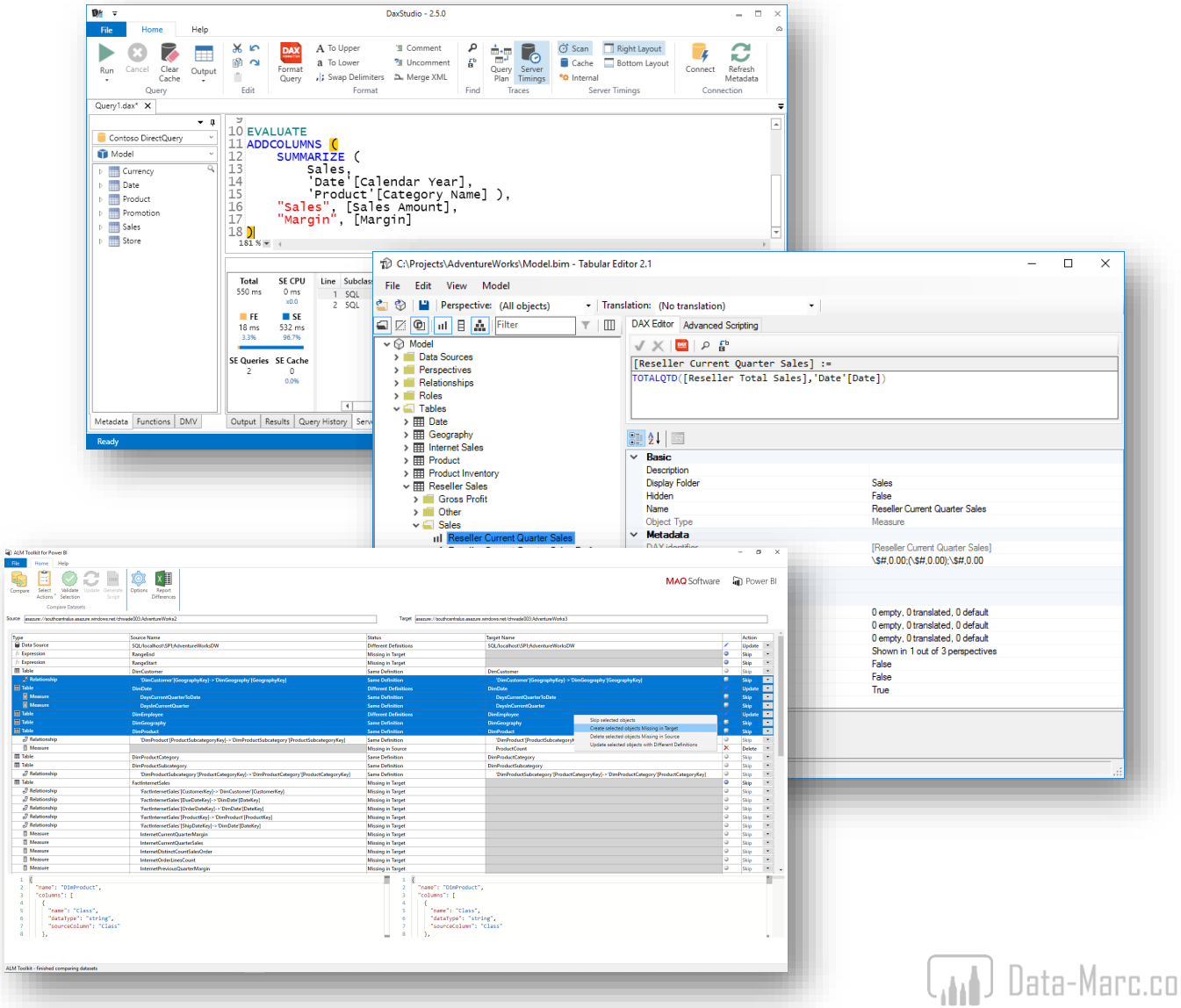
What are external tools in Power BI?

- 3rd party tooling
- Depending on new metadata
- Read + Write to TOM



Connect with 3rd party tools

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



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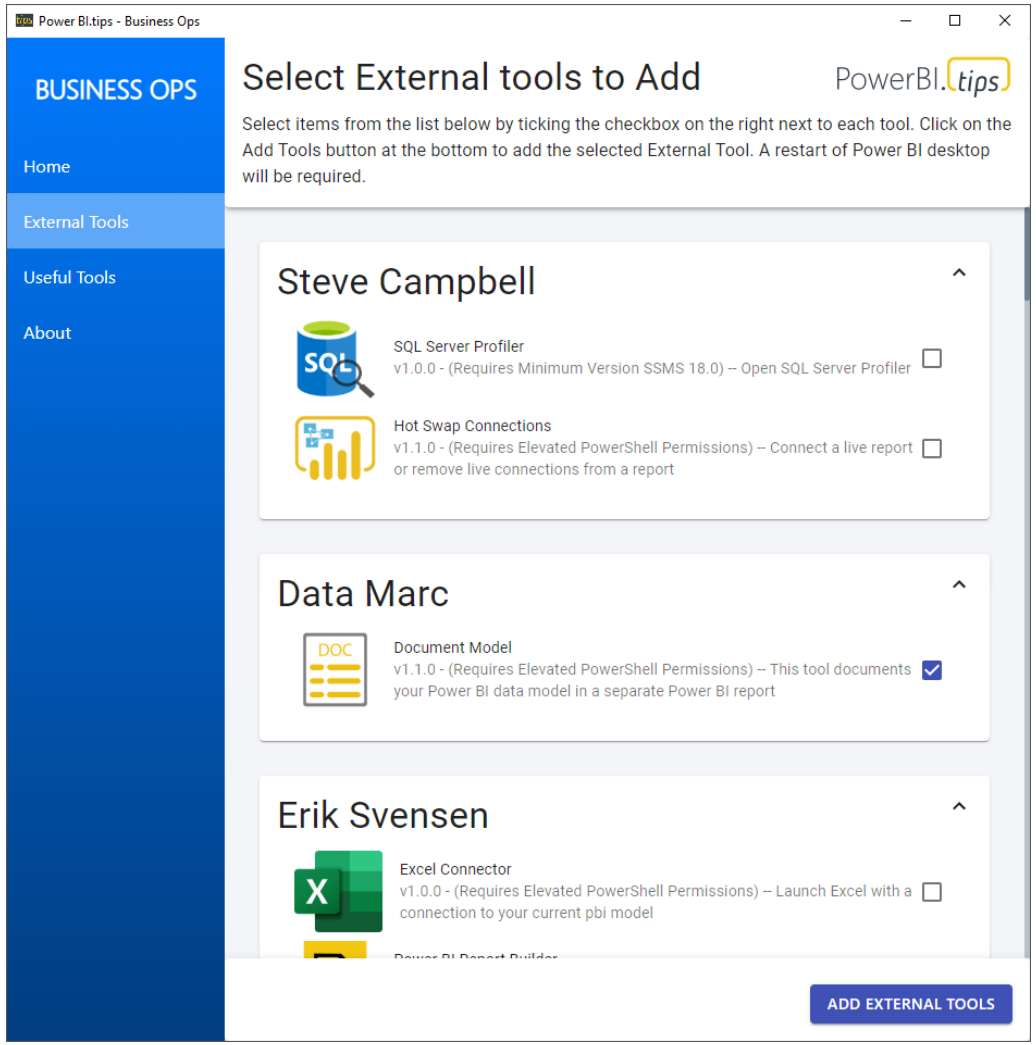
Install additional External Tools?

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



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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

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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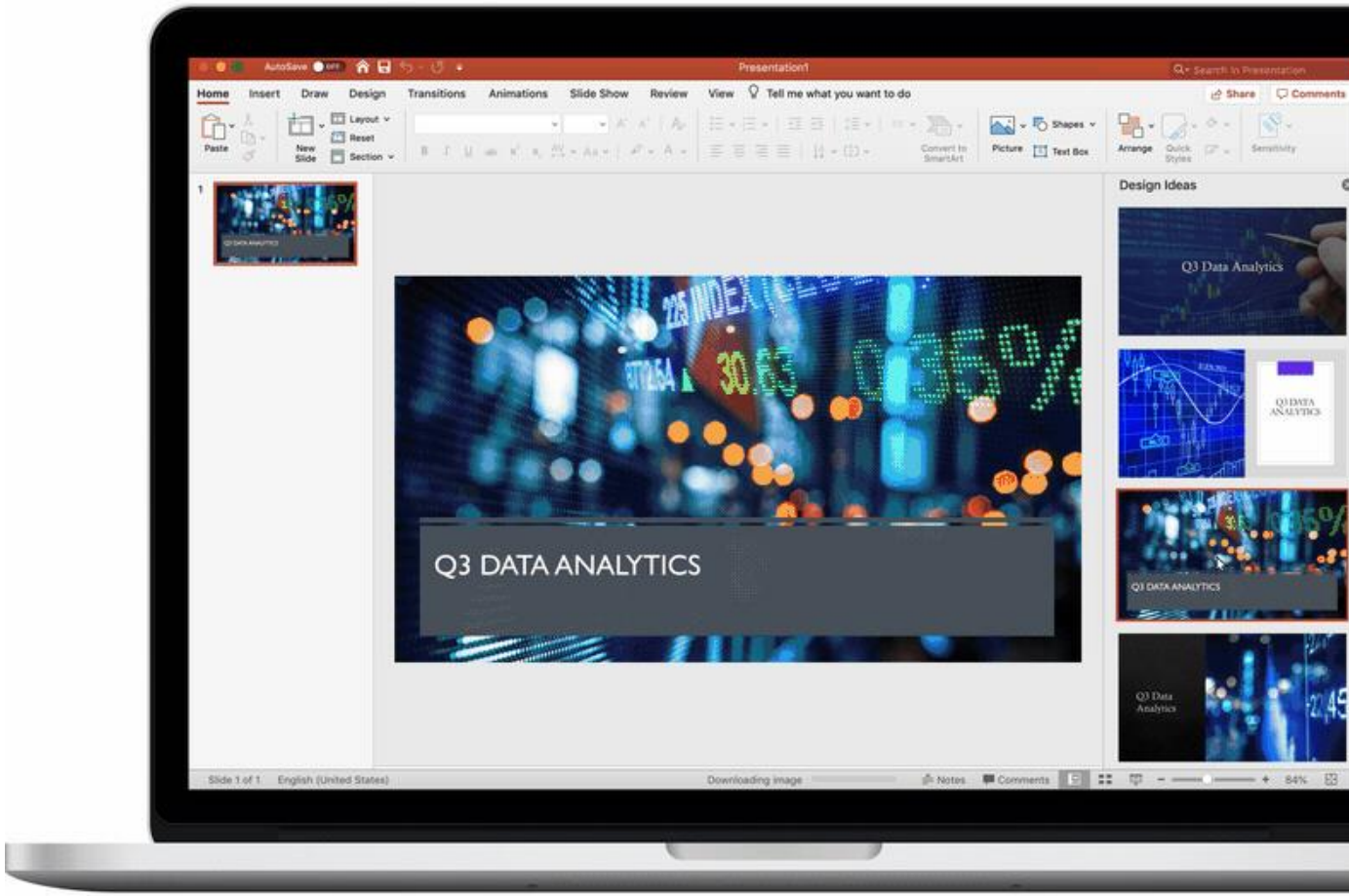
What should a documentation tool look like?

A model documentation tool should be:

- ▲ An application on it's own, like DAX studio, Tabular editor etc.
- ● The current version in Power BI is fine for me
- ◆ Flexible and easy to customize



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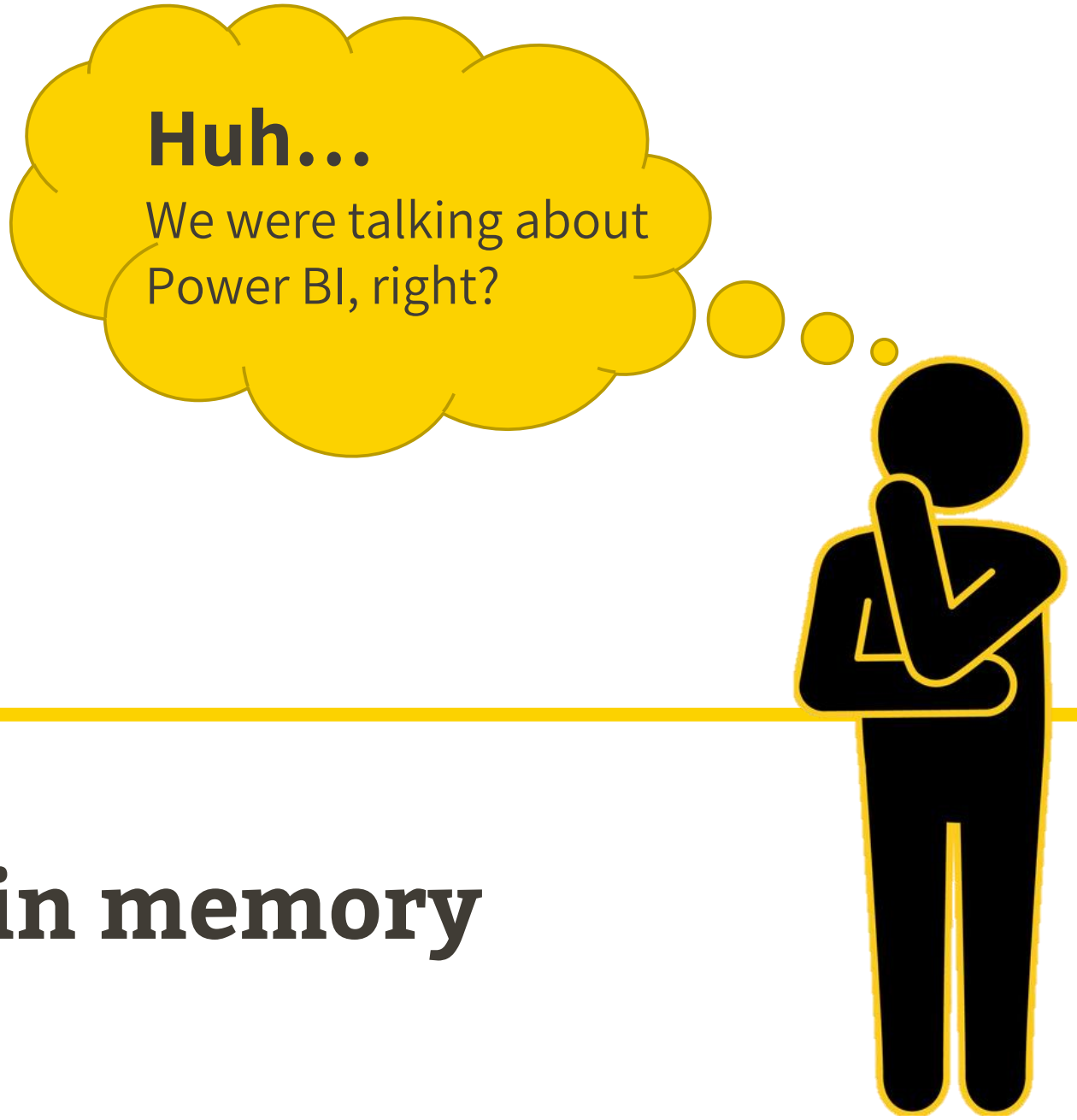

Analysis Services in memory

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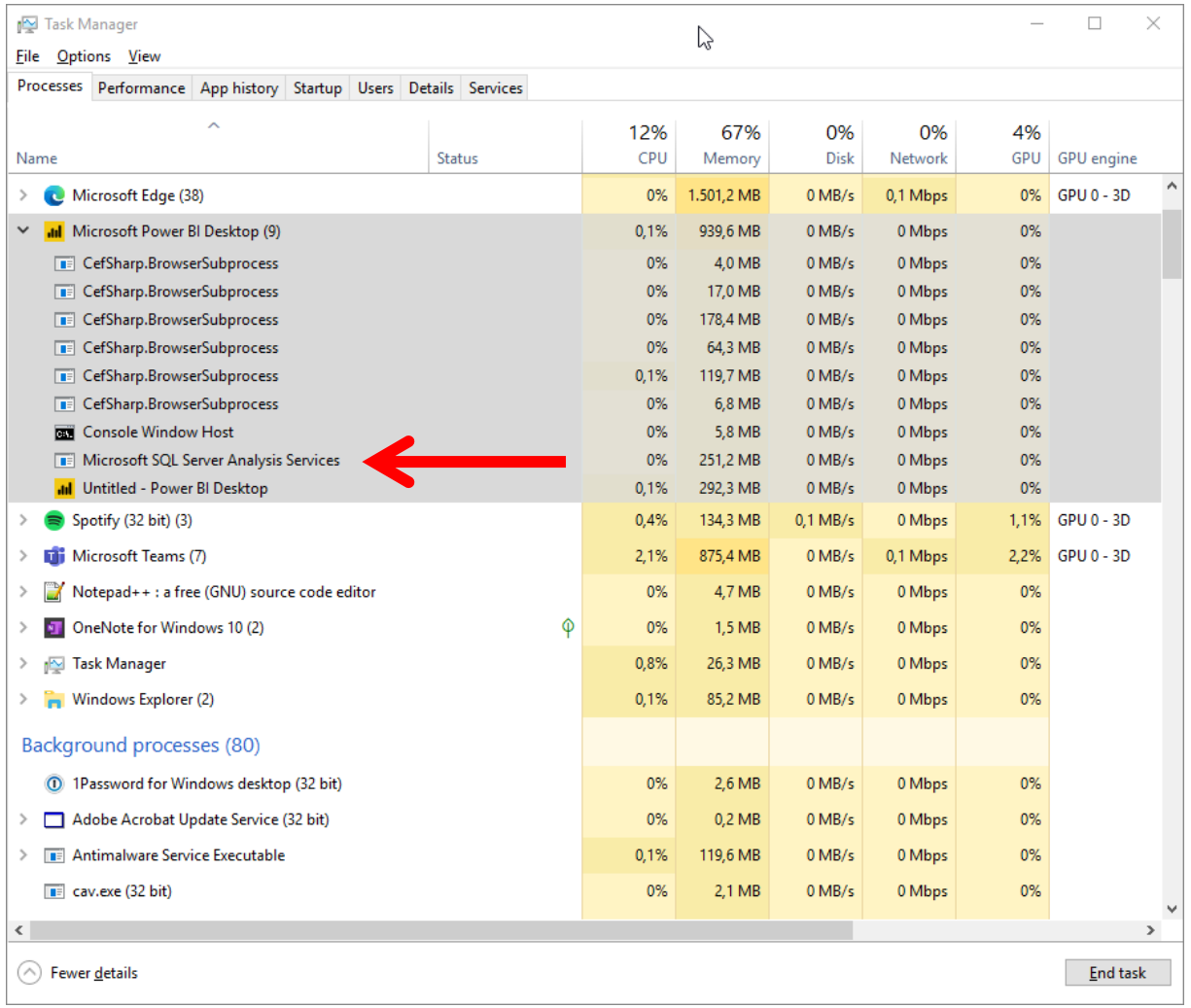
Analysis services in memory

Power BI

=

Analysis Services

under the hood



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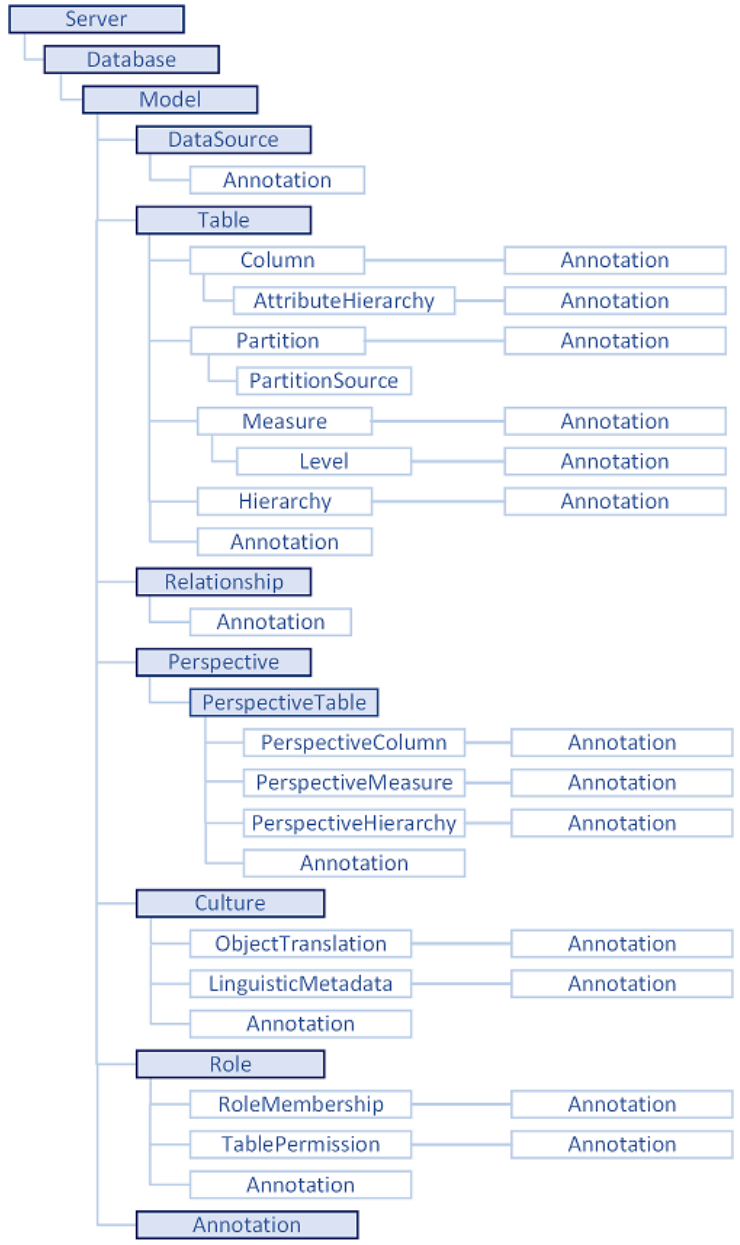
New metadata

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



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```
{
    "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

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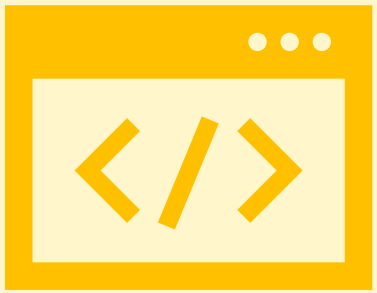
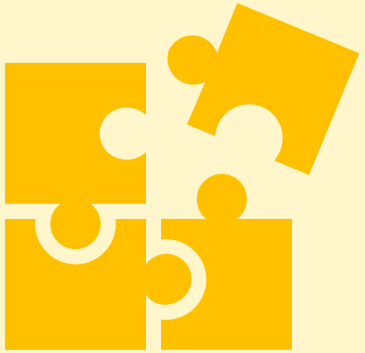
How to setup your own External Tool?



Build your application

Create your icon



Integrate in Power BI Desktop

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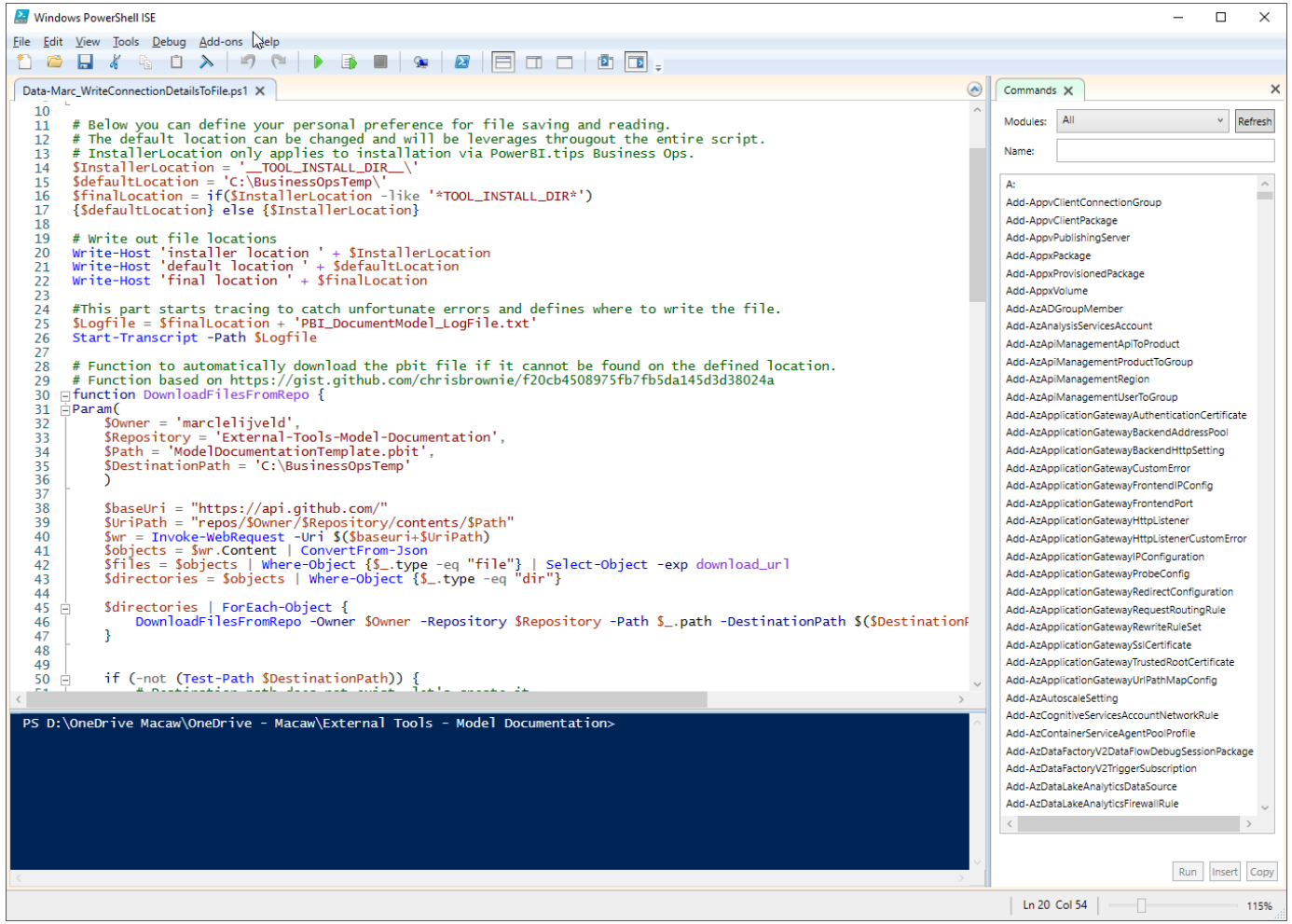
How to setup your own External Tool?

Build your application



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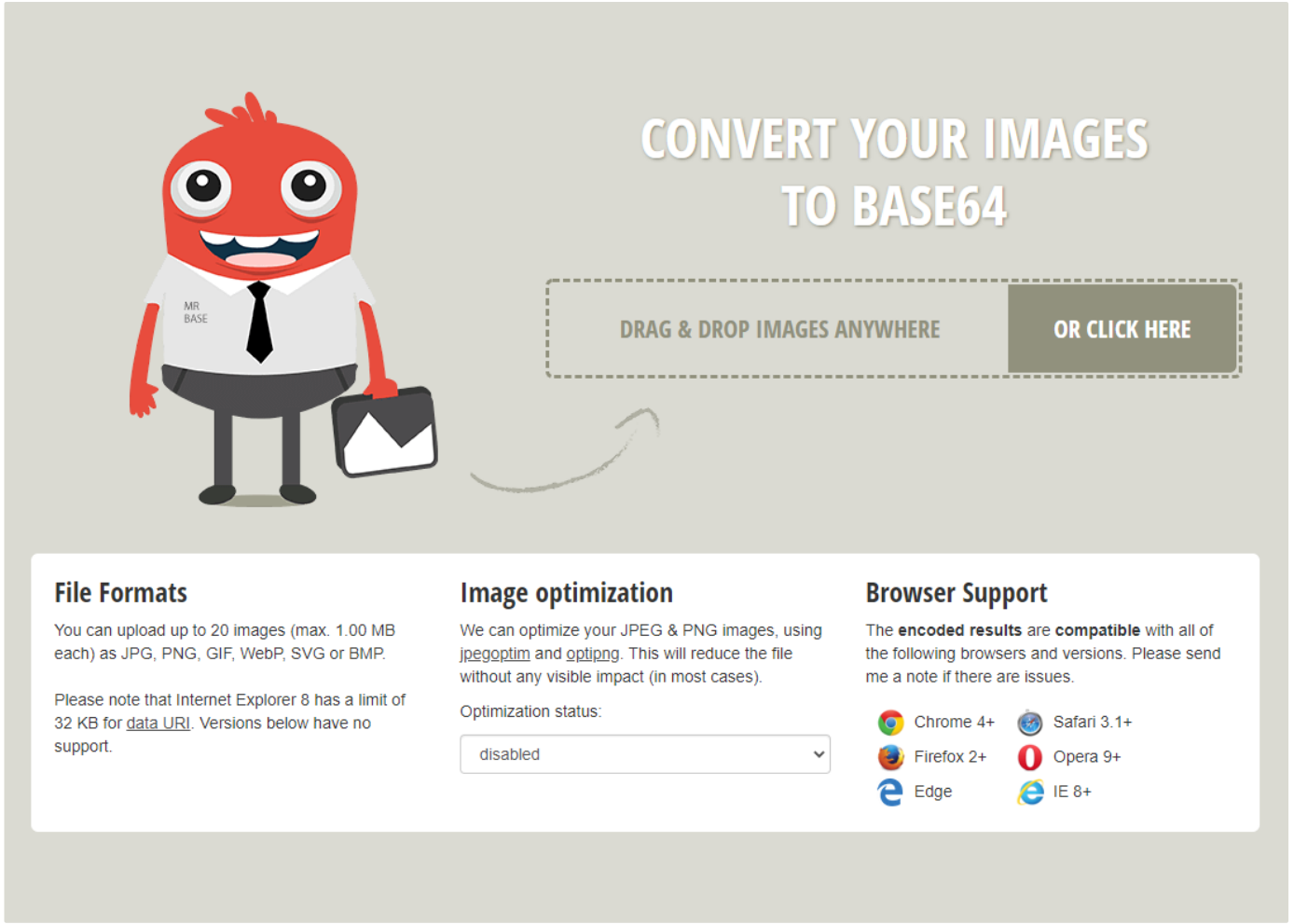
How to setup your own External Tool?

Create your icon



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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": "
}
```

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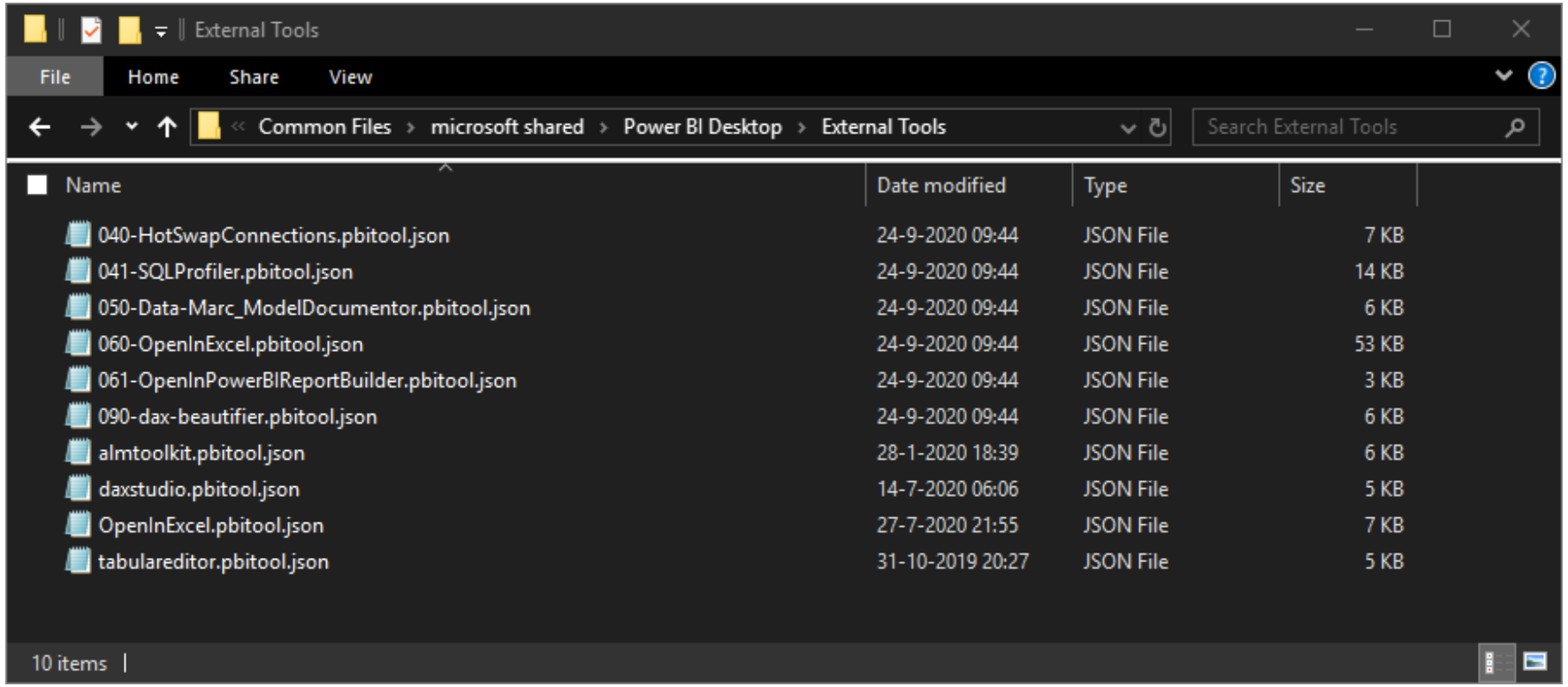
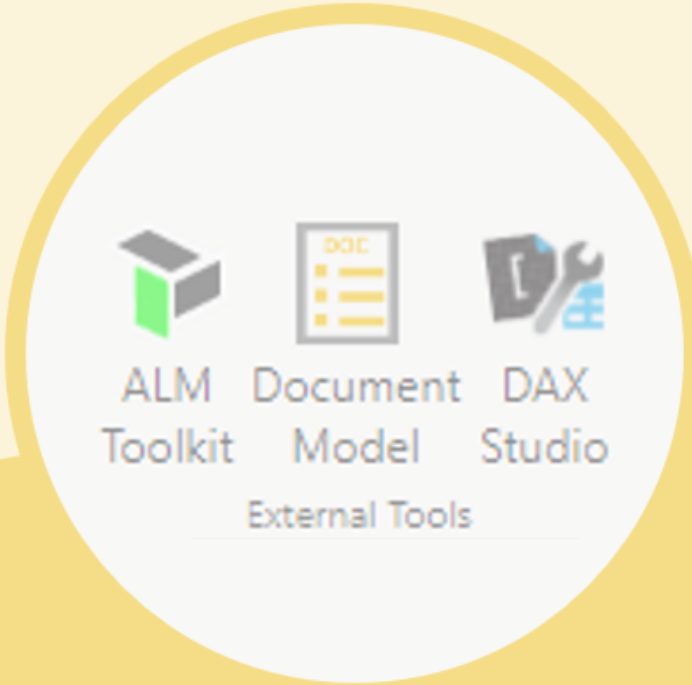
Drop the file in the right location

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





Power BI Model Documenter

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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

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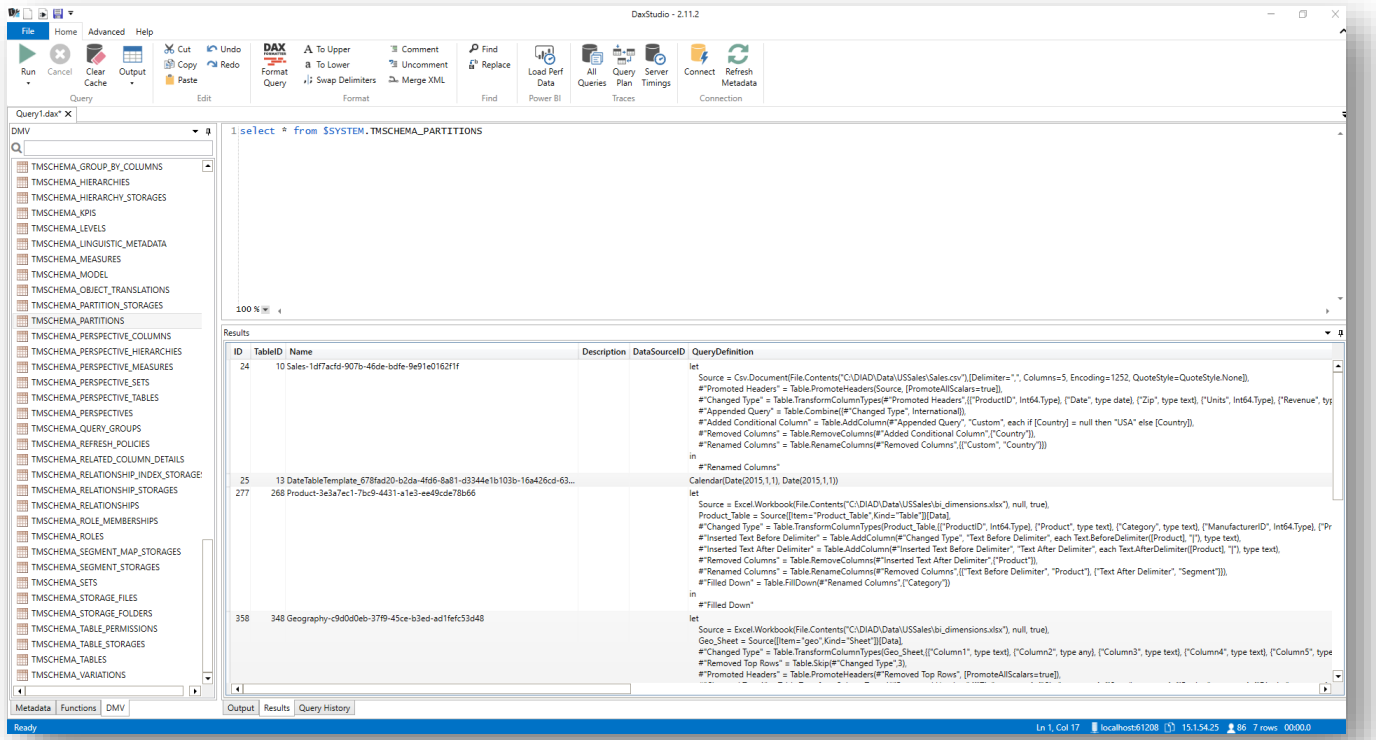
Dynamic Management Views

- Analysis Services metadata
  - Tables
  - Columns
  - Measures
  - Perspectives
  - Partitions
  - …
- Query via DAX Studio



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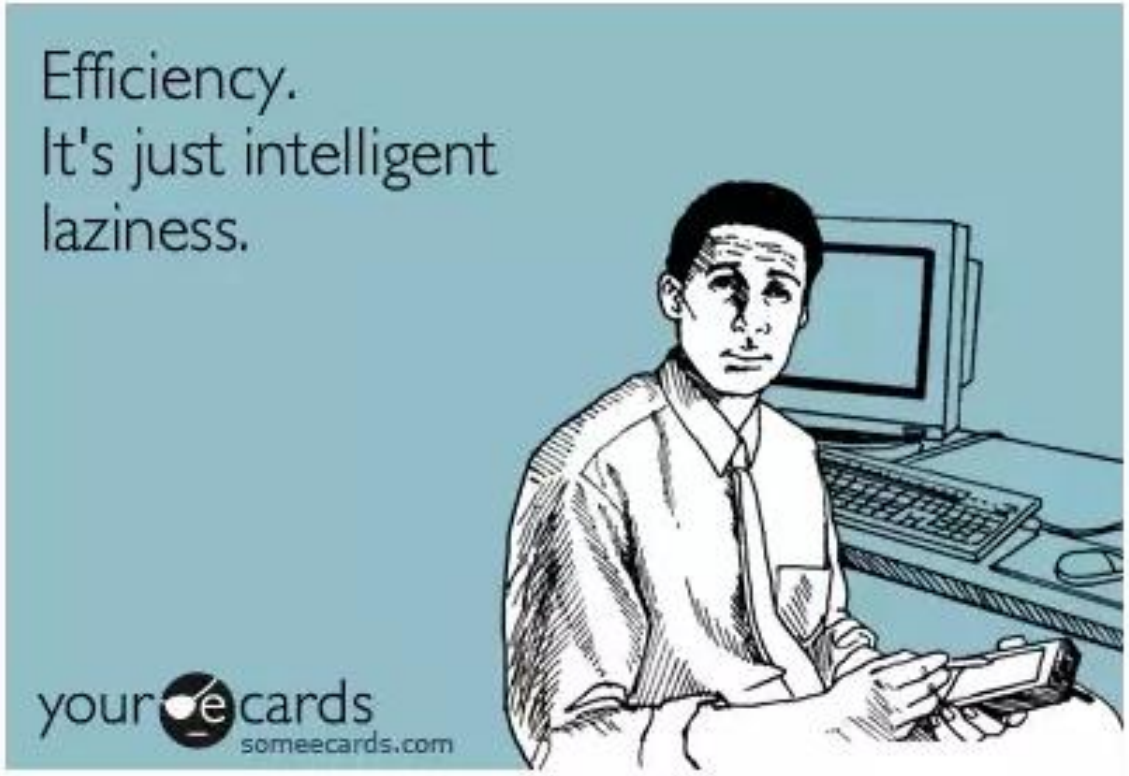
DEMO!

- 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



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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
```

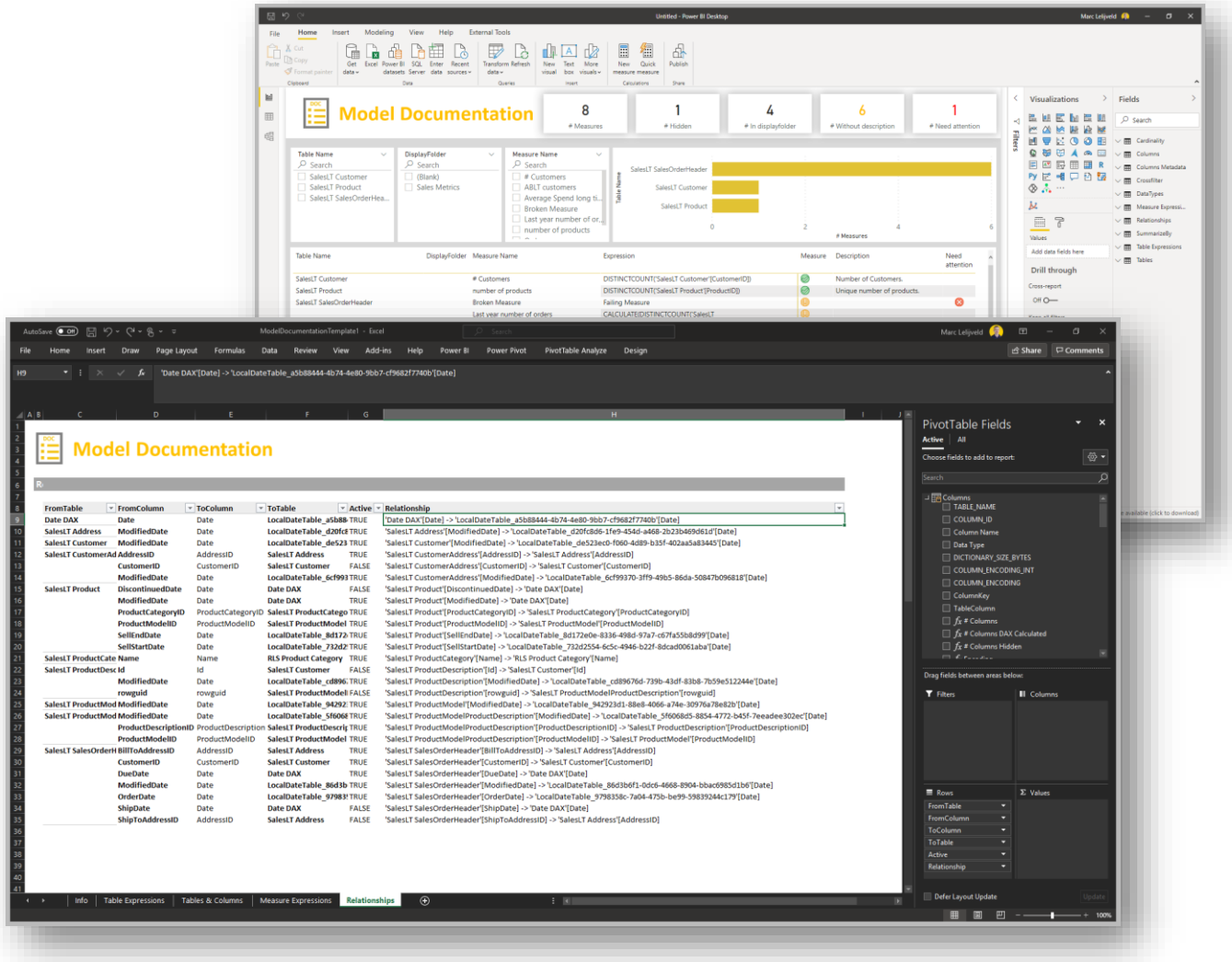
Learnings

- 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



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DEMO!

Build new tool for PBIG

- New icon in PBI Desktop

Demo Model Documenter

- How to query DMVs in Power BI
- The tool itself

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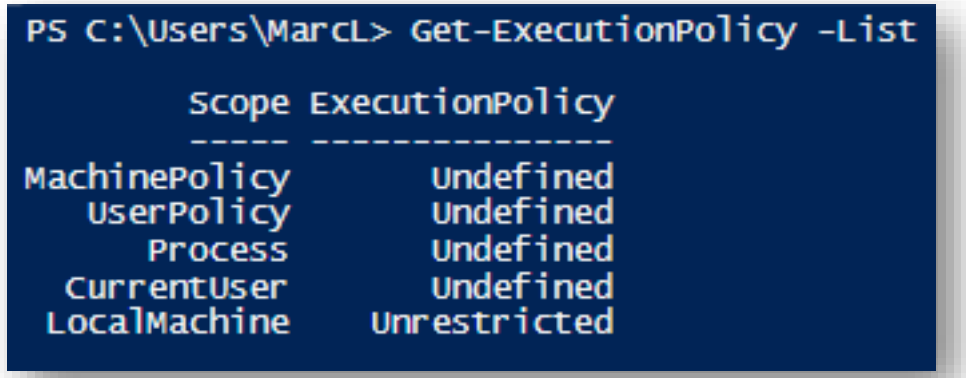
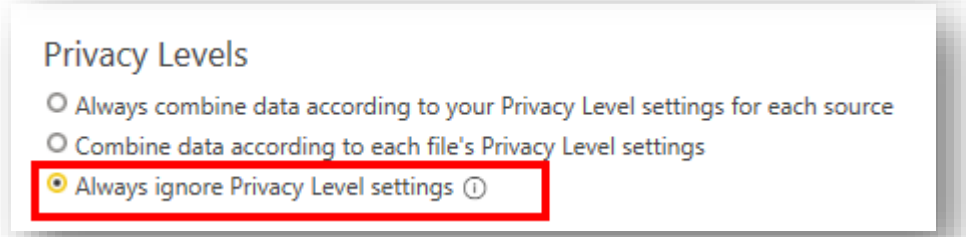
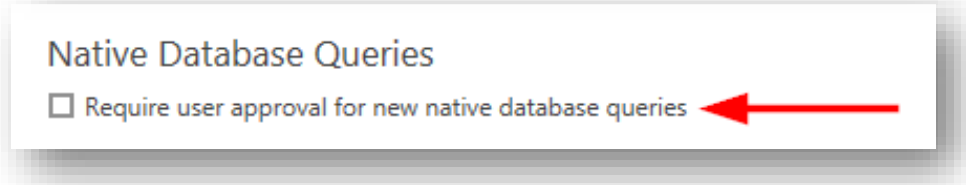
Known limitations (or irritations)

- 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







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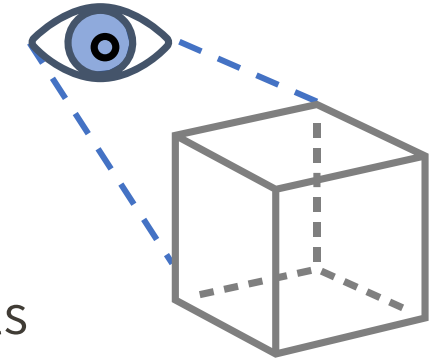
Planned enhancements

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

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So, from now on...

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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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