

The background image is a night-time photograph of a cityscape. On the left, a hillside is covered with a series of terraced buildings, each with its own warm, yellow light emanating from the windows. To the right, a large, illuminated steel arch bridge spans across the frame, its lights reflecting on the water below. The sky is a deep blue with some clouds, and the overall scene is a blend of urban architecture and natural landscape.

devscope

Rui Romano

Power BI Tips & Tricks

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devscope



DevScope Suite of Power BI tools



PowerBI Tiles

Embed Power BI Reports in PowerPoint presentations, Word documents or Outlook messages.

[Try Now](#)



PowerBI Robots

Schedule and automatically send Power BI data to anyone, anywhere.

[Try Now](#)



PowerBI SmartPivot

Connect data from Power BI or OLAP cubes to Excel, search for any values in the data model and apply filters in bulk.

[Try Now](#)

Agenda

Learn some Best Practices

Learn useful tips / hacks on Power BI

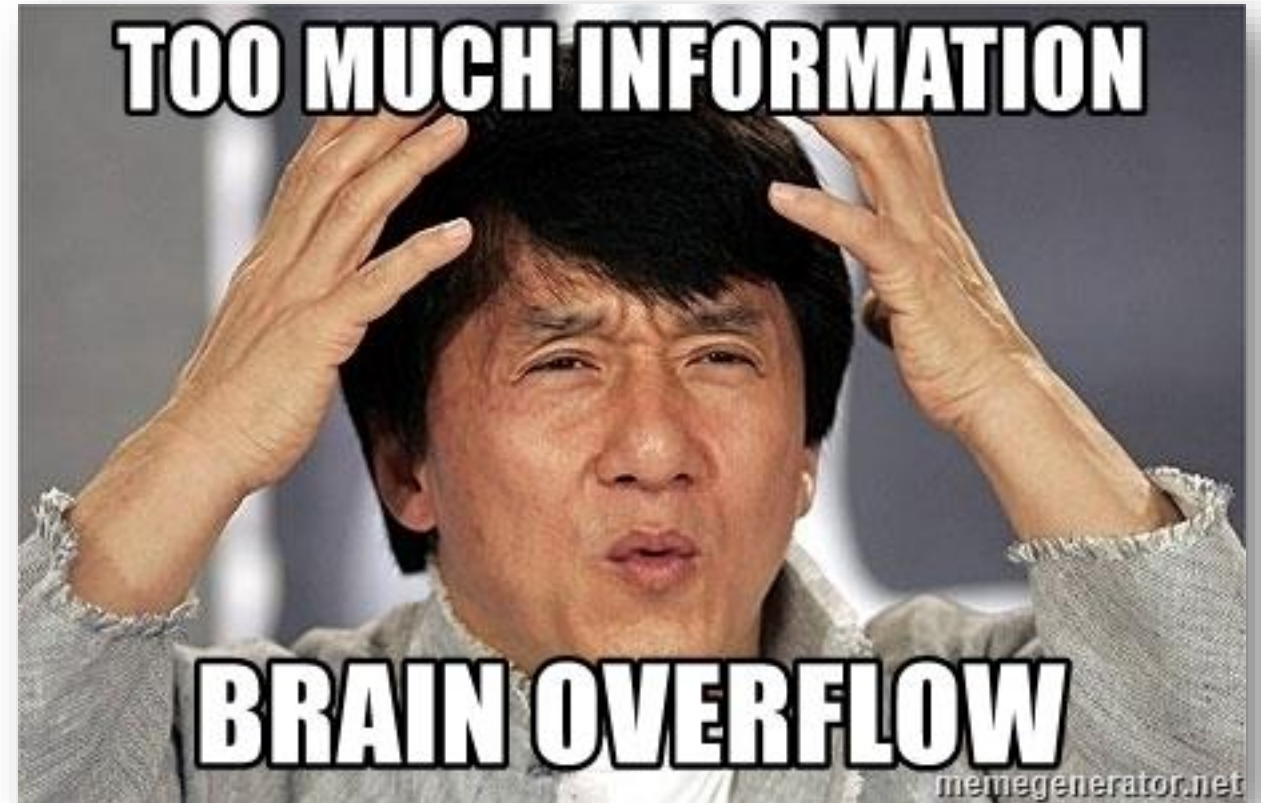
Fast-paced, full of demos

This session is not:

- Intro to Power BI

- Deep-Dive

- Advanced DAX




Tip - Think like a Analyst (not a DBA 😊)

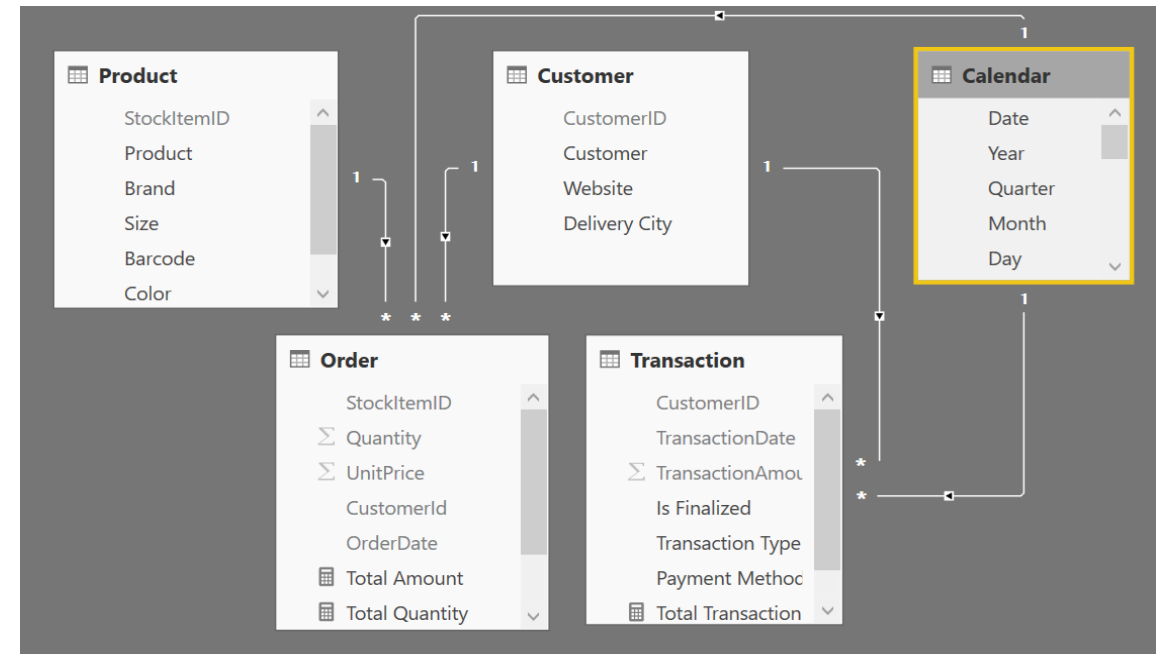
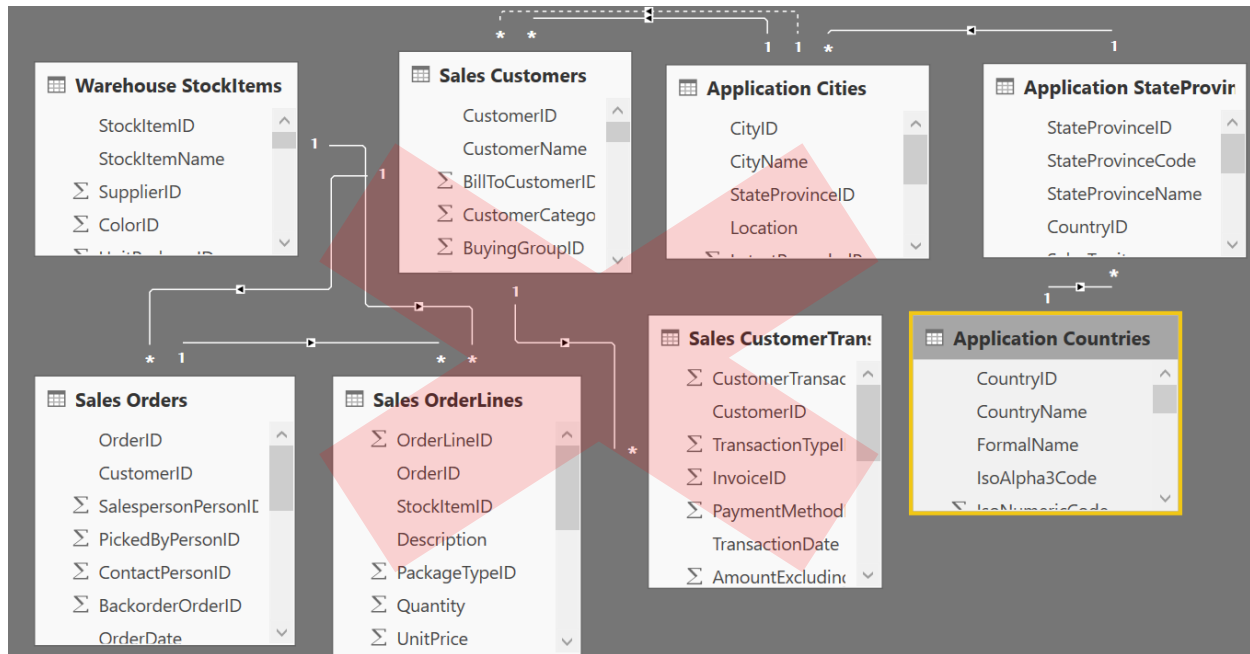
Entities not Tables => Power BI is not MS Access!

Think about your naming & be coherent

Only load what you really need



Sales
% Sales Growth vs PY
Market Share of VanArs...
Total Costs
Total Profit
Total Sales
Total Sales (py)
Total Sales (ytd)
Total Sales of VanArsdel
Total Units



Learn more: [link1](#)

Tip – Change defaults on Data Load

GLOBAL

- Data Load
- Power Query Editor
- DirectQuery
- R scripting
- Security
- Privacy
- Updates
- Usage Data
- Diagnostics
- Preview features
- Auto recovery

CURRENT FILE

- Data Load
- Regional Settings

Type Detection

- ☒ Automatically detect column types and headers for unstructured sources

Relationships

- ☒ Import relationships from data sources ⓘ
- ☐ Update relationships when refreshing queries ⓘ
- ☐ Autodetect new relationships after data is loaded ⓘ

Time intelligence

- ☒ Auto Date/Time ⓘ

Background Data

- ☐ Allow data preview to download in the background

Parallel loading of tables

- ☒ Enable parallel loading of tables ⓘ

Natural language

- ☒ Turn on natural language questions with Q&A ⓘ

Be Careful... (pbix from 30Mb to 100kb)

Unexpected error: Evaluation was canceled.

Tip – Always use Base Measures

Create measures from numeric base values

Reuse the base measure in: YTD, LY,...

Analyse in Excel support

```
Total Amount = SUMX('Order', [Quantity] * [UnitPrice])
```

```
Total Amount (ly) = CALCULATE([Total Amount], SAMEPERIODLASTYEAR('Calendar'[Date]))
```

```
Total Amount (ytd) = TOTALYTD([Total Amount], 'Calendar'[Date])
```

```
Total Amount (ytd, ly) = CALCULATE([Total Amount (ytd)], SAMEPERIODLASTYEAR('Calendar'[Date]))
```

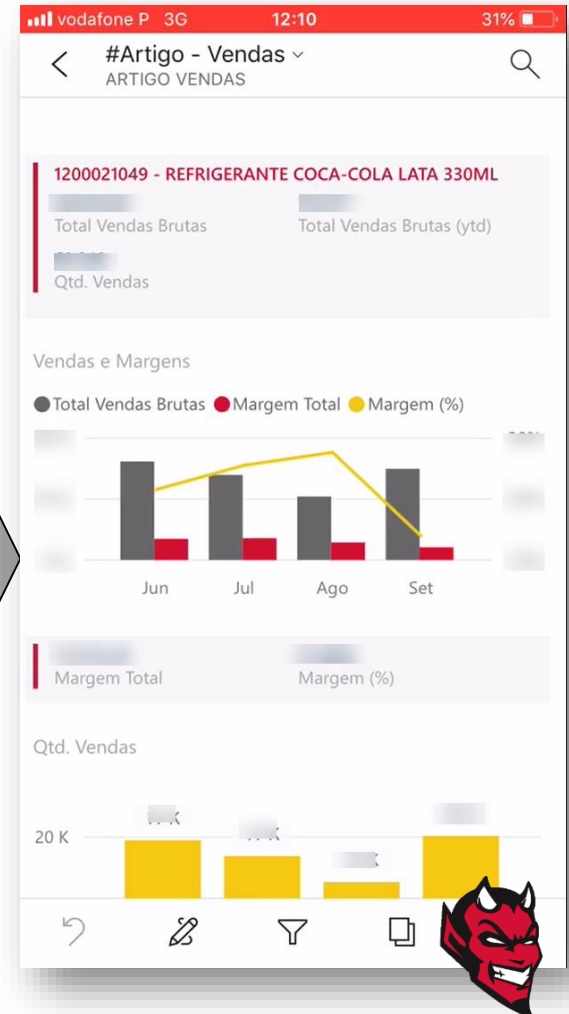
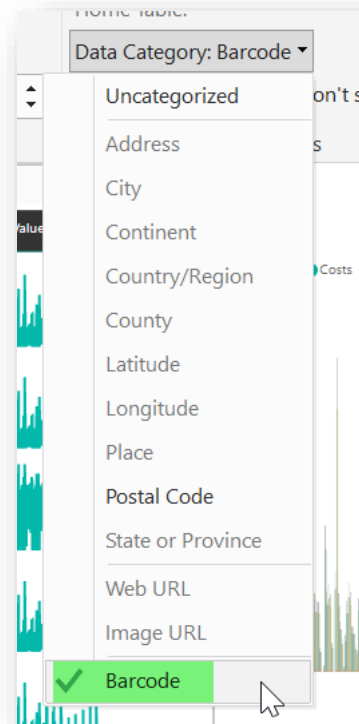
Tip – Use the Barcode Scanner

Little effort, **big impact**

IOS only 😞

PowerApps as alternative

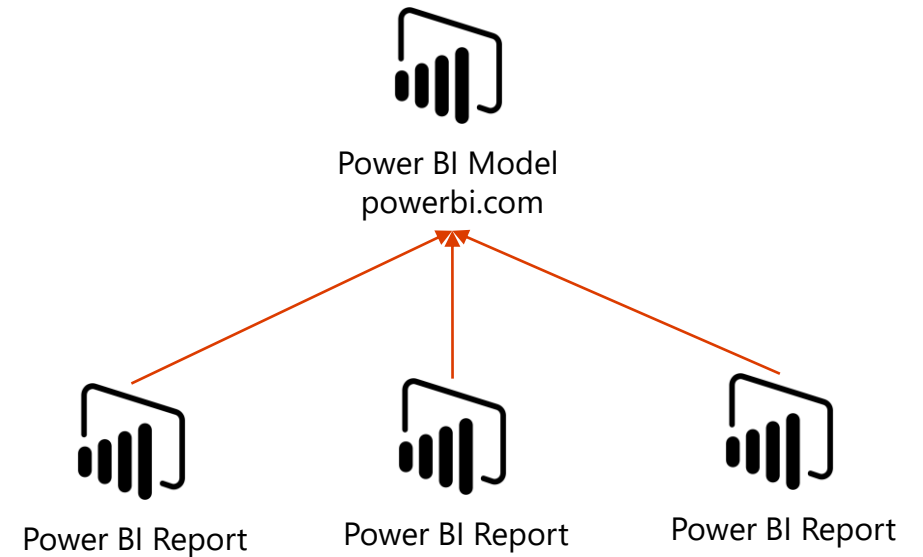
[Vote!](#)



Tip – Separate the Model from the Report

You can convert an Import model into a Live Connection

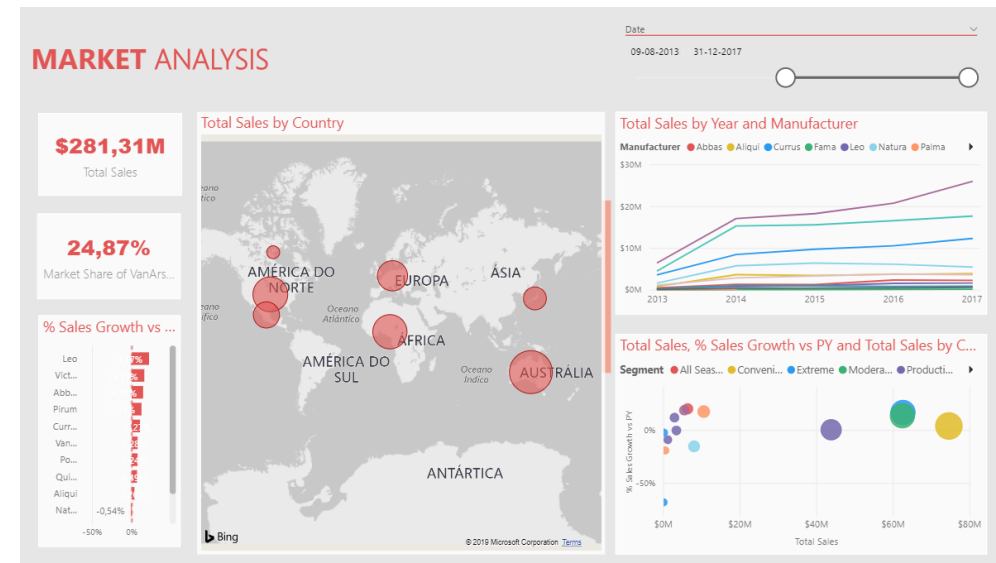
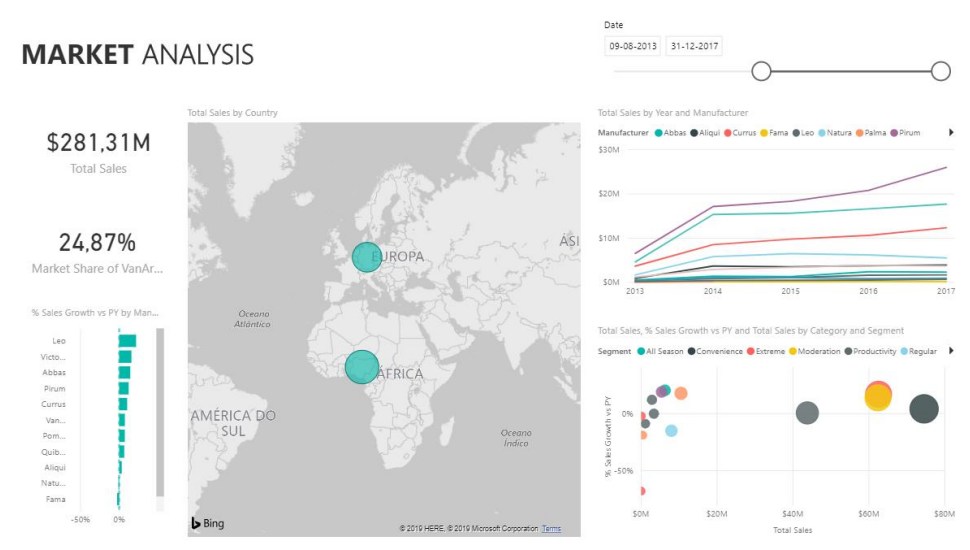
- PowerBIPS
- Hack: Delete all the queries & Rebind



Tip – Report Theming

Colors
Fonts
Headers
Spacings
Shapes
Backgrounds

...



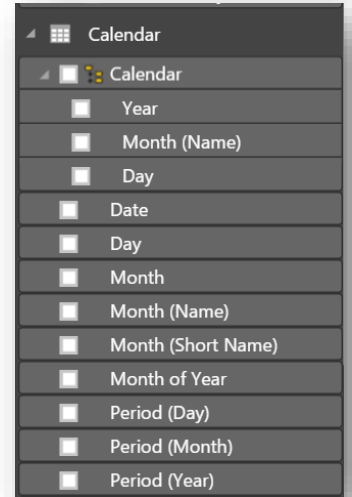
Learn more: <https://github.com/deldersveld/PowerBI-ThemeTemplates>



Tip – Calendar/Date table

Generate your calendar table with M Script or DAX

Use Relative *Period fields => Dynamic Filter Reports over Time



```
Advanced Editor

Calendar

let
    P_Today = #date(2016,08,27),
    P_StartDate = #date(2013,1,1),
    P_EndDate = #date(Date.Year(P_Today),12,31),
    P_Culture = "en-US",
    P_Lang = "EN",
    P_FirstDayOfWeek = 1,
    DayCount = Duration.Days(Duration.From(P_EndDate - P_StartDate)) + 1,
    Source = List.Dates(P_StartDate,DayCount,#duration(1,0,0,0)),
    TableFromList = Table.FromList(Source, Splitter.SplitByNothing()),
    ChangedType = Table.TransformColumnTypes(TableFromList,{{"column1", type date}}),
    RenamedColumns = Table.RenameColumns(ChangedType,{{"column1", "Date"}}),
    InsertYear = Table.AddColumn(RenamedColumns, "Year", each Date.Year([Date])),
    InsertQuarter = Table.AddColumn(InsertYear, "Quarter", each Date.QuarterOfYear([Date])),
    InsertMonth = Table.AddColumn(InsertQuarter, "Month", each Date.Month([Date])),
    InsertDay = Table.AddColumn(InsertMonth, "Day", each Date.Day([Date])),
    InsertMonthName = Table.AddColumn(InsertDay, "Month (Name)", each Date.ToText([Date], "MMMM", P_Culture), type text),
    InsertShortMonthName = Table.AddColumn(InsertMonthName, "Month (Short Name)", each try(Text.Range([#"Month (Name)"],0,3)) otherwise [#"Month (Name)"]),
    InsertCalendarMonth = Table.AddColumn(InsertShortMonthName, "Month of Year", each [#"Month (Short Name)"] & " " & Number.ToText([Year])),
    InsertCalendarQtr = Table.AddColumn(InsertCalendarMonth, "Quarter of Year", each "I" & Number.ToText([Quarter]) & " " & Number.ToText([Year])),
    InsertWeek = Table.AddColumn(InsertCalendarQtr, "Week", each Date.WeekOfYear([Date], P_FirstDayOfWeek)),
    InsertCalendarWeek = Table.AddColumn(InsertWeek, "Week of Year", each "W" & Number.ToText([Week]) & " " & Number.ToText([Year])),
    InsertDayWeek = Table.AddColumn(InsertCalendarWeek, "Week Day", each Date.DayOfWeek([Date], P_FirstDayOfWeek) + 1),
    InsertDayWeekName = Table.AddColumn(InsertDayWeek, "Week Day Name", each Date.DayOfWeekName([Date], P_Lang))
```

```
VAR TodayReference =
    TODAY () -- Change this if you need to use another date as a reference "current" day
VAR FirstYear = 2008
VAR LastYear =
    YEAR ( TodayReference )
VAR FiscalCalendarFirstMonth = 9 -- For Fiscal 52-53 weeks (start depends on rules) and Gr
VAR FirstDayOfWeek = 0 -- Use: 0 - Sunday, 1 - Monday, 2 - Tuesday, ... 5 - Friday, 6 - Sa
VAR IsoCountryHolidays = "US" -- Use only supported ISO countries or "" for no holidays
VAR WeeklyType = "Last" -- Use: "Nearest" or "Last"
VAR QuarterWeekType = "445" -- Supports only "445", "454", and "544"
```

CalendarAuto()

Calendar(<start>, <end>)

Learn more: [link1](#)

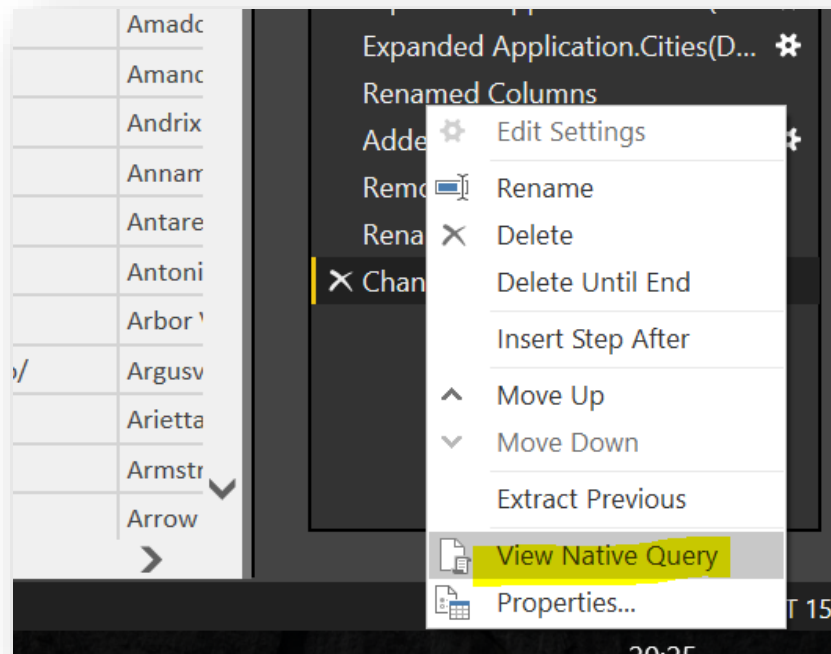


Tip – Filter first, Transform later

Know “Query Folding” concept

Some transformations don’t “fold” the query

Filter ASAP (as second step if possible)



Native Query

```
select [_].[Supplier],  
       [_].[Category],  
       [_].[Primary Contact]  
from [Dimension].[Supplier] as [_]  
where (([_].[Category] = 'Clothing Supplier' or [_].[Category] = 'Co
```



Tip – When Importing from SQL DBs

Write your own SQL (if you can)

Generated query could be very bulky

Push shaping/transform to the DB (if possible)

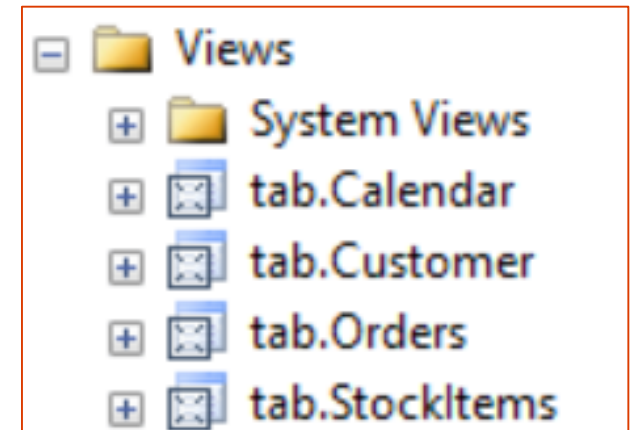
Reusability, Performance

Free the gateway from heavy lifting transformations

Use Views & Schemas

Isolation

Easy to export all the “BI” content



Tip – Parameters

PBIX Templates

Change the values after Publish

Change the Database without Re-Publish

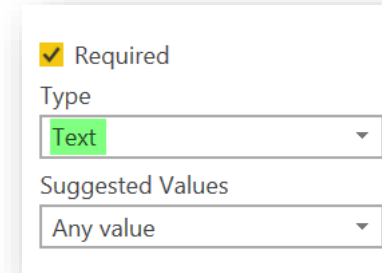
Change the Query without Re-Publish

Set the Type (don't use "Any")

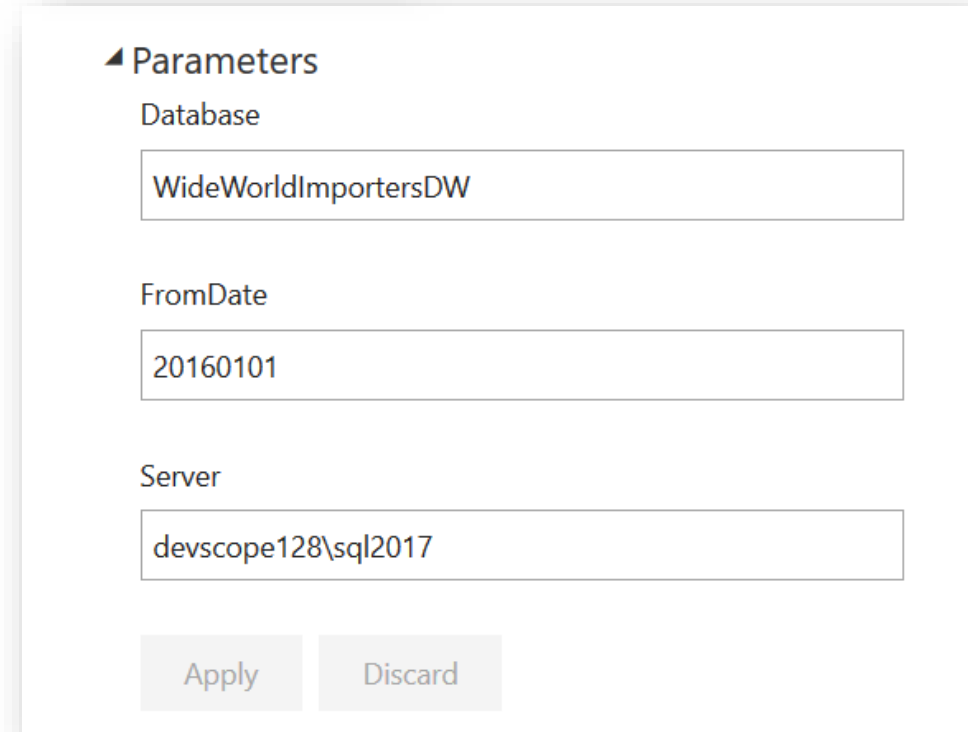
Use [REST API](#) to change values

Set-PBIDatasetParameters => DevOps Scenarios

Learn more: [link1](#)



A screenshot of a parameter configuration dialog box. It has a 'Required' checkbox which is checked. Below it is a 'Type' dropdown menu with 'Text' selected and highlighted in green. At the bottom is a 'Suggested Values' dropdown menu with 'Any value' selected.



A screenshot of the 'Parameters' dialog box in Power BI. It has a title bar with a collapse icon and the text 'Parameters'. Below the title bar are three text input fields: 'Database' with the value 'WideWorldImportersDW', 'FromDate' with the value '20160101', and 'Server' with the value 'devscope128\sql2017'. At the bottom are two buttons: 'Apply' and 'Discard'.

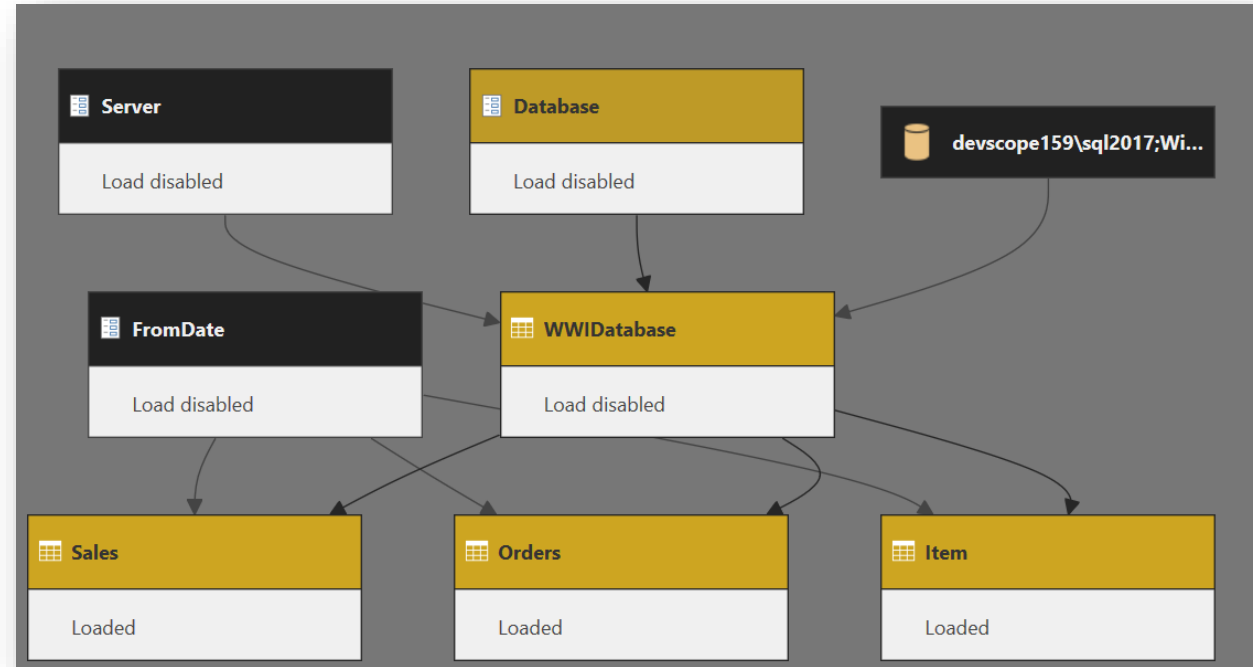


Tip – Value.NativeQuery / Centralized Connection

Connection as separate query
timeouts, maxdop,...


Query Parameters

Query as a separate step
No UI on Value.NativeQuery



```
let
    Source = Sql.Database(Server, Database,
        [CommandTimeout=#duration(0, 0, 30, 0),
        ConnectionTimeout=#duration(0, 0, 0, 15),
        MaxDegreeOfParallelism=1])
in
    Source
```

```
let
    Query = "select [Sale Key], [Invoice Date Key], [Description],
        [Quantity] #(1f)from [Fact].[Sale]#(1f)where [Invoice Date Key] >=
        @fromDate",
    Source = Value.NativeQuery(WWIDatabase, Query, [fromDate =
        FromDate])
in
    Source
```



Hack – Folder Proxy

FolderProxy (M Query)

Redirects to:

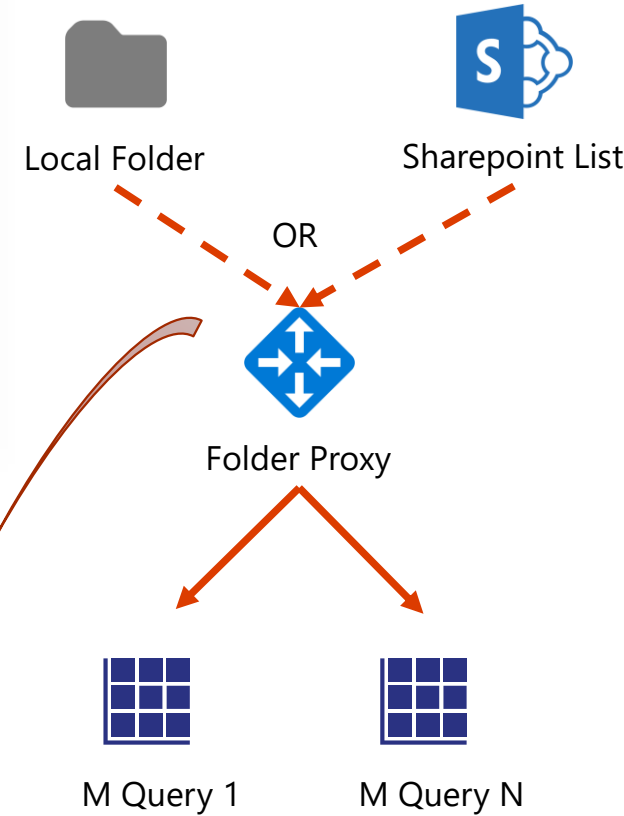
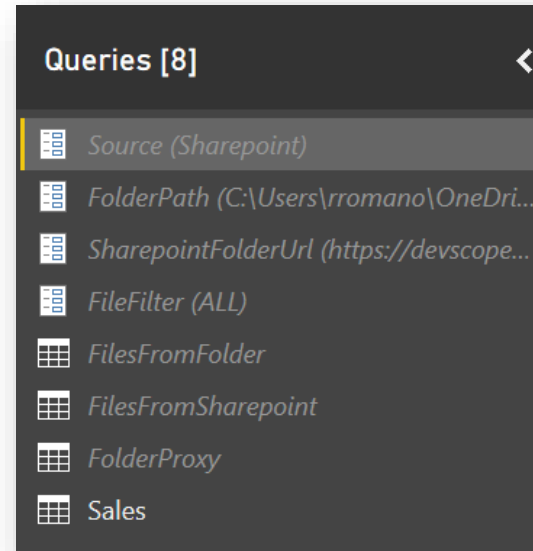
FileSystem

or

Online Source(ex: Sharepoint)

More productivity w/ online data sources (ex: Sharepoint or DataLake)

ABC 123	Content	AB _C Name	AB _C Extension	Date accessed
Binary		2018-08-01.csv	.csv	26/09/2018 20:25:02
Binary		2018-08-02.csv	.csv	26/09/2018 20:25:02
Binary		2018-08-03.csv	.csv	26/09/2018 20:25:02
Binary		2018-08-04.csv	.csv	26/09/2018 20:25:02
Binary		2018-08-05.csv	.csv	26/09/2018 20:25:02
Binary		2018-08-06.csv	.csv	26/09/2018 20:25:02
Binary		2018-08-07.csv	.csv	26/09/2018 20:25:02



FolderProxy

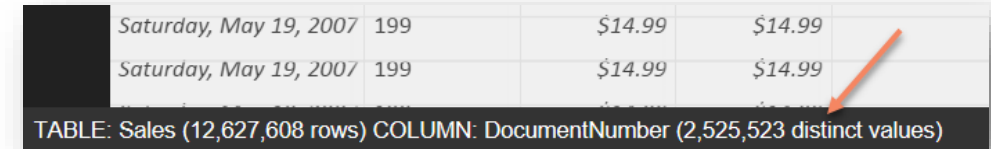
```
let
    Source = FilesFromSharepoint // or FilesFromFolder,
    #"Removed Other Columns" = Table.SelectColumns(Source,
    Filter = Table.SelectRows(#"Removed Other Columns", e
in
    Filter
```



Tip – Optimize your model size

Focus on columns w/ high cardinality

Use Status Bar, DMV's or tools like [VertiPaq Analyser](#)



Saturday, May 19, 2007	199	\$14.99	\$14.99
Saturday, May 19, 2007	199	\$14.99	\$14.99

TABLE: Sales (12,627,608 rows) COLUMN: DocumentNumber (2,525,523 distinct values)

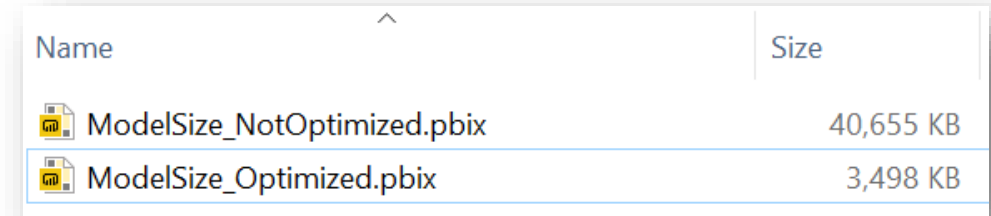
Try to



Review DataTypes, ex: reduce decimal numbers

Remove columns you don't need (ex: Transaction Number)

Separate query for things ex: "Transaction Count"

Split columns, ex: Date & Time, Id's



Name	Size
 ModelSize_NotOptimized.pbix	40,655 KB
 ModelSize_Optimized.pbix	3,498 KB

Learn more: [link1](#)

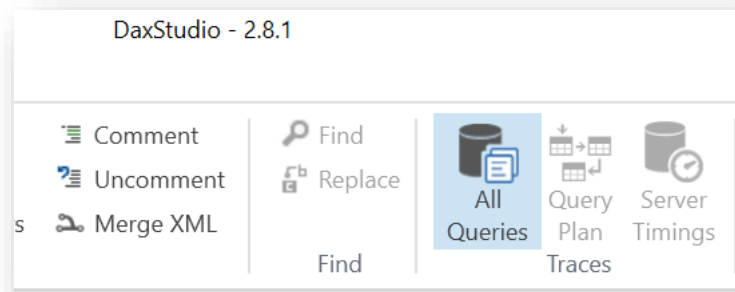


Hack – Slow Report? Identify the cause (with focus)...

DAXStudio & Queries Capture

By [SQLBI](#) & [DAXStudio](#)

Focus on what matters by identifying the slowest



The screenshot shows a PivotTable in DAXStudio. The PivotTable has 'A. Datum' as the row label and 'Customers' as the column labels. The data is grouped by 'Product Name'. The 'Total' row is highlighted in red, and a red arrow points to it. The 'Customers' column is also highlighted in red. The 'Total' row shows a value of 2160. The 'Customers' column shows values for 'Adventure Works 2017 720p LCD HDTV M140 Silver' (270), 'SV 16xDVD M360 black' (270), 'A. Datum SLR camera X137 Grey' (109), and 'Adventure Works 2017 720p LCD HDTV M140 Silver' (109).

A. Datum	Adventure Works	Contoso	Fabrikam	Litware	Northwind Traders
(Blank)	20.45K	44.50K	8.46K	14.23K	876.65
Proseware	3.79K	325.71	(Blank)	2.78K	Red
6.04K					
A. Datum	Adventure Works	Contoso	Fabrikam	Litware	Northwind Traders
22.75K	80.95K	95.83K	82.16K	24.36K	94.99
Proseware	Southridge Video	Tailspin Toys	The Phone Company	World Wide Importers	Black
73.49K	81.42K	5.24K	37.71K	94.08K	
A. Datum	Adventure Works	Contoso	Fabrikam	Litware	Northwind Traders
1.93K	9.12K	17.64K	63.97K	14.78K	64.66K
Proseware	Southridge Video	Tailspin Toys	The Phone Company	World Wide Importers	Blue
4.63K	1.42K	7.77K	(Blank)	27.42K	

Product Name	Customers
Adventure Works 2017 720p LCD HDTV M140 Silver	270
SV 16xDVD M360 black	270
A. Datum SLR camera X137 Grey	109
Adventure Works 2017 720p LCD HDTV M140 Silver	109
Total	2160

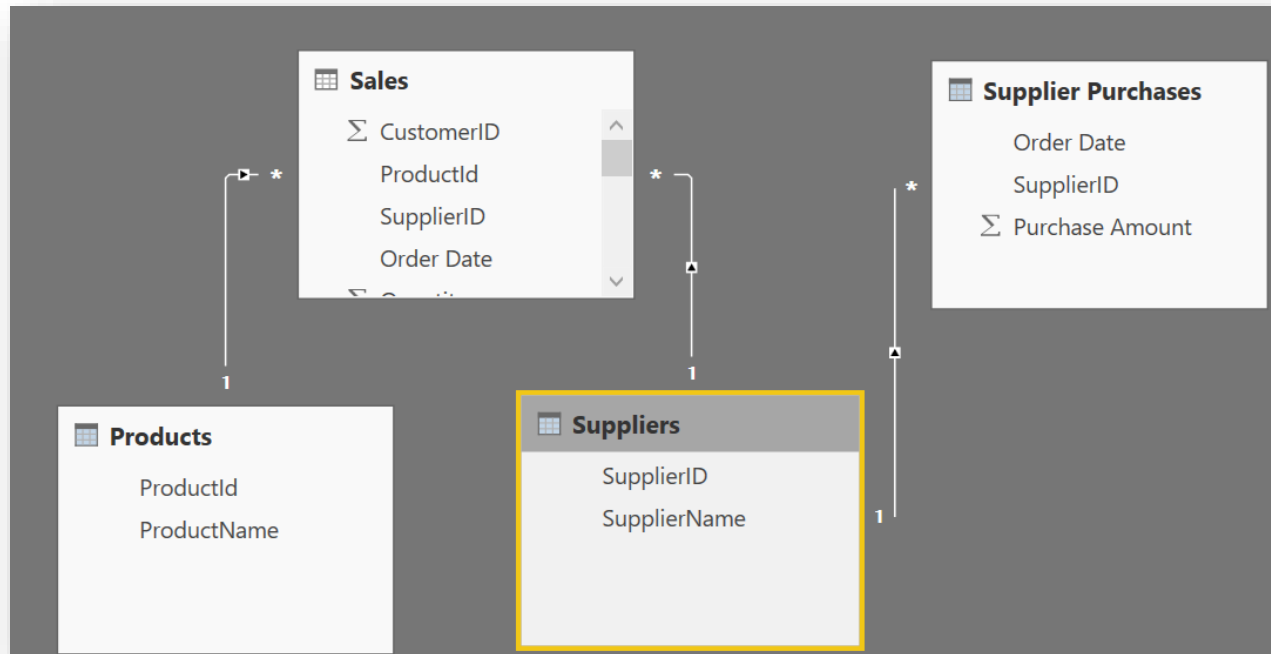
Learn more: [link1](#)

Tip – DAX Tables/Columns to reduce DB Impact

Not a Best Practice! But very useful to reduce DB round trips

1 Server Query => N Tables

Complex Calculated Column in DAX is blazing fast



```
Products = SUMMARIZE('Sales', [ProductId], [ProductName])
```

```
Suppliers = SUMMARIZE('Sales', [SupplierID], [SupplierName])
```



Hack – “Incremental Loading” w/ “Report Refresh”

Only loads on first refresh

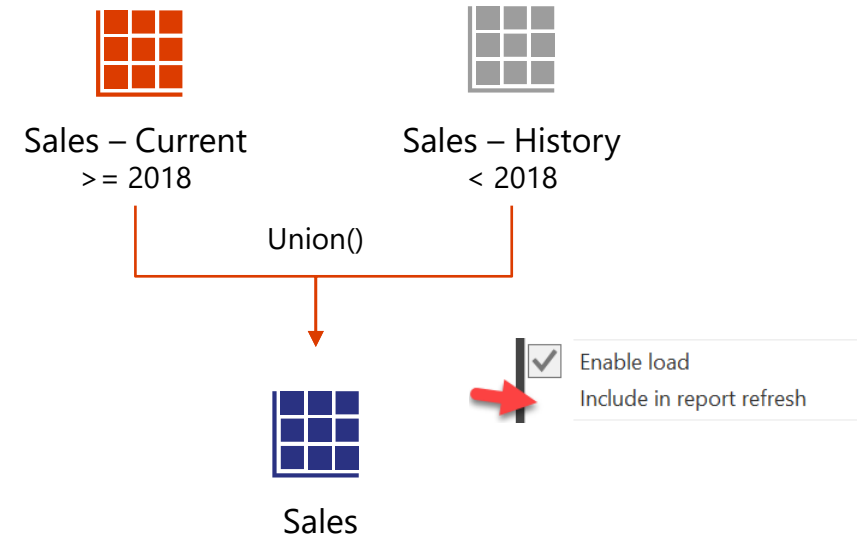
Useful for Static Data (history)

*Alternative to “Incremental Loading”

Not Perfect

Use DAX to avoid duplicating tables

If there's attributes to slice on the fact, then use UNION



```
Quantity (DAX) = SUM('Sales - History'[Quantity]) + SUM('Sales - Current'[Quantity])
```

```
Sales = UNION('Sales - Current', 'Sales - History')
```

Learn more: [link1](#)



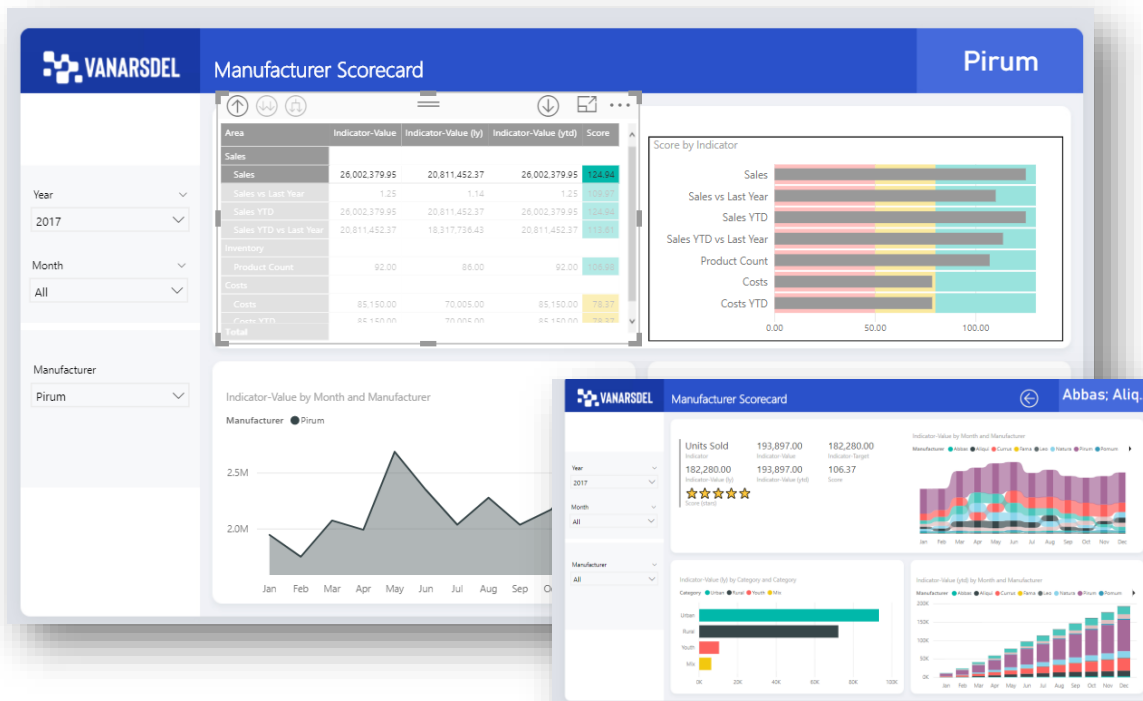
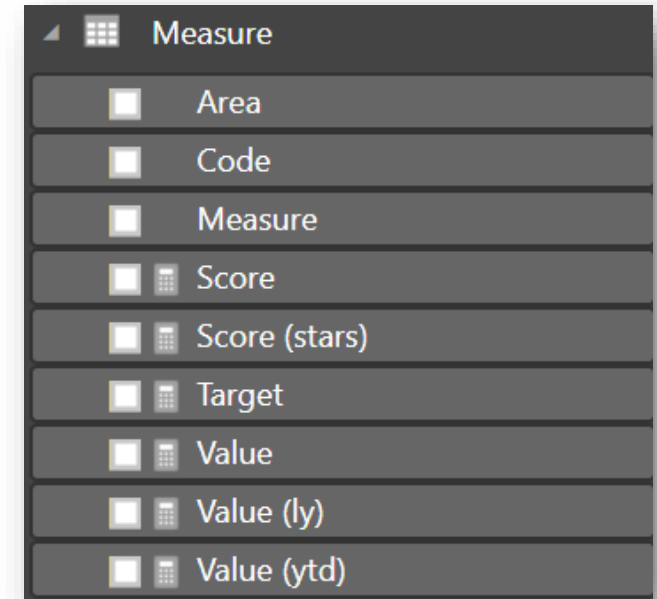
Hack – Measures as Dimension

Scorecards & KPIs

Reusability: YTD, LY,... for all the measures

One report for multiple analysis

*Performance hit



```
Value =  
if (HASONEVALUE('Measure'[Code]) && ISFILTERED('Measure'[Measure]),  
var currentIndicator = SELECTEDVALUE('Measure'[Code],BLANK())  
return |  
SWITCH(currentIndicator  
, BLANK(), BLANK()  
, 1, [Sales]  
, 2, DIVIDE([Sales], [Sales (py)])  
, 3, [Units]  
, 4, CALCULATE([Sales YTD], SAMEPERIODLASTYEAR('Date'[Date]))  
, 10, DISTINCTCOUNT('Sales'[ProductID])
```



Hack – Measure as Image

Lot of flexibility for KPI's / Scorecards

Use base64 to embed images in PBIX

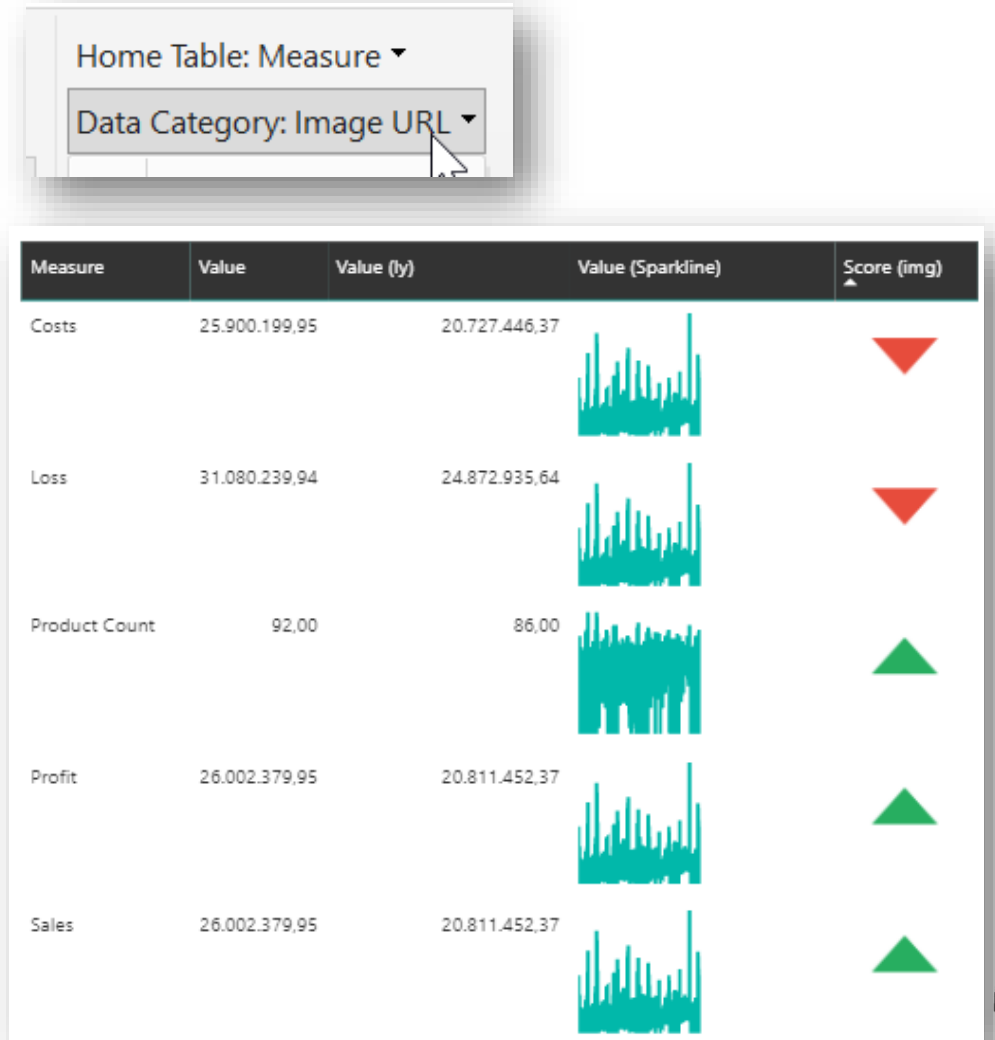
Use SVG for flexibility

Can do sparklines ([David Eldersveld](#))

Only works on tables/matrix

This month 😊

Learn more: [link1](#), [link2](#), [link3](#), [link4](#)

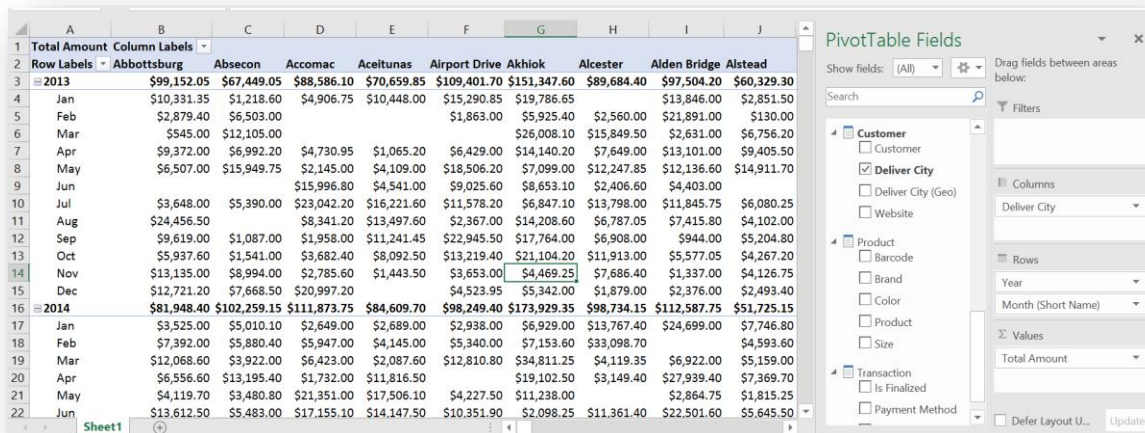


Hack – Excel + Power BI Desktop

PBIDesktop has an Analysis Services Instance

Great for data validation at development time

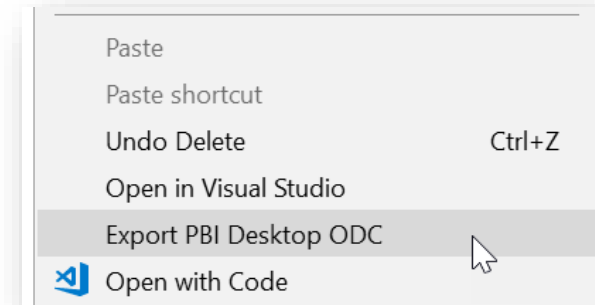
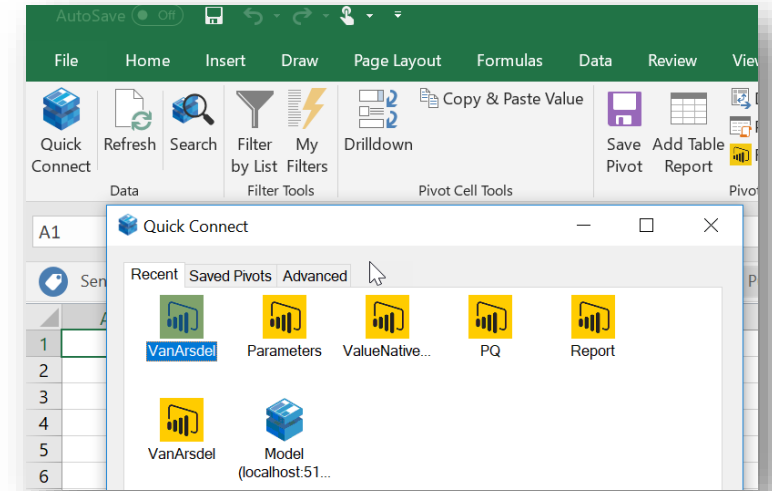
Discover the TCP Port using netstat,
[PowerBIPS.Tools](#), [DAXStudio](#), [SmartPivot](#)



The screenshot shows an Excel spreadsheet with a PivotTable. The PivotTable Fields task pane is open on the right, showing the following structure:

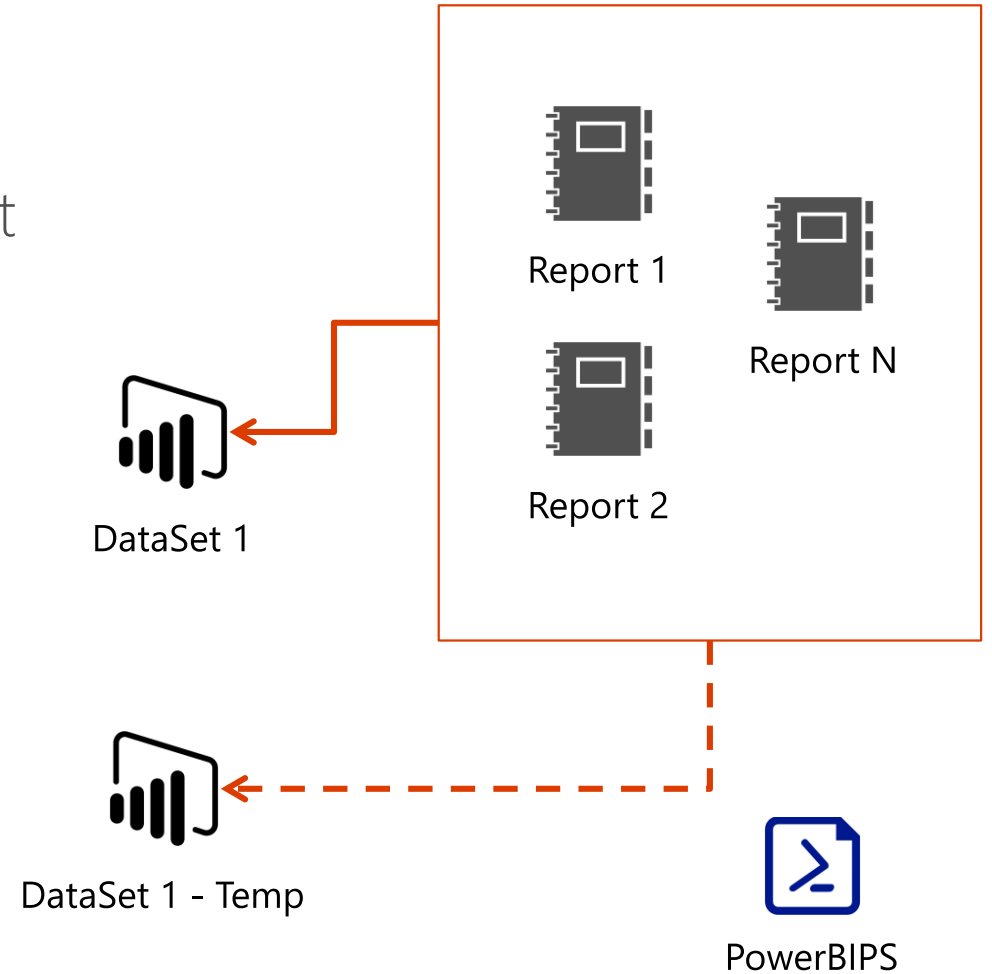
- Customer** (checked)
 - Deliver City (checked)
 - Deliver City (Geo)
 - Website
- Product** (checked)
 - Barcode
 - Brand
 - Color
 - Product
 - Size
- Transaction** (checked)
 - Is Finalized
 - Payment Method

The PivotTable shows data for the year 2013, grouped by month (Jan to Dec). The columns represent different categories: Total Amount, Column Labels, Absecon, Accomac, Aceitunas, Airport Drive, Akhiok, Alcester, Alden Bridge, and Alstead. The values are numerical, representing monetary amounts.



Hack – DevOps – Publish & Rebind

1. Publish to a TEMP dataset
2. Refresh & Test the TEMP dataset
3. Rebind the all the reports to the TEMP dataset
4. Rename DataSet



Learn more: [link1](#)



Hack – REST API & DevOps

Use the [REST API](#) to:

Automation, Productivity, DevOps, Realtime...

Examples:

PBIX Publish & Rebind

Export all pbix from PowerBI.com to Folder

Bulk Create Multiple Workspaces using Folders and Files

Sync between Workspaces: (ex: Dev to Prod)

...

Learn more: [link1](#), [link2](#)



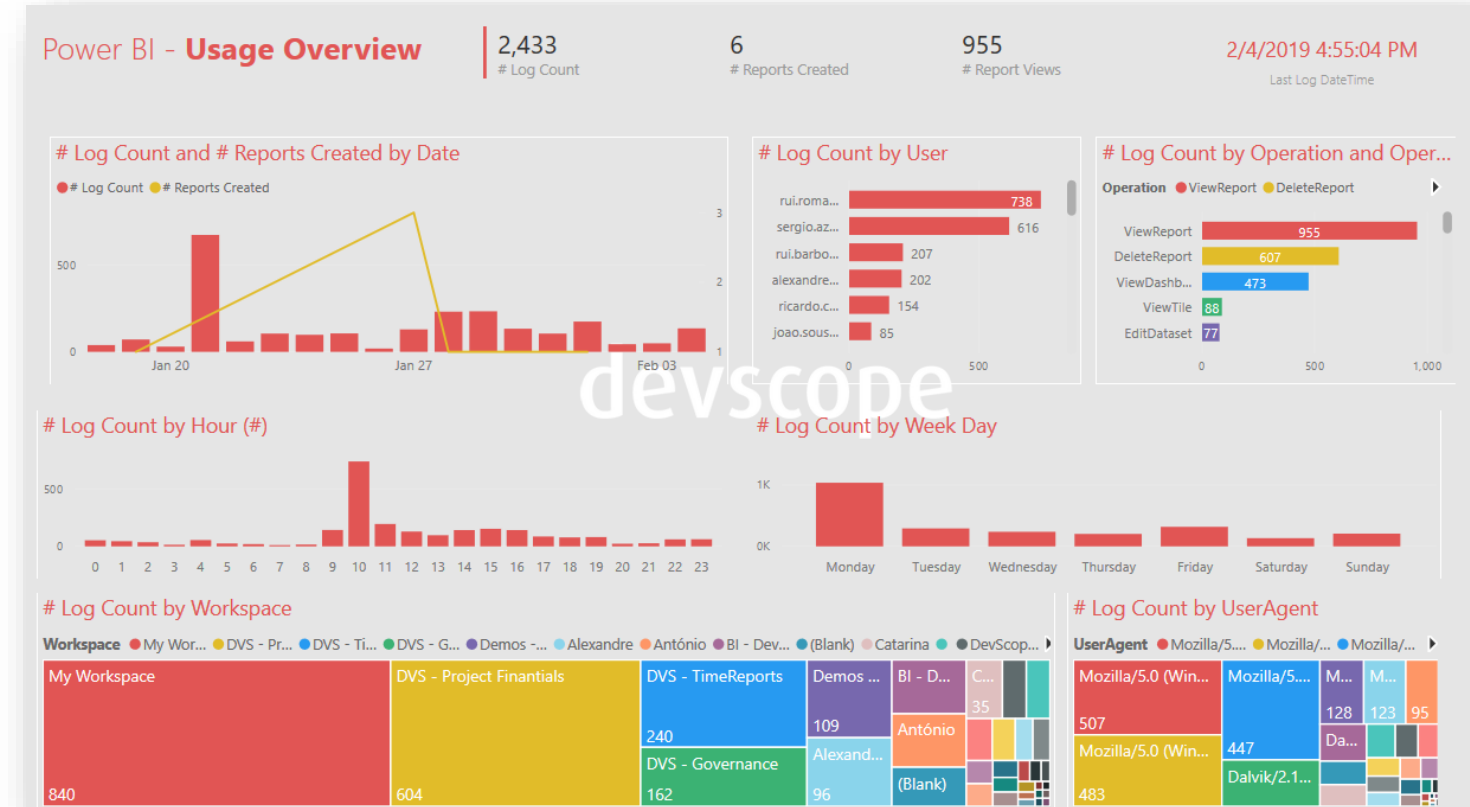
Tip – Governance on Power BI

Use the [REST API](#) & Audit Logs to get the Data

Monitor everything: personal included

Monitor datasources, usage, mobile usage, excel usage

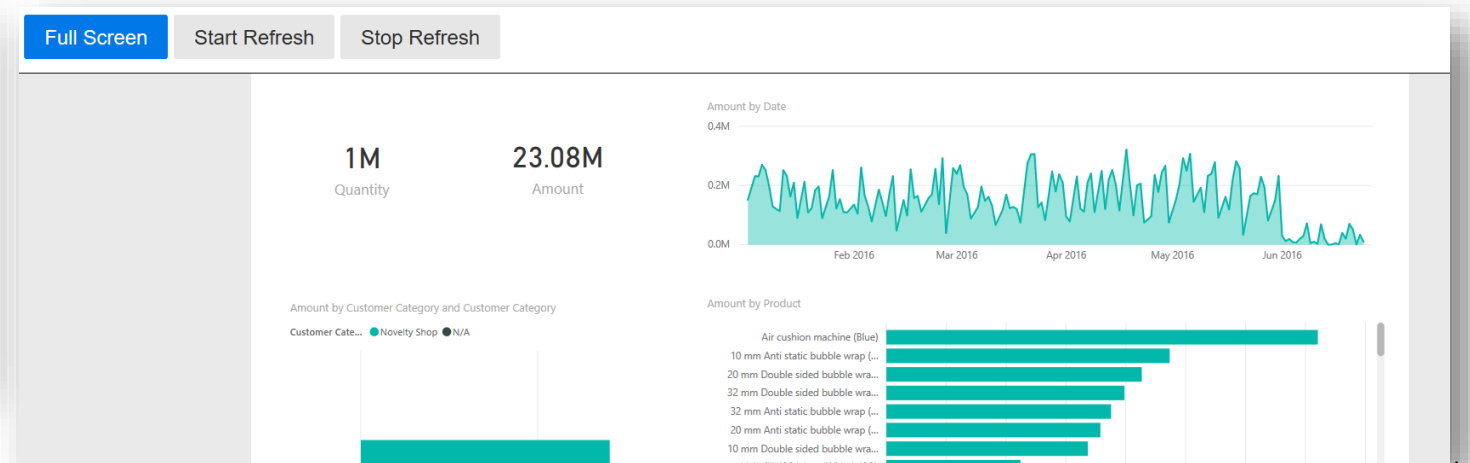
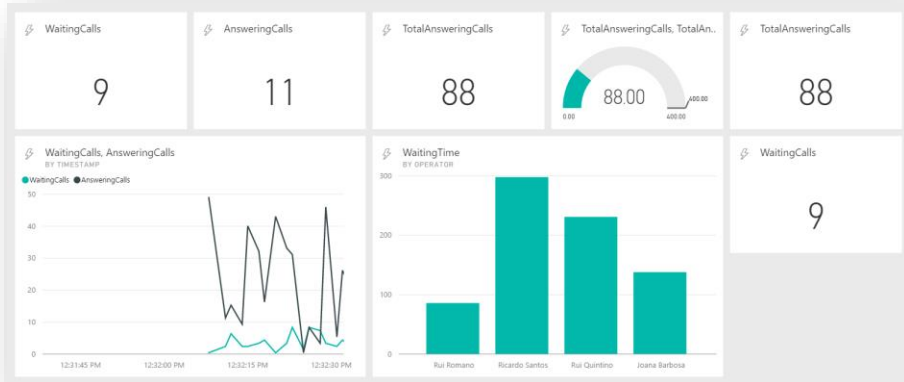
Monitor No Activity



Hack – Power BI + Real Time!

Multiple ways => Choose the best for you!

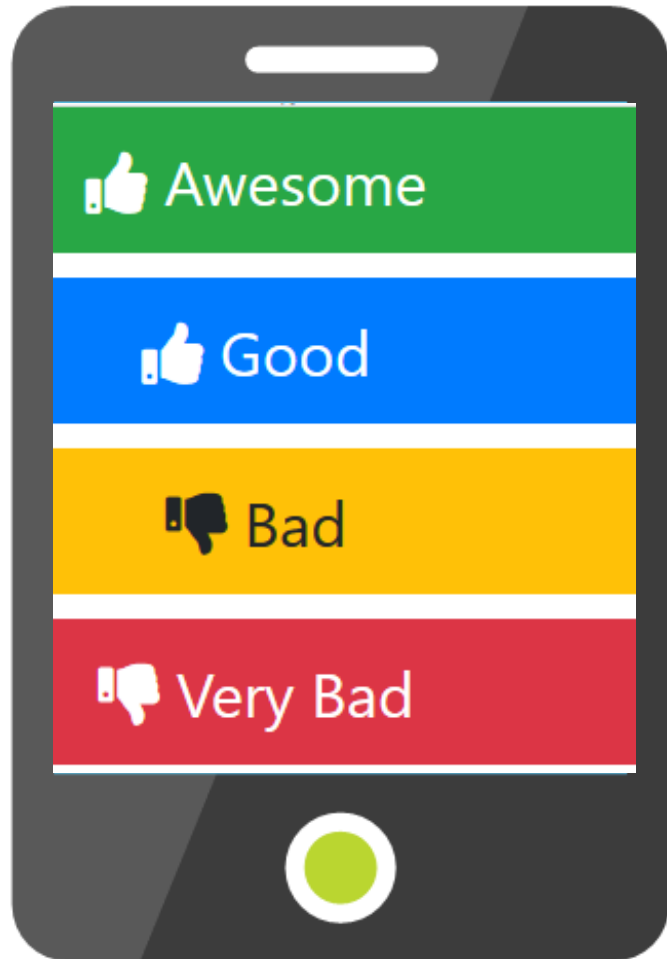
1. [Streaming DataSets](#) => Quick w/ Low Effort (very fast...)
2. [REST API](#) => More Control (not so fast...)
3. DirectQuery/Live
[Power BI Embedded](#) ([Ted Pattinson GitHub as sample](#))



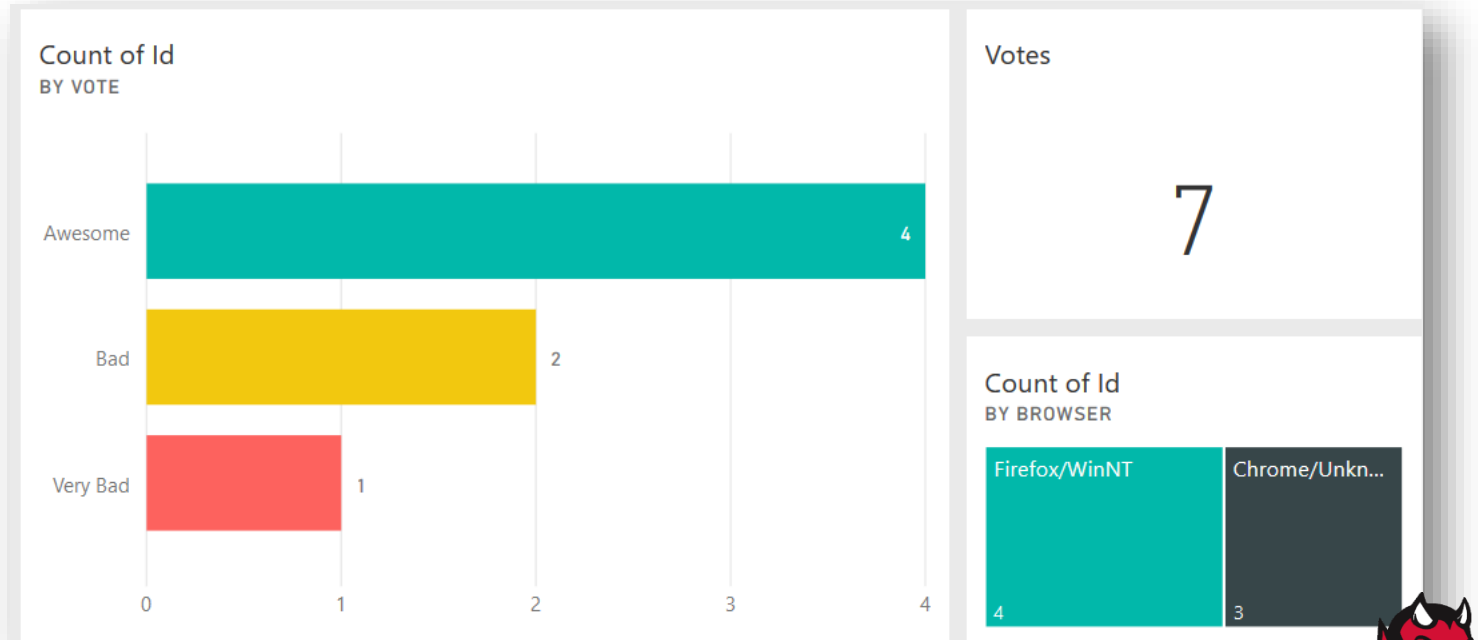
Learn more: [link1](#), [link2](#)



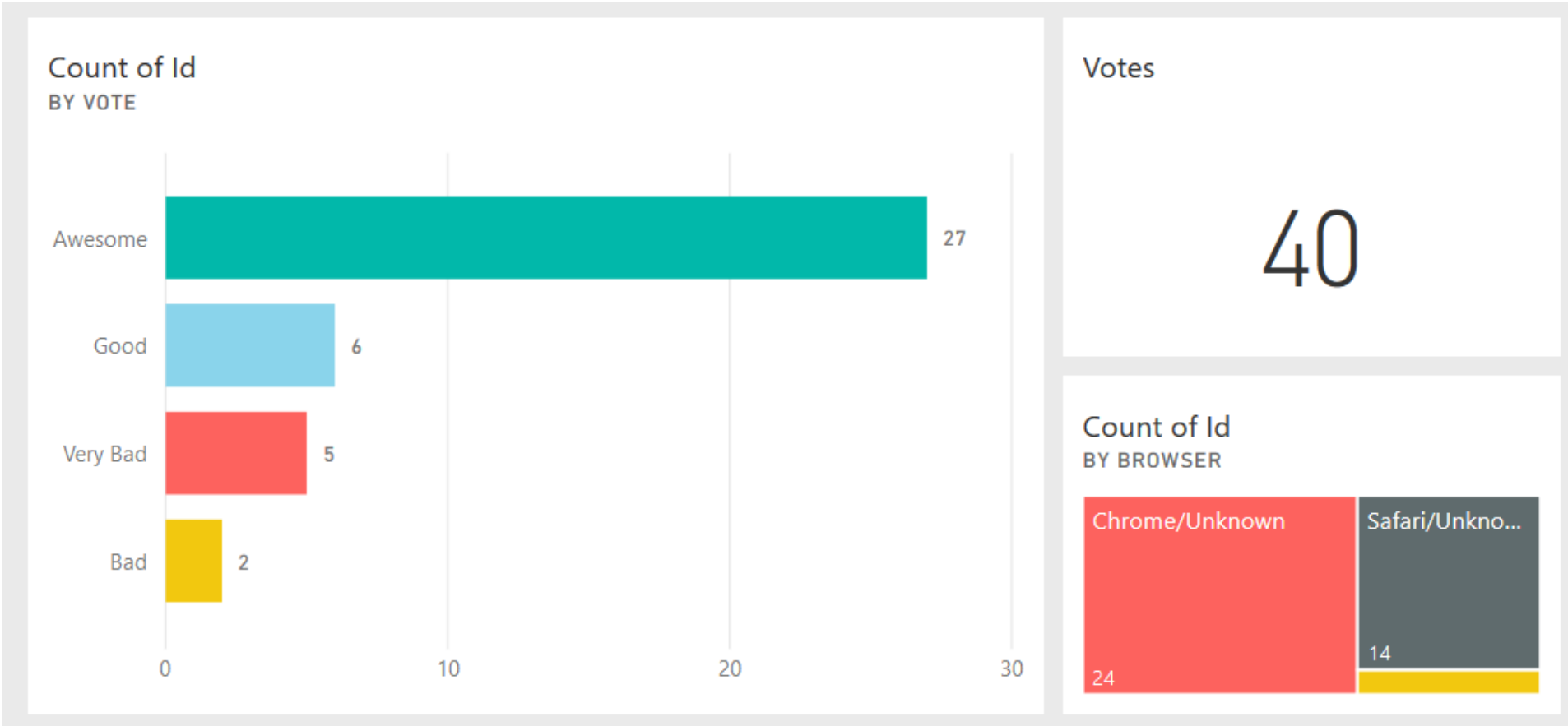
Tip – Real-Time Session Voting



<https://tinyurl.com/pbivoting>
<https://bit.ly/2HVi5ej>



Session Votes – Thank You!



DevScope Offer

5 Licenses of Power BI Tiles PRO

[illegible]

Balancete

0
Valor Lançamento

266 M
Valor Lançamento

-266 M
Valor Lançamento

Filtrar por Num. Conta

Enter Field Values

Ex: SKU1, SKU2, SKU3

Ex:

SKU1

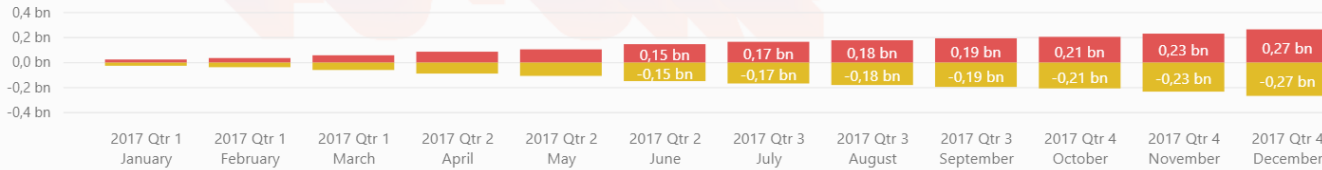
SKU2

SKU3

Empresa	Crédito	Débito	Total
Empresa 1	57.752.384	-57.752.384	0
Ativo - Curto prazo	19.935.462	-21.744.672	-1.809.210
Caixa e depósitos bancários	17.014.708	-19.281.637	-2.266.929
Caixa	2.209	-1.522	687
Caixa - Conta Transitoria - Atendimento	31.943	-24.845	7.099
Caixa - Conta Transitoria - Débito Directo	4.285.824	-3.098.263	1.187.561
Caixa - Conta Transitoria - SIBS/Multibanco	4.379.952	-3.161.572	1.218.379
Depósitos à Ordem	8.314.779	-9.195.434	-880.655
Outros Depósitos Bancários - STD C/Nº23238238264		2.800.000	2.800.000
Total	265.965.387	-265.965.387	0

Valor Lançamento (ytd) por Year, Quarter, Month e Tipo

Tipo ● Crédito ● Débito



January February March April May June July August September October November December

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Obrigado!

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