Cracking the Power BI Performance!
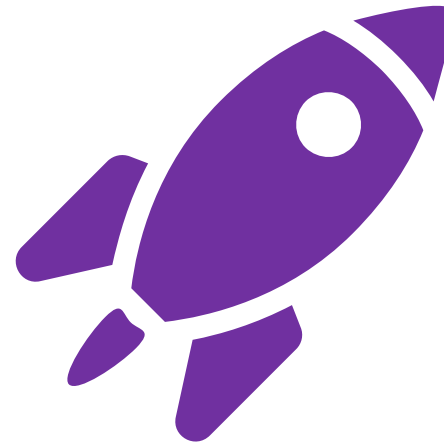
Nikola Ilic

Data Mozart, Microsoft Data Platform MVP

Nikola Ilic

Data Platform Consultant & Trainer

Data-mozart.com

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PLURALSIGHT

➢ *I'm making music from the data*!

➢ Power BI and SQL Server addict, Data Platform MVP, MCT, blogger, speaker...

➢ Father of 2, Barca & Leo Messi fan...

✓Creating Power BI report is an easy task!

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Where do I start?!

1. Data Model size

2. Data refresh process

3. DAX calculations

4. Visualization rendering time

5. Storage mode choice

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DATA MODEL SIZE

DATA MODEL SIZE

✓ VertiPaq is a columnar database

✓ Data snapshot in memory

✓ Periodically refreshed

Formula Engine		Storage Engine

DATA MODEL SIZE

DATA MODEL SIZE BEST PRACTICES

✓ Reduce the amount of data for import

✓ Reduce the column cardinality

✓ Avoid using calculated columns

✓ Disable Auto Date/Time

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DATA MODEL SIZE

Cardinality ~ 8.8 Million
Column size ~ 455 MB

Cardinality ~ 1.300
Column size ~ 7 MB

DATA REFRESH PROCESS

DATA REFRESH PROCESS

✓ Data transformations – currency conversion, filtering, calculations...

✓ Where do you shape the data?

✓ QUERY FOLDING = Ability to generate single SQL query to be executed on the data source side

Power Query

DATA REFRESH BEST PRACTICES

✓ https://dax.tips/2021/02/15/visualise-your-power-bi-refresh/

✓ Push transformations ssible

✓ Create database view

✓ ALL or NOTHING

✓ Turn off Allow data p
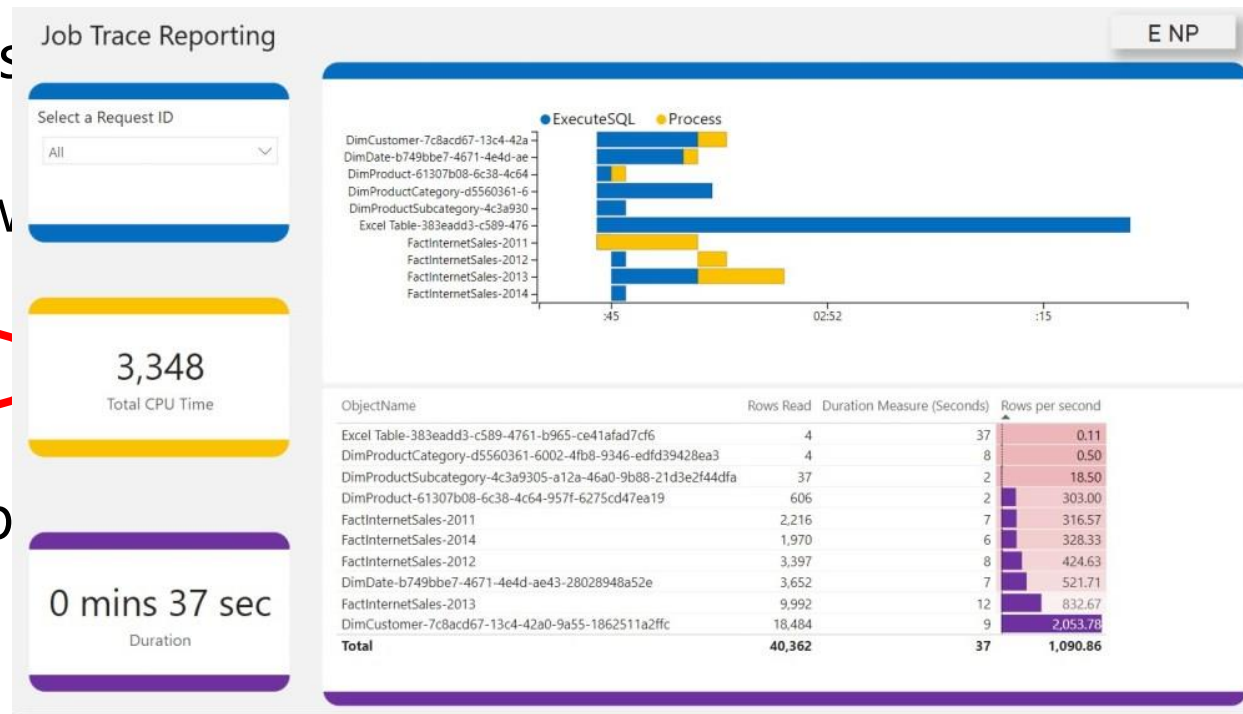
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DATA REFRESH PROCESS GOLDEN RULE

„Push transformations and calculations as upstream as possible,

and as downstream as necessary!"

Matthew Roche

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DAX CALCULATIONS

DAX CALCULATIONS

✓ Unique customers, top selling products, running totals...

✓ The „beauty" of DAX – get same result in multiple different ways

✓ Little nuances can make a huge difference!

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VISUALS RENDERING TIME

VISUALS RENDERING TIME

✓ Performance Analyzer feature in PBI Desktop

✓ The more visuals – the longer time for rendering!

VISUALS RENDERING BEST PRACTICES

✓ Reduce the number of visuals!

✓ Use PowerPoint to design background of Power BI report page

✓ Reduce the number of DAX query generated – Card visuals->Matrix

✓ Display aggregated data by default, enable Drill-through for details

✓ Consider disabling cross-filtering

✓ Sync Slicers?

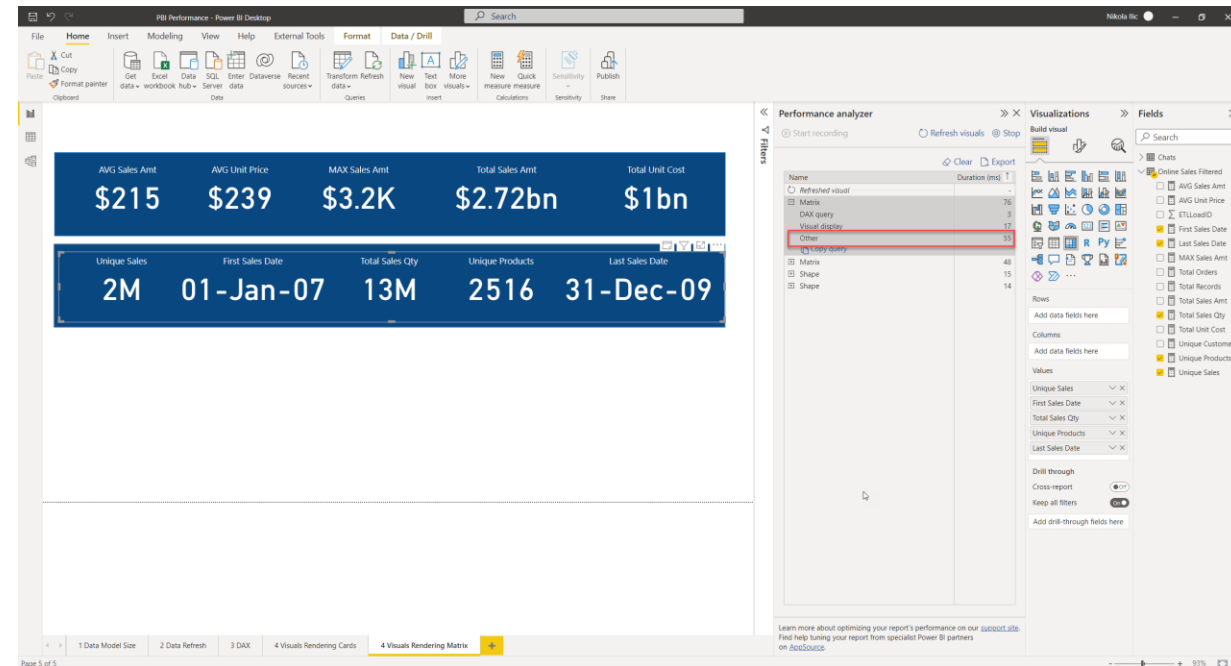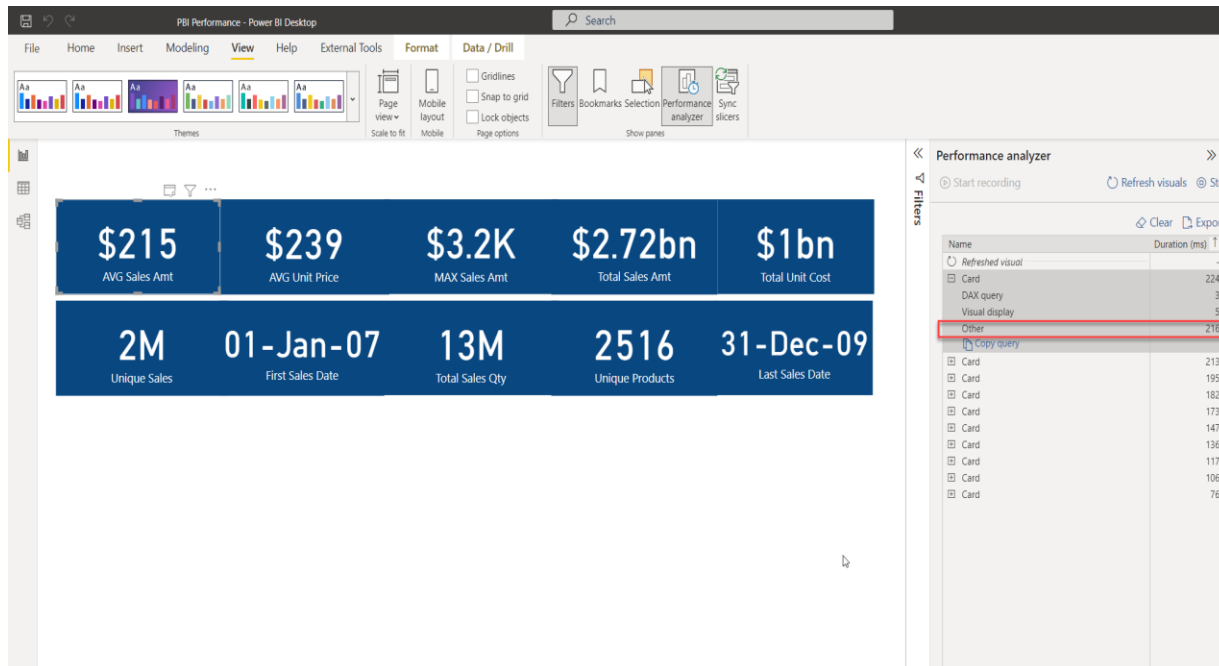@DataMozart

VISUALS RENDERING TIME

10 visuals = 10 queries
Other???

2 queries = the same result!
Design!

STORAGE MODE DECISION

WHAT IS A DIRECT QUERY?!

✓ Data is retrieved from the source at the query time!

✓ Data resides outside of Power BI before, during, and after the query execution

✓ Direct Query will NEVER improve performance of your Power BI report!!!

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WHEN TO USE A DIRECT QUERY?!

1. Data is too large for Import mode

2. Real-time reporting requirements

   • Is it really necessary?

3. Security policies on the data source side

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DIRECT QUERY BEST PRACTICES

Permissions on the data source?

✓ Create proper indexes

✓ Data integrity

✓ Persistent data objects

✓ Avoid complex PQ transformations

✓ Avoid complex DAX measures

✓ Avoid relationship on GUIDs

✓ Limit parallelism and apply Query reduction

✓ Check Assume referential integrity

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DIRECT QUERY BEST PRACTICE!

AVOID DIRECT QUERY IF POSSIBLE!

MONDAY TO-DO LIST

- ✓ Identify the poor performing area(s)

- ✓ Remove unnecessary data

- ✓ Check Query folding

- ✓ Be mindful when writing DAX

- ✓ Reduce the number of visuals on the page

- ✓ Stay away from Direct Query!

QUESTIONS

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THANK YOU!

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