

Turn your model from turtle to rabbit performance

Erik Svensen

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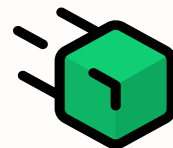
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Raffle prizes from the sponsors



TABULAR
EDITOR 3



DAX
Optimizer

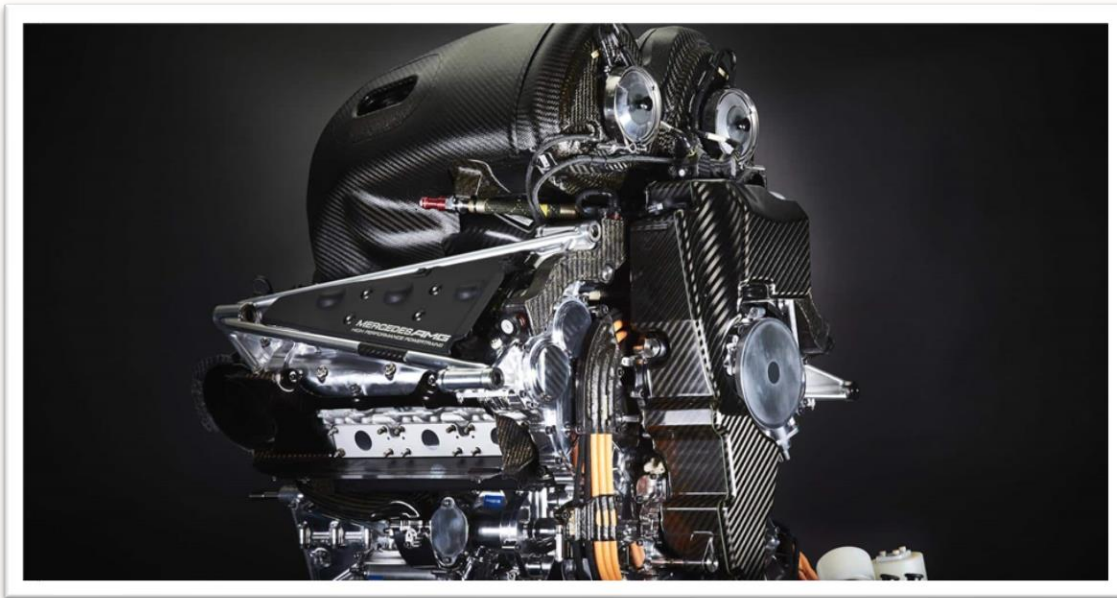


Disclaimer

This session is not a session about
how to optimize DAX
it's true Power BI crime stories from
the real world

Model vs report experience

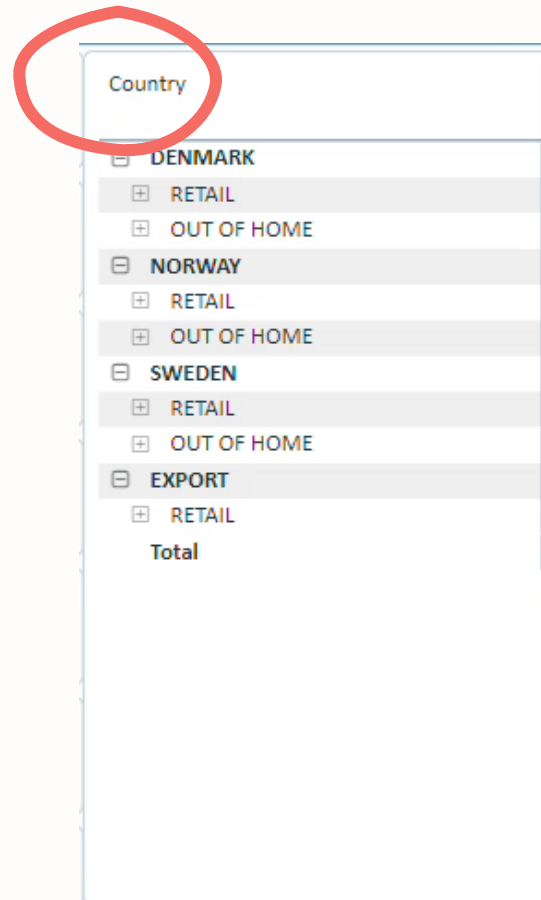
You thought you build this



The reports



The circle of “Power BI is slow”



A screenshot of a Power BI table showing a hierarchical structure. The table has a header row with the column name "Country" circled in red. Below the header, the data is organized into four main categories: DENMARK, NORWAY, SWEDEN, and EXPORT. Each of these categories is expanded to show two sub-levels: RETAIL and OUT OF HOME. A "Total" row is visible at the bottom of the table.

Country
DENMARK
RETAIL
OUT OF HOME
NORWAY
RETAIL
OUT OF HOME
SWEDEN
RETAIL
OUT OF HOME
EXPORT
RETAIL
Total

What could possibly cause this performance



Suspect no 1

- Too many visuals ?

Selection Panel:

- 241 Card
- 242 Card
- 243 Card
- 244 Card
- 245 Card
- 246 Card
- 247 Card
- 248 Card
- 249 Card
- 250 Product Hierarchy:
- 251 Card
- 252 Card
- 253 Card
- 254 Slicer
- 255 Card
- 256 Button
- 257 Card
- 258 Button
- 259 Card
- 260 Slicer
- 261 Card

Segment Beans Value (K €)

R3M 2021	R3M 2022	R3M 2023
312.607	336.962	342.306
chg. (%)	7.8%	1.6%

Non Promotion Volume (t)

R3M 2021	R3M 2022	R3M 2023
17.239	15.473	16.841
chg. (%)	-10.2%	8.9%

CWD (Non Promotion)

R3M 2021	R3M 2022	R3M 2023
27.757	26.204	25.881
chg. (%)	-5.6%	-1.2%

Promotion

R3M 2021	R3M 2022	R3M 2023
14.9%	47.8%	47.5%
40.307	160.974	162.627
chg. (%)	14.7%	1.0%

Promotion Price (€/kg)

R3M 2021	R3M 2022	R3M 2023
8.85	10.11	10.16
chg. (%)	14.3%	0.4%

Total Coffee Market

W2023031

Value (k €) Volume (t)

Less per CWD (Promotion) Volume (t)

R3M 2021	R3M 2022	R3M 2023
1.42	1.31	1.24
chg. (%)	-8.0%	-5.1%

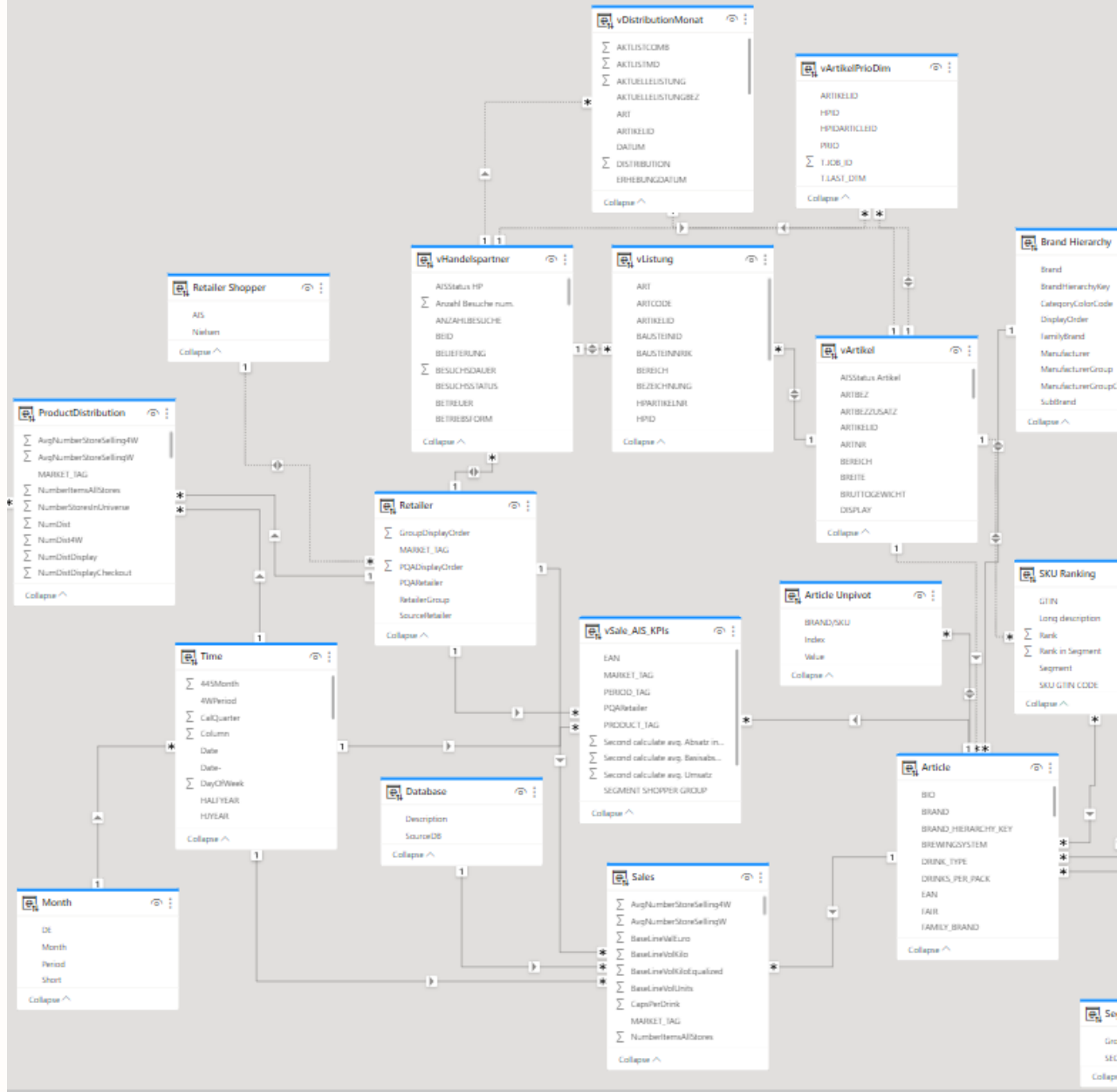
Suspect no 2

- Too many measures ?

Overgruppe	Sales LY	Sales	Sales Budget	Sales Budget Δ	Budget Index	LY Index	GP LY	GP	GP Budget	GP Budget Δ	Budget Index	LY Index	GM% LY	GM%	GM% Budget	Quantity LY	Quantity	LY Index	
60 - Convenience	386,433,768	473,088,492	493,277,487	19,289,005	120	122	36,896,787	42,088,023	45,451,388	3,363,365	98	122	9.3%	9.3%	9.3%	27,488,823	26,477,122	96	
RETAIL	352,438,861	473,087,278	496,222,282	23,139,376	128	128	32,281,849	39,922,888	42,288,282	2,366,436	94	128	9.2%	9.2%	9.2%	26,272,221	25,288,282	92	
OUT OF HOME	33,994,907	99,999,482	94,999,482	-5,000,000	112	108	4,614,937	12,165,134	3,163,106	-8,997,232	108	108	12.8%	12.8%	12.8%	1,216,601	9,188,840	108	
30 - Dairy & Cheese	383,833,038	409,888,088	441,238,888	31,350,800	97	112	38,888,888	42,888,888	48,788,888	5,900,000	98	112	12.7%	12.7%	12.7%	38,888,888	41,238,888	106	
RETAIL	371,033,038	411,033,038	431,033,788	20,000,000	98	112	47,121,038	41,078,038	48,000,000	6,921,962	98	112	12.7%	12.7%	12.7%	48,178,038	48,178,038	100	
OUT OF HOME	12,800,000	18,855,050	10,205,100	-8,649,900	92	100	1,767,850	2,810,850	1,000,000	-1,810,850	112	100	9.2%	9.2%	9.2%	4,010,850	3,060,850	76	
50 - Fish & Seafood	511,387,488	548,488,488	548,488,488	0	100	100	11,178,488	12,888,488	12,888,488	0	100	100	9.2%	9.2%	9.2%	8,888,488	8,888,488	100	
70 - Beverages	388,888,888	522,888,888	528,888,888	6,000,000	98	108	38,888,888	42,888,888	48,888,888	6,000,000	98	108	9.2%	9.2%	9.2%	22,888,888	28,888,888	124	
10 - Poultry	178,888,888	222,888,888	222,888,888	0	100	100	22,888,888	28,888,888	28,888,888	0	100	100	9.2%	9.2%	9.2%	22,888,888	22,888,888	100	
40 - Groceries	222,888,888	282,888,888	282,888,888	0	100	100	28,888,888	38,888,888	38,888,888	0	100	100	12.7%	12.7%	12.7%	28,888,888	28,888,888	100	
80 - Ice Cream	388,888,888	478,888,888	478,888,888	0	100	100	18,888,888	22,888,888	22,888,888	0	100	100	9.2%	9.2%	9.2%	18,888,888	18,888,888	100	
20 - Meat	388,888,888	488,888,888	488,888,888	0	100	100	38,888,888	48,888,888	48,888,888	0	100	100	12.7%	12.7%	12.7%	38,888,888	38,888,888	100	
95 - Other	78,888,888	78,888,888	78,888,888	0	100	100	7,888,888	7,888,888	7,888,888	0	100	100	9.2%	9.2%	9.2%	7,888,888	7,888,888	100	
97 - Packaging & Merchandise	0	88,888,888	88,888,888	88,888,888	100	100	0	88,888,888	88,888,888	0	100	100	9.2%	9.2%	9.2%	88,888,888	88,888,888	100	
98 - Samples & Services	1,111,111	0	1,111,111	-1,111,111	0	0	1,111,111	0	1,111,111	-1,111,111	0	0	0%	0%	0%	0	0	0	
96 - Pallets	0	0	88,888,888	88,888,888	100	100	0	0	88,888,888	88,888,888	0	100	100	9.2%	9.2%	9.2%	88,888,888	88,888,888	100
Total	3,288,888,888	3,288,888,888	3,288,888,888	0	100	100	328,888,888	328,888,888	328,888,888	0	100	100	9.2%	9.2%	9.2%	328,888,888	328,888,888	100	

Suspect no 3

A complicated data model not following best practices



Suspect no 4

Too much data ?

Log Results History **VertiPaq Analyzer**

Tables	Name	Cardinality	Total Size ↓	Data	Dictionary	Hier Size	Enc
Columns	▶ Finance	7.459.735	350.768.244	103.066.712	201.275.468	46.348.152	M
Relationships	◀ Sales	4.155.838	273.444.084	78.606.416	164.174.732	30.602.440	M
	DBCost	540.321	27.523.152	1.833.872	21.366.704	4.322.576	H
Partitions	Freight(Sales)	331.536	15.013.268	1.040.560	11.320.404	2.652.304	H
Summary	SalesAmount	149.829	14.781.124	8.097.216	5.485.268	1.198.640	H
	Freight(Sales)NEW	306.997	14.449.080	936.672	11.056.424	2.455.984	H
	Financing(cost)	298.599	14.413.120	1.055.432	10.968.888	2.388.800	H
	SalesCostAmount	249.663	14.285.772	1.805.848	10.482.612	1.997.312	H
	Financing(cost)NEW	258.153	13.567.416	937.960	10.564.224	2.065.232	H
	AverageWarehouseRent(cost)	247.696	13.514.040	1.067.248	10.465.208	1.981.584	H
	SalesCostAmountDB	211.943	13.434.416	1.603.728	10.135.136	1.695.552	H
	AverageWarehouseRent(cost)NEW	208.279	12.710.308	940.456	10.103.612	1.666.240	H
	DocumentNo	172.777	11.118.808	1.904.696	7.831.888	1.382.224	H

Suspect no 5

Daxser Söze ?

```
1 DEFINE
2 ---- MODEL MEASURES BEGIN ----
3 MEASURE Sales[Sales Value] =
4 IF(
5     HASONEVALUE( 'Measures Sales'[Measure] ),
6     SWITCH(
7         VALUES( 'Measures Sales'[MeasureSort] ),
8         "10", CALCULATE (
9             SELECTEDVALUE ( 'Incl Internal Amount'[Incl. Internal Amount] ),
10            "No", CALCULATE (
11                CALCULATE (
12                    CALCULATE (
13                        IF(
14                            HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
15                            DIVIDE( SUM( Sales[SalesAmount] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
16                            SUM( Sales[SalesAmount] )
17                        )
18                    ), "CurrencyCalculation'[Name] - "Running"
19                ),
20            "Yes", CALCULATE (
21                CALCULATE (
22                    CALCULATE (
23                        IF(
24                            HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
25                            DIVIDE( SUM( Sales[SalesAmount] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
26                            SUM( Sales[SalesAmount] )
27                        )
28                    ), 'CurrencyCalculation'[Name] - "Running"
29                )
30            )
31        ),
32        CALCULATE (
33            CALCULATE (
34                CALCULATE (
35                    IF(
36                        HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
37                        DIVIDE( SUM( Sales[SalesAmount] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
38                        SUM( Sales[SalesAmount] )
39                    )
40                ), "CurrencyCalculation'[Name] - "Running"
41            )
42        )
43    )
44 /* OLD:
45 CALCULATE(
46     CALCULATE (
47         IF(
48             HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
49             DIVIDE( SUM( Sales[SalesAmount] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
50             SUM( Sales[SalesAmount] )
51         )
52     ), "CurrencyCalculation'[Name] - "Running"
53 )
54 */
55 "10", CALCULATE (
56     CALCULATE (
57         CALCULATE (
58             CALCULATE (
59                 IF(
60                     HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
61                     DIVIDE( SUM( Sales[SalesAmount] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
62                     SUM( Sales[SalesAmount] )
63                 )
64             ), "CurrencyCalculation'[Name] - "Running"
65         )
66     )
67 ) /* CALCULATE (
68     CALCULATE (
69         CALCULATE (
70             IF(
71                 HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
72                 DIVIDE( SUM( Sales[SalesAmount] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
73                 SUM( Sales[SalesAmount] )
74             )
75         ), "CurrencyCalculation'[Name] - "Running"
76     )
77 ) skal bruges, da DB ikke skal påvirkes af om det er med eller uden eliminerings (Sundergaard)"/
78 - CALCULATE (
79     CALCULATE (
80         CALCULATE (
81             IF(
82                 HASONEVALUE( 'Value Scale'[ValueScaleInt] ),
83                 DIVIDE( SUM( Sales[DRCost] ), VALUES( 'Value Scale'[ValueScaleInt] ) ),
84                 SUM( Sales[DRCost] )
85             )
86         ), "CurrencyCalculation'[Name] - "Running"
87     )
88 )
```

The tools to locate forensic evidence

Performance Analyzer

DAX Studio

Tabular Editor 2

Tabular Editor 3

DAX Optimizer

Demo time on real data

DAX OPTIMIZER

The screenshot displays the DAX Optimizer web application interface. The browser address bar shows the URL: <https://app.daxoptimizer.com/my/251707066930-1585cdfa-8e6a-4118-898d-ae471592fb7d/251707066929-d6a63dbb-3986-4de6-ac9c-2cbeca15600f/25170706690...>

The main workspace area is titled "Datamodel DK New Segmentation" and shows the following metrics:

- 1.29 GB (Data Size)
- 23 (Tables)
- 192 (Columns)
- 176 (Measures)
- 0 (Faulty Measures)
- 8 (Calculation Groups)
- 0 (RLS Filters)

Additional information includes:

- Max Rows: 2 M
- Max Col Size: 163.99 MB
- Last Update: 9/20/2023
- File Name: Datamodel DK New Segmentation.vpax

The interface also displays a summary of 49 open issues, categorized by status:

Issue Type	OPEN	FIXED	IGNORED
Red Circle	0	0	0
Yellow Diamond	0	0	0
Yellow Triangle	49	1	0
Total	49	1	0

Below the table, there are input fields for "Weight", "CPU Cost", and "RAM Cost", and radio buttons for "Open", "Fixed", "Ignored", and "Others".

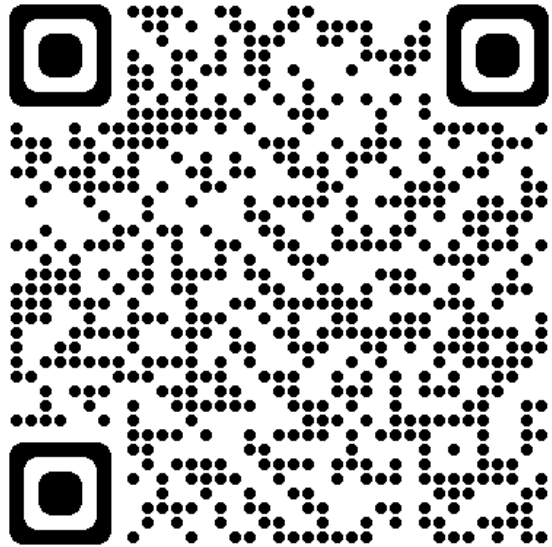
The footer of the application indicates: "Analyzed with DAX Optimizer Engine v04.25" and "DAX Optimizer v0.1.57 BETA © Tabular Tools Corp."

Extra clues

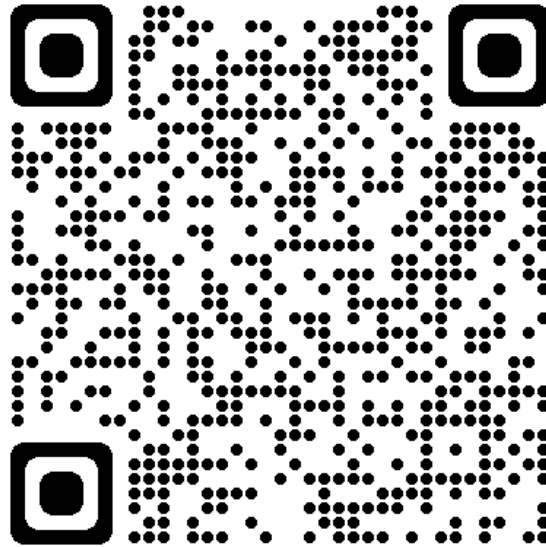
- 🔍 If your models are built with an old version of Power BI desktop – try and build the visual from scratch again
- 🔍 All **visible** elements on the report page is affecting the performance of your report page – be sure that no visual is placed behind any of your visuals with a nontransparent background

Erik Svensen – Follow/connect with me on

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Links

DAX Studio - [DAX Studio | DAX Studio](#)

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DAX Optimizer - [DAX Optimizer](#)

Best Practice Analyzer - [Analysis-Services/BestPracticeRules at master · microsoft/Analysis-Services · GitHub](#)