



Power BI Datamarts

What is it and how do I benefit from it?

Guy in a Cube:

“A datamart is the access layer of the data warehouse environment that is used to easily analyze and distribute data to the users.”



Watch the video at: <https://youtu.be/ZJzCkxv5wxg>



Matthew Roche:

“Power BI Datamarts are like dataflows with benefits”

Read more on Matthew his blog: <https://ssbipolar.com/2022/05/25/dataflows-with-benefits/>



I'll take you on a journey through
my investigation on datamarts.



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@MarcLelijveld



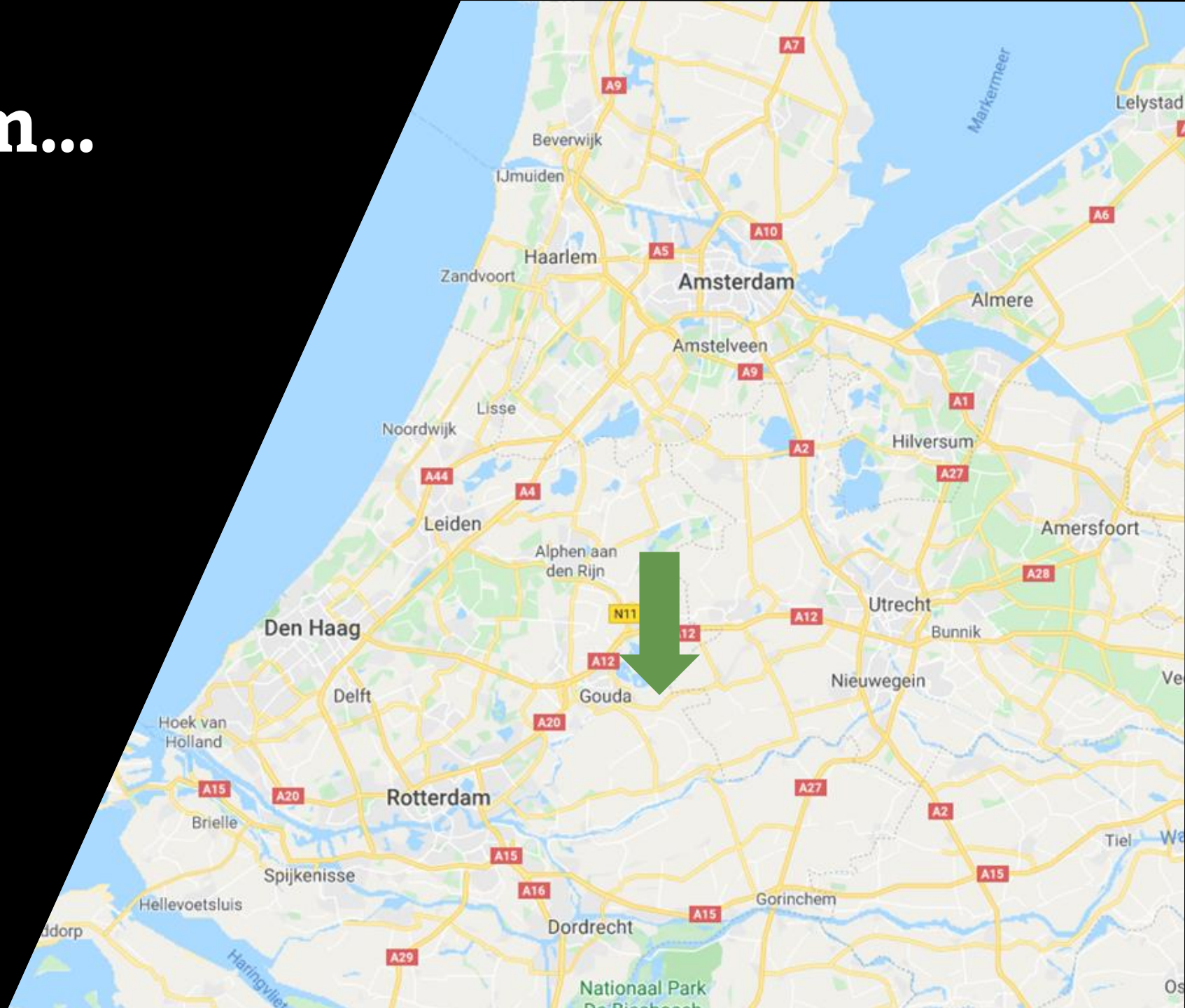
[linkedin.com/in/MarcLelijveld](https://www.linkedin.com/in/MarcLelijveld)



Data-Marc.com



Where I'm from...



What we cover today

- Datamarts... say what?
- Understanding the fundamentals of Datamarts
- Consuming Datamarts
- Let's build a datamart together!
- Open ends...



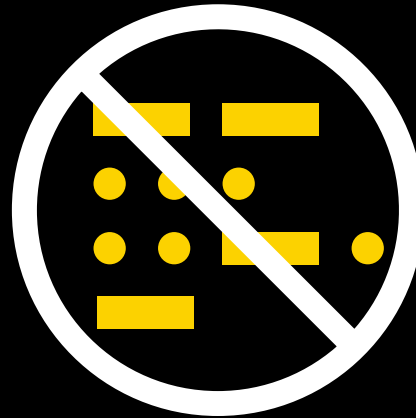


Datamarts... Say what?

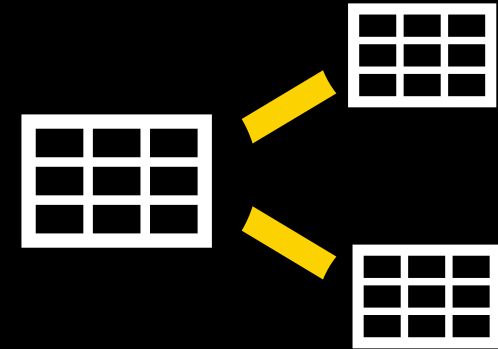
What are Datamarts?



Self service relational database capabilities without IT involvement



No-code experience for data ingestion, preparation and transformation



Build semantic models in a holistic cloud experience

What is it **NOT**?



Replacement for
Power BI datasets



Replacement for
Power BI dataflows



Replacement for
Power BI Desktop



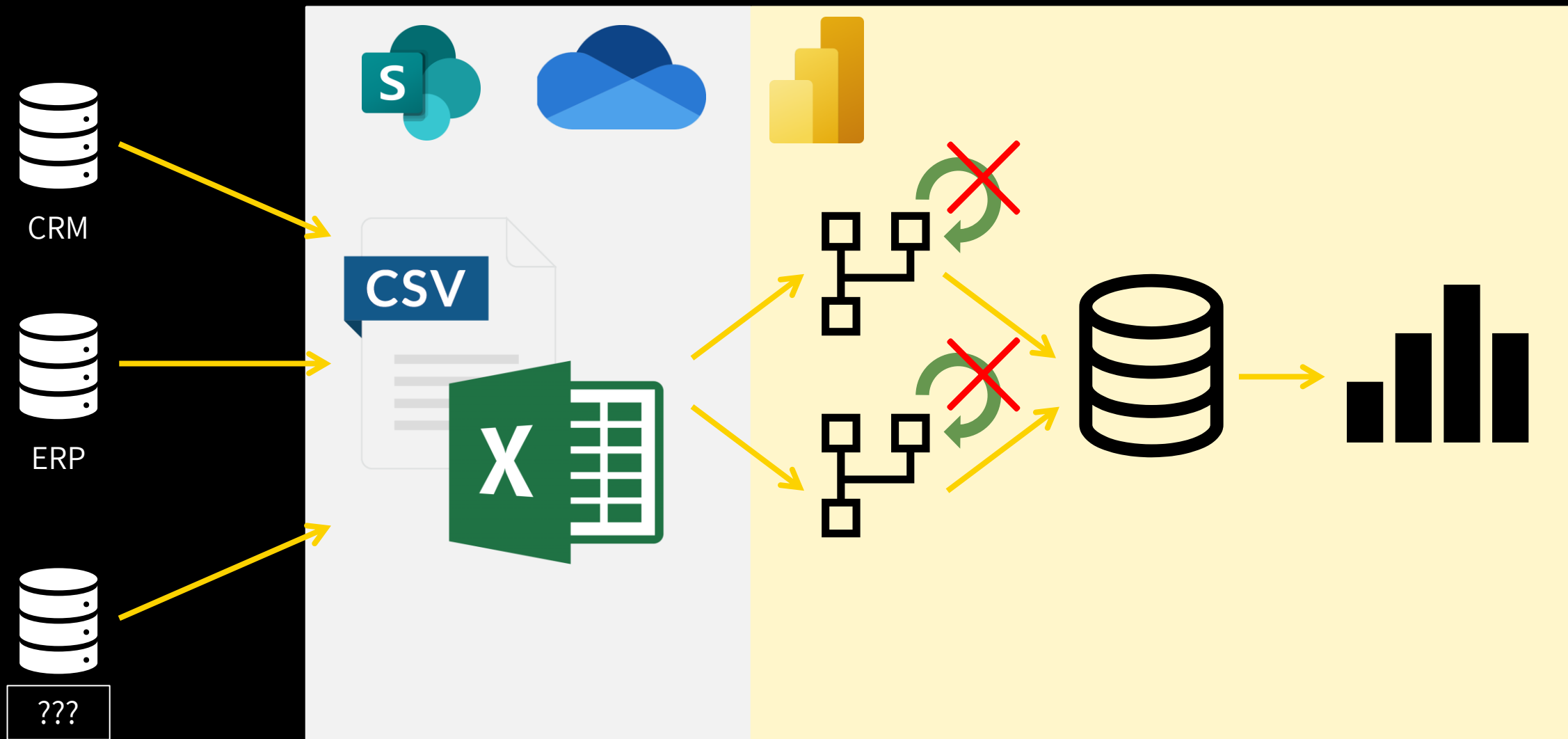
Replacement your
data platform / DWH

Business

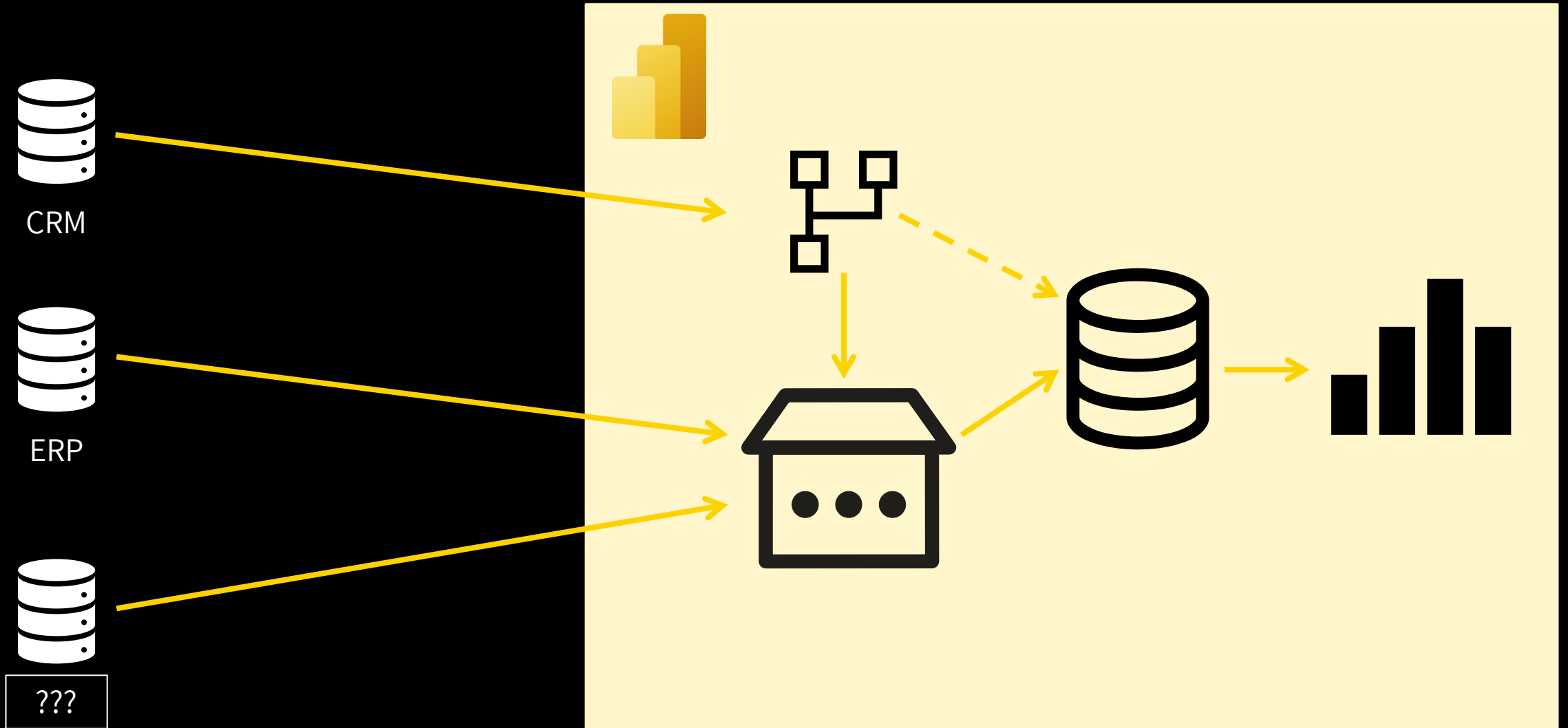
IT



(Power) BI Development today



(Power) BI Development today



Auto generated and managed experience

▴ Query Caching

Apply this setting to the dataset that was automatically created for the datamart.

▴ Q&A

Apply this setting to the dataset that was automatically created for the datamart.

▴ Endorsement and discovery

Apply this setting to the dataset that was automatically created for the datamart.

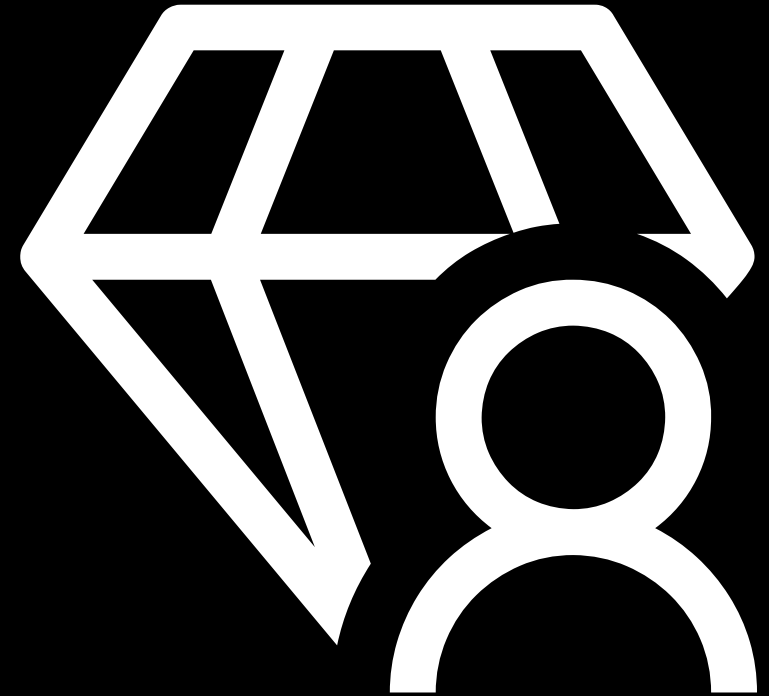
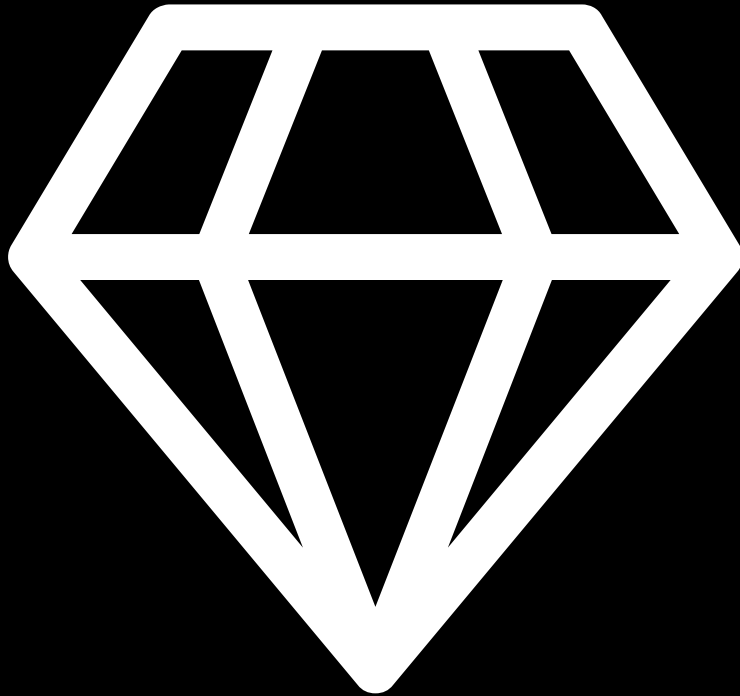
▴ Request access

Apply this setting to the dataset that was automatically created for the datamart.



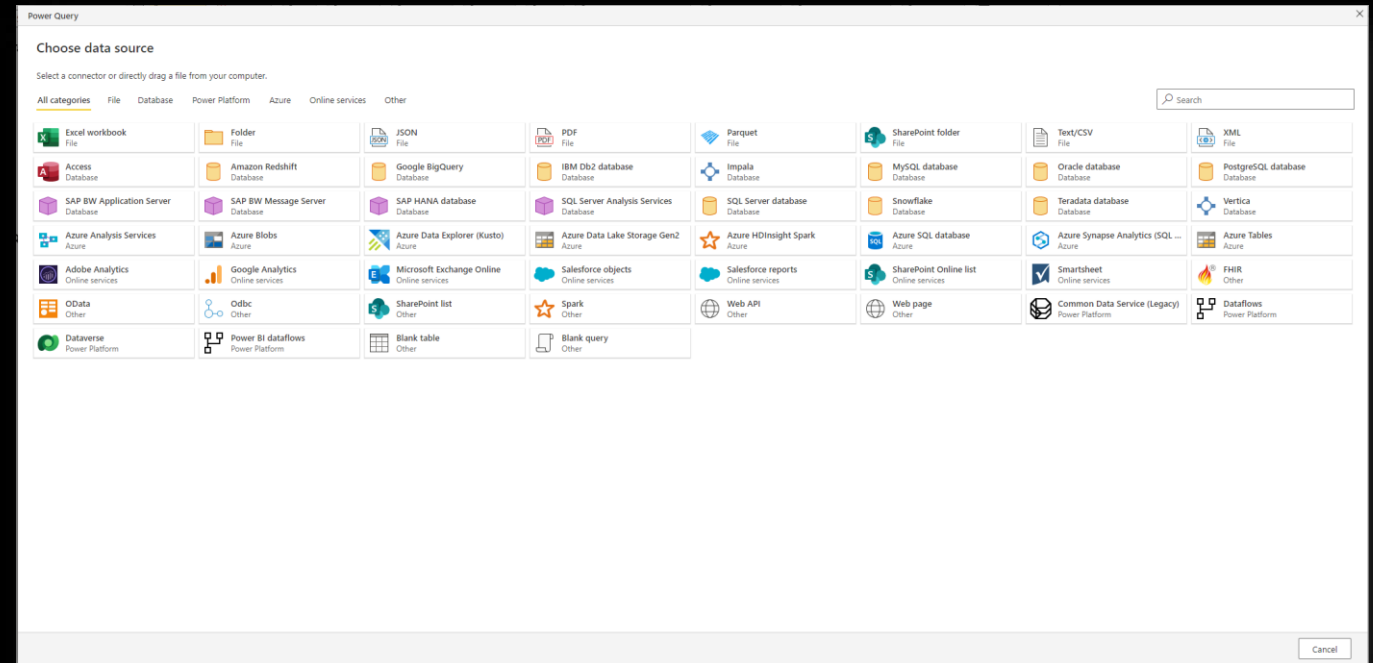
Understanding the fundamentals of datamarts

Any type of premium



Datamarts or dataflows?

Ingest new sources, all the Power Query connectors are available!



Datamarts or dataflows?

The web-based experience we all know from dataflows to transform data. But now data is loaded in a fully managed Azure SQL Database.

Power Query

Search (Alt + Q)

Home Transform Add column View Help

Get data v data Options Manage parameters v Refresh v Properties v Advanced editor v Choose columns v Remove columns v Keep rows v Filter rows v Sort v Split column v Group by v Data type: Whole number v Use first row as headers v Merge queries v Append queries v Replace values v Combine files v

Queries [11]

Table: RemoveColumns("Navigation 2", ("rowguid"))

	ProductID	Name	ProductNumber	Color	StandardCost	ListPrice	Size	Weight	ProductCategoryID	ProductModelID	SellStartDate	SellEndDate	DiscontinuedDate	ThumbnailPhoto
1	660	HL Road Frame - Black, 58	FR-R028-S8	Black	1,039.21	1,431.50	58	1016.04	18	6	6/1/2002, 12:00:00 AM	null	null	[Binary]
2	706	HL Road Frame - Red, 58	FR-R028-S8	Red	1,039.21	1,431.50	58	1016.04	18	6	6/1/2002, 12:00:00 AM	null	null	[Binary]
3	707	Sport-100 Helmet, Red	HL-U509-R	Red	13.09	34.99	null	null	33	7/1/2005, 12:00:00 AM	null	null	null	[Binary]
4	708	Sport-100 Helmet, Black	HL-U509	Black	13.09	34.99	null	null	33	7/1/2005, 12:00:00 AM	null	null	null	[Binary]
5	709	Mountain Bike Socks, M	SO-B909-M	White	3.40	9.50	M	null	27	18	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
6	710	Mountain Bike Socks, L	SO-B909-L	White	3.40	9.50	L	null	27	18	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
7	711	Sport-100 Helmet, Blue	HL-U509-B	Blue	13.09	34.99	null	null	33	7/1/2005, 12:00:00 AM	null	null	null	[Binary]
8	712	AWC Logo Cap	CA-1098	Multif	6.92	8.99	null	null	23	2	7/1/2005, 12:00:00 AM	null	null	[Binary]
9	713	Long-Sleeve Logo Jersey, S	LJ-D192-S	Multif	38.49	49.99	S	null	25	11	7/1/2005, 12:00:00 AM	null	null	[Binary]
10	714	Long-Sleeve Logo Jersey, M	LJ-D192-M	Multif	38.49	49.99	M	null	25	11	7/1/2005, 12:00:00 AM	null	null	[Binary]
11	715	Long-Sleeve Logo Jersey, L	LJ-D192-L	Multif	38.49	49.99	L	null	25	11	7/1/2005, 12:00:00 AM	null	null	[Binary]
12	716	Long-Sleeve Logo Jersey, XL	LJ-D192-X	Multif	38.49	49.99	XL	null	25	11	7/1/2005, 12:00:00 AM	null	null	[Binary]
13	717	HL Road Frame - Red, 62	FR-R028-62	Red	866.63	1,431.50	62	1043.26	18	6	7/1/2005, 12:00:00 AM	null	null	[Binary]
14	718	HL Road Frame - Red, 44	FR-R028-44	Red	866.63	1,431.50	44	961.61	18	6	7/1/2005, 12:00:00 AM	null	null	[Binary]
15	719	HL Road Frame - Red, 48	FR-R028-48	Red	866.63	1,431.50	48	979.75	18	6	7/1/2005, 12:00:00 AM	null	null	[Binary]
16	720	HL Road Frame - Red, 52	FR-R028-52	Red	866.63	1,431.50	52	997.9	18	6	7/1/2005, 12:00:00 AM	null	null	[Binary]
17	721	HL Road Frame - Red, 56	FR-R028-56	Red	866.63	1,431.50	56	1016.04	18	6	7/1/2005, 12:00:00 AM	null	null	[Binary]
18	722	LL Road Frame - Black, 58	FR-R388-S8	Black	204.63	337.22	58	1115.83	18	9	7/1/2005, 12:00:00 AM	null	null	[Binary]
19	723	LL Road Frame - Black, 60	FR-R388-60	Black	204.63	337.22	60	1124.9	18	9	7/1/2005, 12:00:00 AM	null	null	[Binary]
20	724	LL Road Frame - Black, 62	FR-R388-62	Black	204.63	337.22	62	1133.98	18	9	7/1/2005, 12:00:00 AM	null	null	[Binary]
21	725	LL Road Frame - Red, 44	FR-R388-44	Red	187.16	337.22	44	1052.23	18	9	7/1/2005, 12:00:00 AM	6/30/2007, 12:00:00 AM	null	[Binary]
22	726	LL Road Frame - Red, 48	FR-R388-48	Red	187.16	337.22	48	1070.47	18	9	7/1/2005, 12:00:00 AM	6/30/2007, 12:00:00 AM	null	[Binary]
23	727	LL Road Frame - Red, 52	FR-R388-52	Red	187.16	337.22	52	1088.62	18	9	7/1/2005, 12:00:00 AM	6/30/2007, 12:00:00 AM	null	[Binary]
24	728	LL Road Frame - Red, 58	FR-R388-58	Red	187.16	337.22	58	1115.83	18	9	7/1/2005, 12:00:00 AM	6/30/2007, 12:00:00 AM	null	[Binary]
25	729	LL Road Frame - Red, 60	FR-R388-60	Red	187.16	337.22	60	1124.9	18	9	7/1/2005, 12:00:00 AM	6/30/2007, 12:00:00 AM	null	[Binary]
26	730	LL Road Frame - Red, 62	FR-R388-62	Red	187.16	337.22	62	1133.98	18	9	7/1/2005, 12:00:00 AM	6/30/2007, 12:00:00 AM	null	[Binary]
27	731	ML Road Frame - Red, 44	FR-R728-44	Red	352.14	594.83	44	1006.87	18	16	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
28	732	ML Road Frame - Red, 48	FR-R728-48	Red	352.14	594.83	48	1025.11	18	16	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
29	733	ML Road Frame - Red, 52	FR-R728-52	Red	352.14	594.83	52	1043.26	18	16	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
30	734	ML Road Frame - Red, 58	FR-R728-58	Red	352.14	594.83	58	1070.47	18	16	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
31	735	ML Road Frame - Red, 60	FR-R728-60	Red	352.14	594.83	60	1079.54	18	16	7/1/2005, 12:00:00 AM	6/30/2006, 12:00:00 AM	null	[Binary]
32	736	ML Road Frame - Black, 44	FR-R388-44	Black	204.63	337.22	44	1052.23	18	9	7/1/2005, 12:00:00 AM	null	null	[Binary]
33	737	ML Road Frame - Black, 48	FR-R388-48	Black	204.63	337.22	48	1070.47	18	9	7/1/2005, 12:00:00 AM	null	null	[Binary]

Completed (0.68 s) Columns: 19 Rows: 99+

Query settings

Properties

Name

Product

Applied steps

Source

Navigation 1

Navigation 2

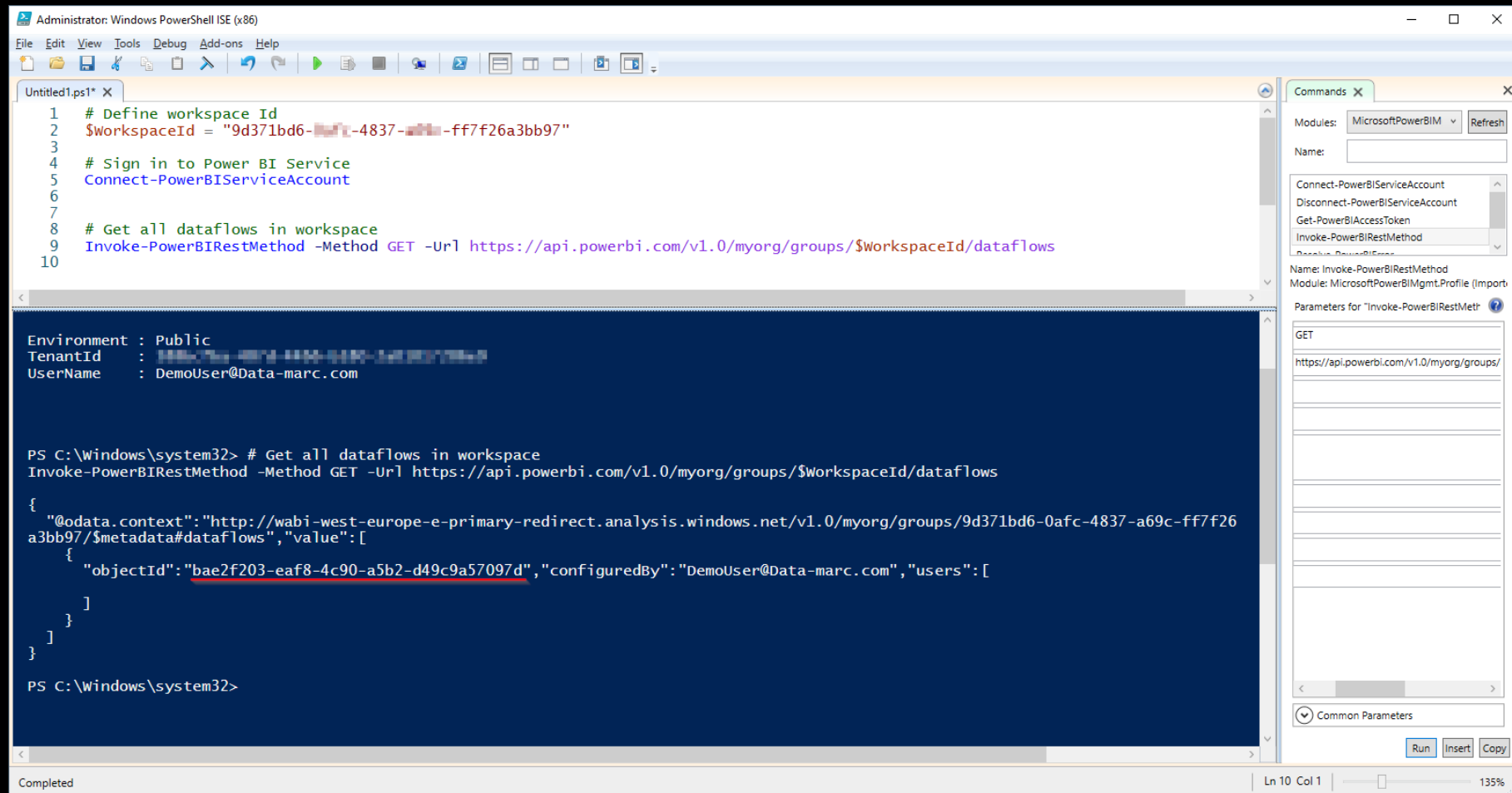
Removed c...

Step

Cancel Save

Magic uncovered?

Each table, is first saved as dataflow before being part of the datamart.



The screenshot shows the Windows PowerShell ISE (x86) interface. The main editor window displays a PowerShell script in a file named 'Untitled1.ps1'. The script defines a workspace ID, signs in to the Power BI service, and then uses the 'Invoke-PowerBIRestMethod' cmdlet to retrieve all dataflows in the workspace. The output of the command is shown in the console window below the script. The output is a JSON object containing metadata and a list of dataflows. The first dataflow in the list has an object ID of 'bae2f203-eaf8-4c90-a5b2-d49c9a57097d' and was configured by 'DemoUser@Data-marc.com'. The right-hand pane shows the 'Commands' window with the 'Invoke-PowerBIRestMethod' cmdlet selected. The parameters for this cmdlet are displayed as 'GET' and the URL 'https://api.powerbi.com/v1.0/myorg/groups/9d371bd6-0afc-4837-a69c-ff7f26a3bb97/\$metadata#dataflows'.

```
1 # Define workspace Id
2 $workspaceId = "9d371bd6-0afc-4837-a69c-ff7f26a3bb97"
3
4 # Sign in to Power BI Service
5 Connect-PowerBIServiceAccount
6
7
8 # Get all dataflows in workspace
9 Invoke-PowerBIRestMethod -Method GET -Url https://api.powerbi.com/v1.0/myorg/groups/$workspaceId/dataflows
10
```

Environment : Public
TenantId : 9d371bd6-0afc-4837-a69c-ff7f26a3bb97
UserName : DemoUser@Data-marc.com

PS C:\Windows\system32> # Get all dataflows in workspace
Invoke-PowerBIRestMethod -Method GET -Url https://api.powerbi.com/v1.0/myorg/groups/\$workspaceId/dataflows

```
{
  "@odata.context": "http://wabi-west-europe-e-primary-redirect.analysis.windows.net/v1.0/myorg/groups/9d371bd6-0afc-4837-a69c-ff7f26a3bb97/$metadata#dataflows",
  "value": [
    {
      "objectId": "bae2f203-eaf8-4c90-a5b2-d49c9a57097d",
      "configuredBy": "DemoUser@Data-marc.com",
      "users": [
      ]
    }
  ]
}
```

PS C:\Windows\system32>

Magic uncovered?

Sources of the dataflows listed easily

```
PS C:\Windows\system32> # Get all dataflows in workspace
$ListDataflows = Invoke-PowerBIRestMethod -Method GET -Url https://api.powerbi.com/v1.0/myorg/groups/$WorkspaceId/dataflows | ConvertFrom-Json
$ListDataflows.value

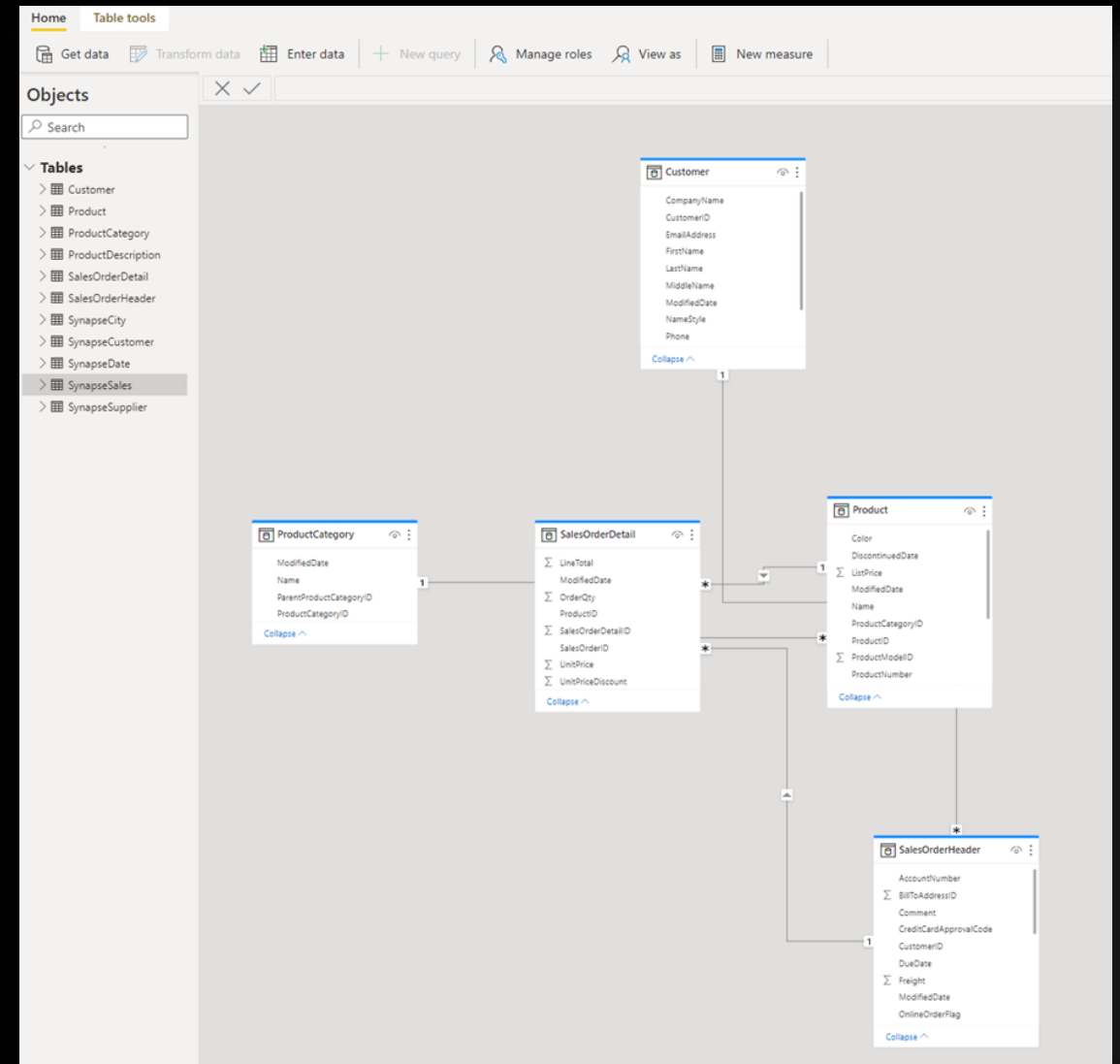
objectId                configuredBy            users
-----
bae2f203-[REDACTED]-a5b2-d49c9a57097d DemoUser@Data-marc.com {}

PS C:\Windows\system32> # Get Dataflow sources
$DataFlowObjectId = $ListDataflows.value.objectId
Invoke-PowerBIRestMethod -Method GET -Url https://api.powerbi.com/v1.0/myorg/groups/$WorkspaceId/dataflows/$DataFlowObjectId/datasources

{
  "@odata.context": "http://wabi-west-europe-e-primary-redirect.analysis.windows.net/v1.0/myorg/groups/9d371bd6-[REDACTED]-a69c-ff7f26a3bb97/$meta
data#datasources", "value": [
    {
      "datasourceType": "Sql", "connectionDetails": {
        "server": "[REDACTED].database.windows.net"
      }, "datasourceId": "02bacc67-4570-4c7c-a801-2d47ae9a209c", "gatewayId": "c1d863df-d137-453e-9504-0d1d99268906"
    }, {
      "datasourceType": "Sql", "connectionDetails": {
        "server": "[REDACTED].database.windows.net", "database": "PowerBICheatSheet"
      }, "datasourceId": "dc69e506-3d08-4f50-ba5f-daf90eb1f700", "gatewayId": "c1d863df-d137-453e-9504-0d1d99268906"
    }, {
      "datasourceType": "Sql", "connectionDetails": {
        "server": "[REDACTED]-ondemand.sql.azuresynapse.net"
      }, "datasourceId": "318de039-d12b-48f7-b676-963f2e077a75", "gatewayId": "c1d863df-d137-453e-9504-0d1d99268906"
    }, {
      "datasourceType": "Sql", "connectionDetails": {
        "server": "[REDACTED]-ondemand.sql.azuresynapse.net", "database": "lake"
      }, "datasourceId": "104ee253-d4d0-4692-90d1-283dfd905642", "gatewayId": "c1d863df-d137-453e-9504-0d1d99268906"
    }
  ]
}
```


Modeling experience

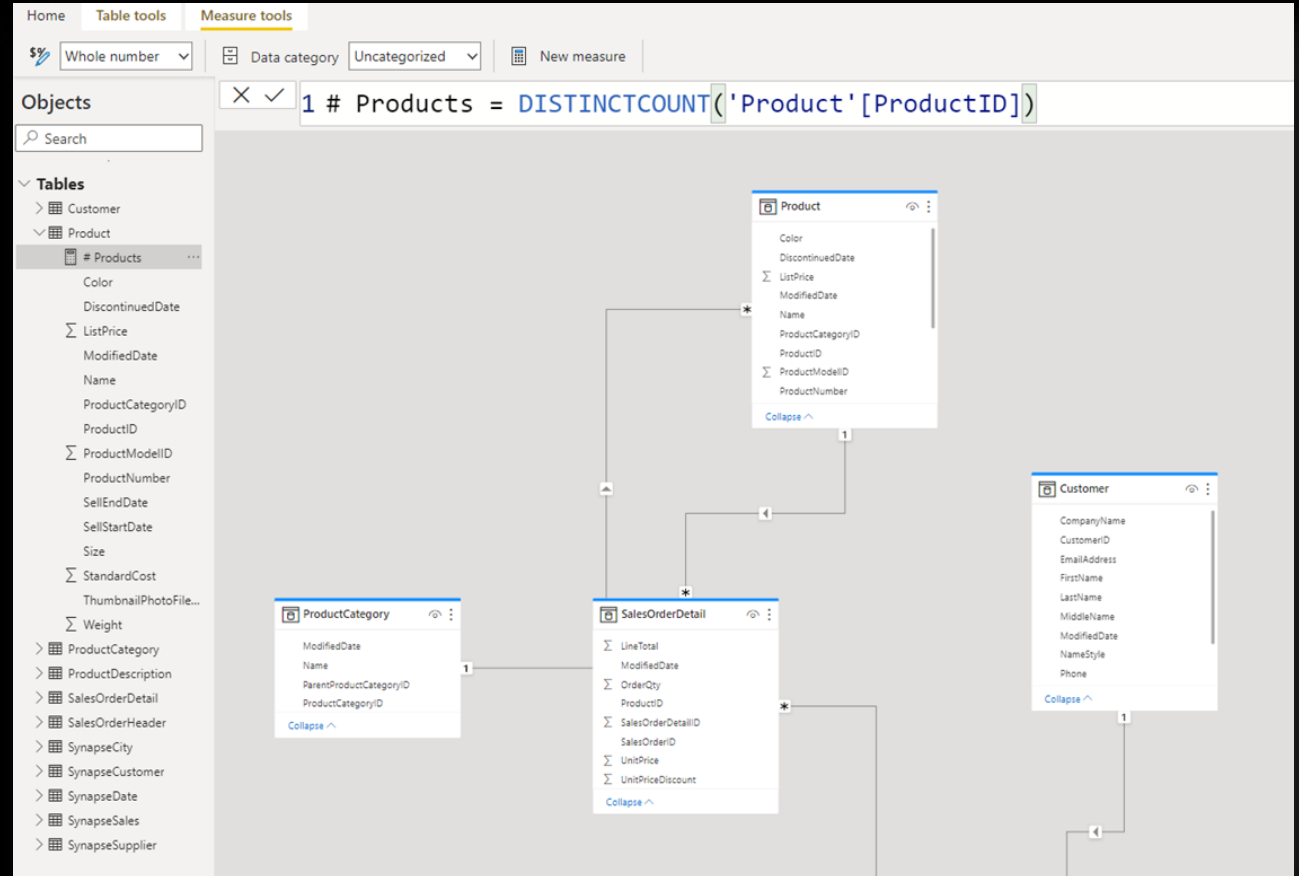
Modeling experience in the service, which allows you to build new relationships, define measure and more!



Measures

Datamarts allow you to build measures directly, as part of the modeling experience.

Measures results cannot be displayed inside the datamart.



Security

Simplified experience to setup row level security, without the need to understand DAX.

Object level security is not possible (yet?).

Row security settings. ×

Create Assign

Create security roles to manage the rows people can access.

Roles

Create role

Bikes ...

Not bikes ...

Select tables

Customer ...

Product ...

ProductCateg... ▼ ...

ProductDescri... ...

SalesOrderDet... ...

SalesOrderHea... ...

SynapseCity ...

SynapseCusto... ...

SynapseDate ...

SynapseSales ...

Add filters

Select tables to create filters

Select all + Add Delete Group Ungroup

All ▼ of these rules are true

⋮ Name ▼ Equals ▼ Bikes

Save Close

Assign users to roles

Assign users or groups to roles directly in the service. Even external users can easily be added.


“View As” functionality is available, but test as user to validate RLS is missing.


Row security settings. ×

Create Assign

Add people or groups to roles to manage access to data.

Roles

 Bikes

 Not bikes

Members (2)
People or groups who belong to this role

Enter email addresses

Add

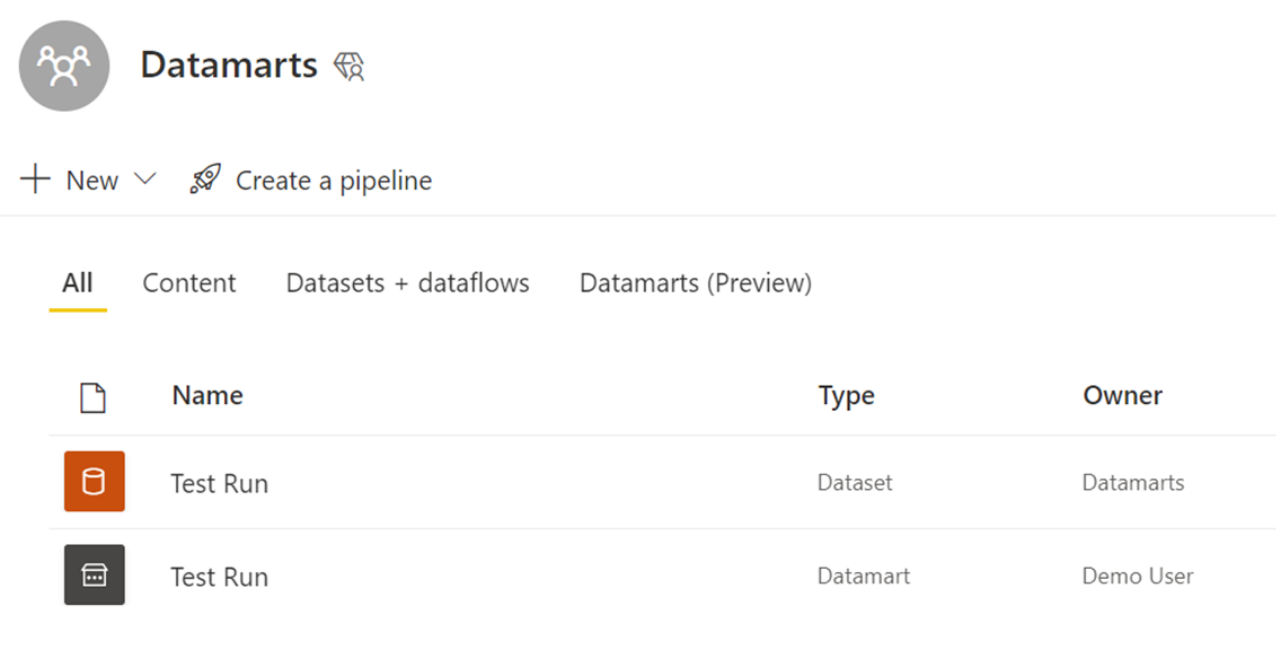
AAD-PBI-ExternalGuestEditing ×

Marc Lelijveld ×



Save Close

Auto-generated dataset

A Power BI dataset is automatically generated in the same workspace, using a DirectQuery connection to your datamart.



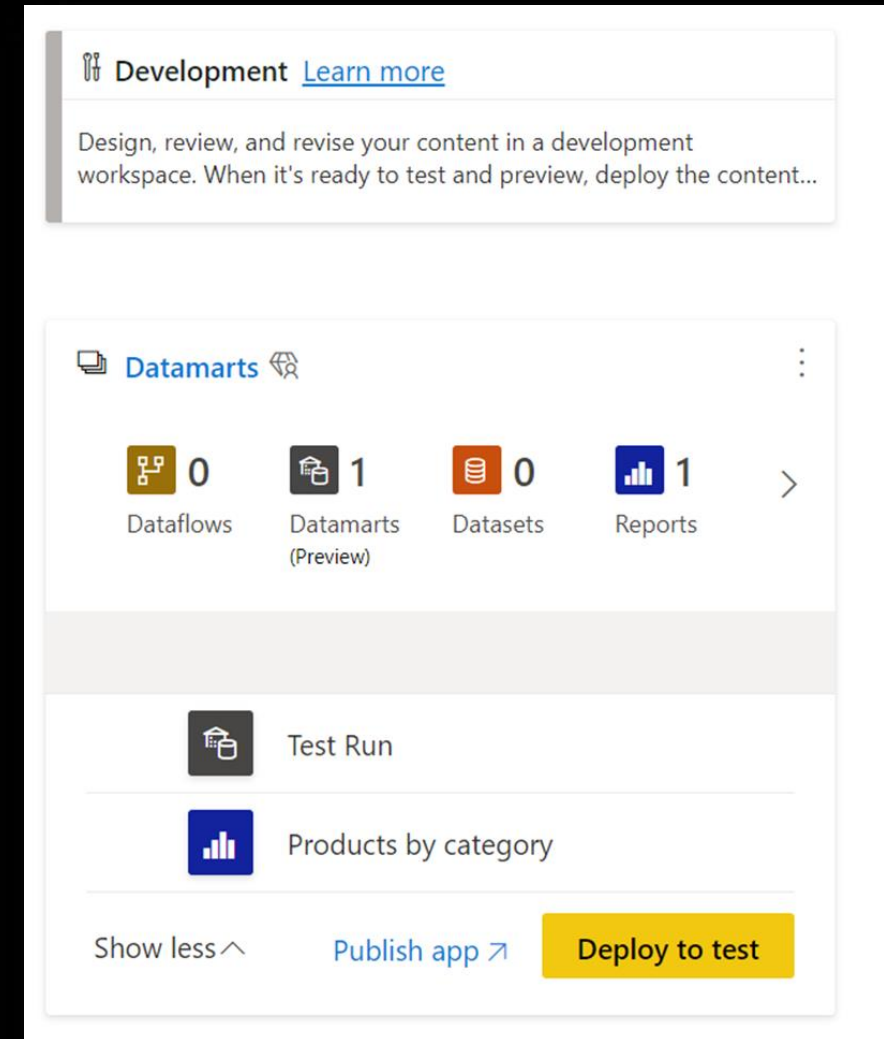
The screenshot shows the 'Datamarts' workspace interface. At the top, there's a header with the 'Datamarts' logo and a '+ New' dropdown menu. Below the header, there are tabs for 'All', 'Content', 'Datasets + dataflows', and 'Datamarts (Preview)'. The 'All' tab is selected. Below the tabs is a table with four columns: 'Name', 'Type', and 'Owner'. The table contains two rows: one for a 'Test Run' (Dataset) owned by 'Datamarts', and another for a 'Test Run' (Datamart) owned by 'Demo User'.

	Name	Type	Owner
	Test Run	Dataset	Datamarts
	Test Run	Datamart	Demo User

ALM for datamarts

Datamarts can be deployed to different stages using Power BI deployment pipelines.

Notice the auto-generated dataset is not visible in the pipeline.

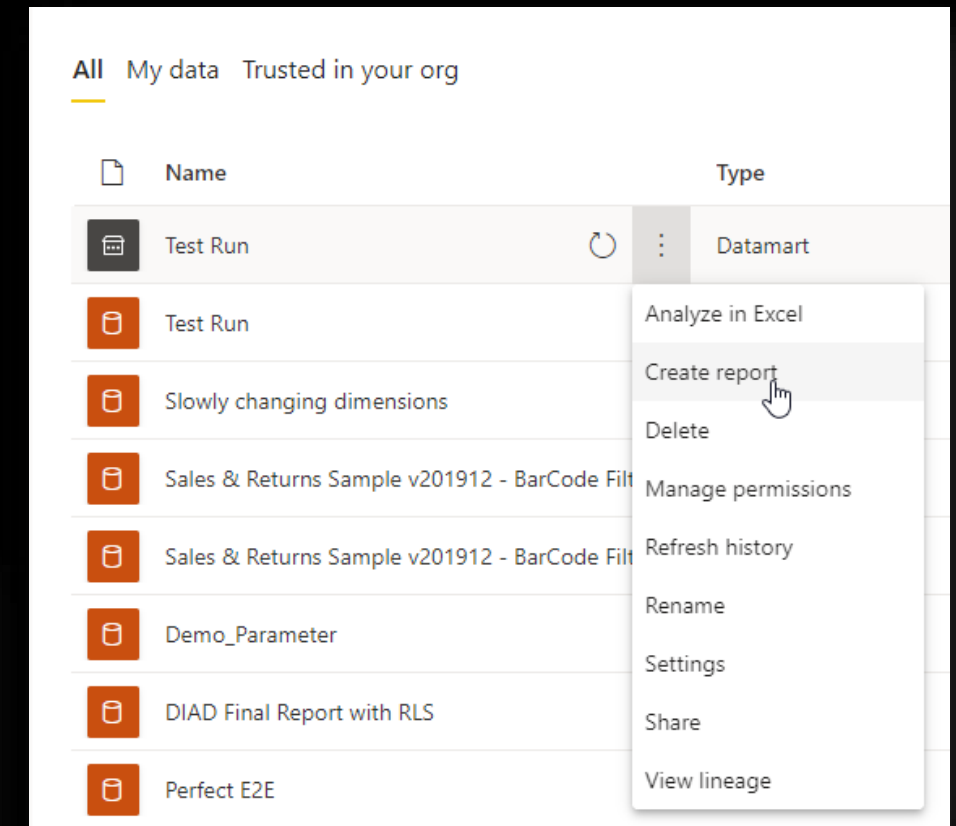
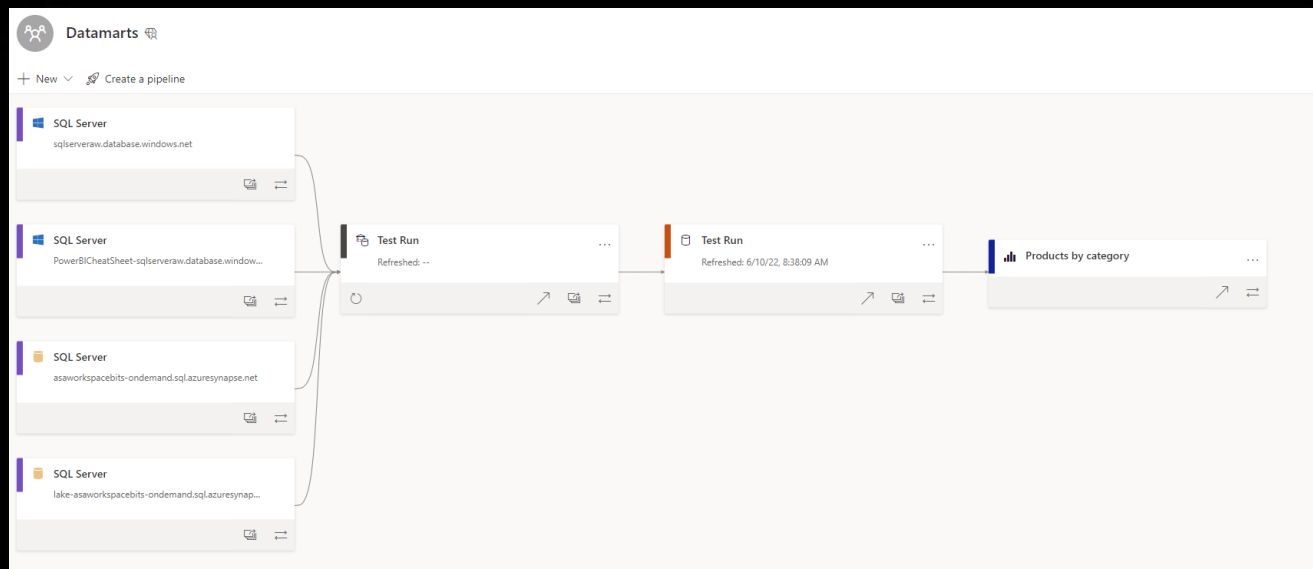




Consuming datamarts

Datamarts in the data hub

Create new reports on top of a datamart, directly from the data hub in the Power BI Service.



Query experience

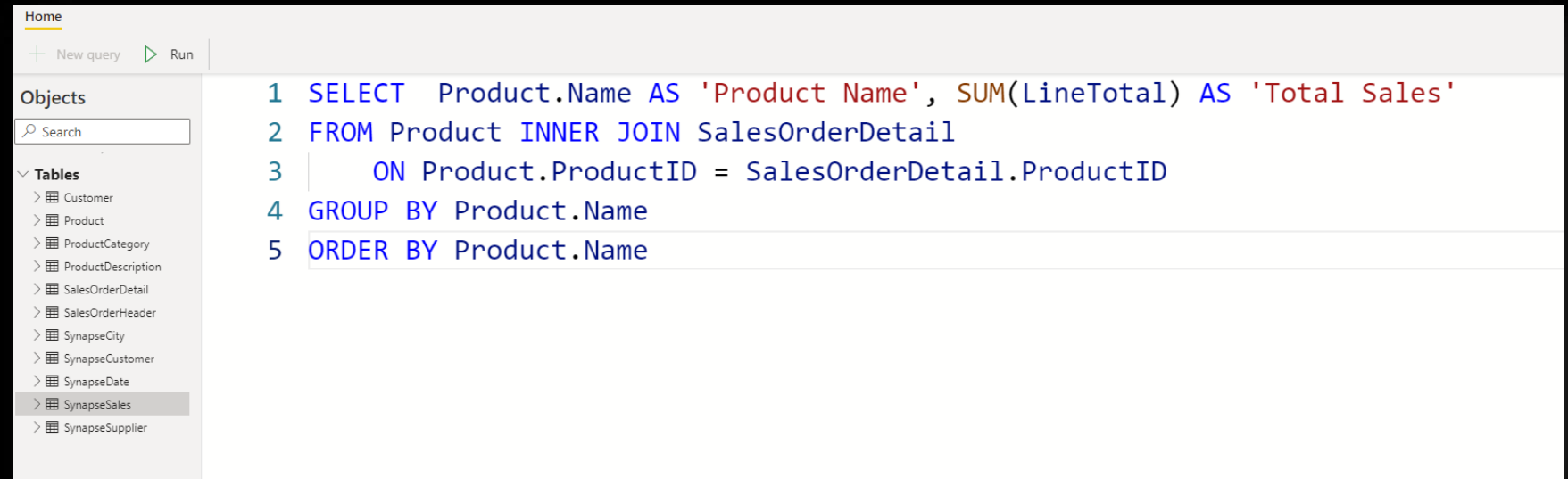
Ad-hoc M-queries
(PowerQuery) in a visual
experience.

The screenshot displays the PowerQuery M-queries interface. The top ribbon includes tabs for Home, Transform, Add column, View, and Help. The Home tab contains various actions like Refresh, Manage, Choose columns, Remove columns, Keep rows, Filter rows, Sort, Group by, Replace values, Merge queries, and Append queries. The left pane shows a list of tables: Customer, Product, ProductCategory, ProductDescription, SalesOrderDetail, SalesOrderHeader, SynapseCity, SynapseCustomer, SynapseDate, SynapseSales, and SynapseSupplier. The main workspace shows a visual query diagram where three source tables (SynapseSales, SalesOrderHeader, and SalesOrderDetail) are connected to a Merge operation. The bottom pane displays a table of data with columns: SalesOrderID, RevisionNumber, OrderDate, DueDate, ShipDate, Status, and On. The data is as follows:

	SalesOrderID	RevisionNumber	OrderDate	DueDate	ShipDate	Status	On
1	71774	2	10/18/2020, 12:00:00 PM	10/20/2020, 12:00:00 PM	10/19/2020, 12:00:00 PM	5	FALSE
2	71776	2	10/18/2020, 12:00:00 PM	10/20/2020, 12:00:00 PM	10/19/2020, 12:00:00 PM	5	FALSE
3	71780	2	10/18/2020, 12:00:00 PM	10/20/2020, 12:00:00 PM	10/19/2020, 12:00:00 PM	5	FALSE
4	71782	2	10/18/2020, 12:00:00 PM	10/20/2020, 12:00:00 PM	10/19/2020, 12:00:00 PM	5	FALSE
5	71783	2	10/18/2020, 12:00:00 PM	10/20/2020, 12:00:00 PM	10/19/2020, 12:00:00 PM	5	FALSE

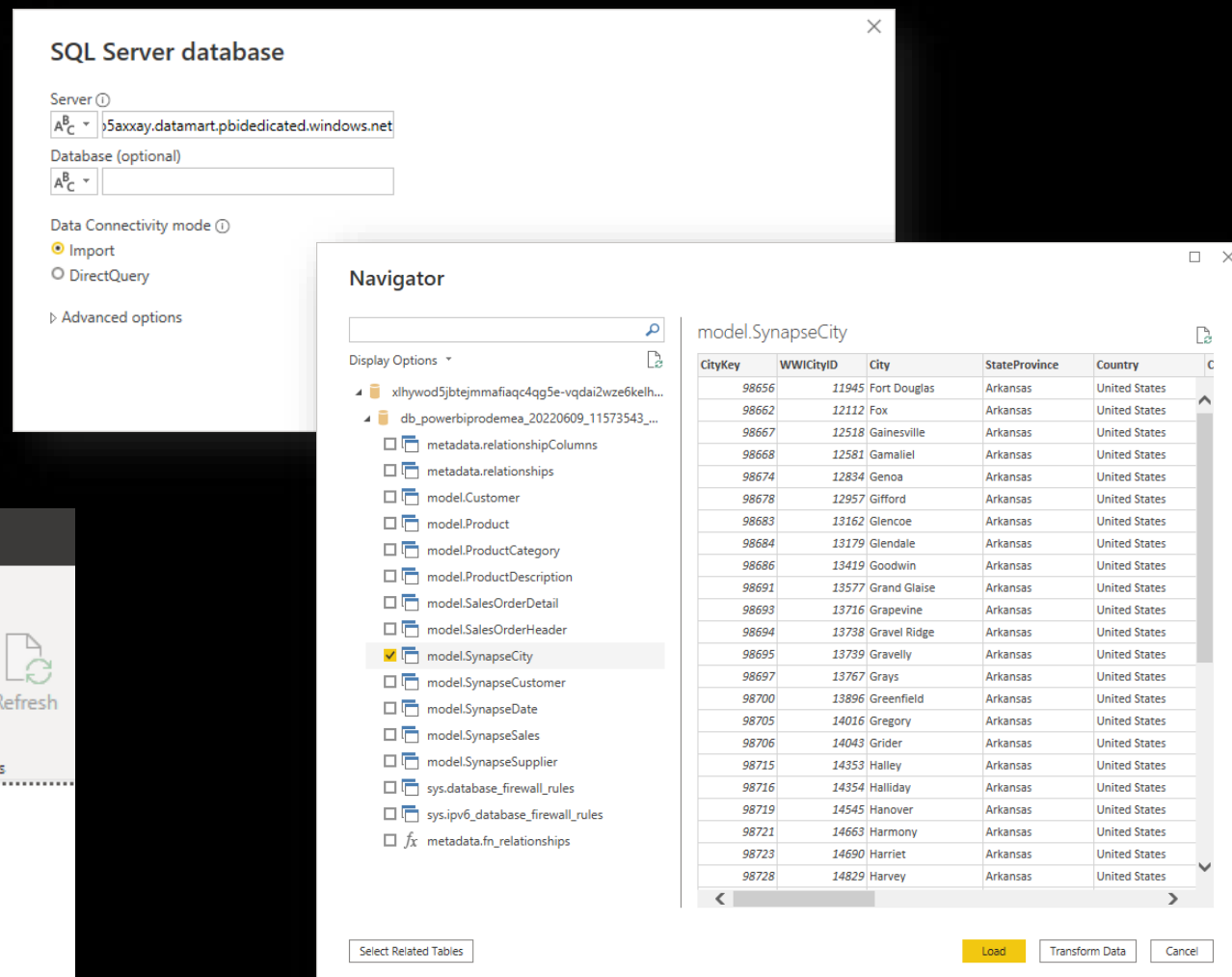
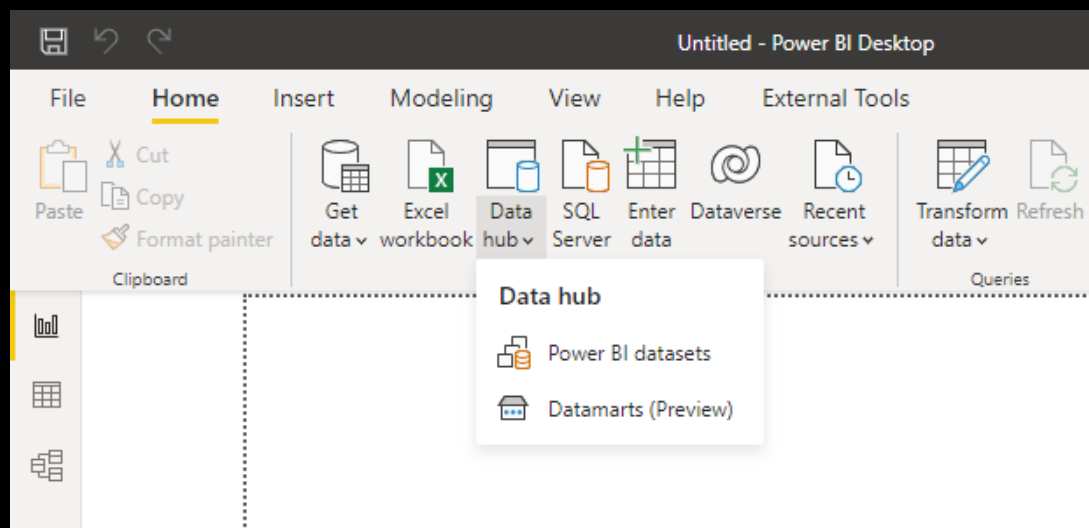
Query experience

Write on-demand SQL queries in the same datamart interface.



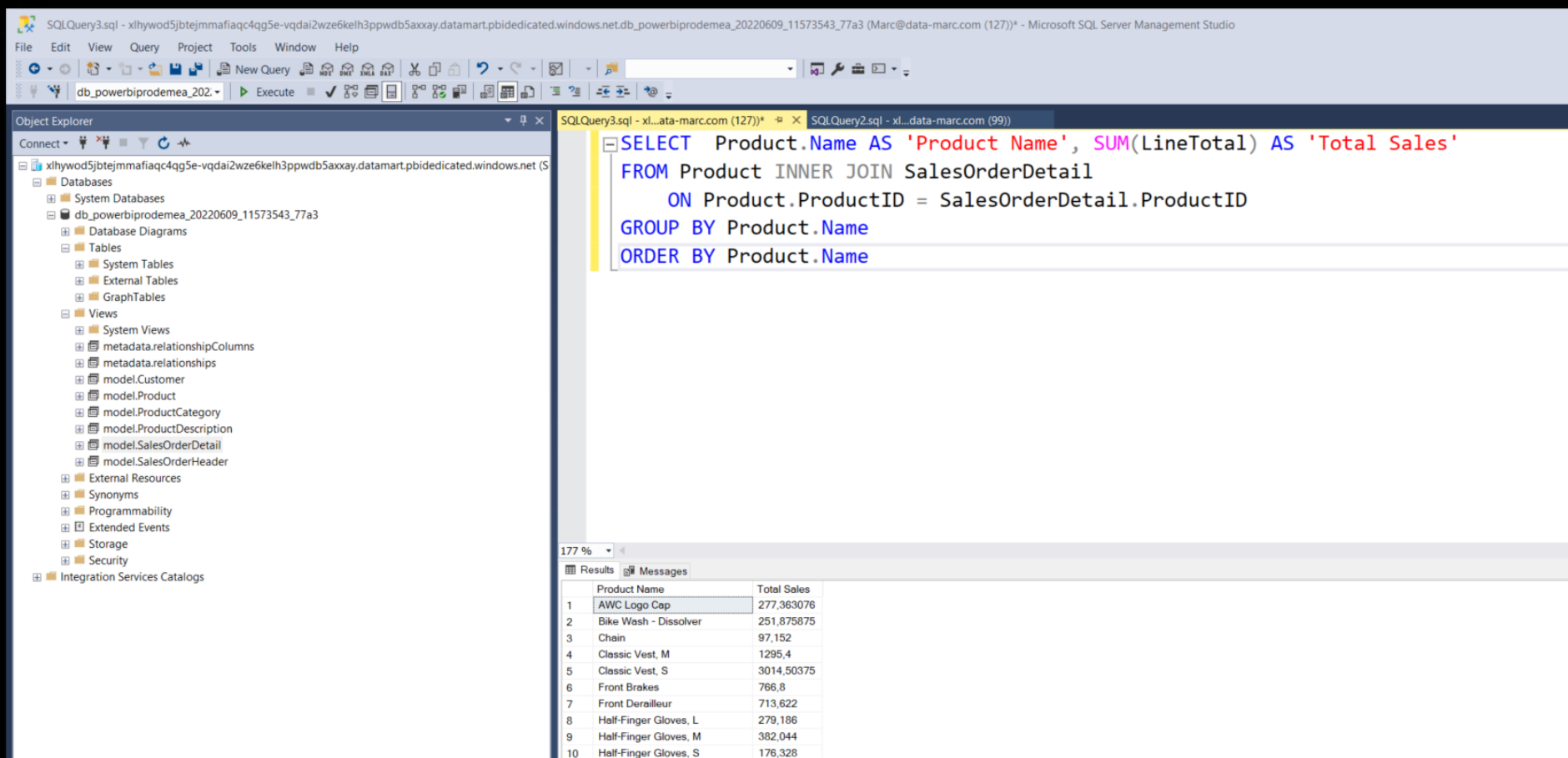
Access datamarts from Power BI Desktop

Access the datamart using the Datamarts connector or just like any other SQL data source.



Access datamarts from any other tool

Use tools like SSMS or Azure Data Studio to connect to your datamart.



The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The left pane shows the Object Explorer with the database 'db_powerbiprodemea_20220609_11573543_77a3' expanded, showing various system and user-defined objects. The right pane shows a SQL query window with the following query:

```
SELECT Product.Name AS 'Product Name', SUM(LineTotal) AS 'Total Sales'
FROM Product INNER JOIN SalesOrderDetail
ON Product.ProductID = SalesOrderDetail.ProductID
GROUP BY Product.Name
ORDER BY Product.Name
```

Below the query window, the Results pane shows the output of the query, displaying a table with two columns: Product Name and Total Sales. The results are as follows:

Product Name	Total Sales
AWC Logo Cap	277,363,076
Bike Wash - Dissolver	251,875,875
Chain	97,152
Classic Vest, M	1295,4
Classic Vest, S	3014,50375
Front Brakes	766,8
Front Derailleur	713,622
Half-Finger Gloves, L	279,186
Half-Finger Gloves, M	382,044
Half-Finger Gloves, S	176,328



Let's build a datamart together!



Open ends

Unclarities and current limitations

Limit of 100GB per datamart (only during preview?)

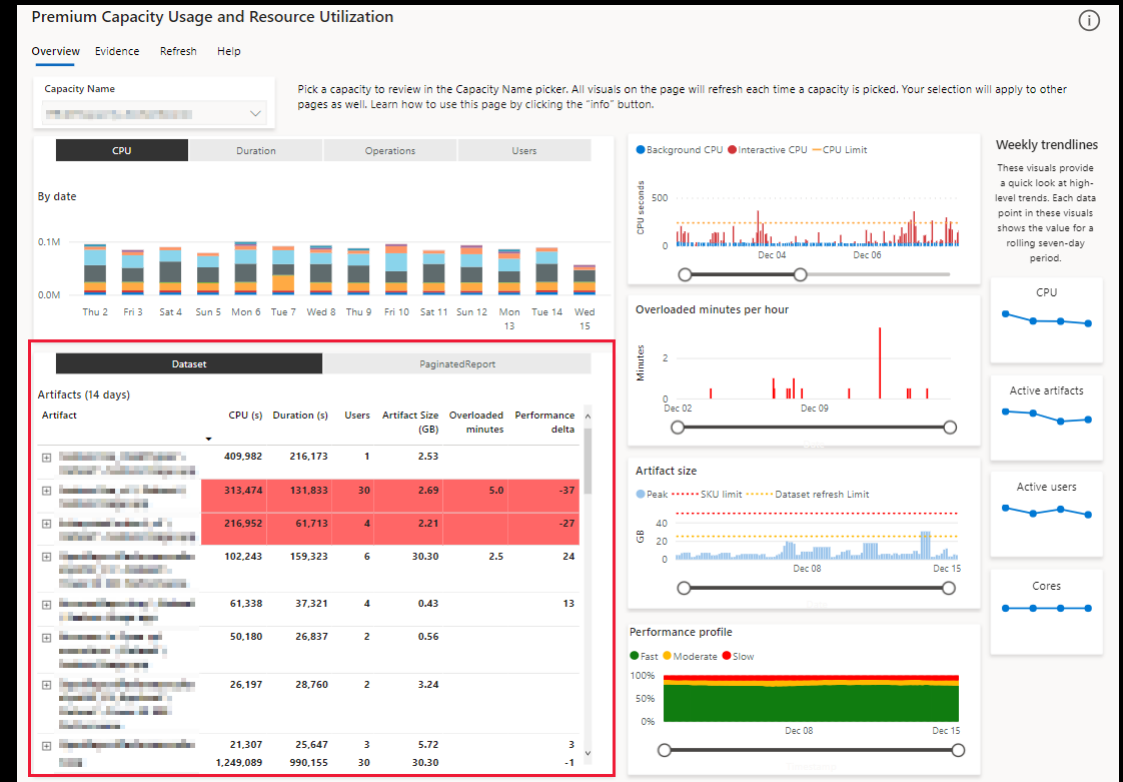
Request ID ↑↓	Request content ↑↓	Submit time ↑↓	Duration	Data processed	Status ↑↓
995217	select [\$Table].[Supplie... More	6/11/22, 8:39:12 AM	14 sec	10.00 MB	✓ Completed
995910	select [\$Table].[SaleKey... More	6/11/22, 8:39:09 AM	6 min	163.00 GB	✓ Completed
995143	select [\$Table].[CityKey... More	6/11/22, 8:39:09 AM	17 sec	16.00 MB	✓ Completed
995059	select [\$Table].[DateKe... More	6/11/22, 8:39:09 AM	16 sec	10.00 MB	✓ Completed
995128	select [\$Table].[Custom... More	6/11/22, 8:39:09 AM	17 sec	10.00 MB	✓ Completed

Refresh history

Time	Duration	Status
06/11/2022 08:39 am	15:00:57	Completed

Unclarities and current limitations

Datamarts will contribute to Premium capacity utilization. Impact on the capacity is still unclear. Processing of the datamart and querying the datamart is not visible in the metrics right now and free during preview.



Wrap up

LET'S
RECAP...

Datamarts can be considered as **dataflows on steroids**

Flexibility for end users in query capabilities with SQL, M and DAX

Existing **modeling capabilities** made available in the service

Spin up Datamarts to easily **share secured data artifacts** with others

It is still **preview**, keep that in mind while building solutions

Thanks for attending!



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