



ENHANCING POWER BI DEVELOPMENT: IT IS FUN TO STAY AT THE T-M-D-L

Jason Romans

Power BI DC August 2025



Jason Romans

Analytics Engineer

The DAX Shepherd



📍 Nashville, TN, USA

🔧 Began Career as a SQL Server DBA

➔ Transitioned to Microsoft BI Stack

📦 Data Engineering to Data Modeling

✍️ Simple Talk Author at Redgate

🧭 Fan of Dimensional Models & Doctor Who



✕ @sql_jar

in jason-r-sql-jar

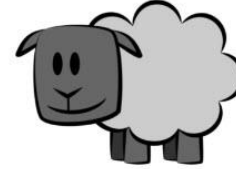
🔗 <https://thedaxshepherd.com/>

SHOULDERS OF GIANTS



www.thedaxshepherd.com

SLIDES



The DAX Shepherd

Musings on the Microsoft BI Stack



[Home](#) [About Me](#) [Simple Talk](#) [Presentations](#) [A Speaker's Journey](#)

Presentations

Sessionize

This is my [Sessionize Profile](#) that has the conferences I have spoken at along with future events. It has a couple of my most popular sessions.

Presentation Slides

This is my [GitHub Repository](#) with the presentation slides for each event.

Recorded Sessions

Simple Talks Podcast | Episode 4 – Coffee chat with Jason Romans

About Jason Romans



I love working with the Microsoft BI Stack. I am passionate about learning.

[A Speaker's Journey](#)

The TMDL Journey



1. What is TMDL
2. PBIP & TMDL
3. TMDL View
4. External Tools
5. Conclusion

The TMDL Journey



1. What is TMDL

2. PBIP & TMDL

3. TMDL View

4. External Tools

5. Conclusion

IN THE BEGINNING...

- SQL Server Analysis Services Tabular
 - Single BIM File
 - Tabular Model Scripting Language (TMSL)
 - JSON Format
- Creator of Tabular Editor - Daniel Otykier
 - TE started as a glorified JSON editor

Sample Model.Bim File

```
{ } model.bim X
Contoso10K - Copy.SemanticModel > { } model.bim > { } model > [ ] cultures > { } 0
3      "model": {
44      "relationships": [
112      }
113  ],
114  "sourceQueryCulture": "en-US",
115  "tables": [
116      {
117          "name": "Product",
118          "annotations": [
119              {
120                  "name": "PBI_ResultType",
121                  "value": "Table"
122              }
123          ],
124          "columns": [
125              {
126                  "name": "ProductKey",
127                  "annotations": [
128                      {
129                          "name": "SummarizationSetBy",
130                          "value": "Automatic"
131                      }
132                  ]
133              }
134          ]
135      }
136  ]
137  }
```


ISSUES WITH A SINGLE LARGE BIM FILE

- Difficult to comprehend
 - Too much text is focused on delimiters {}, ()
- Single, large file - harder to collaborate with others
- Power BI and Fabric are advancing toward complete version control across all assets
 - Does it exist if it is not in source control?

POWER BI PBIX FILE

In some ways a step backwards



POWER BI DEVELOPER MODE

- Store PBIX as a Project Folder
 - PBIP
- Enhanced Format for Semantic Model
 - TMDL
- Enhanced Format for Reports
 - PBIR

WHAT'S IN A NAME

TMDL

Tabular

Model

Definition

Language

KEY POINTS

- Ease of reading – similar to YAML
- Folder structure – separate files for each table, perspective, role, and culture
 - Increases collaboration
- Minimal delimiters
- Copilot

WHAT IT IS NOT

THIS IS NOT IN JSON FORMAT.



WWW.SMLCREW.COM

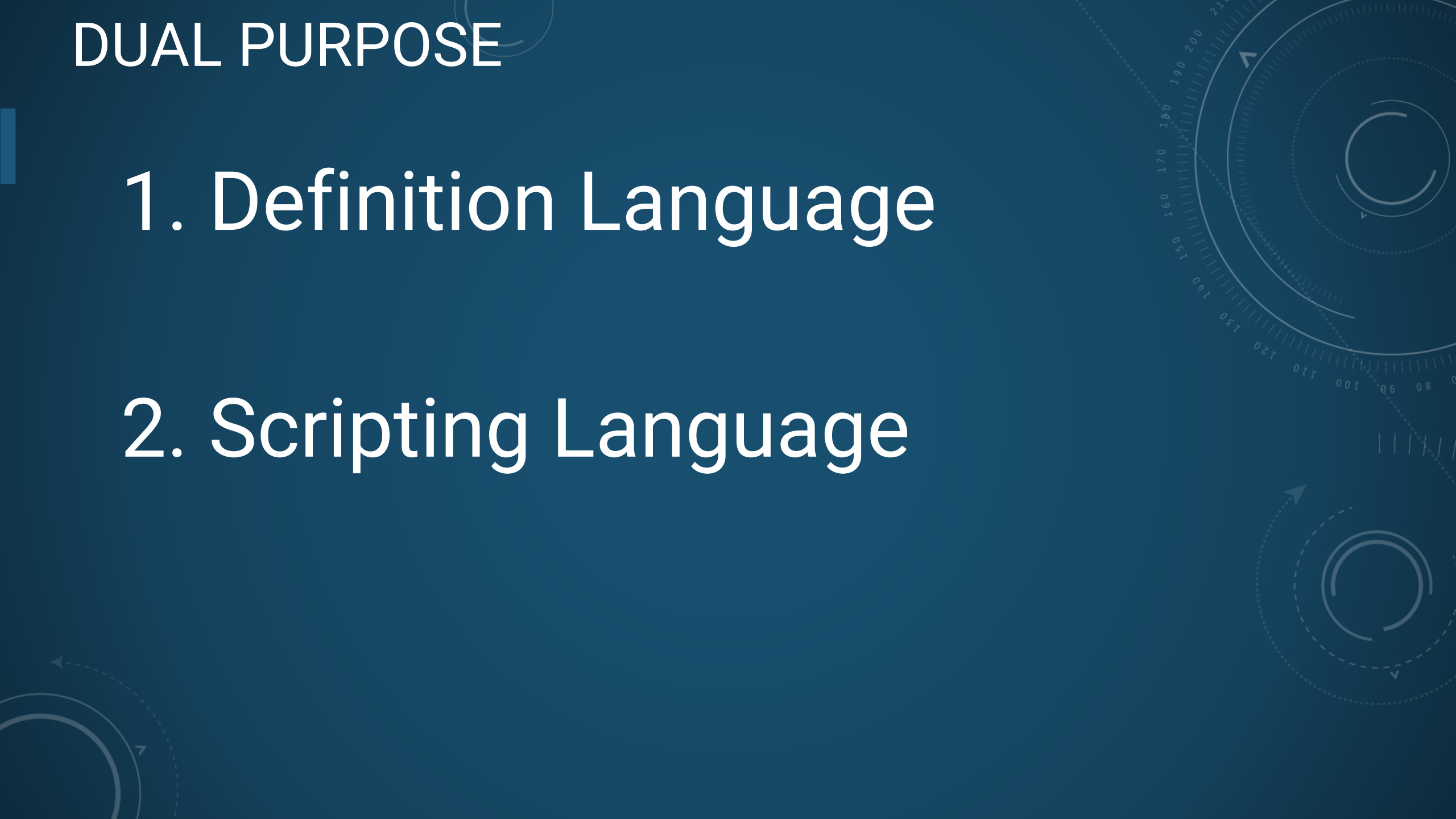
TMDL CREDIT

- Mathias Thierbach
 - Microsoft MVP
 - pbi-tools
- Community involvement

DUAL PURPOSE

1. Definition Language

2. Scripting Language



UNLOCKING THE POWER OF TMDL

With code:

- Create Date Table
- Turn on or off features
 - Auto Date/Time
 - Discourage Implicit Measures
- Quickly Create Objects
- Move object between Projects
- Make mass changes quickly

Example of TMDL

```
1 createOrReplace
```

```
2  
3 table Date
```

```
4 lineageTag: 093cc89d-ab2b-423e-9810-be9d879345e1
```

```
5  
6 column Date
```

```
7 dataType: dateTime
```

```
8 formatString: Long Date
```

```
9 lineageTag: 0bbfcfc4-20b3-48c4-b1d8-b3580bde1eee
```

```
10 summarizeBy: none
```

```
11 sourceColumn: Date
```

```
12  
13 annotation SummarizationSetBy = Automatic
```

```
14  
15 annotation UnderlyingDateTimeDataType = Date
```

```
16  
17 column Year
```

```
18 dataType: int64
```

```
19 formatString: 0
```

```
20 lineageTag: 7de18a58-8189-4a64-a8b9-9b278f40a9d2
```

```
21 summarizeBy: sum
```

```
22 sourceColumn: Year
```

```
23
```

Quick TMDL Primer

- Whitespace for indenting
- Hierarchy
 - Table
 - Column
 - Properties
 - Measure
 - Properties



More TMDL

- Triple slash (///) syntax
 - Description – good for documentation
 - For example /// Table Description

Best Way to Learn Syntax

- Create Object in GUI
 - Script out object
- View snippets

The TMDL Journey



1. What is TMDL
2. PBIP & TMDL
3. TMDL View
4. External Tools
5. Conclusion

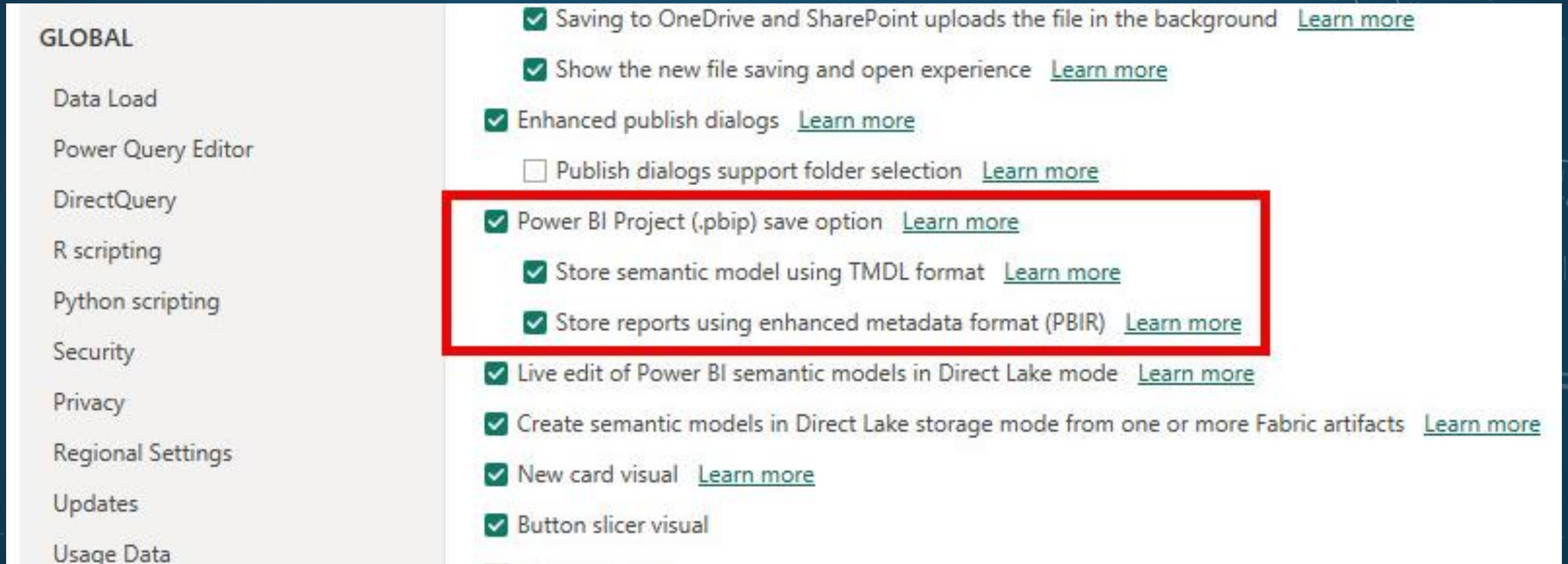
TMDL IN POWER BI DESKTOP

Related but independent

- Power BI Project (.pbip)
 - Store semantic model in TMDL format
- TMDL View
 - Can be used with PBIX files

PREVIEW OPTIONS - POWER BI PROJECT

****PREVIEW: READ LIMITATIONS ****



The image shows a screenshot of the Power BI Project preview options. On the left is a sidebar with a 'GLOBAL' section containing links to 'Data Load', 'Power Query Editor', 'DirectQuery', 'R scripting', 'Python scripting', 'Security', 'Privacy', 'Regional Settings', 'Updates', and 'Usage Data'. The main area on the right lists various preview features, each with a green checkmark and a 'Learn more' link. A red rectangular box highlights a specific group of three options: 'Power BI Project (.pbip) save option', 'Store semantic model using TMDL format', and 'Store reports using enhanced metadata format (PBIR)'. Other visible options include background saving to OneDrive/SharePoint, new file saving experience, enhanced publish dialogs, folder selection support, live edit in Direct Lake mode, creating semantic models from Fabric artifacts, new card visual, and button slicer visual.

Category	Option	Status	Learn more
GLOBAL	Saving to OneDrive and SharePoint uploads the file in the background	✓	Learn more
	Show the new file saving and open experience	✓	Learn more
	Enhanced publish dialogs	✓	Learn more
	Publish dialogs support folder selection	<input type="checkbox"/>	Learn more
	Power BI Project (.pbip) save option	✓	Learn more
	Store semantic model using TMDL format	✓	Learn more
	Store reports using enhanced metadata format (PBIR)	✓	Learn more
	Live edit of Power BI semantic models in Direct Lake mode	✓	Learn more
	Create semantic models in Direct Lake storage mode from one or more Fabric artifacts	✓	Learn more
	New card visual	✓	Learn more
Button slicer visual	✓		

PREVIEW OPTIONS – TMDL VIEW

****PREVIEW: REVIEW OF LIMITATIONS ****

The image shows a screenshot of the Power BI settings application. On the left is a sidebar menu with the following items: 'Diagnostics', 'Preview features' (highlighted with a red rectangle), 'Save and Recover', 'Report settings', 'Copilot (preview)', 'CURRENT FILE', 'Data Load', and 'Regional Settings'. The main area on the right displays a list of preview features, each with a checkbox, a 'Learn more' link, and a 'Share feedback' link. The features are: 'Text slicer visual' (unchecked), 'Write DAX queries with Copilot' (unchecked), 'Summary with Copilot visual' (checked), 'Improve Q&A with Copilot' (unchecked), 'Measure descriptions with Copilot' (unchecked), 'Visual calculations' (checked), 'TMDL View' (checked and highlighted with a red rectangle), and 'Prep data for AI' (checked).

Diagnostics

- Preview features**
- Save and Recover
- Report settings
- Copilot (preview)

CURRENT FILE

- Data Load
- Regional Settings

☐ Text slicer visual

☐ Write DAX queries with Copilot [Learn more](#) | [Share feedback](#)

☒ Summary with Copilot visual [Learn more](#)

☐ Improve Q&A with Copilot [Learn more](#)

☐ Measure descriptions with Copilot [Learn more](#) | [Share feedback](#)

☒ Visual calculations [Learn more](#) | [Share feedback](#)

☒ **TMDL View** [Learn more](#) | [Share feedback](#)

☒ Prep data for AI [Learn more](#)



LEARN MORE













- ✓ Power BI Project (.pbip) save option [Learn more](#)
- ✓ Store semantic model using TMDL format [Learn more](#)
- ✓ Store reports using enhanced metadata format (EMR) [Learn more](#)
- ✓ Live edit of Power BI semantic models in Direct Lake mode [Learn more](#)
- ✓ New card visual [Learn more](#)
- ✓ Button slicer visual
- ☐ List slicer visual
- ☐ Text slicer visual
- ✓ Low-level report...
- ✓ Summary with Copilot visual [Learn more](#)
- ☐ Improve Q&A with Copilot [Learn more](#)
- ☐ Measure descriptions with Copilot [Learn more](#) | [Share feedback](#)
- ✓ Visual calculations [Learn more](#) | [Share feedback](#)
- ☐ Copilot chat pane in report view [Learn more](#) | [Share feedback](#)
- ✓ TMDL View [Learn more](#) | [Share feedback](#)
- ☐ Use user-installed Vertica ODBC driver [Learn more](#)

TMDL IN POWER BI DESKTOP

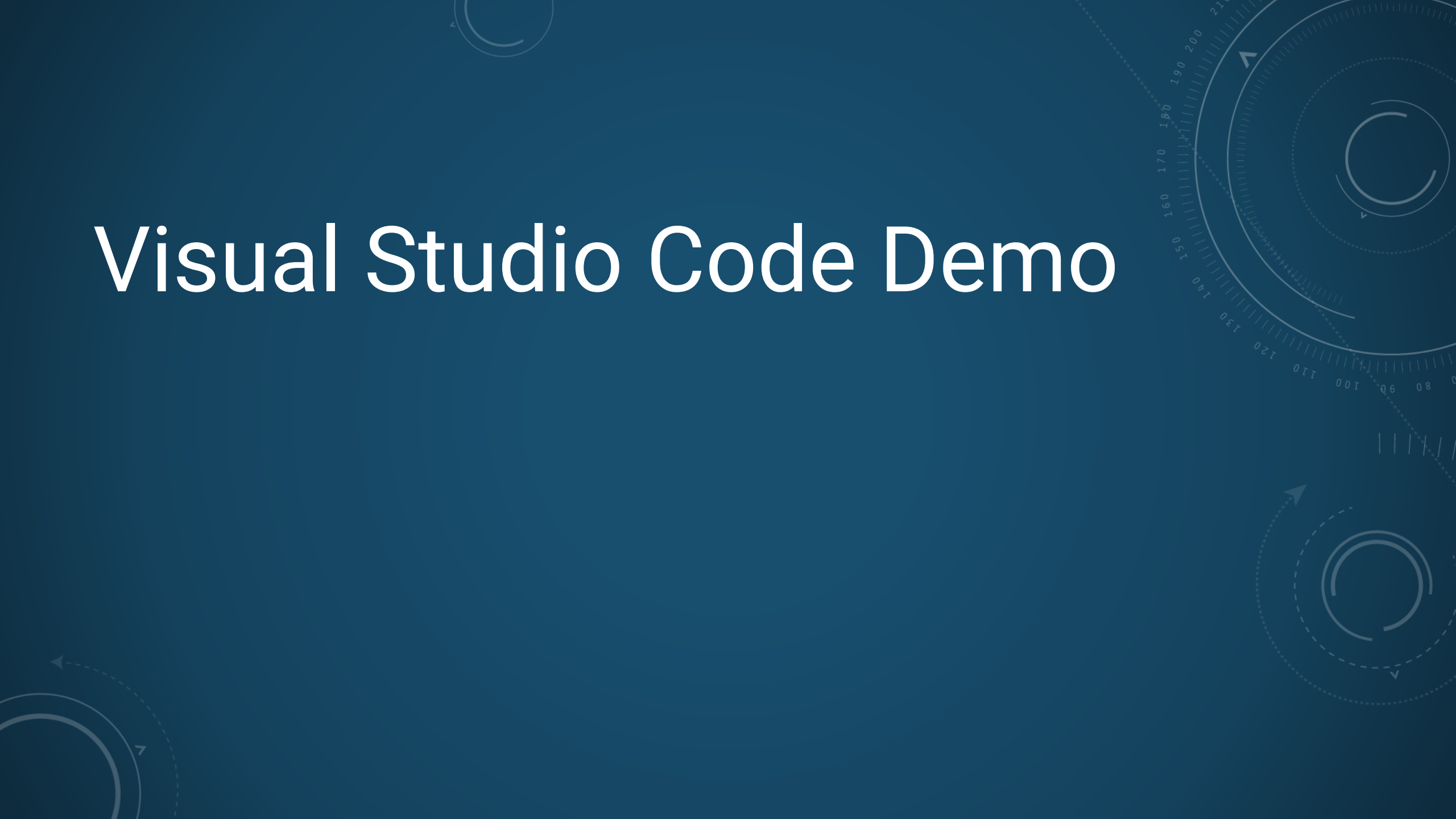
1. Power BI Project (.pbip)

- Store semantic model in TMDL format

FOLDER RENAMING IS NOT VERSION CONTROL

Name	Status	Date modified	Type	Size
 BeforeBossFight_Original_Power_BI		3/20/2025 9:23 AM	File folder	
 Broken_Original_Power_BI		3/20/2025 9:23 AM	File folder	
 Lost_Original_Power_BI		3/20/2025 9:24 AM	File folder	
 Original_Power_BI		3/20/2025 9:22 AM	File folder	
 Restore_of_Restore_Original_Power_BI		3/20/2025 9:24 AM	File folder	
 zOriginal_Power_BI		3/20/2025 9:22 AM	File folder	

Visual Studio Code Demo



POWER BI – TMDL ISSUE

Issues were found

There's a problem with the definition content in your Power BI Project.

TMDL Format Error:

Parsing error type - UnsupportedObjectType

Detailed error - Unsupported object type - 1model is not a supported property in the current context!

Document - './model'

Line Number - 2

Line - '1model Model'

[Copy details to clipboard](#)

Close

Git Changes

From PBIX to PBIP

GRAPH

Auto

Updated report format to PBIR thedaxshepherd

main

page.json

Contoso10K.Report\definition\pages\2da5c93ee0b34b13ee76

A

visual.json

Contoso10K.Report\definition\pages\2da5c93ee0b34b13ee76\visuals\32514...

A

visual.json

Contoso10K.Report\definition\pages\2da5c93ee0b34b13ee76\visuals\691f45...

A

page.json

Contoso10K.Report\definition\pages\ReportSection

A

visual.json

Contoso10K.Report\definition\pages\ReportSection\visuals\ea99ca648040b5...

A

pages.json

Contoso10K.Report\definition\pages

A

report.json

Contoso10K.Report\definition

A

version.json

Contoso10K.Report\definition

A

report.json

Contoso10K.Report

D

diagramLayout.json

Contoso10K.SemanticModel

M

Upgraded to TMDL thedaxshepherd

TMDL

en-US.tmdl

Contoso10K.SemanticModel\definition\cultures

A

TMDL

database.tmdl

Contoso10K.SemanticModel\definition

A

TMDL

model.tmdl

Contoso10K.SemanticModel\definition

A

TMDL

relationships.tmdl

Contoso10K.SemanticModel\definition

A

TMDL

Customer.tmdl

Contoso10K.SemanticModel\definition\tables

A

TMDL

Date.tmdl

Contoso10K.SemanticModel\definition\tables

A

TMDL

Product.tmdl

Contoso10K.SemanticModel\definition\tables

A

TMDL

Sales.tmdl

Contoso10K.SemanticModel\definition\tables

A

TMDL

Store.tmdl

Contoso10K.SemanticModel\definition\tables

A

model.bim

Contoso10K.SemanticModel

D

Deleted PBIX thedaxshepherd

≡

Contoso10K.pbix

D

Changed to PBIP thedaxshepherd

◆

.gitignore

A

≡

.platform

Contoso10K.Report

A

CY23SU04.json

Contoso10K.Report\StaticResources\SharedResources\BaseThemes

A

≡

definition.pbir

Contoso10K.Report

A

report.json

Contoso10K.Report

A

editorSettings.json

Contoso10K.SemanticModel\pbi

A

≡

.platform

Contoso10K.SemanticModel

A

daxQueries.json

Contoso10K.SemanticModel\DAXQueries\pbi

A

≡

Query 2.dax

Contoso10K.SemanticModel\DAXQueries

A

tmdlScripts.json

Contoso10K.SemanticModel\TMDLScripts\pbi

A

TMDL

Script 1.tmdl

Contoso10K.SemanticModel\TMDLScripts

A

≡

definition.pbism

Contoso10K.SemanticModel

A

diagramLayout.json

Contoso10K.SemanticModel

A

model.bim

Contoso10K.SemanticModel

A

≡

Contoso10K.pbip

A

Initial thedaxshepherd

≡

Contoso10K.pbix

A

Our Journey



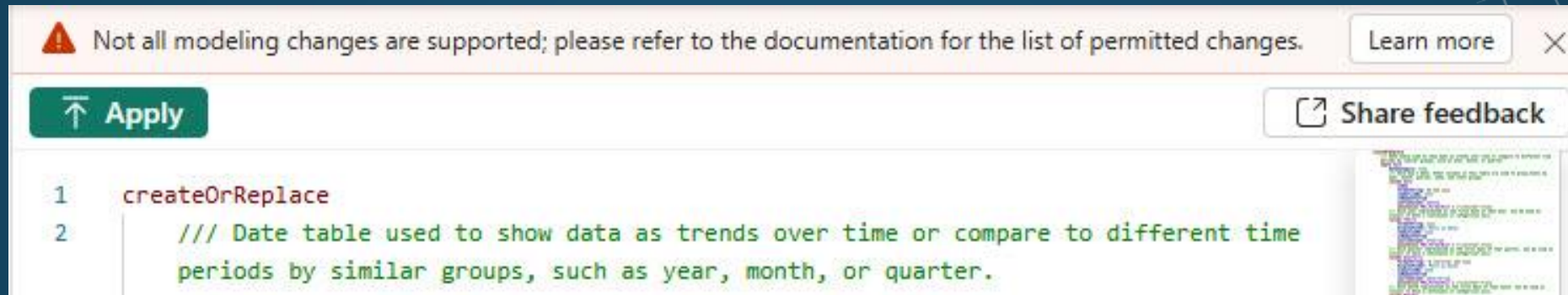
1. What is TMDL
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- 3. TMDL View**
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TMDL IN POWER BI DESKTOP

2.TMDL View

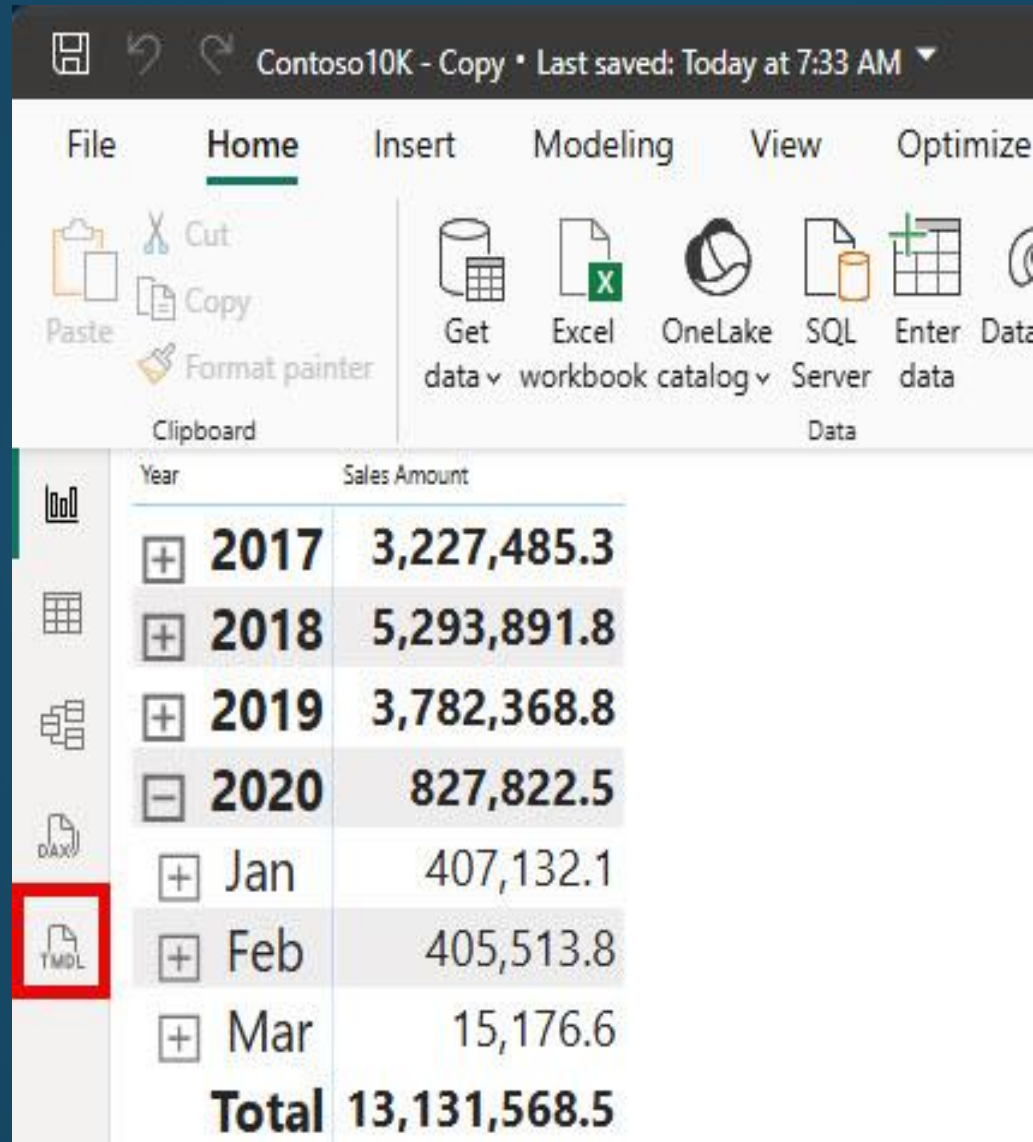
- Can be used with PBIX files

WARNING



Learn More: <https://learn.microsoft.com/en-us/power-bi/developer/projects/projects-overview#model-authoring>

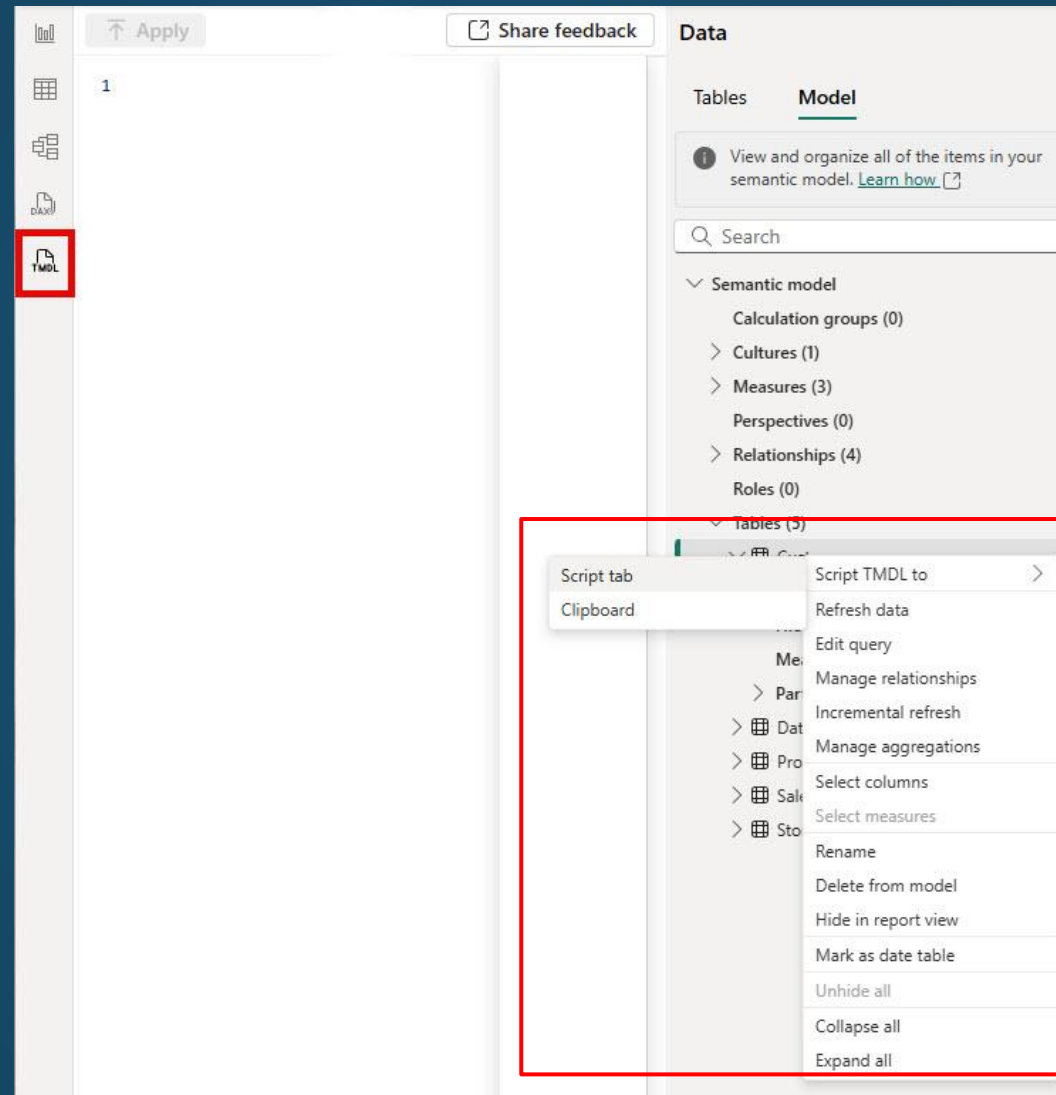
TMDL VIEW BUTTON



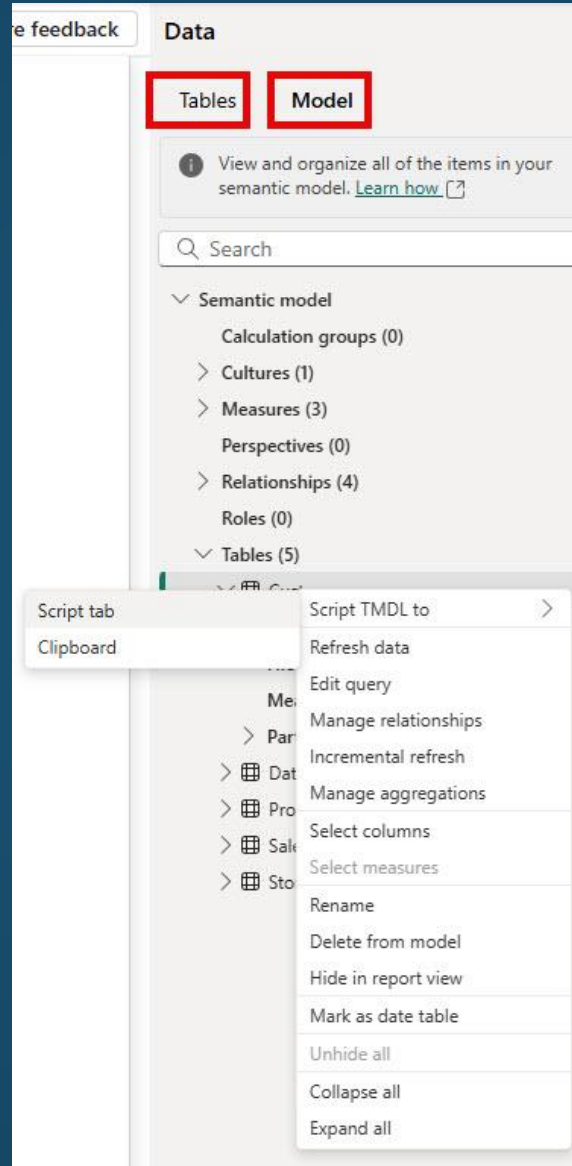
The screenshot displays the Microsoft Power BI Desktop application window. The title bar indicates the file is "Contoso10K - Copy" and it was last saved today at 7:33 AM. The ribbon menu is set to the "Home" tab, showing options for File, Home, Insert, Modeling, View, and Optimize. The "Home" ribbon includes sections for Clipboard (Paste, Cut, Copy, Format painter) and Data (Get data, Excel workbook, OneLake catalog, SQL Server, Enter data). The left-hand navigation pane shows icons for Report View, Table View, Data View, DAX View, and TMDL View. The TMDL View icon, which depicts a document with a circular arrow, is highlighted with a red rectangular box. The main workspace area displays a table with the following data:

Year	Sales Amount
+ 2017	3,227,485.3
+ 2018	5,293,891.8
+ 2019	3,782,368.8
- 2020	827,822.5
+ Jan	407,132.1
+ Feb	405,513.8
+ Mar	15,176.6
Total	13,131,568.5

SCRIPT TMDL

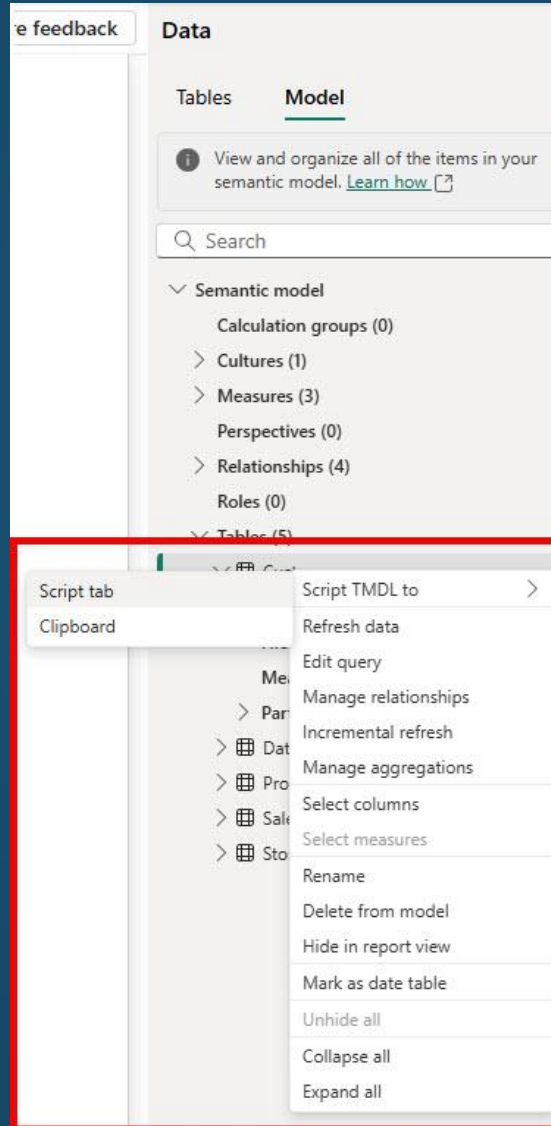


CAN BE IN TABLE OR MODEL SELECTION

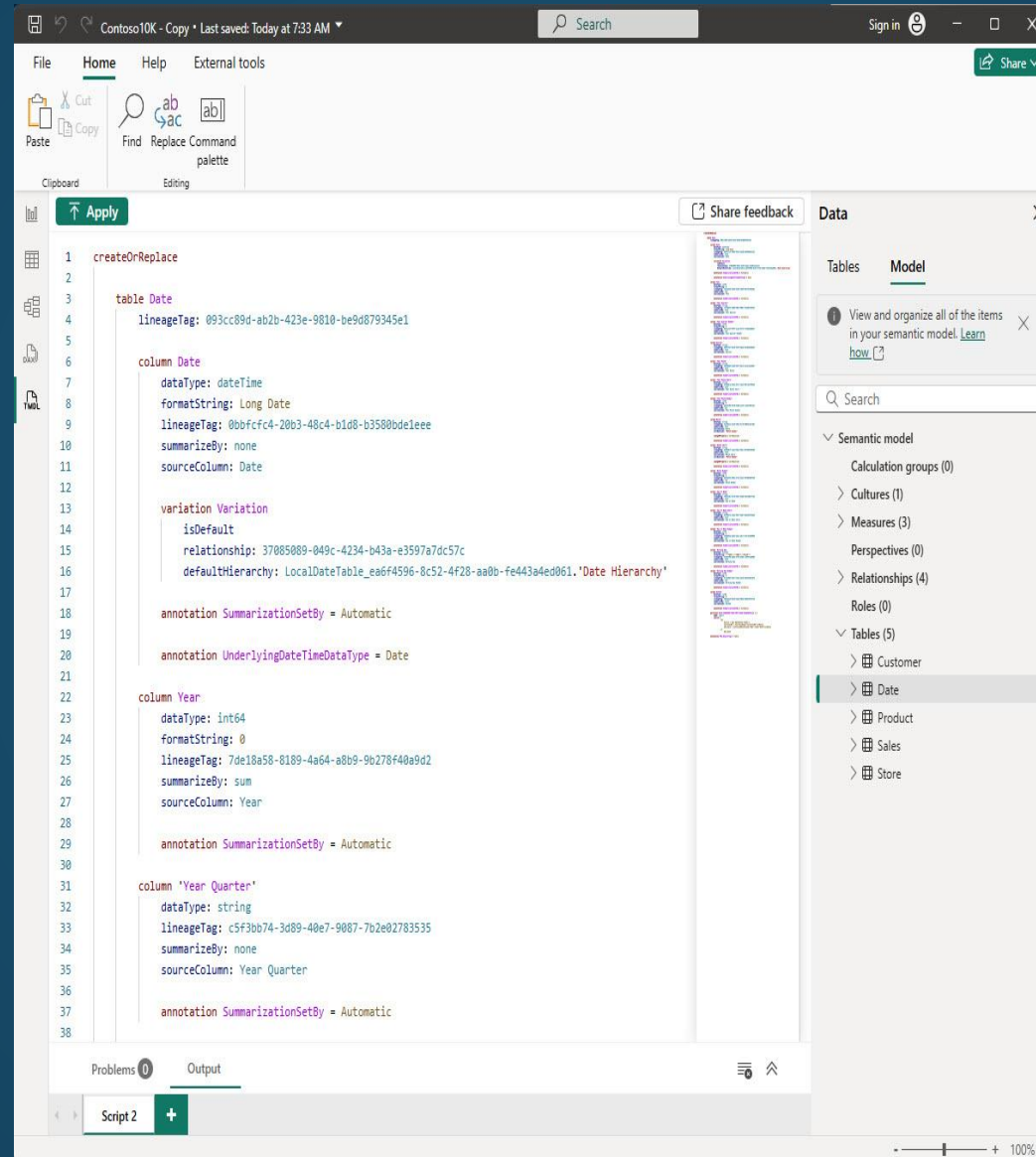


CAN SCRIPT TO SCRIPT TAB OR CLIPBOARD

**** ALSO DRAG AND DROP TO TAB ****



TMDL VIEW – SCRIPT TAB



TMDL VIEW – CODE INTERFACE

↑ Apply

Preview

🔗 Share feedback

1 createOrReplace

2

3 table Customer

4 lineageTag: 8b57b73a-c7ab-4e11-bd1d-3b4134f84e05

5

6 column CustomerKey

7 dataType: int64

8 formatString: 0

9 lineageTag: 476a899b-b9ab-4699-bba8-df9642e39bfd

10 summarizeBy: none

11 sourceColumn: CustomerKey

12

13 annotation SummarizationSetBy = Automatic

14

15 column Gender

16 dataType: string

17 lineageTag: a373a8a9-7a80-4f5a-852b-0374aef50f7e

18 summarizeBy: none

19 sourceColumn: Gender

20

21 annotation SummarizationSetBy = Automatic

22

23 column Name

24 dataType: string

25 lineageTag: 3cfe8fb1-58aa-4087-9781-a6a68a5ed24e

26 summarizeBy: none

27 sourceColumn: Name

28

29 annotation SummarizationSetBy = Automatic

30

31 column Address

Problems 0

Output

☰ ⬆

Script_CustomerTable

+

CODE INTERFACE - PREVIEW

↑ Apply

Preview

Share feedback

↑ ↓ ↗ ... ✕

1 createOrReplace

2

3 table Customer

4 lineageTag: 8b57b73a-c7ab-4e11-bd1d-3b4134f84e05

5

6 column CustomerKey

7 dataType: string

8 formatString: 0

9 lineageTag: 476a899b-b9ab-4699-bba8-df9642e39bfd

10 summarizeBy: none

11 sourceColumn: CustomerKey

12

13 annotation SummarizationSetBy = Automatic

14

15

16 column Gender

17 dataType: string

18 lineageTag: a373a8a9-7a80-4f5a-852b-0374aef50f7e

19 summarizeBy: none

20 sourceColumn: Gender

21

22 annotation SummarizationSetBy = Automatic

23

24 column Name

25 dataType: string

26 lineageTag: 3cfe8fb1-58aa-4087-9781-a6a68a5ed24e

27 summarizeBy: none

28 sourceColumn: Name

29

30 annotation SummarizationSetBy = Automatic

31

32 column Address

33 dataType: string

34 lineageTag: 61be27ea-9431-48fb-956d-7e3c265d0c5f

35

1 model Model

419 table Date

575 partition

577 source =

582 in

584

585 annotation PBI_ResultType =

Table

586

587 table Customer

588 lineageTag:

8b57b73a-c7ab-4e11-bd1d-3b4134

f84e05

589

590 column CustomerKey

591 dataType: int64

592 formatString: 0

593 lineageTag:

476a899b-b9ab-4699-bba8-df

9642e39bfd

594 summarizeBy: none

595 sourceColumn: CustomerKey

596

597 annotation

SummarizationSetBy =

Automatic

598

599 column Gender

600 dataType: string

601 lineageTag:

a373a8a9-7a80-4f5a-852b-03

74aef50f7e

1 model Model

419 table Date

575 partition

577 source =

582 in

584

585 annotation PBI_ResultType = Table

586

587 table Customer

588 lineageTag:

8b57b73a-c7ab-4e11-bd1d-3b4134f84

e05

589

590 column CustomerKey

591 dataType: string

592 formatString: 0

593 lineageTag:

476a899b-b9ab-4699-bba8-df964

2e39bfd

594 summarizeBy: none

595 sourceColumn: CustomerKey

596

597 annotation

SummarizationSetBy =

Automatic

598

599 column Gender

600 dataType: string

601 lineageTag:

a373a8a9-7a80-4f5a-852b-0374a

ef50f7e

Problems 0

Output

Script_CustomerTable

+








TMDL VIEW – RENAME TABS

```
28      annotation PBI_FormatHint = {"isCustom":true}
29      /// Each month represented as the first date of that
      month. Can be used on visuals to have a continuous or
      categorical axis.
30      column Monthly
31          formatString: mmm yyyy
32          displayFolder: Parts as dates
33          summarizeBy: none
```

Problems 0 Output

Date Table Calculation Groups +

TMDL SCRIPTS – SAVED IN FILE (PBIP/PBIX)

Name	Date modified	Type	Size
 .pbi	3/17/2025 8:41 AM	File folder	
 DAXQueries	3/17/2025 8:41 AM	File folder	
 TMDLScripts	3/17/2025 8:41 AM	File folder	
 .platform	3/17/2025 8:41 AM	PLATFORM File	1 KB
 definition.pbism	3/17/2025 8:41 AM	PBISM File	1 KB
 diagramLayout.json	3/17/2025 8:41 AM	JSON File	2 KB
 model.bim	3/17/2025 8:41 AM	BIM File	79 KB

ENABLES FUNCTIONALITIES WITHOUT EXTERNAL TOOL

For example:

- Perspectives
- Translations

Share TMDL Scripts

- Centralized collection
 - SharePoint site or Teams
- Sites with TMDL samples
 - TMDL Gallery
 - FabSnippets
- Article in resources regarding security precautions

TMDL View Demo



The TMDL Journey



1. What is TMDL

2. PBIP & TMDL

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EXTERNAL TOOLS

- Visual Studio Code
 - TMDL Extension
 - Power BI Studio
- pbi-tools
- Tabular Editor



TABULAR EDITOR 2.X

– SAVE TO FOLDER –

TMDL

Tabular Editor Preferences

Features General DAX **Serialization**

Serialization mode: TMDL ☒ Save .bim copy

General Serialization Settings

- | | |
|---|--|
| <input checked="" type="checkbox"/> Ignore inferred objects | <input checked="" type="checkbox"/> Ignore inferred properties |
| <input checked="" type="checkbox"/> Ignore timestamps | <input checked="" type="checkbox"/> Split multiline string |
| <input type="checkbox"/> Ignore lineage tags | <input type="checkbox"/> Ignore privacy settings |
| <input type="checkbox"/> Ignore incr. refresh partitions | <input type="checkbox"/> Include sensitive |

TMDL Serialization Options

☐ Include metadata order

Indentation: Tabs

Indentation width: 4

Encoding: UTF8

Newline style: Default

Casing style: camelCase

Expression trim style: Trim trailing whitespaces

OK

Cancel

TABULAR EDITOR 3

Preferences

▼ Data Browsing

Pivot Grid

DAX Query

Table Preview

▼ Text Editors

General

> DAX Editor

> SQL Editor

> M Editor

> C# Editor

Schema Compare

▼ File Formats

General

Save-to-folder

VertiPaq Analyzer

▼ Model Deployment

General

Data Refresh

▼ DAX Optimizer

General

Save-to-folder

Serialization mode TMDL

TMDL settings

☐ Include metadata order

Indentation Tabs

Indentation width 4





Encoding UTF8

Newline style Default

Casing style camelCase

Expression trim style Trim trailing whitespaces

TABULAR EDITOR 2 – SAVE TO FOLDER

Name	Date modified	Type
 cultures	3/14/2025 10:48 AM	File folder
 tables	3/14/2025 10:48 AM	File folder
 database.tmdl	3/14/2025 10:49 AM	TMDL File
 model.tmdl	3/14/2025 10:49 AM	TMDL File
 relationships.tmdl	3/14/2025 10:49 AM	TMDL File

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FUTURE EXPANSION

- Expanding support for changes that are not currently supported
- TMDL View available on the Web
- TMDL View Copilot

Reference:

<https://powerbi.microsoft.com/en-us/blog/deep-dive-into-tmdl-view-for-power-bi-desktop-preview/>

ENDLESS POSSIBILITIES

- Assist with Development
 - Reuse Modules
- Build Models with AI
- Best Practices

RESOURCES

- Microsoft TMDL Overview
 - <https://learn.microsoft.com/en-us/analysis-services/tmdl/tmdl-overview>
- Developer Mode
 - <https://learn.microsoft.com/en-us/power-bi/developer/projects/projects-dataset#tmdl-format>
- TMDL View
 - <https://learn.microsoft.com/en-us/power-bi/transform-model/desktop-tmdl-view>

RESOURCES

- Power BI TMDL View: Benefits, Security Risks and Best Practices by John Kerski
 - <https://www.red-gate.com/simple-talk/business-intelligence/power-bi-tmdl-benefits-security-risks-best-practices>
- FabSnippets
 - <https://fabsnippets.com/>
- DataZoe – DAX Date table in TMDL
 - <https://www.datazoe.blog/post/dax-date-table-in-tmdl>

RESOURCES

- Deep dive into TMDL view for Power BI Desktop
 - <https://powerbi.microsoft.com/en-us/blog/deep-dive-into-tmdl-view-for-power-bi-desktop-preview/>
- Microsoft Lineage Tags
 - <https://learn.microsoft.com/en-us/analysis-services/tom/lineage-tags-for-power-bi-semantic-models>
- #SML (Saturday Morning Learning)
 - www.smlcrew.com

Hope you enjoyed your stay

Thank you

Jason Romans



thedaxshepherd@gmail.com



jason-r-sql-jar



<https://thedaxshepherd.com/>



@sql_jar



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