



POWER BI REPORT DEVELOPMENT POWER BI REPORT DEVELOPMENT WITH CODE AND A PINCH OF AI

BUDAPEST BI FORUM 2024

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INTRODUCTION



Mihaly Kavasi

Group Manager

Delivery Lead and Trainer

Avanade

- ✓ 8+ Years of Power BI Experience
- ✓ 7+ Year of Training Experience
- ✓ Microsoft Certified Solution Expert – Data Management and Analytics
- ✓ Microsoft Certified Trainer
- ✓ Azure Enterprise Data Analyst
- ✓ Fasttrack Recognized Solution Architect



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Blog: <https://selfservicebi.co.uk/>

DATA MODEL DEVELOPMENT

Developer support for the whole life cycle management

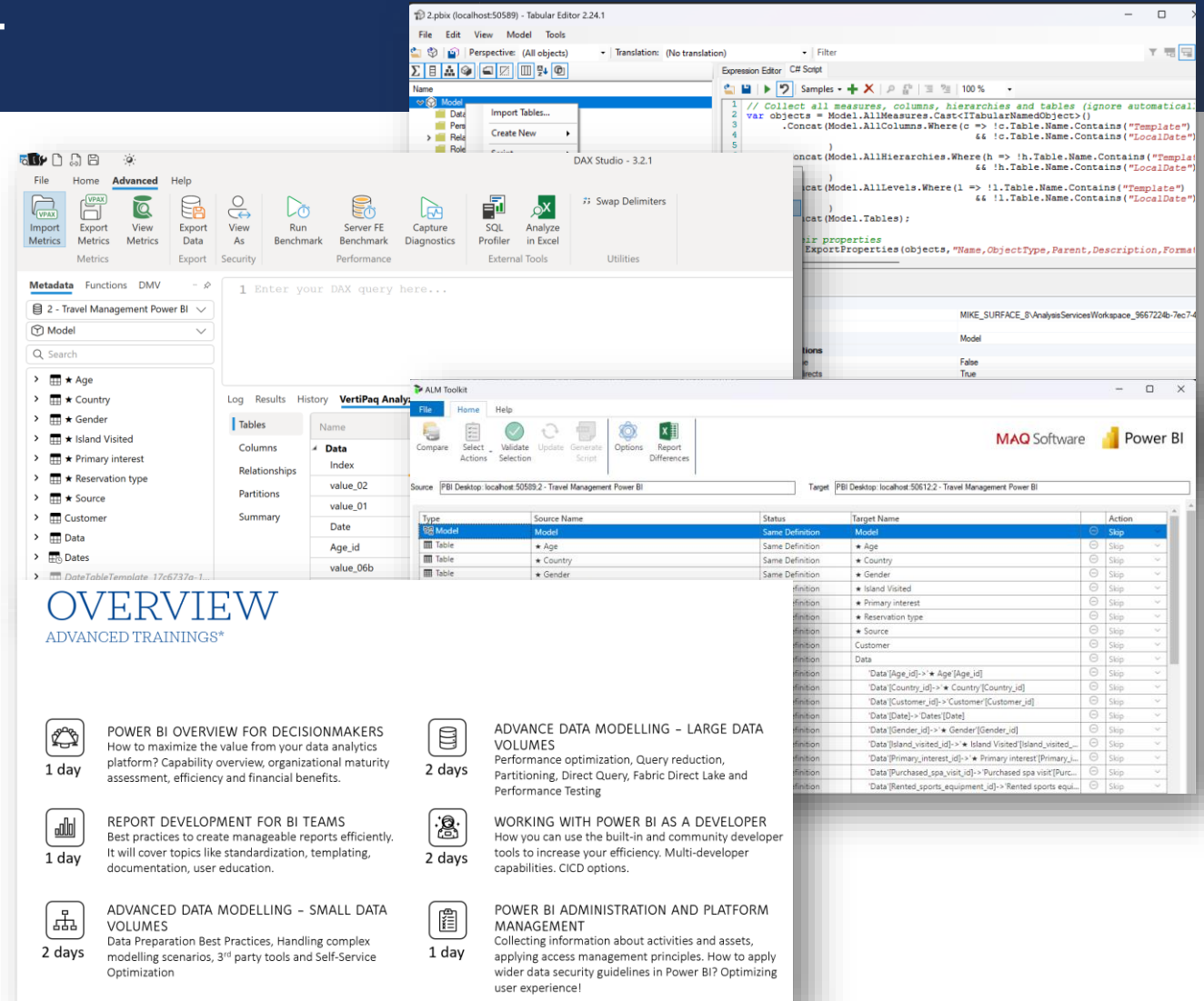
- Version Control
- Multi-Developer Support
- Development
- Testing
- Optimization
- Documentation
- Automation

Extensive Microsoft and community tooling

- Tabular Editor
- Dax Studio
- ALM Toolkit
- Visual Studio Code
- Azure DevOps
- Rest API
- Realistic Load Testing Tool

Developer level training is also available:

- Power BI Masterclass



The image displays a collage of three software interfaces used in Power BI development:

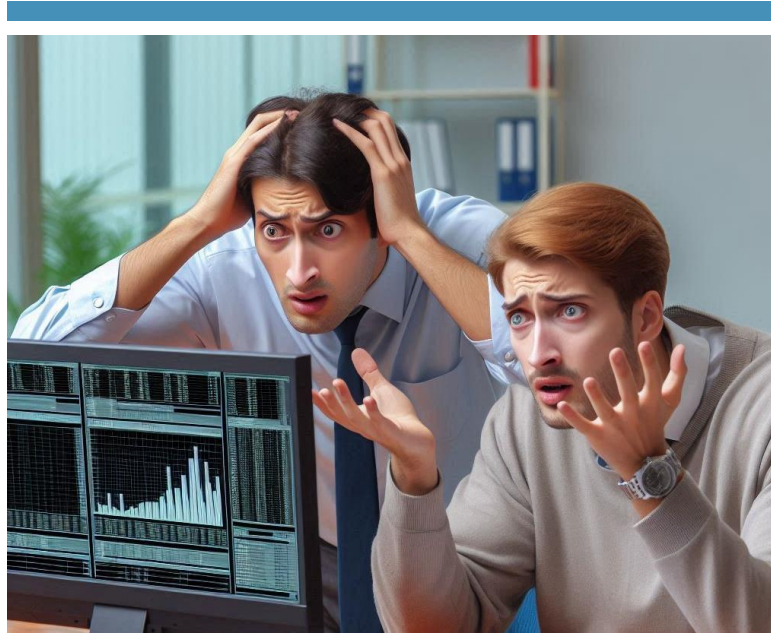
- Tabular Editor 2.24.1:** A window showing the 'Model' pane with a tree view of tables and columns. The 'Expression Editor' on the right contains DAX code for creating a measure.
- DAX Studio 3.2.1:** A window with a menu bar (File, Home, Advanced, Help) and a toolbar. The main area is a text editor for entering DAX queries.
- ALM Toolkit:** A window titled 'VertiPaaS Analysis' showing a table with columns for Name, Data, Index, Relationships, Partitions, and Summary. It also includes a 'Compare' button and a 'Generate Script' button.

OVERVIEW
ADVANCED TRAININGS*

Icon	Duration	Topic	Description
	1 day	POWER BI OVERVIEW FOR DECISIONMAKERS	How to maximize the value from your data analytics platform? Capability overview, organizational maturity assessment, efficiency and financial benefits.
	2 days	ADVANCE DATA MODELLING - LARGE DATA VOLUMES	Performance optimization, Query reduction, Partitioning, Direct Query, Fabric Direct Lake and Performance Testing
	1 day	REPORT DEVELOPMENT FOR BI TEAMS	Best practices to create manageable reports efficiently. It will cover topics like standardization, templating, documentation, user education.
	2 days	WORKING WITH POWER BI AS A DEVELOPER	How you can use the built-in and community developer tools to increase your efficiency. Multi-developer capabilities. CICD options.
	2 days	ADVANCED DATA MODELLING - SMALL DATA VOLUMES	Data Preparation Best Practices, Handling complex modelling scenarios, 3rd party tools and Self-Service Optimization
	1 day	POWER BI ADMINISTRATION AND PLATFORM MANAGEMENT	Collecting information about activities and assets, applying access management principles. How to apply wider data security guidelines in Power BI? Optimizing user experience!

REPORT DEVELOPMENT SO FAR

- Binary file
- No efficient multi developer options
- No real version control and fallback options
- No developer tools and no automation



INTRODUCING PBIR FORMAT

Microsoft Power BI Blog

DEVELOPERS FEATURES POWER BI

Power BI enhanced report format (PBIR) in Power BI Desktop developer mode (Preview)



Rui Romano
Principal Program Manager

June 13, 2024



Enhancing team collaboration and automation is crucial for any enterprise BI development, which is the primary goal of Power BI Desktop developer mode. The **Power BI enhanced report format (PBIR)** for Power BI Project files (PBIP) represents a significant milestone in that direction. This new report format offers source control-friendly file structures, facilitating co-development and improving development efficiency for Power BI reports.

Together with TMDL for the semantic model, Power BI Projects now have a great source control experience for both report and semantic model:

The screenshot displays the Power BI Desktop developer mode interface. On the left, a file explorer shows the project structure for 'Financials.Report' and 'Financials.SemanticModel'. The 'Financials.Report' folder contains files like '.pbi', 'definition', 'pages', 'report.json', 'version.json', 'StaticResources', '.platform', 'definition.pbir', and 'Financials.SemanticModel'. The 'Financials.SemanticModel' folder contains files like '.pbi', 'cultures', 'tables', 'database.tmdl', 'model.tmdl', 'relationships.tmdl', '.platform', 'definition.pbism', 'diagramLayout.json', '.gitignore', and 'Financials.pbip'. Two yellow arrows point from the 'definition.pbir' and 'definition.pbism' files in the explorer to the code editors on the right.

The top code editor shows the 'Report PBIR format' (definition.pbir) with JSON content. The bottom code editor shows the 'Semantic model TMDL format' (definition.pbism) with TMDL content.

Report PBIR format

Power BI Project with TMDL and PBIR

Semantic model TMDL format




<https://powerbi.microsoft.com/en-us/blog/power-bi-enhanced-report-format-pbir-in-power-bi-desktop-developer-mode-preview/>

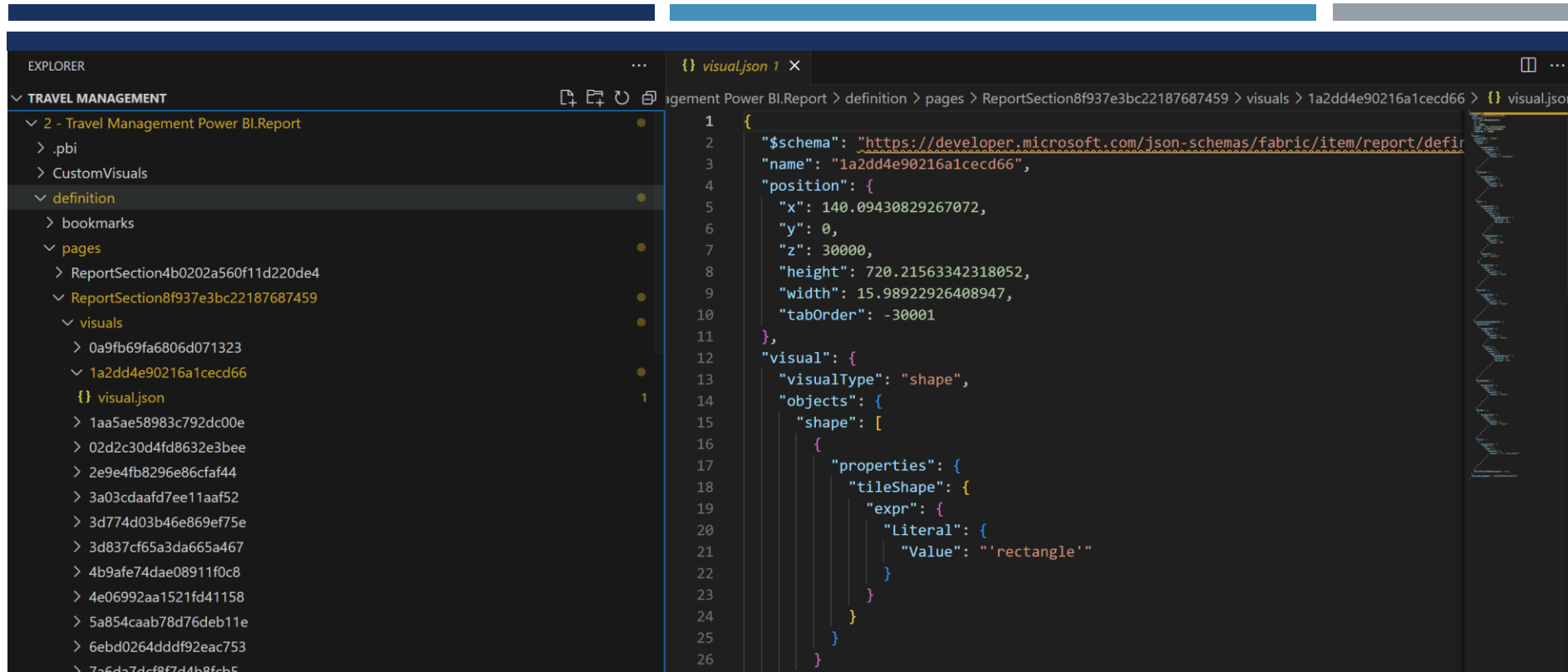
GETTING STARTED

- Turn on Preview Feature for PBIP and PBIR
- Save Power BI File as a Project file

- ✓ 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](#)

Name

-  2 - Travel Management Power BI.Report
-  2 - Travel Management Power BI.SemanticModel
-  2 - Travel Management Power BI.pbip



UNDERSTANDING THE NEW FORMAT

HOW THE CODE IS STRUCTURED

UNDERSTANDING THE NEW FORMAT

- Where can you find?
 - Themes
 - Images and Icons
 - Groups
 - Report level measures
 - Report and Page level filters
- Complications:
 - Matching files with visuals and attributes because everything is stored with its ID
 - Attributes of a visual can also be in a theme file
 - Small change in desktop can affect multiple files
 - Desktop makes updates to files that are not intentional




DEMO - REPORT DOCUMENTATION


Level 0	Level 1	page_name	visual_name	visual_type
definition	pages	Audience	'8 - Vertical'	shape
definition	pages	Audience	'9 - Horizontal'	shape
definition	pages	Audience	'9 - Vertical'	shape
definition	pages	Audience	'Charts	Visual Group
definition	pages	Audience	'Contoso'	actionButton
definition	pages	Audience	'CUSTOMER SERVICES'	actionButton
definition	pages	Audience	'Customer Type'	shape
definition	pages	Audience	'Customers by Gender'	donutChart
definition	pages	Audience	'Customers by Group and Gender'	clusteredColumnChart
definition	pages	Audience	'Customers by Group and Gender'	clusteredColumnChart
definition	pages	Audience	'Customers by island visited'	shapeMap
definition	pages	Audience	'Customers by island visited'	textbox
definition	pages	Audience	'Customers by Reservation Type'	columnChart
definition	pages	Audience	'Customers' Country'	barChart
definition	pages	Audience	'Customers' Country'	barChart
definition	pages	Audience	'Elements	Visual Group
definition	pages	Audience	'Horizontal Guide	Visual Group
definition	pages	Audience	'Interesting'	slicer
definition	pages	Audience	'KPI	Visual Group
definition	pages	Audience	'Lines	Visual Group
definition	pages	Audience	'Logo'	image
definition	pages	Audience	'New	Visual Group
definition	pages	Audience	'New Customers'	kpi
definition	pages	Audience	'Not found	actionButton


	A	B	C	D	E	F	G
1	entity	display_folder	measure_name	expression	dataType	formatString	
2	Calculations	Housing	Freehold Sales	CALCULATE([Properties Sold], 'Housing Market Data'[Estate Type] = "Freehold")	Double	General Number	
3	Calculations	Housing	Leasehold Sales	CALCULATE([Properties Sold], 'Housing Market Data'[Estate Type] = "Leasehold")	Double	General Number	
4	Calculations	Housing	New Build Sales	CALCULATE([Properties Sold], 'Housing Market Data'[New Build?])	Double	General Number	
5	Calculations	Housing	Detached Sales	CALCULATE([Properties Sold], 'Housing Market Data'[Property Type] = "Detached")	Double	General Number	
6							

DEMO – EXPLORATION

A	B
C:\Users\kavas\Documents\GitHub\PBITraining\Microsoft Demos\Travel Management\2 - Travel Management Power BI.Report	visualGroup
C:\Users\kavas\Documents\GitHub\PBITraining\Microsoft Demos\Travel Management\2 - Travel Management Power BI.Report	slicer
C:\Users\kavas\Documents\GitHub\PBITraining\Microsoft Demos\Travel Management\2 - Travel Management Power BI.Report	kpi

 matching_files_kpi_20241116.csv

 matching_files_slicer_20241116.csv

 matching_files_visualGroup_20241116.csv

```

1 import os
2 import csv
3 from datetime import datetime
4
5 # Create a script to find and list the files in a directory that have specific words
6 def find_files_with_words(directory, words):
7     # Add a counter to count the number of files that have been checked
8     file_count = 0
9     matching_file_count = 0
10    matching_files = []
11    print("Checking files in directory: {}".format(directory))
12    print("Words to search for: {}".format(words))
13    for root, _, files in os.walk(directory):
14        for file in files:
15            file_path = os.path.join(root, file)
16            file_count += 1
17            # Print the number of files checked and the number of matching files
18            print("\rNumber of files checked: {} | Number of matching files: {}".format(file_count, matching_file_count))
19            try:
20                with open(file_path, 'r') as f:
21                    file_content = f.read()
22                    if all(word in file_content for word in words):
23                        matching_files.append(file_path)
24                        matching_file_count += 1
25            except:
26                continue
27
28    return matching_files

```

[illegible]



DEMO – CHANGE REPORT

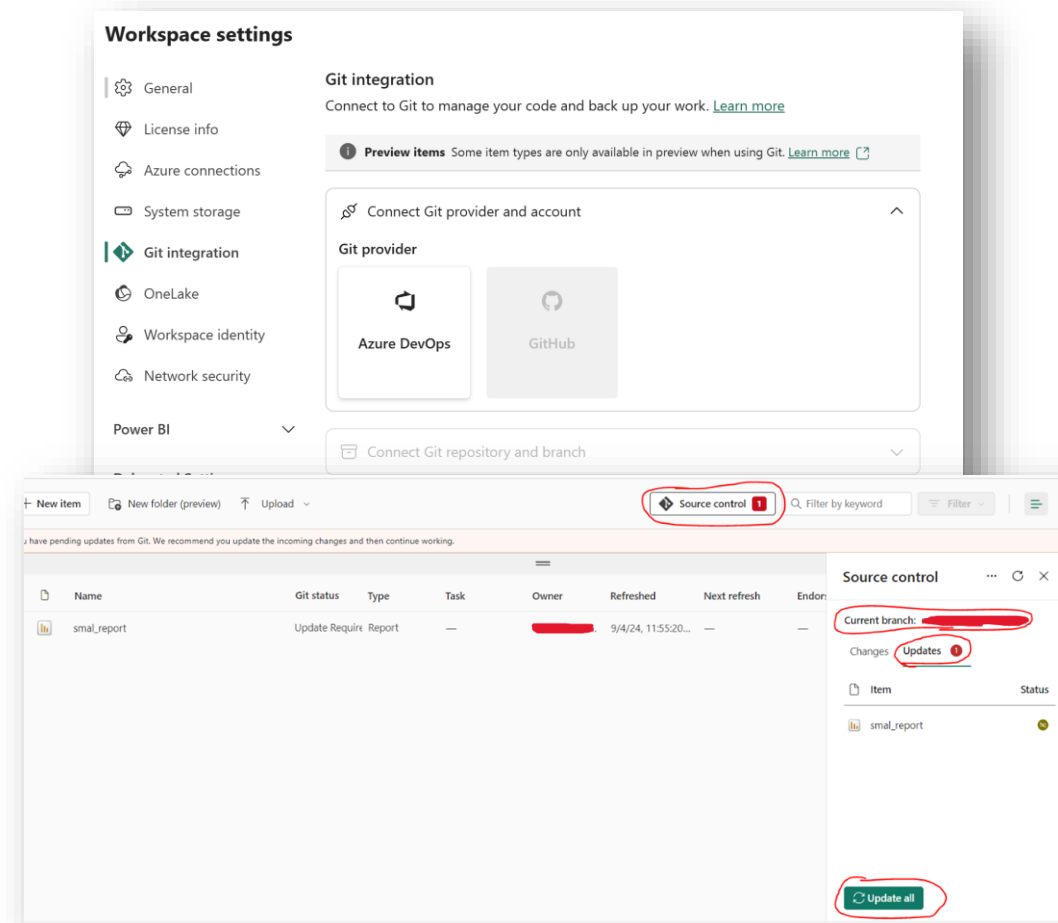


GITHUB CO-PILOT DEMO FOR CODE CREATION



REPORT DEVELOPMENT WITH CODE PILOT EXPERIENCES

- DevOps integration is synchronized 2-ways
- Any update in the web automatically updated master
- Once the report is edited through git integration then Power BI Desktop authoring is not available
- Large reports constantly erroring while saving/updating



CONCLUSION

- Currently too risky for development use
- The creative part of report development will still need a graphical interface (PBI Desktop/Web Authoring)
- Seamless integration with existing tools is essential for adoption
- Documentation and Analysis use cases
- Worth understanding and experimenting with the format
- Copilot can greatly increase productivity



THANK YOU

LinkedIn: [Kavasi Mihaly](#)

Blog: <https://selfservicebi.co.uk/>

Scripts Library:

<https://github.com/KavasiMihaly/Conference-Open>