

# Extending Power BI With Fabric: Semantic Link

Added ability to improve quality, understand metrics and share Power BI data with Data Scientists to add insights with `pre-built libraries`

*Power BI datasets contain the most refined and valuable data in your organization. With Semantic Link, we unlock this data's potential beyond traditional business intelligence by making it accessible to notebooks and Python in Microsoft Fabric.*





## Benefits of Extending Power BI with Fabric Semantic Link

### Automated **Best Practices Analysis**

Easily analyze and track all Power BI models in all workspaces

### Document and understand Business Logic using **Semantic Link**

Document tables, relationships, measures, KPIs

### Unit Test Quality using **Great Expectations** and other tools

Faster and cost savings without need of other than Power BI

### Share data models and metrics with **Data Science**

Pre-built AI empowers users and gives insights out of the box

### Add **Predictive Insights** to Power BI Reports and Data

Business Users data can easily be enhanced by Data Scientists and back



# What is: Semantic Link

Bridging Data Science and BI

## Python data access for Power BI

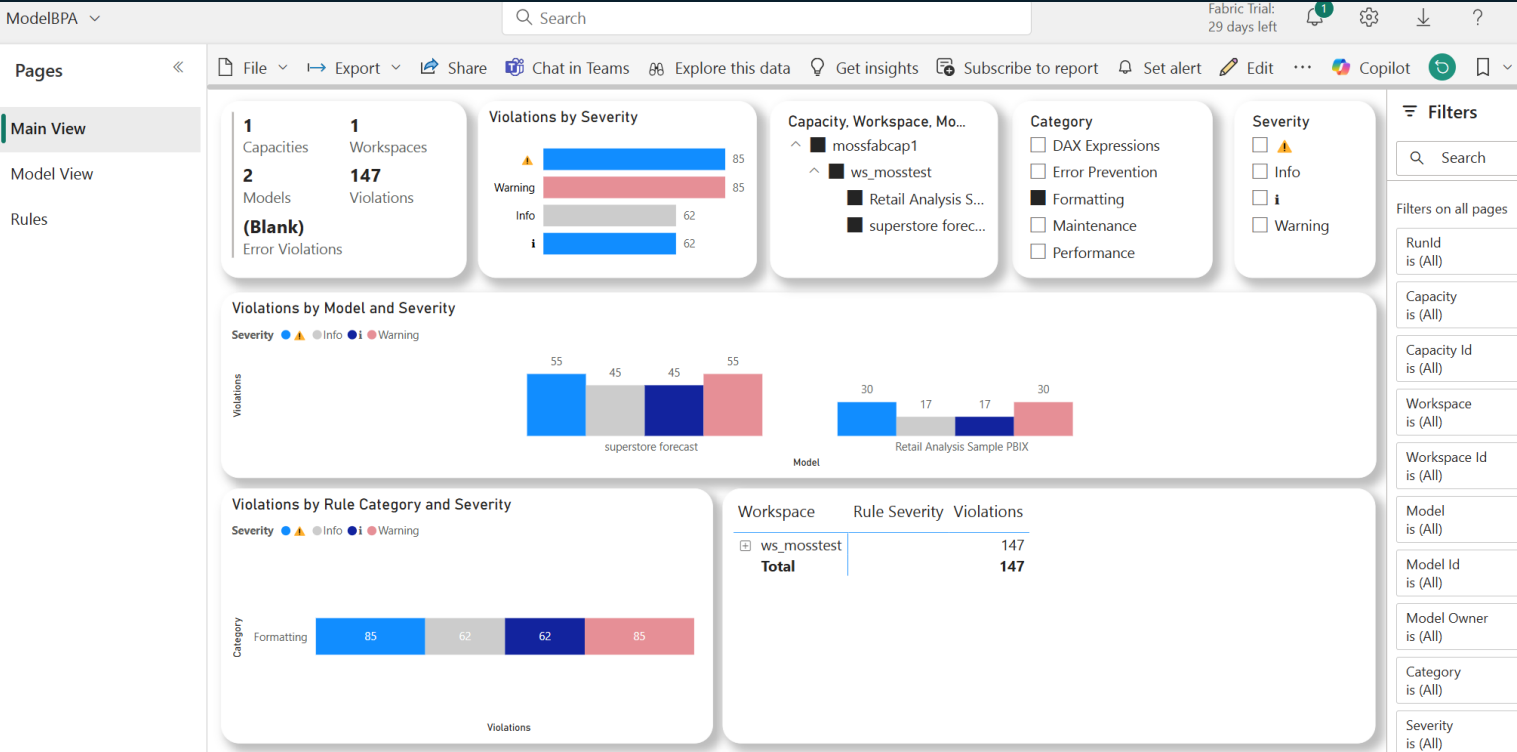
- Evaluate Power BI measures
- Read Power BI tables
- Support for Pandas and Spark
- Validate and test your data
- Automate Power BI (e.g. refresh)

...and propagate metadata to unlock more insights!

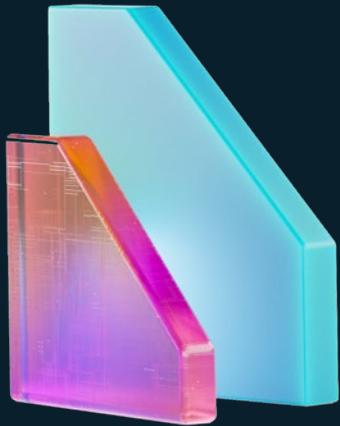


# Semantic Link Use Case: Automate Best Practices Analyzer

Easily run for all workspaces. Track improvement over time. Detailed explanation of rules. Included PBI Report.

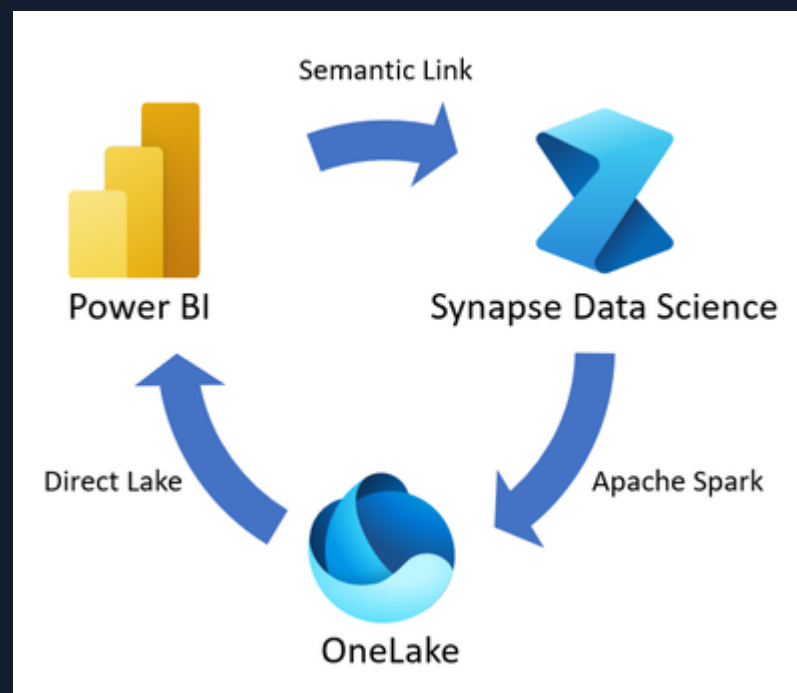


Category	Severity	Rule Name	Description
Performance	Warning	Avoid using calculated columns	Calculated columns do not compress as well as data columns so they take up more memory. They also slow down your data warehouse and turn these calculated columns into data columns.
Performance	Warning	Avoid using calculated columns	Calculated columns do not compress as well as data columns so they take up more memory. They also slow down your data warehouse and turn these calculated columns into data columns.
Performance	Warning	Check if bi-directional and many-to-many relationships are valid	<a href="https://www.sqlbi.com/articles/bidirectional-relationships-and-ambiguity-in-dax">https://www.sqlbi.com/articles/bidirectional-relationships-and-ambiguity-in-dax</a>
Performance	Warning	Check if bi-directional and many-to-many relationships are valid	<a href="https://www.sqlbi.com/articles/bidirectional-relationships-and-ambiguity-in-dax">https://www.sqlbi.com/articles/bidirectional-relationships-and-ambiguity-in-dax</a>
DAX Expressions	Error	Column references should be fully qualified	Using fully qualified column references makes it easier to distinguish between column and measure references. Then specify the column name in square brackets.
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# Semantic Link in Fabric: Business Users link to Data Scientists

Allows Business Users to Share their live Data, KPIs and Measures with Data Science...

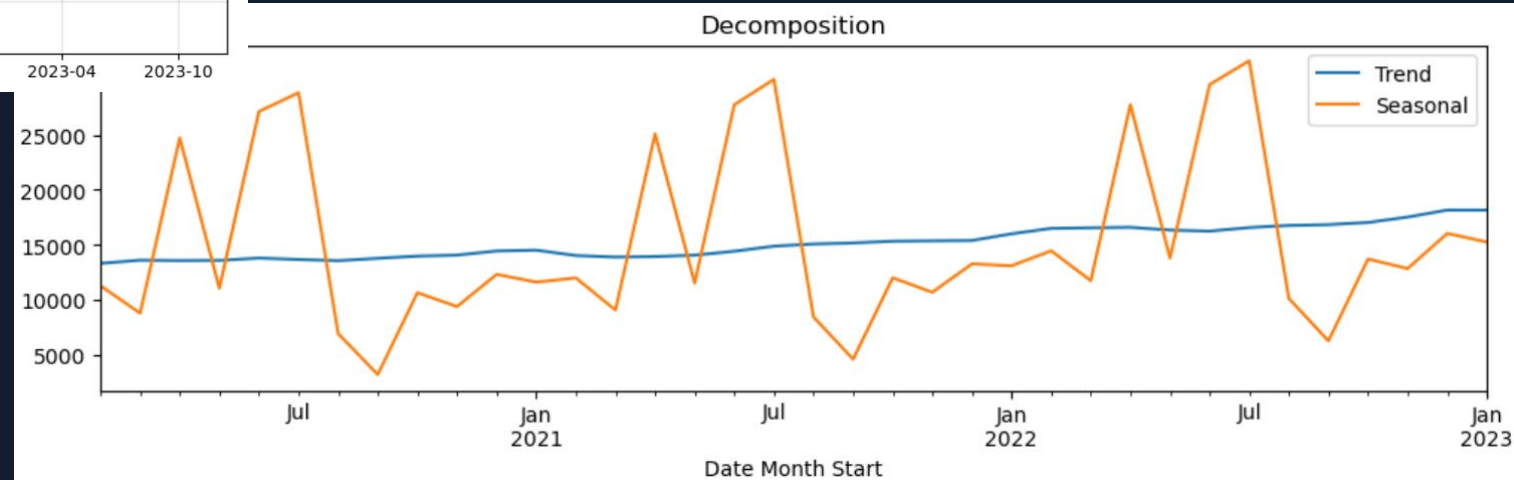
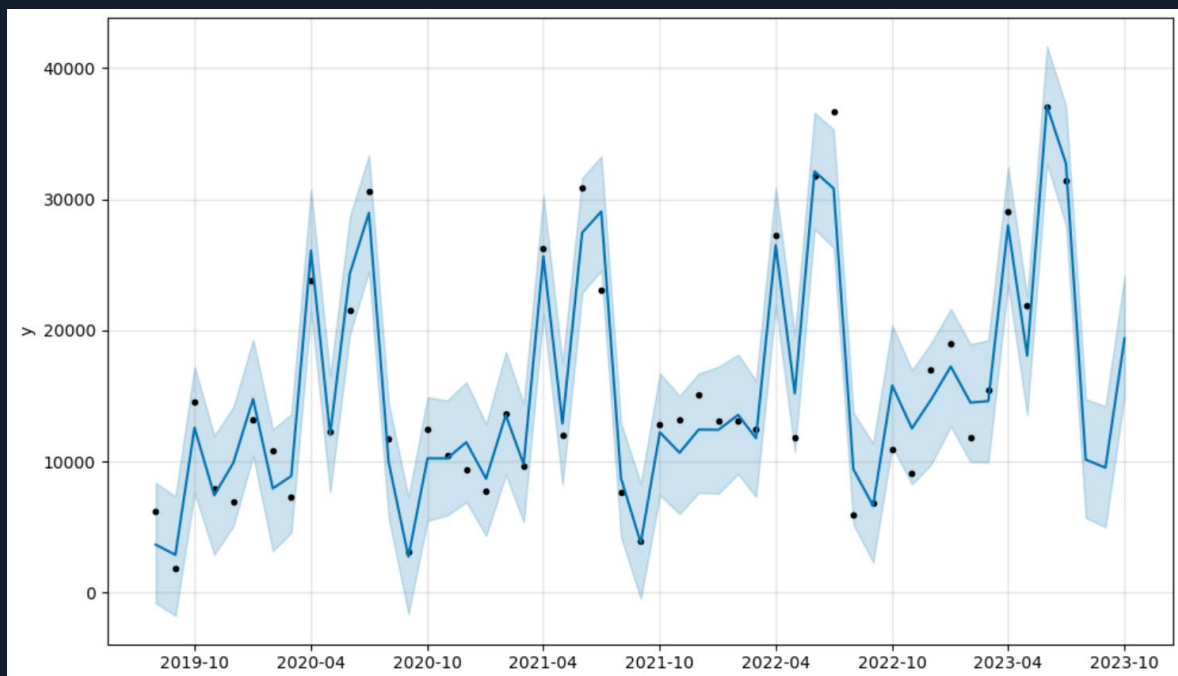


... which allows data scientists to add predictions and AI directly to their reports data, kpi and measures. Could be thought of as "Circular enrichment".



# Semantic Link in Fabric: Data Scientists add forecasting to PBI

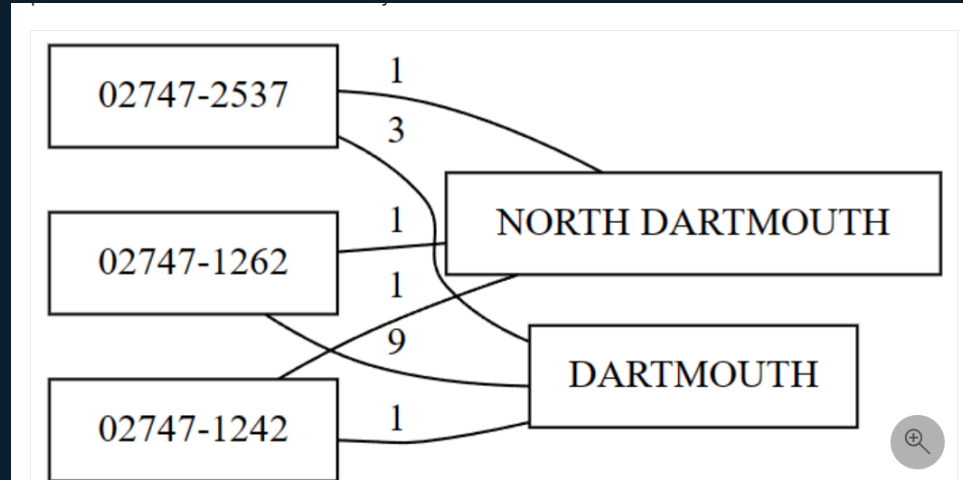
Revenue Forecasting from Power BI Data, Decomposition and trend analysis and write back to PBI.



# Semantic Link Use Case: Improve Data Quality

Identify data quality issues. Visualize issues. Understand dependencies. Validate with Great Expectations

Visualize issues



+



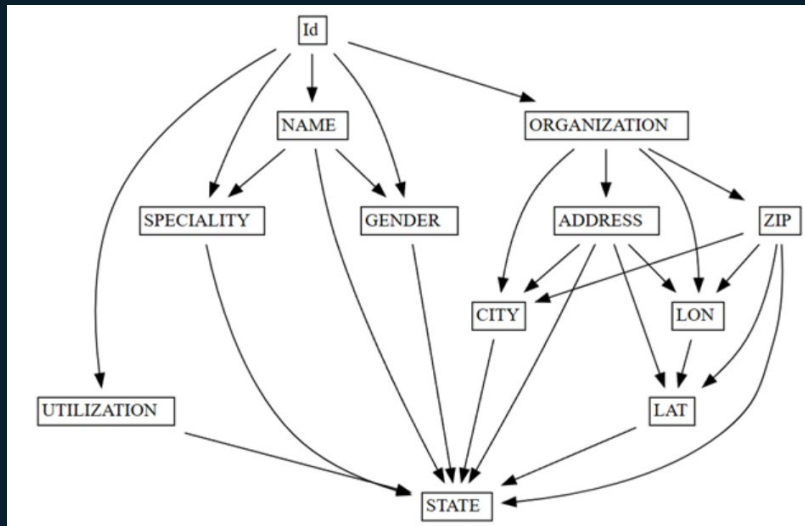
great  
expectations

Use with Semantic Link to ensure data meets specific quality standards

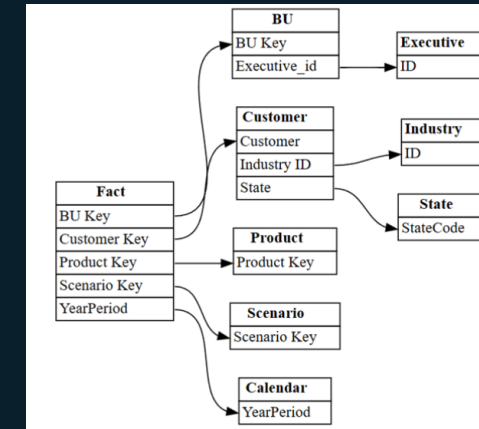
# Semantic Link Use Case: Document Models and Metrics

Visualize. Document measure/calculations used. Run measures and calculations to understand the totals.

Ensuring data quality is a crucial task and semantic link provides tools to support this. In this example we visualize existing relationships defined in your Power BI dataset.



And document the measures used, how they are calculated. And run them to test values!



Understand the data in even more detail, the find dependencies and plot dependencies metadata methods help you understand and visualize functional dependencies present in your data:

```
1 df_measures = fabric.list_measures(my_dataset_name)
2 df_measures
```

✓ - Command executed in 255 ms by System Administrator on 10:32:47 AM, 10/07/24

0	Store	Average Selling Area Size	AVERAGE([SellingAreaSize])	Double
1	Store	New Stores	CALCULATE(COUNTA([Store Type]), FILTER(ALL(Sto...	Int64
2	Store	New Stores Target		14 Int64
3	Store	Total Stores	COUNTA([StoreNumberName])	Int64
4	Store	Open Store Count	COUNTA([OpenDate])	Int64
5	Store	Count of OpenDate	COUNTA('Store'[OpenDate])	Int64
6	Sales	Regular_Sales_Dollars	SUM([Sum_Regular_Sales_Dollars])	Double
7	Sales	Markdown_Sales_Dollars	SUM([Sum_Markdown_Sales_Dollars])	Double
8	Sales	TotalSales	[Regular_Sales_Dollars]+[Markdown_Sales_Dollars]	Double
9	Sales	TotalSalesLY	CALCULATE([TotalSales], Sales[ScenarioID]=2)	Double
10	Sales	Gross Margin This Year	CALCULATE(SUM([Sum_GrossMarginAmount]), Sales[...	Double
11	Sales	Gross Margin This Year %	[Gross Margin This Year]/[TotalSalesTY]	Double



# Semantic Link Use Case: Pre-built AI Functionality!

Translations. Key Phrase Extraction. Categorization.

Translate text data with no knowledge of AI

[front desk staff, other branches, good service, DELICIOUS food, etc]

ati	ABC reviews_tex	ABC translation	ABC keyPhrases	ABC keyPhrases
	We spent the...	We spent the...	▶ ["Nice fl	["front desk staff", "other branches", "good service", "other parts", "DELICIOUS food", "other visits", "hotel", "bit", "apathy", "pool", "view", "room", "experiences"]
	Generally clo...	Generally clo...	▶ ["good br	
	El hotel en g...	The hotel ov...	▶ ["front c	
	Really enjoye...	Really enjoye...	▶ ["awesom	
	Hotel was ve...	Hotel was ve...	▶ ["2 bedrc	

Key phrase extraction to enable categorization..

And use AI to categorize, without knowledge of AI...

ABC reviews_text	ABC translation	ABC reviews_text
We spent the weekend here. Nice furnishings and the bathroo...	We spent the	El hotel en general esta OK. Un poco de apatia en el personal de recepcin, y otras ramas de personal. Muy buena atencin en la alberca. La vista desde la habitacion y otras partes del hotel, DELICIOSA La comida, he tenido experiencias mejores en otras visitas al hotel. Las habitaciones y hotel bien en general Si lo recomiendo
Generally close to Annapolis, without the hustle of tourists. Wel...	Generally clo	
El hotel en general esta OK. Un poco de apatia en el personal d...	The hotel ov...	
Really enjoyed our stay. The beds are very comfy and the staff v...	Really enjoye	
Hotel was very quiet, and the 1 and 2 bedroom suites are very ...	Hotel was ve	
ABC translation		ABC translation
		The hotel overall is OK. A bit of apathy in the front desk staff, and other branches of staff. Very good service in the pool. The view from the room and other parts of the hotel, DELICIOUS food, I've had better experiences on other visits to the hotel. The rooms and hotel are good overall Yes I recommend it

ABC reviews_tex	ABC translation	ABC keyPhrases	ABC class	ABC class
We spent the...	We spent the...	▶ ["Nice fl	facilities	service
Generally clo...	Generally clo...	▶ ["good br	facilities	
El hotel en g...	The hotel ov...	▶ ["front c	service	
Really enjoye...	Really enjoye...	▶ ["awesom	service	
Hotel was ve...	Hotel was ve...	▶ ["2 bedrc	service	