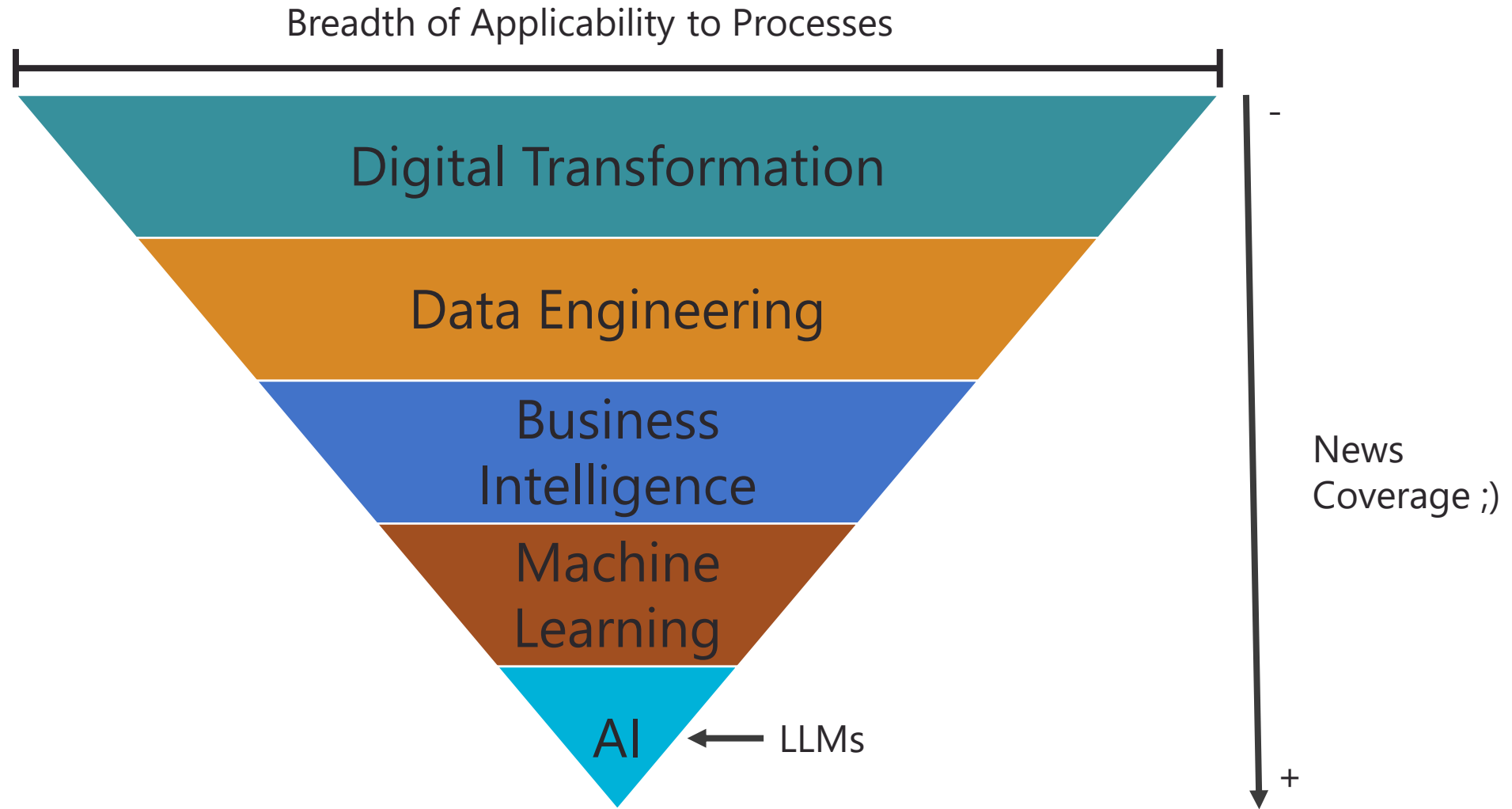


# Fabric Workshop



2025-02-28 Part 2

# Our thoughts on AI (for Organizations)



# AI Skills

The background of the slide is split vertically. The left half is a dark charcoal grey, featuring several concentric, thick-lined circles in a slightly lighter shade of grey. The right half is a solid, bright white.

# What are AI Skills?



- Generative AI system designed to provide insights that answer questions about your data, **as well as the queries to arrive to those insights.**
- Powered by Azure OpenAI.
- Able to interact with data from a Warehouse/Lakehouse, Semantic Models or KQL Databases.
- Additionally trained and tweaked via Example queries and AI instructions.

The screenshot shows a user interface for interacting with a generative AI model. At the top, a text input field contains the question "What is the most expensive product we sell?", which is highlighted with a red border. Below this, the model's response is displayed in a structured format. It shows a table with one column, "EnglishProductName", and one row, "Road-150 Red, 62". Below the table, the SQL query used to generate the result is shown: `SELECT TOP 1 EnglishProductName FROM [dbo].[DimProduct] ORDER BY ListPrice DESC;`. At the bottom, there is a text input field for "Enter a question or request to test the model's response." and a small right-pointing arrow icon. A footer note states: "Conversation history is off. The model does not retain context from previous queries. Note that AI-generated content can have mistakes. [Review terms](#)".

# How AI Skills work

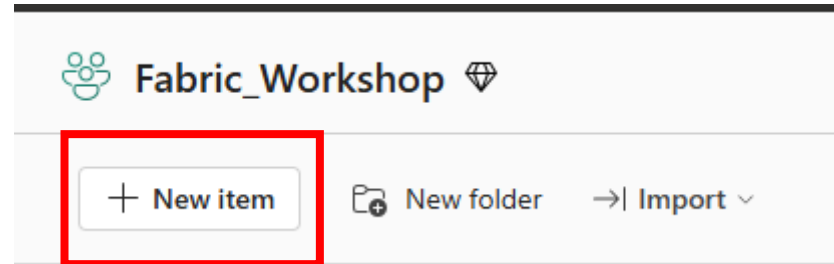
1. System uses credentials to Access the schema of the data source.
2. Prompt is constructed based on:
  - A. Question provided by user.
  - B. Metadata of the data source(s).
  - C. Example queries.
  - D. AI Instructions.
3. Query is generated based on Data Source (SQL, DAX or KQL).
4. Response is provided to the user.

# Prerequisites.

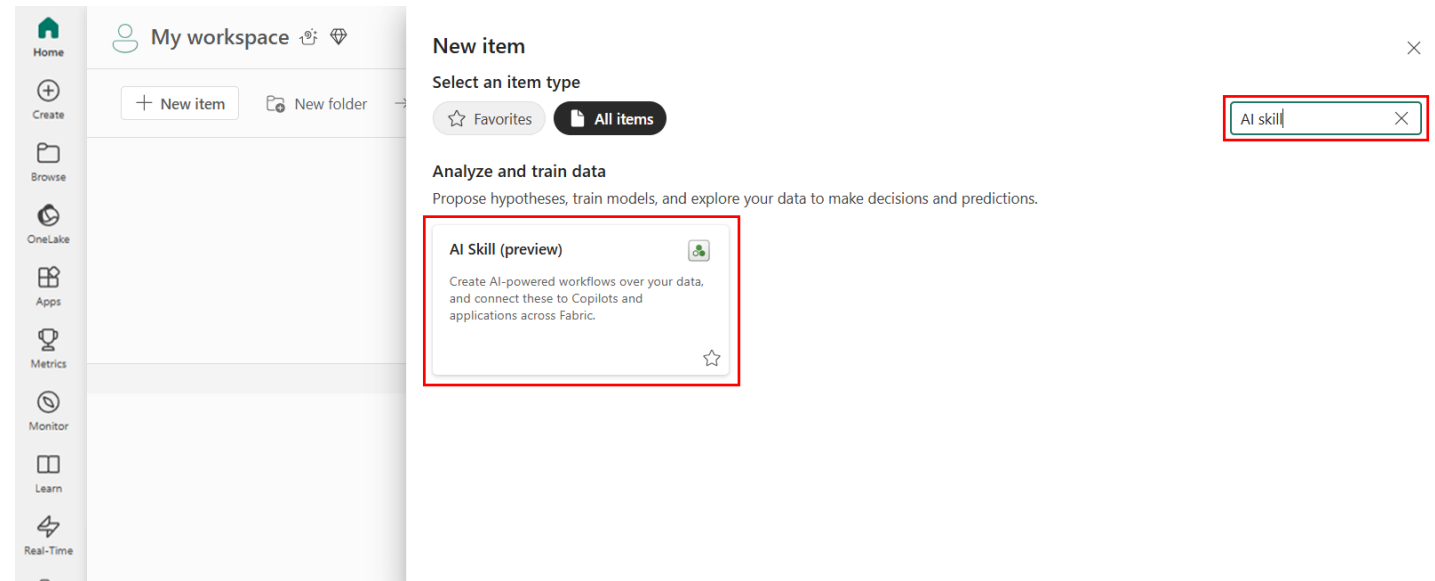
- A paid F64 or higher Fabric capacity resource.
- AI skill tenant switch is enabled.
- Copilot tenant switch is enabled.
- Cross-geo sharing and processing for AI is enabled.
- A Warehouse, Lakehouse, Semantic Model or KQL Database with data.

# Getting started in 2 steps...

1. Click on the “+ New item” button.



2. Click on **AI Skill** item.

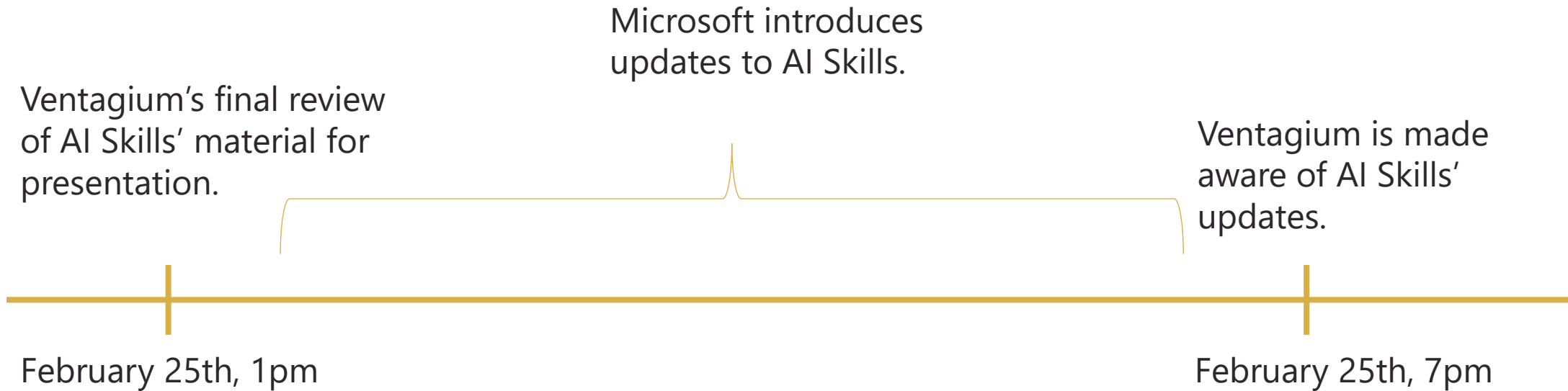


# Exercise: AI Skills Tutorial

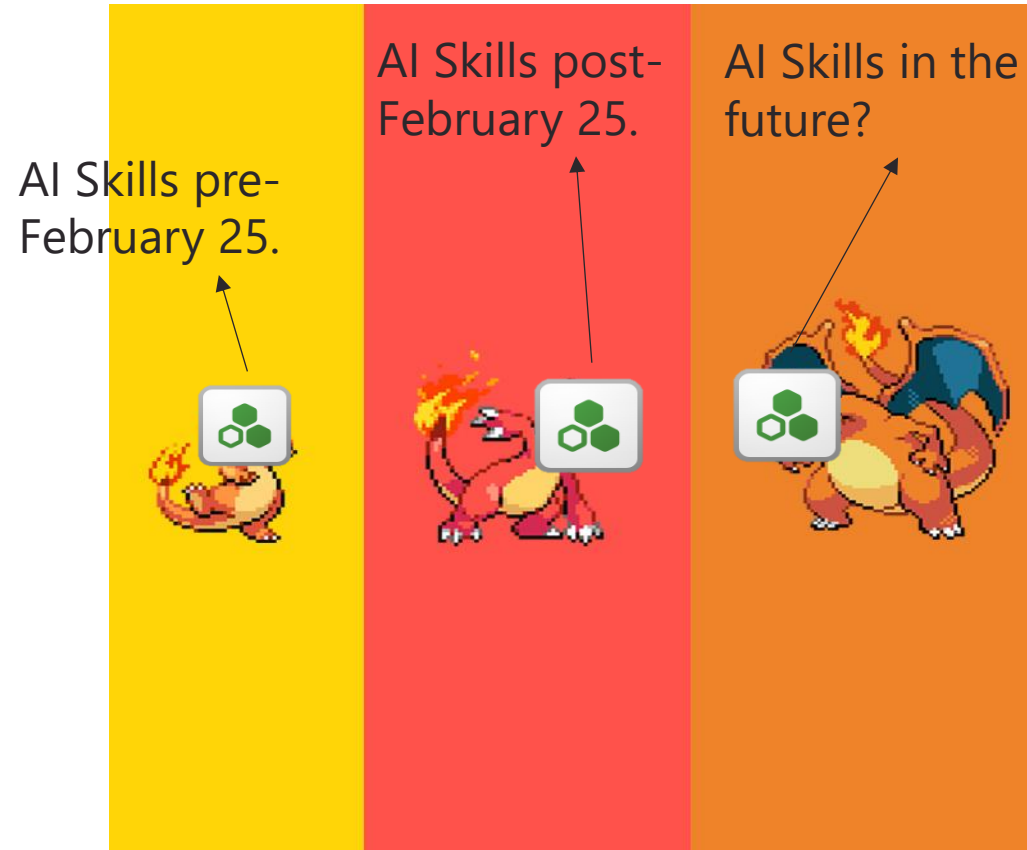




# Could be a joke, but it's actually a true story



# AI Skills' evolutionary line



Long list of  
limitations...  
(25 Feb 1 pm)

## Limitations

The AI skill is currently in public preview and has limitations. Updates will improve the AI skill over time.

- Generative AI doesn't interpret the results of an executed T-SQL query. It only generates that query.
- The AI skill might return incorrect answers. You should test the AI skill with your colleagues to verify that it answers questions as expected. If it makes mistakes, provide it with more examples and instructions.
- Only T-SQL queries on warehouses and lakehouses are supported.
- The AI skill only generates T-SQL "read" queries. It doesn't generate T-SQL queries that create, update, or delete data.
- The AI skill can only access data that you provide. It only uses the data resource configurations that you provide.
- The AI skill has data access permissions that match the permissions granted to the AI skill questioner. This is true when the AI skill is published to other locations, for example, Copilot for Microsoft 365 or Microsoft Copilot Studio.
- You can't use the AI skill to access unstructured data resources. These resources include .pdf, .docx, or .txt files, for example.
- At this time, you can only select a single warehouse or a single lakehouse.
- The AI skill doesn't support a conversational interface. Every question must be fully self-contained. It doesn't remember earlier questions.
- It blocks non-English language questions or instructions.
- You can't connect the AI skill to Fabric copilots, Microsoft Teams, or other experiences outside of Fabric.
- You can't change the LLM that the AI skill uses.
- The AI skill loses accuracy if you use nondescriptive column names.
- The AI skill loses accuracy if you use large schemas with dozens of tables.
- The AI skill is in a preview status. It has a limited scope and it might have bugs. Because of these considerations, we recommend that you avoid its use in production systems. Also avoid its use for critical decisions.
- Nondescriptive data resource column and table names have a significant, negative impact on generated T-SQL query quality. We recommend the use of descriptive names.
- Use of too many columns and tables might lower AI skill performance.
- The AI skill is currently designed to handle simple queries. Complex queries that require many joins or sophisticated logic tend to have lower reliability.

**Even longer**  
list of  
limitations...  
(25 Feb 7 pm)

## Limitations

The AI skill is currently in public preview and it has limitations. Updates will improve the AI skill over time.

- The AI skill can retrieve data by generating structured queries (SQL, DAX, or KQL) for questions that involve facts, totals, rankings, or filters. However, it can't interpret trends, provide explanations, or analyze underlying causes.
- The AI skill only generates SQL/DAX/KQL "read" queries. It doesn't generate SQL/DAX/KQL queries that create, update, or delete data.
- The AI skill can only access data that you provide. It only uses the data resource configurations that you provide.
- The AI skill has data access permissions that match the permissions granted to the user interacting with the AI skill. This is true when the AI skill is published to other locations-for example, Microsoft Copilot Studio, Azure AI Foundry, and Microsoft Teams.
- You can't add more than five data sources to the AI skill.
- You can't use the AI skill to access unstructured data resources. These resources include .pdf, .docx, or .txt files, for example.
- The AI skill blocks non-English language questions or instructions.
- You can't change the LLM that the AI skill uses.
- You can't add a KQL database as a data source if it has more than 1,000 tables or any table with over 100 columns.
- You can't add a Power BI semantic model as a data source if it contains more than a total of 100 columns and measures.
- The AI skill works best with 25 or fewer tables selected across all data sources.
- Nondescriptive data resource column and table names have a significant, negative impact on generated SQL/DAX/KQL query quality. We recommend the use of descriptive names.
- Use of too many columns and tables might lower AI skill performance.
- The AI skill is currently designed to handle simple queries. Complex queries that require many joins or sophisticated logic tend to have lower reliability.
- If you add a Power BI semantic model as a data source, the AI skill doesn't use any hidden tables, columns, or measures.
- If you previously created an AI skill that used a warehouse as a data source, and the warehouse was located in a workspace that doesn't host that AI skill, you might encounter an error. To resolve this issue, delete the existing data source and add it again.
- To add a Power BI semantic model as a data source for AI skill, you need read/write permissions for that Power BI semantic model. Querying an AI skill that uses a Power BI semantic model also requires that you have read/write permissions for the underlying Power BI semantic model.
- The AI skill might return incorrect answers. You should test the AI skill with your colleagues to verify that it answers questions as expected. If it makes mistakes, provide it with more examples and instructions.
- If you previously created and published an AI skill, and you have used its URL programmatically, the URL will no longer work if you open the AI skill in the AI skill new user interface page. To resolve this, you must republish the AI skill, and use the new URL based on the Assistants API.

# Questions?



# SQL Database in Fabric

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 <https://www.linkedin.com/in/robertohj/>



Data  
Factory



Real-Time  
Intelligence



Databases



Analytics



Industry  
Solutions



Power BI



Partner  
solutions



Copilot in Fabric



OneLake



Microsoft Purview



# SQL database in Fabric

Build AI apps faster and easier than ever

**Simple**

**Autonomous**

**Optimized for AI**

Built upon the familiar SQL Server/Azure SQL Database engine, in Microsoft Fabric

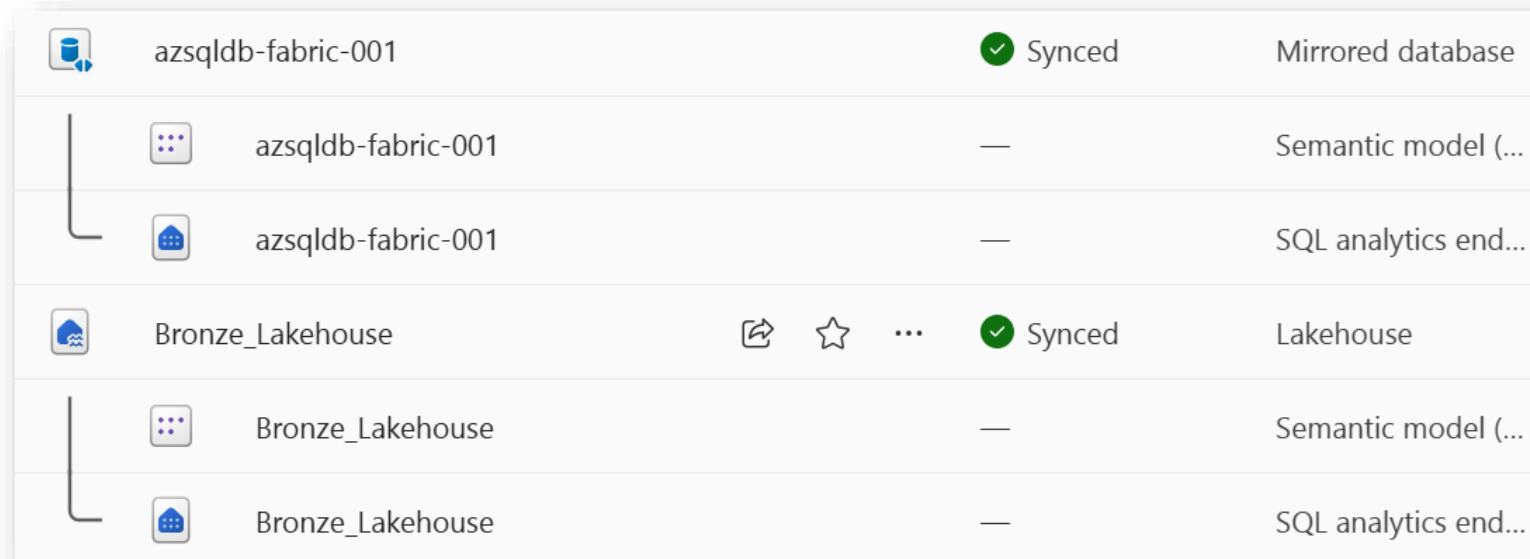














# SQL Database ([Preview](#))

- OLTP (vs OLAP)
- Based on Azure SQL Database
- Automatic provisioning and scaling
- Near real time into OneLake
  - Available with Spark, notebooks, data engineering, reports
- Query editor
  - Fabric Query Editor
  - SQL Server Management Studio
  - Visual Studio Code
- GraphQL APIs

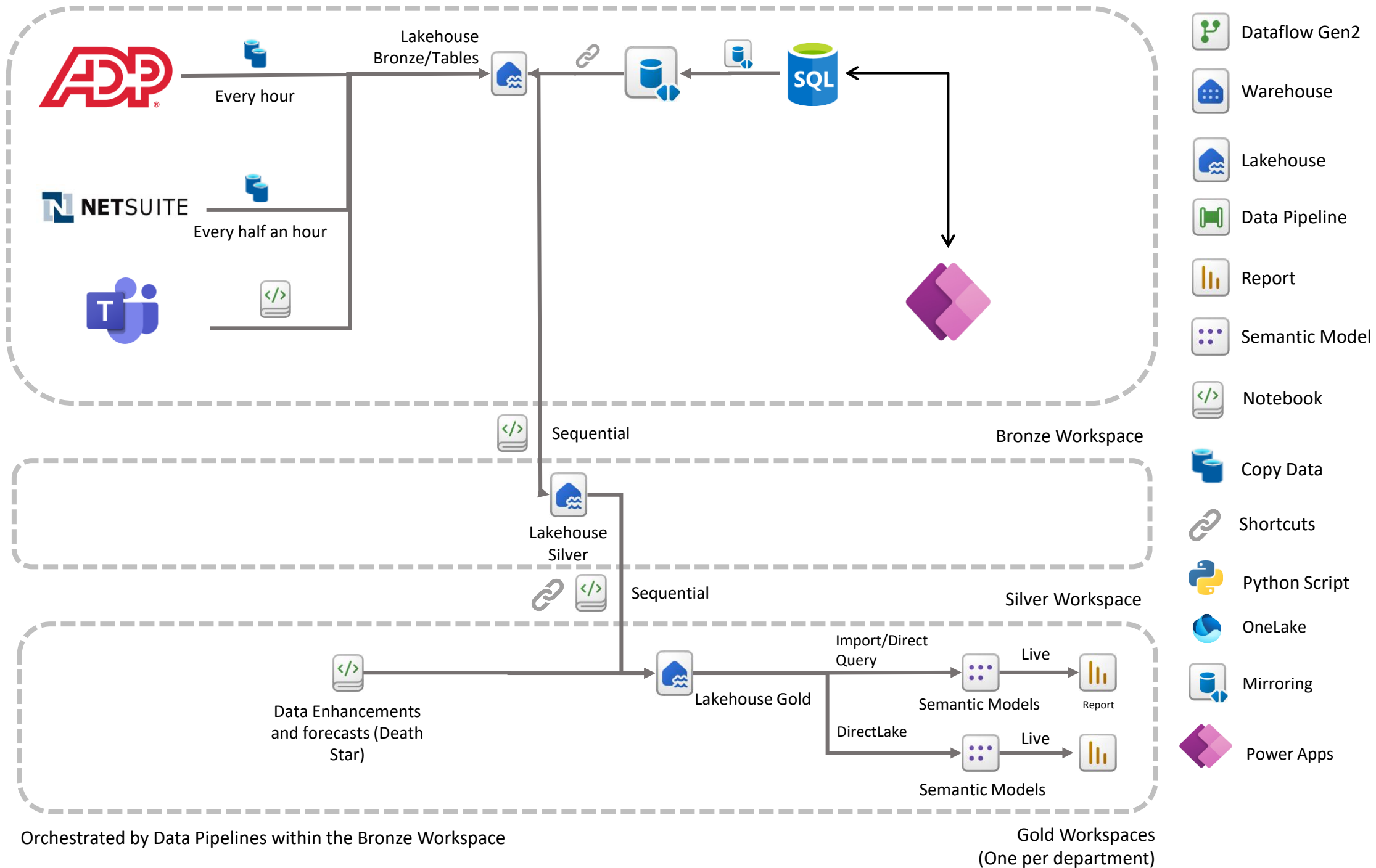
# SQL Database – Use case example

- Bring your OLTP data to Fabric: Near Real Time data

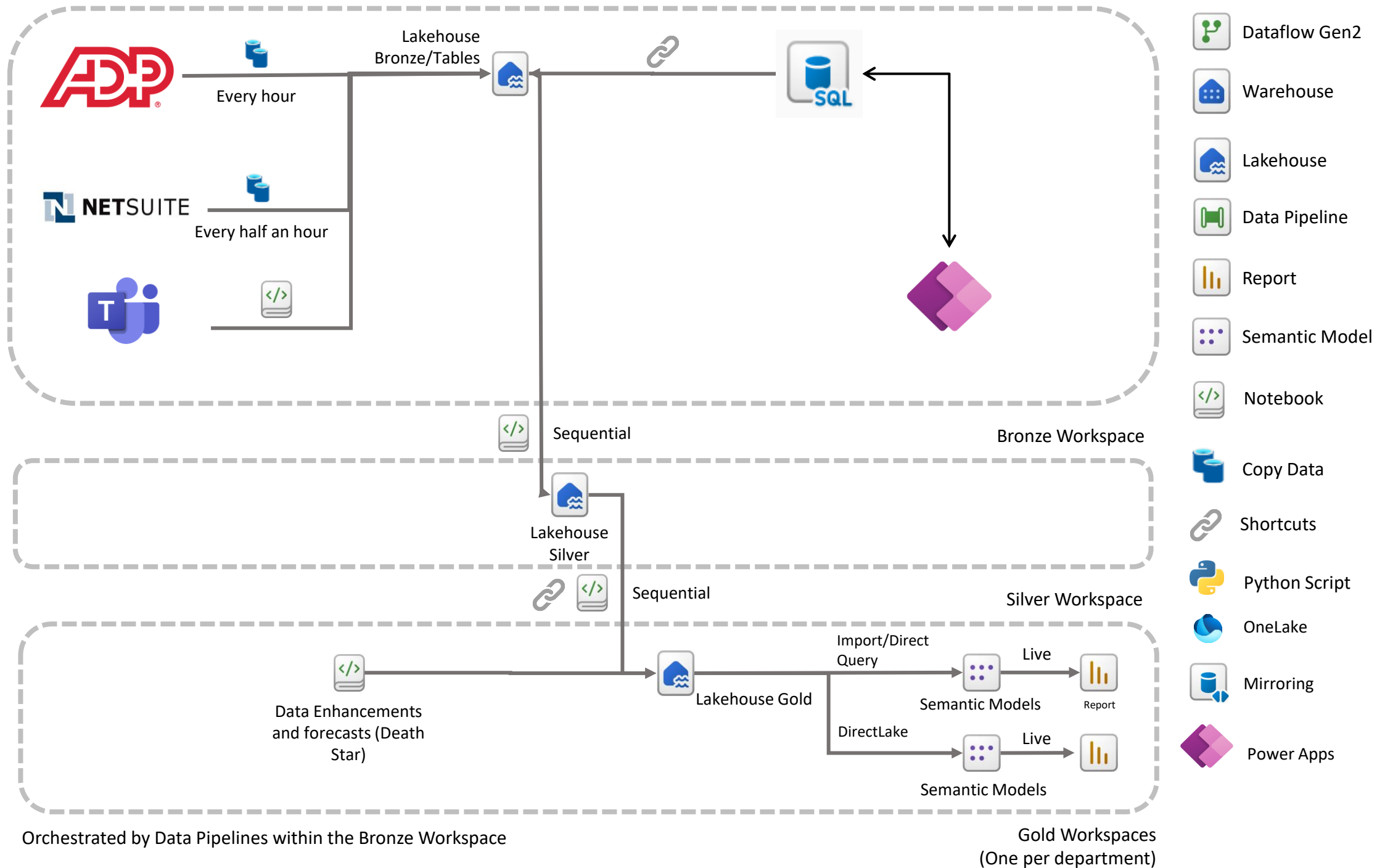


	azsqldb-fabric-001		 Synced	Mirrored database
		azsqldb-fabric-001	—	Semantic model (...)
		azsqldb-fabric-001	—	SQL analytics end...
	Bronze_Lakehouse	  ...	 Synced	Lakehouse
		Bronze_Lakehouse	—	Semantic model (...)
		Bronze_Lakehouse	—	SQL analytics end...

# Data Flow NexaCore



# Data Flow NexaCore



# DEMO – SQL Database in Fabric

- [Enable SQL Database](#) in Fabric
- 1. Create a SQL DB
- 2. Explore different sections
- 3. Upload/Create data
  - Dataflow
  - Pipeline
- 4. Copilot <- sample query
- 5. API for GraphQL <- notebook (api)
- 6. Connect to an App <- Power App

# DEMO – Enable

- Admin Portal > tenant settings
  - Enable for your tenant
  - Enable for a capacity
  - Disable

The screenshot shows the Microsoft Fabric Admin Portal settings page. The 'Admin portal' section is highlighted with a red box, showing 'SQL Database (preview)' as 'Enabled for the entire organization'. The 'Tenant settings' section is also visible, showing 'Usage metrics', 'Users', 'Premium Per User', 'Audit logs', and 'Domains' (marked as 'New'). The 'Resources and extensions' section includes 'Manage personal storage', 'Power BI settings', 'Manage connections and gateways', 'Manage embed codes', and 'Azure Analysis Services migrations'. The 'Governance and insights' section includes 'Admin portal' and 'Microsoft Purview hub (preview)'.

**Settings**

**Preferences**

- General →
- Notifications →
- Item settings →
- Developer settings →

**Resources and extensions**

- Manage personal storage →
- Power BI settings →
- Manage connections and gateways →
- Manage embed codes →
- Azure Analysis Services migrations →

**Governance and insights**

- Admin portal →
- Microsoft Purview hub (preview) →

**Admin portal**

Tenant settings **New**

- Usage metrics
- Users
- Premium Per User
- Audit logs
- Domains **New**

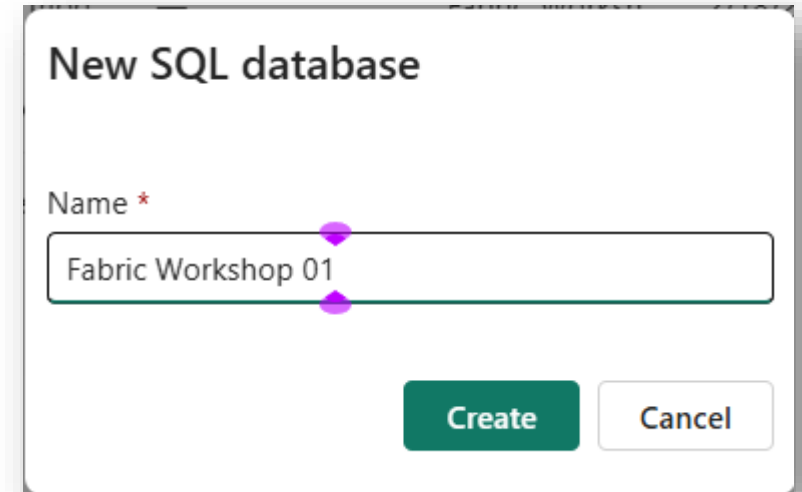
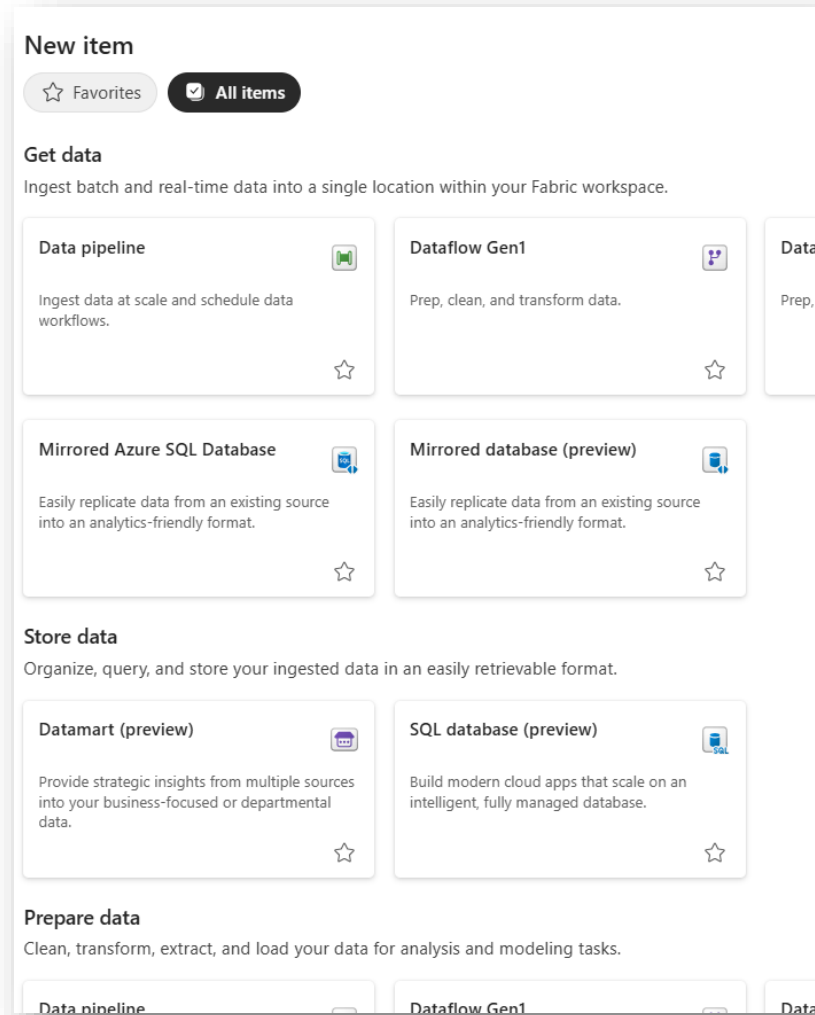
There are new or updated tenants

**Microsoft Fabric**

- API for GraphQL (preview)  
Enabled for the entire organization
- SQL Database (preview)**  
Enabled for the entire organization

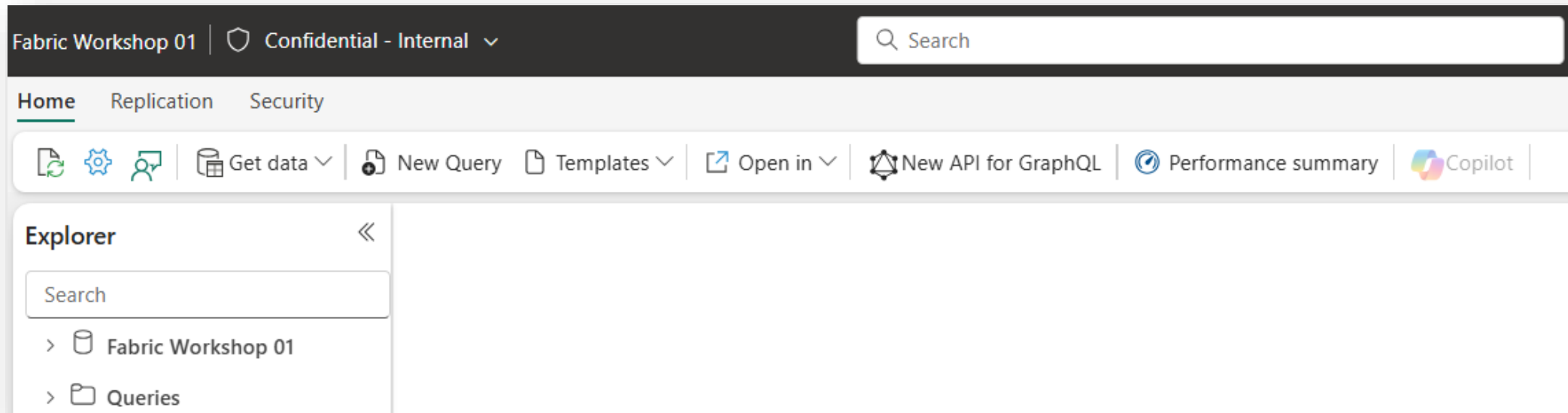
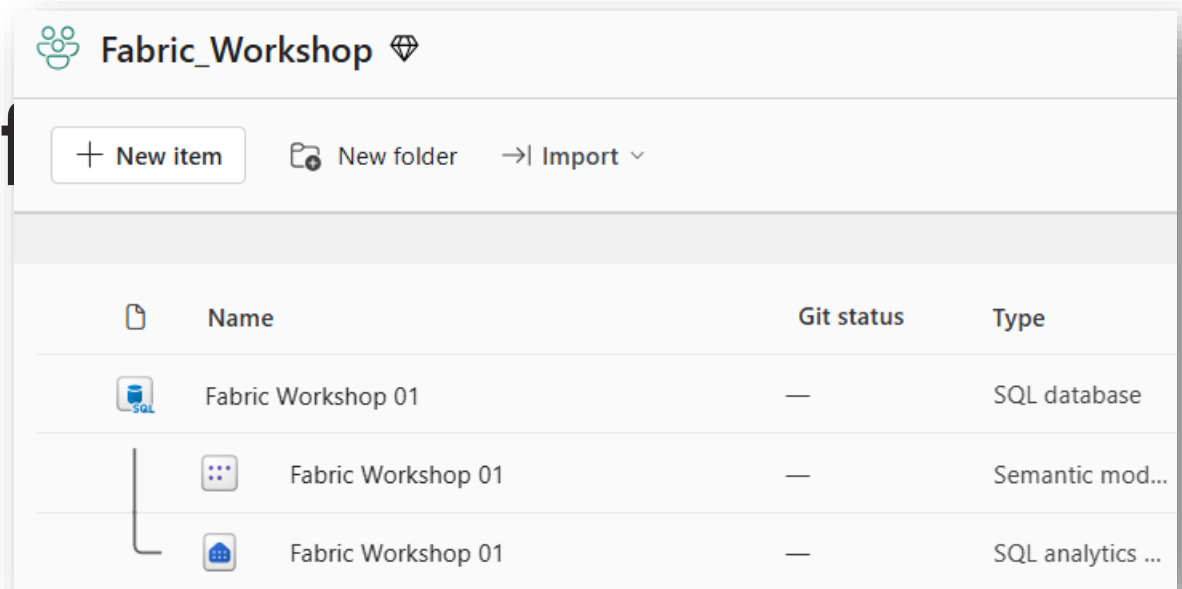
# DEMO – Create a SQL Database

- 1. Create a DB



# DEMO – Explore different sections

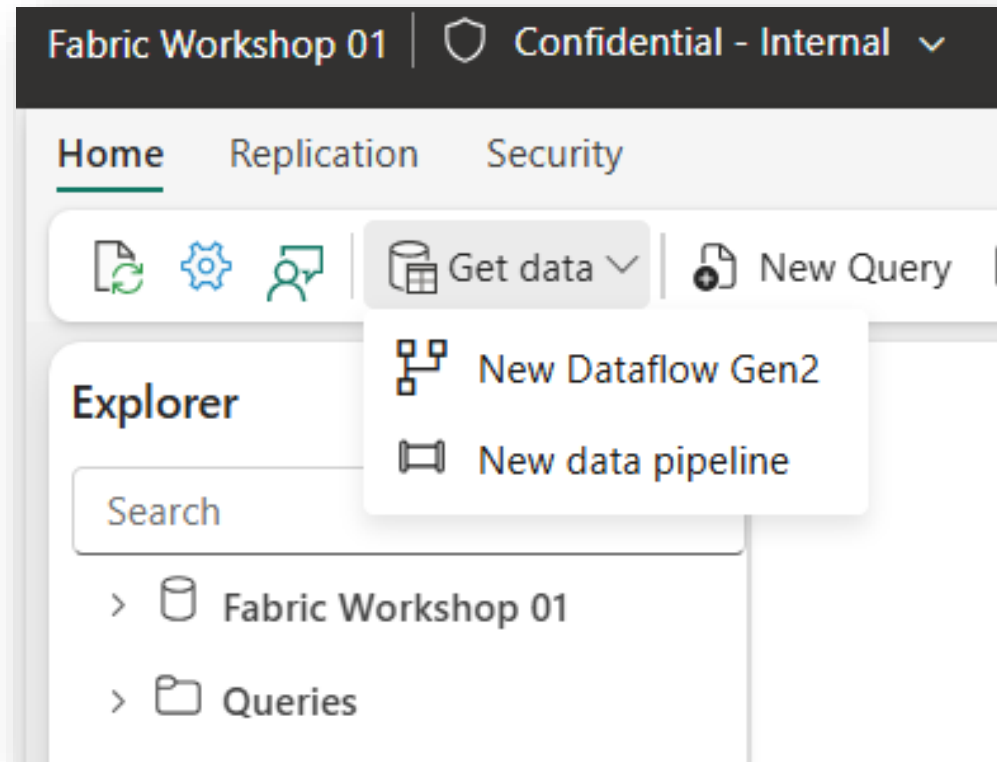
- 2. Explore different sections





# DEMO – Upload data

- **3. Upload data**
  - Dataflow Gen2
  - Pipeline

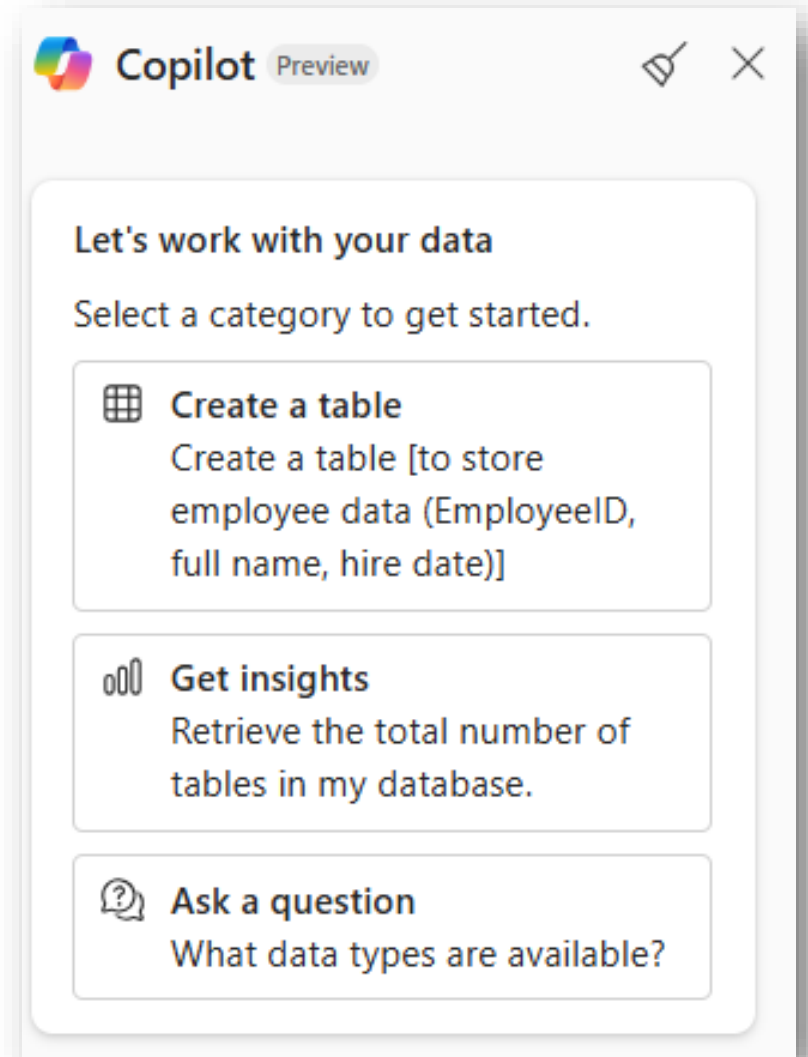


[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# DEMO – Copilot

## • 4. Copilot

- What is the product with less inventory?
- What is the product ordered more frequently?
- Give me the user that placed the more orders
- Give me the products that the top customer ordered
- Create a view to show the products with id, name, category\_name and price.



[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# DEMO – API

- 5. API for GraphQL

```
query{
  vw_Products {
    items{
      id
      name
      category_name
      price
    }
  }
}
```

The screenshot displays the Microsoft Fabric interface. On the left, the 'Schema explorer' pane shows the database structure for 'Fabric Workshop 01', including a view 'vw\_Products' with columns 'id', 'name', 'category\_name', and 'price'. Below this, the 'Queries' section shows a query named 'vw\_Products'. On the right, the 'Query1' editor shows a GraphQL query being executed. The query is:

```
1 query{
2   vw_Products {
3     items{
4       id
5       name
6       category_name
7       price
8     }
9   }
10 }
```

Below the query editor, the 'Results' pane shows the output of the query, which is a JSON array of product objects:

```
13 {
14   "name": "Running Shoes",
15   "category_name": "Home & Kitchen",
16   "price": 155
17 },
18 {
19   "id": 3,
20   "name": "Smartwatch",
21   "category_name": "Electronics",
22   "price": 14
23 },
24 {
25   "id": 4,
26   "name": "Blender",
27   "category_name": "Home & Kitchen",
28   "price": 120
29 }
```

[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# DEMO

- 5. API for G

```
query{  
  vw_Prod  
    item  
      id  
      nam  
      cat  
      pri  
    }  
}
```

## Generate code

Python

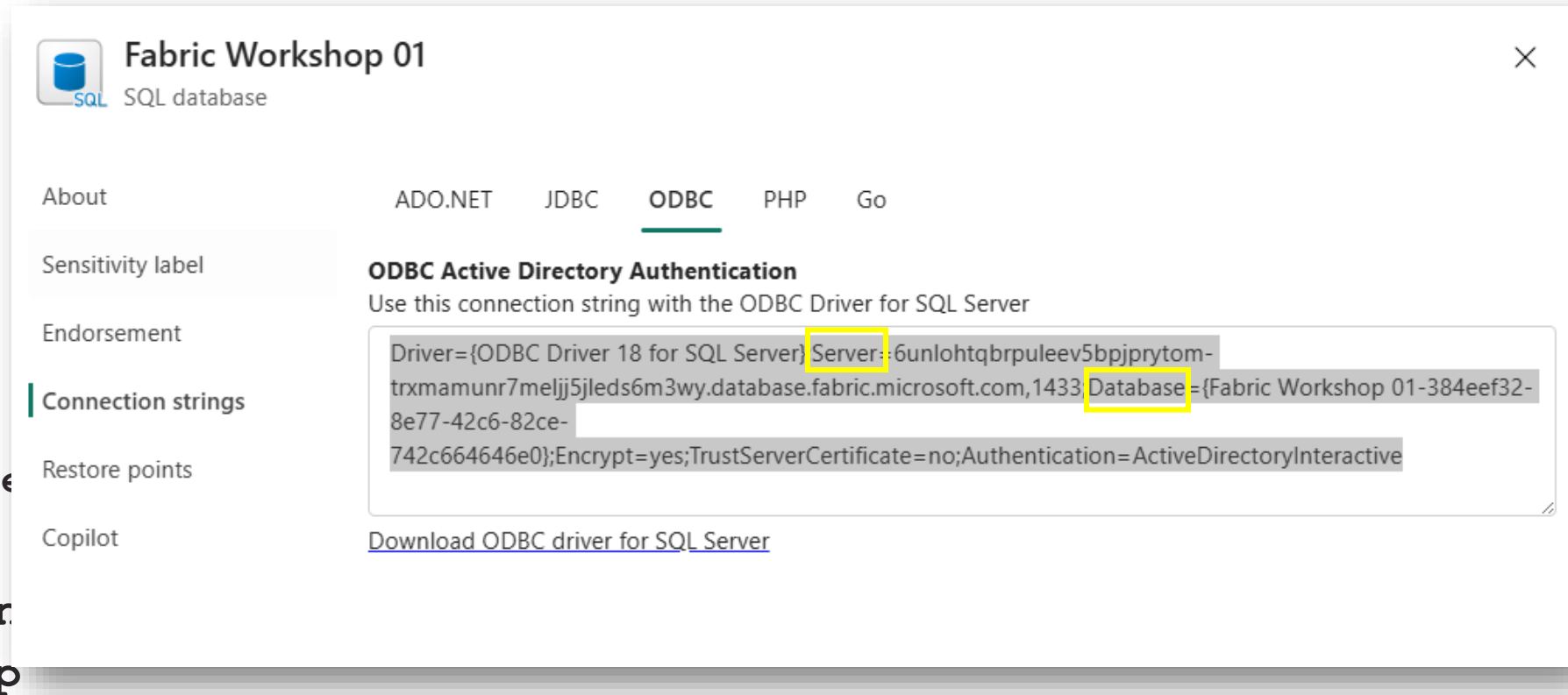
```
1 from azure.identity import InteractiveBrowserCredential  
2 import requests  
3 import json  
4  
5 # Acquire a token  
6 # DO NOT USE IN PRODUCTION.  
7 # Below code to acquire token is for development purpose only to test the GraphQL endpoint  
8 # For production, always register an application in a Microsoft Entra ID tenant and use t  
9 # https://learn.microsoft.com/en-us/fabric/data-engineering/connect-apps-api-graphql#crea  
10  
11 app = InteractiveBrowserCredential()  
12 scp = 'https://analysis.windows.net/powerbi/api/user_impersonation'  
13 result = app.get_token(scp)  
14  
15 if not result.token:  
16     print('Error:', "Could not get access token")  
17  
18 # Prepare headers  
19 headers = {  
20     'Authorization': f'Bearer {result.token}',  
21     'Content-Type': 'application/json'  
22 }
```

Copy

[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# DEMO – Connect to Apps

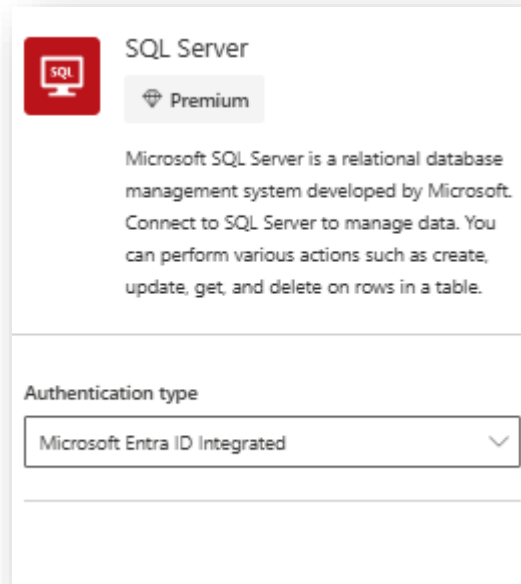
- 6. Connect
- Power App
  - Connection
    - Conn str:
      - Server
      - Database
  - Read/Write
    - Permission
    - Use in App



[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# DEMO – Connect to Apps

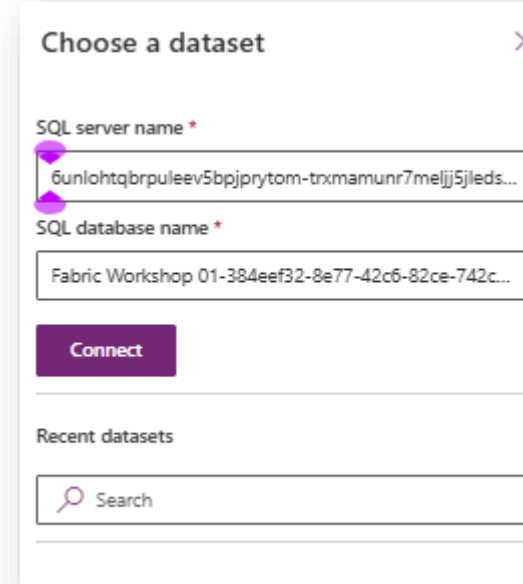
- 6. Connect
- Power App
  - Connection
    - Conn str:
    - Server
    - Database
  - Read/Write
    - Permission
    - Use in App



**SQL Server**  
Premium

Microsoft SQL Server is a relational database management system developed by Microsoft. Connect to SQL Server to manage data. You can perform various actions such as create, update, get, and delete on rows in a table.

Authentication type  
Microsoft Entra ID Integrated



**Choose a dataset**

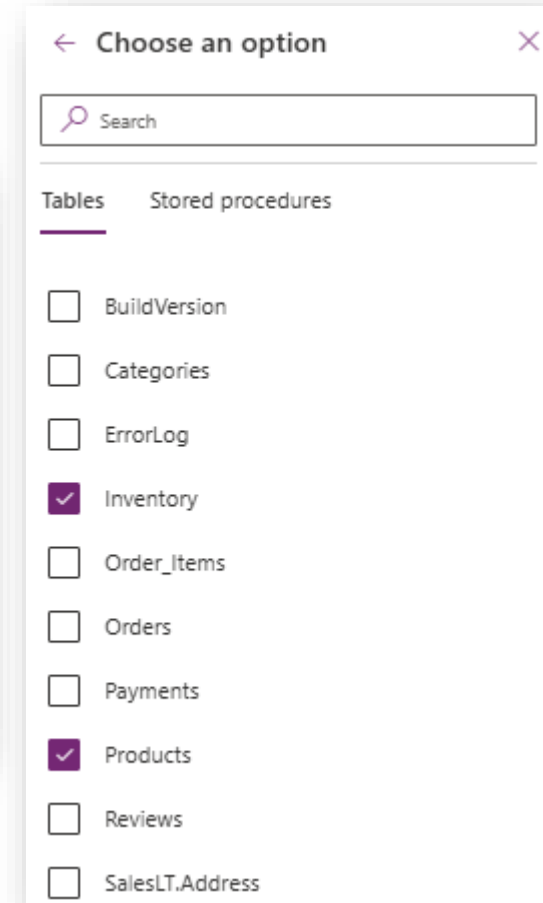
SQL server name \*  
6unlohtqbrpuleev5bpjpryom-trxmamunr7meljj5jleds...

SQL database name \*  
Fabric Workshop 01-384eef32-8e77-42c6-82ce-742c...

**Connect**

Recent datasets  
Search

```
CREATE USER [myemail@mail.com] FROM EXTERNAL PROVIDER;  
ALTER ROLE db_datareader ADD MEMBER [myemail@mail.com]; -- Read Access  
ALTER ROLE db_datawriter ADD MEMBER [myemail@mail.com]; -- Insert/Update Access
```



**Choose an option**

Search

**Tables**   Stored procedures

- ☐ BuildVersion
- ☐ Categories
- ☐ ErrorLog
- ☒ Inventory
- ☐ Order\_Items
- ☐ Orders
- ☐ Payments
- ☒ Products
- ☐ Reviews
- ☐ SalesLT.Address

[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# DEMO – Con

- **6. Connect**
- **Power App**
  - **Connection**
    - Conn str:
      - Server
      - Database
  - **Read/Write**
    - Permission
    - Use in App

Product	Category	Price
Smartwatch	Electronics	14
Bluetooth Speaker	Electronics	135
Gaming Mouse	Clothing	121
Coffee Maker	Clothing	77
Yoga Mat	Home & Kitchen	77

Id	Name	Email
1	John Doe	john.doe@example.com
2	Jane Smith	jane.smith@example.com
3	Alice Johnson	alice.johnson@example.com
4	Bob Brown	bob.brown@example.com
5	Charlie Davis	charlie.davis@example.com
6	Eve Martinez	eve.martinez@example.com
7	Frank Wilson	frank.wilson@example.com
8	Grace Lee	grace.lee@example.com
9	Hank Harris	hank.harris@example.com
10	Ivy Clark	ivy.clark@example.com
11	Robert	robert@mail.com

11

Robert

robert@mail.com

Add User

[https://docs.google.com/spreadsheets/d/1\\_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx](https://docs.google.com/spreadsheets/d/1_J5etWV3L2Or9vk5nkH2ScmhQsQx8FjY/export?format=xlsx)

# References

- [SQL Database in Fabric](#)
- [API for GraphQL](#)



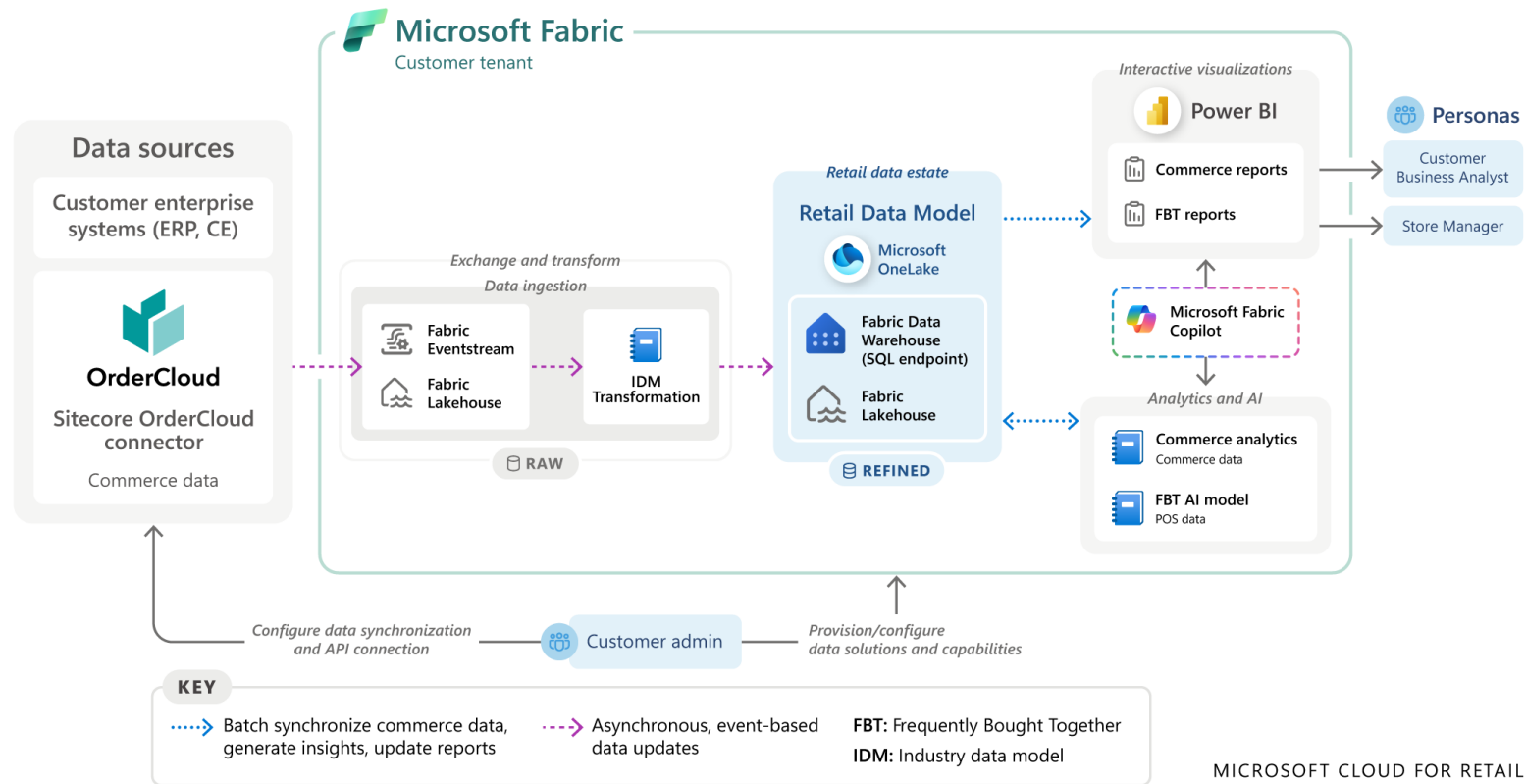
# Industry Solutions

# Industry Solutions – Intro

- Industry Data Models
  - Standardization: A consistent structure for storing and organizing retail data. This simplifies data management and analysis.
  - Efficiency: Simplify data input and minimize errors by providing preset fields and formats for retail data.
  - Data integrity: Apply data validation rules and quality checks to ensure accurate reporting and analysis.
  - Consolidation: Make data easier to work with by consolidating data from different sources like POS, ecommerce, etc.
  - Analysis and reporting: Well structured data lead to high quality insights and timely decision-making.
  - Data governance: Ensure compliance, security, and privacy for data visibility.
- Pre-built AI/ML Retail Models

# Retail Data Solutions - Example

## Retail data solutions



# Data Science with Fabric

**Roberto Hernández**

roberto.Hernandez@ventagium.com

 <https://www.linkedin.com/in/robertohj/>

# Data Science in Fabric

Microsoft Fabric offers Data Science experiences to empower users to complete **end-to-end data science workflows** for the purpose of data enrichment and business insights. You can complete a wide range of activities across the entire data science process, all the way from data **exploration, preparation** and **cleansing** to experimentation, **modeling**, model scoring and serving of predictive insights to BI reports.

## New

Current workspace:  my\_workspace

Items will be saved to this workspace.



ML model



Experiment



Notebook



Environment  
(Preview)



Import notebook



Use a sample

## Recommended



**Getting Started with Data  
Science**



Getting Started with ML Models



**Getting Started with Data  
Science**



Getting Started with ML Experiments

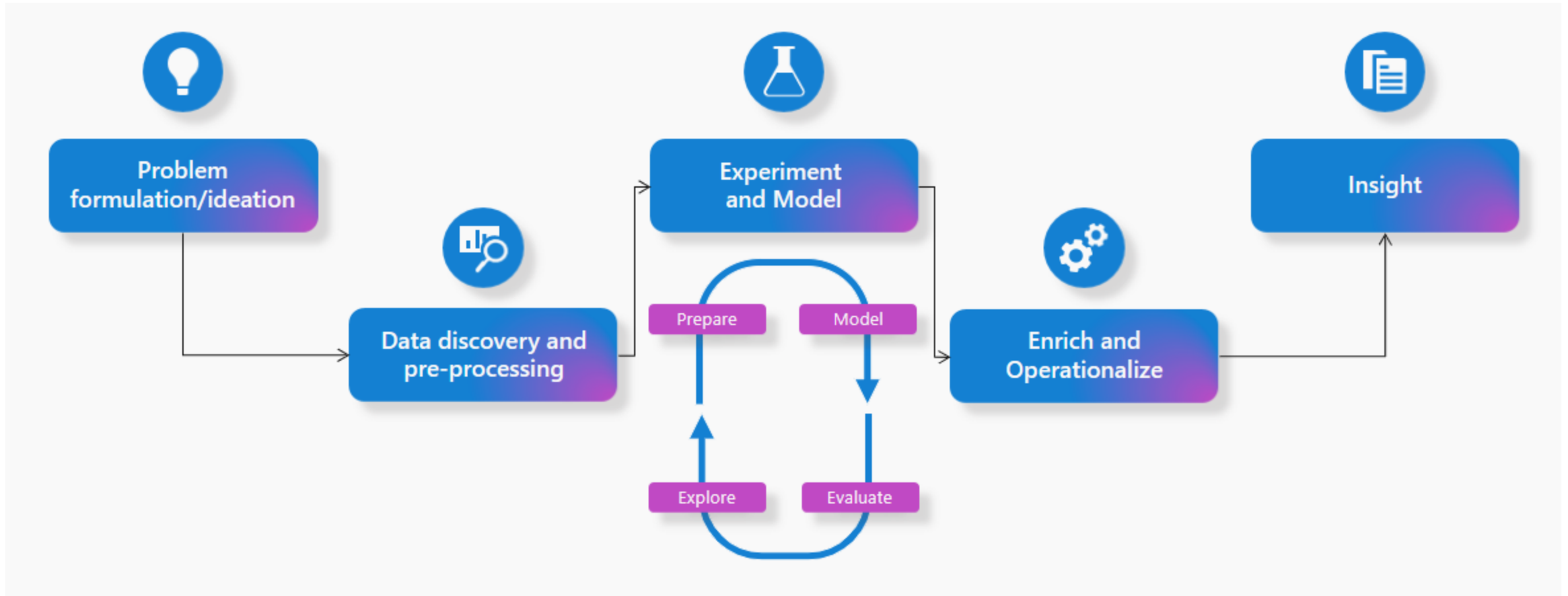


**Getting Started with Data  
Science**



Getting Started with Notebooks

# The Data Science Process



# Data Wrangler

- A tool in Notebooks that prepares data and generates Python code
- Useful for quick data exploration and cleansing



# Machine Learning experiments

- The primary unit of organization and control for all related machine learning runs Useful for quick data exploration and cleansing
- Actions:
  - Log parameters, code versions, metrics, and output files when running their machine learning code.
  - Visualize, search for, and compare runs
  - Download run files and metadata for analysis in other tools.

# References

- [Data Science in Fabric](#)
- [Data Wrangler](#)
- [Machine Learning Experiments](#)
- [MLFlow](#)

# Open AI + Fabric

## Overview of Integration

- APIs
- Azure OpenAI Service
- Fabric's Capabilities (Spark notebooks, Data Factory Pipelines)

## Key Use Cases

- Data Summarization
- Text Classification
- Chatbot Assistance for Insights
- Automated Data Cleaning

# Fabric + Open AI

## Key Considerations

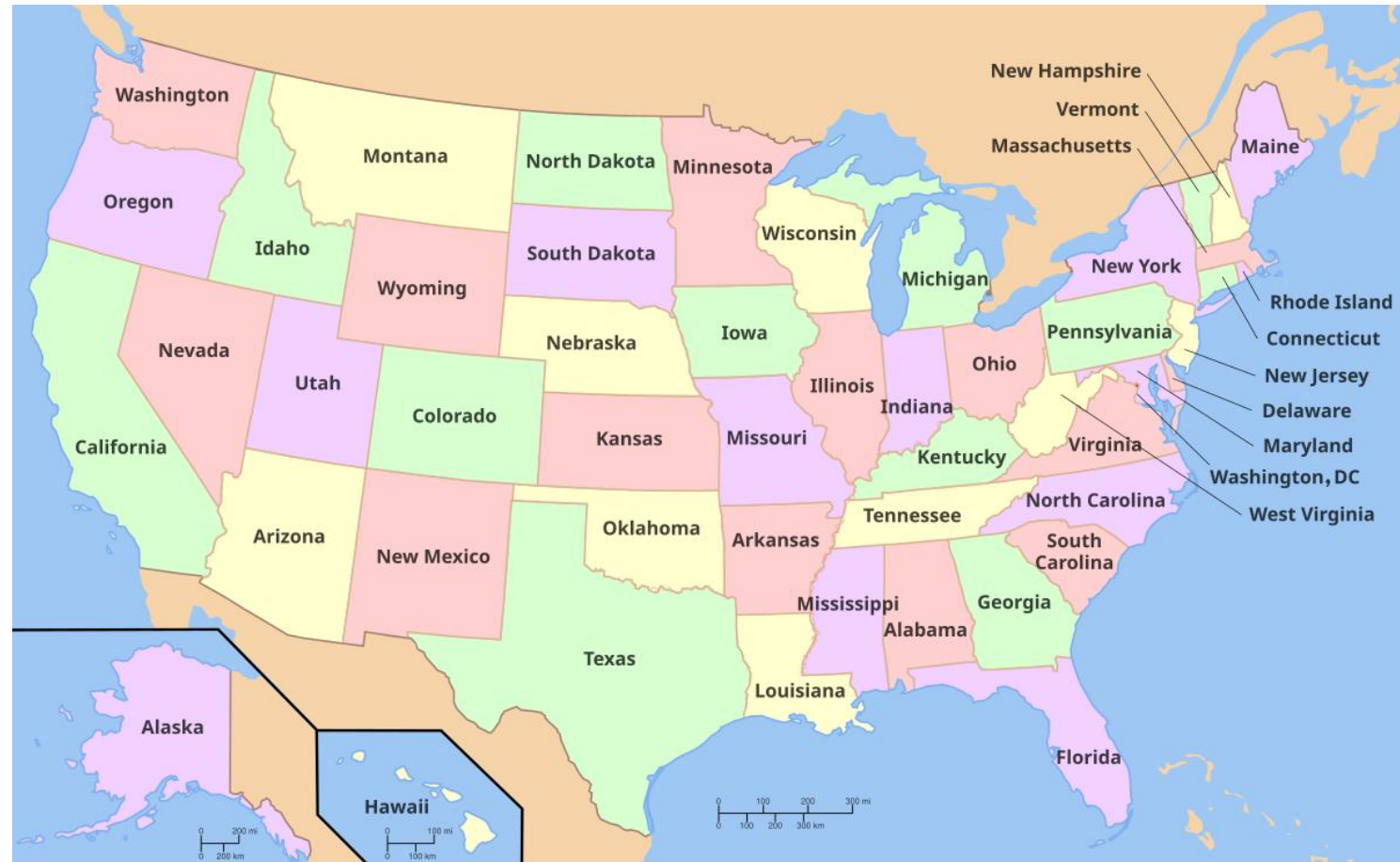
API Rate Limits & [Pricing](#)

Data Security & Governance

Model	Input	Cached input	Output
<b>gpt-4o</b> ↳ gpt-4o-2024-08-06	\$2.50	\$1.25	\$10.00
<b>gpt-4o-audio-preview</b> ↳ gpt-4o-audio-preview-2024-12-17	\$2.50	-	\$10.00
<b>gpt-4o-realtime-preview</b> ↳ gpt-4o-realtime-preview-2024-12-17	\$5.00	\$2.50	\$20.00
<b>gpt-4o-mini</b> ↳ gpt-4o-mini-2024-07-18	\$0.15	\$0.075	\$0.60
<b>gpt-4o-mini-audio-preview</b> ↳ gpt-4o-mini-audio-preview-2024-12-17	\$0.15	-	\$0.60
<b>gpt-4o-mini-realtime-preview</b> ↳ gpt-4o-mini-realtime-preview-2024-12-17	\$0.60	\$0.30	\$2.40
<b>o1</b> ↳ o1-2024-12-17	\$15.00	\$7.50	\$60.00
<b>o3-mini</b> ↳ o3-mini-2025-01-31	\$1.10	\$0.55	\$4.40
<b>o1-mini</b> ↳ o1-mini-2024-09-12	\$1.10	\$0.55	\$4.40

# Case Study: Home Delivery with Open AI

- Context:
  - Thousands of reviews with comments.
  - 5 Carriers
  - 100 Hubs
- Problem:
  - Providing Actionable Insights from Reviews



# Fabric + Open AI Demo