



Microsoft Fabric

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Microsoft Fabric
COMMUNITY CONFERENCE

SQLCON

Microsoft SQL
COMMUNITY CONFERENCE

ATLANTA MARCH 16 - 20, 2026

AGENTIC DEVELOPMENT IN POWER BI FOR NON-DEVELOPERS

If you're feeling underwater....we've got you.



Tori Pinheiro — Ex-fisheries ecologist, PM
Emily Lisa — Current SCUBA diver, GPM

DISCLAIMER: THIS IS A TALK FOR NEWBS!

If you...

- are a developer or generally technical
- are familiar with AI basics
- know what “agentic development” actually means
- think “vibe coding” is for plebes

This talk is not for you, you may go now!

***Hot tip:** Check out Rui Romano’s talk on Agentic Development for pro-devs instead!*

BUT if you...

- are an AI newb
- are drowning in agentic development jargon (MCP server, skill, tool, agent, model, CLI, IDE...)
- want to see what they hype is about but don’t know where to start

This talk IS EXACTLY for you. Welcome!



FROM A SCUBA DIVER & A FISH ECOLOGIST:

We're used to being
underwater...but this AI
revolution is a *lot*.



GOALS FOR THIS SESSION



Translate AI buzzwords into concrete concepts



Demo how you can start using agentic development in Power BI

THE MODELS AND THE AGENTS THAT USE THEM

Many people confuse the actual “AI” (or the models) with the agents they interact with (and the chat interfaces they use to interact with them).

Note that there are both first- and third-party agents!

Company that produces the model	Model	Example agents that use that model
Google	Gemini 3 Pro	Gemini
Open AI	GPT 5.4 CODEX 5.3	Chat GPT, Power BI Report Copilot GitHub Copilot
Anthropic	Claude Opus 4.6	Claude, Claude Code

- If you’re still skeptical about how useful AI is...you’re probably using old models.
- Experiment! Things are constantly changing.

CORE CONCEPTS & METAPHORS

Definition	Metaphor
Agent The coordinator that decides what to do next, which tools to use, and when to stop	Chef de Cuisine She has attended culinary school, she takes the orders, sequences prep, keeps going till everyone is fed.
Model (LLM) The reasoning engine (brain) that interprets instructions and produces text, plans, or decisions.	The cook's brain Understands orders, interprets recipes, etc. It can reason, but can't prepare a meal alone.
Skill Folder of knowledge and functionality exposed to the agent.	A recipe or technique Lists instructions and the kitchen equipment needed to achieve a specific outcome
MCP Server Service that exposes tools in a standard, discoverable way.	A well-documented commercial kitchen Houses all the equipment, enforces safety rules, has clear instructions about what equipment to use when.
Tool External capabilities the agent can call to take actions.	Kitchen equipment or appliance Ovens, knives, inventory systems. Each tool DOES something, but needs the cook to use them.

MAPPING OUR METAPHORS TO POWER BI

GitHub Copilot | Agent | Chef

The agent we'll use to produce a semantic model from messy raw data. Breaks your goal into steps, decides which skills to load and tools to call, keeps looping until it's done

Claude Opus 4.6 | Model | Brain

The model that the agent will leverage to interpret your intent, reason, and plan.

Fabric skill for semantic modeling | Agent skill | Recipe

Explains how to execute modeling operations, like designing a star schema or name tables and columns, and describes what capabilities are needed. Lives as a SKILL.md file in the Skills for Fabric repo and is loaded by Copilot CLI when the agent decides it's relevant

Power BI Modeling MCP server | MCP Server | Well-documented kitchen

MCP server that makes Power BI *operable* by an agent. Without it, we'd have instructions but no way to act on them. Exposes modeling capabilities as discoverable tools and enforces auth, permissions, and safety.

RunDAXQuery, CreateTable, etc. | Tools | Kitchen equipment

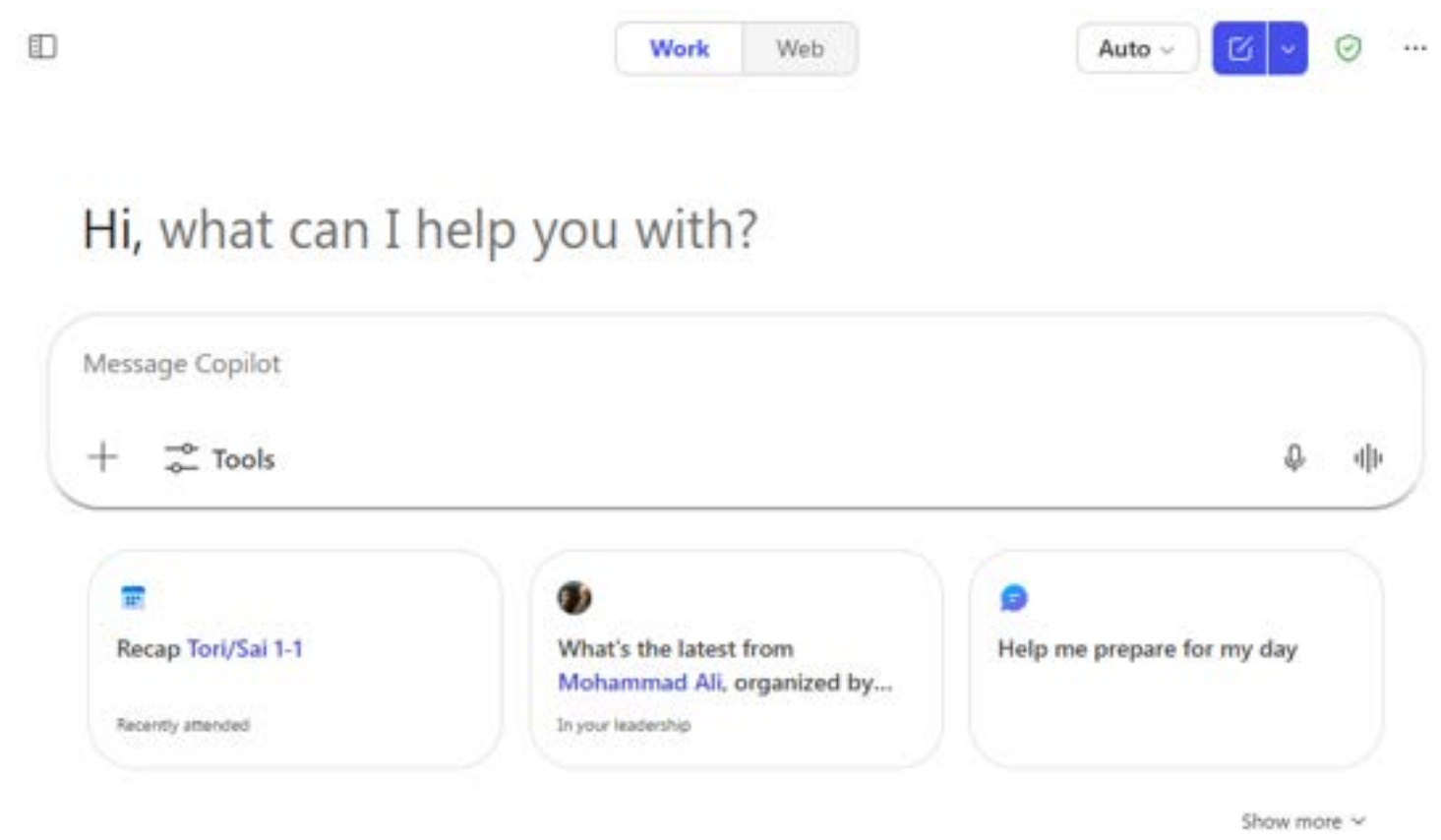
Tools that execute modeling operations, which are exposed by the Modeling MCP Server

TWO WAYS TO USE AI: CHAT VS. DEV ENVIRONMENTS

Chat Interfaces

(the more common way)

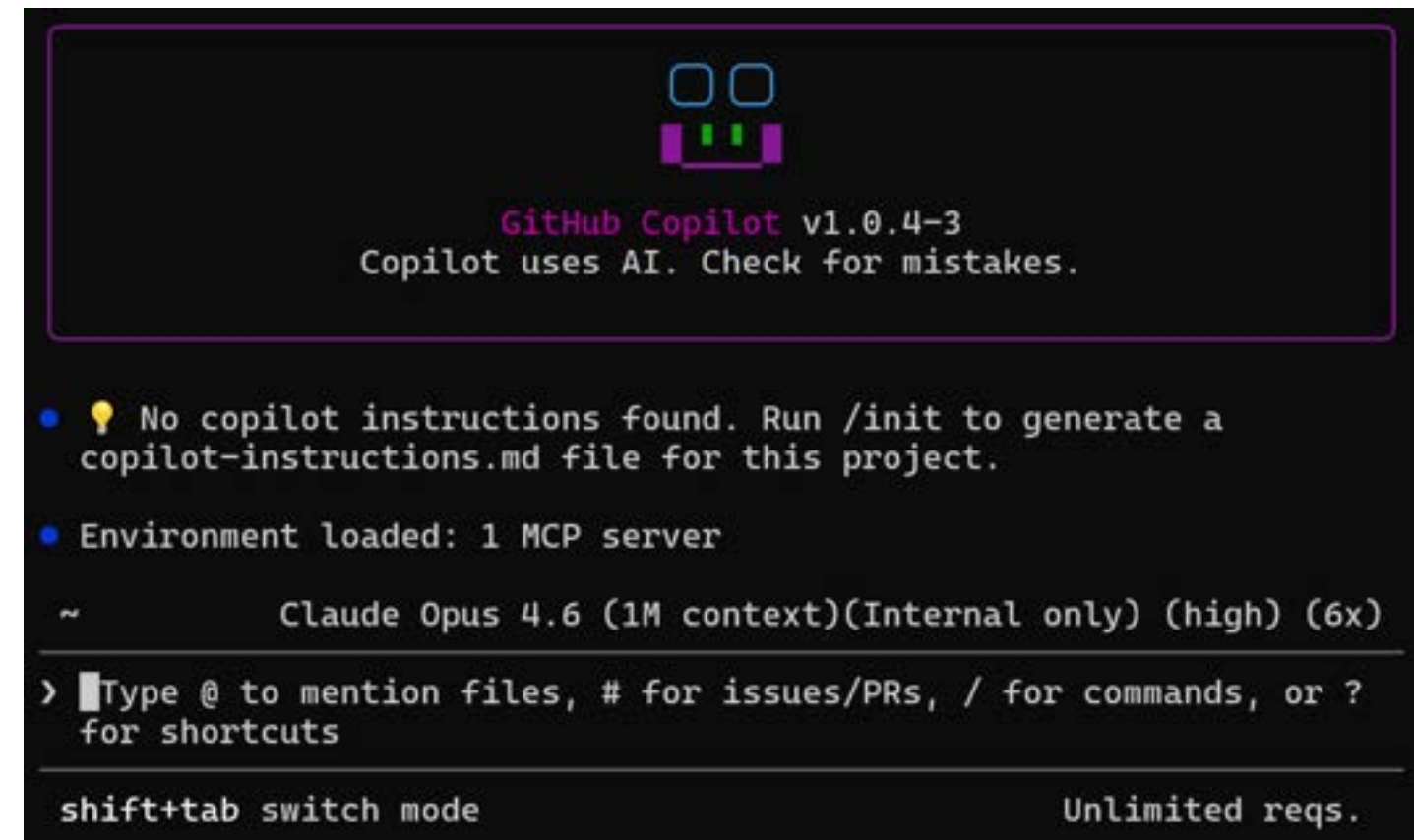
Access them on the internet, often with a nice interface. **Optimized for usability.**



Developer Environments

(the way the pros do it)

Download the agent and run it in a terminal or IDE. **Optimized for flexibility.**



WHY WOULD I USE A DEVELOPER ENVIRONMENT...

- **Access the best/newest tech first** The shiniest models and capabilities are available in dev environments long before reaching remote chat interfaces. You'll notice the difference immediately.
- **More flexibility** Unlike most chat interfaces, developer typically environments let you:
 - Swap out models
 - Customize your skills
 - Add specific tools you need
 - Build multi-step workflows (for example, involving multiple agents)

With a chat interface, you're often boxed in by limited configurations and pre-defined tools and skills.

CODING AGENTS: WHERE THINGS REALLY TOOK OFF

- **Before coding agents:** a lot of copy/paste back and forth
- **After coding agents:** Coding agents run inside your code environment, sometimes using models specialized for coding, and can read files, edit code, and run commands directly. You describe the goal; they write and execute the code to get there.

Like texting with an engineer and pasting the code they send.

Like handing them your laptop instead.

Developers, I apologize in advance for any hand-waving, also why are you at this talk?

CODE-Y TERMS TO BE FAMILIAR WITH

CLI A program that you run *from a terminal* to parse commands, coordinates actions, read and write files, etc. (Azure CLI and Fabric CLI)

Terminal app This runs the CLIs (and more), just a window for text input and output (like Windows Terminal).

IDE A code editing workspace with a nice interface that lets you see all the parts of and edit your code *and* has a terminal app built in. (VS Code and Visual Studio)

Two ways to work:

1. You can work right from a terminal app: Type commands and a CLI will run it.
2. OR you can work from an IDE so you can browse your files, edit them manually, and run your programs.

METAPHORS AND CONCRETE EXAMPLES

Definition	Metaphor
CLI A program that you run <i>from a terminal</i> to parse commands, coordinates actions.	The hostess who takes your order She reads your order in and calls them out to the kitchen.
Terminal app This runs a CLI, just a window for text input and output	The order window at a restaurant You explain exactly what you want.
IDE A code editing workspace that lets you see all the parts of and edit your code.	A birds eye view of the kitchen So the chef can oversee all the appliances, the shelves of food, etc.

SOME NICE PICTURES FOR THE VISUAL LEARNERS

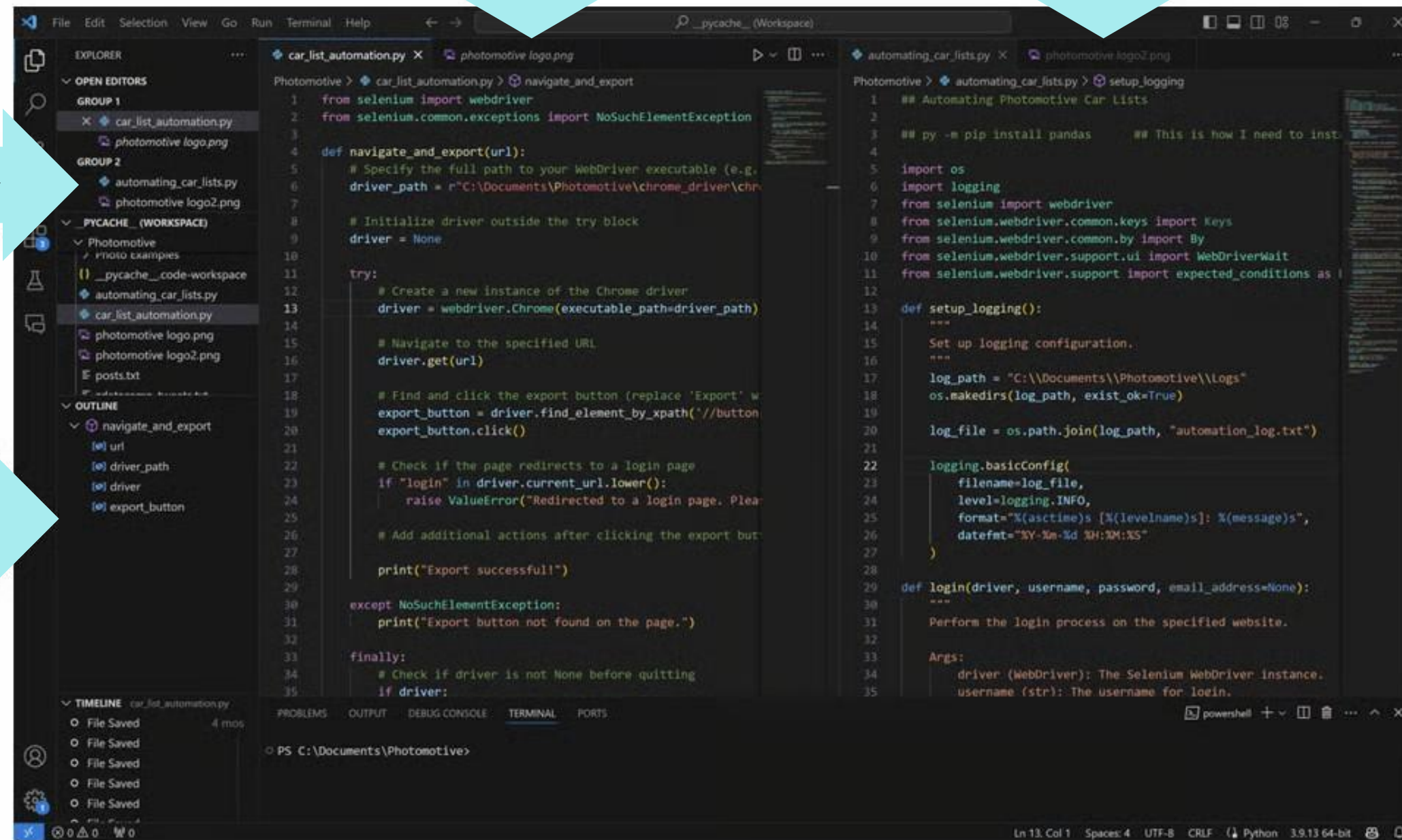
VS CODE (an IDE)

Script
window

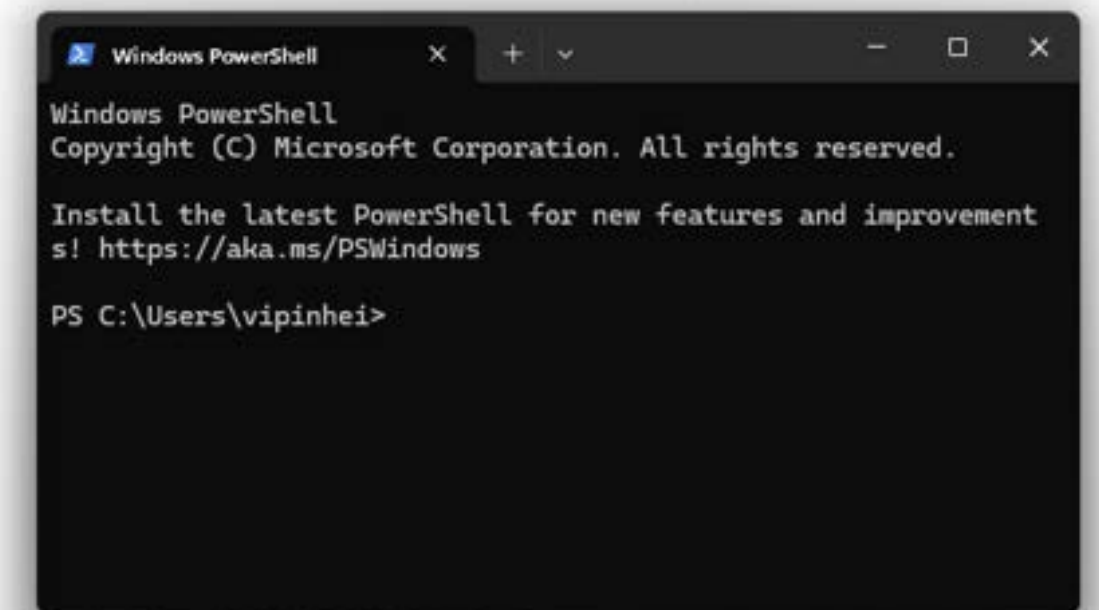
Script
window

File explorer

List of
variables



Windows PowerShell (a terminal app)



Terminal

OK back to the title of the talk...

AGENTIC DEVELOPMENT = AI THAT DOES COMPLICATED STUFF

Agentic development refers to using software that can plan and execute multi-step tasks with LLMs.

Instead of responding with text only, these agents can do cool stuff for you:

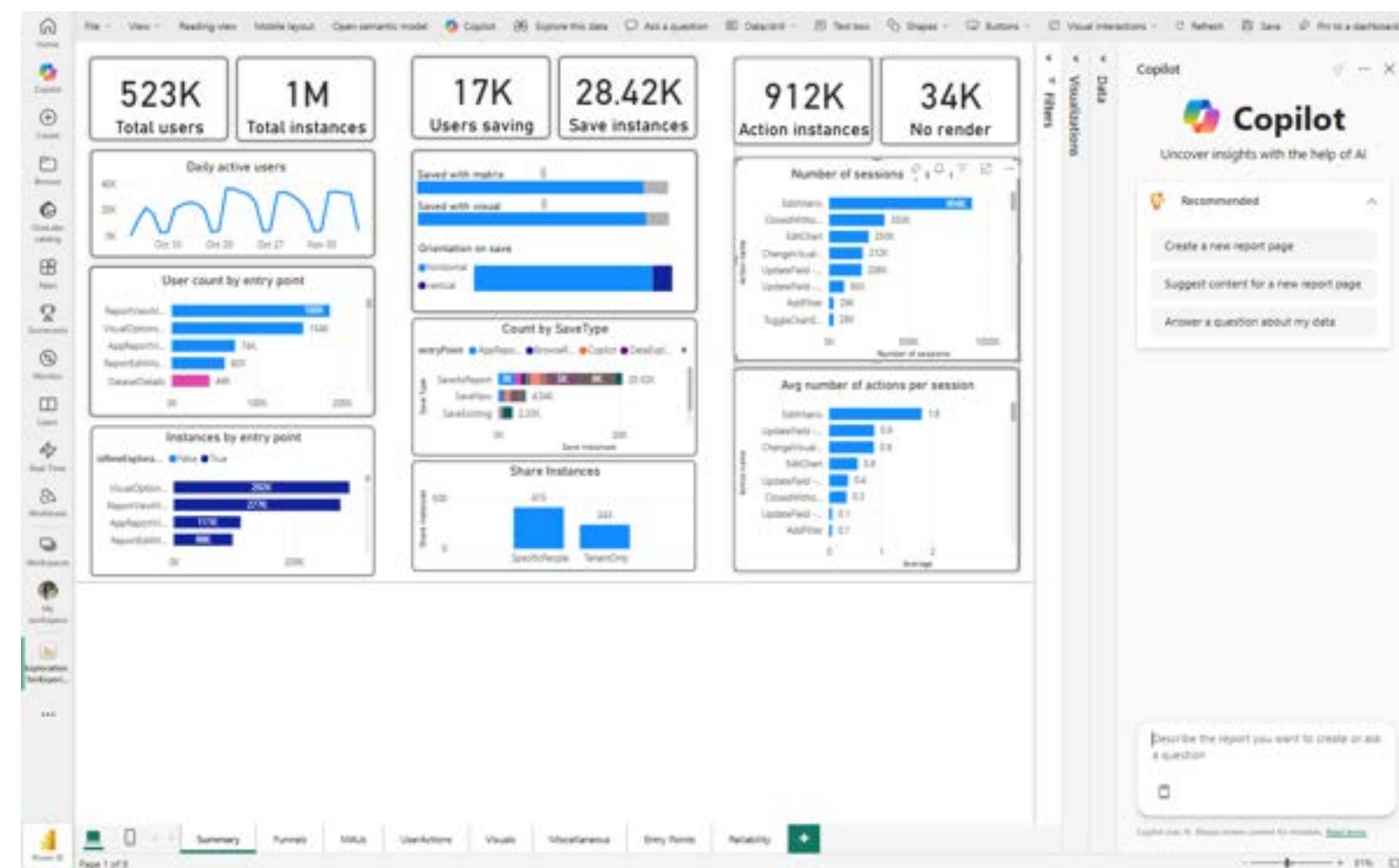
- Decide what steps are required to complete a request
- Select tools that allow it to perform actions
- Use the results to determine the next step

In Power BI, you can use coding agents to ~aGeNtIcAlLy DeVe10p~ a bunch of modeling tasks that used to take days.

POWER BI: THE CHAT EXPERIENCES

You can use our chat experiences to expedite the work required for report and model editing

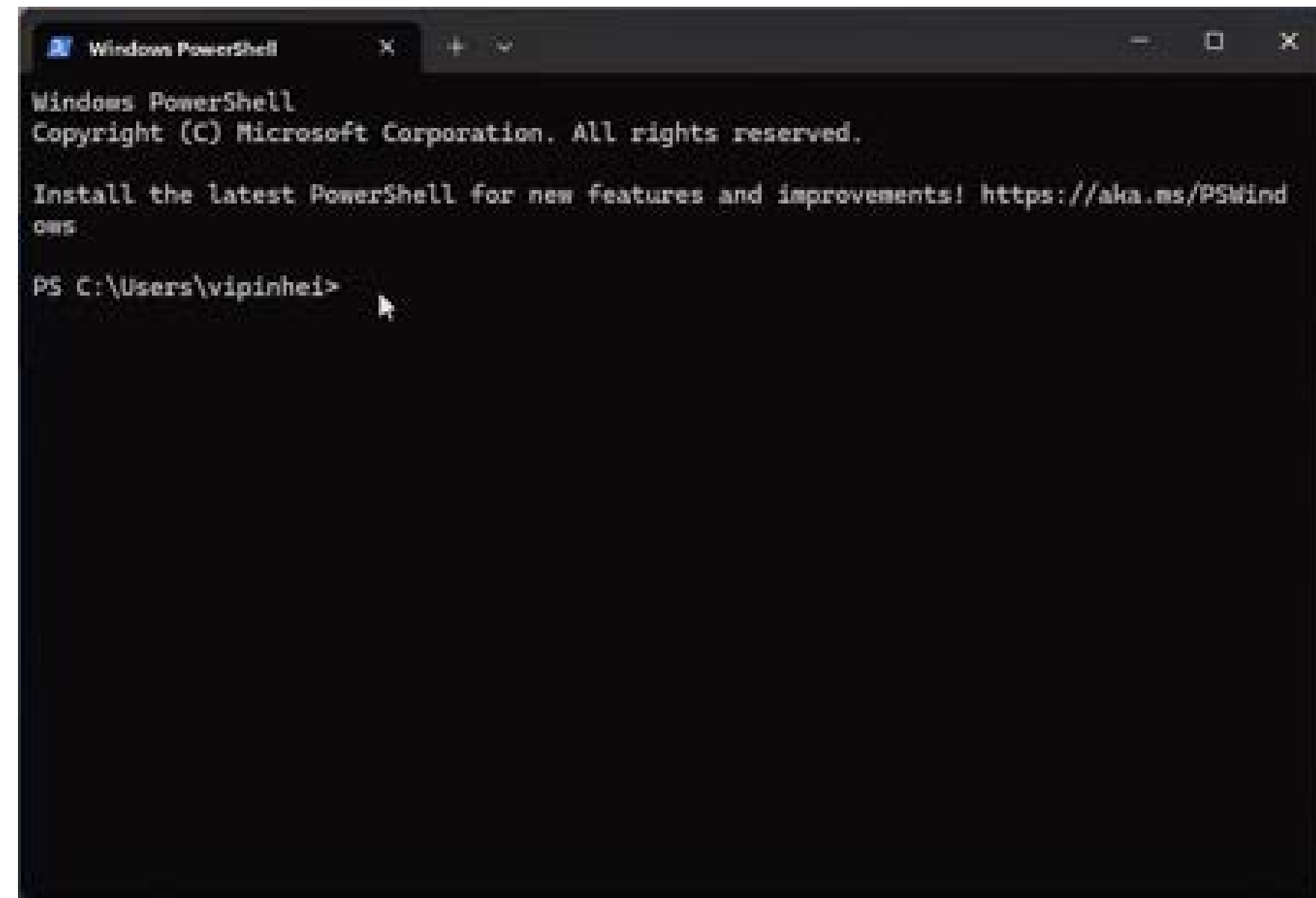
Remote chat experiences	Details
Report Creator Copilot pane	Opens next to a report, generates and modifies visuals.
DAX Query View Copilot pane	Writes, explains, and debugs DAX queries.
Modeling Copilot pane (sneak peek)	Creates measures, describes relationships, suggest model improvements .



POWER BI: THE AGENTIC DEVELOPMENT EXPERIENCES

But if you REALLY want to speed things up, try these out:

Local developer offerings	Details
GitHub Copilot CLI	Microsoft's coding agent accessed via a terminal app
GitHub Copilot	Microsoft's coding agent accessed via an IDE
Power BI Modeling MCP Server	This is a tool that can execute on Power BI modeling tasks
Fabric skills	These are skills that provide instructions and tools to execute on a variety of different Fabric capabilities. You can also build your own!



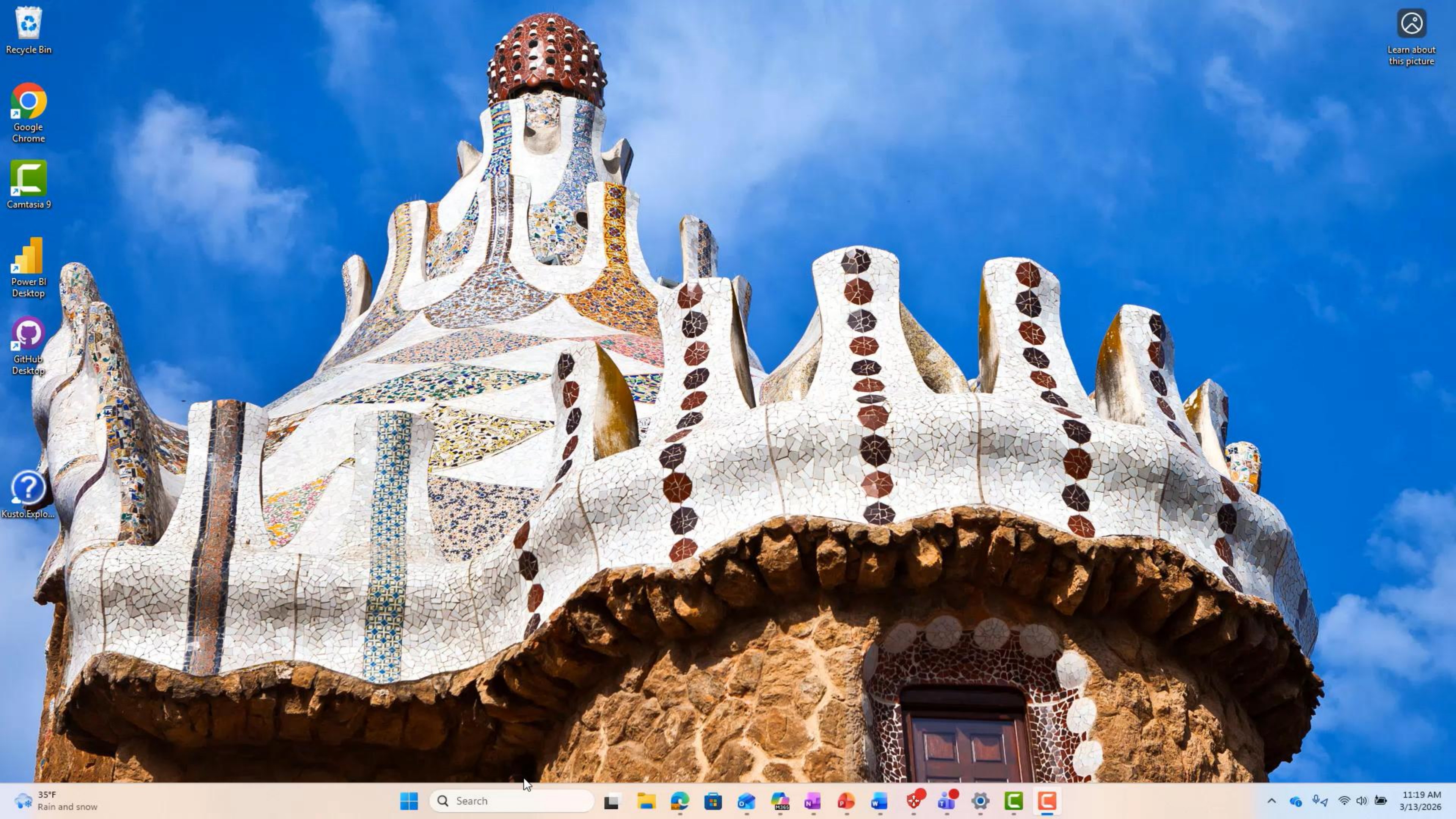
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\vipinhei>
```

BRINGING IT ALL TOGETHER

- We're going to use **coding agents** to do build a whole semantic model for us.
- The coding agent we're going to use is called **GitHub Copilot CLI** (and you can pick what AI model it uses!).
- We're going to launch and interact with that agent from a **terminal app**.
- The agent will then select the appropriate **Fabric skills** (recipes) that leverage the **Modeling MCP server** (a tool, like a cake mixer or an oven) to build the semantic model.



Learn about
this picture



Recycle Bin



Google
Chrome



Camtasia 9



Power BI
Desktop



GitHub
Desktop



Kusto.Explo...



35°F
Rain and snow



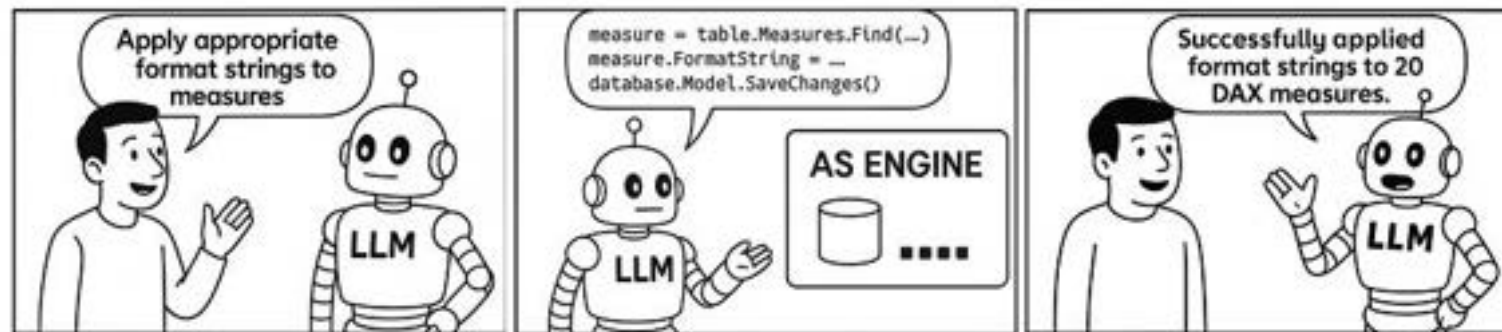
Search



11:19 AM
3/13/2026

POWER BI MODELING MCP SERVER

Preview



<http://aka.ms/powerbi-modeling-mcp>

- AI tools can interact with Power BI's semantic layer
- AI can understand, query and modify semantic models using natural language
- Integrate through AI workflows you already know and love

AGENT SKILLS FOR MICROSOFT FABRIC

Preview



```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\saravik> .\copilot

GitHub Copilot v1.8.2
Describe a task to get started.

Tip: /cmd Change working directory or show current directory
Copilot uses AI, so always check for mistakes.

• No copilot instructions found. Run /init to generate a copilot-instructions.md file for this project.
• Environment loaded: 2 MCP servers, 1 plugin, 29 skills
• All permissions are now enabled. Tool, path, and URL requests will be automatically approved.

> Create a Medallion Workspace named 'Zava_Product_Analytics_Workspace' and attach it to the Fabric Capacity 'enterprisefabriccapacity'. Inside this workspace, create a Lakehouse named 'Zava_Product_Silver' and a Spark Environment named 'Zava_HighPerf_Env' optimized for memory-intensive bronze-to-silver processing; Read from the customer_support_tickets table in Zava_Main_Lakehouse in the workspace Zava_Operations_Landing ; Filter out any rows where Customer_ID, Ticket_Description, or Status are NULL; Ensure Status only contains values from ['Open', 'In-Progress', 'Resolved', 'Closed']; Write the cleaned and confirmed results to a Delta table named Cleaned_Tickets_Silver in the Zava_Product_Silver lakehouse and create a powerbi report using this table.

* Thinking (Esc to cancel)

-

> Type @ to mention files, @ for issues/URLs, / for commands, or ? for shortcuts
shift+tab switch mode - ctrl+q enqueue                               Unlimited reqs.
```

Enable AI agents anywhere

Orchestrate analytics and more

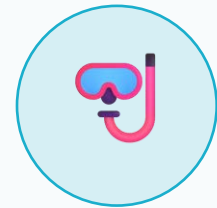
Integrate seamlessly and safely

Scale your analytics and app dev

→ [aka.ms link: aka.ms/skills-for-fabric](https://aka.ms/skills-for-fabric)

DEMO INTRODUCTION

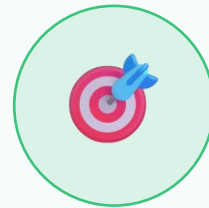
Exploring My Dive Patterns with Garmin Data



THE DATA

Garmin Dive Watch

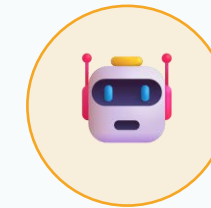
Personal dive log data captured by my Garmin watch — every dive tracked since September 2022. Depth, duration, water temp, and more.



THE GOAL

Fun, Ad-Hoc Exploration

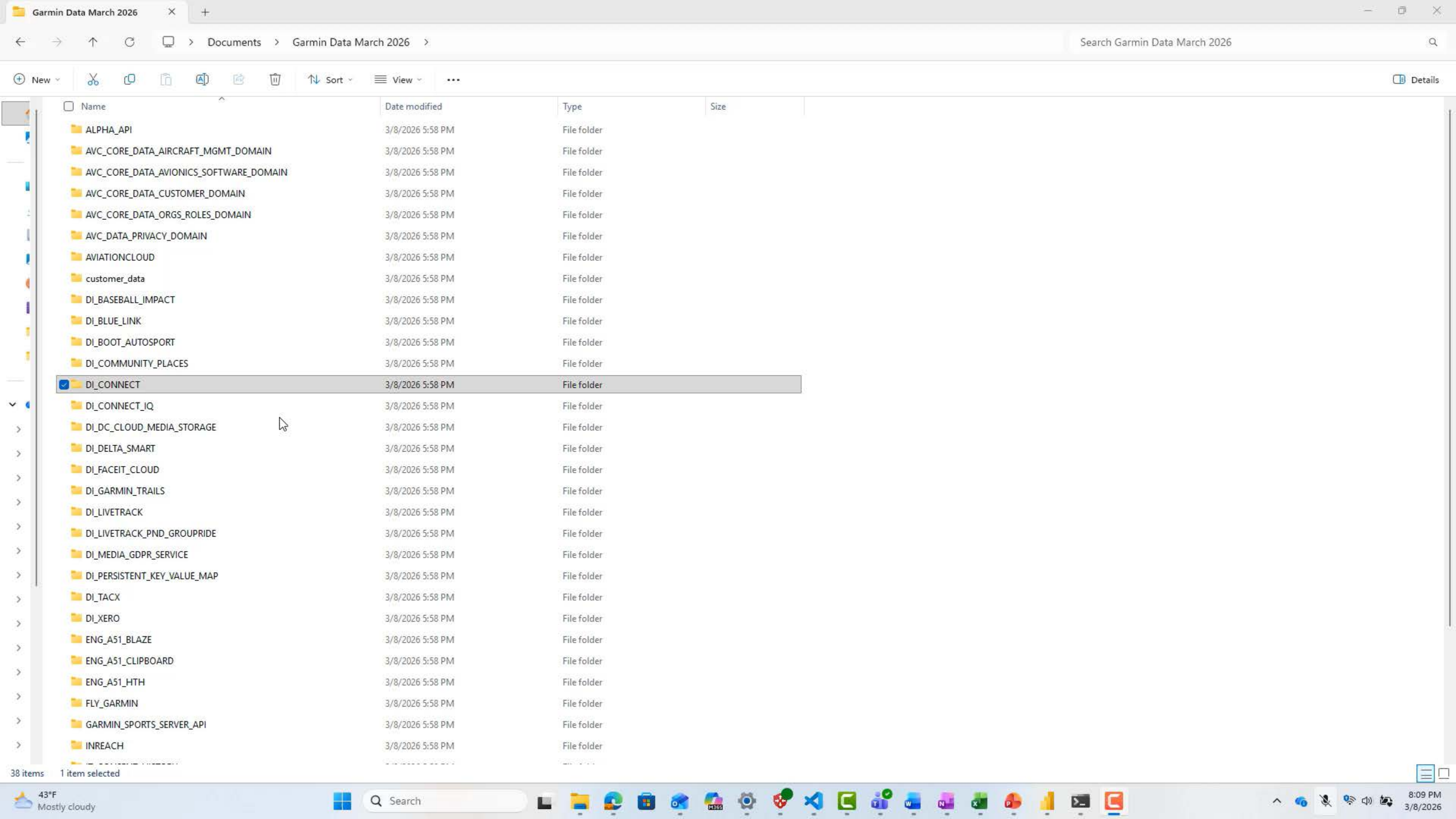
This isn't meant to be business-critical. It's a personal exercise to understand my own dive data and show what a realistic, low-effort first analysis looks like



AI's ROLE

Semantic Model Builder

AI does the heavy lifting — automating the creation and shaping of the semantic model so I can focus on exploration, not configuration.



Garmin Data March 2026				
Documents > Garmin Data March 2026				
Search Garmin Data March 2026				
New Cut Copy Paste Delete Sort View Details				
☐	Name	Date modified	Type	Size
☐	ALPHA_API	3/8/2026 5:58 PM	File folder	
☐	AVC_CORE_DATA_AIRCRAFT_MGMT_DOMAIN	3/8/2026 5:58 PM	File folder	
☐	AVC_CORE_DATA_AVIONICS_SOFTWARE_DOMAIN	3/8/2026 5:58 PM	File folder	
☐	AVC_CORE_DATA_CUSTOMER_DOMAIN	3/8/2026 5:58 PM	File folder	
☐	AVC_CORE_DATA_ORGS_ROLES_DOMAIN	3/8/2026 5:58 PM	File folder	
☐	AVC_DATA_PRIVACY_DOMAIN	3/8/2026 5:58 PM	File folder	
☐	AVIATIONCLOUD	3/8/2026 5:58 PM	File folder	
☐	customer_data	3/8/2026 5:58 PM	File folder	
☐	DI_BASEBALL_IMPACT	3/8/2026 5:58 PM	File folder	
☐	DI_BLUE_LINK	3/8/2026 5:58 PM	File folder	
☐	DI_BOOT_AUTOSPORT	3/8/2026 5:58 PM	File folder	
☐	DI_COMMUNITY_PLACES	3/8/2026 5:58 PM	File folder	
☒	DI_CONNECT	3/8/2026 5:58 PM	File folder	
☐	DI_CONNECT_IQ	3/8/2026 5:58 PM	File folder	
☐	DI_DC_CLOUD_MEDIA_STORAGE	3/8/2026 5:58 PM	File folder	
☐	DI_DELTA_SMART	3/8/2026 5:58 PM	File folder	
☐	DI_FACEIT_CLOUD	3/8/2026 5:58 PM	File folder	
☐	DI_GARMIN_TRAILS	3/8/2026 5:58 PM	File folder	
☐	DI_LIVETRACK	3/8/2026 5:58 PM	File folder	
☐	DI_LIVETRACK_PND_GROUPRIDE	3/8/2026 5:58 PM	File folder	
☐	DI_MEDIA_GDPR_SERVICE	3/8/2026 5:58 PM	File folder	
☐	DI_PERSISTENT_KEY_VALUE_MAP	3/8/2026 5:58 PM	File folder	
☐	DI_TACX	3/8/2026 5:58 PM	File folder	
☐	DI_XERO	3/8/2026 5:58 PM	File folder	
☐	ENG_A51_BLAZE	3/8/2026 5:58 PM	File folder	
☐	ENG_A51_CLIPBOARD	3/8/2026 5:58 PM	File folder	
☐	ENG_A51_HTH	3/8/2026 5:58 PM	File folder	
☐	FLY_GARMIN	3/8/2026 5:58 PM	File folder	
☐	GARMIN_SPORTS_SERVER_API	3/8/2026 5:58 PM	File folder	
☐	INREACH	3/8/2026 5:58 PM	File folder	
38 items 1 item selected				
43°F Mostly cloudy 8:09 PM 3/8/2026				



GitHub Copilot v1.0.2

Describe a task to get started.

Tip: `/cwd` Change working directory or show current directory
Copilot uses AI, so always check for mistakes.

-  No copilot instructions found. Run `/init` to generate a `copilot-instructions.md` file for this project.
- Environment loaded: 6 MCP servers, 4 plugins, 15 skills, 6 agents
- All permissions are now enabled. Tool, path, and URL requests will be automatically approved.
- All permissions are now enabled. Tool, path, and URL requests will be automatically approved.

```
> Connect to my data in C:\Users\emlisa\OneDrive - Microsoft\Documents\Garmin Data March 2026\DI_CONNECT\DI-Connect-Metrics
```

@ Thinking (Esc to cancel)

C:\Windows\System32

claude-opus-4.6 (high) (3x)

```
> | Type @ to mention files, # for issues/PRs, / for commands, or ? for shortcuts
```

```
shift+tab switch mode · ctrl+q enqueue
```

Unlimited reqs.

GITHUB COPILOT MODES

Ask Mode

Chat, ask questions, get inline completions. You direct every step.

Plan Mode

Copilot maps out a step-by-step plan first. You review and approve before any code changes.

Autopilot Mode

Copilot runs autonomously — editing files, running tests, iterating until done.

- Exploring Garmin dive data (Esc to cancel · 14.8 KiB)

C:\Windows\System32

- **List directory** ~\Microsoft Fabric\repos\Example Fabric Workspace\AdventureWorks_CustomModel.SemanticModel

```

L 5 files found

```

- **List directory** ~\Microsoft Fabric\repos\Example Fabric Workspace\AdventureWorks_CustomModel.SemanticModel\definition

```

L 6 files found

```

- Good – I now have a complete picture. Let me ask one clarifying question before creating the plan:

- Asked user: Where would you like me to create the PBIP project folder?

↳ User selected: C:\Users\emlisa\Documents\GarminDiveAnalysis (Recommended)

- Create ~\.copilot\session-state\6aa751e1-6900-4b6e-9ae1-9a935ca643b3\plan.md (+127)

- Todo added: Write Python ETL script

- Plan ready for review:

```
**Garmin Dive Data → Power BI Semantic Model (...)
```

claude-opus-4.6 (high) (3x)

Plan Ready for Review

Garmin Dive Data → Power BI Semantic Model (PBIP)

- 233 dive logs (Oct 2021 – Mar 2026) with rich dimensions: depth, temperature, gases, CNS/N₂ loading, GPS, notes, and more
- Star schema: **Dives** fact table (34 columns), **DiveGases** dimension (1:many for multi-gas dives), **DateDim** calculated date table
- Python ETL flattens all nested JSON → CSV files stored alongside the PBIP project
- TMDL-based PBIP project at **C:\Users\emlisa\Documents\GarminDiveAnalysis** with Power Query M partitions reading the CSVs
- Key measures: Total Dives, Avg/Max Depth, Avg Bottom Time, CNS trends, temperature ranges, time-intelligence comparisons
- 7 implementation steps with dependencies (ETL + scaffold first → tables → relationships → validate)

- ```
1. Accept plan and build on autopilot (recommended)
2. Accept plan and build on default permissions
3. Exit plan mode and I will prompt myself
> 4. Is there any dive data about the location of where I was diving including any possibly rich data showing my movement throughout the dive?
```

↑↓ to navigate · Enter to select · ctrl+e to show full plan · Esc to cancel

- SQL: Update todos for new plan
  - └ 0 row(s) deleted.
- Now let me present the updated plan:
- Plan ready for review: ## Updated Plan: Garmin Dive PBIP with Depth Pr...

### Plan Ready for Review

Updated Plan: Garmin Dive PBIP with Depth Profiles

Key addition: [DiveProfiles](#) table with second-by-second dive data from FIT files (depth, heart rate, temperature, ascent rate, nitrogen loading, CNS, PO<sub>2</sub>, NDL, time-to-surface, deco stops).

#### Schema (4 tables)

- Dives - 233 rows, 36 columns from JSON (summary metrics, location, environment, gas, performance, config)
- DiveProfiles (new) - ~250K-400K rows from FIT files (1 record/sec: depth, HR, temp, ascent rate, N<sub>2</sub>, CNS, PO<sub>2</sub>, NDL, deco info)
- DiveGases - ~391 rows (gas mixes per dive)
- DateDim - DAX calculated date table

#### 8 implementation steps

1. ETL Python script - parse 233 JSONs + scan 14K FIT files in ZIPs to extract dive profiles, match by timestamp
2. PBIP scaffold - project files at [C:\Users\emlisa\Documents\GarminDiveAnalysis\](#)
3. Dives.tmdl - fact table + measures (Total Dives, Avg Max Depth, etc.)
4. DiveProfiles.tmdl (new) - second-by-second depth/HR/temp/gas data
5. DiveGases.tmdl - gas dimension
6. DateDim.tmdl - date dimension
7. relationships.tmdl - all joins
8. Run ETL + validate in Power BI Desktop

#### Notes

- FIT files have NO GPS during dives (only entry point from JSON)
- ~400K profile rows is very manageable for Power BI
- FIT→JSON matching done by start-time proximity

- › 1. [Accept plan and build on autopilot \(recommended\)](#)
2. Accept plan and build on default permissions
3. Exit plan mode and I will prompt myself
4. Suggest changes

↑↓ to navigate · Enter to select · ctrl+e to show full plan · Esc to cancel

- SQL: Update todos for new plan  
└ 0 row(s) deleted.
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1. Accept plan and build on autopilot (recommended)
2. Accept plan and build on default permissions
3. Exit plan mode and I will prompt myself
- > 4. In the Garmin app I can win badges for different activites, any way I can bring in data on the bades related to dives?

↑↓ to navigate · Enter to select · ctrl+e to show full plan · Esc to cancel

- Exploring badge data (Esc to cancel · 79.1 KiB)

Let me revise my approach to incorporate all these fields.

- Unfortunately, badge/achievement data is not included in the Garmin data export – those live only in Garmin Connect's cloud. However, I found great additional data in `summarizedActivities` that wasn't in the dive JSONs. Let me incorporate these extra fields:

- Asking user: Garmin badges/achievements aren't included in the data ex...

Garmin badges/achievements aren't included in the data export - they only exist in the Garmin Connect cloud service.

However, I found **\*\*additional dive data\*\*** in the summarizedActivities file that isn't in the individual dive JSONs:

- **Heart rate summary**: avgHR, maxHR, minHR + time in HR zones (7 zones)
- **Deco dive flag**: 5 of your dives were decompression dives!
- **Descriptions**: Some dives have text descriptions (separate from notes)
- **Start + End GPS**: Both entry and exit lat/lon coordinates
- **Max vertical speed** (ascent/descent rate)
- **Training load** and **intensity minutes** (moderate + vigorous)

I can merge this data into the Dives table by matching on activityId. Want me to update the plan with these additional fields?

- > 1. Yes, add all those fields to the model (Recommended)
2. Yes, but just the HR and deco data
3. Skip the extra fields, just proceed with the current plan
4. Other (type your answer)

↑↓ to select · Enter to confirm · Esc to cancel

- Exploring badge data (Esc to cancel · 79.1 KiB)

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- **Training load** and **intensity minutes** (moderate + vigorous)

I can merge this data into the Dives table by matching on activityId. Want me to update the plan with these additional fields?

- > 1. Yes, add all those fields to the model (Recommended)
2. Yes, but just the HR and deco data
3. Skip the extra fields, just proceed with the current plan
4. Other (type your answer)

↑↓ to select · Enter to confirm · Esc to cancel

● SQL: Update ETL todo description  
└ 1 row(s) updated.

○ Plan ready for review: ## Updated Plan: Garmin Dive PBIP with Full Dat...

Plan Ready for Review

Updated Plan: Garmin Dive PBIP with Full Data

Badge data: Not available in Garmin export (cloud-only). But found rich supplemental data!

New fields added from summarizedActivities:

- Heart rate: avgHR, maxHR, minHR + 7 HR zone durations
- Deco flag: 5 of your dives were decompression dives
- Descriptions: Some dives have text descriptions (separate from notes)
- GPS: Both entry AND exit coordinates (start + end lat/lon)
- Training: maxVerticalSpeed, trainingLoad, moderate + vigorous intensity minutes

Schema (4 tables, ~57 columns on Dives)

- Dives - 233 rows, ~57 columns (JSON + summarizedActivities merged)
- DiveProfiles - ~250K-400K rows (second-by-second from FIT files)
- DiveGases - ~391 rows
- DateDim - DAX calculated date table

8 implementation steps

1. ETL Python script (JSON + summarizedActivities merge + FIT extraction)
2. PBIP scaffold
3. Dives.tmdl (57 cols + measures)
4. DiveProfiles.tmdl (depth profiles)
5. DiveGases.tmdl
6. DateDim.tmdl
7. relationships.tmdl
8. Run ETL + validate in Power BI Desktop

> 1. Accept plan and build on autopilot (recommended)

2. Accept plan and build on default permissions
3. Exit plan mode and I will prompt myself
4. Suggest changes

↑↓ to navigate · Enter to select · ctrl+e to show full plan · Esc to cancel

FileHomeInsertModelingViewOptimizeHelpExternal tools

PasteCutCopyFormat painter

Get dataExcelOneLakeSQL ServerEnter dataDatawarehouseRecent sources

Transform dataRefresh

New visual

Insert

Text boxMore visuals

New visual calculationNew measureQuick measure

Calculations

SensitivitySensitivity

SharePublish

Prep data for AI

Copilot

Build

Suggestions

Filters

Data

+Add data

Once loaded,

Import data from Excel

Import data from

Issues were found

Cannot read  
'C:\Users\emlisa\Documents\GarminDiveAnalysis\GarminDiveAnalysis.pbip'.  
'C:\Users\emlisa\Documents\GarminDiveAnalysis\GarminDiveAnalysis.pbip':  
Property 'semanticModel' has not been defined and the schema does not allow additional properties. Path 'artifacts[1].semanticModel', line 10, position 22.  
Required properties are missing from object: report. Path 'artifacts[1]', line 9, position 5.

Copy details to clipboard

Close

```
"$rel ($sz)"...
l 19 lines...
```

```

@ Validating ETL output (Esc to cancel · 143.6 KiB)

```

- Everything is in place. Let me mark the final todo and give the summary:

- Todo completed: `run-etl-validate`

• Your Garmin dive PBIP project is complete at `C:\Users\emlisa\Documents\GarminDiveAnalysis\`. Here's what was built:

**Data extracted:**

- Dives.csv - 233 dives, 57 columns (JSON summaries + HR/deco/GPS from summarizedActivities)
- DiveGases.csv - 391 gas mix records
- DiveProfiles.csv - 266,635 second-by-second depth profile records (matched 214 of 233 dives to FIT files)

Semantic model (4 tables):

- **Dives** - fact table with 14 DAX measures (Total Dives, Avg Max Depth, Cumulative Dives, Deco Count, etc.)
- **DiveProfiles** - depth/HR/temp/N<sub>2</sub>/CNS/PO<sub>2</sub> every second, with 5 measures
- **DiveGases** - gas dimension with Nitrox count measure
- **DateDim** - calculated date table (2021-2026) with Year, Quarter, Month, Season

To open: Double-click [GarminDiveAnalysis.pbip](#) in Power BI Desktop. It will load the CSVs and build the model. You may need to approve the data source (local file access) on first load.

- Continuing autonomously (3 premium requests)

✓ Task complete

```
ETL pipeline (`data/etl_garmin_dives.py`):
```

- Parsed 233 dive JSON files + merged supplemental data from summarizedActivities (HR, deco flags, GPS, training load)
- Scanned 14,115 FIT files across 2 ZIP archives, identified 215 dive FIT files, matched 214 to dive JSONs by timestamp
- Output: Dives.csv (233 rows, 57 cols), DiveGases.csv (391 rows), DiveProfiles.csv (266,635 second-by-second records)

```
Semantic model (4 tables, star schema):
```

- **\*\*Dives\*\*** - 57 columns covering depth, time, location, temperature, water type, CNS/N<sub>2</sub>/PO<sub>2</sub>, HR zones, deco flag, GPS, training load + 14 DAX measures
- **\*\*DiveProfiles\*\*** - second-by-second depth, heart rate, temperature, ascent rate, nitrogen loading, CNS, PO<sub>2</sub>, NDL, deco stops + 5 measures
- **\*\*DiveGases\*\*** - gas mixes per dive (AIR/EANx, O<sub>2</sub>/He percentages) + 2 measures
- **\*\*DateDim\*\*** - calculated DAX date table with year, quarter, month, season, day of week

Open 'GarminDiveAnalysis.pbip' in Power BI Desktop to load the model.

> I got the following issue [Saved pasted content to workspace (39.8 KB) id=1]

autopilot · shift+tab switch mode · ctrl+s run command

But....there's more you can do!

# VIBE-BASED VS. SPEC-BASED AGENTIC DEVELOPMENT

## Vibe-based (what we just did)

Prompt it, watch what it does, tweak prompts/examples until it “looks right.” Can be imprecise, harder to explain “why” something didn’t work and how to adjust.

## Spec-based

Write a detailed spec in **markdown** (saved as an **.md** file) that tells the agent what to do. Things like:

- What is my job?
- What am I allowed to do?
- What tools may I use?
- When should I stop?
- What should I never do?

**Markdown** is a simple text format that both humans and agents can read easily. An **.md** file is a text file written using markdown

It gives the agent a more stable (and re-usable) reference. Preferred method if you plan to ship, scale, or persist what you make.

```
1 # Report Authoring Agent Spec
2
3 ## Purpose
4 Help users create Power BI report pages from an existing semantic model.
5
6 ## What success looks like
7 - The user gets one or more report pages that match their request.
8 - Visuals use fields that exist in the provided model.
9 - The agent stops once pages are created and validated.
10
11 ## Allowed actions
12 - Inspect the semantic model schema.
13 - Create report pages.
14 - Add visuals with explicit field mappings.
```

## Learn more about spec-driven development:

### Expert vs. AI: The Power BI Turing Test

Thursday, March 19 2:00 PM

Room: C111-C112

### Data Modeling Like a Pro in Fabric

Friday, March 20 2:00 PM

Room: TMB 2-3

# AI HELPED BUILD A SEMANTIC MODEL FROM SCRATCH

## WHAT WE BUILT W/AI

### A net-new semantic model from raw JSON files

#### INPUT

A collection of hard-to-navigate JSON files

#### OUTPUT

A structured Power BI semantic model

## WHY IT MATTERS

Semantic models bridge raw data and business context

- ▶ Clearly defined metrics & KPIs
- ▶ AI enabler for trustworthy answers
- ▶ Powers reports & data storytelling

# AI READY SEMANTIC MODELS

## SEMANTIC MODELING

- **Star Schema**  
Simplifies relationships for faster, more accurate queries
- **Human-readable naming**  
Consistent, unambiguous field names
- **Defined relationships**  
Ensure relationships are well-structured and logical.
- **Metadata enrichment**  
Descriptions on fields and objects to provide additional context
- **Core measures**  
Build essential DAX measures for important calculations

## PREP FOR AI COPILOT TOOLING

- **Simplify the Data Schema**  
Define exactly which tables, columns, and measures Copilot will use when answering requests
- **Verified Answers**  
Mark pre-built visuals as verified with key phrases so Copilot returns the right visualization
- **AI Instructions**  
Custom guidance tells Copilot how to interpret your business context and respond accurately

Power BI

Power BI

+

https://daily.powerbi.com/groups/828b37c8-a769-415e-8736-5b271ddc6de0/modeling/a749eaaf-d46f-4ba8-8424-428ab886c80c/modelView?experience=power-bi

Search

Trials activated: 17 days left

Chat

GarminDiveAnalysis | Confidential\Microsoft Extended

FileHomeHelp

Get data

OneLake catalog

Transform data

Refresh data

New measure

New column

New table

Calculation group

Calendar options

New parameter

Manage roles

Manage permissions

Manage relationships

Best practice analyzer

Memory analyzer

Community notebooks

Generate Ontology

New report

Explore Lineage

Analyze in Excel

Prep data for Copilot AI

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OneLake catalog

Scorecards

Databases

Workspaces

Emily and Tori FabCo...

Garmin Dive Data

GarminDive Analysis

DiveGases

DiveID

GasID

GasMode

GasStatus

GasType

PercentHelium

PercentOxygen

Nitrox Dive Count

Uninno Car Tuner

Collapse

DiveProfiles

AbsolutePressurePa

AscentRateM

CNSLoadPct

DepthM

DiveID

ElapsedSec

HeartRate

N2LoadPct

NDLTimeSec

Collapse

Dives

AvgDepthM

AvgHR

AvgPO2

AvgTempC

BottomTimeSec

Calories

ConnectActivityId

Conservatism

Description

Collapse

DateDim

Date

DayOfWeek

DayOfWeekNumber

MonthName

MonthNumber

Quarter

QuarterNumber

Season

WeekOfYear

Year

YearMonth

Collapse

Properties

Cards

Show the database in the header when applicable

Show related fields when card is collapsed

Pin related fields to top of card

Data

Tables

Model

DateDim

Date

DayOfWeek

DayOfWeekNumber

MonthName

MonthNumber

Quarter

QuarterNumber

Season

WeekOfYear

Year

YearMonth

DiveGases

DiveProfiles

Dives

Avg Bottom Time (min)

Avg End CNS %

Avg HR

Avg Max Depth (m)

Avg Max PO2

Avg Surface Interval (min)

Avg Temp (°C)

Avg Training Load

AvgDepthM

AvgHR

AvgPO2

AvgTempC

BottomTimeSec

Calories

Copilot

Uncover insights with the help of AI

Recommended

Suggest improvements to optimize my model for AI

Suggest improvements to optimize my model for AI

All tables

Model view

DAX query view

TMDL View

41°F

Mostly cloudy

Search

10:17 PM

3/8/2026

# Copilot in Web Modeling

Sneak Peek

- Zero-setup Copilot experiences directly in web modeling
- Powered by the Power BI Modeling MCP Server
- Make your data AI-ready

Power BI

Garmin Dive Data - Power BI

←

↺

🏠

https://daily.powerbi.com/groups/828b37c8-a769-415e-8736-5b271ddc6de0/aikills/c47ba69e-37a0-49c3-8ec1-efb926985874?experience=power-bi

🔍

A

☆

⚙️

🌟

👤

...

Chat

Garmin Dive Data

Confidential\Microsoft Extended

Search

Trial activated: 17 days left

🔔12

⚙️

⬇️

?

🗨️

👤

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Emily and Tori FabCo...

Garmin Dive Data

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Test the agent's responses

Home

Test the agent's responses

⌵

GarminDiveAnalysis

>

✓

📊

DateDim

>

✓

📊

DiveGases

>

✓

📊

DiveProfiles

>

✓

📊

Dives

Test the agent's responses

Clear chat

...

Garmin Dive Data

Ask a question about this data, using your own words. For example:

☰

What are the historical trends across all my data?

🗨️

Analyze recent data for any outliers

🔍

Show me the details for a specific subcategory of data

📄

Sample questions

Ask a question to test the data agent's response

➡️

Created with AI. Mistakes are possible. [Review terms](#)

Power BI

Dive Data Agent - Power BI

https://daily.powerbi.com/groups/828b37c8-a769-415e-8736-5b271ddc6de0/modeling/a749eaaf-d46f-4ba8-8424-428ab886c80c/modelView?experience=power-bi

Search

Trials activated: 17 days left

Editing

Share

GarminDiveAnalysis

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File

Home

Help

Get data

OneLake catalog

Transform data

Refresh data

New measure

New column

New table

Calculation group

Calendar options

New parameter

Manage roles

Manage permissions

Manage relationships

Best practice analyzer

Memory analyzer

Community notebooks

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DayOfWeekNumber

MonthName

MonthNumber

Quarter

QuarterNumber

Season

WeekOfYear

Collapse

Properties

Formatting

Data type

Decimal number

Format

General

Percentage format

No

Thousands separator

No

Decimal places

Auto

Advanced

Sort by column

Latitude (Default)

Data category

Latitude

Summarize by

None

Is nullable

Yes

Data

Tables

Model

Search

EndCNSPct

EndLatitude

EndLongitude

EndN2Pct

GFHigh

GFLow

HRZone0Sec

HRZone1Sec

HRZone2Sec

HRZone3Sec

HRZone4Sec

HRZone5Sec

HRZone6Sec

InferredSource

IsDecoDive

Latitude

LocationName

Longitude

Max Depth Ever (m)

MaxDepthM

MaxHR

MaxPO2

MaxTempC

MaxVerticalSpeedM

MinHR

MinTempC

ModerateIntensityMin

Notes

O2Toxicity

Copilot

Preview

Allow copilot to make changes to your workspace during this chat session?

Granting access allows Copilot to update your model and any related reports or downstream items. View impact

To change this decision later, you must close and reopen the Copilot pane.

Allow

Deny access

Restore checkpoint

Help add in instructions providing context that these are the dates I got each of my PADI certifications : Open water certified Oct 12, 2021  
Advanced open water certified July 10,2022  
Rescue diver certified September 3, 2023  
Deep diver certified February 4, 2024

Copilot

Working on it...

Ask a question about your semantic model or request help with modeling

Copilot uses AI. Always review content for mistakes. Read terms

All tables

Model view

DAX query view

TMDL View

News for you

Cuba reacts afte...

Search

12:12 AM 3/9/2026

Power BI

Garmin Dive Data - Power BI

https://daily.powerbi.com/groups/828b37c8-a769-415e-8736-5b271ddc6de0/aikills/c47ba69e-37a0-49c3-8ec1-efb926985874?experience=power-bi

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Chat

Garmin Dive Data

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Add tools

Build agent with AI

Test data agent

Agent instructions

Publish

Revert to published version

Explorer

Data

Setup

Tools

Add Data

GarminDiveAnalysis

DateDim

DiveGases

DiveProfiles

Dives

Test the agent's responses

Clear chat

What's the deepest dive I've done?

The deepest dive you've done reached 40.7 meters. (Source: max\_dive\_depth.json)

Table 1

Showing 1 of 1 rows

Search data...

|   | <sup>12</sup> Max Depth Ever (m) |
|---|----------------------------------|
| 1 | 40.7                             |

Expand response

1 step completed

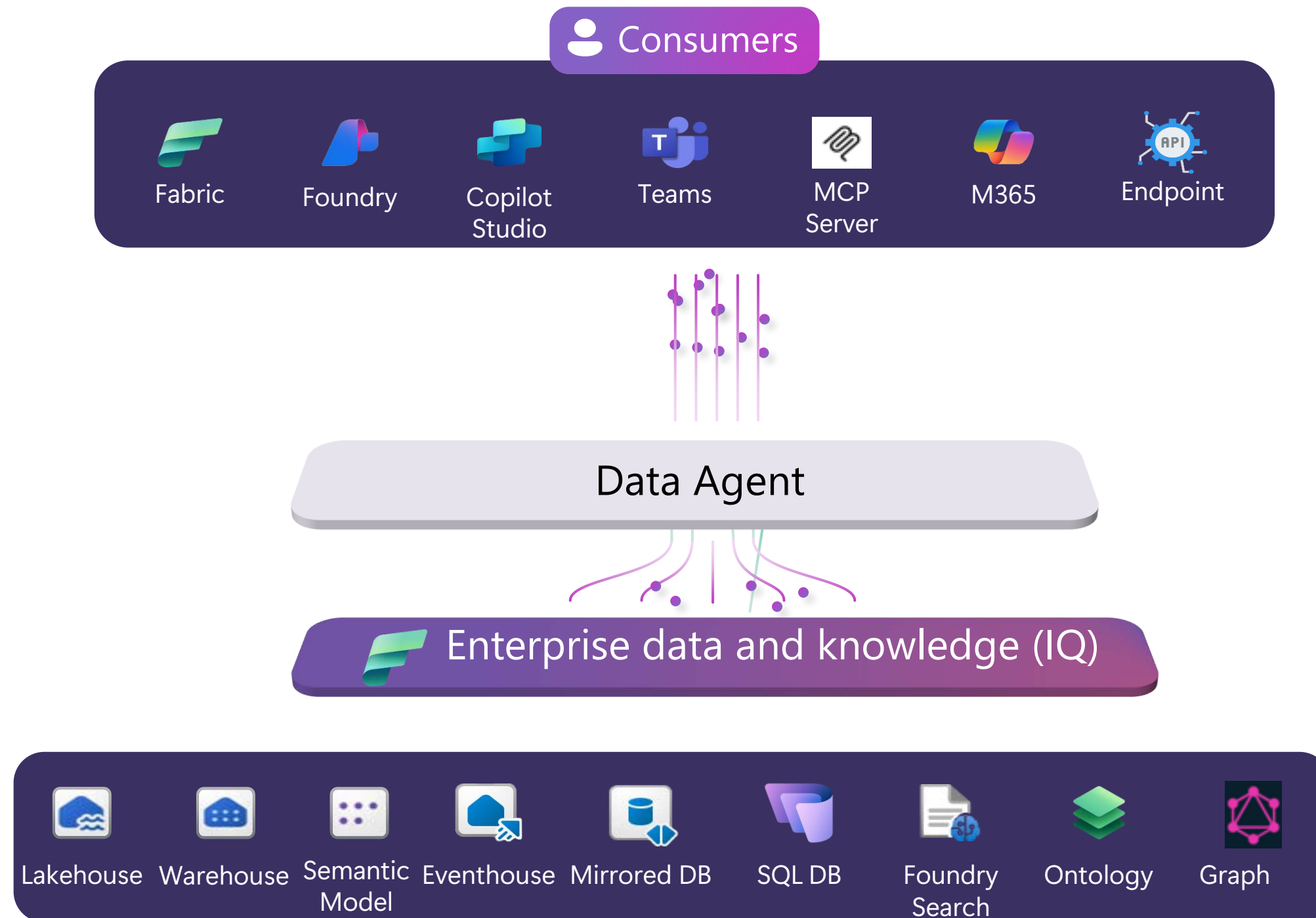
Response time: 24 sec

Sample questions

Ask a question to test the data agent's response

Created with AI. Mistakes are possible. Review terms

# FABRIC DATA AGENT



A **virtual analyst** that allows users to interact with and gain insights from enterprise data and knowledge in Fabric

Generally available

# AI INSTRUCTIONS

## Preview

**AI Instructions** give business context and instructions for Copilot to use to provide better answers

### WHAT DOES IT DO?

- Provides context and guidance to Copilot
- Defines terminology, tone, and response style
- Clarifies business terms and guides analysis approaches

### WHY USE IT?

- Aligns Copilot with your business context
- Improves the quality and relevance of responses
- More meaningful insights, less user frustration



GitHub Copilot v1.0.3  
Describe a task to get started.

Tip: `/help` Show help for interactive commands  
Copilot uses AI, so always check for mistakes.

- No copilot instructions found. Run `/init` to generate a `copilot-instructions.md` file for this project.
- Environment loaded: 10 MCP servers, 6 plugins, 35 skills, 6 agents
- All permissions are now enabled. Tool, path, and URL requests will be automatically approved.

# Remote Power BI MCP Server

Preview

- AI agents can query Power BI semantic models with natural language
- Retrieve schemas, generate DAX, run queries, and answer data questions

# WHY SEACREST COVE 2?



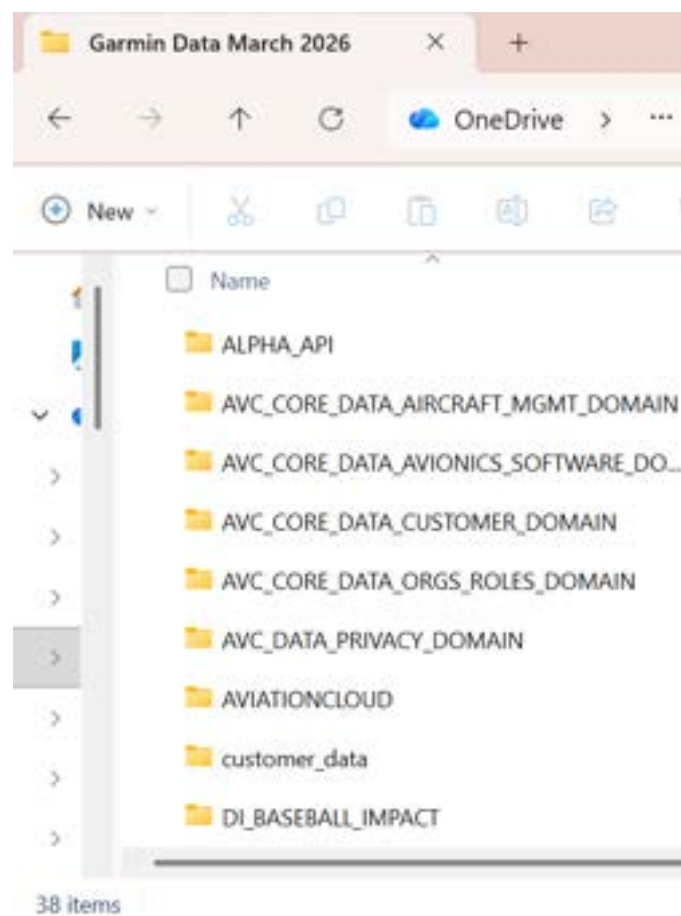
 Mike Nguyen

[@abaloneadventure](#) 

# THIS DATA WAS SCATTERED ACROSS HUNDREDS OF FILES

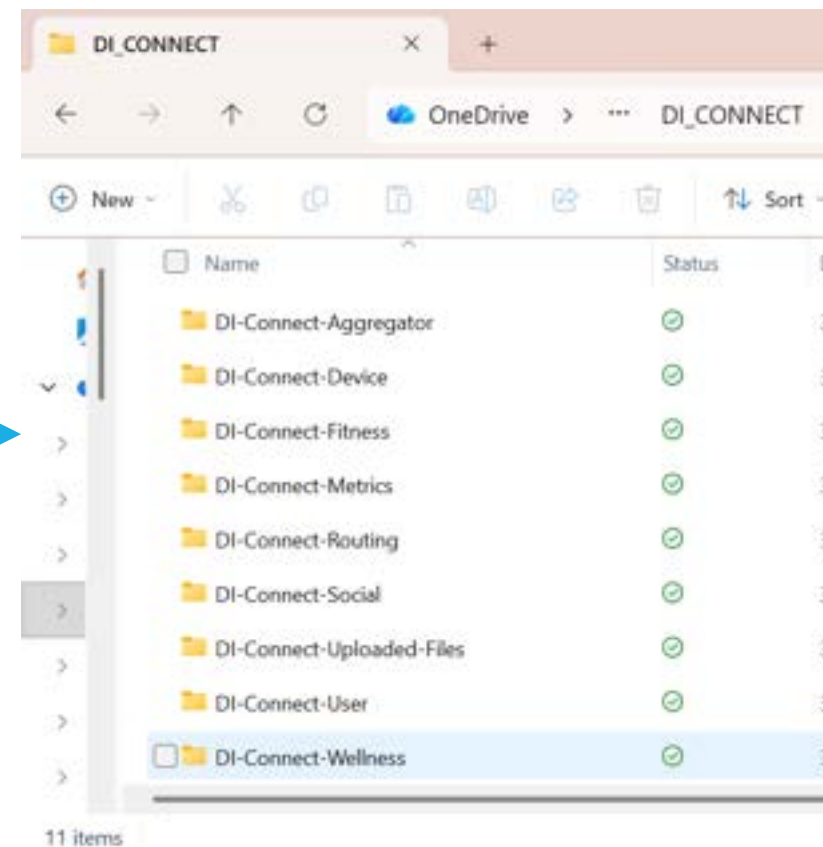
Dive site names weren't stored on the watch. Required internet lookups too

*Just finding the lat/long data required navigating 8+ subfolder levels and 200+ individual JSON files*



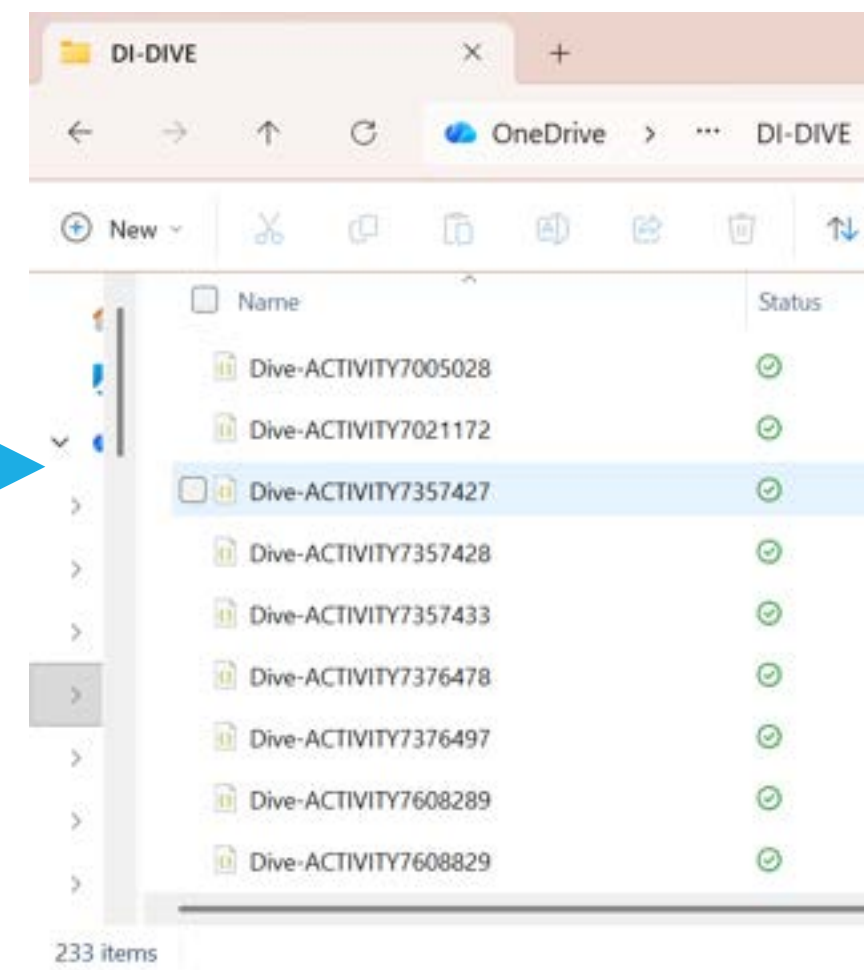
## Root folder

38 subfolders — find the right one



## DI\_CONNECT subfolder

11 more folders inside



## DI\_DIVE folder

Individual JSON files for every recorded dive



## Inside each file

Lat/long buried in nested keys

└ {"success":true,"message":"DAX query executed successfully,returned 30 rows ...

- Most dives are named "Single-Gas Dive" which is a generic Garmin name. The coordinates 47.59, -122.38 is clearly Alki Beach, Seattle waterfront area near the piers.

Let me also check what's at the other key coordinates. Let me also check the dive names for the other clusters to see if any sites.

- **dax\_query\_operations**

└ {"success":true,"message":"DAX query executed successfully, returned 20 rows ...

- Now I can map these precisely. Here's your **Seattle-area dive site breakdown**:

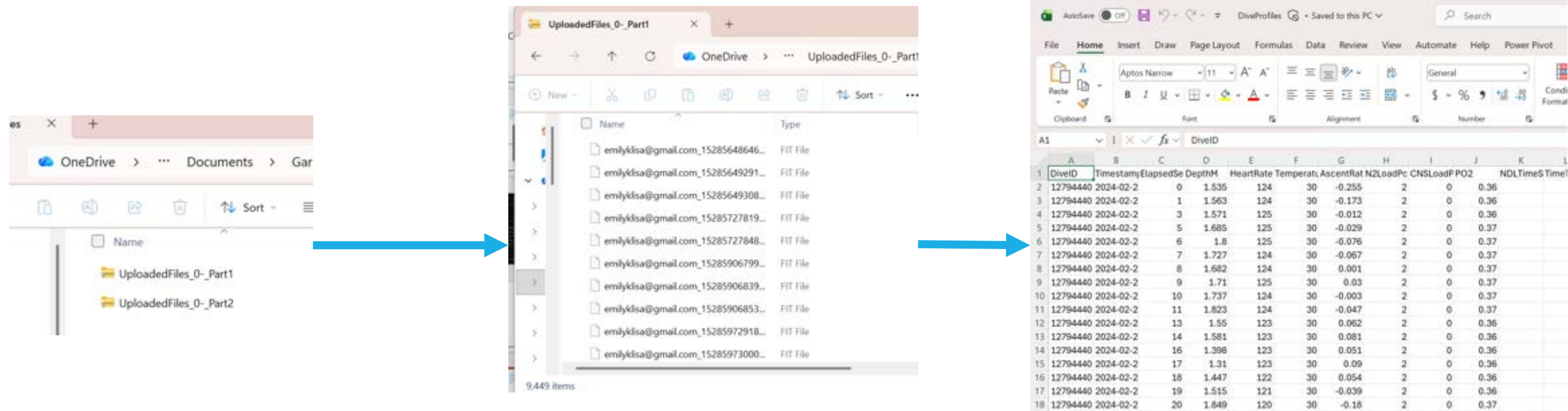
| # | Dive Site                          | Coords         | Dives | Notes                                     |
|---|------------------------------------|----------------|-------|-------------------------------------------|
| 1 | Alki Beach / Cove 2 (West Seattle) | 47.59, -122.38 | 95    | Your home dive! Depths from 1-31m         |
| 2 | Seattle Waterfront / Piers         | 47.61, -122.34 | 34    | Downtown shore diving                     |
| 3 | Mukilteo (Lighthouse Park)         | 47.95, -122.30 | 11    | Rescue Diver course, crab dives 🦀         |
| 4 | Lincoln Park (West Seattle)        | 47.57, -122.38 | 7     | First PNW dive, AOW course, dry suit cert |
| 5 | Saltwater State Park (Federal Way) | 47.35, -122.33 | 7     | AOW + training dives                      |
| 6 | Me-Kwa-Mooks (West Seattle)        | 47.58, -122.42 | 3     |                                           |
| 7 | Edmonds Underwater Park            | 47.81, -122.39 | 2     |                                           |

Alki Cove 2 is your spot – 95 out of 160 Seattle-area dives (59%)! Looks like Lincoln Park holds some sentimental value too for certifications. And Mukilteo was where you did your Rescue Diver course! 🦄

# THE GREAT BLUE HOLE, BELIZE



# THE SECOND-BY-SECOND DIVE DATE WAS SCATTERED



**Zipped upload folders**

2 compressed archives in DI-Connect

**9,449 FIT files inside**

One binary file per dive activity

**Python ETL -> DiveProfiles.csv**

Parses binary → CSV w/ thousands of rows per dive

This script works well for a small personal data, but wouldn't scale well to larger volumes that require scheduling, orchestration, or governance.

# WHAT WAS COVERED



## **Translate AI buzzwords into concrete concepts**

- What “agentic development” actually means (agents, models, tools, skills)
- How chat experiences differ from developer-integrated AI
- Where Power BI fits into the broader AI / agent ecosystem



## **How to start using agentic development in Power BI**

- Power BI AI experiences in GitHub Copilot and the web
- Preparing semantic models for AI (clean schema, instructions, verified answers)
- End-to-end demo: using AI to build a semantic model from scratch and ask ad-hoc questions

# FEATURES DEMOED

- Fabric Agent Skills Preview
- Power BI Modeling MCP Server Preview
- Copilot in Web Modeling Sneak peek
- Prep Data for AI Tooling Preview
- Fabric Data Agent Generally available
- Remote Power BI MCP Server Preview

**Want to  
learn  
more?**

**Join us!**

## **Expert vs. AI: The Power BI Turing Test**

Thursday, March 19 2:00 PM

Room: C111-C112

## **Intelligent Analytics in Real World Scenarios**

Friday, March 20 8:00 AM

Room: TMB 2-3

## **Data Modeling Like a Pro in Fabric**

Friday, March 20 2:00 PM

Room: TMB 2-3

Sound off.  
The mic is all yours.  
Influence the product roadmap.

Join the Fabric User Panel



Share your feedback directly with our Fabric product group and researchers.

<https://aka.ms/JoinFabricUserPanel>

Join the SQL User Panel



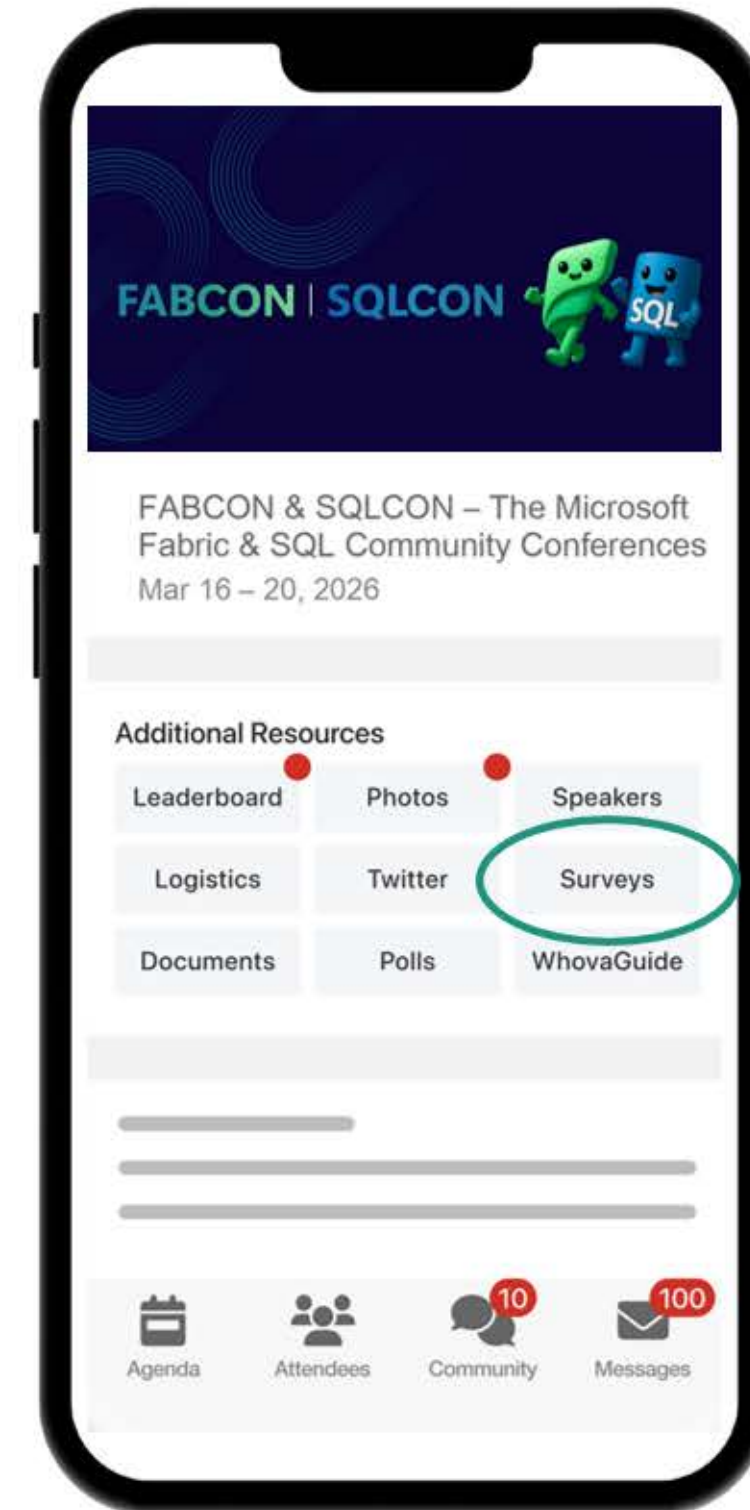
Influence our SQL roadmap and ensure it meets your real-life needs

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# How was the session?



Complete Session Surveys in  
*Whova* for your chance to WIN  
PRIZES!









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Share your feedback directly with our  
Fabric product group and researchers.

<https://aka.ms/JoinFabricUserPanel>

Join the SQL User Panel



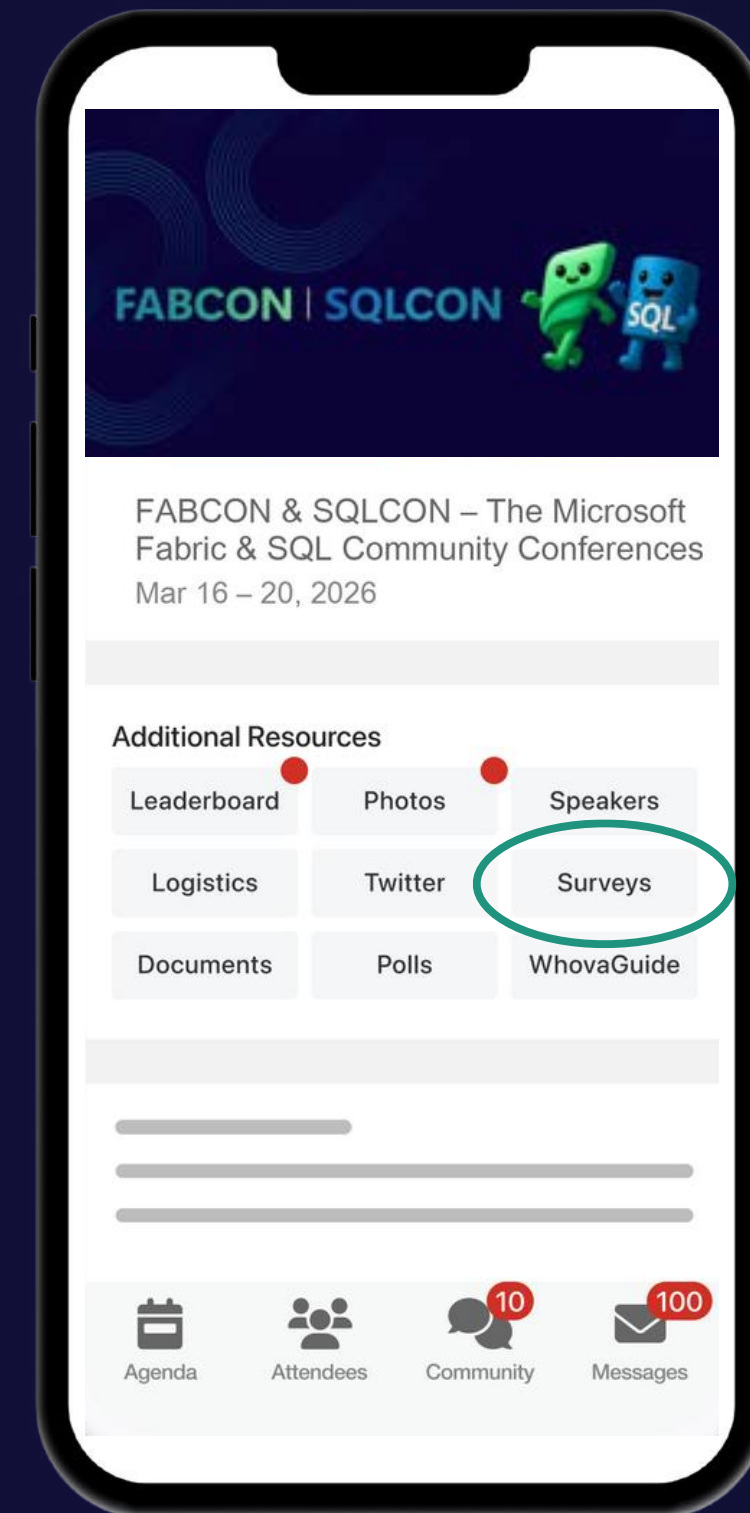
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