

CapitaLand Pre-Hackathon: Azure AI Introduction

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What is an AI agent?



Unlike previous tools, AI Agent can...



reason, 🖍 act and 📖 learn

Agentic components



Reasoning aka planning

Create a JSON describing the user issues



I'll look at the logs to see what happened



✗ Machine is past due for maintenance



I've captured the underlying issue in the details

```
{  
  "name": "John Clar  
  "issue": "Washing m
```

Go beyond transcriptions and slot filling by allowing agents to deduce the why



Acting aka tool calling

Fill out and submit the workorder



Populate field: name



Populate field: issue

✓ Name field populated
✓ Issue field populated



Submit form

The form has been successfully

Agents can take a simple request and chain multiple tool calls to complete the ask



Learning aka memory

Assign technician



✗ Alex is already booked at this same time
+ Saved memory: Alex is OOF next week



Let me try again with an available technician.

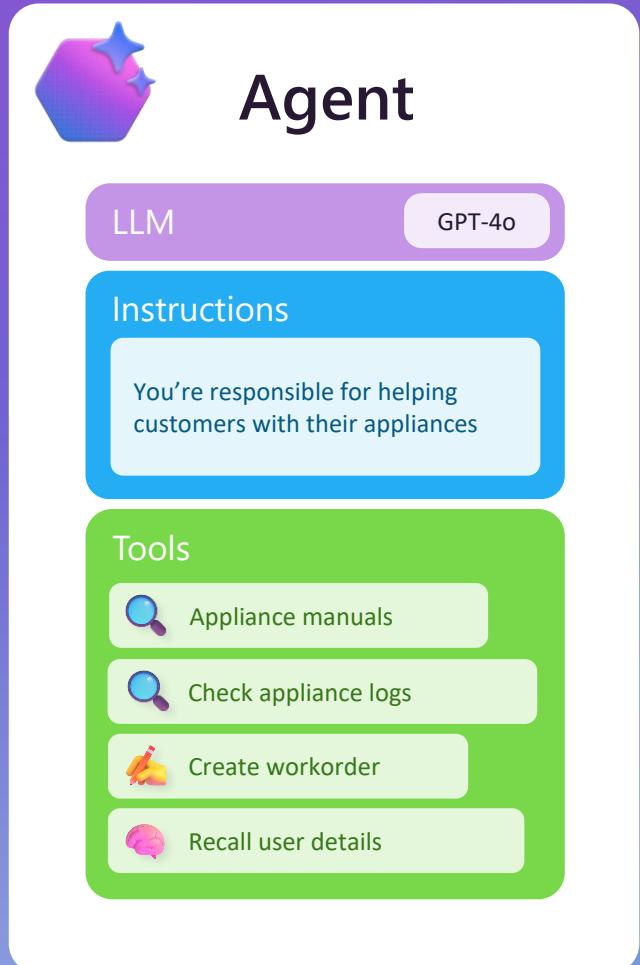


Update work order

✓ Successfully assigned technician

Only make a mistake once. With memory, agents can recall prior experiences

An AI agent in action...



User: My washer machine is making weird noises
Agent: *Recall user washing machine*
Tool: User has w100 with sn: 142352
Agent: I'll see what could be causing your w100 issues
Agent: *Search manuals*
Agent: It looks like there are three common reasons
Agent: I'll check your machine if it has any notices
Agent: *Check logs for 142352*
Agent: It looks like your machine is due for maintenance and is still under warranty.
Want me to schedule an appointment?
User: Sure! Let's target early next week
Agent: *Look for available times*
Agent: Would Monday at 1:00pm work?
User: Let's do it!
Agent: *Create workorder*
Agent: Done! Is there anything else I could help you with?

Agents range from simple to complex

Tasks can vary in level of complexity and capabilities depending on your need

Simple



Chatbots

Answer questions for users with retrieval augmented generation

Knowledge tools



Copilots

Performs actions on-behalf-of a user with human supervision

+ Action tools



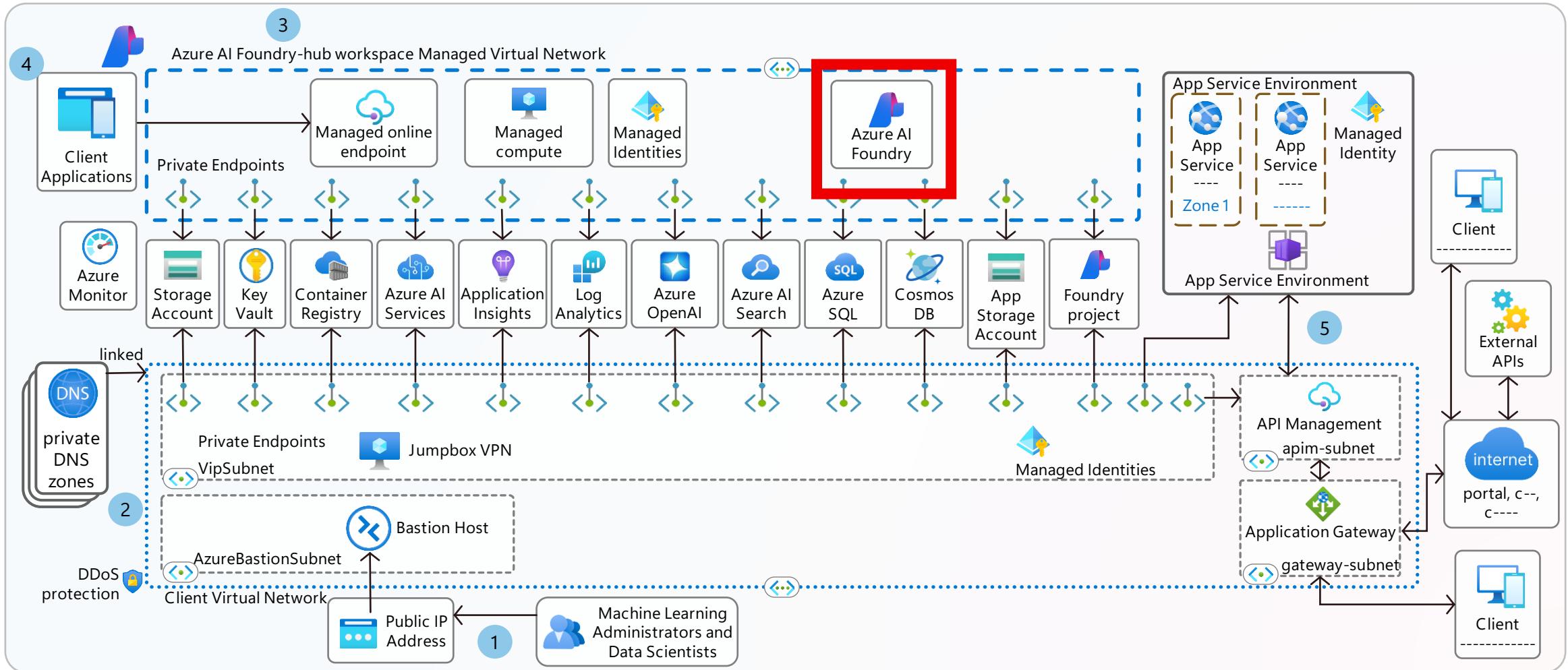
Advanced

Automated agents

Automatically complete tasks as background jobs on-behalf-of users

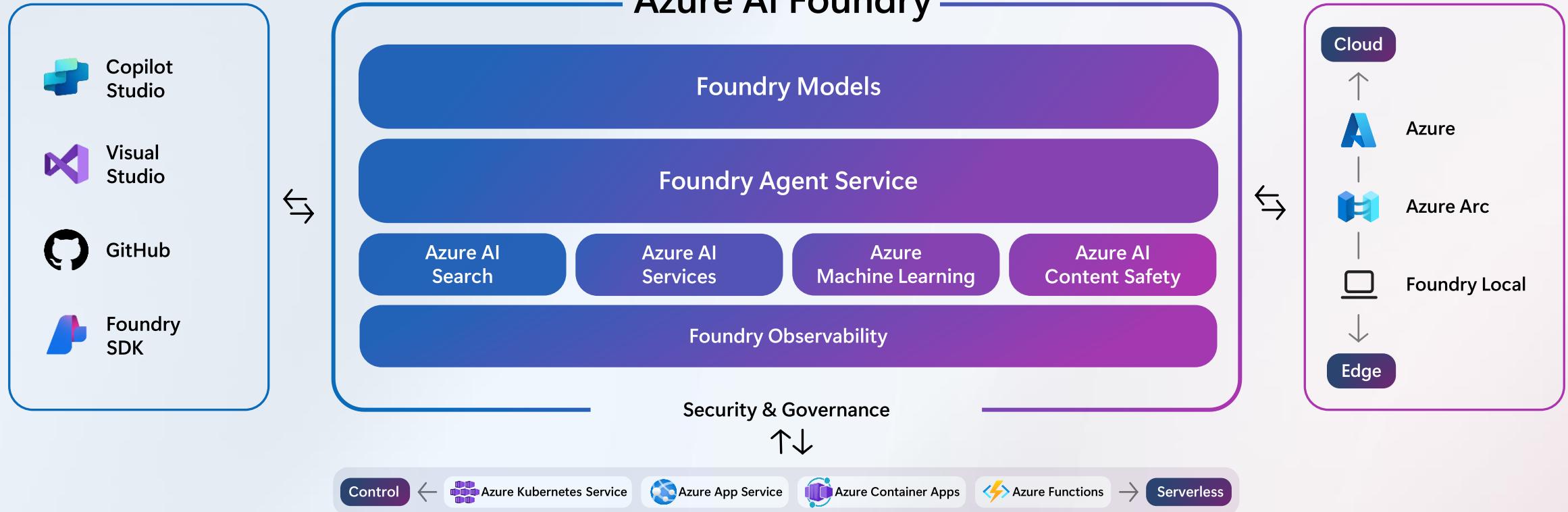
+ Triggers

Building is Easy: Just do this





Azure AI Foundry





Azure AI Foundry Agent Service

Securely customize, orchestrate, and deploy AI agents with ease

Multi-Agent
Orchestration

Open and
Interoperable Tools

Trust & Enterprise
Readiness

AI.Azure.com



Azure AI Foundry Agent Service

Securely customize, orchestrate, and deploy AI agents

Model choice

Model choice and flexibility with the model catalog



Azure OpenAI Service

o1, o3-mini, GPT-4.1, 4o, etc



Llama 3.1-405B-Instruct



Mistral Large



Cohere-Command-R-Plus

Non-OpenAI models are coming soon

AI tools

Richest set of enterprise connectivity

Knowledge



Actions



Logic Apps Azure Functions OpenAPI MCP

Trust

Customer control over data, networking, and security

- BYO-file storage
- BYO-search index
- BYO-virtual network
- BYO-thread storage
- OBO authentication
- Content filtering

How does your agent work?

"Help me book a trip to New York for a client meeting? I need to fly out next Monday and return on Friday."



User

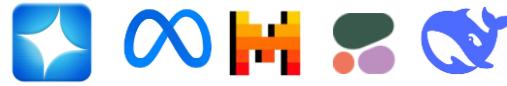
"I've booked your trip to New York as requested. Here are details:..."



Travel Booking
Agent



Knowledge Sources
(search, files, databases, storage etc.)



Models
(Azure OpenAI Service, Models-as-a-Service)



Actions
(Pre-built or custom tools to automate processes)

How does your agent work?

Step 1:
Create an Agent

Step 2:
Create a Thread

Step 3:
Run the Agent

Step 5:
Check the Run status

Step 6:
Display the Agent's Response

Agent
Travel Planning Agent

Instructions

You are a travel booking and expense management assistant designed to help employees plan, book, and manage business travel.

Model



Your data (optional)

Azure AI Search

Files (local or Azure Blob)

Tools (optional)

File Search
Code Interpreter
Function Calling
Bing Search
Microsoft SharePoint (coming soon)
Microsoft Fabric (coming soon)
Azure Logic Apps (coming soon)
Azure Functions
OpenAPI 3.0 specified tools

Thread
Travel Planning

User's message

I need to book a hotel in New York for 2 stays.

Agent's message

Here are some suggestions:

Run 1

1 Use Tripadvisor API to search the nearest hotel

2 Create message

User's message

What's the daily meal allowance for the business trip?

Run 2

1 Use Microsoft SharePoint to query the company travel policy

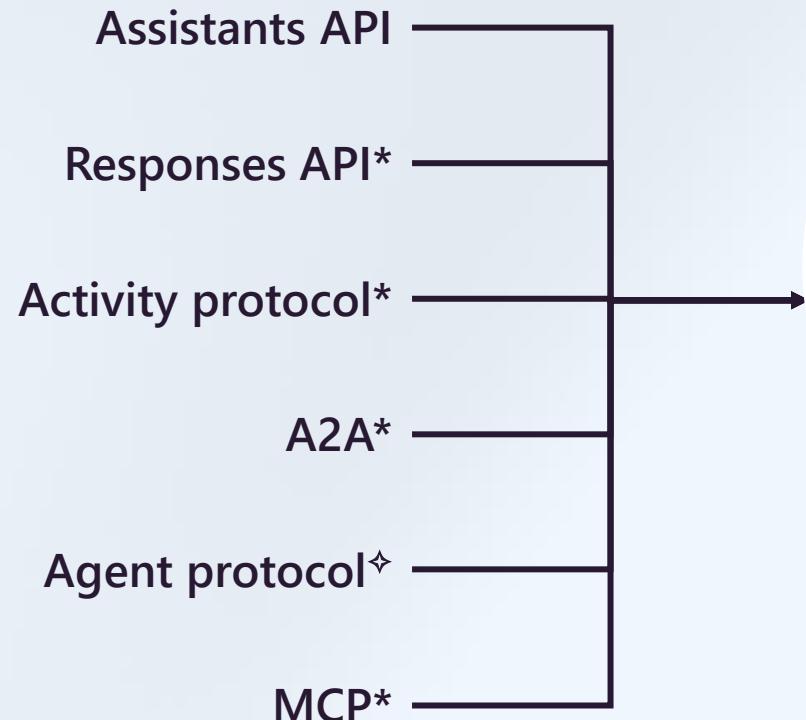
2 Create message

Agent's message

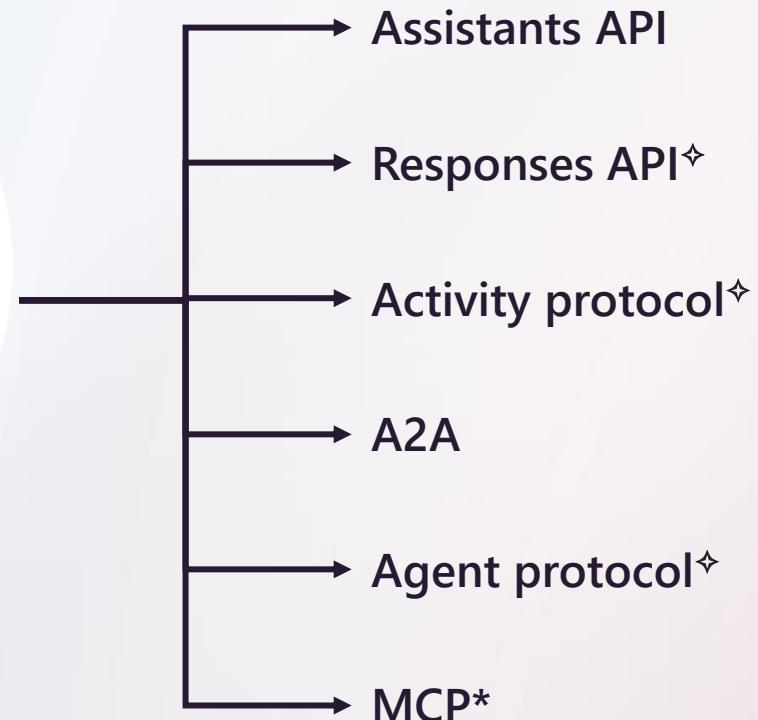
The daily allowance for your business trip is \$75, as per company policy.

Foundry Agent Service will work with the top agent protocols

Import external agents



Expose your agent externally

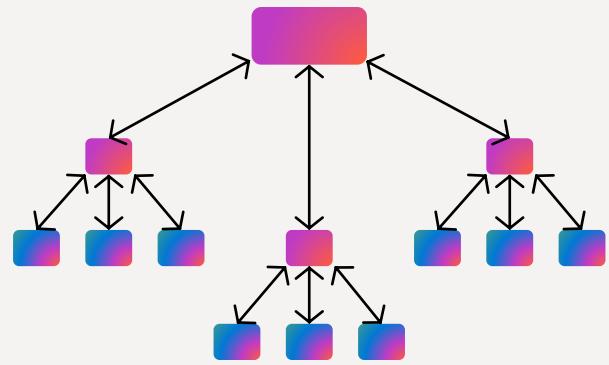


* Available with Semantic Kernel † Coming soon

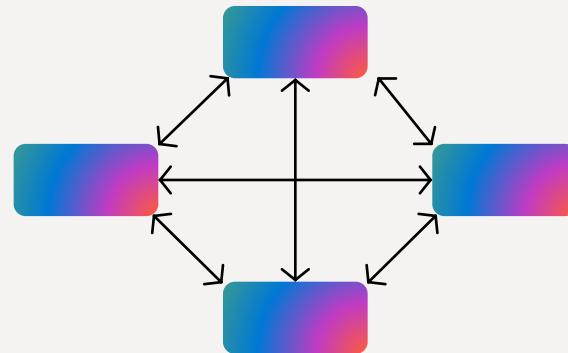
Multi-Agent Orchestration

Multi-Agent Orchestration Patterns

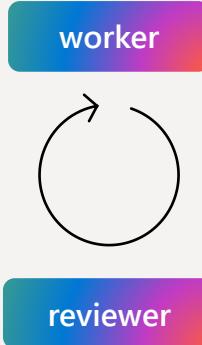
Hierarchical



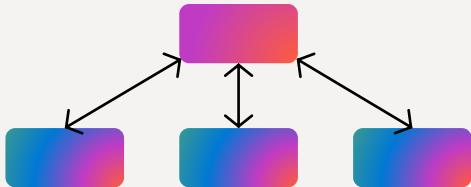
Network



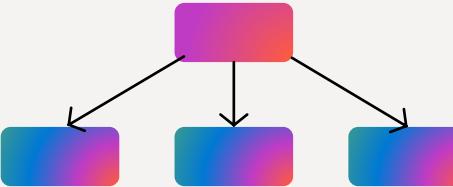
Maker-Checker



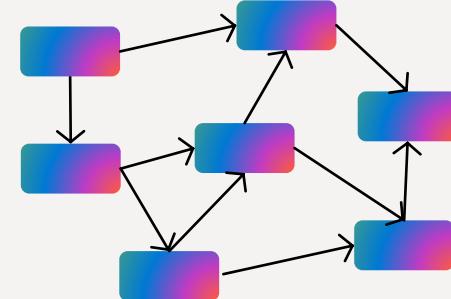
Supervisor



Hand-Off

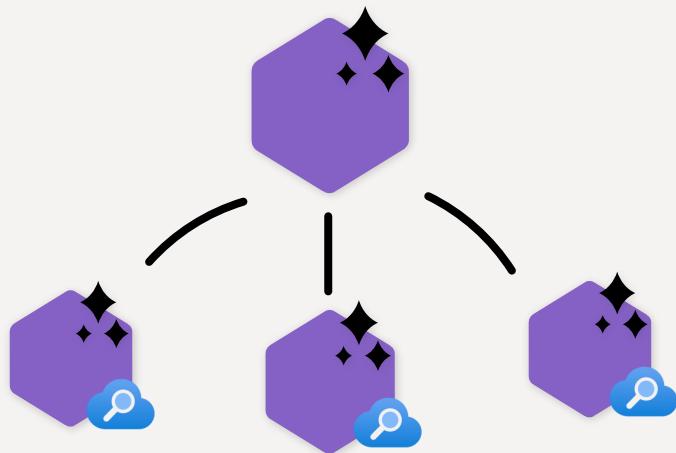


Custom



Multi-agent orchestration in Foundry Agent Service

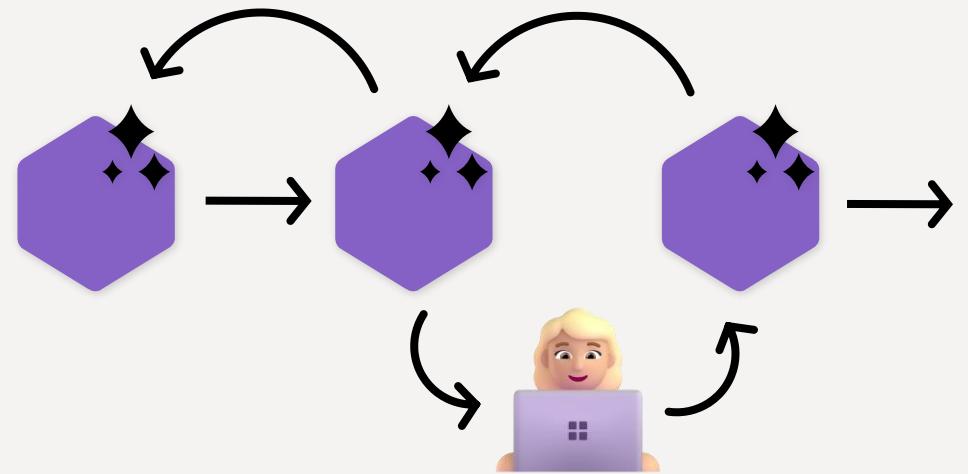
Agent-as-tools



Give one agent the abilities of another...

Workflow automation

Powered by AutoGen



Declaratively orchestrate multiple agents together

Azure AI Foundry API and SDK

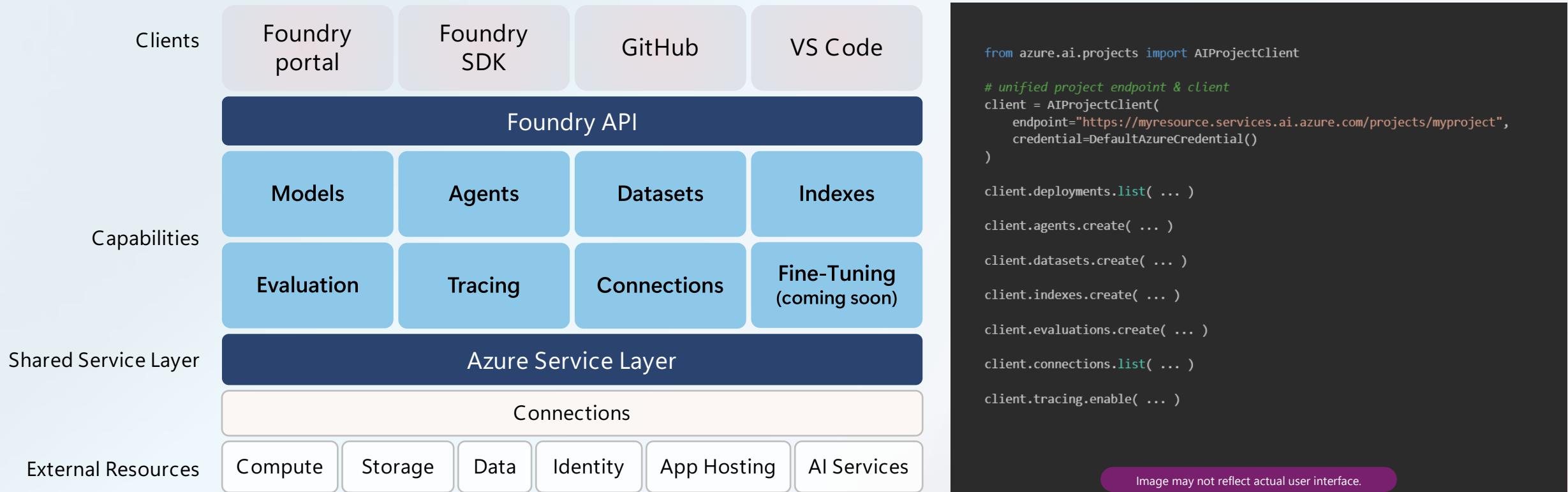
A unified AI development toolchain.

- Simplifies coding
- Improves development productivity
- Enables organizations to responsibly scale their AI applications and agents

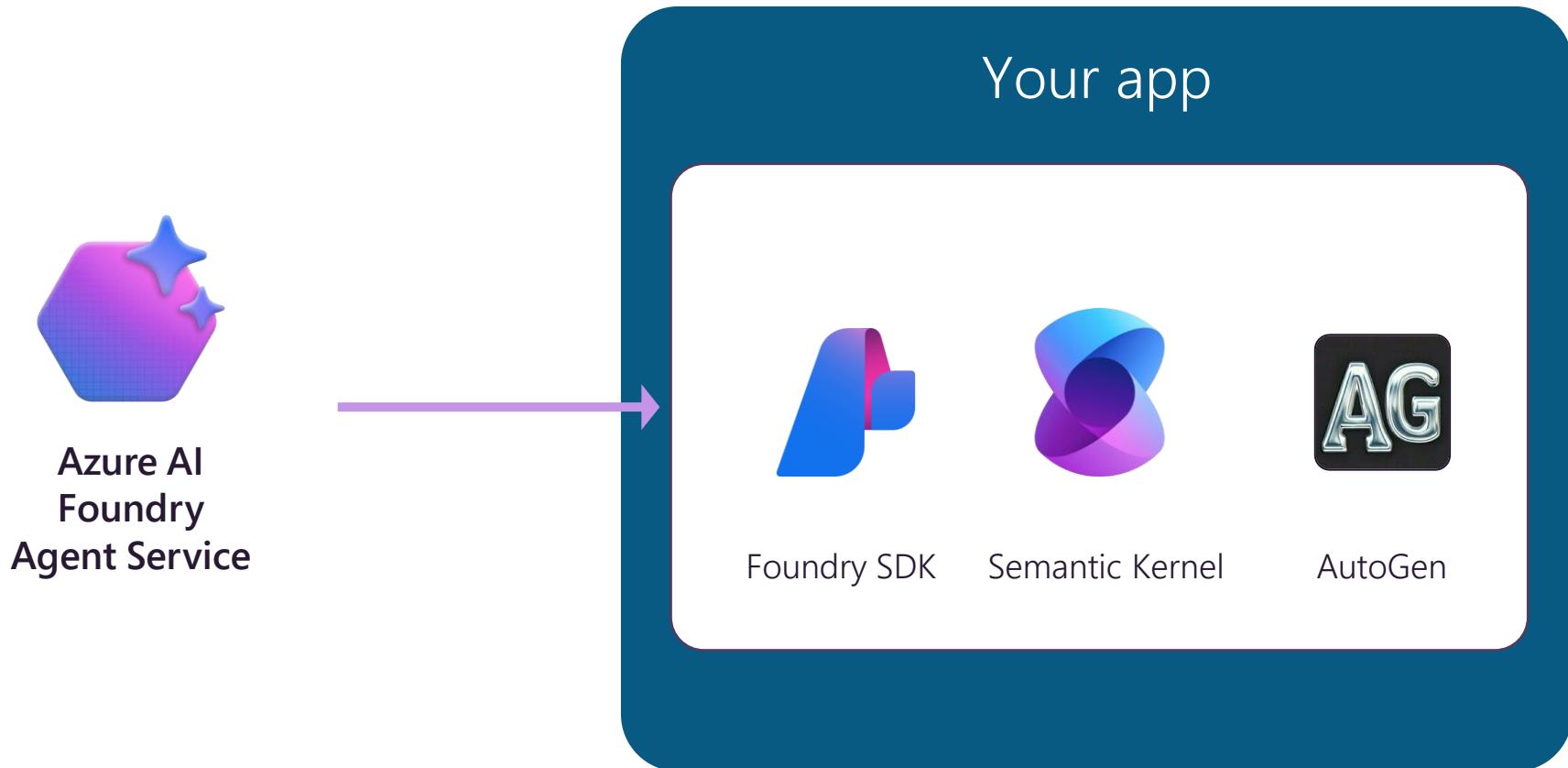
```
project = AIPProjectClient(  
    endpoint=os.environ["AZURE_AI_PROJECT_ENDPOINT"],  
    credential=DefaultAzureCredential())  
  
# Create tool to search an existing knowledge base  
search_tool = AzureAISeachTool(  
    index_connection_id="ai-search-connection",  
    index_name="product_index",  
    query_type=AzureAISeachQueryType.SIMPLE,  
    top_k=3,  
)  
  
# Create a new agent with the search tool attached  
agent = project.agents.create_agent(  
    name="my-agent",  
    model="gpt-4o",  
    tools=search_tool.definitions,  
    tool_resources=search_tool.resources,  
    instructions="You are a helpful that answers questions about the attached knowledge base.")  
  
# Run the agent with a sample question  
thread = project.agents.threads.create()  
project.agents.messages.create(  
    thread_id=thread.id,  
    role="user",  
    content="What products do you recommend for solo travelers?",  
)  
  
run = project.agents.runs.create_and_process(thread_id=thread.id, agent_id=agent.id)  
messages = project.agents.messages.list(thread_id=thread.id)  
print(messages.data[0].content) Image may not reflect actual user interface.
```

Download the SDK aka.ms/aifoundrysdk

Azure AI Foundry API

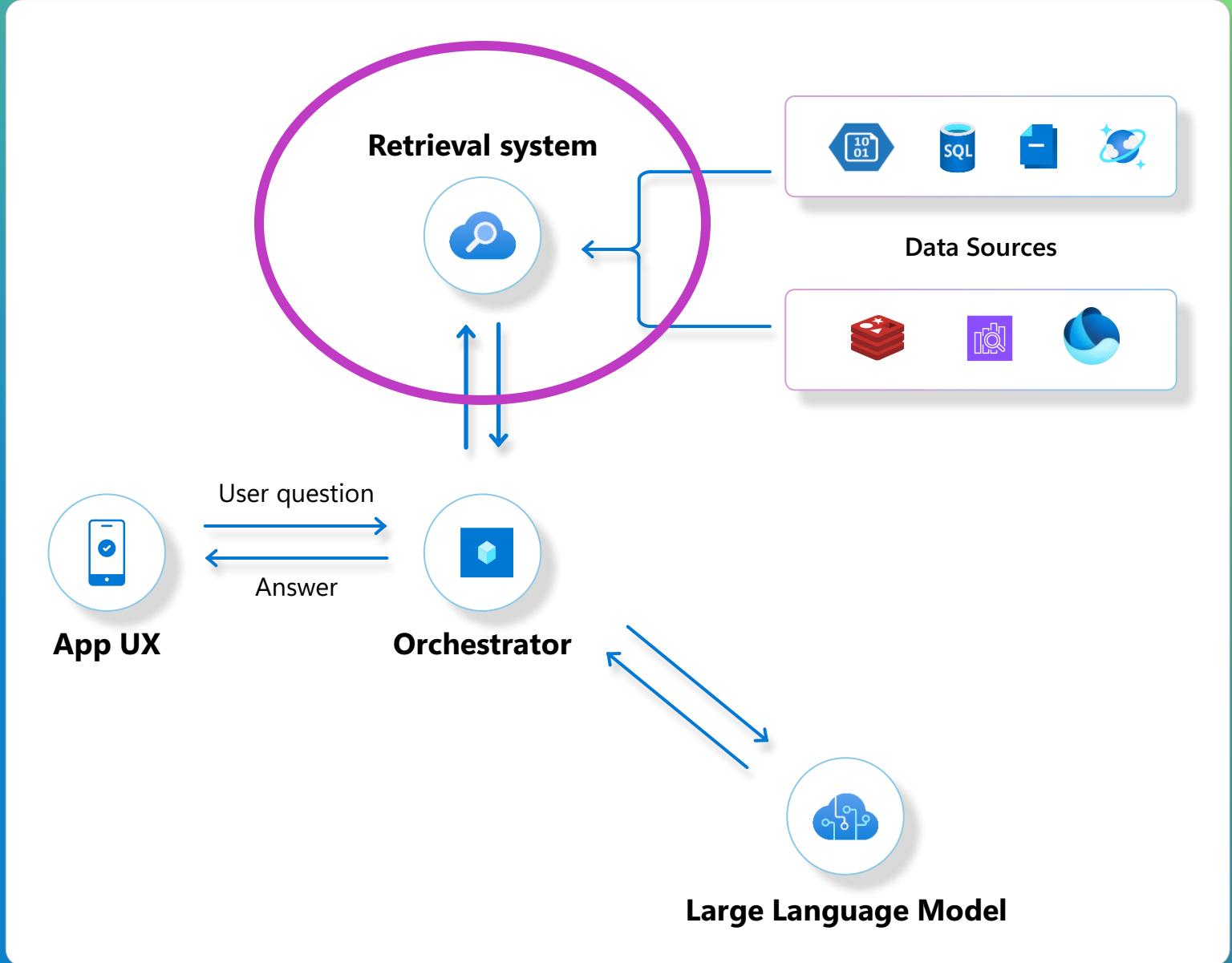


And you can integrate agents into your existing apps with our agent frameworks



* Available with Semantic Kernel [↗] Coming soon

Retrieval-augmented generation



Retrieval strategies

Keyword search

- **For exact, plain text matches**
- “Vocabulary gap” in Q&A systems like Copilot

Vector search

- **For conceptual similarity, or underlying meaning**
- Weak performance on exact matches (like a product ID or code)

Hybrid search

- **Best of both vectors and keywords**
- Brings more accurate responses across various scenarios

Search re-ranking

- **Scores and ranks all retrieved documents by relevance**
- Reranking runs after performing search strategy (can't retrieve information)

RAG Takeaways



Knowledge with RAG

Incorporate domain-specific knowledge into your GenAI app



Retrieval matters

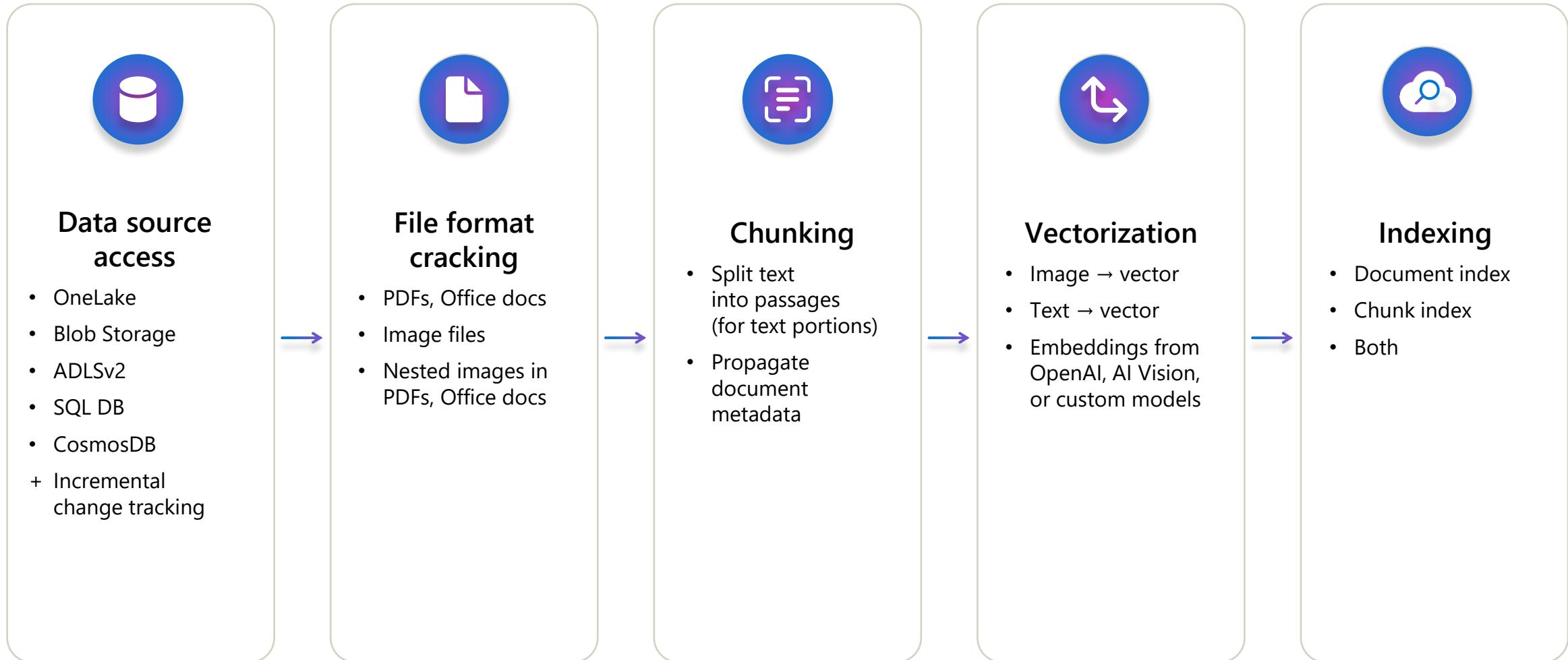
A retrieval system delivers better information, you can't rely on the LLM

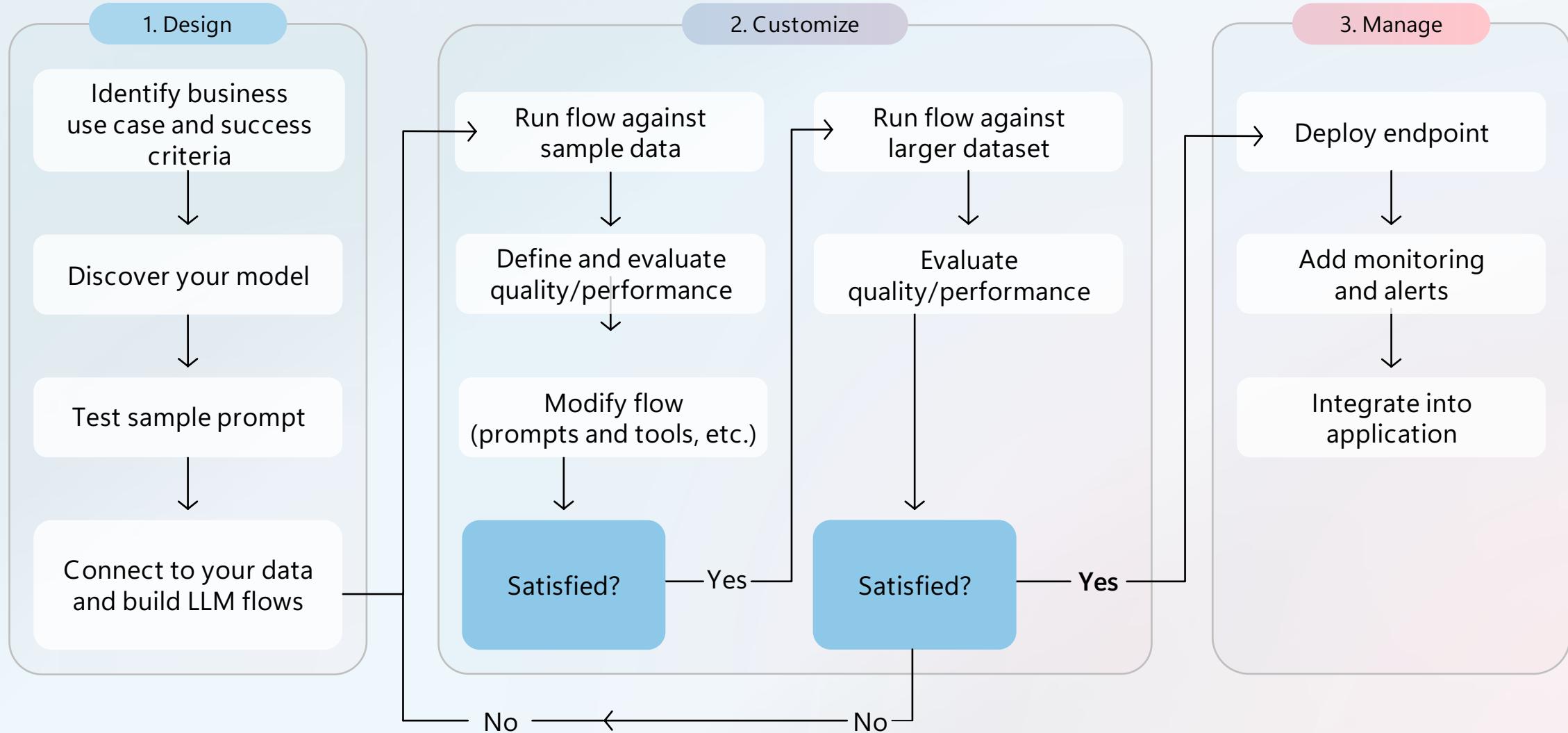


Better results with robust search

Using multiple search strategies will retrieve more relevant information

Integrated vectorization





References

- [**What is Azure AI Foundry? - Azure AI Foundry**](#)
- [Introduction to Azure AI Search - Azure AI Search](#)
- [**What is Azure AI Foundry Agent Service? - Azure AI**](#)
 - [Quickstart - Create a new Azure AI Foundry Agent Service project - Azure AI](#)
- [What is Azure AI Content Understanding? - Azure AI services](#)
- [GitHub - azure-ai-foundry/ai-tutorials](#)
- [**GitHub - Azure/azure-ai-agents-labs**](#)