



Advanced Analytics and Azure OpenAI

CERN 30th October 2023



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Created with Microsoft Designer

It's all about data....

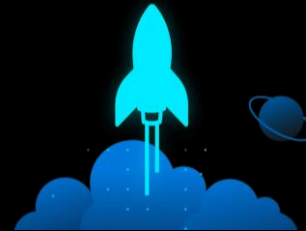
Volume



Variety



Velocity



You must build a **great product/solution**

The model is not your product

It's up to you to create **great experiences**

Today's data realities for startups...

Quality Data

Clean, reliable, and diverse data sources

Infrastructure

Scalable cloud computing and data storage

Privacy/Security

Ensuring data privacy regulations

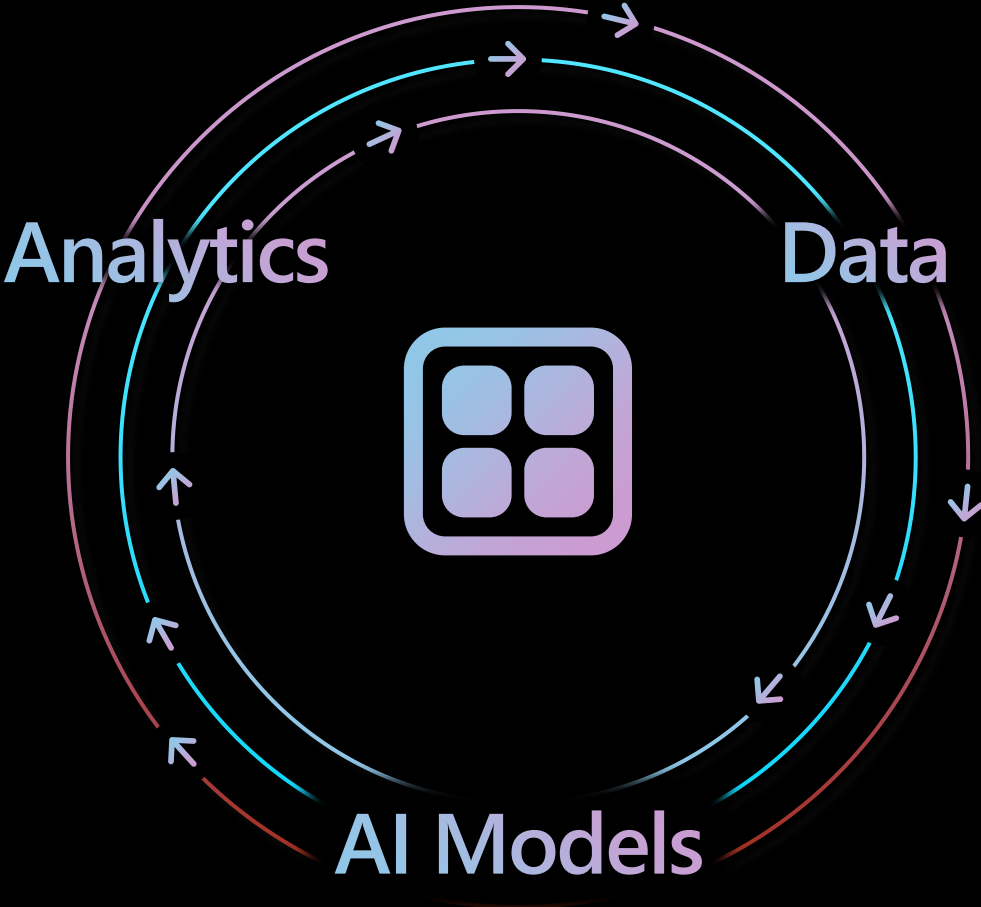
Integration

Seamlessly integrate into existing solutions

Monitoring

Performing regular maintenance

In the age of AI,
every data should
be intelligent



Azure AI

Applications

Microsoft 365



Power BI



Power Apps

Microsoft Dynamics 365



Power Automate



Power Virtual Agents



ISV ecosystem



Customer Solutions



Partner Solutions

Azure AI Services



Bot Service



Cognitive Search



Document Intelligence



Video Indexer



Metrics Advisor



Immersive Reader



Vision



Speech



Language



Decision



Azure Open AI

Machine Learning Platform



Azure Machine Learning

Data Platform



Fabric

AI Infrastructure



Azure

Azure AI Studio



Cloud Services – A LEGO analogy

We partner at scale to drive innovation



OpenAI forms exclusive computing partnership with Microsoft to build new Azure AI supercomputing technologies

July 22, 2019 | Microsoft News Center



Hugging Face Collaborates with Microsoft to Launch Hugging Face Endpoints on Azure

Published May 24, 2022.



Meta selects Azure as strategic cloud provider to advance AI innovation and deepen PyTorch collaboration

Posted on May 25, 2022

[Eric Boyd](#), Corporate Vice President, AI Platform



Azure Scales 530B Parameter GPT-3 Model with NVIDIA NeMo Megatron

Posted on October 24, 2022

[Rachel Pruitt](#), Product Marketing Manager, Azure Marketing, HPC + AI



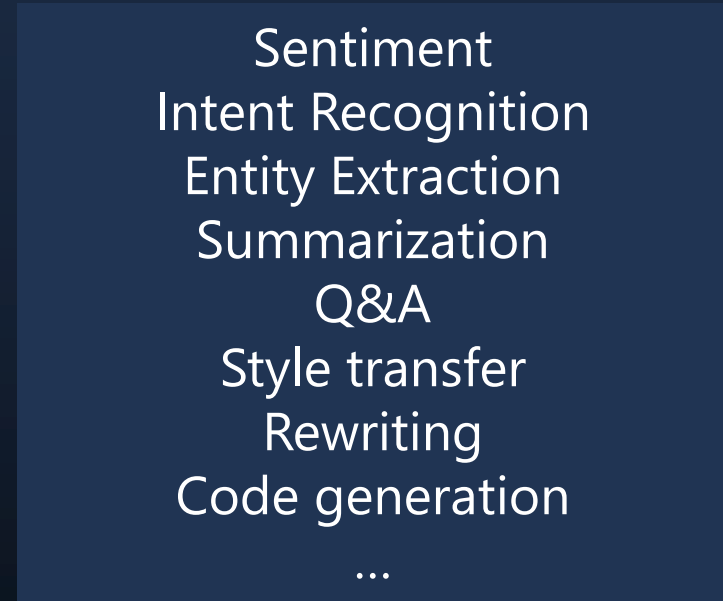
Why is OpenAI different?

Typical ML for NLP



One model per capability
Lots of data to train
Highly optimized for use case

OpenAI GPT-4



Single large model for all use cases
Describe in «human language» what you
want it to do

Top use cases for Generative AI



Enterprise ChatGPT
Better knowledge mining



Intelligent Call Centers
Better analytics and service



Build your own copilot
Your data. Your apps. Your people

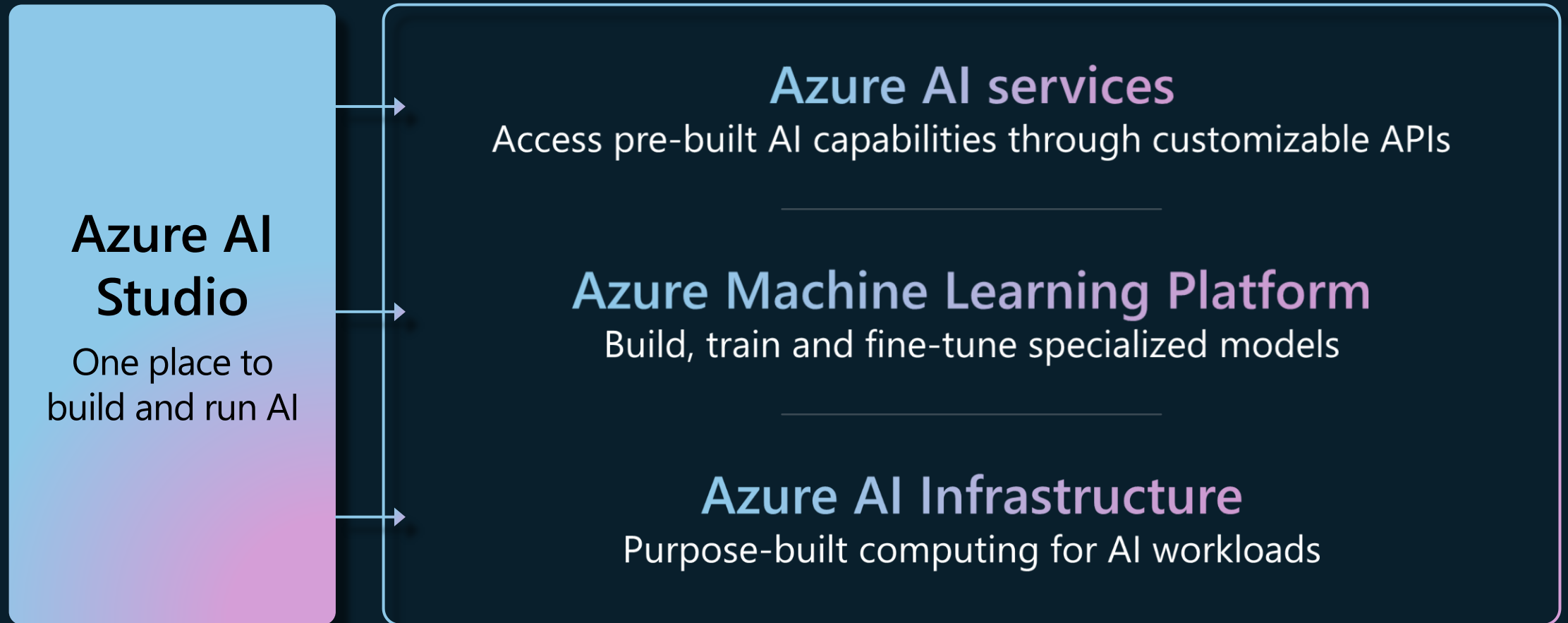


Content Generation
New products and services

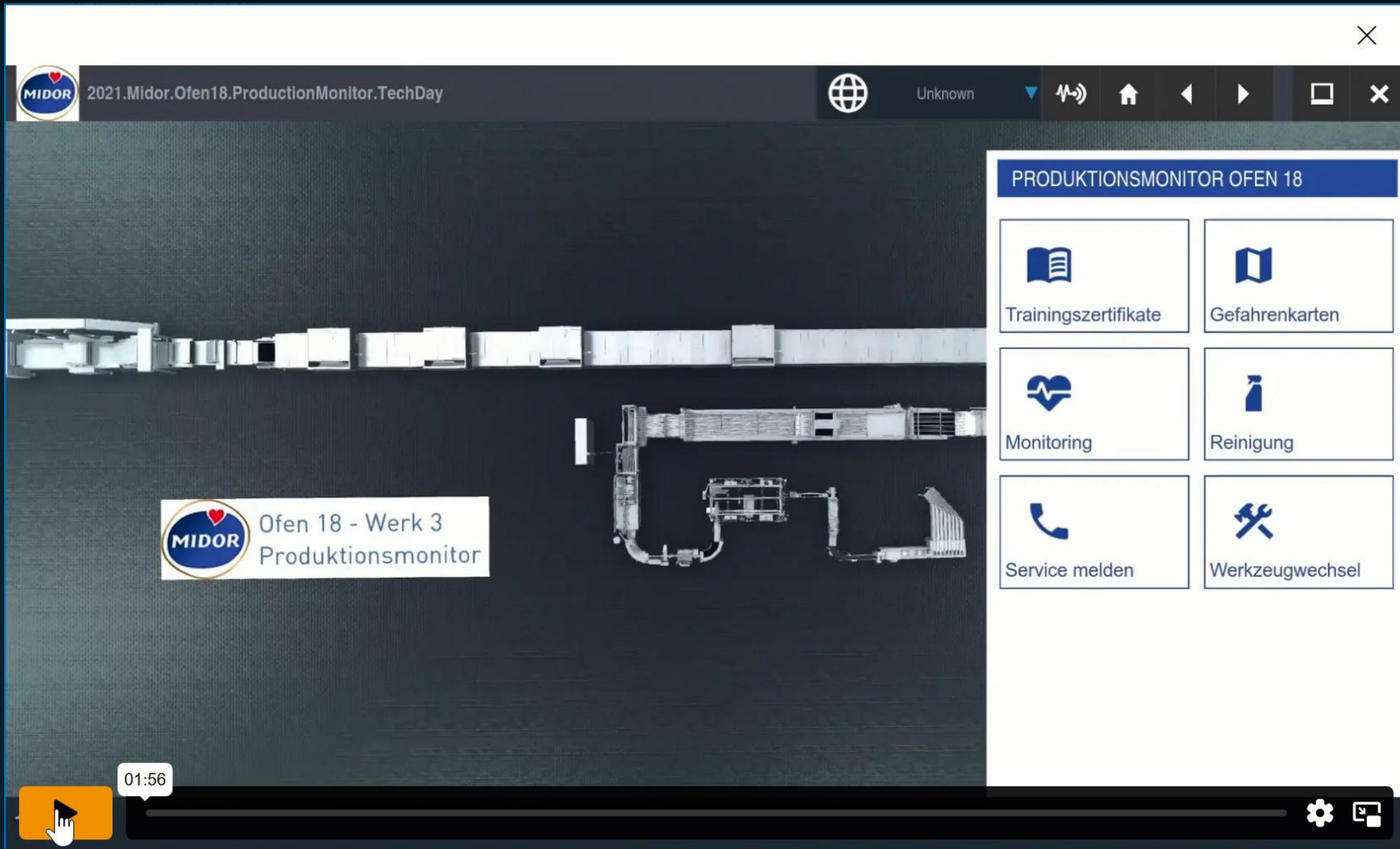


Hyper-personalization
Better sales and marketing

Meet the Azure AI platform



CAD Data becomes an interactive object...



"I want to integrate GPT into my existing application!"

Enhanced applications

Medical research app

Insurance policy app

Machinery maintenance app

Tourism discovery app

Flight booking app

Grocery / cooking app

Techniques

Embeddings

Vectors

Orchestration


Models

 OpenAI

GPT-4

DALL·E

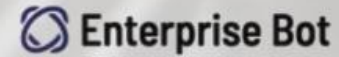
ChatGPT

 Microsoft
Azure OpenAI Service

Infrastructure

Cloud Computing Platform

Chatbot/Knowledge Management powered by Azure OpenAI



GET YOUR ENTERPRISE READY CHATGPT



State-of-the-art security

Deploy all of Enterprise Bot's components in a private cloud or on-premise to ensure utmost data security. Benefit from Azure OpenAI APIs to ensure your data resides in Western Europe

Up-to-date data

Enterprise Bot's DocBrain creates semantic search and knowledge graphs from websites, documents and more and updates them autonomously to ensure the chatbot always has the most recent data

Backend integrations

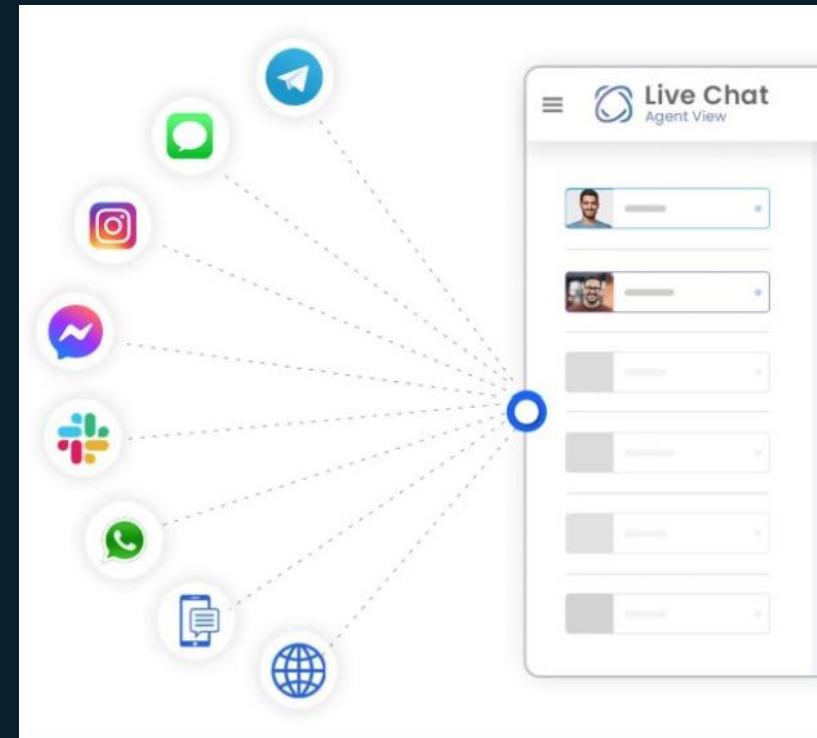
Take the journey one step further by enabling users to not only get information but complete actions via chat through deep integrations via Blitzico by Enterprise Bot

Reduced "halluncinations"

Enterprise Bot's pipeline includes ChatGPT gets relevant data and is then prompt engineered to respond with minimal hallucinations and with no data from the past or from outside the Enterprise Domain

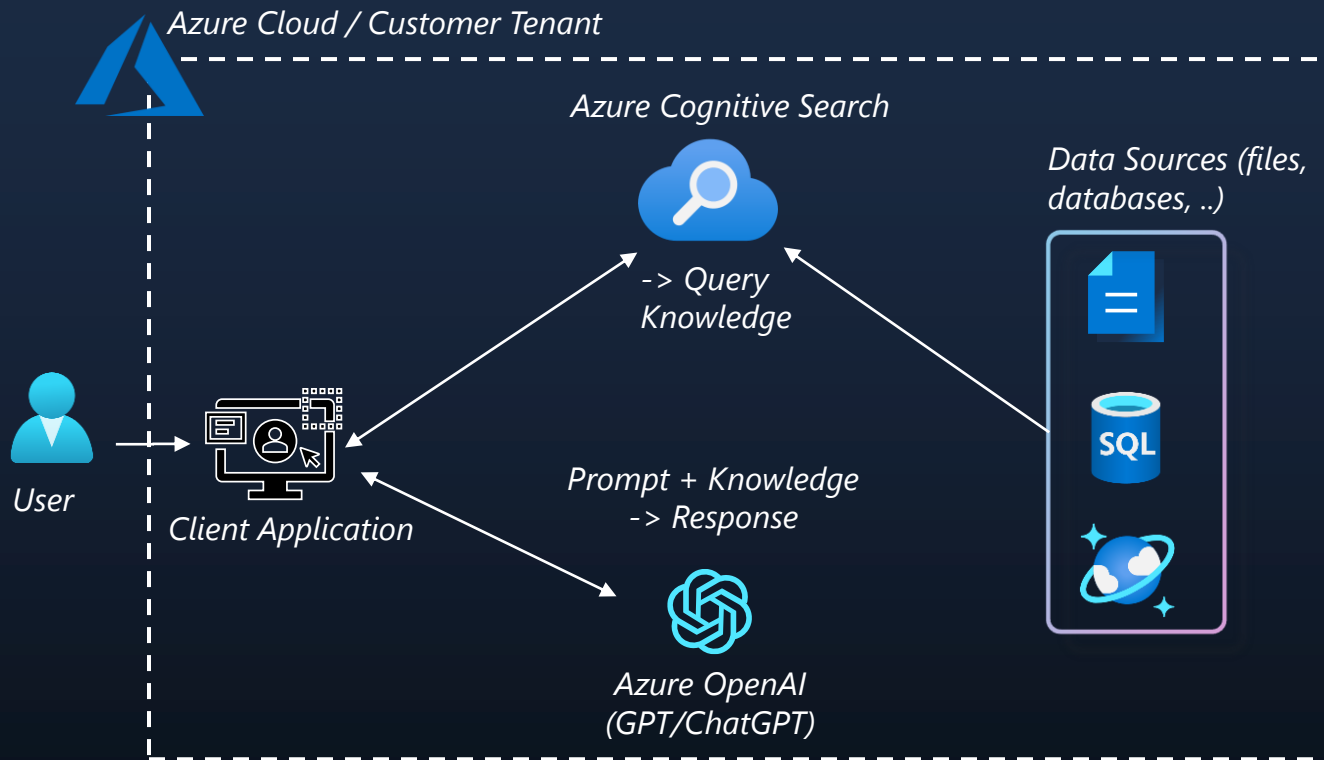
Source references

Enterprise Bot provides auditability, critical for enterprises to ensure that the information is accurate and the sources are referenced so users know where the information came from



[Microsoft Azure Marketplace](#)

Safety Systems

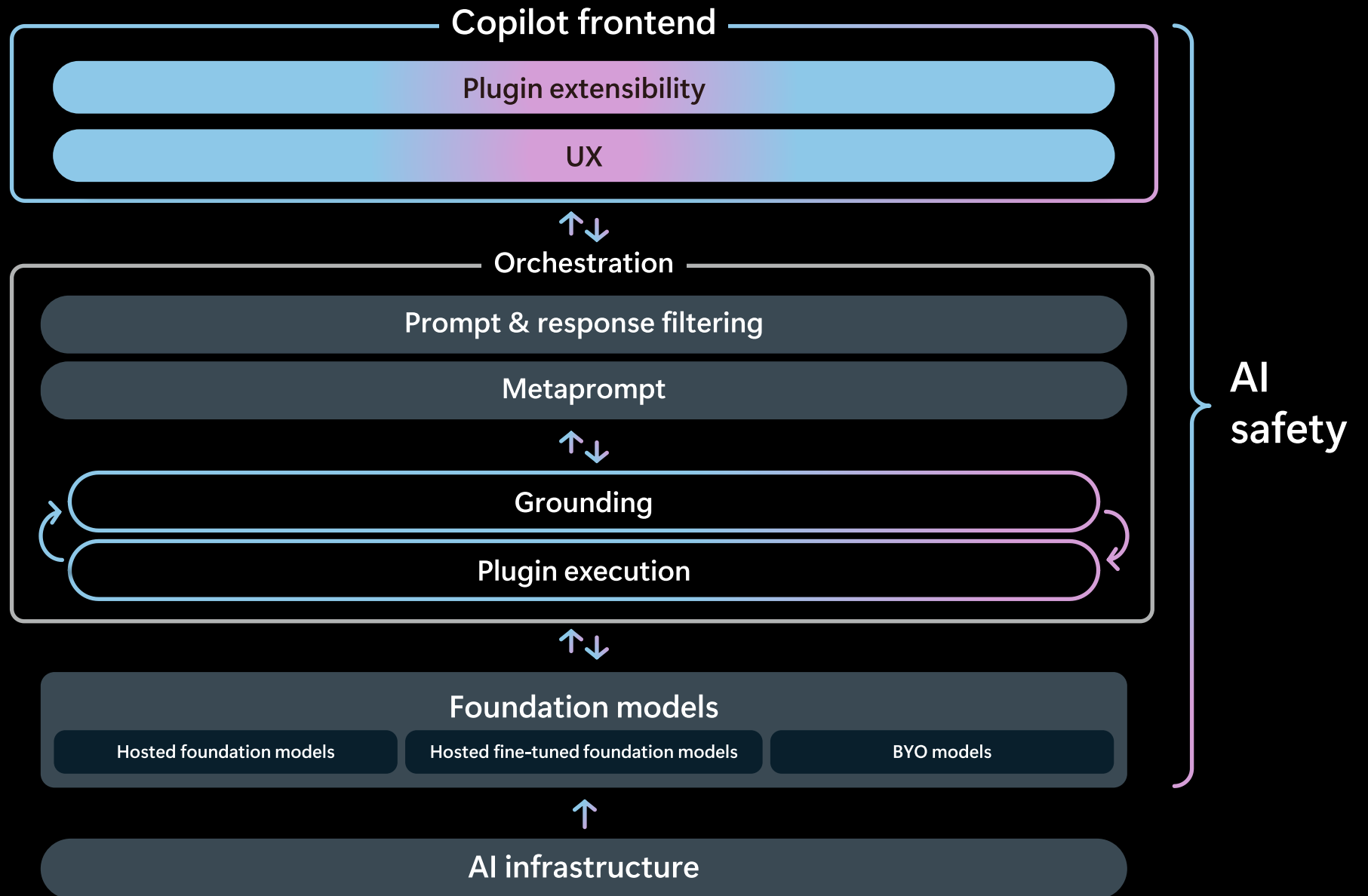


Deployed and secured in customer cloud environment and tied to their datasets and applications

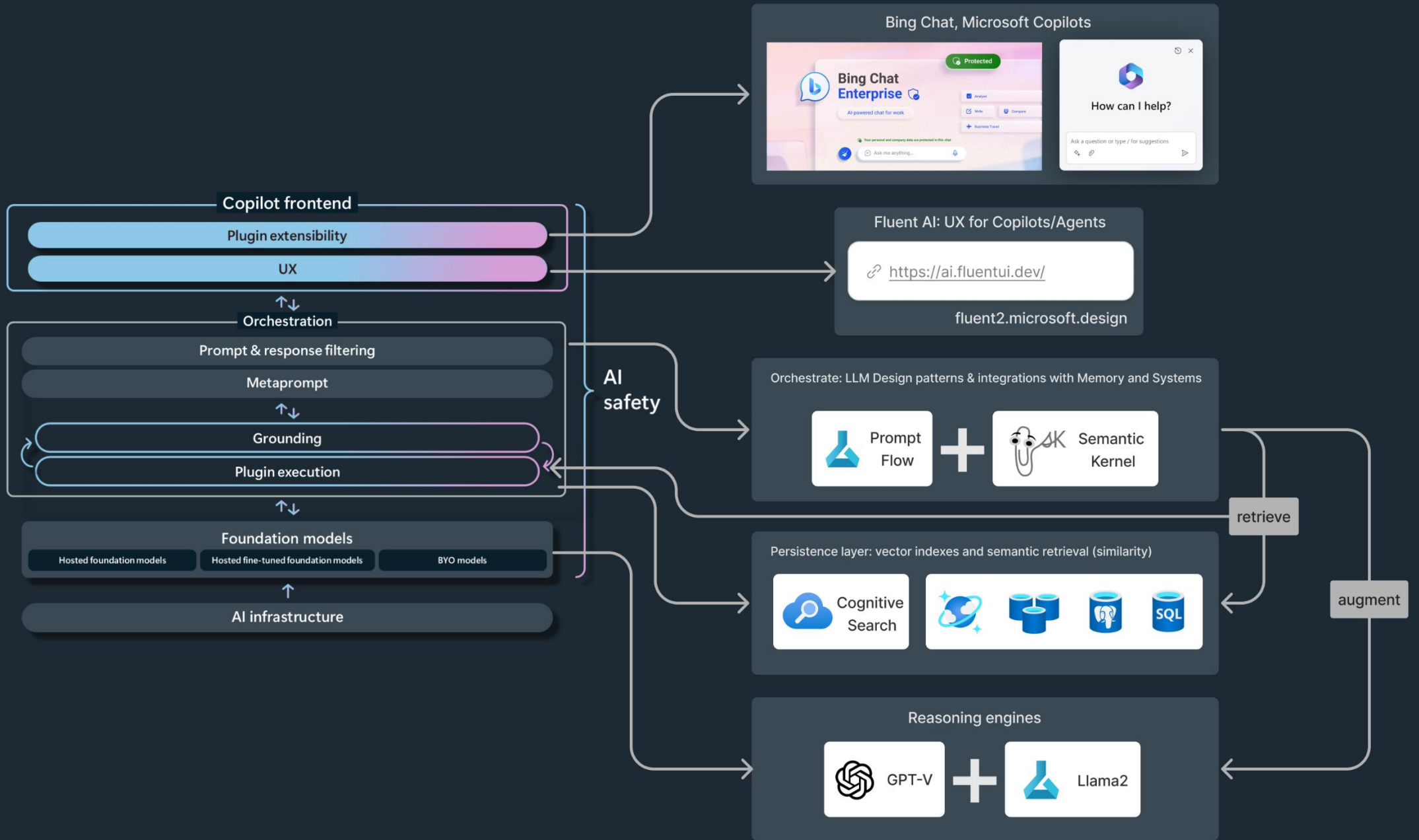
Enterprise-grade security with role-based access control (RBAC) and private networks

Prompts and completions processed by Azure OpenAI are not used to train, retrain or improve the models.





Copilot stack

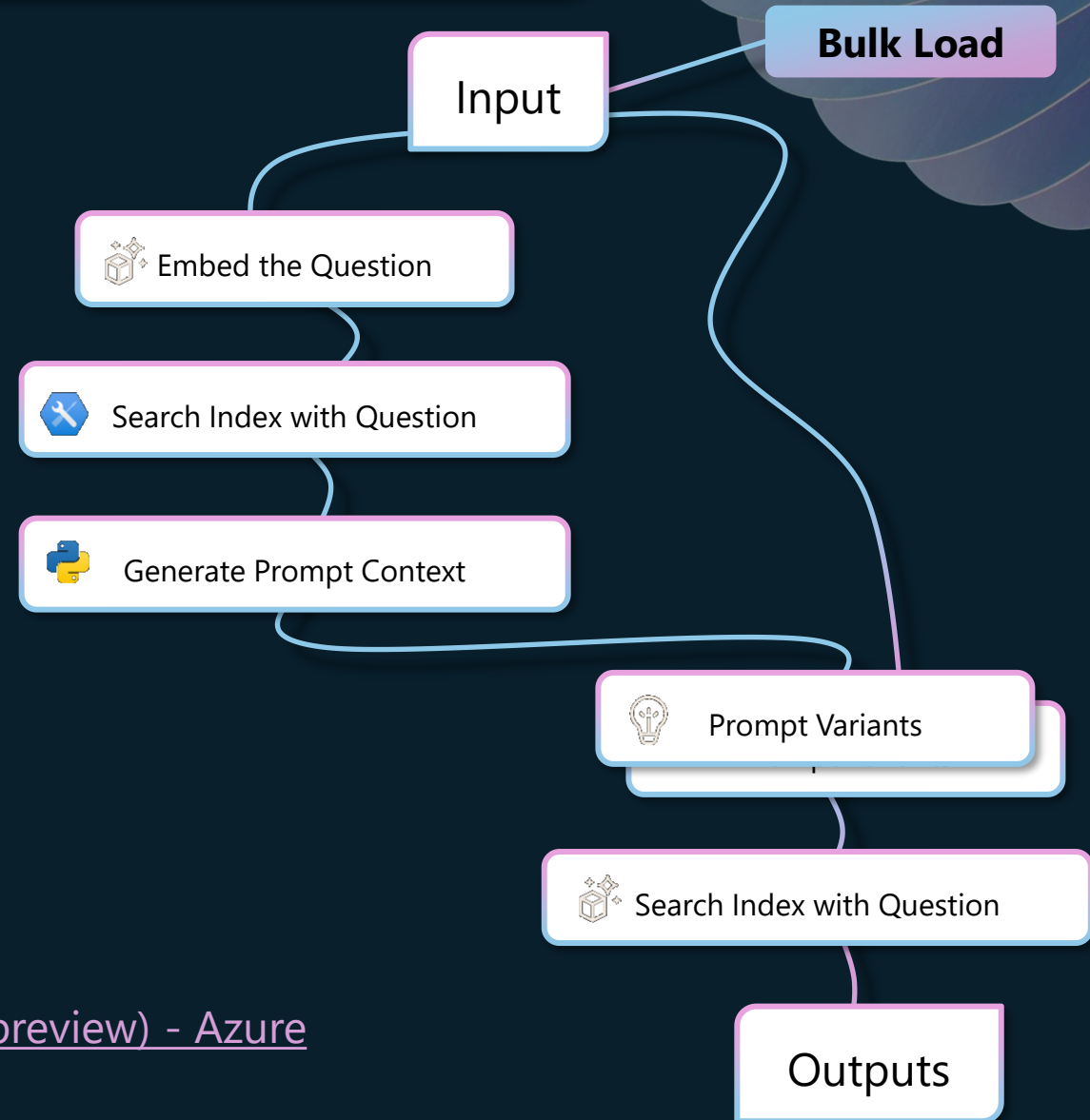


Copilot stack

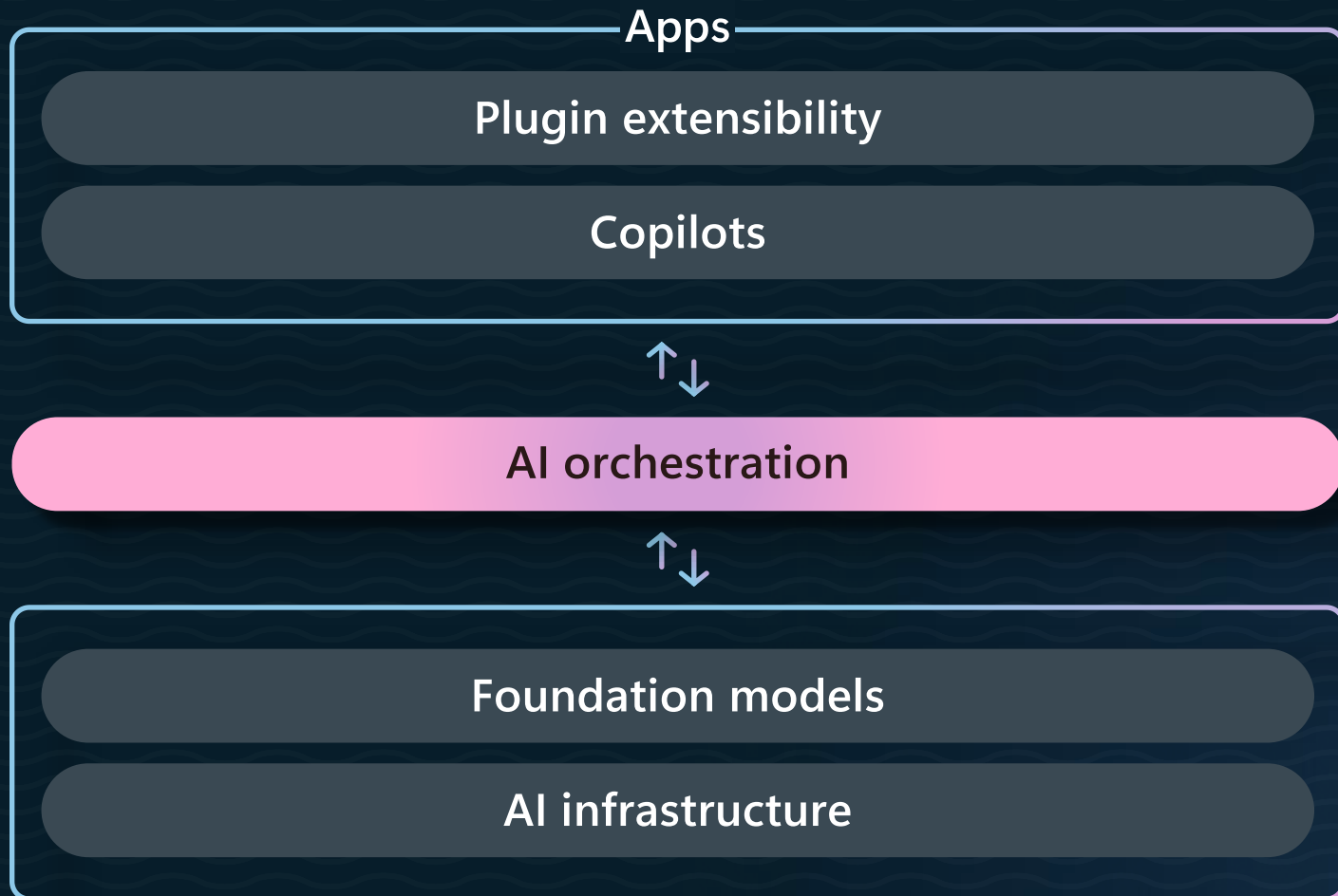


Prompt Flow in Azure OpenAI

-  Orchestrates AI models, prompts, and APIs
-  Support for prompt tuning and experimentation
-  Blue/green deployments and testing
-  Supports Semantic Kernel, LangChain, Plugins



Copilot stack



Semantic Kernel is a lightweight open-source orchestration SDK that lets you easily mix-and-match AI prompts with conventional programming languages like C# and Python.

Semantic Kernel

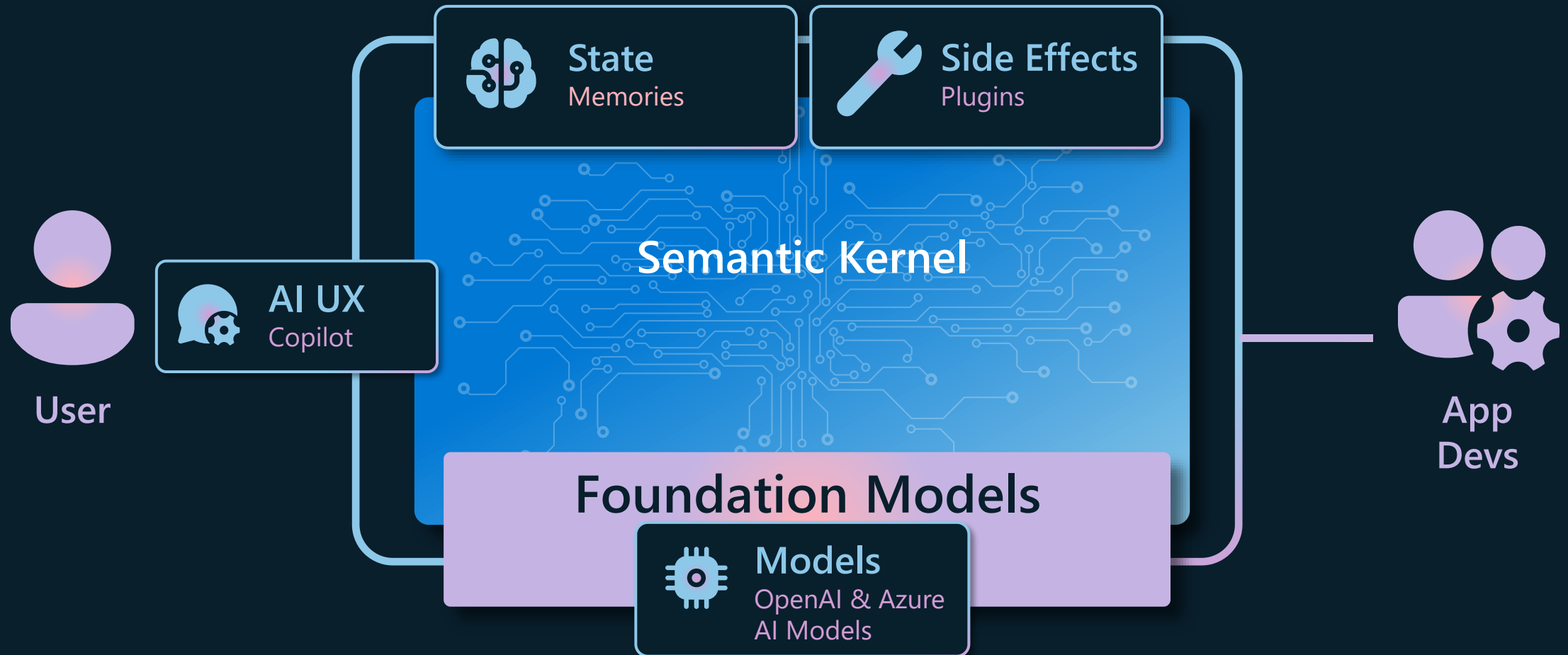
Open Source
& Trustworthy

Reliable
& Performant

Latest AI
Innovations

Powerful Enterprise Data and Software Ecosystem

Make it easier for developers to orchestrate intelligent experiences




Prompt Engineering Builds on Data

User Prompt
"Help me determine the biggest risks to next quarter's earnings"

- System message
- Contract Clauses
- Accounting Data
- Public News
- Task-specific Learning
- User Prompt

RAG pattern

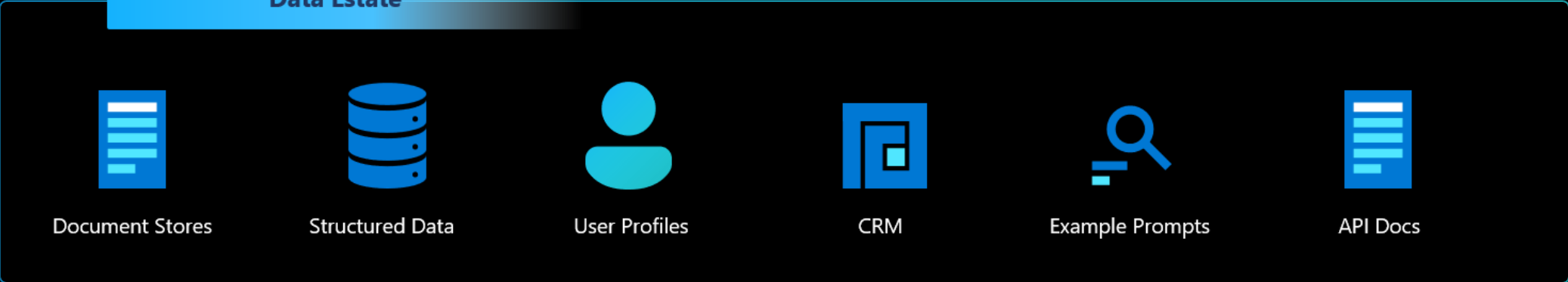
Azure OpenAI Service



- Pre-trained LLMs
- Fine-tuned LLMs

Retrieval Augmented Generation

Data Estate



Sales lakehouse

Search

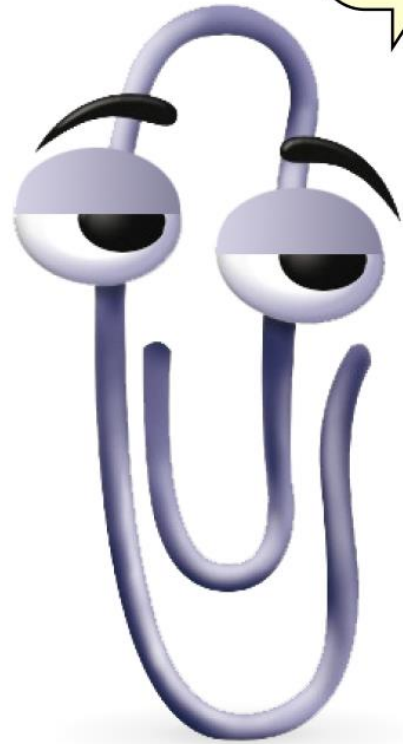
- Tables
 - Calendar
 - Geography
 - Revenue
 - Vendors
- Files
 - Sales
 - CustomerFeedback

Tables > Revenue

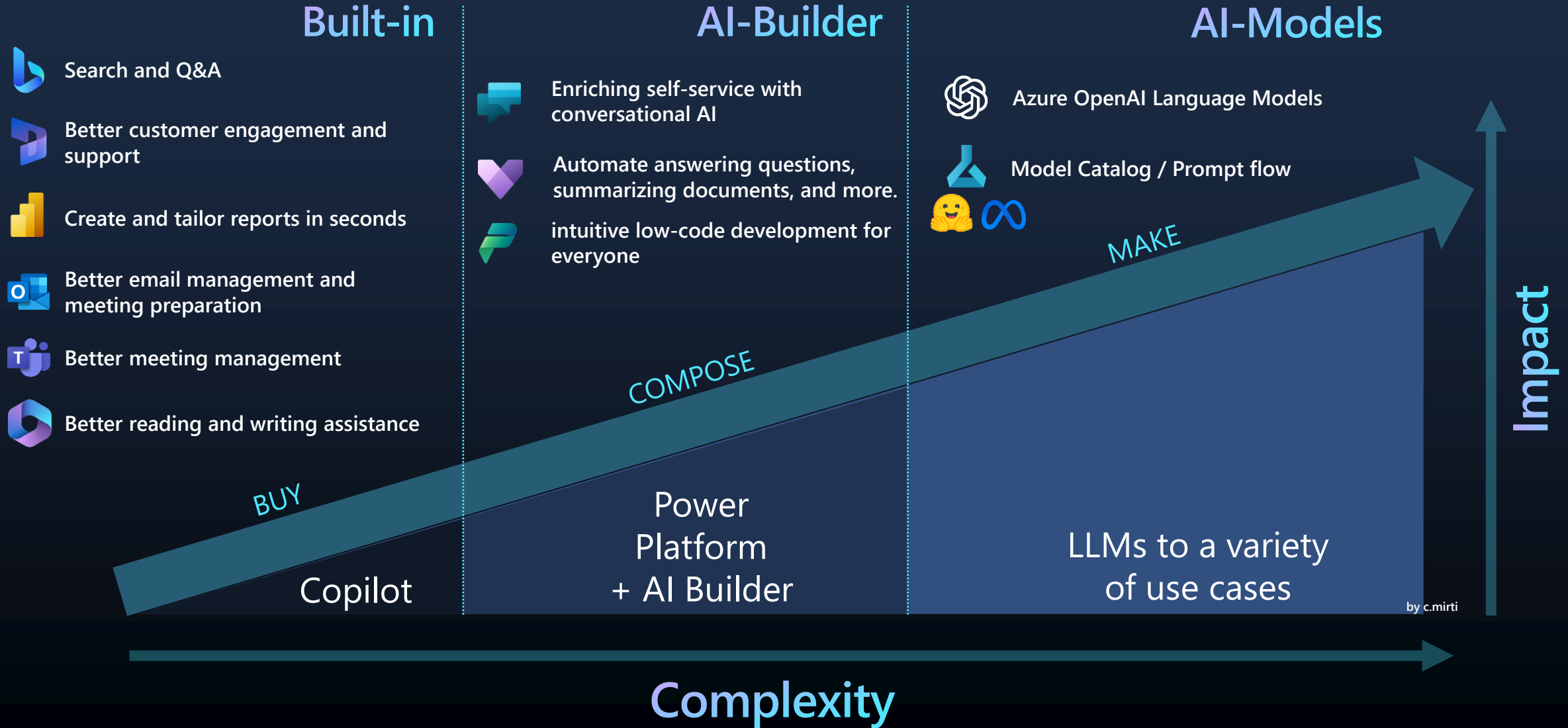
	AB CustomerName	12 CustomerId	AB CustomerCategory	Country	AB Region	12 ZipCode	AB Email	AB LoyaltyLevel
1	Maria Anders	323576-32372332-10	Sales	Berlin	Europe	10115	jackson.graham@example.com	Regular
2	Ana Trujillo	323576-32372332-11	Representative	México D.F.	South America	46958	sara.cruz@example.com	Regular
3	Antonio Moreno	323576-32372332-12	Owner	México D.F.	South America	46864	jessica.hanson@example.com	Regular
4	Thomas Hardy	323576-32372332-13	Owner	London	Europe	533425	deanna.curtis@example.com	Regular
5	Christina Berglund	323576-32372332-14	Sales	Luleå	Europe	533625	nevaeh.simmons@example.com	Regular
6	Hanna Moos	323576-32372332-15	Representative	Mannheim	Europe	533550	tim.jennings@example.com	Frequent
7	Frédérique Citeaux	323576-32372332-16	Order Administrator	Strasbourg	Europe	533537	felicia.reid@example.com	Regular
8	Martin Sommer	323576-32372332-17	Sales	Madrid	Europe	10115	dolores.chambers@example.com	Regular
9	Laurence Leblan	323576-32372332-18	Representative	Marseille	Europe	254876	debbie.baker@example.com	Regular
10	Elizabeth Lincoln	323576-32372332-19	Marketing Manager	Tsawassen	Europe	46864	michelle.rivera@example.com	Regular
11	Victoria Ashworth	323576-32372332-20	Owner	London	Europe	533425	michael.mtc@example.com	Regular
12	Patricio Simpson	323576-32372332-21	Owner	Buenos Aires	Europe	533625	georgia.young@example.com	Frequent
13	Francisco Chang	323576-32372332-22	Accounting	México D.F.	South America	533561	willie.jennings@example.com	Frequent
14	Yang Wang	323576-32372332-23	Manager	Bern	Europe	533527	bill.sanders@example.com	Frequent
15	Pedro Afonso	323576-32372332-24	Sales	Sao Paulo	Europe	10117	tanya.hill@example.com	Frequent
16	Elizabeth Brown	323576-32372332-25	Representative	London	Europe	46959	jessica.hanson@example.com	Regular
17	Yang Wang	323576-32372332-26	Sales Agent	Aachen	Europe	46864	debbie.baker@example.com	Regular
18	Yang Wang	323576-32372332-27	Marketing Manager	Nantes	Europe	533425	kenzi.lawson@example.com	Regular



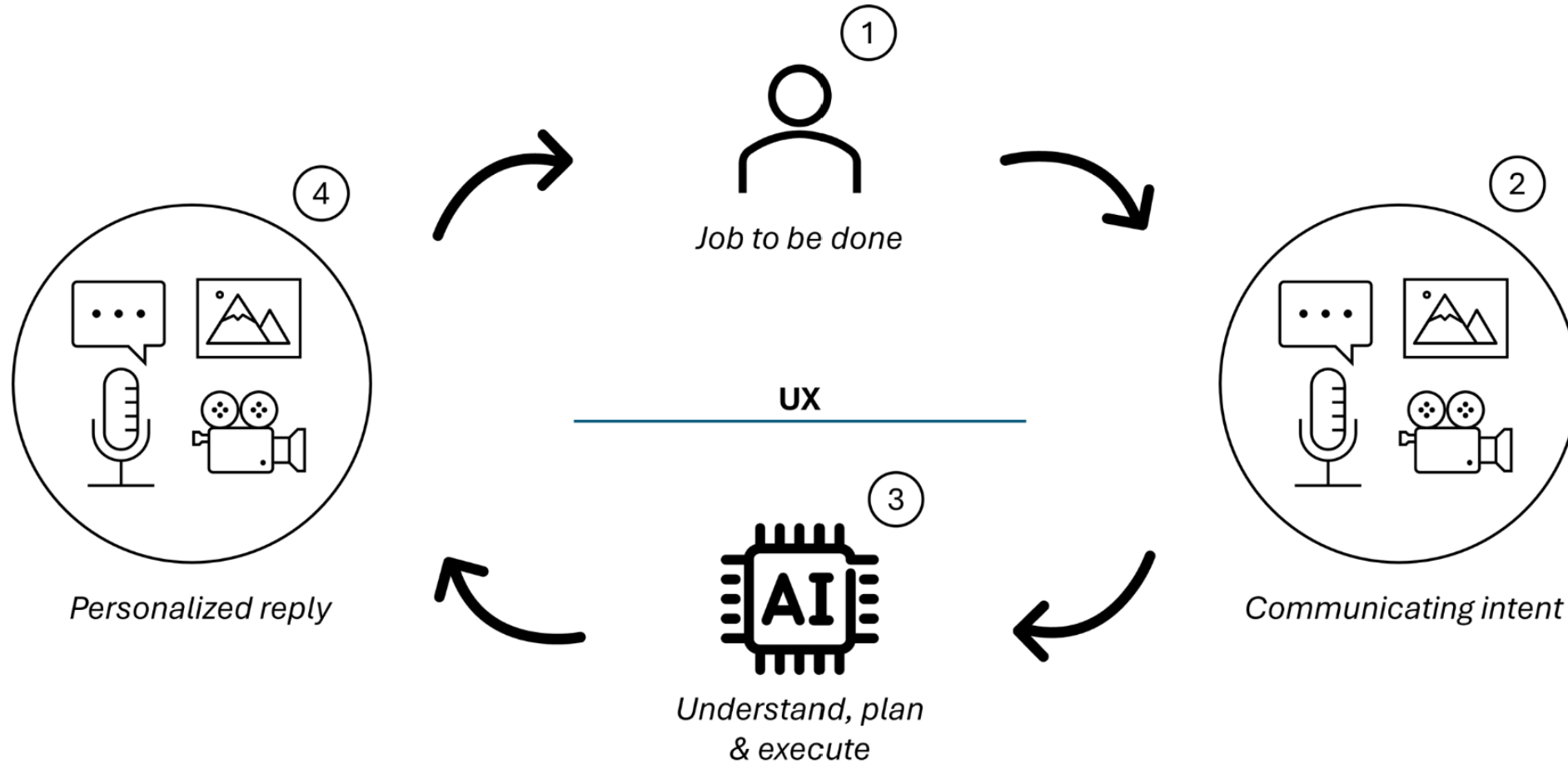
Copilot, I am
your father



From Copilot to enterprise scale AI



UX and the new paradigm of interaction (Copilots)



Conceptual illustration of the new paradigm of interacting with Copilots

Copilot



Plugins



The digital world



Plugins

Augment AI systems to access APIs

Retrieve useful information

Perform new computations

Safely act on the user's behalf

Start building plugins today

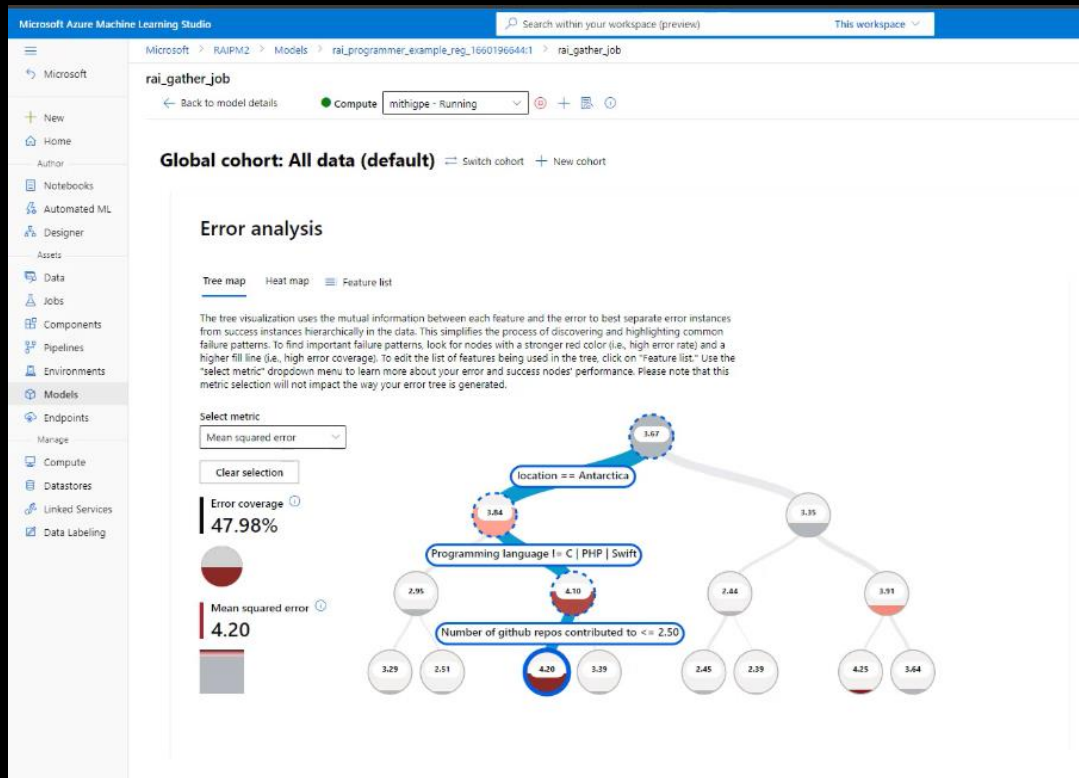
<https://aka.ms/PluginRepo>

The screenshot shows a GitHub repository page for 'Azure-Samples / openai-plugin-fastapi'. The repository is private and has 10 watchers, 2 forks, and 0 stars. The main branch is 'main' with 3 branches and 0 tags. The repository contains several files and folders, including .devcontainer, .github/workflows, .vscode, .well-known, data, infra, routers, scripts, .gitattributes, .gitignore, and Dockerfile. A recent merge pull request #4 is visible, merged 1 hour ago with 16 commits. The 'About' section indicates no description, website, or topics are provided. The 'Releases' and 'Packages' sections show no releases or packages published.

File/Folder	Commit Message	Last Commit
.devcontainer	Init	yesterday
.github/workflows	Remove extra branch	20 hours ago
.vscode	Init	yesterday
.well-known	openapi yaml out of the box (#2)	2 hours ago
data	Init	yesterday
infra	Init	yesterday
routers	openapi yaml out of the box (#2)	2 hours ago
scripts	Init	yesterday
.gitattributes	Init	yesterday
.gitignore	Init	yesterday
Dockerfile	Init	yesterday

Responsible AI & Content filtering

Responsible AI dashboard



AI Content Safety

Configure filters

Use blacklist

View code

Set the severity thresholds for each category and select Run test to see how the results change.

Reset to default

Severity ⓘ

SAFE

LOW

MEDIUM

HIGH

Violence ⓘ



Self-harm ⓘ



Sexual ⓘ



Hate ⓘ



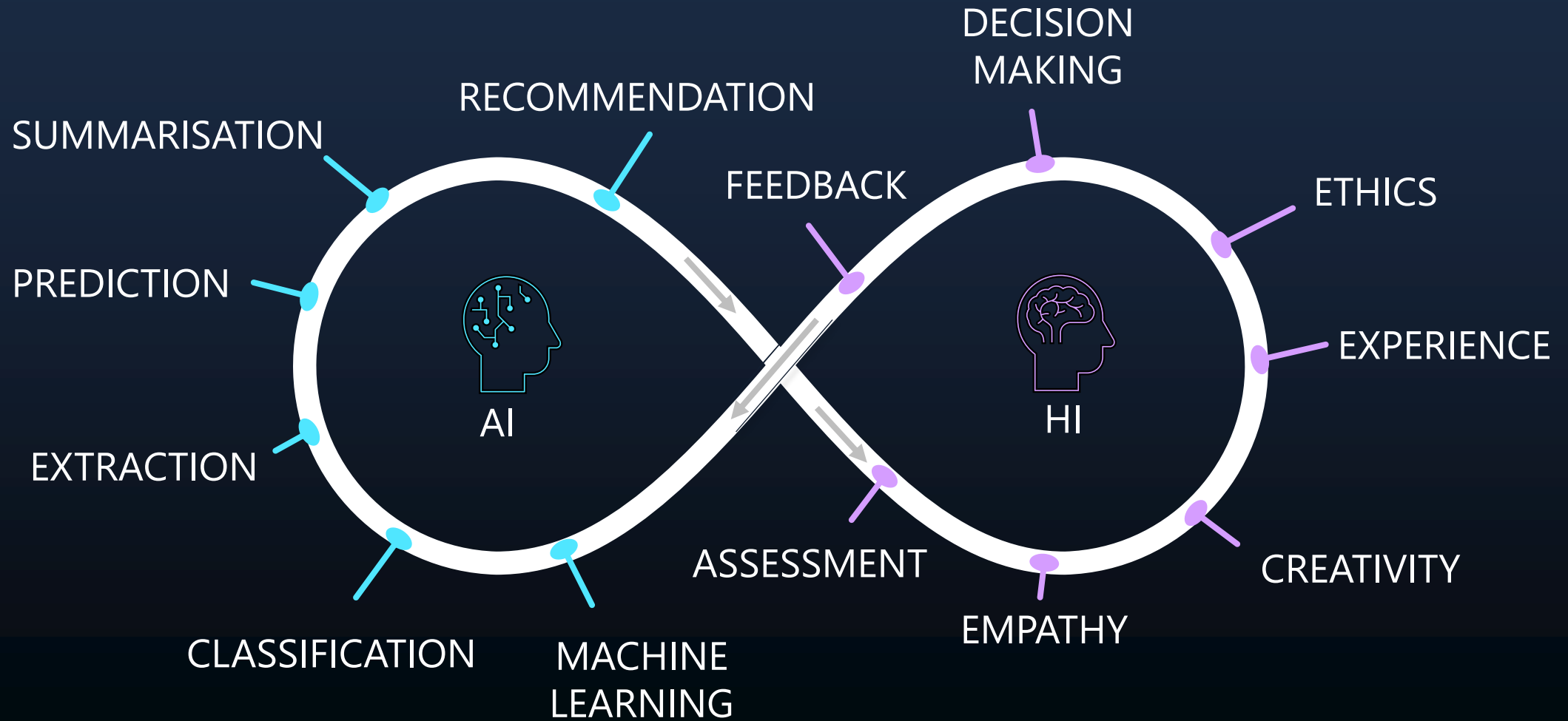
Microsoft Cloud AI you can trust

Your data is your data

Your data is not used to train the OpenAI foundation models without permission

Your data is protected by the most comprehensive enterprise compliance and security controls

Artificial Intelligence and Human Intelligence: Better together



Guidelines for Human AI Interaction

Learn More: <https://aka.ms/aiguideelines>



INITIALLY

1
Make clear what the system can do.

2
Make clear how well the system can do what it can do.

DURING INTERACTION

3
Time services based on context.

4
Show contextually relevant information.

5
Match relevant social norms.

6
Mitigate social biases.

WHEN WRONG

7
Support efficient invocation.

8
Support efficient dismissal.

9
Support efficient correction.

10
Scope services when in doubt.

11
Make clear why the system did what it did.

OVER TIME

12
Remember recent interactions.

13
Learn from user behavior.

14
Update and adapt cautiously.

15
Encourage granular feedback.

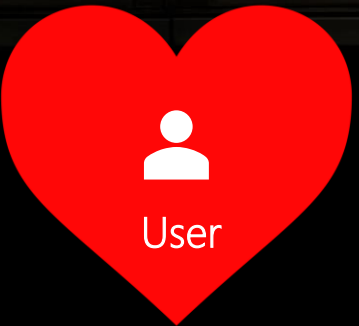
16
Convey the consequences of user actions.

17
Provide global controls.

18
Notify users about changes.

DO SOMETHING GREAT

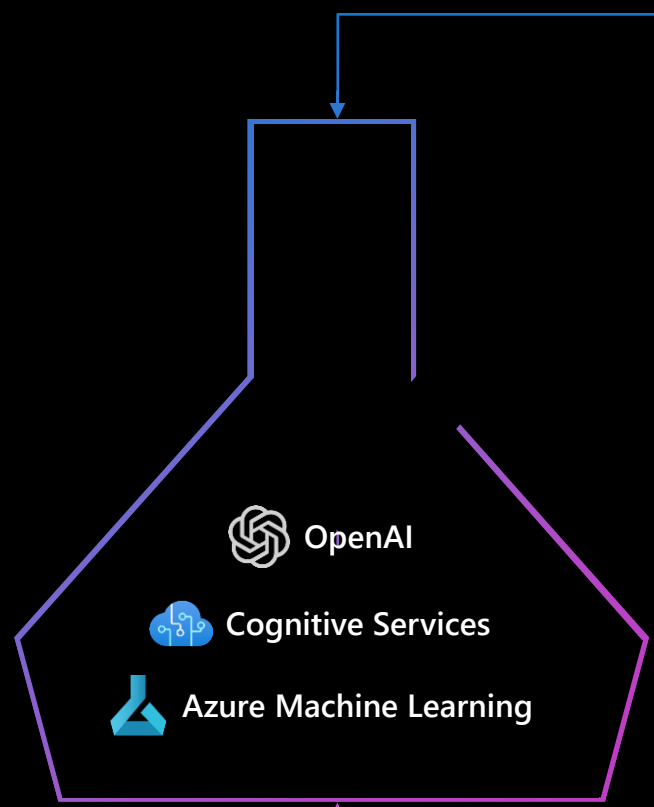
+



User

Enterprise Ready AI

with Microsoft Azure



Business Users

Intelligent Applications (SaaS)

Dynamics | Power Platform | Teams | Microsoft 365 | Power BI | Microsoft Fabric

Business Operations

This layer represents the user interface and core business operations. It includes icons for five business users at the top. Below them are six SaaS application icons: Dynamics, Power Platform, Teams, Microsoft 365, Power BI, and Microsoft Fabric. A blue plug icon is positioned at the bottom center, connecting this layer to the data processing layer below.

Real Time Processing

IOT | Event Hub | Stream Analytics | Data Explorer

Operational Data Stores

CosmosDB | Azure SQL | Azure PostgreSQL

Open and Governed Data Lakehouse Foundation

Data Lake | Synapse | Databricks

Modern Analytics

This layer represents the data processing and storage infrastructure. It is divided into three sections: "Real Time Processing" (IOT, Event Hub, Stream Analytics, Data Explorer), "Operational Data Stores" (CosmosDB, Azure SQL, Azure PostgreSQL), and "Open and Governed Data Lakehouse Foundation" (Data Lake, Synapse, Databricks). A blue plug icon is positioned at the top center, connecting this layer to the business operations layer above.



THANK YOU.

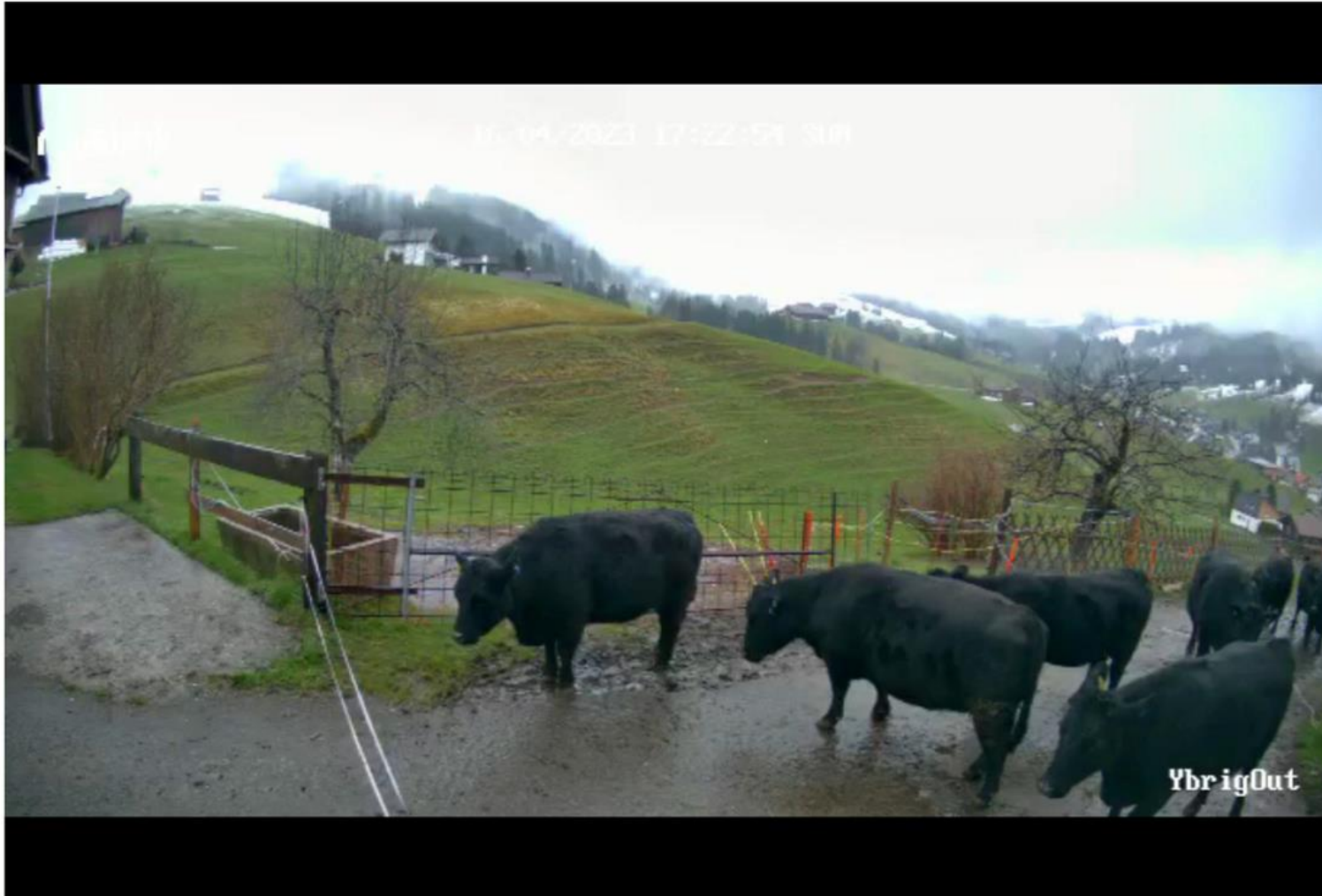


Claudio Mirti



Advancing the state-of-the-art computer vision technologies

YbrigOut-20230416172252-20230416172319.mp4



Run a test

Run frame analysis

Run

Results

Results appear here.



[Project Florence \(AI\) - Microsoft Research](#)

How you can get started today

1 Assess where you are today



Assess the **drivers of AI success** so you can realize meaningful business impact with AI

2 Learn more about Microsoft AI



Learn how to **power your AI transformation** with Microsoft

Learn how to **build safety and responsibility** into your AI journey from the start

3 Take action to transform your business

Envision boosted creativity and work productivity. Prepare for Microsoft 365 Copilot

Start using GitHub Copilot and Sales Copilot, now generally available

Migrate and modernize your data estate and infuse Azure AI to power new and existing apps

Check our latest Copilot announcements across Power Platform, Security, and Dynamics 365