
CODE
PRESENTS
BUILD 2024 Recap
By Markus Egger
May 29, 2024 - Online

About Our Presenter

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CODE STAFFING

CODE MAGAZINE

CODE TRAINING

30 years of

"Helping People Build Better Software"

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Custom Software Development
(Web, Mobile, Desktop and Cloud Platform Apps)

Copilot Development, AI, GPT & Azure OpenAI

Project Rescue, App Modernization
(VB, VFP, Access, etc.)

Application Security Testing

Support & Maintenance for existing applications

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What does AI mean for you?

“Skunk Works” Projects

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...

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Agenda

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- The most important happenings and announcements from BUILD 2024 in Seattle
- No surprise: AI and Copilot everywhere!
- A look at the big trends
- More information about new models
- More information about how these models are integrated into products
- More information about tools
- Hardware news

The new era of AI has begun!

The Big Trends

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1. AI models grow into all directions and gain all kinds of abilities and capabilities
2. Software is being reinvented on top of this new paradigm
3. Hardware changes to enable this new way of computing
4. We are still at the early stages of the current AI era
5. Microsoft is in a great position to capitalize (as are some others).

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Models

New Models

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- New AI Model development continues at a rapid pace
- Models are growing both larger and smaller
  - Smaller models are more efficient, yet still surprisingly capable
  - Larger models are even more capable and impressive
- Models are gaining new abilities
  - Multi-modal models are now common
  - Includes text, images, videos, and speech
- Models are gaining more agency
  - In other words: They can do things, rather than just talk

OpenAI "*Spring Update*" Event

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- OpenAI announced GPT-4o
  - "o" stands for "omni-modal", indicating a focus on multi-modal input (text, images, videos, audio)
- The new model is much faster and cheaper to use
- The model is also "smoother"
  - Communicating with the models is more "natural" as it can be interrupted and it responds quicker
- There also is more "free stuff"

- https://openai.com/index/spring-update

GPT4 to GPT-4o (1 ½ years)

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12x

decrease in cost

6x

increase in speed

Microsoft/OpenAI Partnership

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- Microsoft is heavily invested in OpenAI
- All of OpenAI's tech runs on Azure
- Developers can use OpenAI models either through OpenAI directly or through Azure
- Same-day availability of OpenAI models on Azure through the Azure OpenAI Service

Azure Open AI Service

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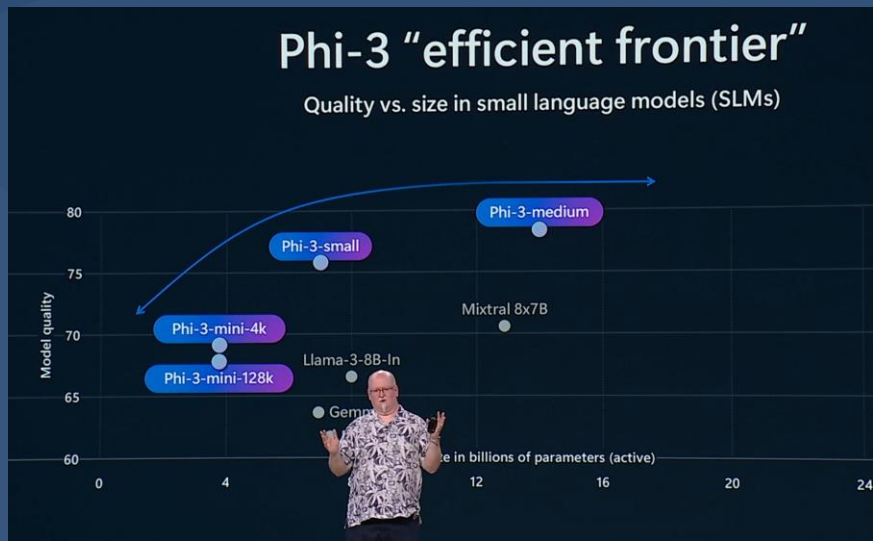
- GPT-4o is generally available through Azure OpenAI services
- New “auxiliary features”, such as Prompt Shields, fine-tuning, and many more
- Also: All other Azure features available in combination
- Used in production by 50,000+ organizations

- https://aka.ms/AOAIUpdates

Phi-3 – Models

- These are small-language-models (SLMs) developed by Microsoft
- “Large model quality at a fraction of the cost”
- Designed to run locally on devices and PCs,…
- …but can be combined with the Cloud in hybrid setups

- * There also is a Phi-3 Vision model



Phi-Silica

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- Small Language Model (SLM) specifically designed to run on specific hardware configurations
- Designed specifically to run locally
- Comes with every Copilot + PC

Hugging Face

- Microsoft is partnering with Hugging Face to bring those models to the overall Microsoft family

Azure AI model breadth

Offering a wide collection of frontier and open models

Azure OpenAI Service

- GPT-4o
- GPT-4-Turbo with Vision, GPT-4, GPT-3.5
- Embeddings
- DALL·E
- Whisper, Text to speech

Phi models

- Phi-3-mini
- Phi-3-small
- Phi-3-medium
- Phi-3-vision

Meta

- Llama-2-70b/70b-chat
- Llama-2-13b/13b-chat
- Llama-2-7b/7b-chat
- Llama-3
- CodeLlama

Mistral AI

- Mistral Large
- Mistral 7B
- Mixtral 8x7B – Mixture of Experts

Cohere

- Cohere R+
- Cohere R
- Embed v3-Multilingual
- Embed v3-English

Hugging Face

- Falcon/TII
- Stable Diffusion/Stability AI
- Dolly/Databricks
- CLIP/OpenAI

Databricks

- Databricks/dbrx-base
- Databricks/dbrx-instruct

NVIDIA

- Nemotron-3-8B-4k
- Nemotron-3-8B-Chat-SFT/RLHF/ SteerLM
- Nemotron-3-8B-QA

Snowflake

- Snowflake/arctic-base
- Snowflake/arctic-instruct

Azure AI Custom Models

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- “Co-innovation with Microsoft”
- Assisted fine tuning
- Training custom language models
- Ingest new knowledge domains
- Improve proficiency for specific languages

Hardware

The Scale Involved

Copilot+PC

Copilot + PC

- New hardware platform specifically designed for the era of Copilots and AI
- Very powerful local processing on top of ARM hardware
- Hardware from Microsoft as well as partners: Acer, ASUS, Dell, HP, Lenovo, and Samsung

Copilot + PC: Surface Laptop

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My Configuration:

- 15” display
- Snapdragon X Elite 12 Core
- 64GB Ram, 1TB SSD
- 22-hour battery life
- NPU (45 trillion operations/sec)

NPUs

- Neural Processing Unit
- Think “GPU but for AI” ;-)
  - Often smaller, more parallel, and less precise than GPU tasks, but LOTS of them!
- Specialized hardware to execute AI tasks
- Often integrated into the CPU or specialty chips right on the motherboard

Microsoft/NVIDIA Partnership

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- Blackwell Platform (available through Azure)
- NIM-optimized models
- Omnivers, DGX, Cloud + Fabric
- Windows 365 and Copilot GPU acceleration

- https://aka.ms/NVIDIAPartnership

Microsoft/AMD Partnership

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- ND MI300X V5 AI Accelerator Chip Support on Azure
- Leading price/performance on GPT-4
- Optimized for Microsoft Azure workloads

- https://aka.ms/AMDPartnership

Azure Maia

- Integrated system of silicon, racks, and software
- Designed for Azure OpenAI workloads

- https://aka.ms/AzureMaia

Azure Cobalt

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- Public preview of Cobalt-based VMs
- Used for things like video processing
- Most power-efficient compute offering in MS Azure

- https://aka.ms/AzureCobalt

Qualcomm Snapdragon Dev Kit for Windows

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- Ships June 18th for $899

Software

What is AI-driven Software?

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- We must fundamentally ask ourselves what software in the age of AI is like
- We do not have good answers for that

- Most software is currently being retro-fitted with AI (which works surprisingly well)…
- …but in the future, we envision completely different approaches to software solutions

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All apps without Copilot/AI features are now legacy!

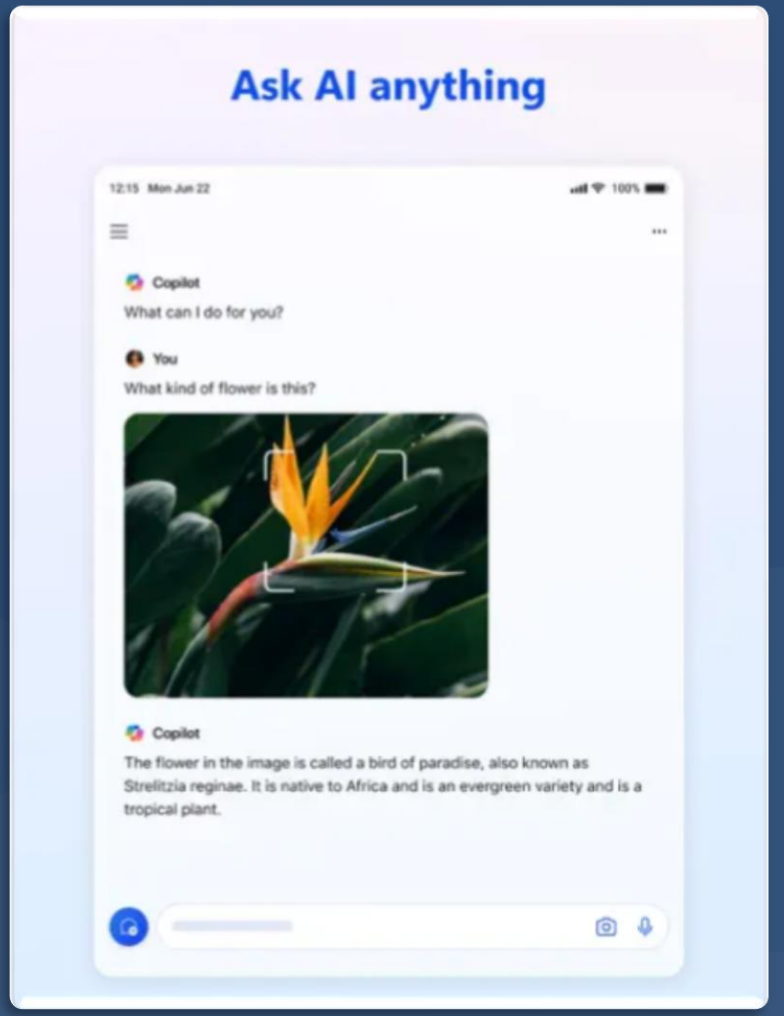
- Copilot is Microsoft’s branding of AI features
- Copilots appear in all Microsoft apps
- The term is also used as an interaction paradigm
  - Microsoft seems to encourage use of the term in our own apps

Microsoft Copilot for...

- Service
- Sales
- Azure
- Finance
- Security
- Teams
- Microsoft 365
- Bing
- Edge
- Windows
- Team
- ...

Copilot App

- Turns out Copilot is very appealing when used on its own, rather than inside anther application as an add-on



Copilots in our own Apps

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- IMO, the more specific the domain of an app is, the more powerful AI becomes
- I find that Copilots built into our own apps are better than the more generic apps in systems such as M365

Recall

Find the red barn

Yesterday

Today

Now

Microsoft Excel

Microsoft PowerPoint

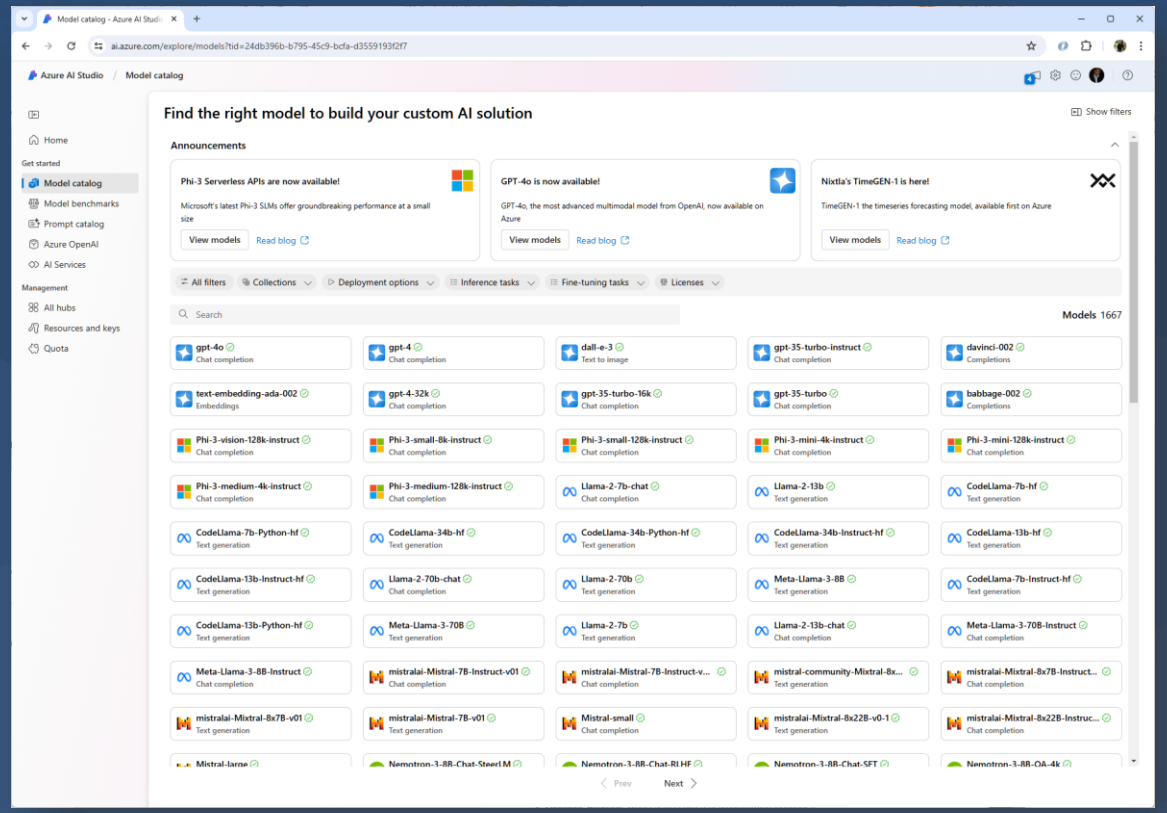
Microsoft Teams

Developer Tools

Azure AI Studio

- Comprehensive Platform for building and deploying custom AI and Copilots
- Now generally available

- http://ai.azure.com



Prompty:
Prompt Engineering Tool

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- Specification
  - A standard format that unifies the prompt and how it is executed into a single asset
- Tooling
  - Developer friendly ways to interact with assets, create new assets, and manage supporting code
- Runtime
  - A simple way to transition this new asset into code

Prompty as a language-agnostic prompt asset

Specification

Prompty is intended to be a language agnostic asset class for creating prompts and managing the responses.

The goal is to simplify your workflow by creating a standard that can be used by any language, any framework, and any tool to create a prompt and manage the response.

Prompty can be imported to/exported from Azure AI Studio for smooth transition between local and cloud. Prompty assets can be also shared across organizations.

```
---
name: Basic Prompt
description: A basic prompt that uses the GPT-3 chat API to answer questions
authors:
  - sethjuarez
  - jietong
model:
  api: chat
  configuration:
    azure_deployment: gpt-35-turbo
sample:
  firstName: Jane
  lastName: Doe
  question: What is the meaning of life?
---
system:
You are an AI assistant who helps people find information.
As the assistant, you answer questions briefly, succinctly,
and in a personable manner using markdown and even add some
personal flair with appropriate emojis.

# Customer
You are helping {{firstName}} {{lastName}} to find answers to their questions.
Use their name to address them in your responses.

user:
{{question}}
```

Prompty – Some Details

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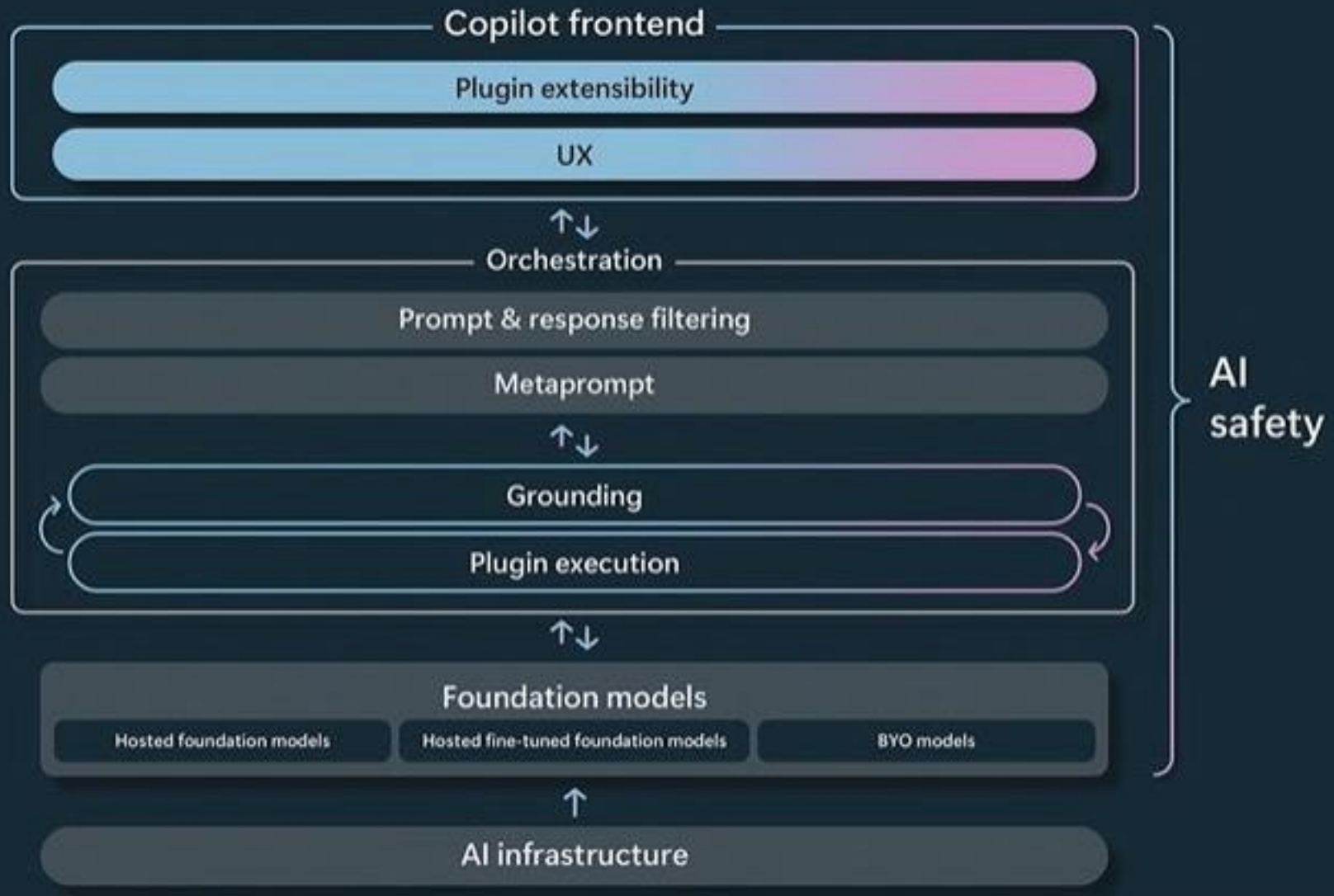
- Langchain, PromptFlow, and Semantic Kernel are supported as runtime environments
- It’s essentially Markdown and Frontmatter
- VS Code has Prompty extensions

Copilot Studio

- Extend Microsoft Copilot and create custom copilots
- This is generally geared to M365 and Power Platform
- It’s a managed environment aimed at ease of use

Copilot Stack



Windows Copilot Runtime

DirectML

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- DirectML is a machine learning API
- Works seamlessly across a wide range of hardware platforms
- Supports DX12 GPUs and (soon) NPUs
- Powered by DirectML on Windows
  - PyTorch now native
  - Web Neural Network (WebNN) – Web-native machine learning framework – Available as developer preview today

Microsoft Intelligent Data Platform

Databases • Analytics • AI • Governance

Azure SQL DB

Azure Cosmos DB

Azure for PostgreSQL

MySQL

Microsoft Fabric

Azure Databricks

Azure AI

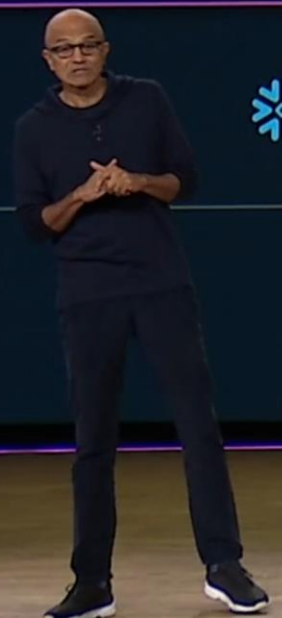
Microsoft Purview

snowflake

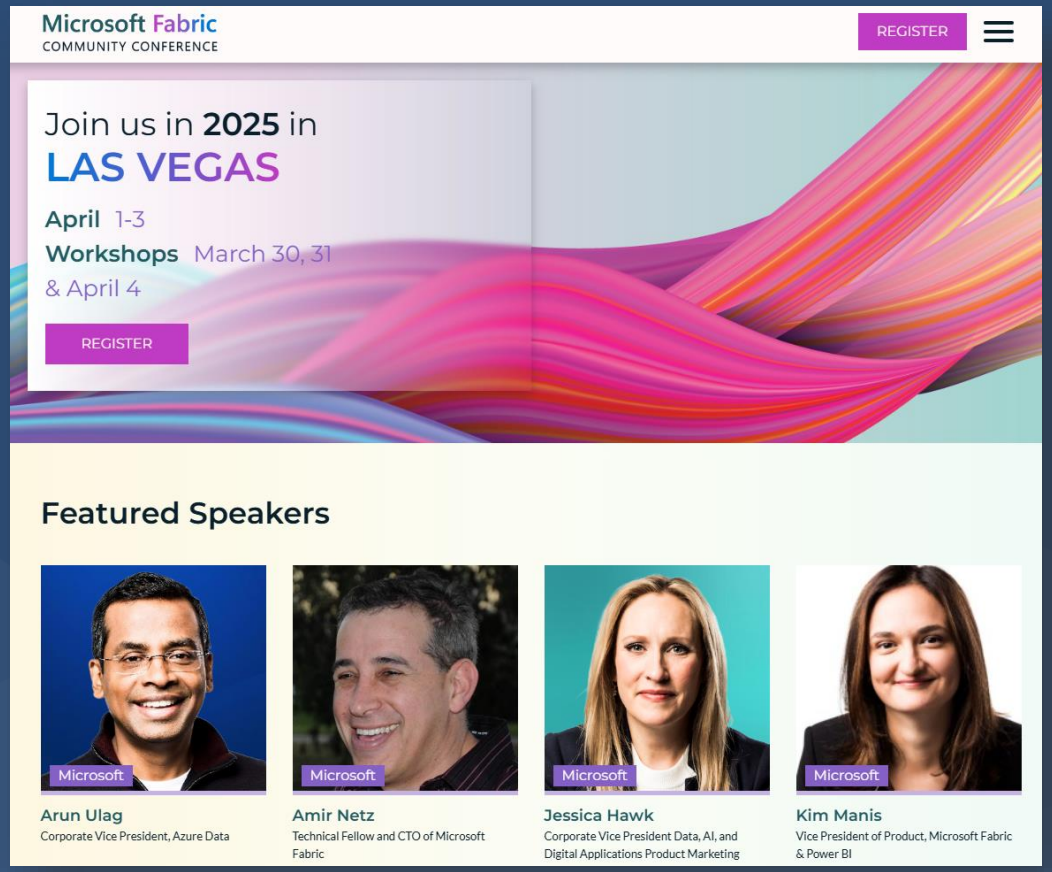
MongoDB.

ORACLE

Redis

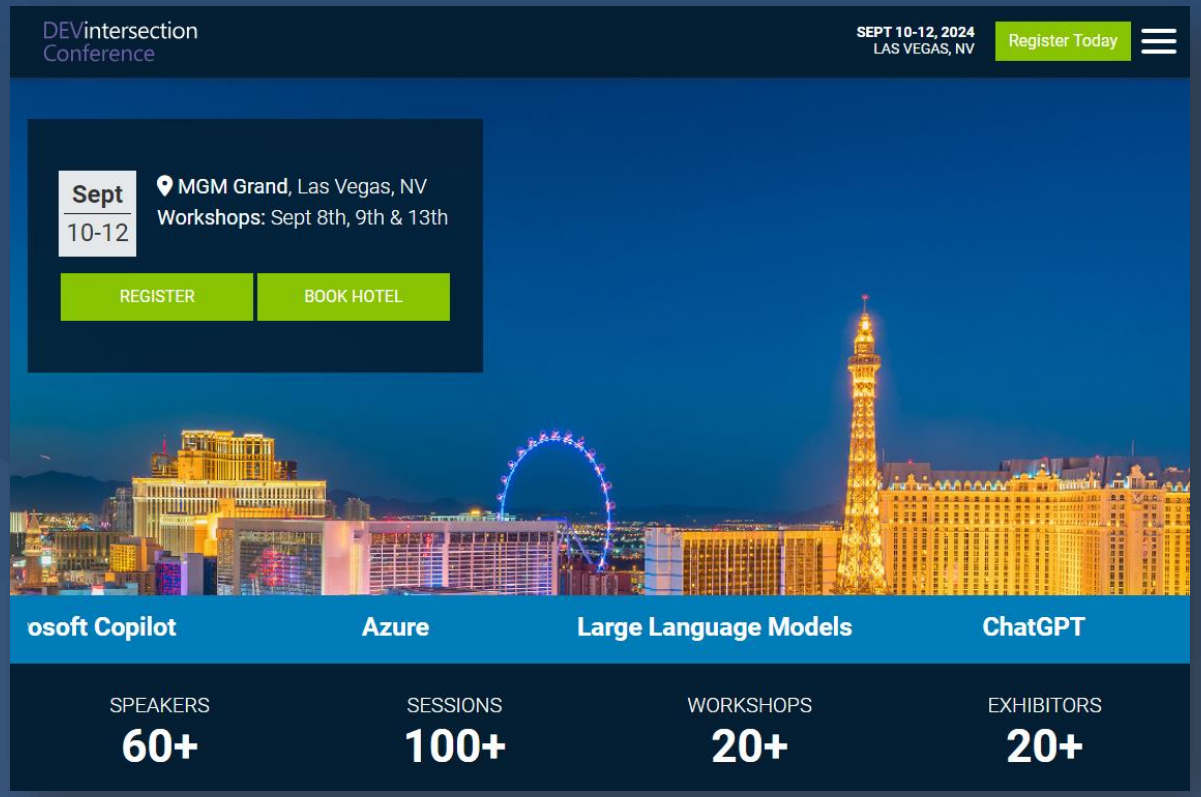


Microsoft Fabric Community Conference



www.fabricconf.com

DevIntersection – Las Vegas Featuring: CODE AI Track



www.devintersection.com

Copilot Capabilities in Azure Databases

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- AI-enhanced management and performance
- Public Preview:
  - Self-help for managing and operating Azure SQL databases
  - Convert natural language to Azure SQL Database T-SQL queries
  - Chat with Azure Database for MySQL technical documentation in natural language

Vector Search in Databases

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- It is probably safe to assume that any kind of database and storage technology will support vector search capabilities in the not too distant future

Azure AI Search

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- State-of-the-art search technology
- Feature-rich vector database
- Seamless data and platform integration
- Up to 12x more scale and performance

Secure Future Initiative

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- Secure by design
  - Protect tenants and isolate production systems
  - Protect identities and secrets
- Secure by default
  - Protect networks
  - Protect engineering systems
- Secure operations
  - Monitor and detect threats
  - Accelerate response and remediation

Azure AI Content Safety

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- Coming Soon: Custom Categories
- Preview: Prompt Shields
- Preview: Groundedness detection

- https://aka.ms/ContentSafetyUpdates

GitHub Copilot

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- 1.8 Million subscriptions across 50,000 organizations
- From personal experience, I ***highly*** recommend using GitHub Copilot for quality and productivity reasons

GitHub Copilot Extensions

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- GitHub Copilot now supports extensions
- https://aka.ms/GitHubCopilotExtensions

GitHub Copilot for Azure

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- GitHub Copilot Extension specific to Azure
  - Available in Visual Studio and VS Code

- https://aka.ms/GitHubCopilotAzure

Side-Note: Developer Tools

- Visual Studio + GitHub are the most widely used dev tools
- .NET 9 will release in November of 2024

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San Francisco, CA
Denver, CO
Chicago, IL
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New AI Classes to be announced soon!
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pment with OpenAI,
ChatGPT, Azure OpenAI, and more...

Other Announcements

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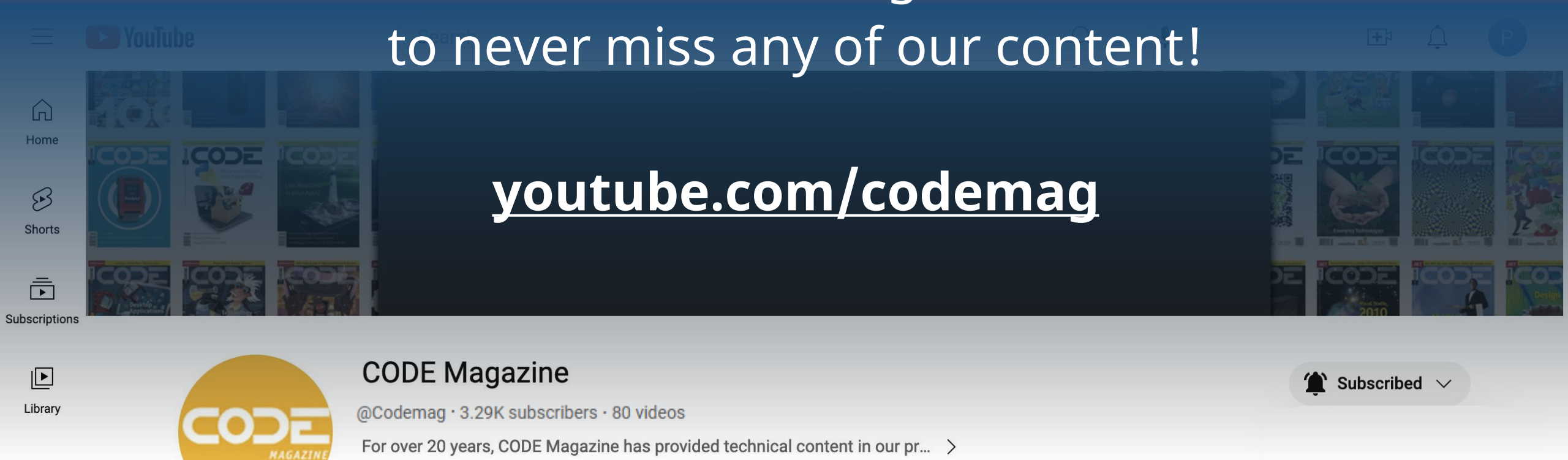

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