

Generative AI & Agents for Researchers: Copilot, What and Why?

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Dr Ryan Payton

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- BSc Environmental Geology and PhD in computational geophysics – CFD modelling of microscale processes in carbon capture and storage at Royal Holloway University of London
- Previously led researcher engagement and training at Oracle for Research across EMEA, supporting researchers getting started with cloud computing
- Leads academic research engagement in the UK with both researchers and institutional IT teams – aligned to >50 universities as part of their Microsoft account team

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Key Topics

- What is Generative AI?
 - High level: Terminology, LLMs, agents and how it all works
- What Generative AI Tools are Available?
 - Free: comparison of M365 Copilot Chat, ChatGPT, Gemini, Claude
 - Subscription: M365 Copilot, Researcher agent & custom agents
 - Training resources
- What can I use Generative AI for?
 - University policy
 - Basic use cases of M365 Copilot Chat examples and demos
 - Advanced integration use cases of M365 Copilot examples and demos

What is Generative AI?

Artificial Intelligence

Is the field of study

Machine Learning

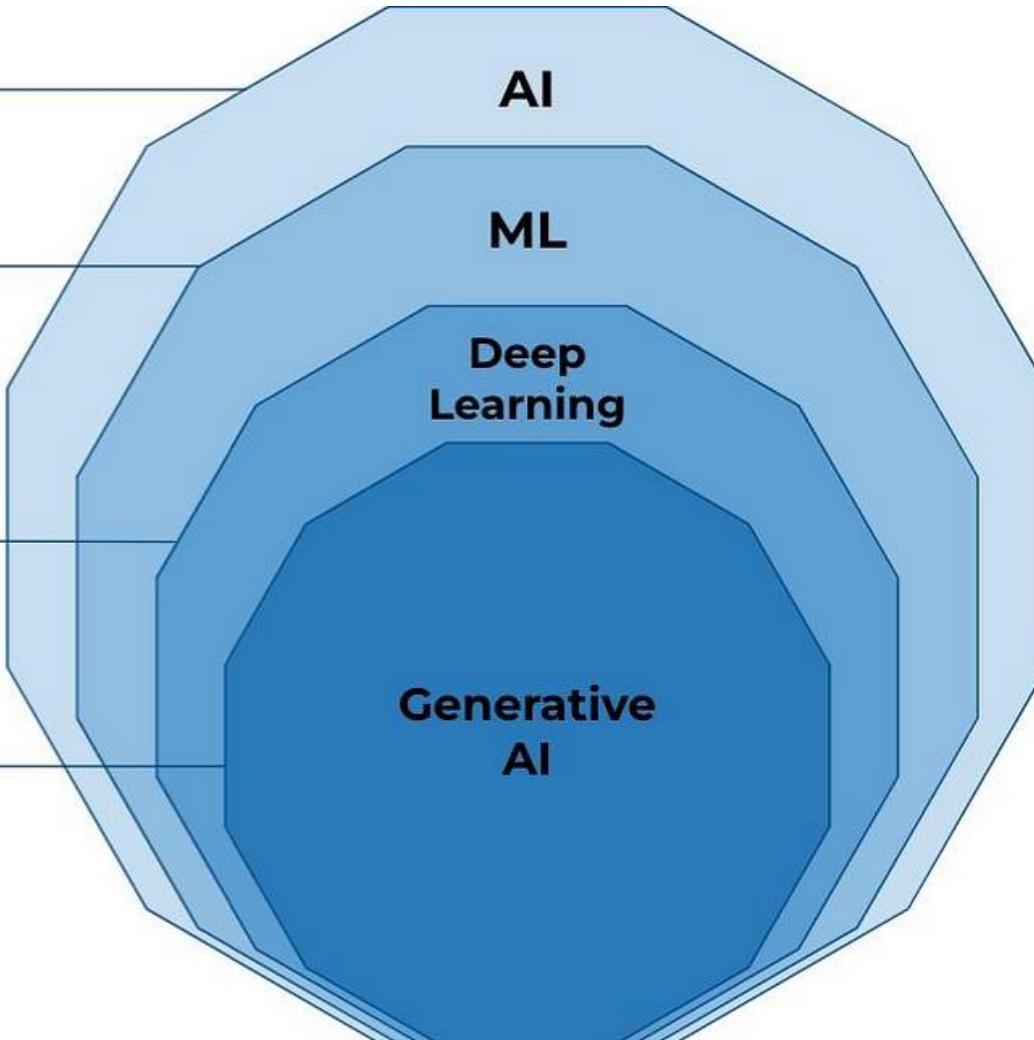
Is a branch of AI that focus on the creation of intelligent machines that learn from data. Another very well known branch inside AI is **Optimization**.

Deep Learning

Is a subset of Machine Learning methods, based on **Artificial Neural Networks**. Examples: CNNs, RNNs

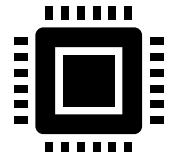
Generative AI

A type of ANNs that generate data that is similar to the data it was trained on. Examples: GANs, LLMs

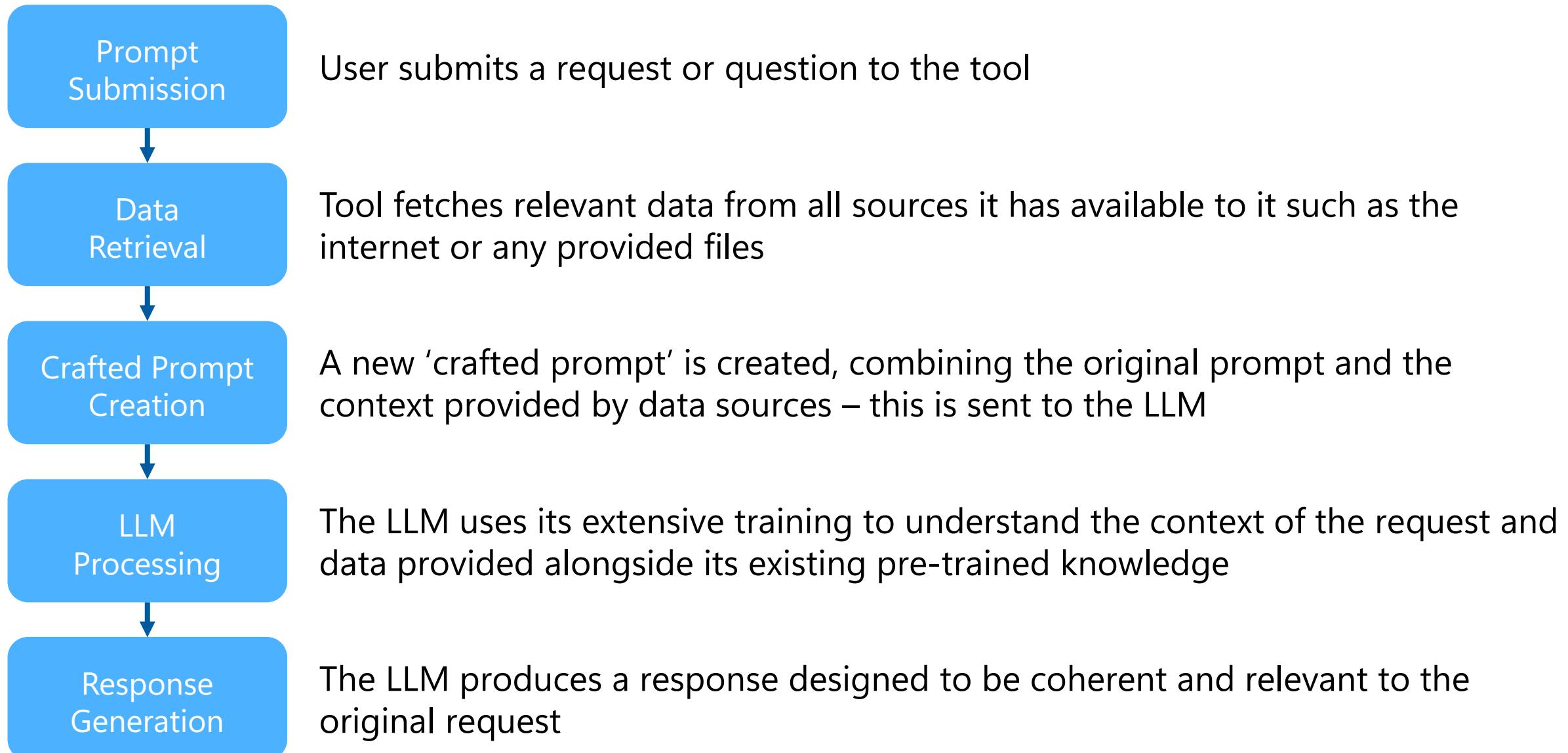


What is Generative AI?

- A sub-category of AI which creates original content like language, images and code from a natural language input
- GenAI apps are powered by LLMs, large language models which are used to understand user input and generate original output
- OpenAI created the first well-known LLM, GPT which stands for Generative Pre-trained Transformer model
- GPT-3, 3.5, 4, 4o etc... are improving iterations of the LLM, which are trained on more data and architected to be more performant and capable
- Training LLMs is expensive and time consuming and therefore we use LLMs as foundational models instead of repeatedly building from scratch
- Foundational models are trained on lots of content and can be used to build on top of and tune to fit a certain application or niche



How Does Generative AI Work?



Topic = Cat

Sentiment = Negative



*“Oh great, the cat knocked over my
coffee again — just what I needed
this morning.”*

Researchers at Google discovered how to not just look at the text itself but enable the model to **understand the importance of each part of the sequence in context** and do this very quickly.

They can also **generate text** by predicting the next words in the sequence

(Transformers)



But LLMs only respond with the data they are trained on, so we needed a way to give them data that they didn't have access to before.

We'd need to build an app around the LLM that **passes it information it could reference when answering a question.**

This is known as Retrieval Augment Generation (RAG) and providing the data is **known as 'grounding'**

This lets the LLM give accurate answers using real-time or private data



Use Tool <Hammer> to hit Nails

Now what if we need to get that app to do something like completing a task or calling another system.

These would be tools that our new app could call when asked to do something.

If we describe what the **tool** did and give it some **instructions**, then the LLM could be used to determine when the app should call it and then also understand the result.

(AI Agent Tools)

Plan:

Step 1: Place Nail

Step 2: Hit with Hammer



But completing a task may require additional steps

We need to be able to give our app the **ability to determine a plan** for how it's going to complete a task.

Our LLM can generate text so let's use it to generate a plan based on the problem too

(Generative Orchestration)

Plan:

- ✓ *Step 1: Place Nail*
- ✓ *Step 2: Hit with Hammer*
- ✗ *Eval: Task Complete? No*

Step 3: Hit with Hammer Again

...



In reality, things rarely go to plan, so we need a way to **reason over our previous steps and check if it got us closer to finishing our plan.**

If not, we should be able to change the plan and come up with new steps from our available tools.

That will need a way to have **memory** on what changes have worked before.

And now we have a generative AI agent that can adapt autonomously!

(Generative AI Agent)



LLMs can also understand machine language like those coming from systems inside enterprises.

And, what if we didn't prompt our new agents into action by asking them but **plugging them into events from our emails, our CRMs or Service Desks.**

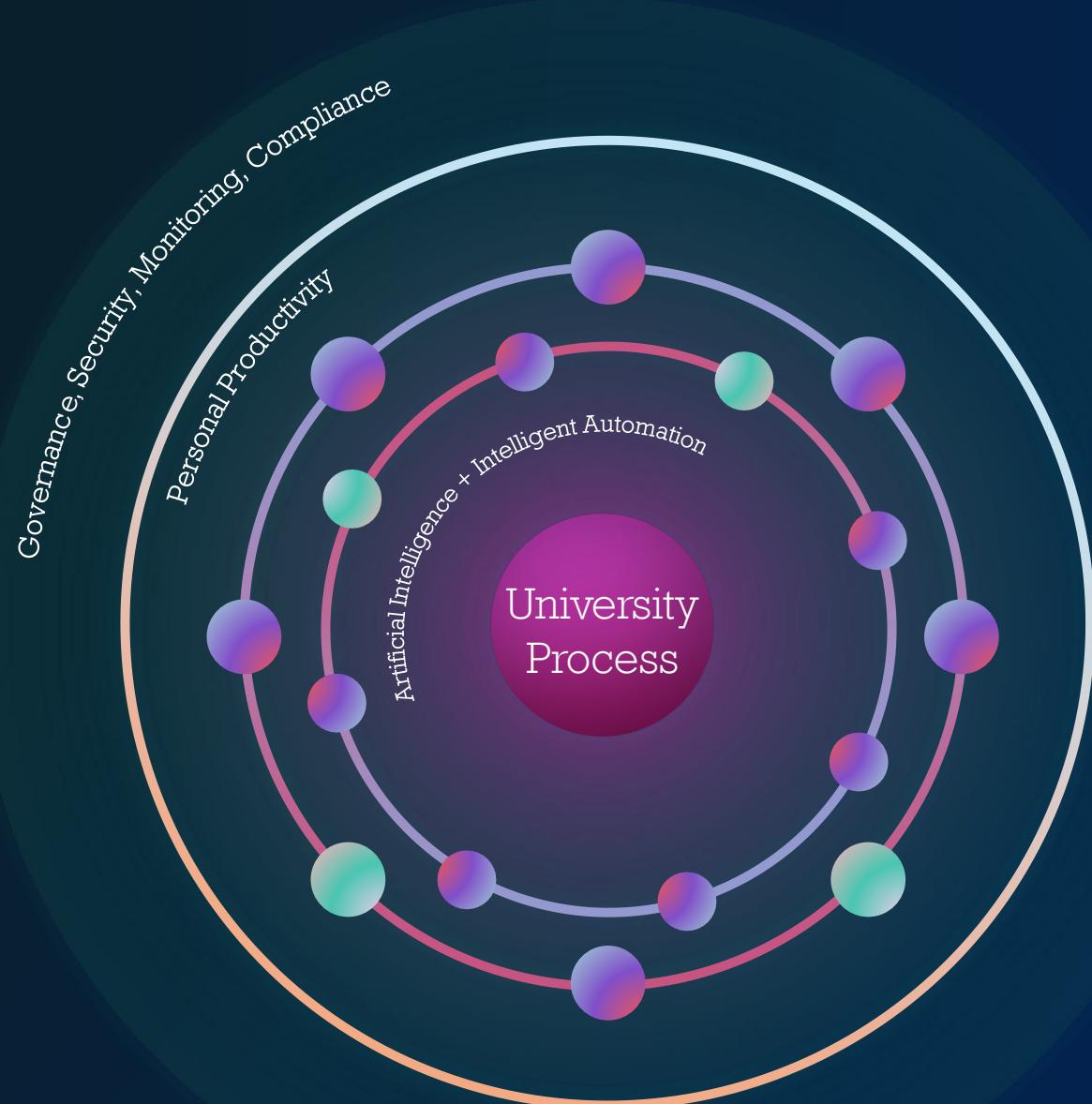
Now they could trigger automatically and work autonomously

(Autonomous Agents)

University and research processes are complicated and involve lots of moving parts, so we **need lots of agents that are built to so specific tasks** that can run autonomously

We can also have **agents talk to other agents** so that they can hand over tasks to more suitable agents.

And we'll need a way to **govern and monitor all these agents** as they complete tasks



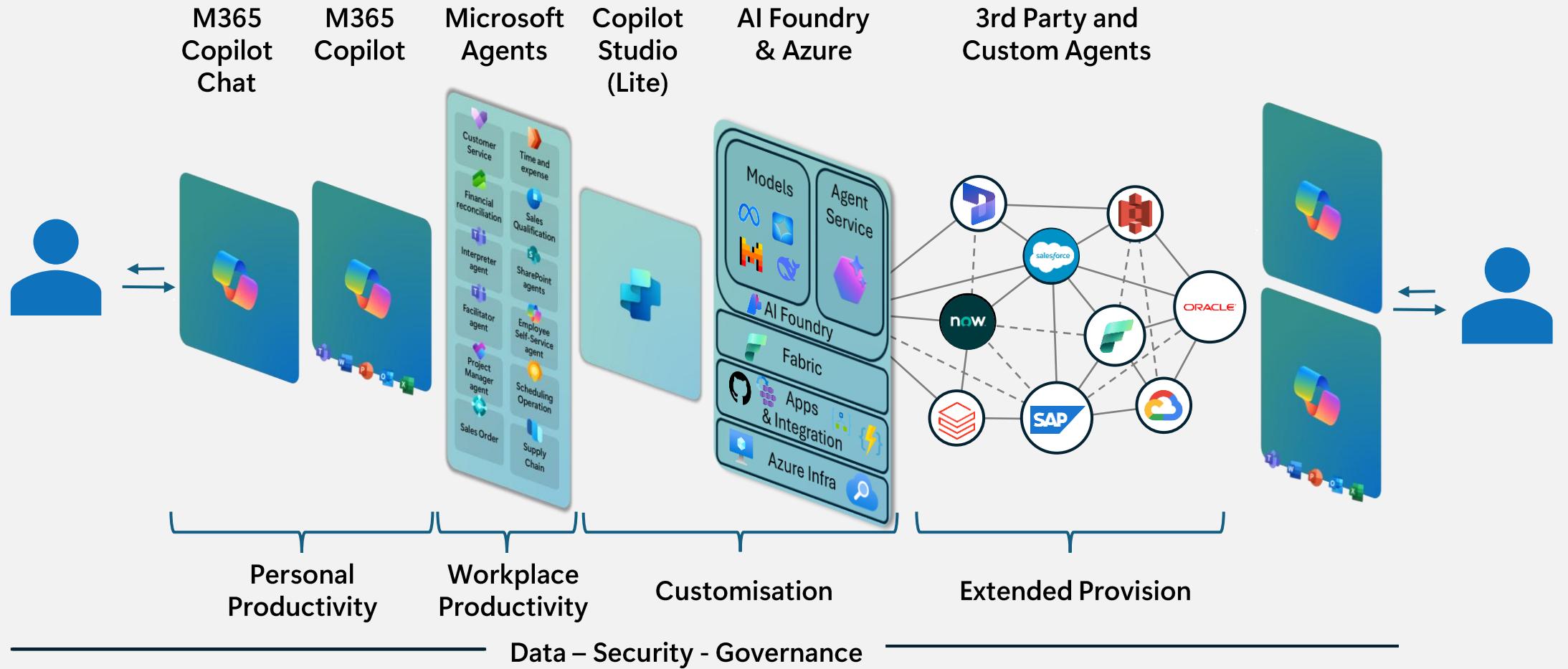
Freely Available Generative AI Tools



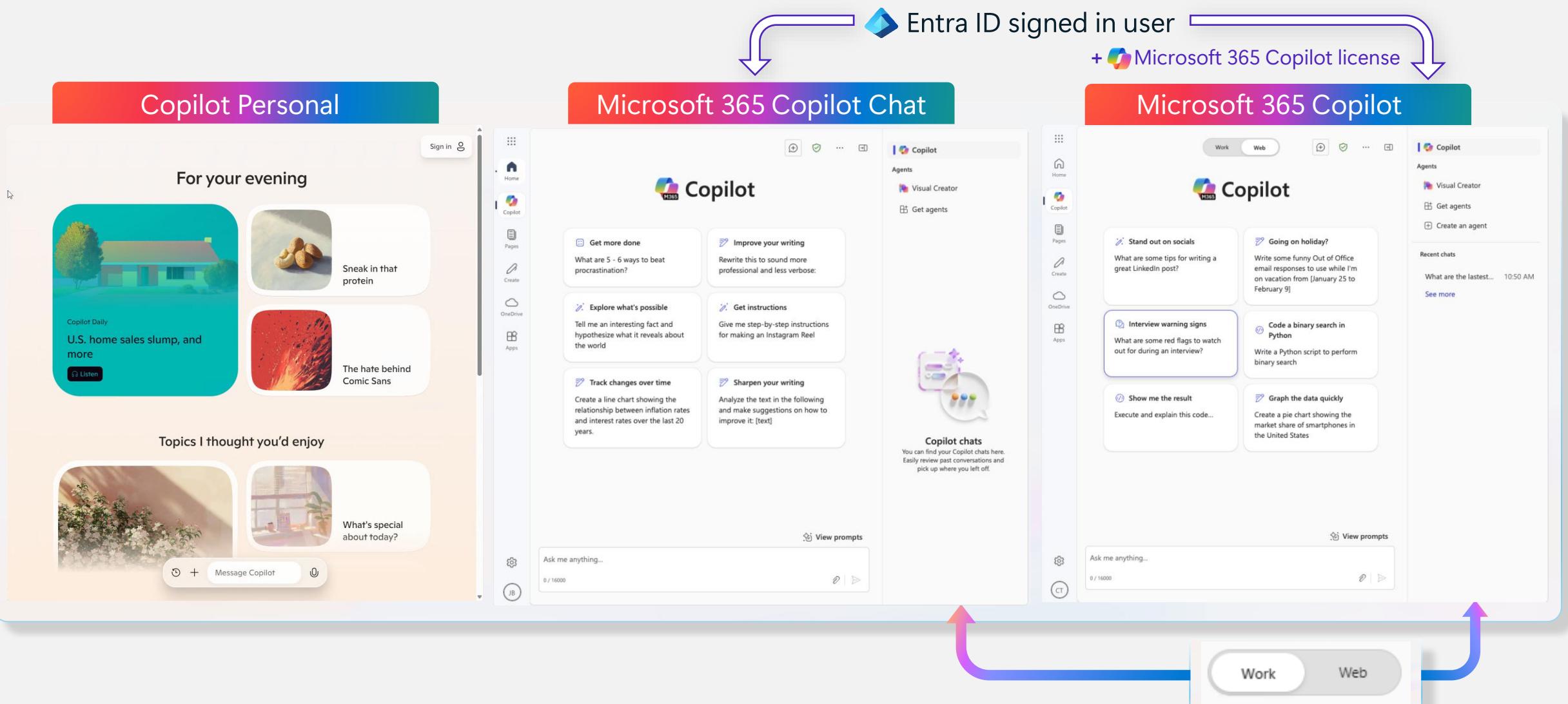
Gen AI Tool	Vendor	LLM	Security	Restrictions
M365 Copilot Chat	Microsoft	GPT-5/GPT-4o/DALL-E3 & Claude models	<p>Never uses your inputs to train the model when you are logged in – ‘Enterprise Data Protection’ – OpenAI</p> <p>Anthropic ‘Data Protection Agreement’ for Claude</p> <p>Controls available for IT teams to control agent PAYG usage/permissions</p>	<ul style="list-style-type: none"> Model access based on real-time demand/availability Response times limited based on availability Variable limits on image generation and file uploads based on availability
ChatGPT	OpenAI	GPT-5/GPT-4o mini/DALL-E3	Uses your inputs to train the model unless you explicitly opt-out	<ul style="list-style-type: none"> 10 (estimated) messages per 5 hours using GPT-5, GPT-4o mini afterwards Limited file uploads (512MB or 2M tokens), data analysis, web browsing and image generation (2 per day) Response times limited based on availability
Gemini	Google	Gemini LLM – 2.5 Flash /Imagen 4	Enterprise data protection	<ul style="list-style-type: none"> Response times limited based on availability Variable limits on image generation Limited file uploads (10x files, 100MB)
Claude	Anthropic	Claude Sonnet 4	Does not use your inputs or outputs to train the model	<ul style="list-style-type: none"> Response times limited based on availability Limited context window Variable limits on prompt responses per day Limited file uploads (5x files, 10MB per) No image generation

- Copilot agents (free and PAYG options)
- One UI for all AI features

Connecting it all Together – Agentic AI



Different Microsoft Copilots





Microsoft 365 Copilot Chat

Natural Language



Large Language
Models

+

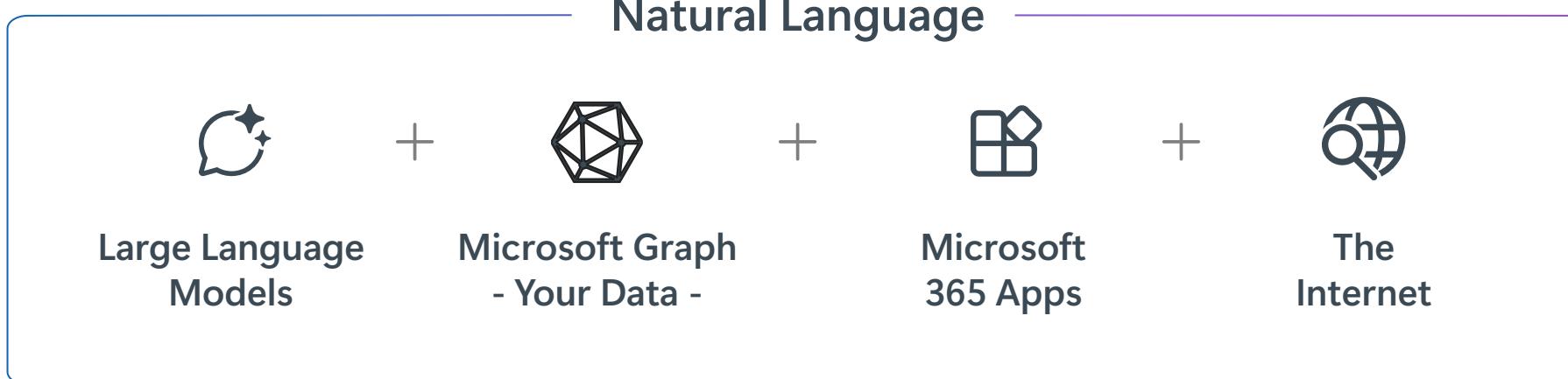


The
Internet

- Free to use chat
- PAYG usage of non-web agents



Microsoft 365 Copilot



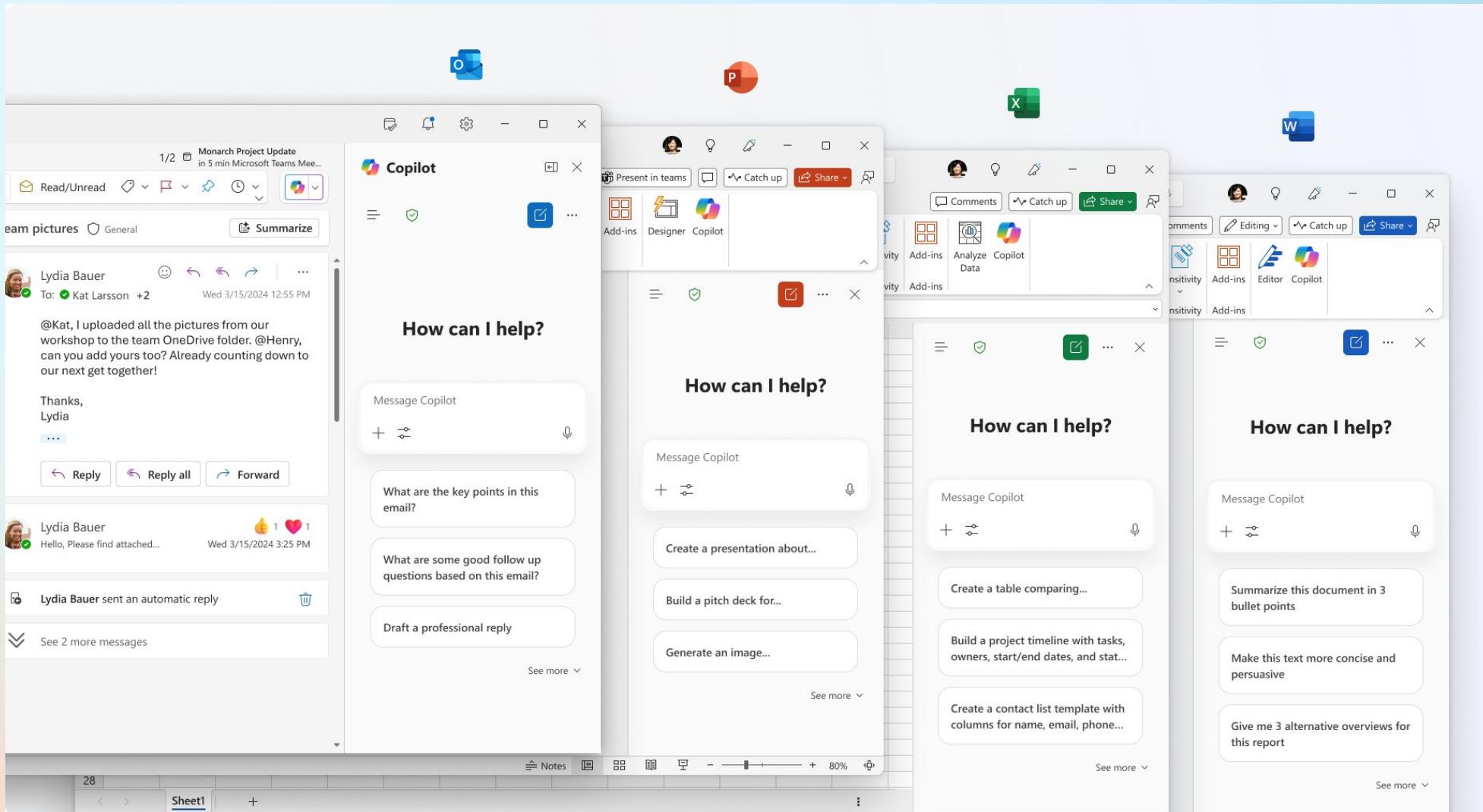
- \$18/month subscription (education pricing)
- No additional PAYG charge for many agents
- PAYG usage of some advanced agents

M365 Copilot Comparison – Free, PAYG, Subscription

		Microsoft 365 Copilot Chat	Microsoft 365 Copilot
		Free + Consumption	\$30 pupm
Chat	Copilot Chat – Web grounded (powered by GPT 4o)	●	●
	Copilot Chat – Work grounded (work data in your tenant's Microsoft Graph and 3rd party data via Graph connectors)		●
	Copilot Pages	●	●
	File upload ¹	●	●
	Code Interpreter ¹	●	●
	Image generation ¹	●	●
Agents²	Create agents using Copilot Studio ³ , including SharePoint agents	●	●
	Discover and pin agents	●	●
	Use agents grounded on Web data	●	●
	Use agents grounded in work data (work data in your tenant's Microsoft Graph and 3rd party data via Graph connectors)	▲	●
	Use agents that act independently using autonomous actions	▲	▲
Personal assistant	Copilot reasons over personal work data (e.g. Outlook, OneDrive, meeting transcripts)		●
	Copilot in Teams (Copilot in Meetings and Meeting Recap, insights from screen-shared content coming soon)		●
	Copilot in Outlook (Prioritize my inbox, schedule focus time and 1:1 meetings, draft agendas, summarize message threads)		●
	Copilot in Word (Suggestions for structure, flow, and tone, draft and summarize documents)		●
	Copilot in Excel (Python, getting started experience, create formulas and visualizations using natural language)		●
	Copilot in PowerPoint (Narrative builder, presentation translation, generate slides or images aligned to company branding)		●
	Copilot Actions		In preview
	Pre-built M365 agents (Interpreter, Facilitator, Project Manager, Employee Self-Service)		In preview
Copilot Control System	Enterprise Data Protection (EDP)	●	●
	IT management controls	●	●
	Agent management	●	●
	SharePoint Advanced Management		●
	Copilot Analytics to measure usage and adoption ⁴		●
	Pre-built reports and advanced analytics to measure ROI		●

**Copilot Chat
now offers
some of this
functionality
too!**

Included for free with Copilot Chat, Copilot now lives in the key M365 apps and automatically has the context of the open document/file/email chain



M365 Copilot Agents – Out of the Box

- Customised, specialised extensions of M365 Copilot
- Available to use out of the box, no configuration necessary

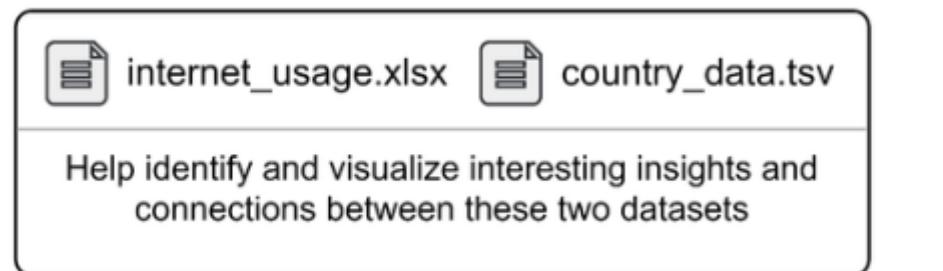


OpenAI o3 Model

- Researcher – deep reasoning logical train of thought: planning, research and synthesis
- Analyst – data science analytics leveraging Python and multiple data sources like Excel, CSV, JSON, PDT, PPT, XML

Claude Opus 4.1 & Sonnet 4

- Available as of September 2025 as an alternative option for the Researcher agent
- Included as part of a M365 Copilot license and will be auto-pinned
- 25 combined queries per user per month (1 report output = 1 query) – additional usage model being developed
- Not available for M365 Copilot Chat users





M365 Copilot Agents – Copilot Studio Lite

- Customised, specialised extensions of M365 Copilot
- Rapid, no-code agent generation
- Create an agent in minutes, grounded in specific data of your choosing
- Shareable within your institution

Copilot Studio My Copilot Agent

Create ... X

Describe Configure Try it

Dec 16, 2024, 1:55 PM

Hello! I'm here to help you build an agent so you can get more done. You can say something like 'provide best practices for project management' or 'help my teammates onboard to a new project'.

What would you like to make?

Type your message

0/2000

AI-generated content may be incorrect | Copilot Studio capabilities in M365 are processed by the Copilot Studio service. By using this experience, you agree to these [Terms](#) | [Privacy and cookies](#)

- Prompt Copilot to describe what you want your agent to do – it will configure automatically
- Tweak the configuration by providing example prompts you want the agent to deal with and specify which files you want it to reference

Knowledge ⓘ

SharePoint

Select folders and file types .docx, .doc, .txt, .pptx, .ppt, and .html, or add a SharePoint site. You can add up to 20 knowledge sources. [Learn more](#)

Browse – or – Enter URL of a SharePoint site

Web content

M365 Copilot Agents – Copilot Studio Lite



- Build a library of agents for different purposes, linked to different knowledge bases
- Add pre-built agents published by others

The screenshot shows the 'Copilot' interface with the 'Agents' section open. It lists several agents: 'Visual Creator', 'Automation Finder', 'Prompt Coach', 'Idea Coach', 'Writing Coach', and 'Lab Onboarding Assistant'. The 'Lab Onboarding Assistant' agent is highlighted with a dark background and white text. Below the list are buttons for 'Show less', 'Get Copilot agents', and 'Create an agent'.

The screenshot shows the 'Lab Onboarding Assistant' interface. It displays a grid of six cards, each with a question and its corresponding answer. The cards are: 'Lab safety procedures' (What are the lab safety procedures I need to follow?), 'Equipment training' (How can I get training for using the lab equipment?), 'Group policies' (Can you tell me about the group's policies?), 'Accessing lab facilities' (How do I get access to the lab facilities?), 'Waste disposal guidelines' (What are the guidelines for waste disposal in the lab?), and 'Emergency contacts' (Who should I contact in case of an emergency in the lab?).

- Copilot agents for
 - **Your lab** - highlighting safety procedures, equipment instructions and onboarding tasks
 - **Your literature library** – interrogate literature with natural language and AI helping to identify trends, patterns and valuable references quickly
 - **Your research services** – access information on demand about RSE resources, HPC, data storage facilities and grant support 24/7.

The screenshot shows a Microsoft Teams chat window. The message 'Who is the lab's first aider?' is sent from the user at 28 October 2024 at 10:43. The 'Lab Onboarding Assistant' responds at 10:43 with the message: 'The designated first aider in the lab is Miss F. Aider. You can find her in office 201 ①. If you have any emergencies, there is a red phone located on the wall at the lab's door that can be used to make emergency calls ①.' Below this, the user asks 'Is there anything else you need help with?'. At the bottom, there are buttons for 'Edit in Pages' and 'Copy'.

With Azure, the latest open-source and foundation models live under one roof

Azure AI Foundry



- Security at the core
- GUI, API, Python SDK access
- Compare models
- Test before deploying
- Integration with popular tools



Microsoft Family
Cost-effective, domain-specific SLM efficiency

Azure OpenAI Family
Multimodal GenAI, privacy, security and enterprise scale

Hugging Face Family
Open-source options that are accessible and adaptable

Mistral Family
Exceptional language and multilingual reasoning

Meta Family
Use case versatility, open ethos and safety

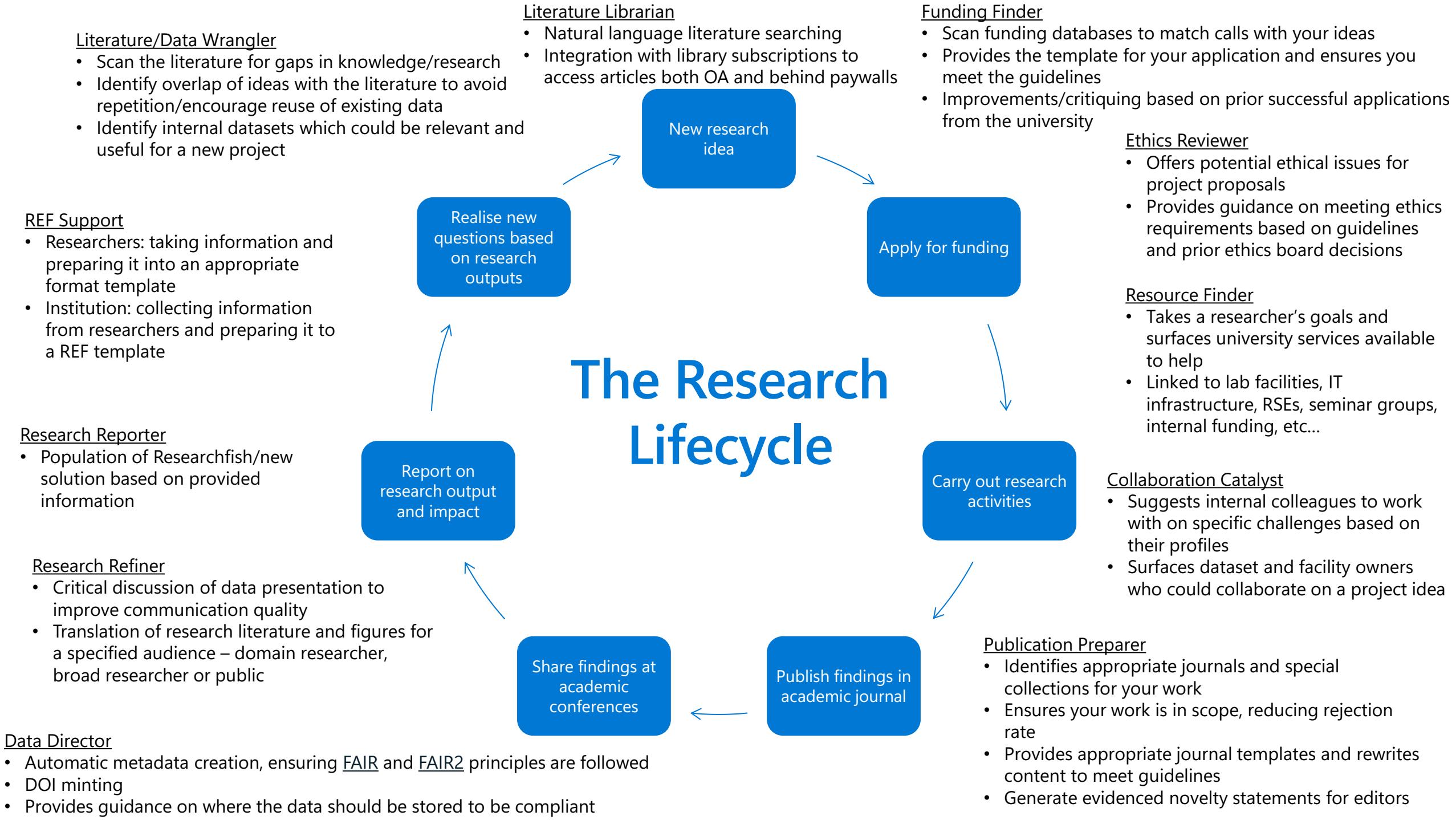
Nvidia Family
High-quality, reliability and designed for optimization

Databricks Family
Expertise in enterprise workloads and databases

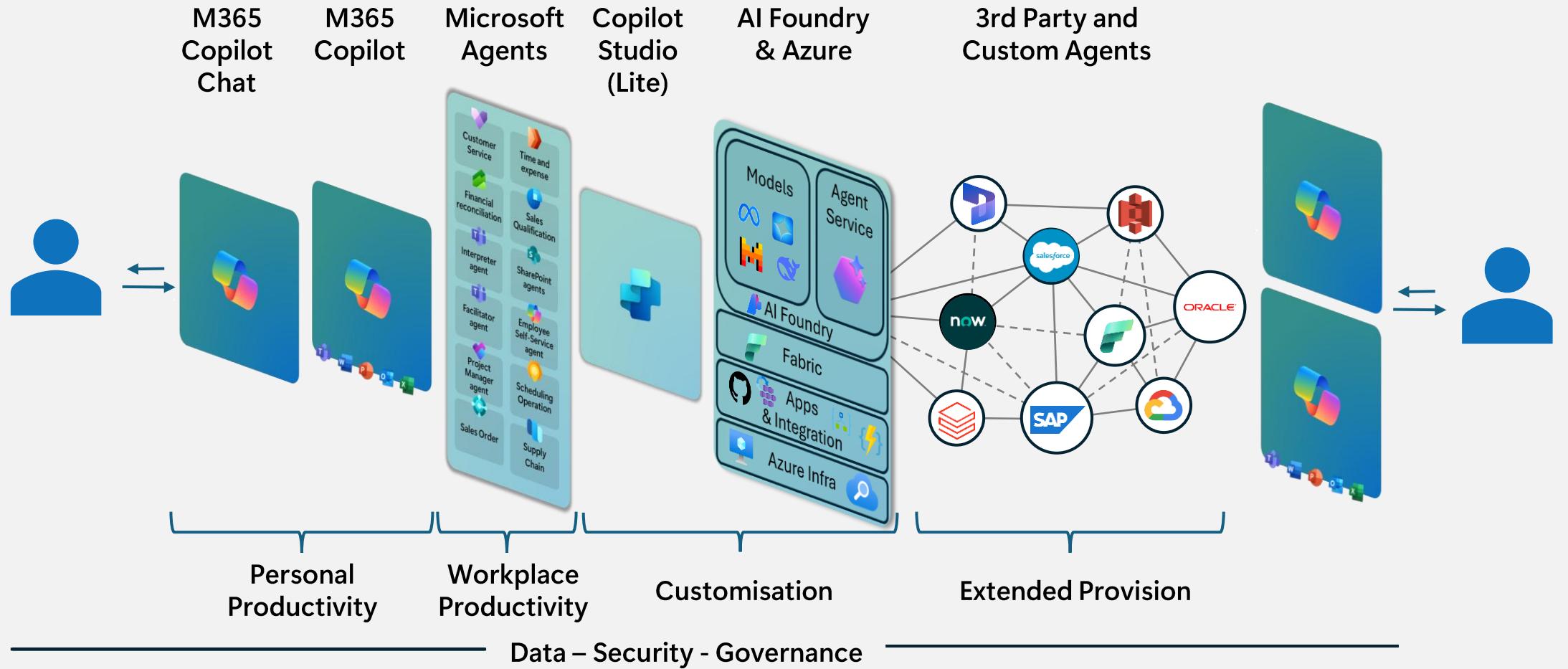
Snowflake Family
Cost-effective training, helpful coding and resources

Cohere Family
Performance, low-latency and built-in grounding

Stability AI Family
Robust image generation models like Stable Diffusion



Connecting it all Together – Agentic AI





Training & Upskilling

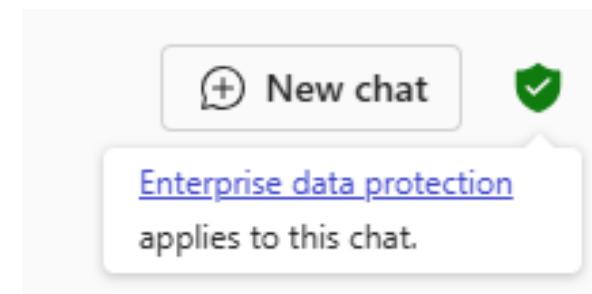
- Ask Copilot for help!
- [Microsoft Learn](#) – documentation and training material for all MS solutions
- [Explore Microsoft 365 Copilot Chat](#)
- [Getting Started with Microsoft 365 Copilot](#)
- [Effective Prompting for Generative AI](#)
- [Copilot Foundations](#)
- [Create agents in Microsoft Copilot Studio](#)
- [Fundamentals of Generative AI](#)
- [Microsoft Azure AI Fundamentals: Generative AI](#)
- [Certifications](#)
- [Azure AI Fundamentals](#)





Use of Generative AI – University Policy

- Whilst many of you are probably already using generative AI tools, please keep in mind any university policies on AI usage in the workplace where applicable
 - It's up to you to follow any university policies communicated to you
 - If you're unsure, get in touch with your IT team
-
- Universities all prioritise security of their data and that means ensuring genAI tools are not taking your data to train their models in the first instance
 - Always ensure you're logged in with your university credentials when using Copilot to get Enterprise Data Protection





Copilot – A Day in the Life of a Researcher



Summarise my emails and messages from the past day, highlighting actions required and follow ups

Ensure I am up to date with actions and asks

Find and summarise all new articles from the past week in X journals

Keep up to date with literature

Build a literature review with citations, suggesting novel ideas to address gaps

Create project ideas and save time on manual literature discovery



Prepare for a research project brainstorming meeting, transcribe it and allocate actions afterwards

Be impactful for my collaborators and drive new ideas

Draft grant application from a template and document of ideas

Ensure continual funding supply

Build an abstract for a conference and associated presentation slides from a manuscript document

Raise visibility of my work

Support in peer review of manuscript/funding proposals

Be efficient with my time and fulfil asks effectively

Translate a technical presentation talk track for a general public audience

Time efficient, impactful science communication



Detailed analysis and visualisation of new data in Excel with (embedded Python)

Upskill and learn new technologies



Requires a M365 Copilot license to achieve the full effect

The Art of Prompting

The ingredients of a good prompt

Generate 3 to 5 points to prepare for a meeting with Client X to discuss their "Phase 3+" brand campaign.

Focus on Teams emails and chats since June.

Thank you for using plain language so I can prepare quickly.

Objective

What response would you like to get from Copilot?

Context

Why do you need it and who is affected?

Source

What sources of information or examples should Copilot use?

Expectations

How should Copilot respond to meet your expectations?

Industry: Education

Getting Started

- M365 Copilot Chat is already available to all
- Simply log in using your university credentials to ensure enterprise data protection

copilot.microsoft.com



Which Copilot experience are you looking for?

Work
A secure and compliant Copilot integrated with your enterprise account.

[Go to copilot.cloud.microsoft
!\[\]\(f92dd4da798b4dcd89fc51d3c718915d_img.jpg\) ryanpayton@microsoft.com](#)

Personal
A helpful AI companion for your everyday life outside of work.

[Switch to a personal account](#)



Copilot

In your corner. By your side. With the Copilot app for iOS and Android, you've got this.

Scan the QR code to get the Copilot mobile app



 Download on the App Store

 GET IT ON Google Play

University of Manchester drives value from Microsoft 365
Copilot with emphasis on creative thinking and continuous learning



Azure



Microsoft 365



Microsoft Copilot



Demos



What's the Catch?

- We feel Copilot offers greater value to the research community than competitors like ChatGPT and want to raise awareness of our solution and collect feedback
- We hope that the community will build and share agents, a unique feature to Copilot, to accelerate research
- We anticipate institutions building PAYG agents to support their academic communities and this is more effective if researchers are already used to using Copilot
 - Think of an agent to help researchers with using your HPC facility or navigating the research ethics approval process
- We hope some of you will see value in M365 app and Microsoft Graph integration and request access to the subscription model
- We hope that if an institution has a large user base of free Copilot, the institution will look to Copilot as their top subscription option for a generative AI assistant

Microsoft's AI Stack



Microsoft 365 Copilot

- M365 Copilot Chat (Free) – Internet information only & PAYG agents
- M365 Copilot – embedded in M365 apps, grounded in your data, agents included



Azure AI Foundry

- Pro-code generative AI application building platform with dev tools, fine-tuning, model evaluation
- Access to a range of models from OpenAI, Meta, Mistral, Cohere, Hugging Face, DeepSeek and more
- Security built-in – ensure no data leaves your governance boundaries when using a range of LLMs

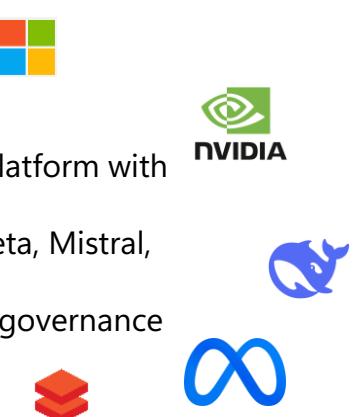
Generative AI Assistants



Copilot Studio/Agents

- No/low-code custom Copilot built on top of standard Copilot
- Agents link directly to SharePoint/Teams files and are shareable

Generative AI Development



Azure Machine Learning

- An easy-to-use UI-based platform to train, evaluate, develop and deploy ML models
- Bring your own data and models
- Use out-of-the-box models

AI for Research



Azure AI Services

- Prebuilt AI models for many use cases
- Browser-based UI
- Option to customize models using your own data

What Next...

Researchers

- Continue testing Copilot Chat's free capabilities in your day-to-day
- Let me know if you're interested in accessing a M365 Copilot subscription for Researcher and custom agents – let IT know too!
- Let me know if you're interested in other parts of Microsoft's AI stack
- Discuss any other technical bottlenecks you're facing with me to see if Microsoft can help



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