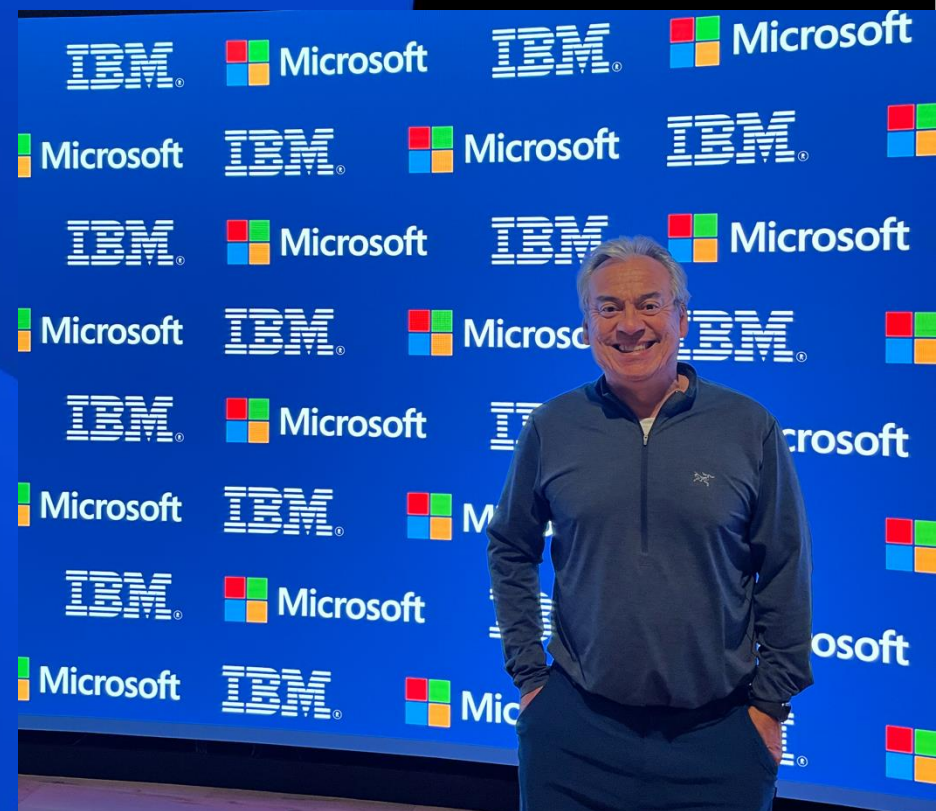


The Future of AI: Transforming Our World Over the Next 5 Years

AI Fundamentals

Ivan Portilla
Ivan.Portilla@ricoh-usa.com
github.com/jiportilla/giveback



Objectives of This Talk

Upon completion of this lecture, you will understand:

- ❑ Primer on Artificial Intelligence (AI)
- ❑ Generative AI (GenAI) & Large Language Models (ChatGPT)
- ❑ GenAI @ Work
- ❑ Demonstrations

Agenda

1. Artificial Intelligence
2. GenAI (ChatGPT)
3. Closing Remarks & Q&A

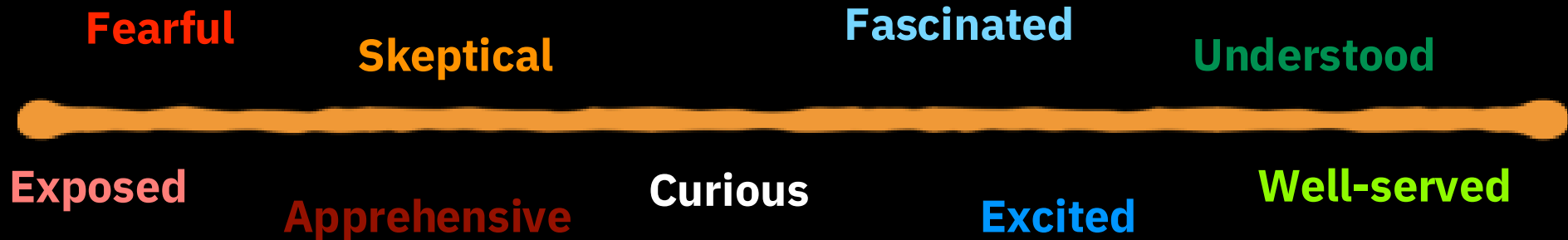
What is AI?

Slido.com

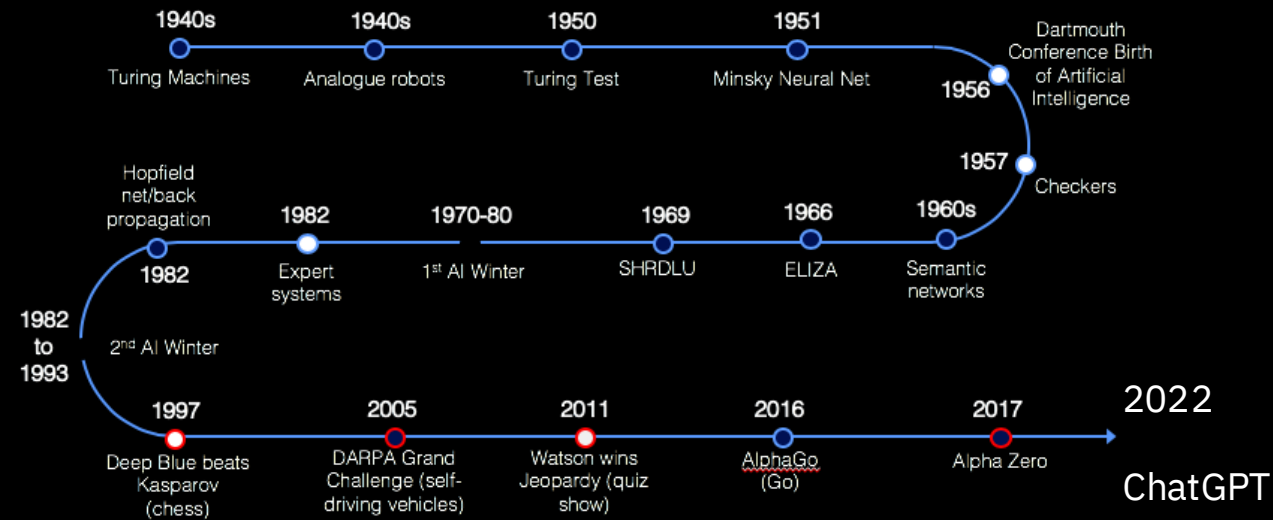
Code: 6772241

AI Perception

What do people feel about AI?



A brief history of AI



ALAN TURING'S OFFICE

Here at his desk in Hut 8, Turing took the lead on breaking naval Enigma ciphers – something few thought could ever be done. His mathematical skills also enabled him to break other ciphers, including the complex Lorenz cipher where he used a method that became known as Turingery. Together with his fellow Codebreaker Gordon Welchman, he developed the Bombe machine to help speed up the codebreaking process.

IN THEIR WORDS

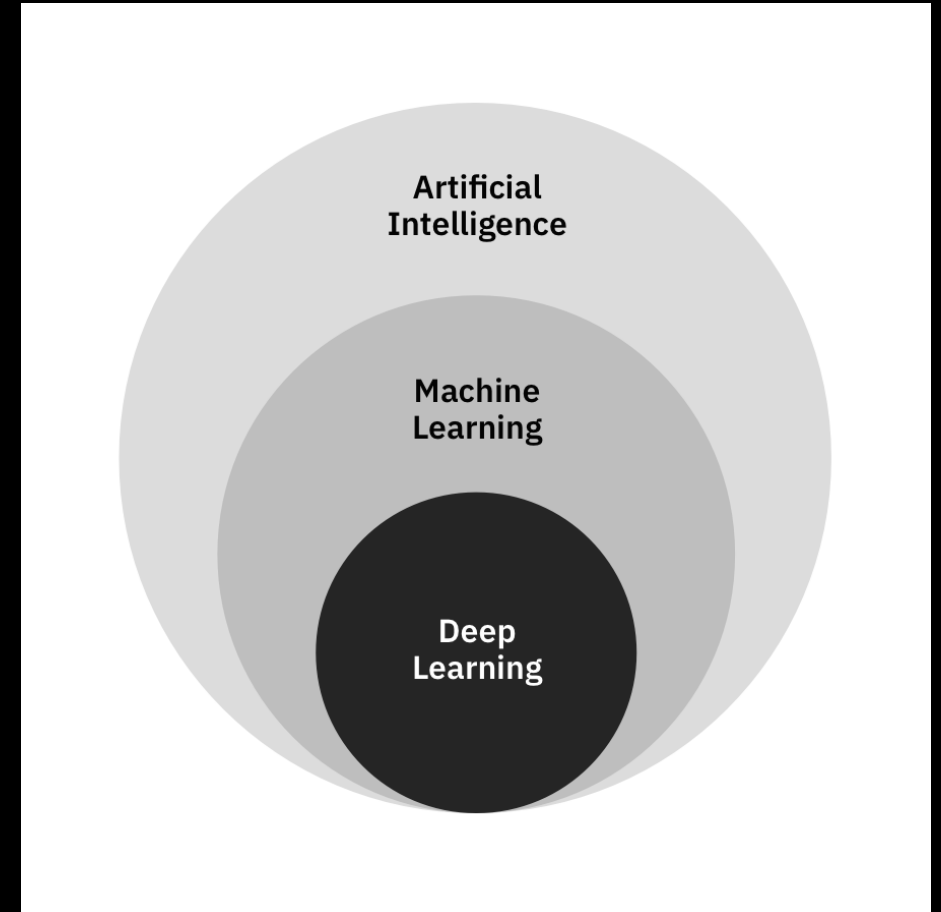
If anyone was indispensable to Hut 8 it was Turing. The pioneer work always tends to be forgotten when experience and routine later make everything seem easy, and many of us in Hut 8 felt that the magnitude of Turing's contribution was never fully realised by the outside world.

Hugh Alexander, Codebreaker, Hut 8



Definitions

- AI: Intelligence demonstrated by machines
- ML: Set of algorithms that allow computers to learn from (big) data
- DL: Set of learning techniques focused on models and neural networks



Why Machine Learning?

Traditional Programing



AI-Machine Learning



ML provides systems the ability to automatically learn from experience (without being explicitly programmed)

Intelligence demonstrated
by attendees

Exercise 1

Lab 1

Create a basic project plan to track a new VC80 feature.
This plan will outline tasks, roles, and timelines.

Your team:

- An architect,
- Two developers,
- UA tester

Timeline Summary

Phase	Tasks	Team Members	Duration

Exercise 2

Machine Learning:

Sample



Label



dog



cat



horse

Human Learning:

We learn through

Cat or Dogs



Long Ear Black nose

dog



Machine Learning:

Sample



Label



dog



cat



horse

Human Learning:

We learn through

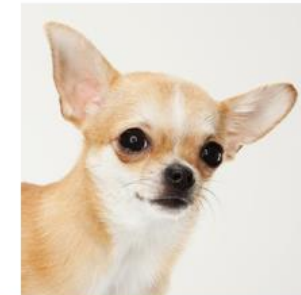


Examples

Long Ear Black nose



Diagrams



Comparisons

Exercise 3

Passing truck in highway



Passing truck in highway

Don't Follow Closely Behind Prior to Passing

- As you prepare to pass, keep a healthy distance between your car and the truck in front of you. At minimum, 30 feet should separate the two vehicles. Signal clearly to indicate your next move.

Pass in the Left Lane

- The left lane is referred to as the 'passing lane' for a reason; it's the safest place to pass any vehicle, but particularly trucks and buses. It's frustrating to be stuck behind a slow truck in the left lane, but resist the urge to pass on the right side.

Don't Linger in the Truck's Blind Spot

- Trucks have huge blind spots on both sides. Pass promptly while still abiding by the speed limit. Don't hang out in the blind spot area, which, in the left (passing) lane, constitutes the truck's entire front half.

Recognition

- With GPS navigation, HiRes cameras, Laser-radar cameras: Location, speed of trucks, road conditions, emergency lane
- With Image Recognition: Turn signal (!lamp), paper or debris on the road

Insights

- Data is fed into multiple CPUs + collected data + rules
- Manufacturer knows who has the right of the way, when trucks can pass + MM miles driven have feedback on different driving style

Action (Cognitive Decision)

- Assist (alerts driver)
- Act (Pass or Not pass, Measure decision effects, feedback loop, and share w other cars)

Why Machine Learning?

Traditional Programing



AI-Machine Learning



ML provides systems the ability to automatically learn from experience (without being explicitly programmed)

NLU Demonstration

Future of AI Example (Semantic Analysis)

The Wining Shot

The soccer game was nearly over. The two teams were tied, one to one.

Alice kicked the ball. Oops! She kicked it the wrong way.

”What a bad kick,” Alice thought.

But wait!. Her teammate John jumped to stop the ball. The ball went off John into the goal!.

Alice’s team won the game. Hooray! It was not a bad kick, after all.

Who won the game?

Why?

Future of AI Example

The Wining Shot

The soccer game was nearly over. The two teams were tied, one to one.

Alice kicked the ball. Oops! She kicked it the wrong way.

”What a bad kick,” Alice thought.

But wait!. Her teammate John jumped to stop the ball. The ball went off John into the goal!.

Alice’s team won the game. Hooray! It was not a bad kick, after all.

Who won the game?

Answer: Alice’s team

✓ Correct

Explanation: Alice’s team won the game because Alice’s team had more points than the other team

✓ Correct

Slido.com

Code: 6772241

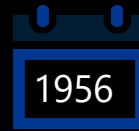
GenAI

Artificial Intelligence

Machine Learning

Deep Learning

Generative AI



Artificial Intelligence

Intelligence demonstrated by machines



Machine Learning

Learn from data



Deep Learning

Model after the human brain (Neural Networks)



Generative AI

Create new written, visual, and auditory content

Generative AI

The best thing about AI is its ability to ...

Adapt = 30%

Process = 22%

Analyze = 7%



OpenAI

GTP-4

Why is the sky blue?

OpenAI GPTx Answer:

The sky blue because the Earth's atmosphere scatters sunlight in all directions and blue light is scattered more then the other colors because it travels as shorter, smaller waves

Playground

Your presets

Save

SYSTEM

you are a science professor

USER

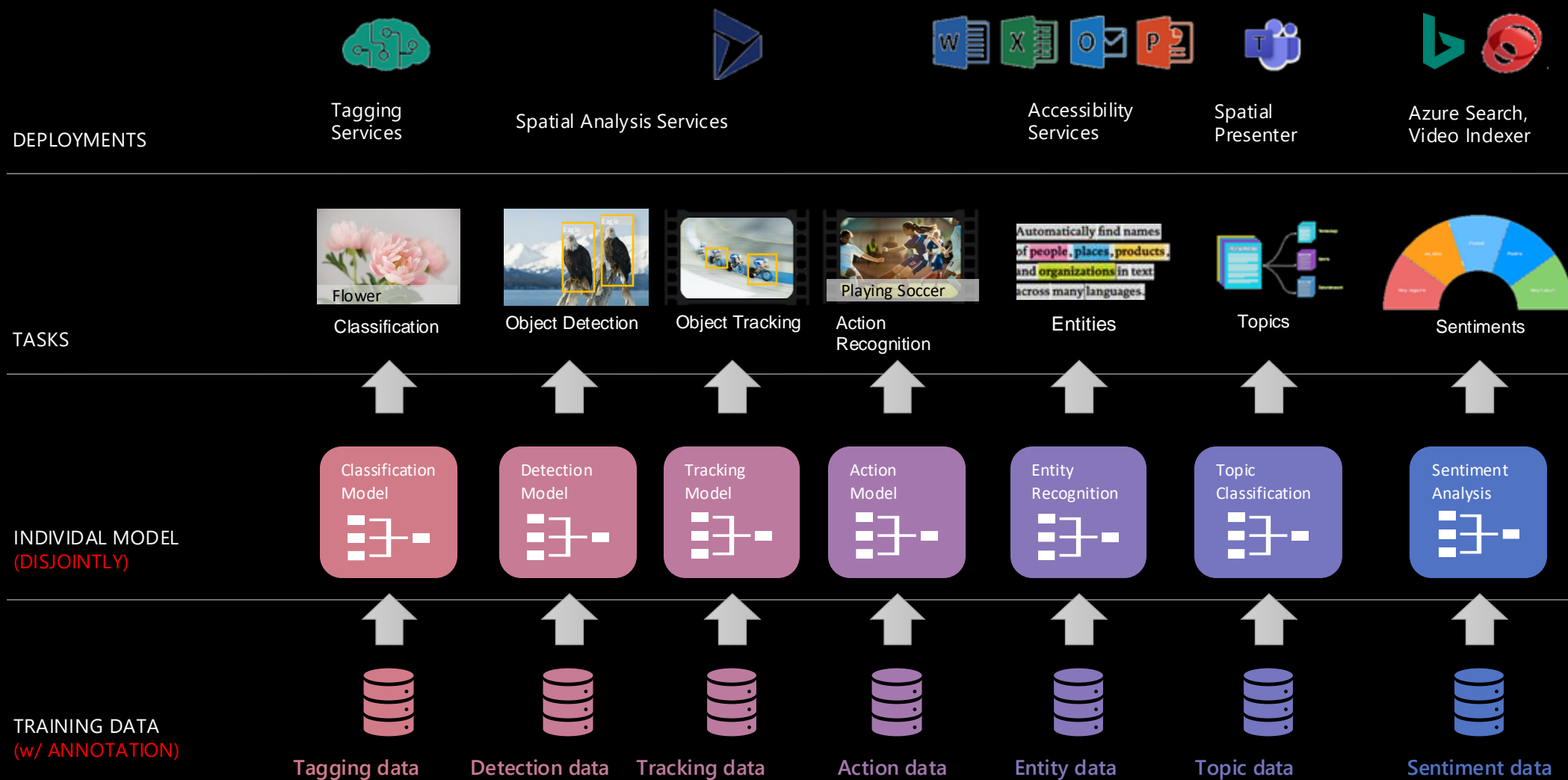
why is the sky blue

ASSISTANT

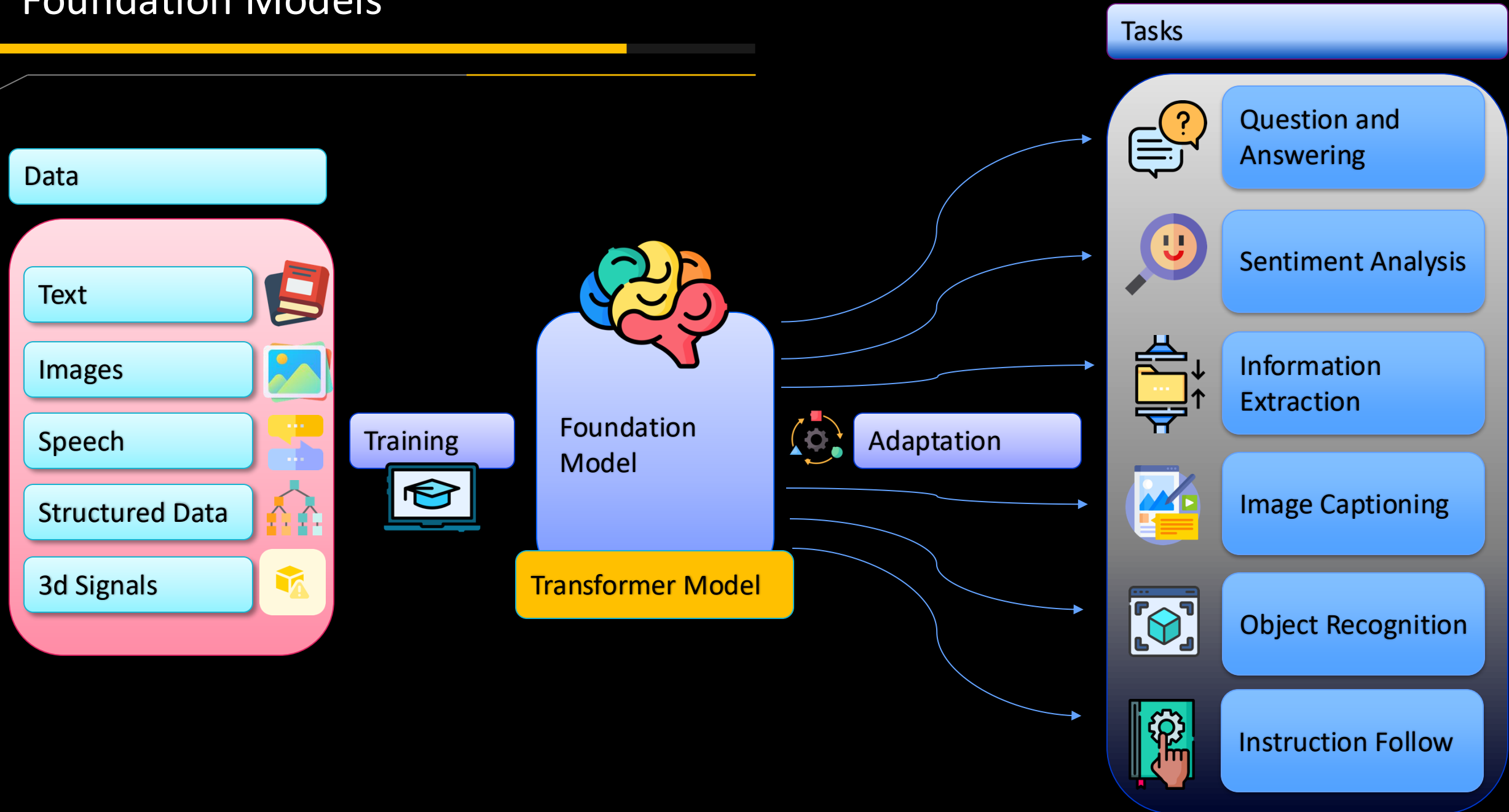
The sky appears blue because of a phenomenon called Rayleigh scattering. Essentially, when sunlight enters Earth's atmosphere, the shorter blue wavelengths are scattered more effectively by the gases and particles in the air compared to the longer red wavelengths. This scattering causes the blue light to be diffused in all directions, giving the sky its blue appearance to our eyes.

Traditional model development

High cost & slow deployment - Each service is trained disjointly



Foundation Models



[https://platform.openai.com/playground?
mode=complete](https://platform.openai.com/playground?mode=complete)

Prompt Engineering

Copilot Prompt Best Practices

Goal

What do you want from Copilot?

"I want a list of 3-5 bullet points to prepare me..."

+

Context

Why do you need it and who is involved?

"...for an upcoming meeting with [client], focusing on their current state and what they're looking to achieve."

+

Expectations

How should Copilot respond to best fulfill your request?

"Respond with a tone that is friendly but authoritative..."

+

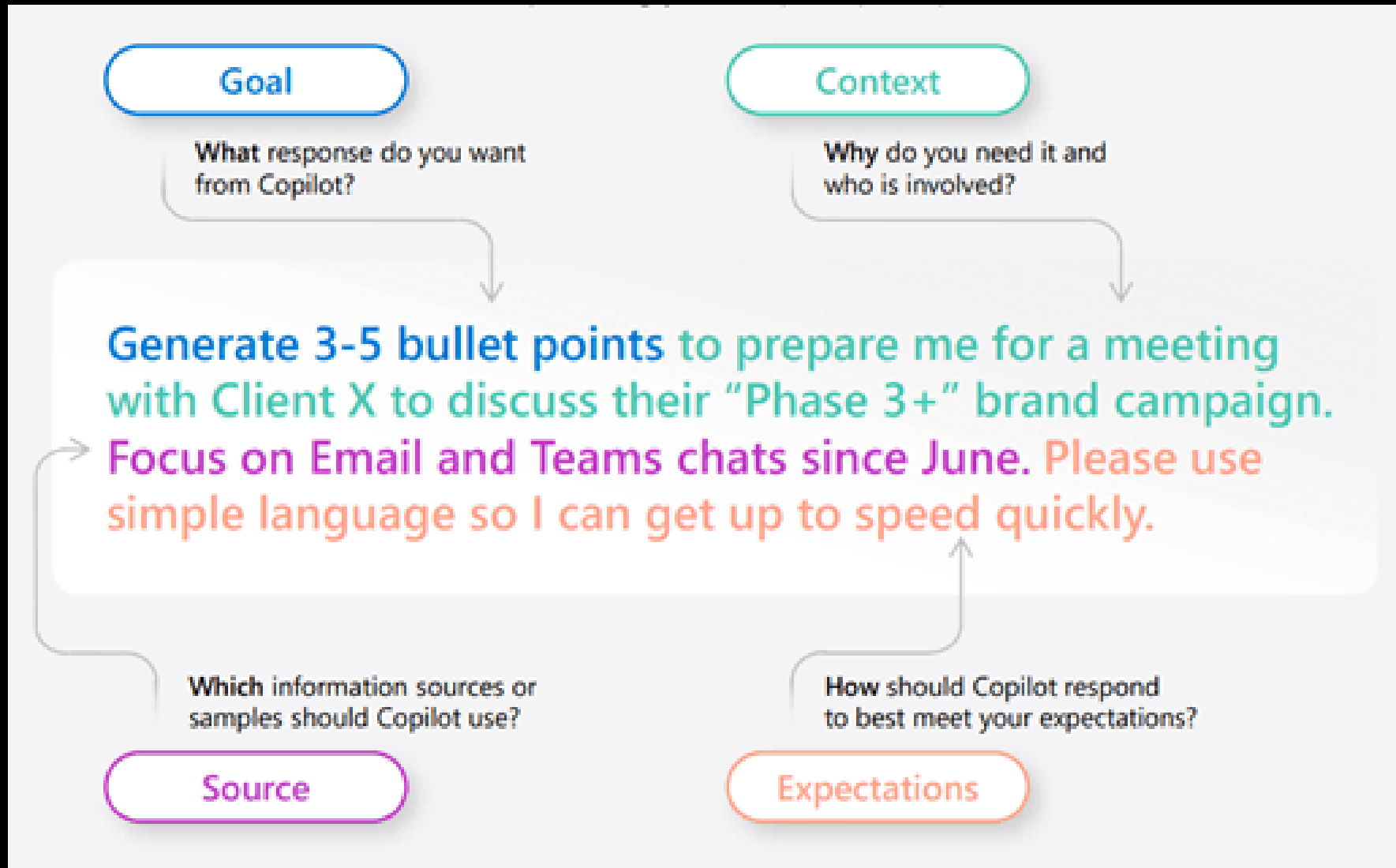
Source

What information or samples do you want Copilot to use?

"... and focus on email and Teams chats with [people] over the last two weeks."

<https://copilot.cloud.microsoft/en-US/prompts>

Copilot Prompt Best Practices



Text Classification

Named Entity Recognition (Zero-Shot)

Extract the **name** and mailing address from this email:

Dear Kaylee,
It was great to talk to you at the seminar. I thought Jane's talk was quite good.
Thank you for the book. Here's my address 2111 Ash Lane,
Boulder, CO 80301

Best,
Marilú

Name: Marilú

Mailing Address: 2111 Ash Lane, Boulder, CO 80301

Text Classification

Custom Named Entities (Few-Shot)

Extract job titles from the following sentences.

Sentence: Jane Doe has been working for Microsoft for 20 years as a Linux Engineer.

Job title: Linux Engineer

###

Sentence: Jane Doe has been working for Microsoft for 20 years and she loved it.

Job title: none

###

Sentence: Marc Simoncini | Director | Meetic

Job title: Director

###

Sentence: Damien is the CTO of Platform.sh, he was previously the CTO of Commerce Guys, a leading ecommerce provider.

Job title: CTO

Text Classification

Multi-Label Text Classification (Few-Shot)

The following is a list of movies and the **categories** they fall into:

Topgun: As students at the United States Navy's elite fighter weapons school compete to be best in the class, one daring young pilot learns a few things from a civilian instructor that are not taught in the classroom.

Category: **Drama, Action**

Hustle: A basketball scout discovers a phenomenal street ball player while in Spain and sees the prospect as his opportunity to get back into the NBA.

Category: **Comedy, Drama, Sport**

The Northman: From visionary director Robert Eggers comes The Northman, an action-filled epic that follows a young Viking prince on his quest to avenge his father's murder.

Category: **Action, Adventure, Drama**



Abstractive Summarization

Contact Center Summarization

Summarize this for a call center agent:

Agent: Thank you for calling ADM. Who am I am speaking to?

Customer: Hello, my name is Peter Smith. I own a small business and have some questions regarding payroll processing.

Agent: Good morning, Peter, before we get started may I ask you a few questions so that I better answer your questions today?

Customer: Thank you that is quite helpful. Are there specific regulations that I need to follow?

Agent: Certain aspects of payroll processing are regulated by the Internal Revenue Service (IRS) and the Department of Labor (DOL)

The agent is speaking to a customer named Peter Smith. Peter is asking for tips on manual payroll processing. The agent also informs Peter that certain aspects of payroll processing are regulated by the Internal Revenue Service (IRS) and the Department of Labor (DOL).

Few-Shot Reasoning (Human version)

1st Prompt

Roger has 5 tennis balls. He buys 2 more cans of tennis balls. Each can has 3 tennis balls. How many tennis balls does he have now?

Answer: The answer is 11.

The cafeteria has 23 apples. If they used 20 to make lunch and bought 6 more, how many do they have?

The answer is 27



2nd Prompt – Provide Reasoning

Roger has 5 tennis balls. He buys 2 more cans of tennis balls. Each can has 3 tennis balls. How many tennis balls does he have now?

Answer: Roger started with 5 balls. 2 cans of 3 tennis balls each is 6 tennis balls. $5+6 = 11$. The answer is 11.

The cafeteria has 23 apples. If they used 20 to make lunch and bought 6 more, how many do they have?

The cafeteria had 23 apples originally. They used 20 to make lunch. So they had $23-20 = 3$. They bought 6 more apples, so they have $3 + 6 = 9$. The answer is 9.



Model Reasoning – Chain-of-Thought

Before

What is the annual water demand of a single-family household containing four people who are at home an average of 200 days per year and use an average of 100 liters of water per day?

The annual water demand of a single-family household containing four people who are at home an average of 200 days per year and use an average of 100 liters of water per day is 8,000,000 liters per year..

After

What is the annual water demand of a single-family household containing four people who are at home an average of 200 days per year and use an average of 100 liters of water per day?

Let's think step by step and explain the calculation step by step.

Step 1: Calculate the total number of days in a year:

There are 365 days in a year.

Step 2: Calculate the total number of days the family is at home:

The family is at home an average of 200 days per year.

Step 3: Calculate the total water demand of the family:

The family uses an average of 100 liters of water per day. Therefore, the total water demand of the family is $100 \text{ liters} \times 200 \text{ days} = 20,000 \text{ liters per year}$.

Step 4: Calculate the annual water demand of the single-family household:

The annual water demand of the single-family household is 20,000 liters per year.

Chain of Thought Example:

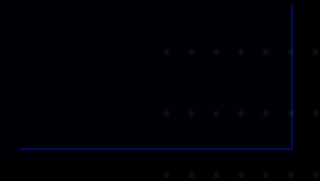
Planning for an Exam Week

Prompt:

“Finals are coming up, and you have exams in several subjects. Let’s make a study plan to cover all the material effectively. First, we’ll list each subject and the main topics to study. Then, we’ll estimate how much time you’ll need for each subject based on difficulty and your confidence level. Finally, we’ll set up a daily schedule, making sure to review the most challenging topics more frequently.”

Chain of Thought Steps:

1. List each subject and the main topics you need to study.
2. Estimate the time required for each subject based on its difficulty.
3. Create a study schedule with specific times for each subject.
4. Prioritize subjects that need more review.
5. Include breaks to avoid burnout and maintain focus.



Chain of Thought Example:

Planning a New Feature Launch

Prompt:

“We’re planning to launch a new feature. Let’s outline a structured approach to ensure a successful launch. First, we’ll clarify the feature’s requirements. Next, we’ll list the development, testing, and deployment tasks. Then, we’ll define the timeline, assign resources, and anticipate potential risks. Finally, we’ll identify key milestones and checkpoints for monitoring progress.

Chain of Thought Steps:

1. Define feature requirements and objectives.
2. Break down tasks by phase (development, testing, deployment).
3. Estimate timelines and allocate team resources.
4. Identify risks and create a mitigation plan.
5. Set milestones for tracking and accountability.

Chain of Thought Example:

Analyzing a Project Delay

Prompt:

“Our project is behind schedule. To understand the cause, let’s break down the possible factors contributing to this delay. First, let’s list each phase of the project and its current status. Then, we’ll evaluate any dependencies, resource issues, and task completion rates in each phase. Finally, we’ll identify any specific bottlenecks and propose solutions.”

Chain of Thought Steps:

1. List project phases and their statuses.
2. Identify key dependencies between tasks.
3. Evaluate resource allocation and team workload.
4. Pinpoint any bottlenecks or high-priority issues.
5. Suggest actions to recover from delays, such as re-allocating resources or reprioritizing tasks.

ReAct Example:

Deciding Whether to Join a New Club

Prompt:

“There’s a new club starting up at school, and you’re considering joining, but you’re already busy with other activities. Let’s think through this to make a good decision. First, list out the activities and responsibilities you already have, along with the time commitment for each. Then, consider what benefits you might get from this new club and whether it aligns with your goals. Finally, decide whether or not to join and, if you join, think about how you’ll balance your time.

ReAct Steps:

- **Reasoning Step:** List current activities and how much time they take each week.
- **Reasoning Step:** Think about what the new club offers and how it fits with your goals.
- **Action Step:** Decide if you’ll join or if it’s better to skip this year.
- **Action Step:** If you join, make a time management plan to balance your activities.

ReAct Example:

Handling a Scope Change

Prompt:

“We have a last-minute scope change request from a client. Let’s reason through this scenario to decide if we should accept or defer it. First, we’ll assess how the change affects the current timeline, resources, and budget. Then, we’ll evaluate if there are any benefits to implementing the change now versus later. Finally, we’ll make a decision and outline the steps needed to communicate it to the client.”

ReAct Steps:

- **Reasoning Step:** Evaluate how the scope change affects the project’s key metrics (timeline, resources, budget).
- **Action Step:** Decide whether to accept or defer the change.
- **Action Step:** Communicate the decision to the client, including reasoning and any alternative suggestions.

ReAct Example:

Evaluating a Project Risk

Prompt:

“There’s a risk of a delay due to a supplier issue. Let’s carefully assess the impact of this risk and decide on a course of action. First, we’ll consider how critical this supplier is to our project timeline. Next, we’ll think of any backup suppliers or alternative solutions. Finally, we’ll either prepare a contingency plan or communicate with stakeholders about the risk.”


ReAct Steps:

- **Reasoning Step:** Evaluate the dependency on this supplier and the delay’s potential impact on the timeline.
- **Reasoning Step:** Consider alternative suppliers or workarounds to minimize impact.
- **Action Step:** Decide whether to pursue a backup option or mitigate the risk in another way.
- **Action Step:** If needed, communicate the risk and contingency plan to stakeholders.



Prompt Engineering Guide





1. Give clearer instructions





2. Split complex tasks into simpler subtasks



3. Structure the instruction to keep the model on task



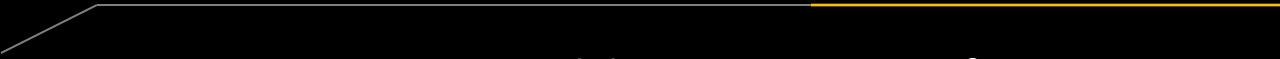

4. Prompt the model to explain before answering



5. Ask for justifications of many possible answers, and then synthesize



6. Generate many outputs, and then use the model to pick the best one

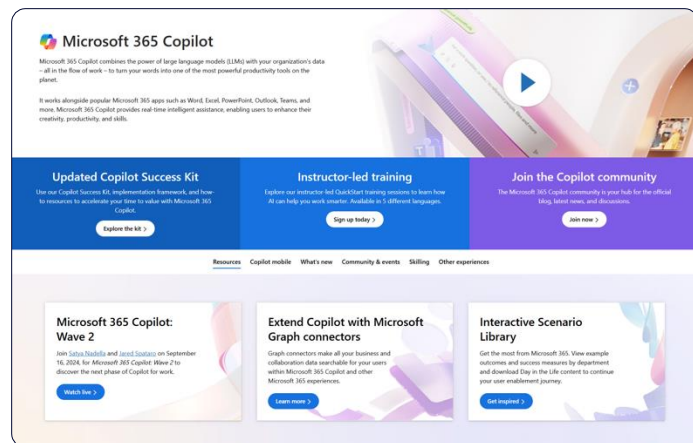


7. Fine-tune custom models to maximize performance



Look ahead

Essential Copilot implementation resources



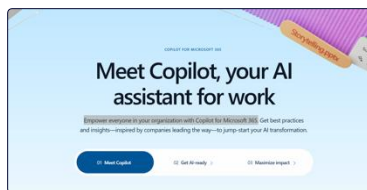
[Microsoft 365 Copilot Hub](#)

Provides resources to help you drive the user enablement of Microsoft services:

- [Copilot Success Kit](#) – a holistic guide that helps you think through the Leadership, Human change, and Technical readiness implementation journeys.
- [Copilot Scenario Library](#) – provides business leaders inspiration on high-value scenarios to select, as well as KPIs they should measure for success.
- [Leading in the era of AI](#) – Practical guidance for leaders of all types to get the most from the adoption of AI capabilities.

More resources

[Meet Copilot](#)



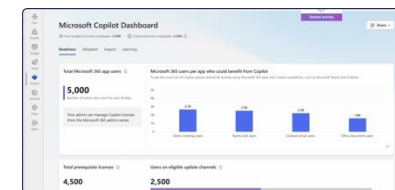
Empower everyone in your organization with Microsoft 365 Copilot.

[Copilot Lab](#)



Learn the art of prompting.

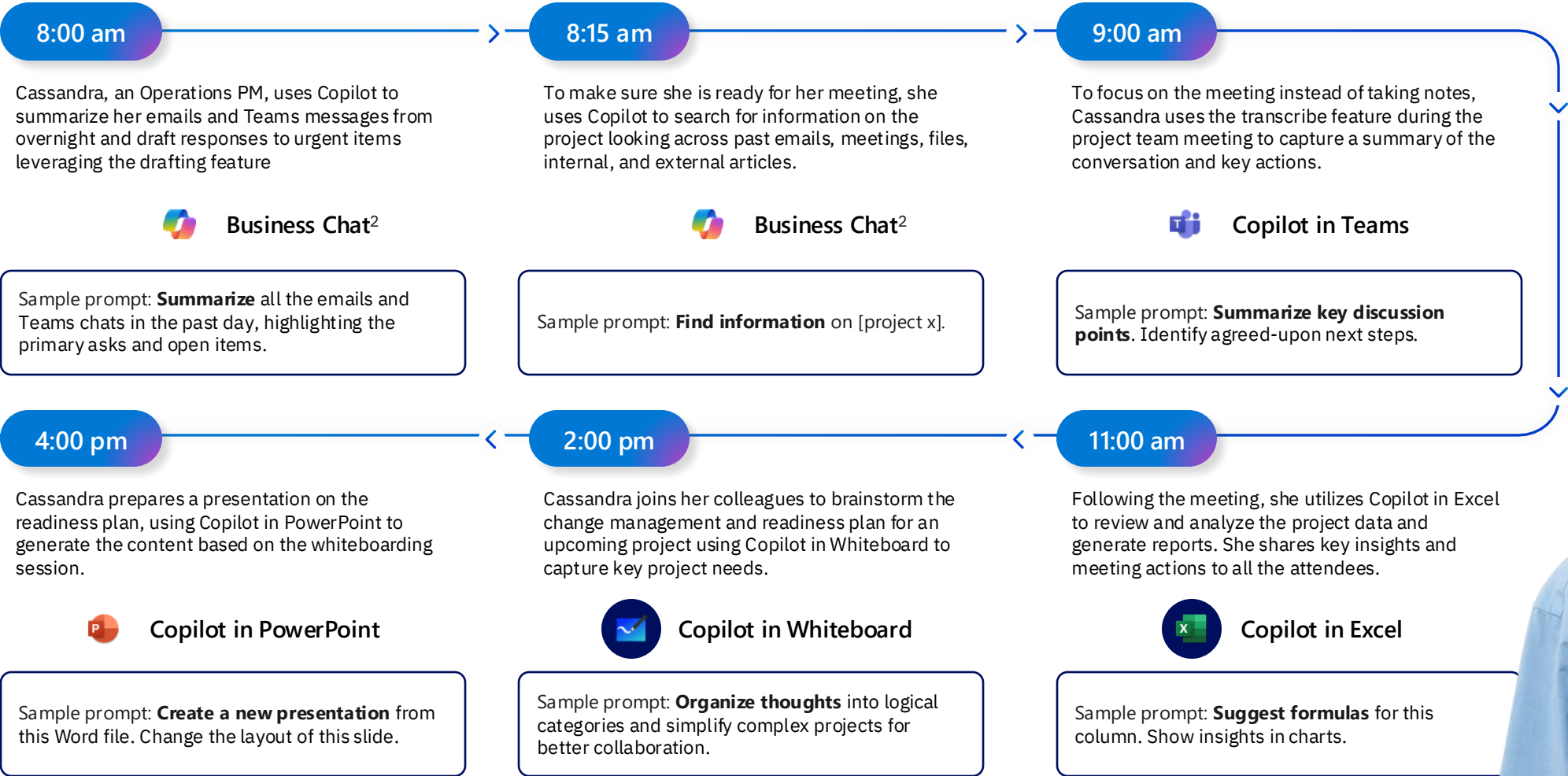
[Copilot Dashboard](#)



Business and IT leaders can plan their AI readiness, drive adoption, and measure impact.

A day in the life of an Operations PM

- Benefits
- ⌚ ~1 hour saved per week
- 🔄 Areas of investment: higher priority projects
- ★ Better communication with colleagues



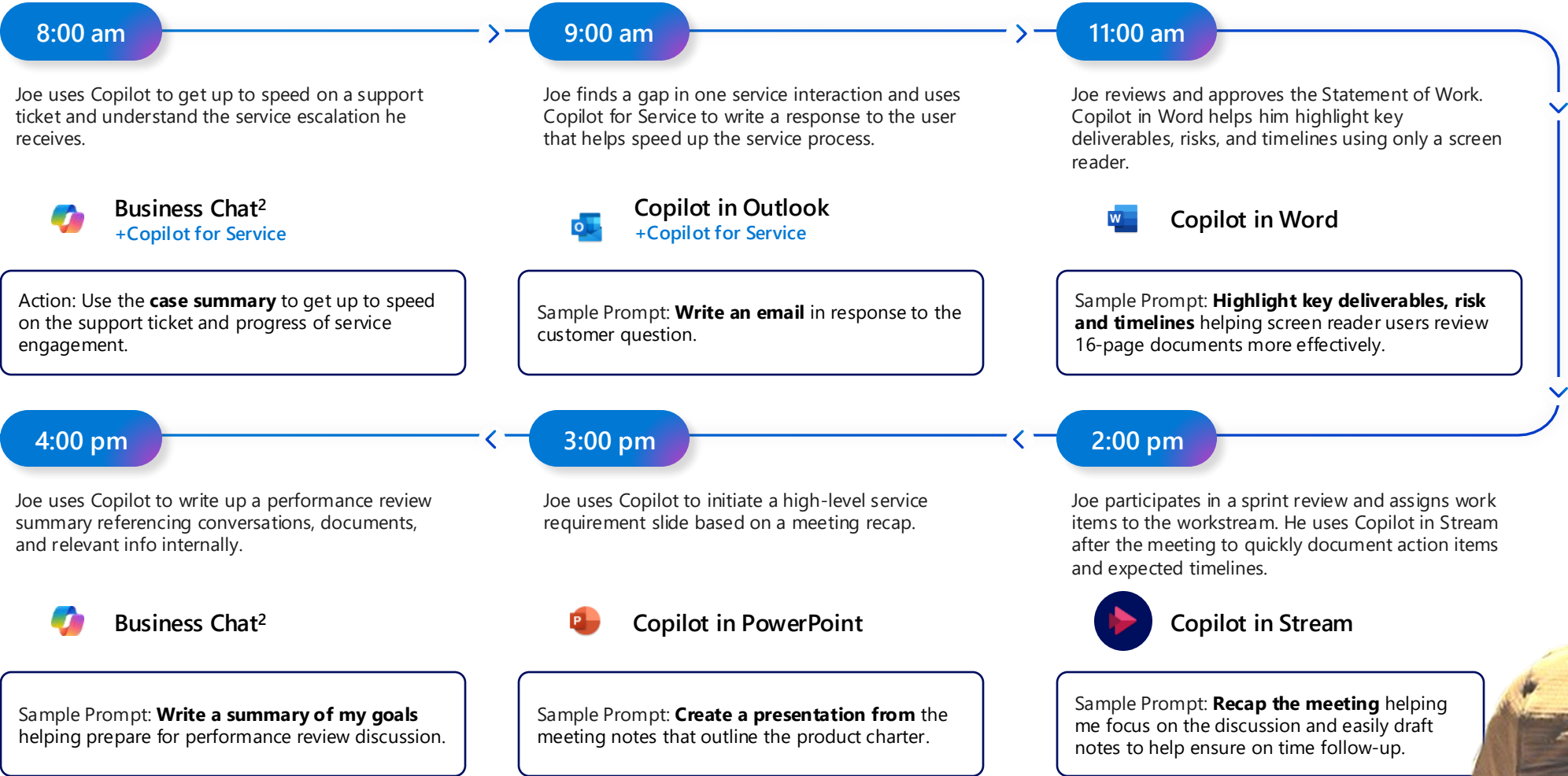
Cassandra
is an Operations
lead at Contoso



¹Access Copilot at copilot.microsoft.com or the Microsoft Copilot mobile app and set toggle to “Web”.
²Access Business Chat at copilot.microsoft.com, the Microsoft Copilot mobile app, or the Copilot app in Teams, and set toggle to “Work”.
³Copilot agents allow Microsoft 365 Copilot to access your company-specific apps. In the past this would have required an API call to get data from a system of record.
The content in this example scenario is for demonstration purposes only. You should evaluate how Copilot aligns with your organization’s business processes, regulatory requirements, and responsible AI principles.

A day in the life of an IT Product Manager at Microsoft

- Benefits
- ⌚ ~1 hour
- 🔄 Brainstorming new solutions
- ★ Faster responses, better insights and better communication

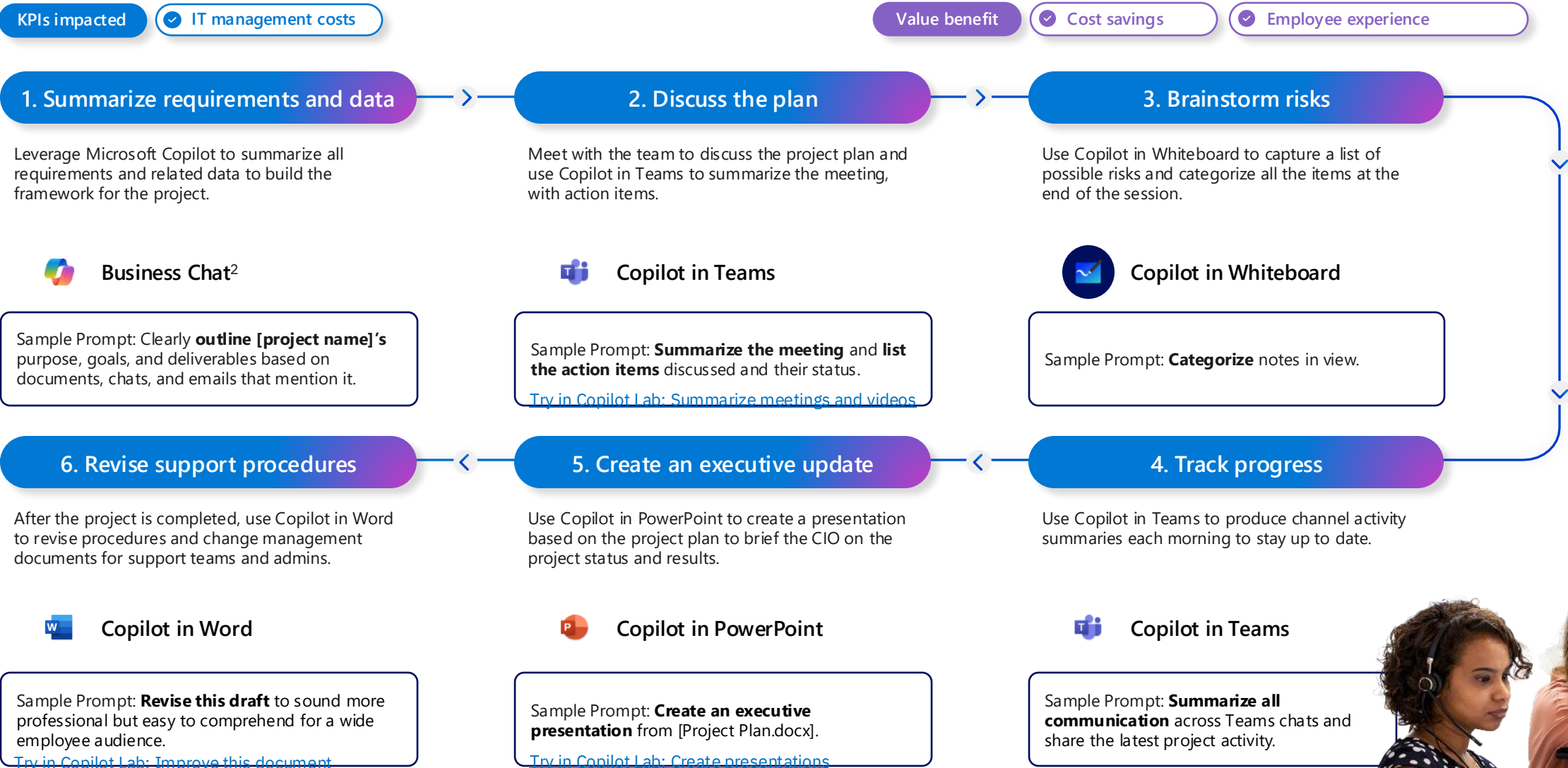


Joe
is a Senior
Product Manager

↓



¹Access Copilot at copilot.microsoft.com or the Microsoft Copilot mobile app and set toggle to “Web”.
²Access Business Chat at copilot.microsoft.com, the Microsoft Copilot mobile app, or the Copilot app in Teams, and set toggle to “Work”.
³Copilot agents allow Microsoft 365 Copilot to access your company-specific apps. In the past this would have required an API call to get data from a system of record.
The content in this example scenario is for demonstration purposes only. You should evaluate how Copilot aligns with your organization’s business processes, regulatory requirements, and responsible AI principles.



¹Access Copilot at [copilot.microsoft.com](#) or the Microsoft Copilot mobile app and set toggle to "Web".
²Access Business Chat at [copilot.microsoft.com](#), the Microsoft Copilot mobile app, or the Copilot app in Teams, and set toggle to "Work".
³Copilot agents allow Microsoft 365 Copilot to access your company-specific apps. In the past this would have required an API call to get data from a system of record.
The content in this example scenario is for demonstration purposes only. You should evaluate how Copilot aligns with your organization's business processes, regulatory requirements, and responsible AI principles.

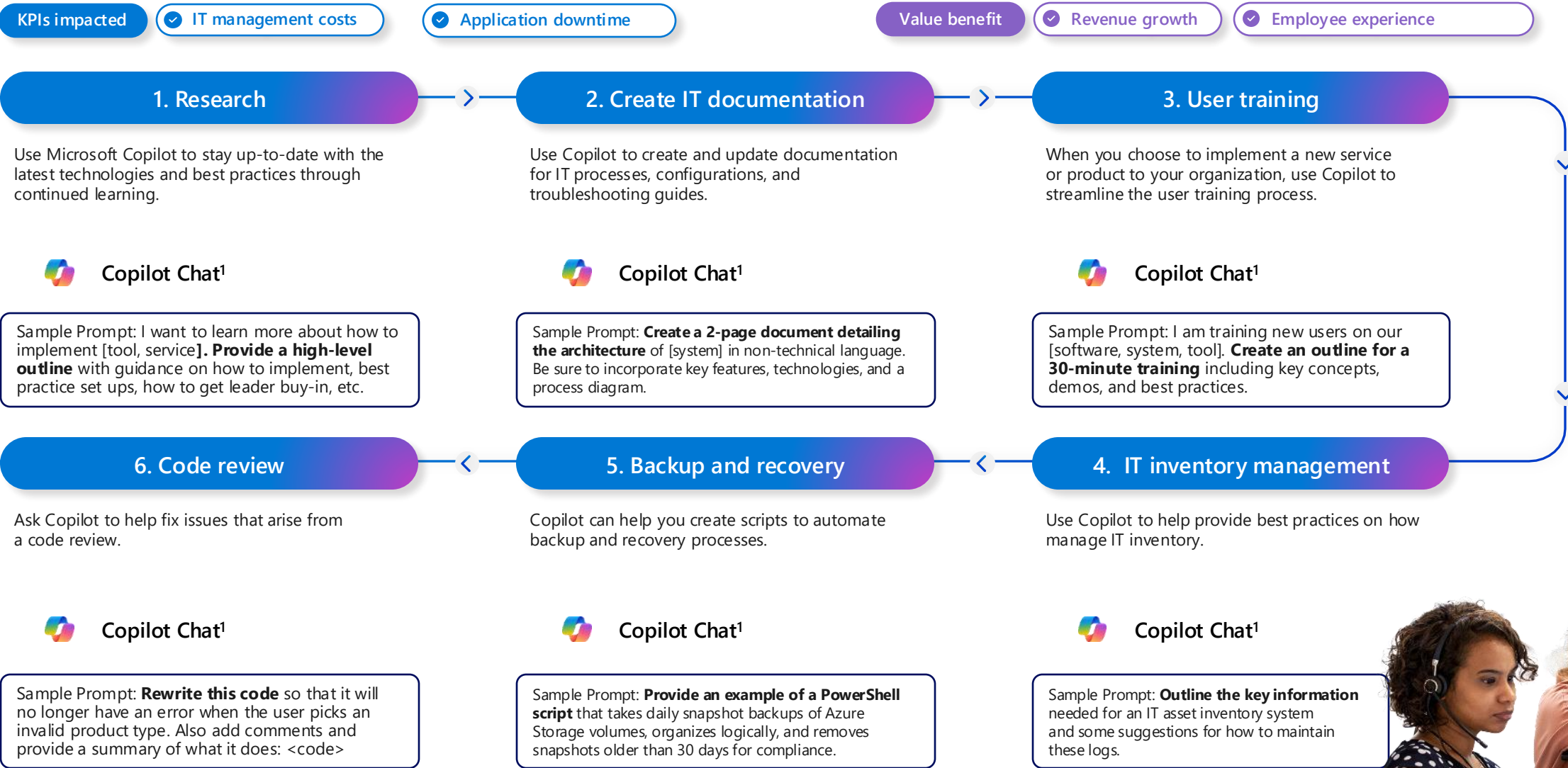


Information Technology | General IT prompts (Microsoft Copilot only)



Available with:
Microsoft Copilot

Scenario level: ● ● ●
Start



¹Access Copilot at copilot.microsoft.com or the Microsoft Copilot mobile app and set toggle to “Web”.
²Access Business Chat at copilot.microsoft.com, the Microsoft Copilot mobile app, or the Copilot app in Teams, and set toggle to “Work”.
³Copilot agents allow Microsoft 365 Copilot to access your company-specific apps. In the past this would have required an API call to get data from a system of record.
The content in this example scenario is for demonstration purposes only. You should evaluate how Copilot aligns with your organization’s business processes, regulatory requirements, and responsible AI principles.



Q & A

Resources

Copilot lab:

<https://copilot.cloud.microsoft/en-US/prompts>

<https://adoption.microsoft.com/en-us/copilot/success-kit/>

<https://adoption.microsoft.com/en-us/copilot-scenario-library/>

Ivan Portilla

portilla@gmail.com

