

Understanding AI

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<https://github.com/iportilla/ERIE>



Objectives of This Talk

Upon completion of this lecture, you will understand:

- ❑ AI & Generative AI (GenAI)
- ❑ Prompt Engineering best practices
- ❑ Applied AI in helpful use cases

Agenda

1. AI & GenAI
2. Prompt Engineering
3. Uses of AI

<https://github.com/iportilla/ERIE>



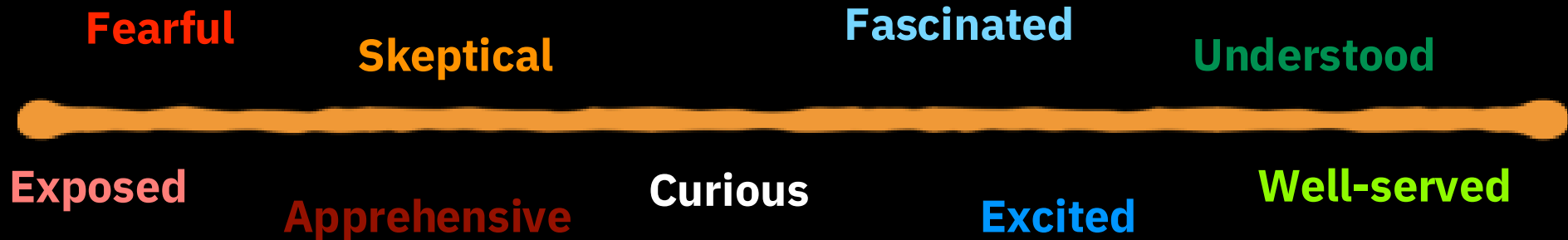
What is AI?

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AI Perception

What do people feel about AI?



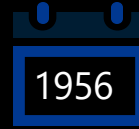
What is AI?

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%

Generative AI

GPT-3

Prompt:

Write a tagline for an ice cream shop.

Response:

We serve up smiles with every scoop!

Codex

Prompt:

Table customers, columns =
[CustomerId, FirstName,
LastName, Company, Address,
City, State, Country,
PostalCode]

Create a SQL query for all
customers in Texas named Jane
query =

Response:

```
SELECT *  
FROM customers  
WHERE State = 'TX' AND  
FirstName = 'Jane'
```

DALL·E

Prompt: A white Siamese cat

Response:



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Prompt Engineering

Process of crafting **effective** inputs to guide the behavior & output of a language model toward a **desired** result.

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..."

+

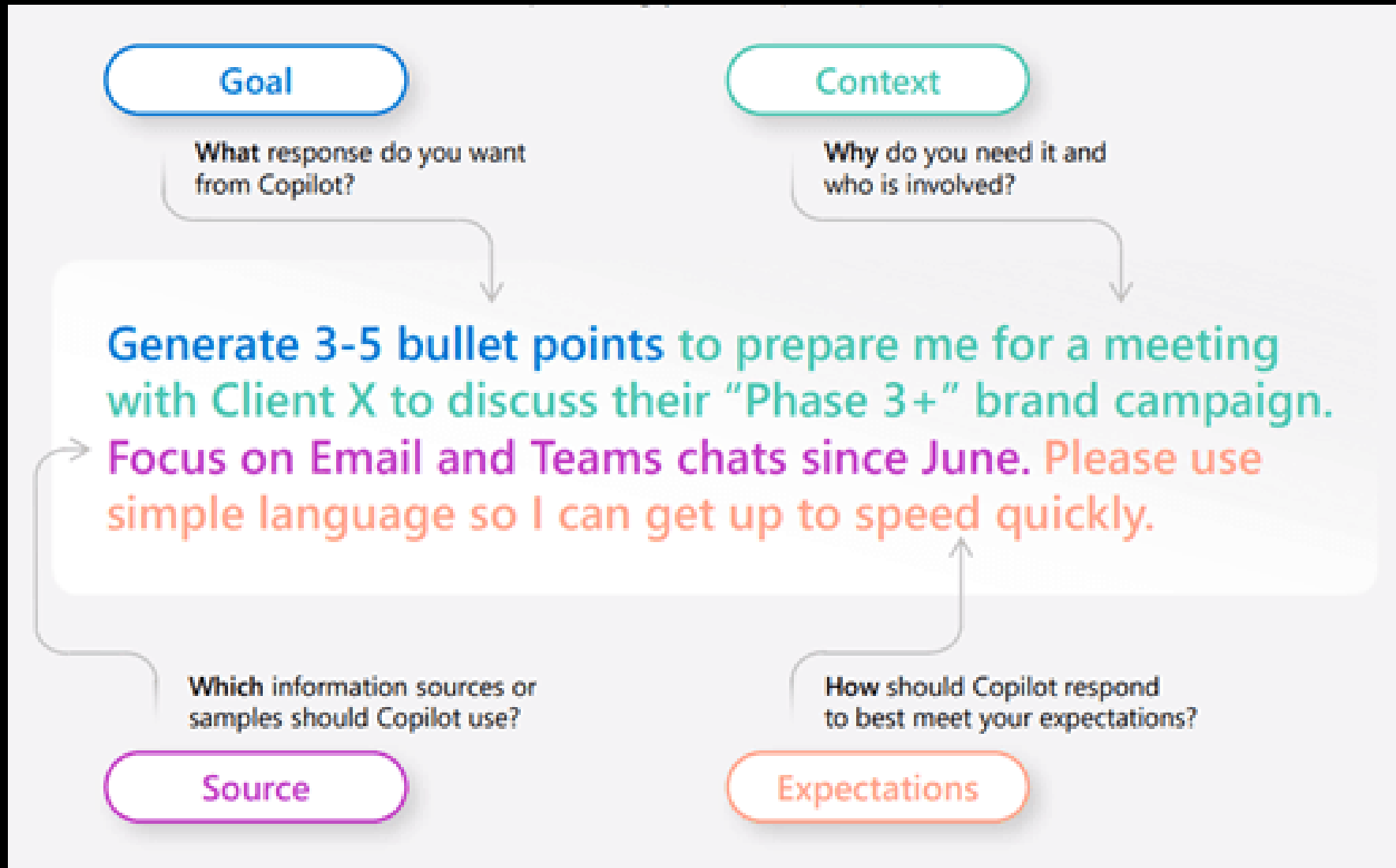
Source

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



Copilot Prompt Best Practices

Prompt 1: Write a blog post about sustainable practices in agriculture

Prompt 2: Craft a 1500-word blog post for a general audience interested in sustainability focusing on the significance and benefits of sustainable agricultural practices like organic farming and agroforestry. Include real-world examples, innovative technologies, and insights from reputable sources. Conclude with a reflection on the importance of these practices and a call for collective efforts to embrace them

Tip 1 – System Role prompt

A special instruction used at the start of a conversation with a LLM to set **its behavior, tone, & expertise level** throughout the session.

Ensures that responses are aligned with the user's expectations, whether for technical support, teaching, brainstorming, or role-play.

Example

- List acceptable uses of AI

System Role

- You are the leader of IT Security at our company, list acceptable uses of AI

Tip 2 – Prompt Chaining

Multiple prompts are used in a **step-by-step sequence**, where each prompt builds on the output of the previous one.

This allows the LLM to perform complex tasks that require reasoning, context building, or structured processing—**breaking big problems into manageable steps**.

1. **Prompt 1** – *Brainstorm ideas:*
“List 3 strong arguments for why renewable energy should replace fossil fuels.”
2. **Prompt 2** – *Expand on one idea:*
“Take the second argument and write a paragraph explaining it in detail.”
3. **Prompt 3** – *Write full essay:*
“Using the three arguments listed earlier, write a complete 5-paragraph persuasive essay.”

Each step “chains” from the previous, making the final result more focused and coherent.

Tip 3 - Reflection

Self-Critique & Correction

The AI reviews its own response, identifies a mistake or weak logic, and corrects it.

"Is 17 a prime number? Explain your answer."

AI Response:

"17 is not a prime number because it can be divided by 1, 17, and also by other numbers like 3."

Reflection:

"Wait, that answer is incorrect. Let me check again. A prime number is only divisible by 1 and itself. 17 cannot be divided evenly by any number other than 1 and 17. So, 17 **is** a prime number."

Tip 4 – Multimodal RAG

A hybrid method where the model *retrieves relevant documents* (from a knowledge base) and uses them to generate responses.

Goal:

Give the model **fresh, factual, or domain-specific knowledge** that it wasn't trained on.

Prompt Engineering

Explain the French Revolution in simple terms for a 10-year-old



Language Model



The French Revolution was a period of major social change in France...



Output



RAG (Retrieval-Augmented Generation)

What were the major events of the French Revolution?



Document

Some major events of the French Revolution included...



Language Model

Can I trust GenAI

Strengths

- Content Creation at Scale
- Personalization
- Rapid Prototyping
- Code Assistance
- Translation & Summarization
- Accessibility

Weaknesses

- Hallucinations
- Factual Inconsistency
- Bias & Fairness
- Security Risks
- Copyright Issues.
- No Real Understanding

How can I use AI?

Using AI to improve your life

Home Life

1. Declutter
2. Create a family chore system
3. Plan home improvement project
4. Maintain your car

Food, Health& Wellness

1. Organize your weekly meal planning & prep
2. Reduce Food Waste
3. Improve your cooking
4. Create a fitness plan
5. Provide emotional support & guidance
6. Prepare for a medical visit

Using AI to improve your life

Career Development & Workplace

1. Apply for jobs
2. Practice interviewing
3. Negotiate higher compensation
4. Review & negotiate contracts
5. Draft year-end reviews
6. Improve professional communications
7. Evaluate new opportunities
8. Elevate your professional brand in social media

Personal finances & financial literacy

1. Optimize your budget
2. Boost your savings
3. Negotiate larger expenses
4. Prepare your taxes
5. Buy a home
6. Sell your stuff
7. Learn how to Invest

Using AI to improve your life

Personal Growth & Learning

1. Become your life coach
2. Achieve your goals
3. Aid decision making
4. Learn new skills
5. Summarize learning materials
6. Learn a foreign language
7. Study and prepare for tests

Relationships & Social skills

1. Strengthen relationships
2. Engage better with others
3. Resolve conflicts
4. Give great gifts
5. Deliver memorable gifts
6. Throw stellar parties
7. Navigate parenthood

Using AI to improve your life

Fun & Entertainment

1. Entertain children
2. Make work more fun
3. Learn about the world around you
4. Help with game night
5. Play 1:1 games with AI
6. Conduct a role play
7. Get inspired

Travel

1. Get personalized destination ideas
2. Create an itinerary
3. Discover activities at your destination
4. Get 'know-before-you-go' details
5. Make a recommended packing list
6. Get translation assistance abroad

Lab

Where can I access GenAI

Free

1. ChatGPT (Free Tier) – Use GPT-3.5 for writing, Q&A, & brainstorming at chat.openai.com.
2. Gemini (Google) – Access Google’s Gemini AI for help with search, summaries, & code:
<https://gemini.google.com/>
3. Microsoft Copilot – Free GPT-4 access via Bing Chat or Edge browser (limited use):
<https://m365.cloud.microsoft/chat/>
4. Hugging Face Spaces – Try many open-source models like LLaMA and Stable Diffusion for free:
<https://huggingface.co/>

Takeaways

1.The purpose of AI is to augment human intelligence

2.Data and insights belong to their creator

3.AI systems must be transparent and explainable

Takeaways

Citizen AI:

Develop critical thinking skills, have your voice heard

Big Data Advantage:

When giving away your personal data, choose wisely

Intelligent Automation:

Educate yourself on AI, thrive in your profession

Q & A

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