AI Agents in the Wild

BUILDING SCALABLE AGENTIC SYSTEMS

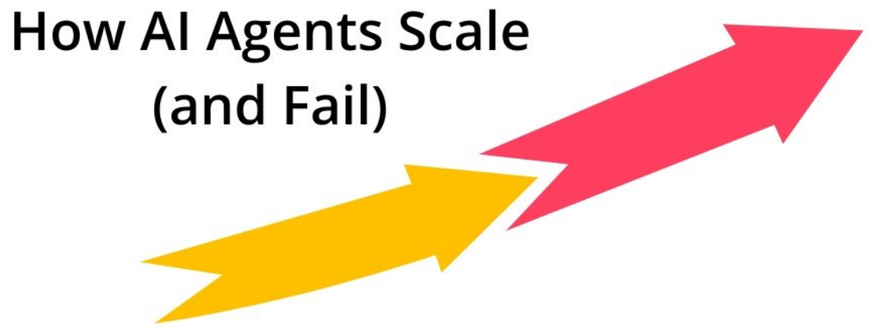
Korey Stegared-Pace
Senior AI Cloud Advocate, Microsoft

datacamp

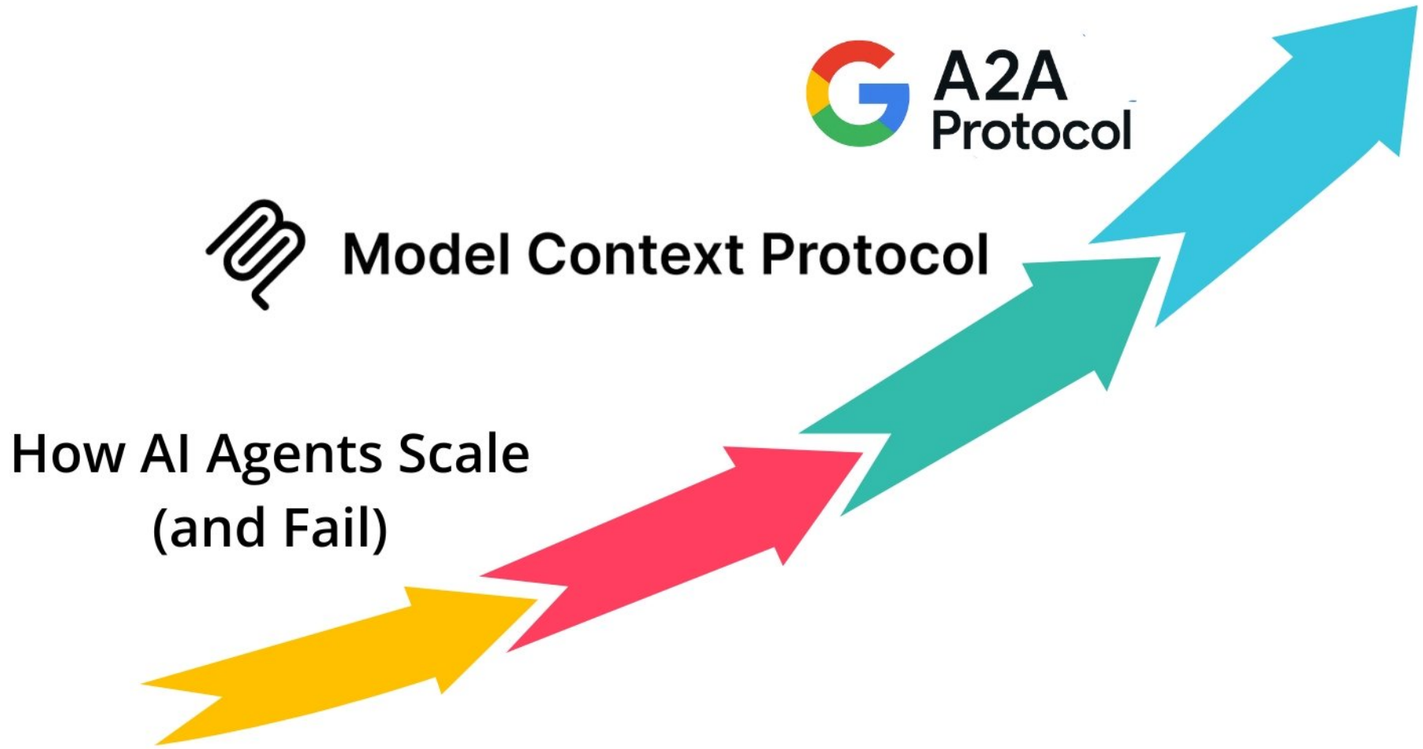
Meet your instructor

- Senior AI Cloud Advocate, Microsoft

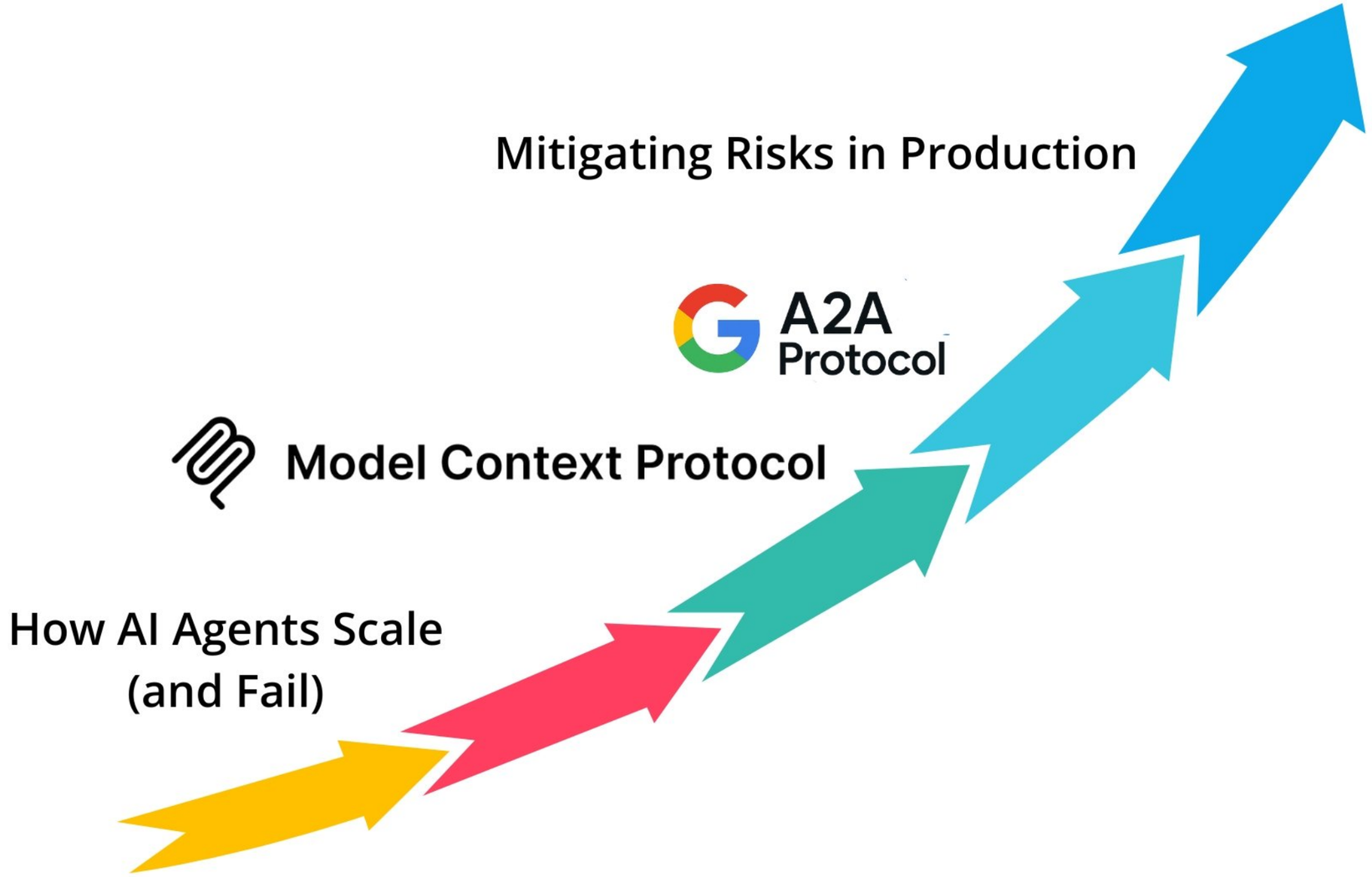
The journey ahead!



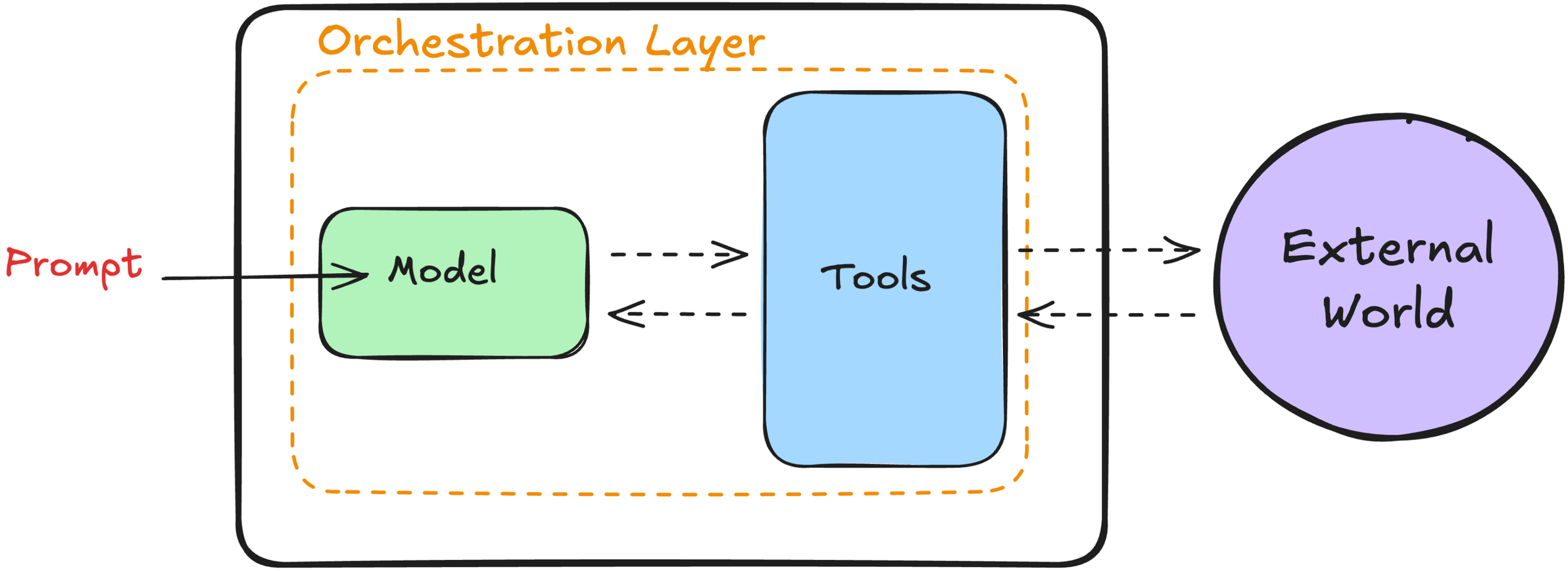
The journey ahead!



The journey ahead!



Components of an agent



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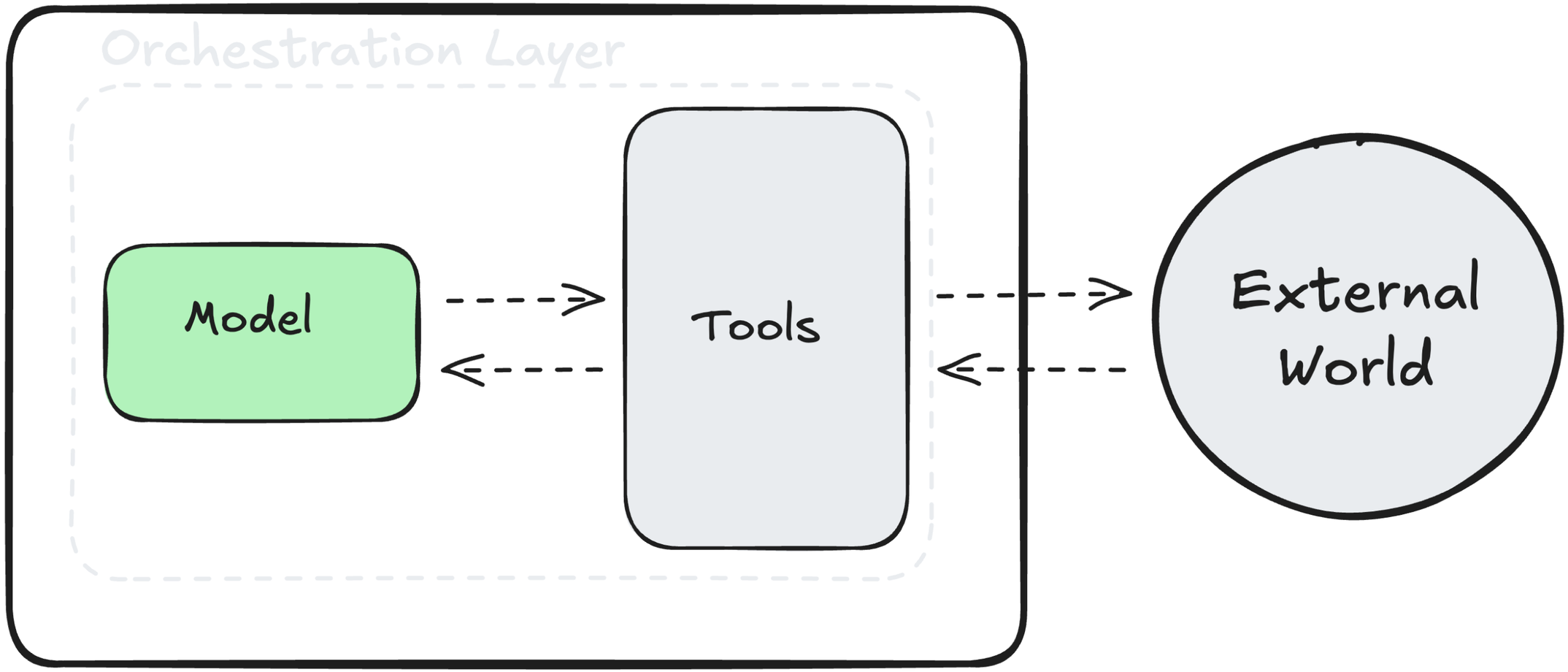

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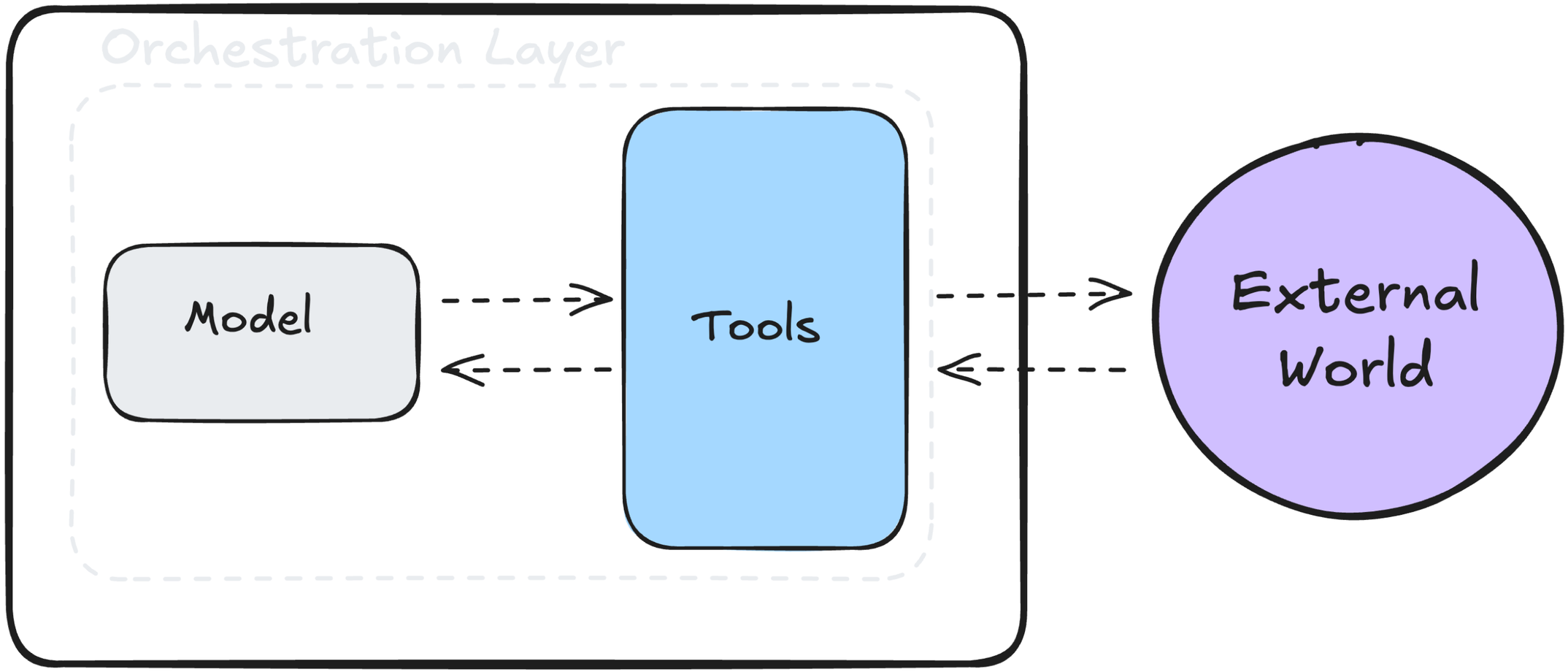

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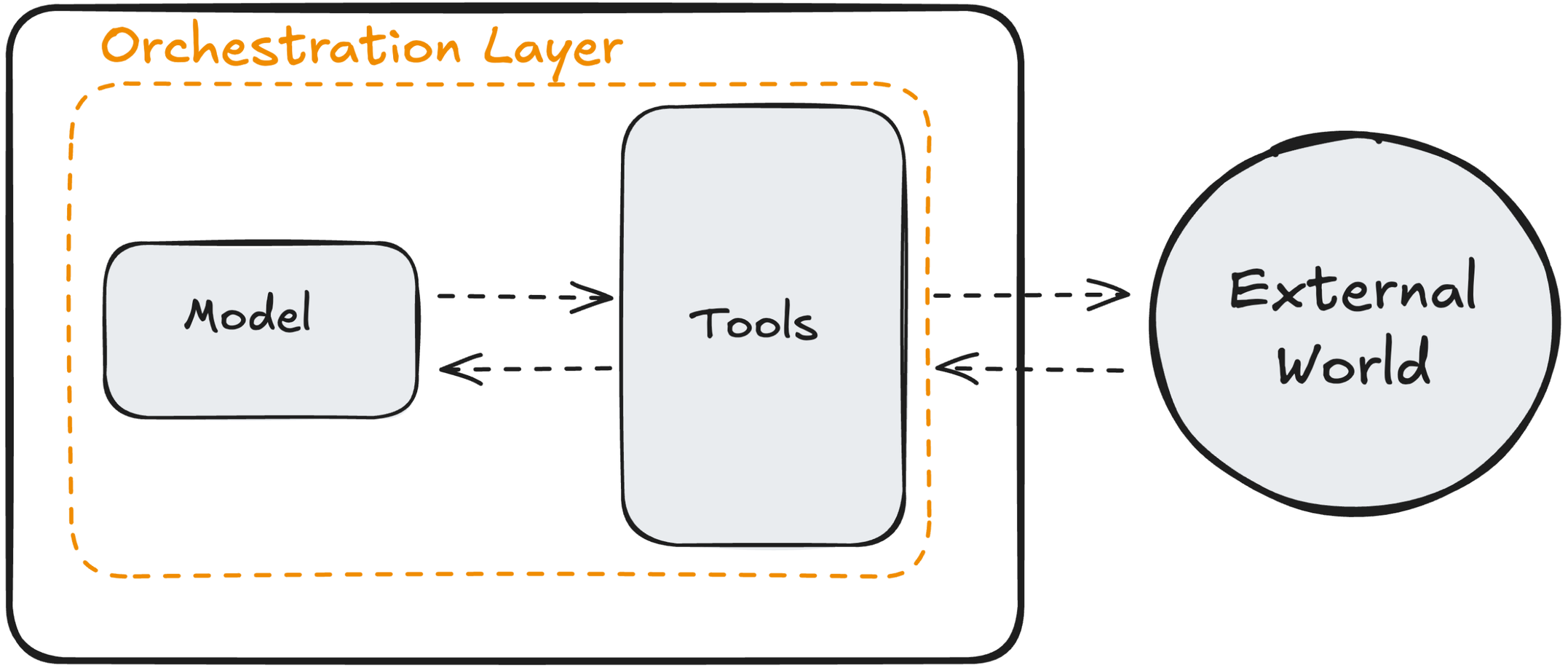
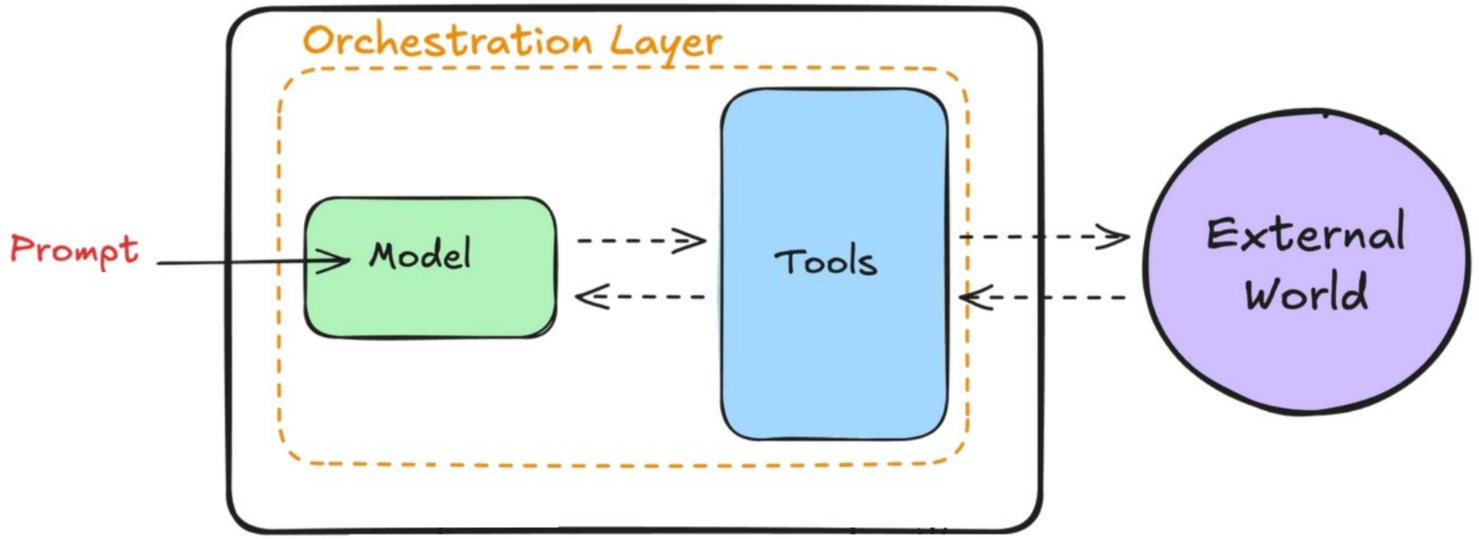


An agentic application



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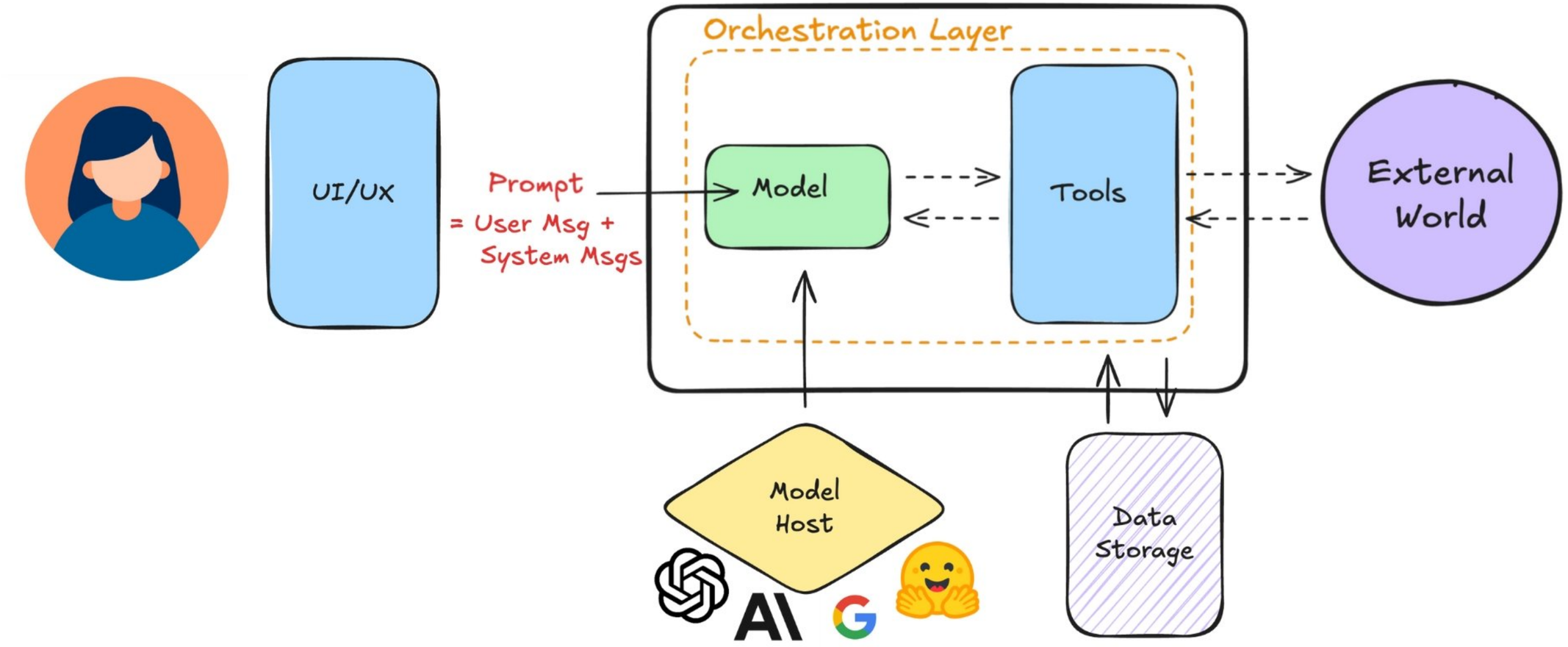
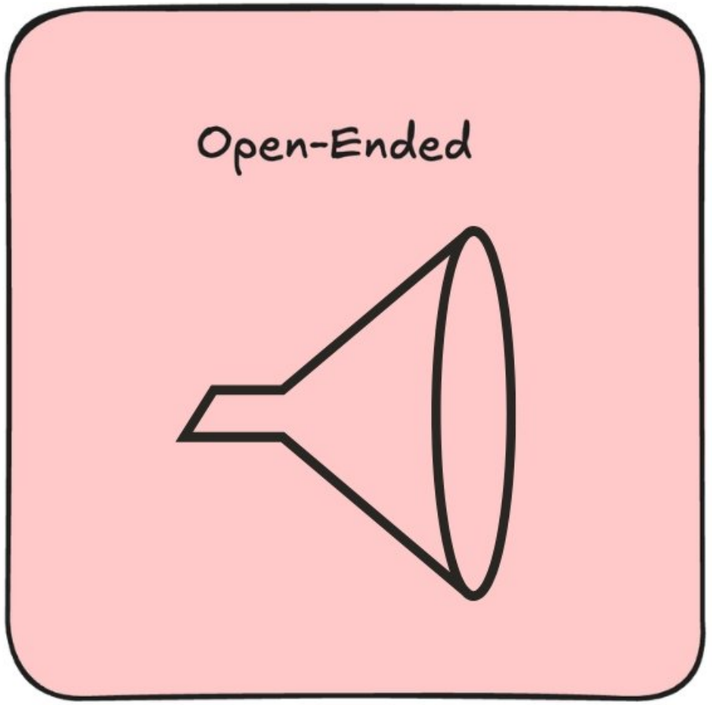


When to use agents?



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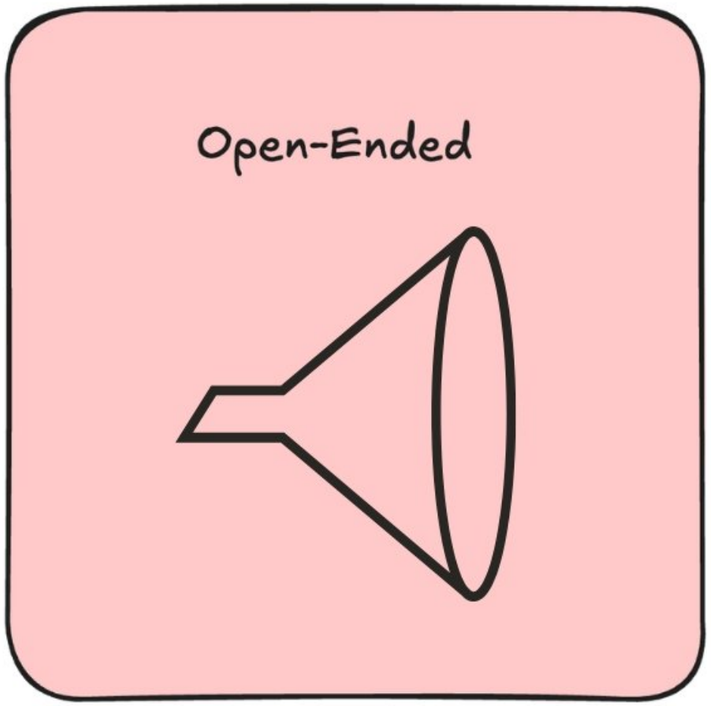

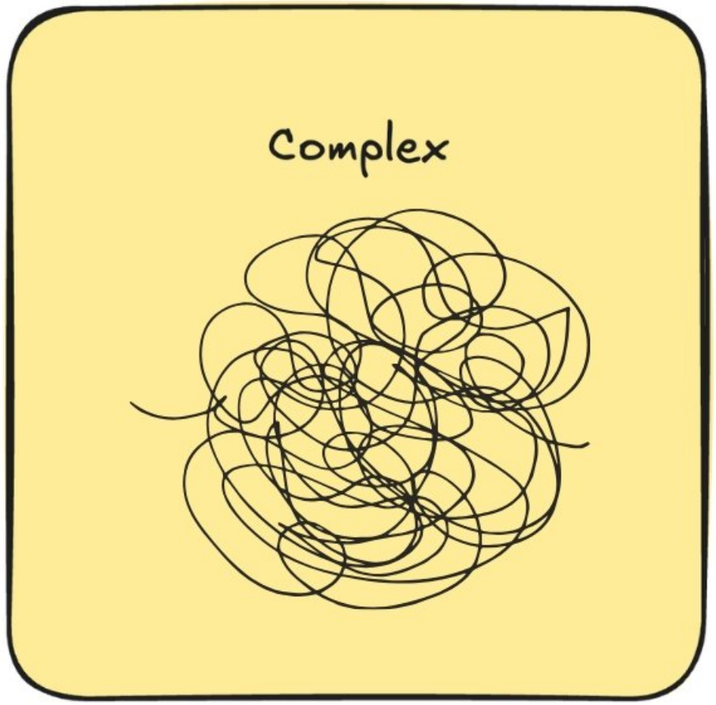

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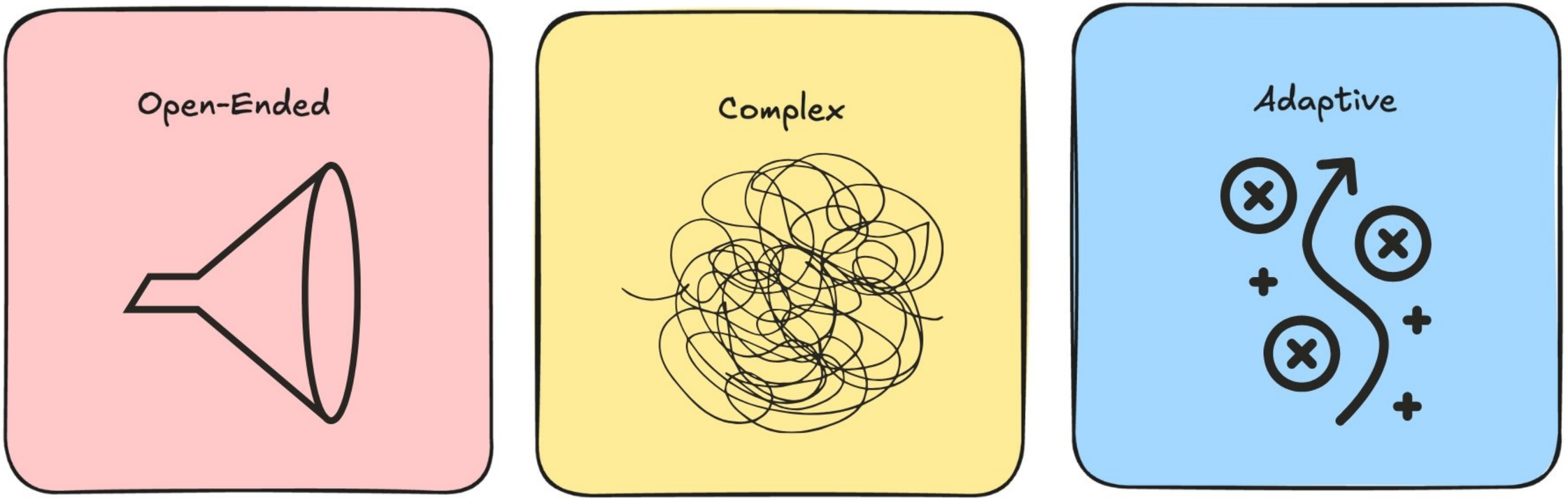

Example: sending reminder emails

Open-ended

Complex

Adaptive

Example: sending reminder emails

Open-ended

Complex

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Example: sending reminder emails

Open-ended

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Adaptive

Example: sending reminder emails

Open-ended

Complex

Adaptive

→ IT solution

Example: IT support agent

Example: IT support agent

Open-ended

Complex

Adaptive

→ Investigate AI agent solution

Let's practice!

BUILDING SCALABLE AGENTIC SYSTEMS

Design Principles for Scalable Agents

BUILDING SCALABLE AGENTIC SYSTEMS

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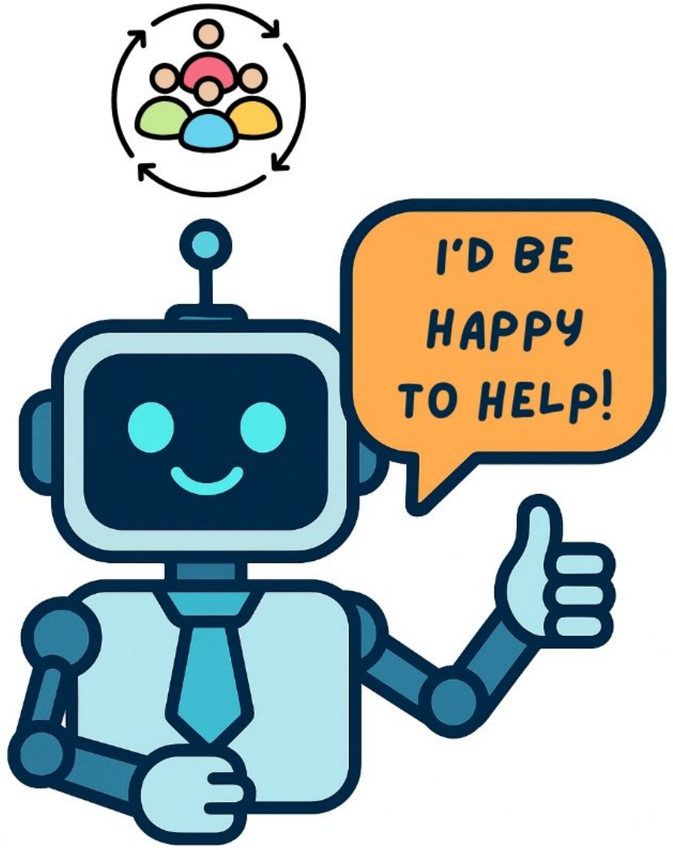
Scalable or not scalable?



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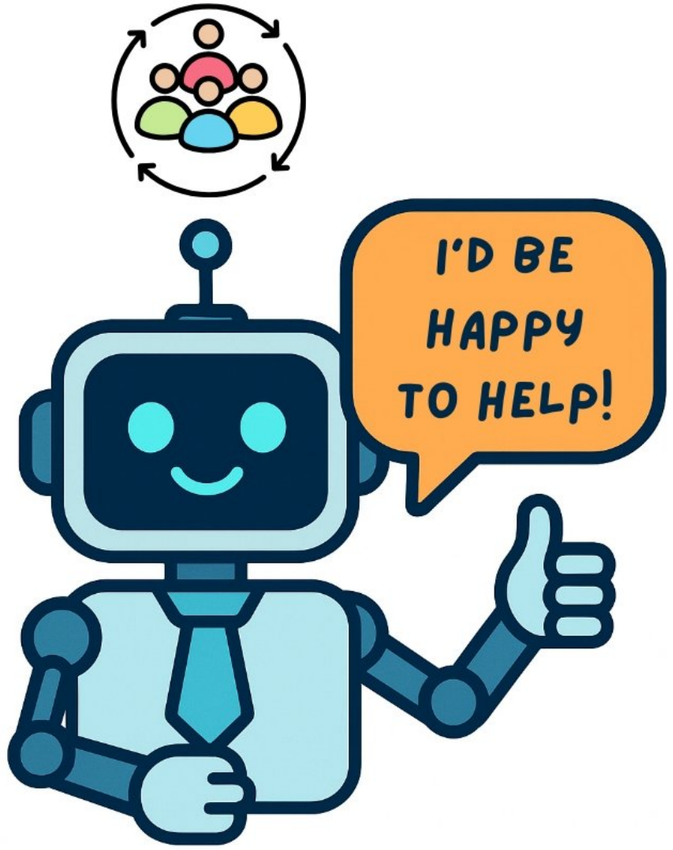

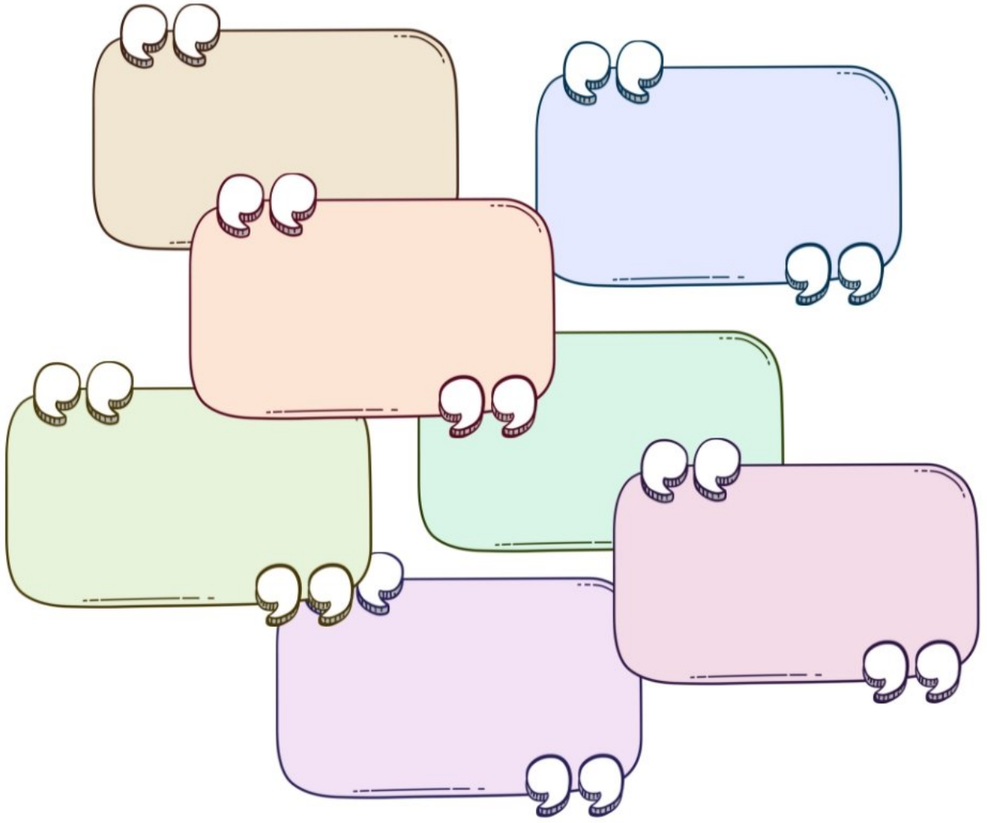

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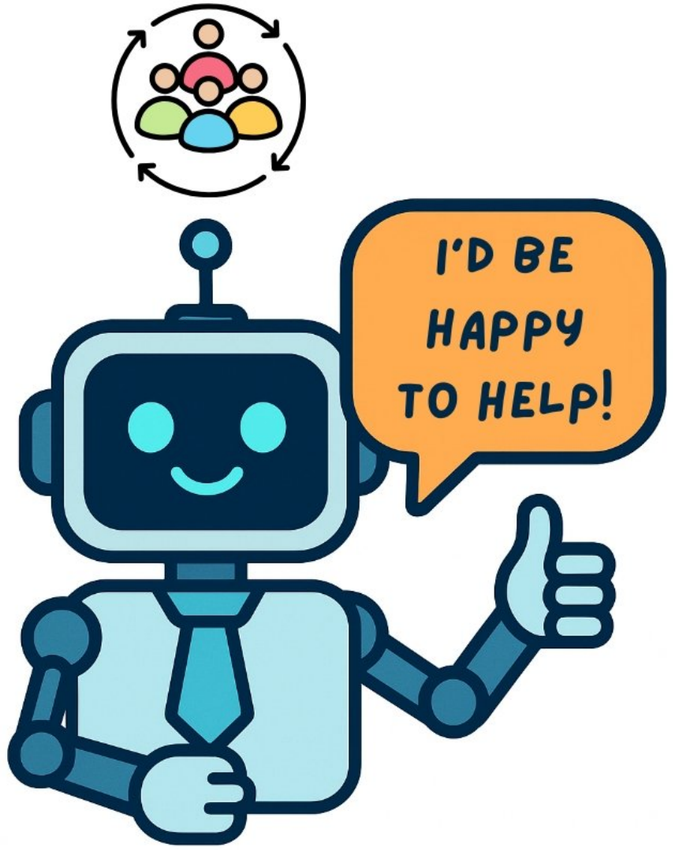

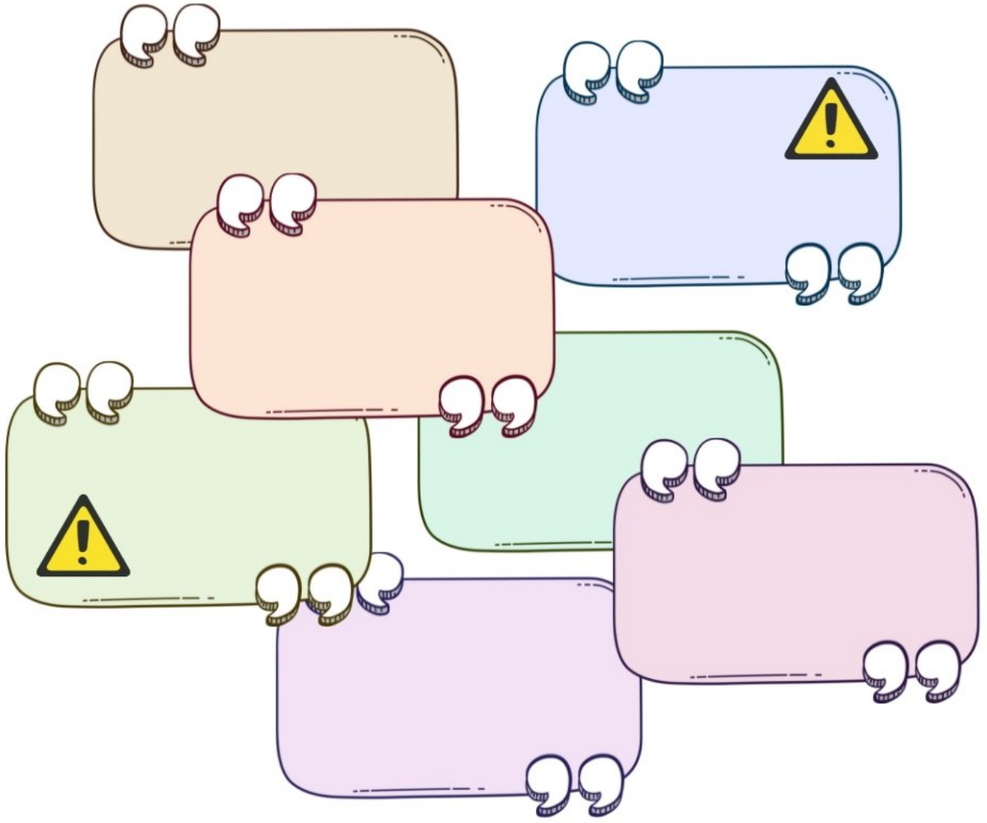

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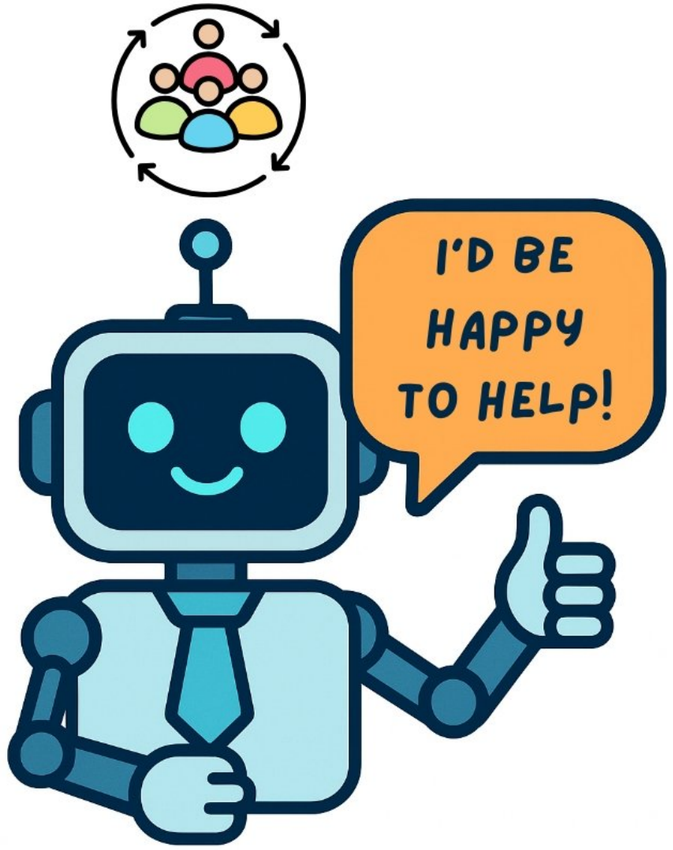
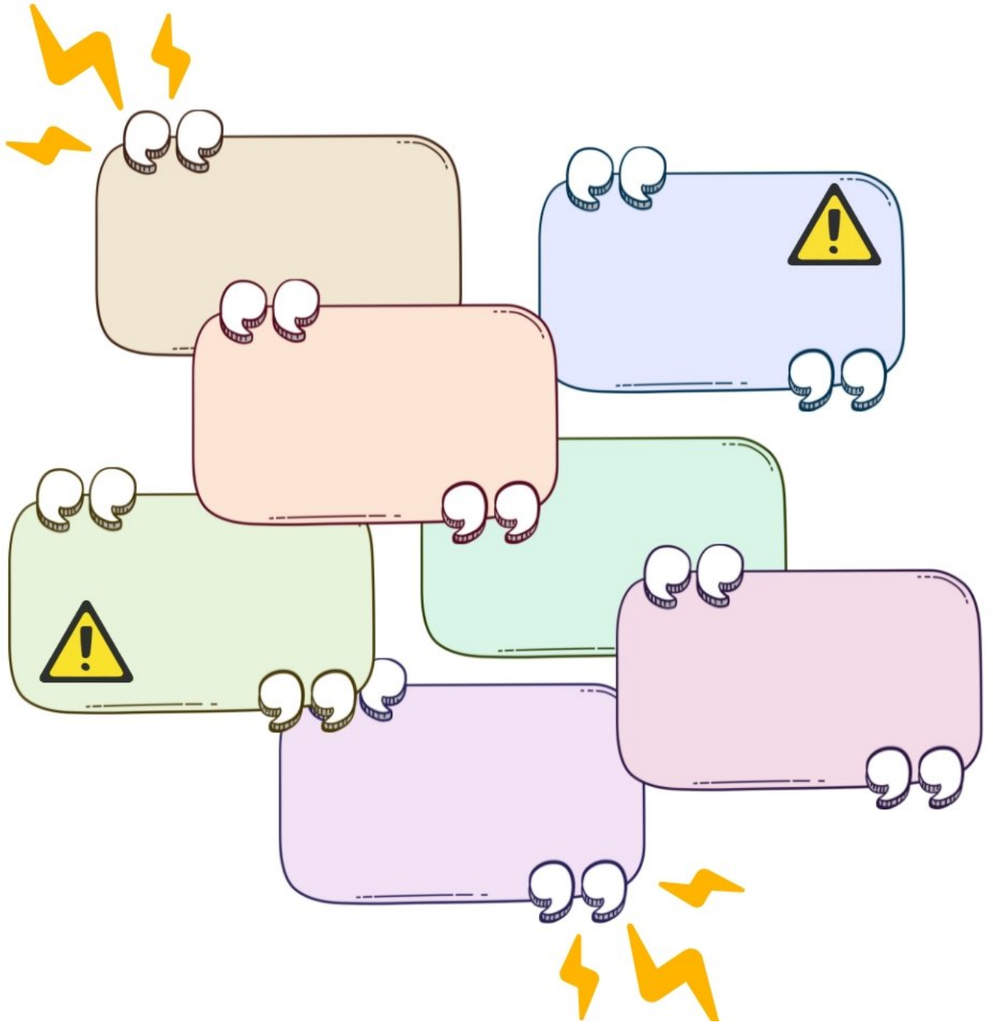
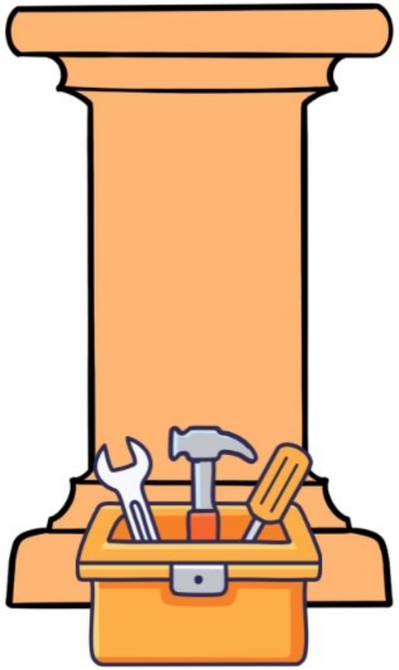


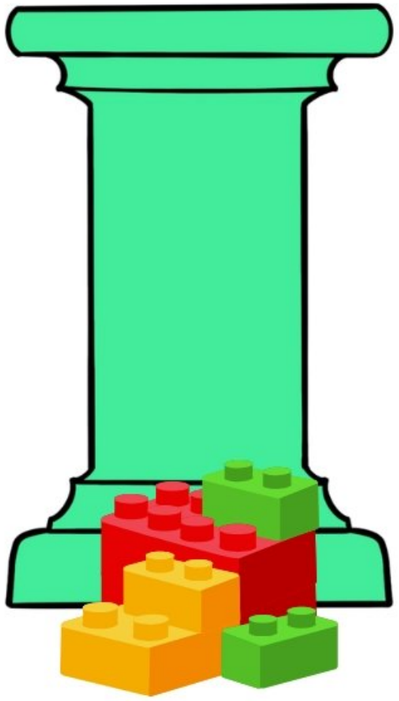


The pillars of scalable agentic systems

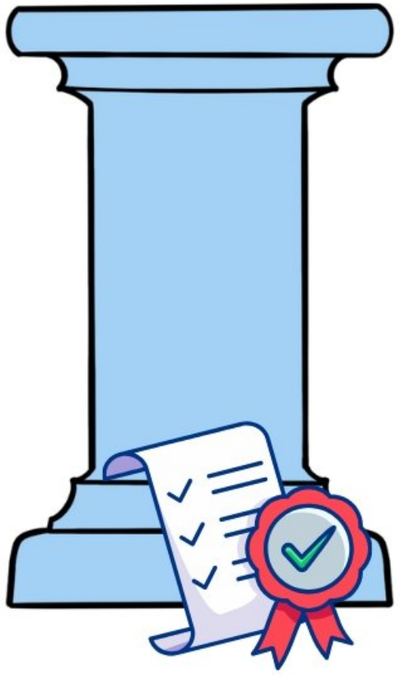
Robust Infrastructure and Tooling



Modular Design Architecture

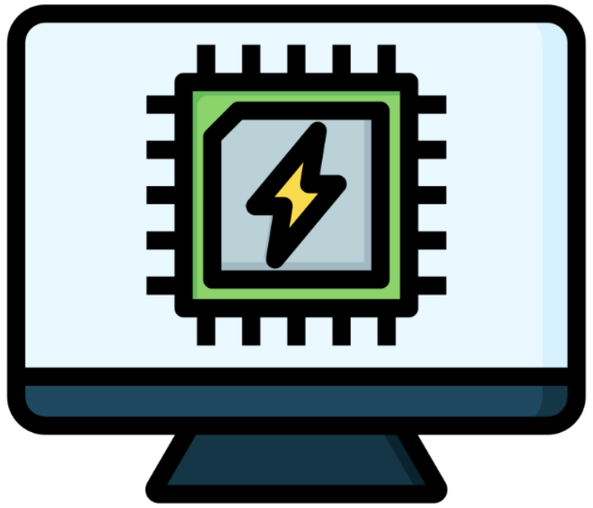


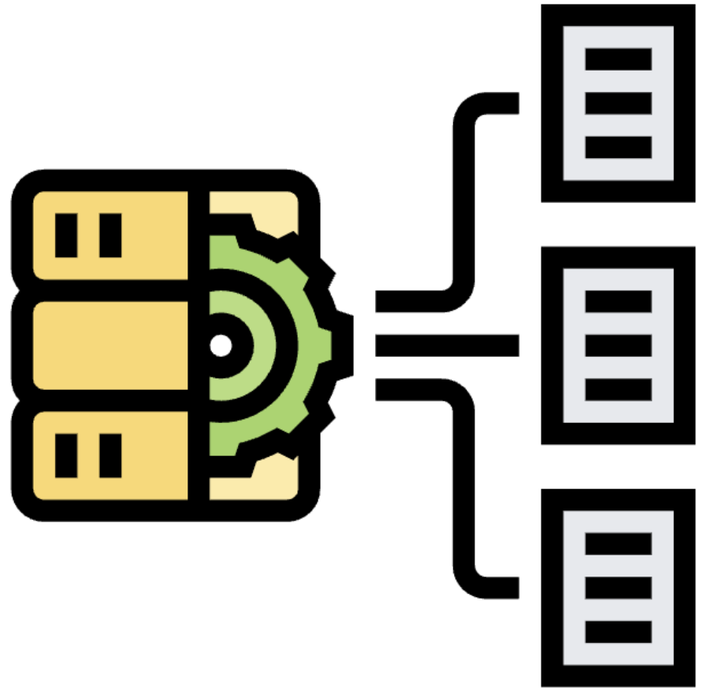
Continuous Evaluation & Feedback Loops



Robust infrastructure and tooling

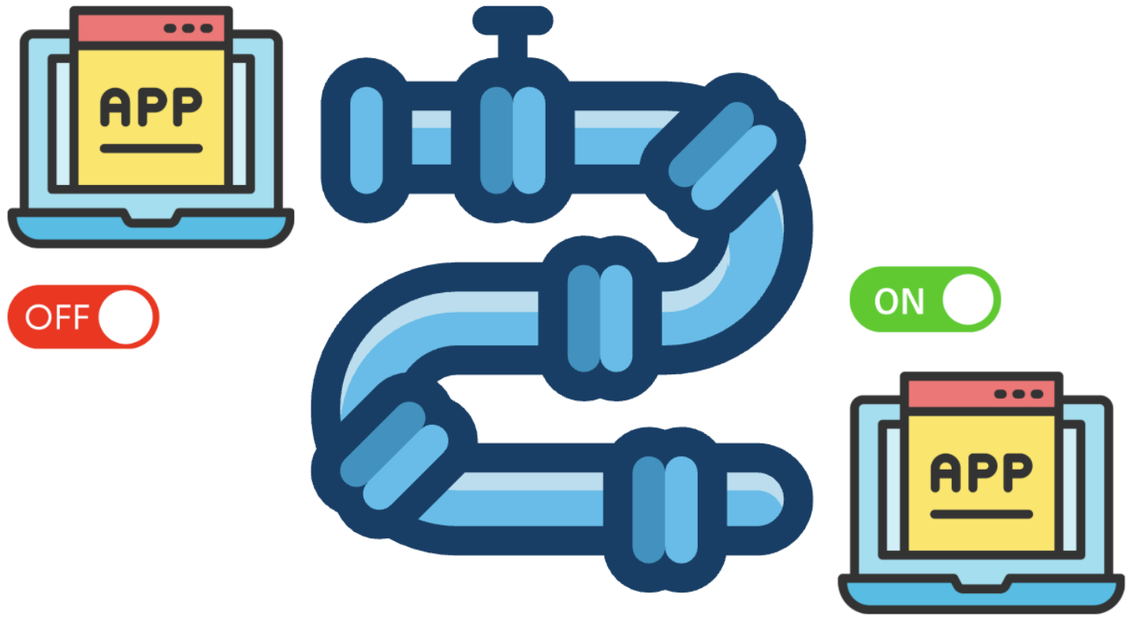
- **Compute:** Resources for running code
- **Storage:** Storing states, logs, and history



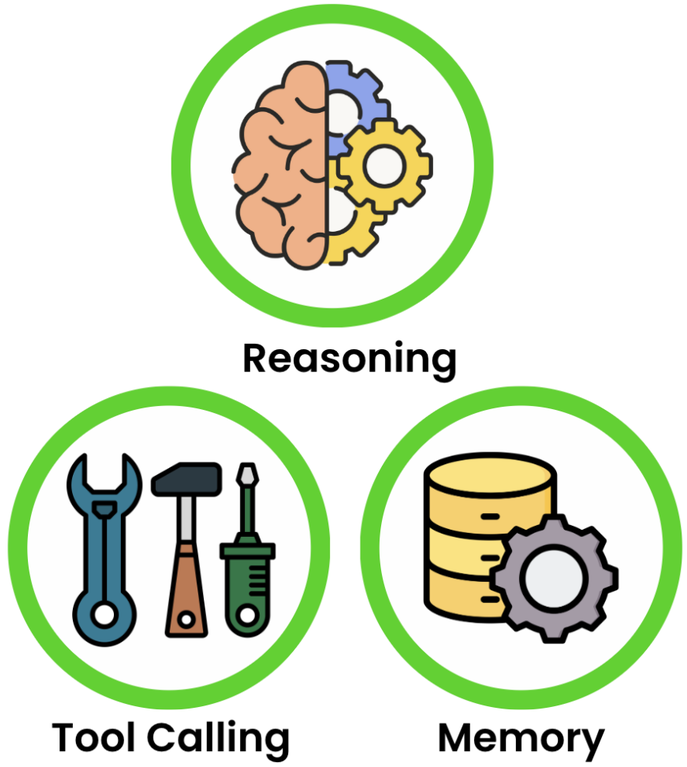


Robust infrastructure and tooling

Reliable Deployment Pipelines



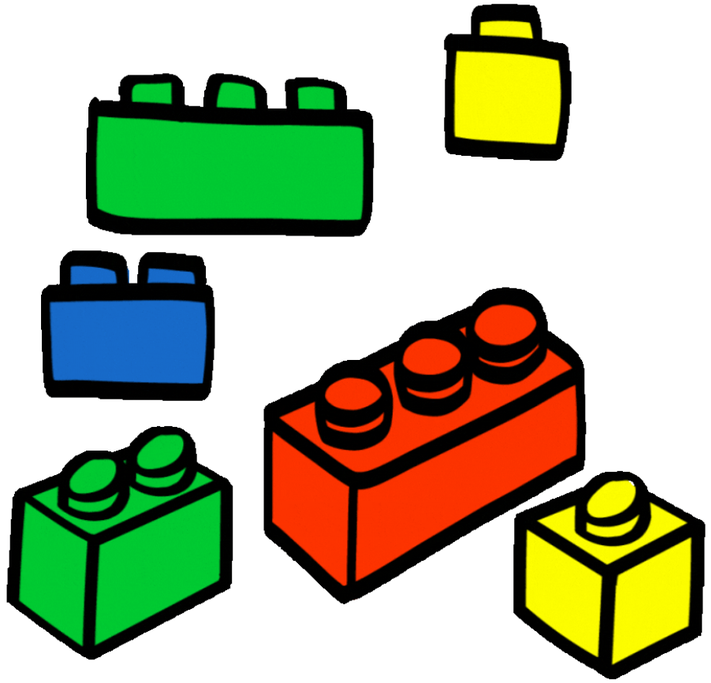
Established Agent Tooling



Modularity

> Designing systems as separate *independent* components to create a larger whole

- Enables independent design, development, and maintenance



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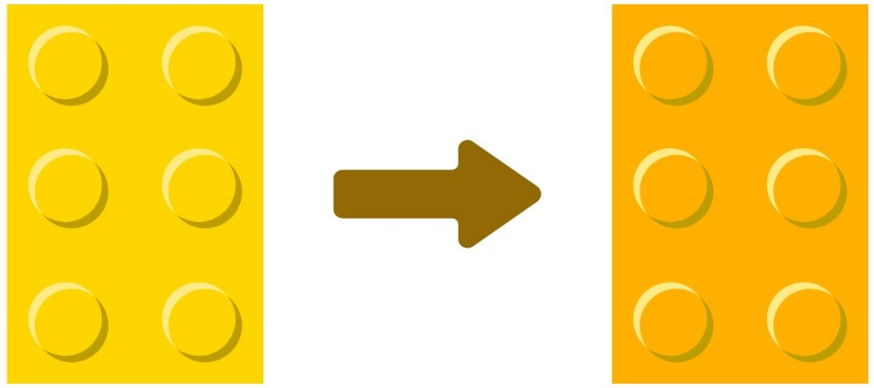

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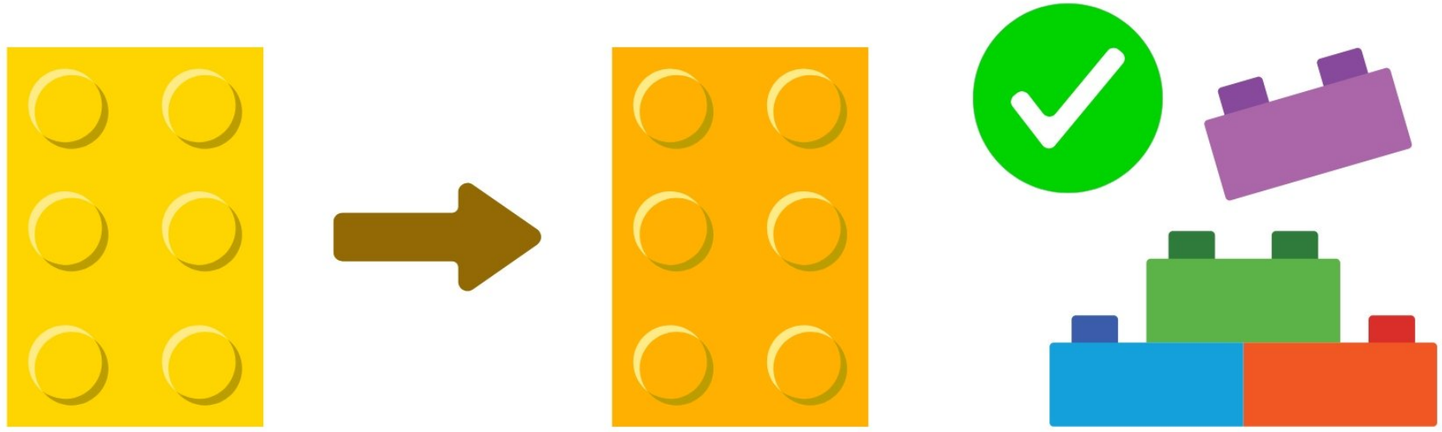
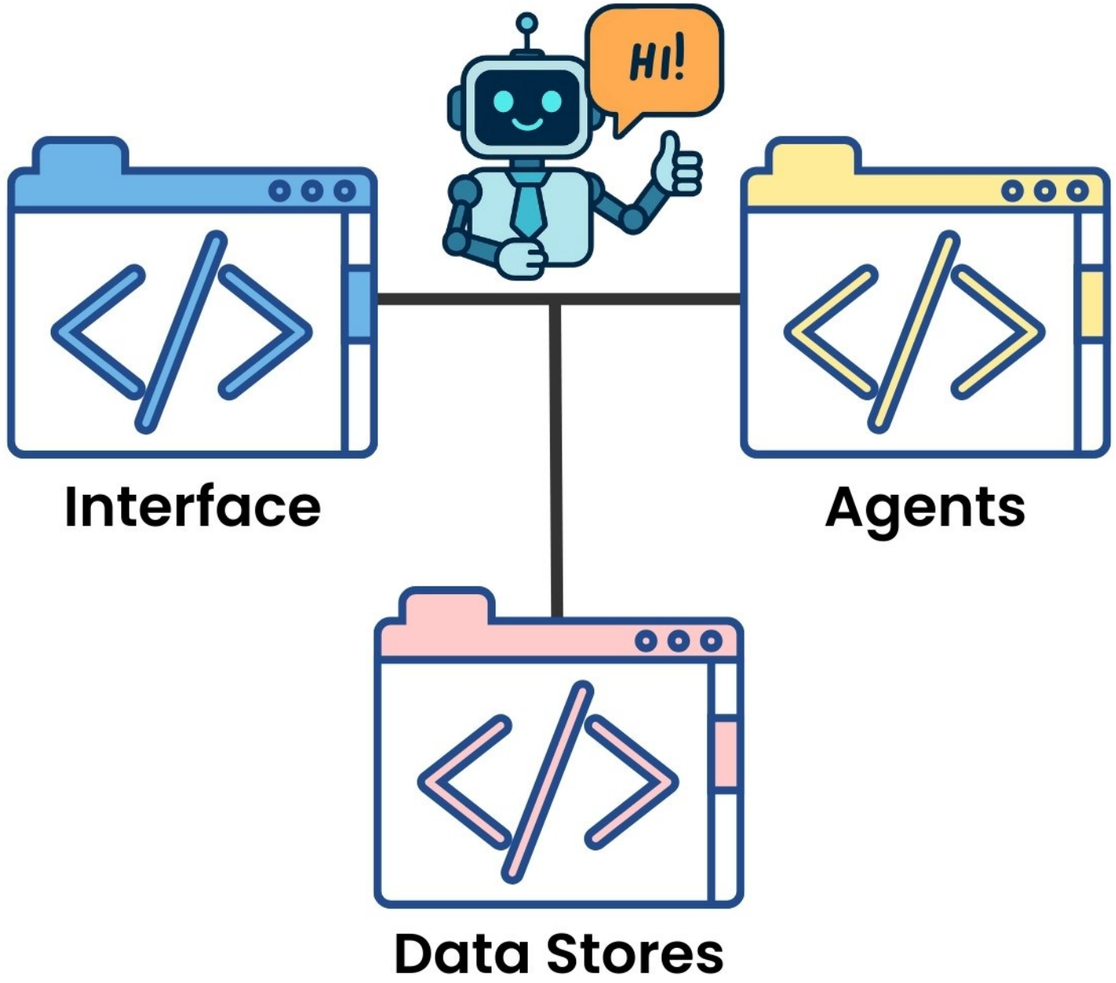
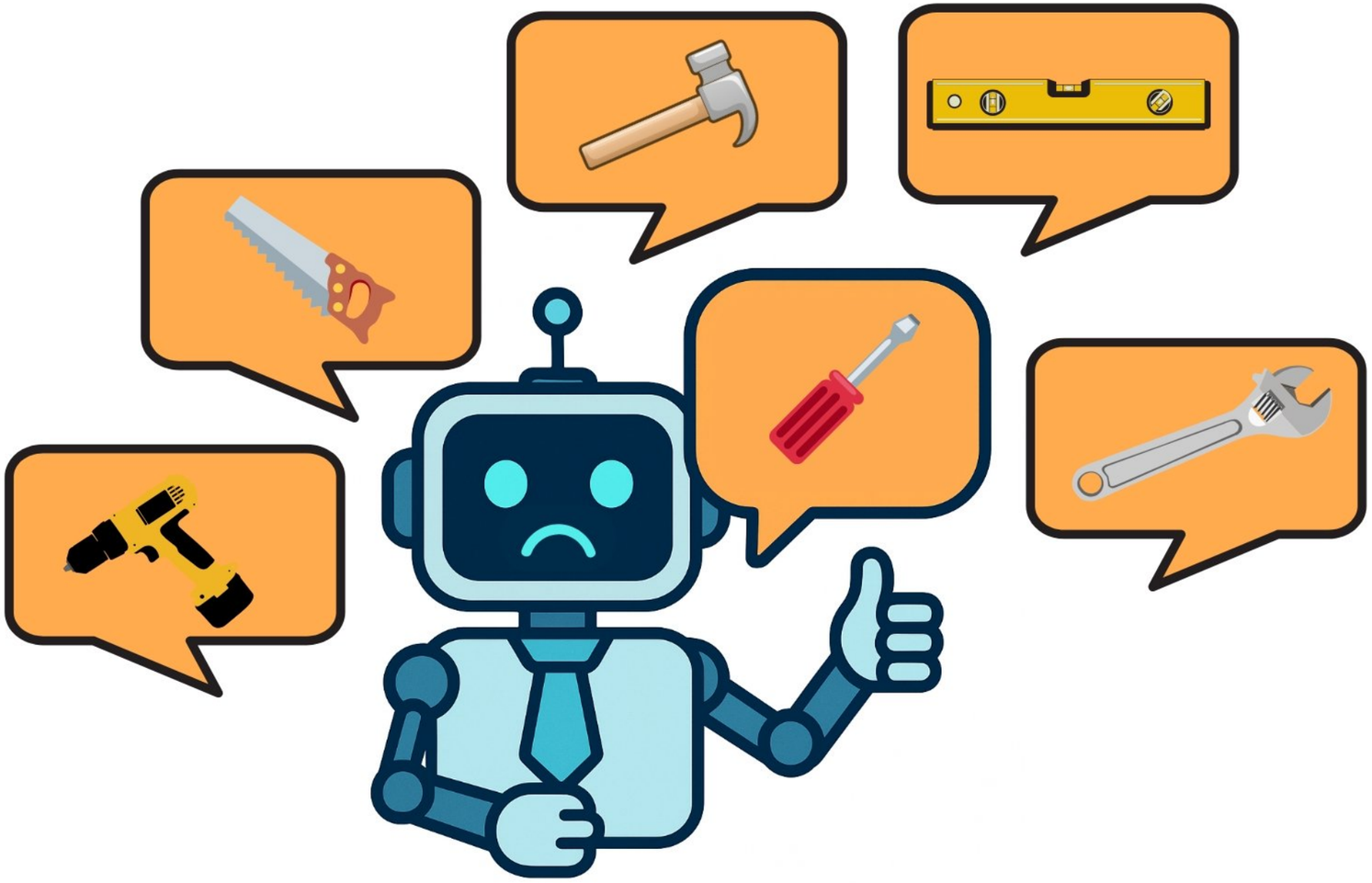


Modularity in agents: Software modularity



Modularity in agents: Multi-agents



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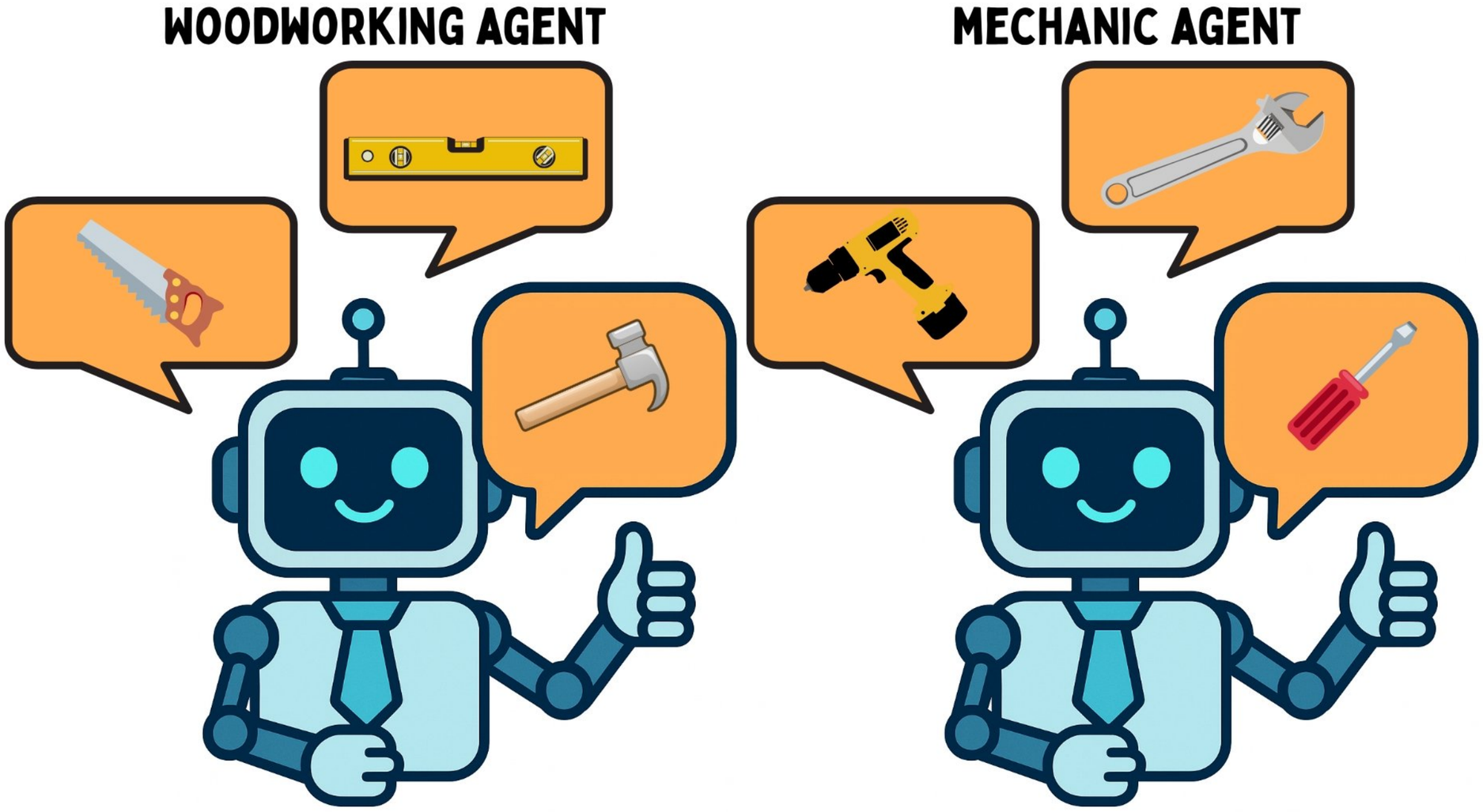
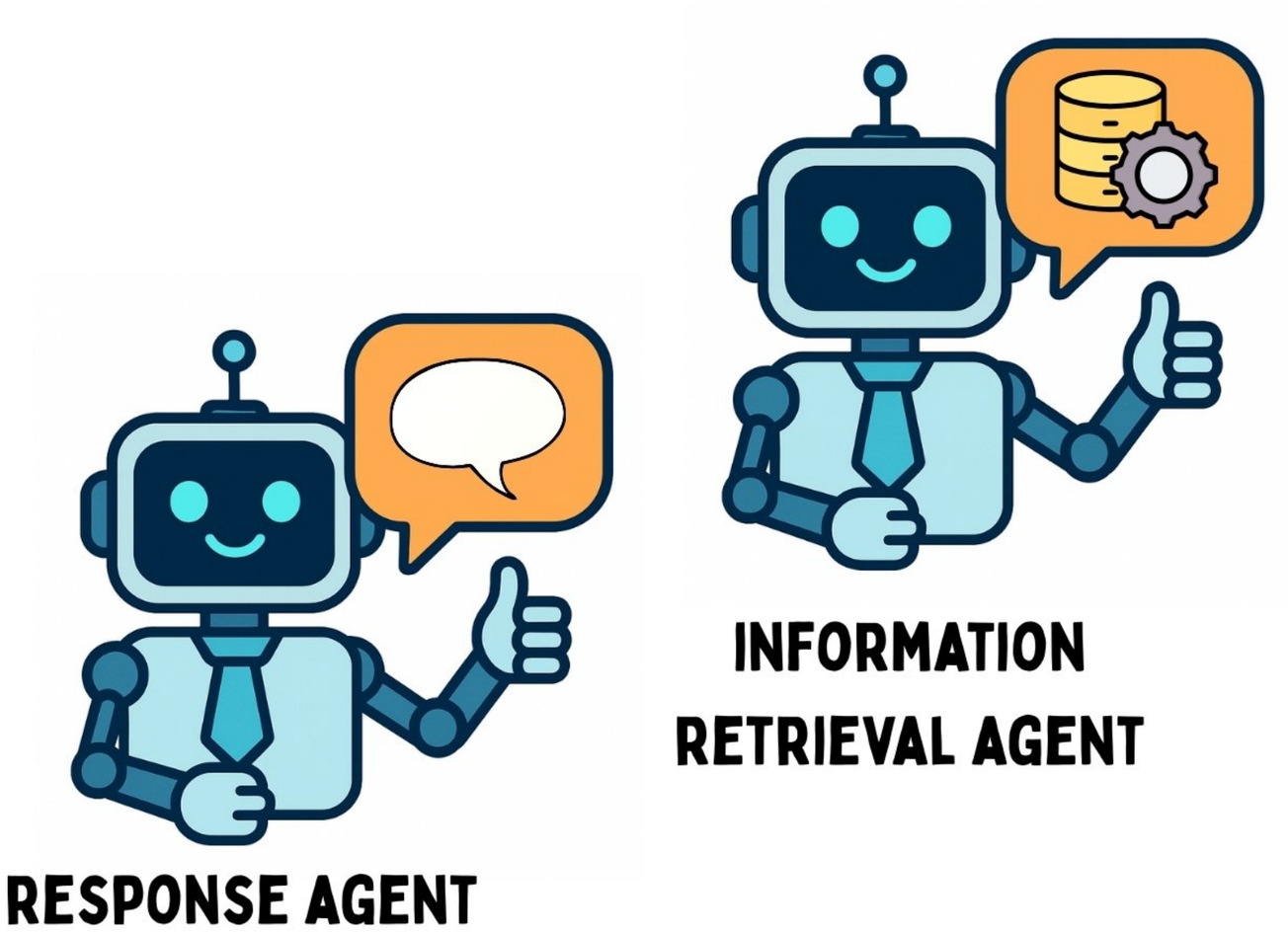
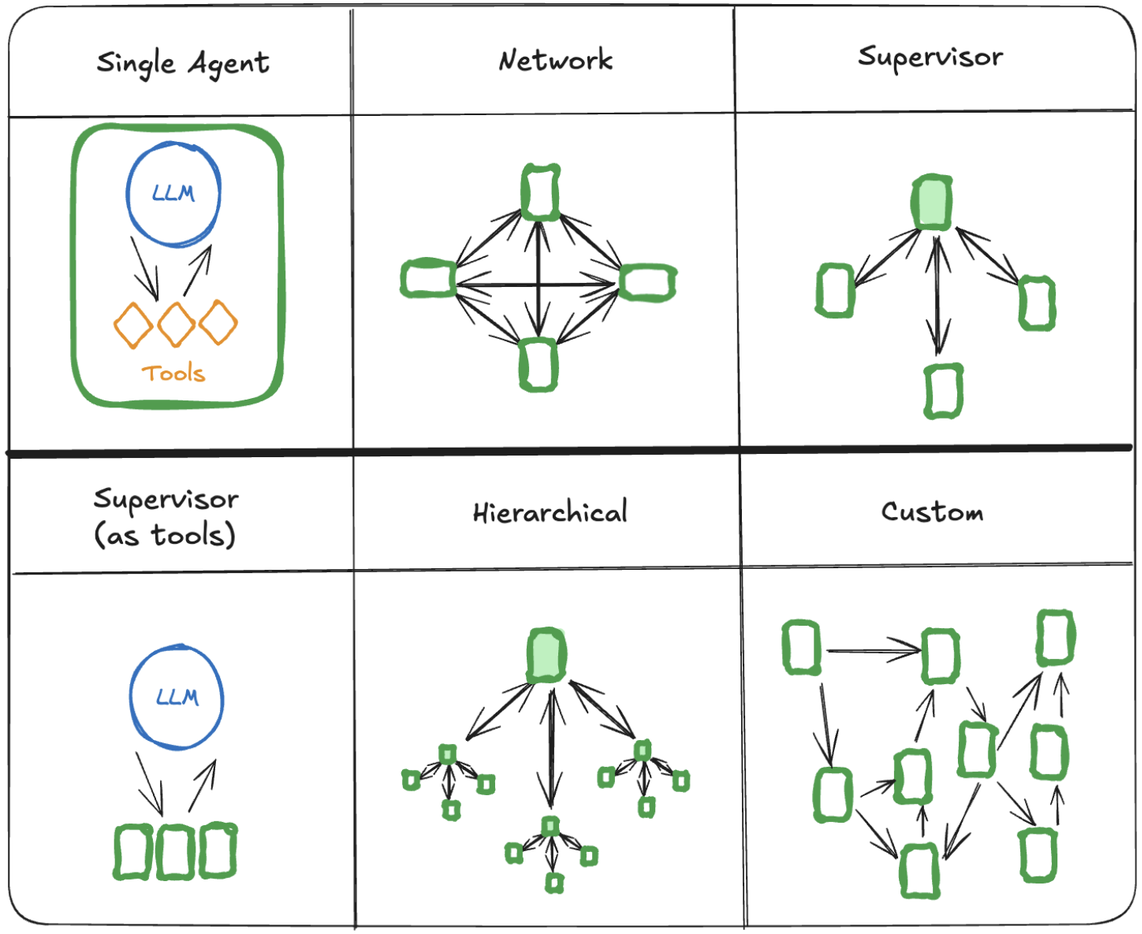


Example: Customer support multi-agent



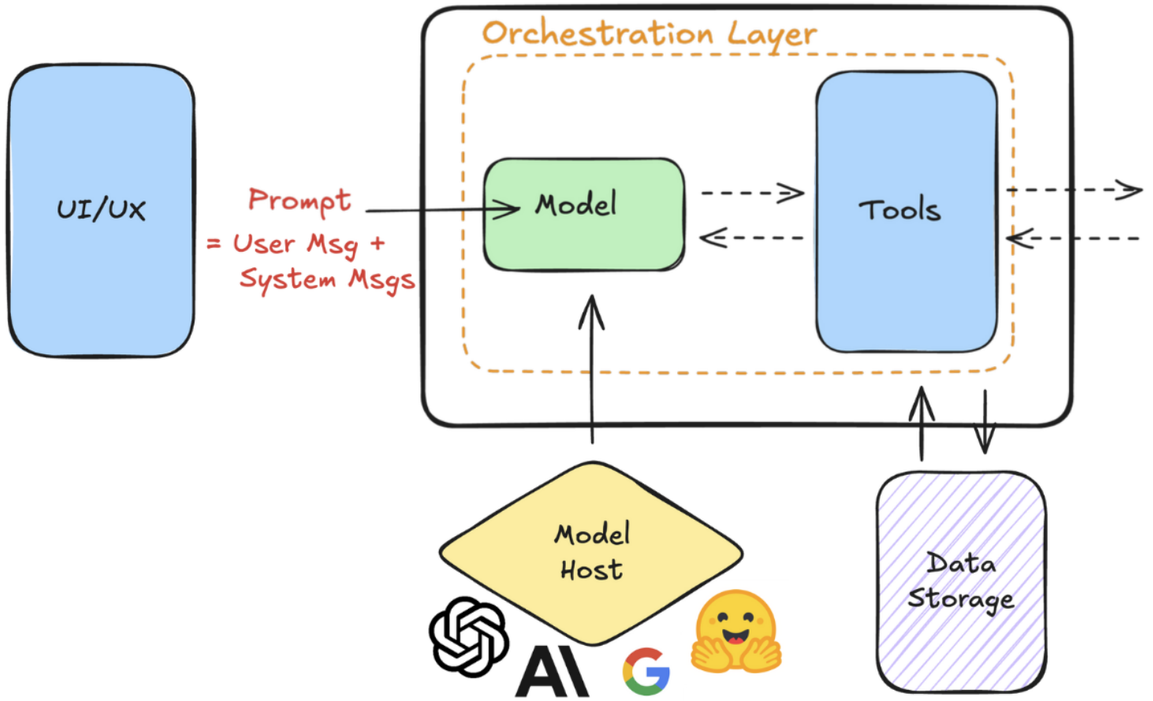
Sneak peak at Chapter 2



[1] https://langchain-ai.github.io/langgraph/concepts/multi_agent/#multi-agent-architectures

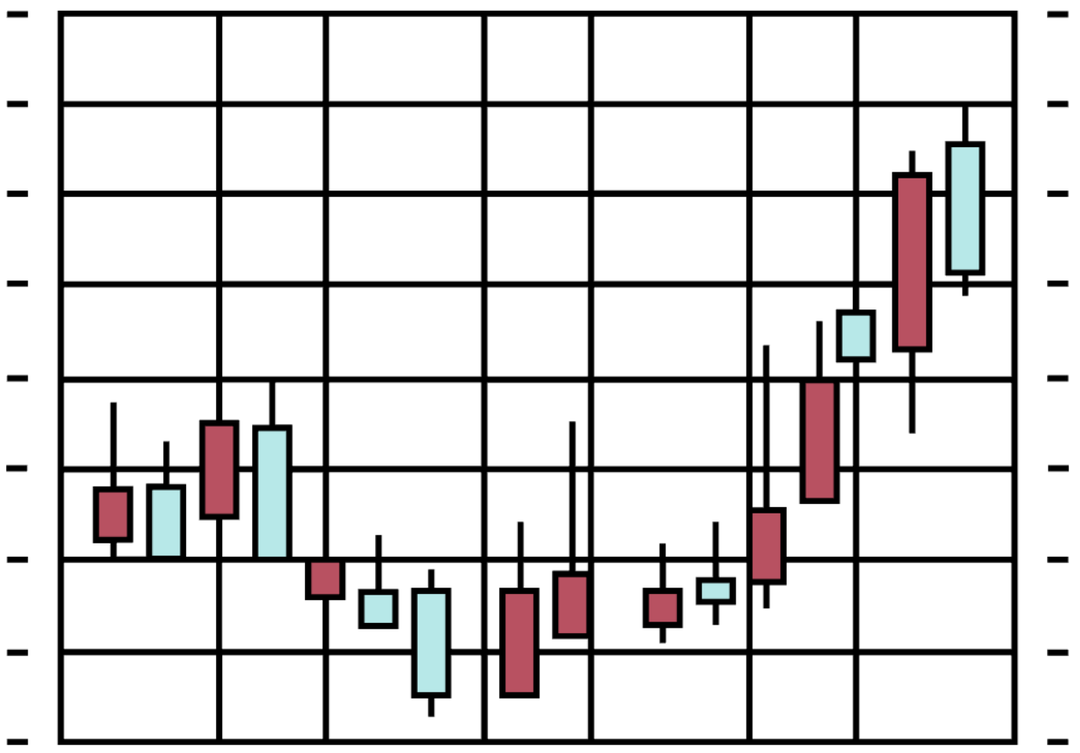
Continuous evaluation and feedback loops

- Comprehensive *monitoring*



Continuous evaluation and feedback loops

- Comprehensive *monitoring*
- Common metrics:
  - Success rate
  - Latency
  - Errors



Continuous evaluation and feedback loops

- Comprehensive *monitoring*
- Common metrics:
  - Success rate
  - Latency
  - Errors
- Collect user feedback

Let's practice!

BUILDING SCALABLE AGENTIC SYSTEMS

How AI Agents Scale (and Fail)

BUILDING SCALABLE AGENTIC SYSTEMS

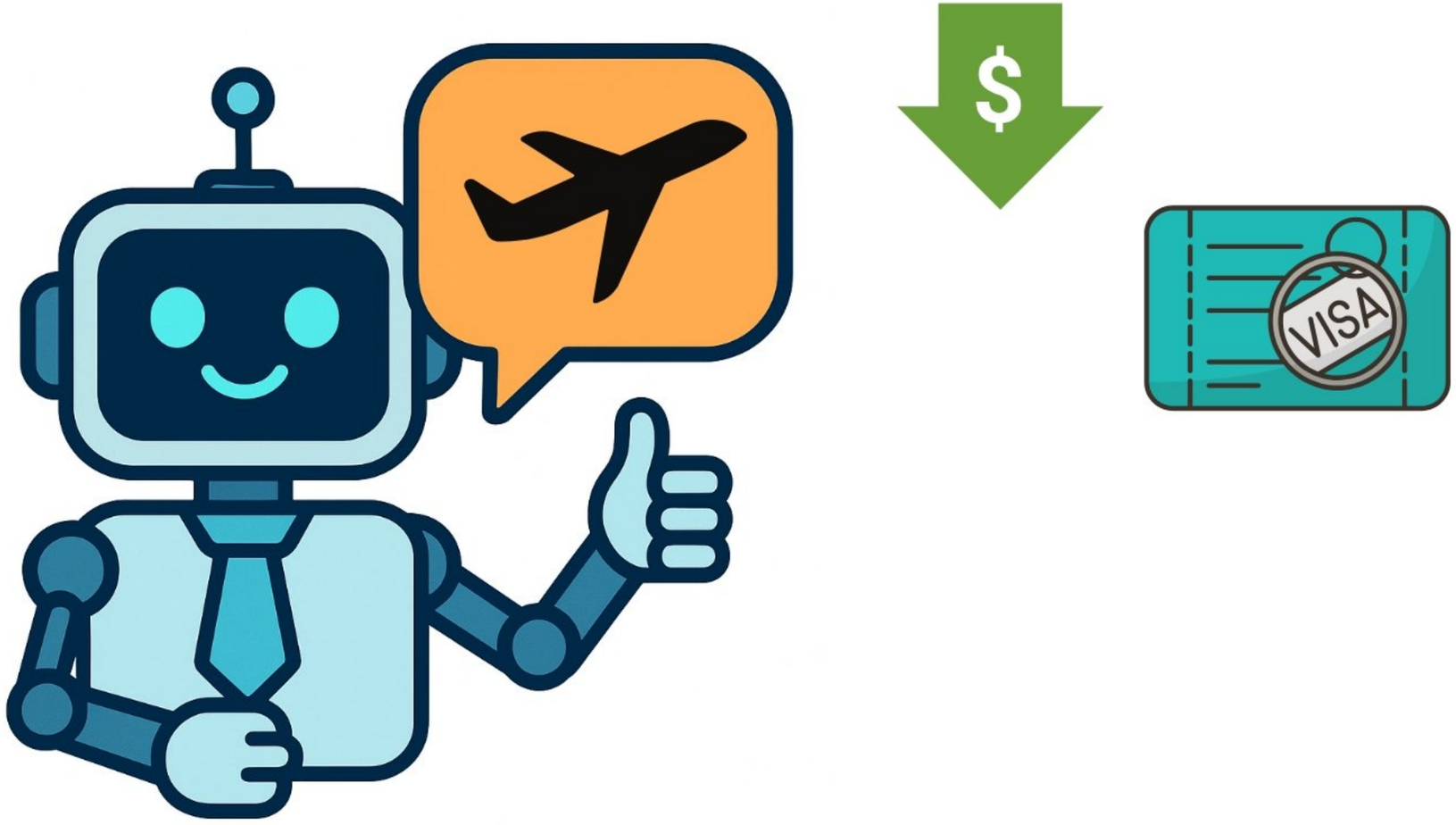
Korey Stegared-Pace
Senior AI Cloud Advocate, Microsoft

datacamp

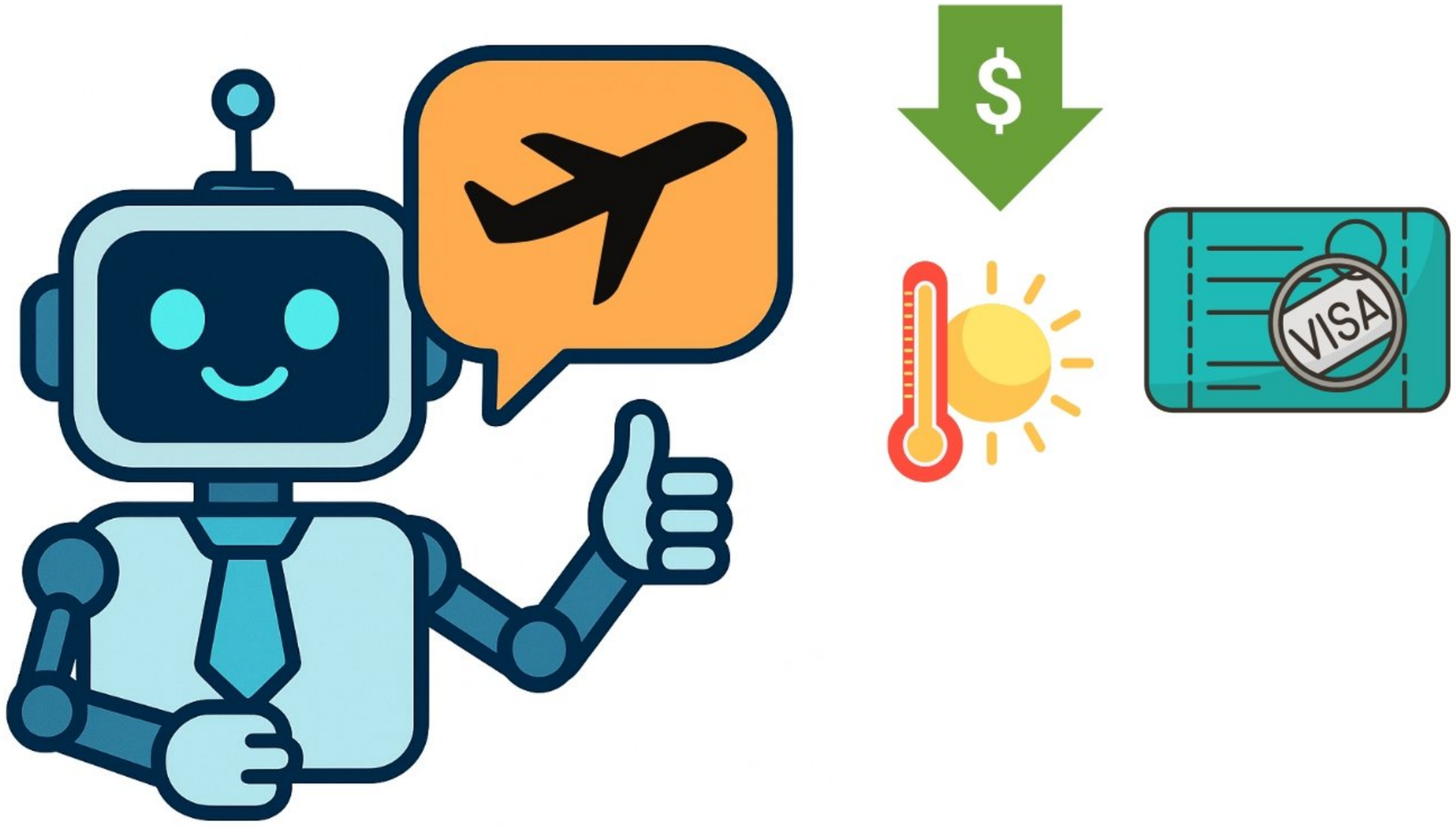
The confident start

The confident start

The confident start



The confident start



The confident start

The confident start

Trouble at scale

Failure mode #1 - Fragile evaluation

FRAGMENTED Travel to Naples...
> From Stockholm...
> Fly to Rome first...
> Train from Naples to Rome

SLANG I'd like to *nip over* to Dublin from Belfast

EMOJIS London ✈️ Bali

LANGUAGES *Vorrei prenotare un volo per Parigi.*

[1] nip over = British slang for a quick visit

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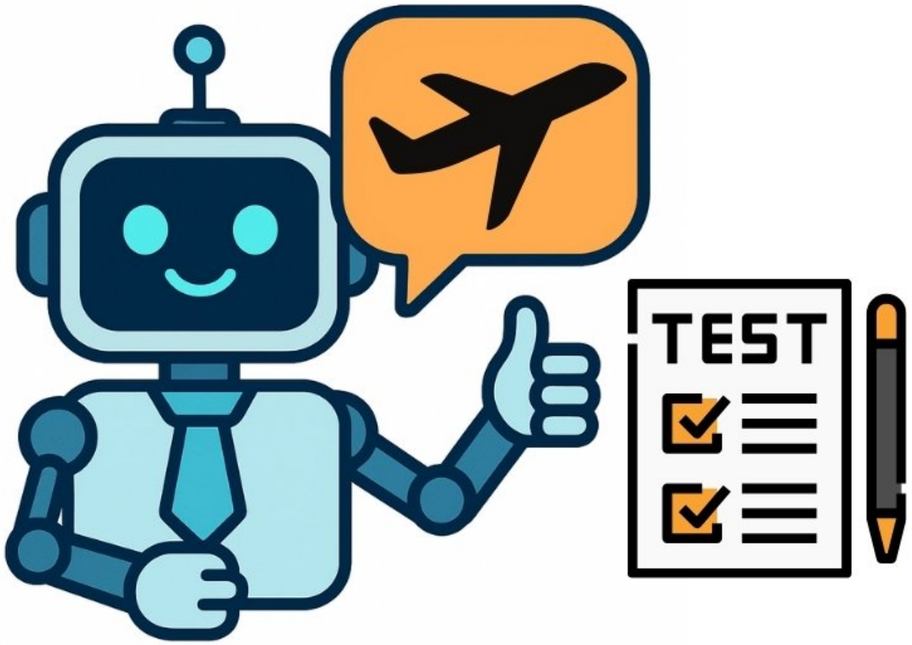

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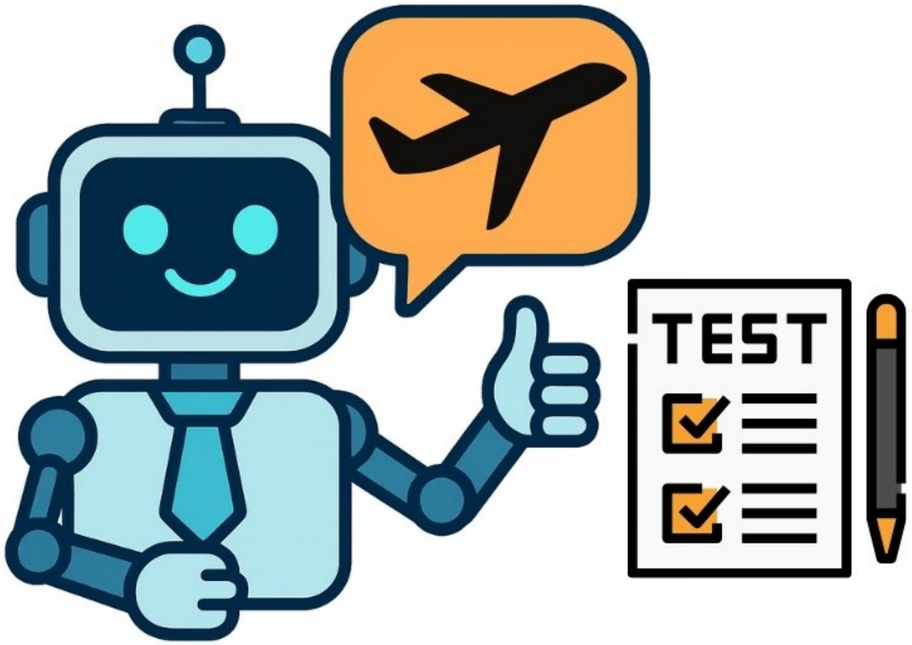
Include **MESSY** data in your evaluations



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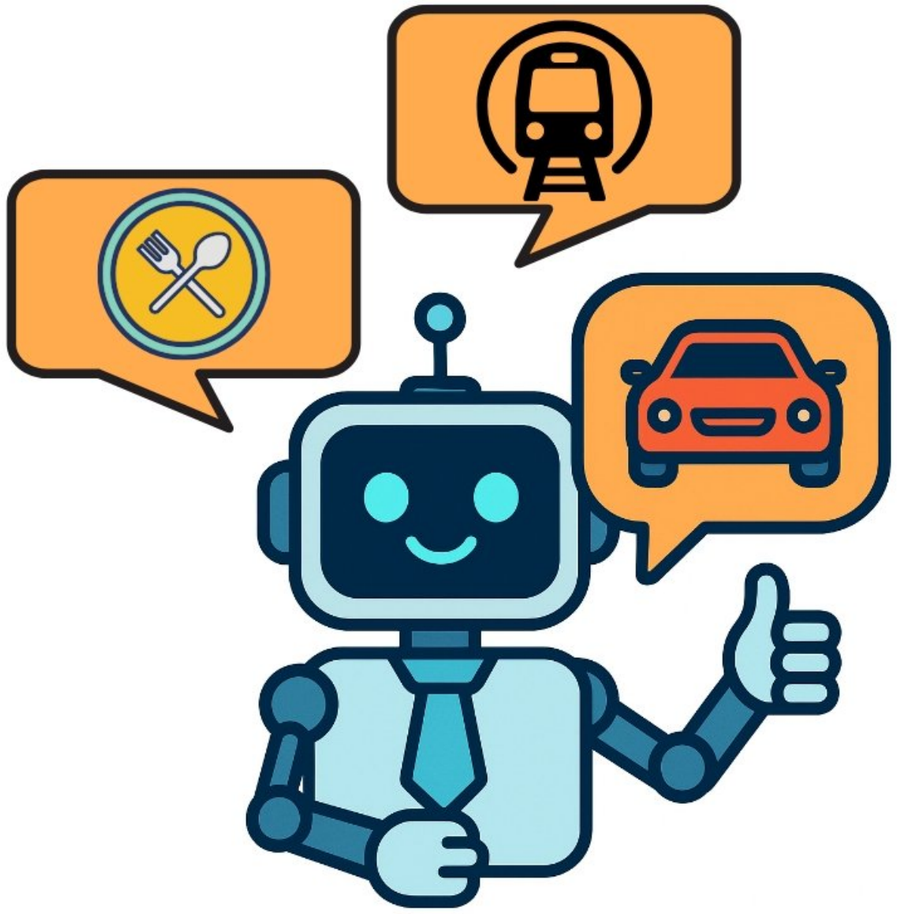
Failure mode #2 - Intent drift



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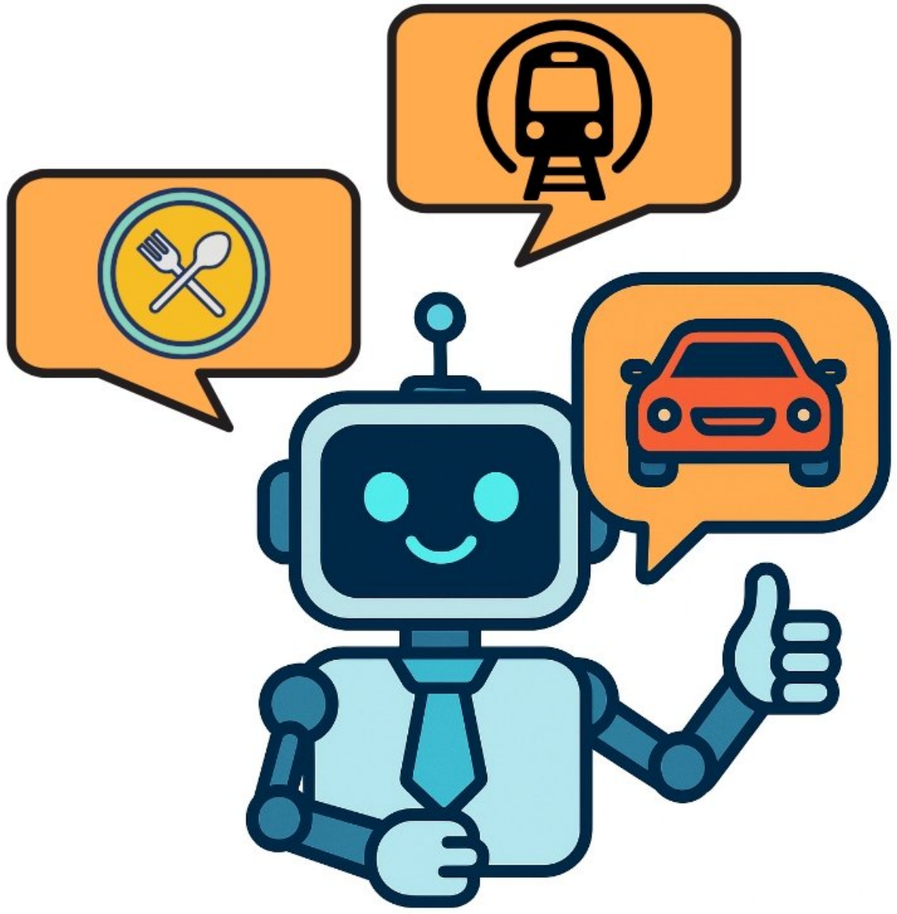
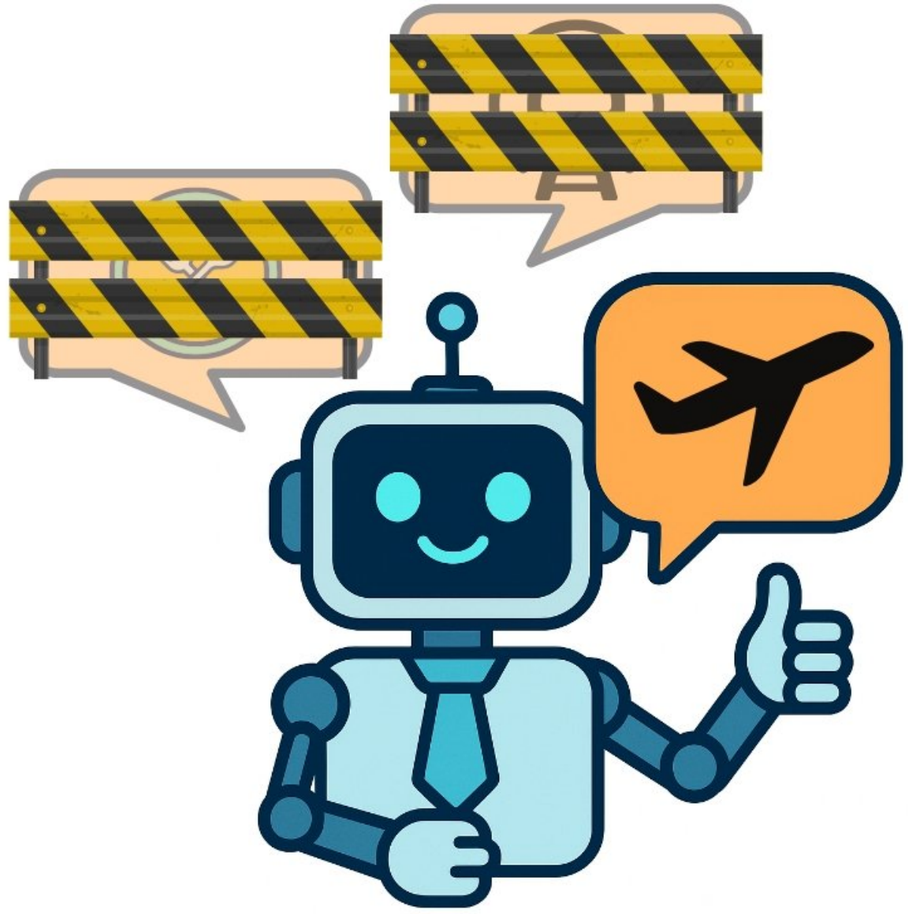




Failure mode #3 - Undesirable feedback loops

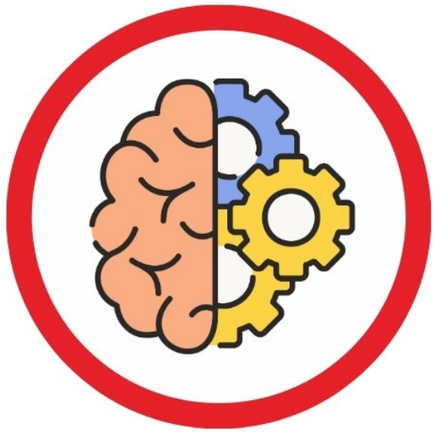
Upvoting → jokes, sarcasm, etc.

Result → truth is deprioritized

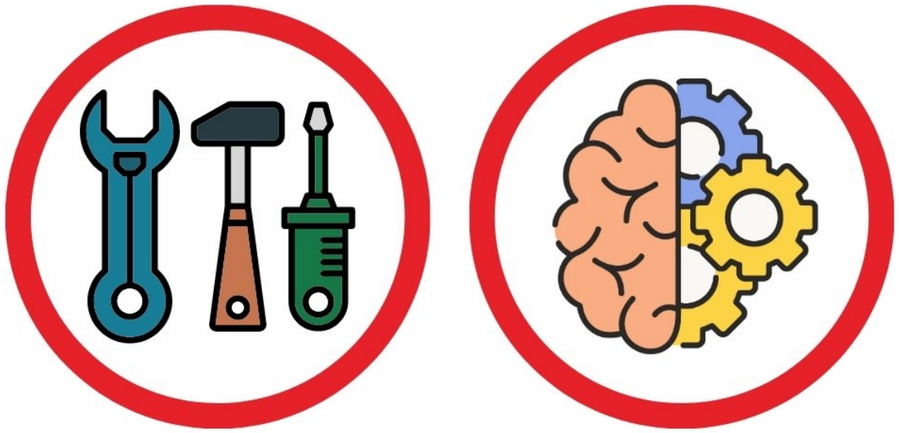
Define clear metrics for all aspects of performance

- *Truthfulness*
- *Clarity*
- *Tone*

Failure mode #4 - Latency bottlenecks

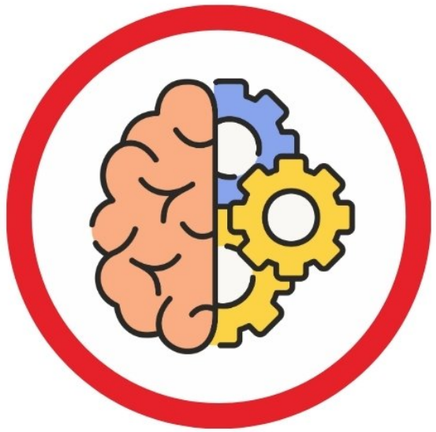


Failure mode #4 - Latency bottlenecks



Failure mode #4 - Latency bottlenecks

Tool Use

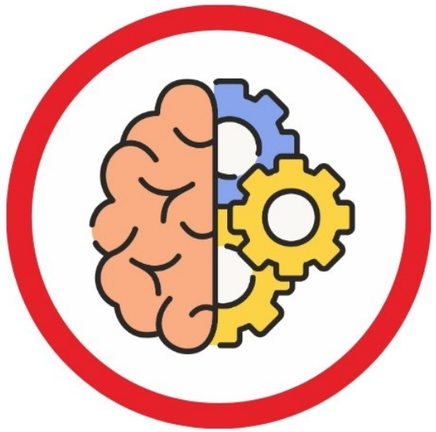


Reasoning

Retrieval

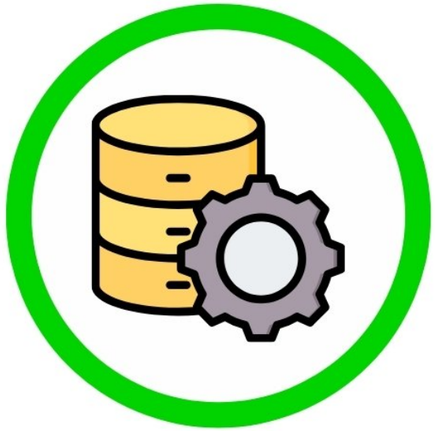
Failure mode #4 - Latency bottlenecks

Tool Use



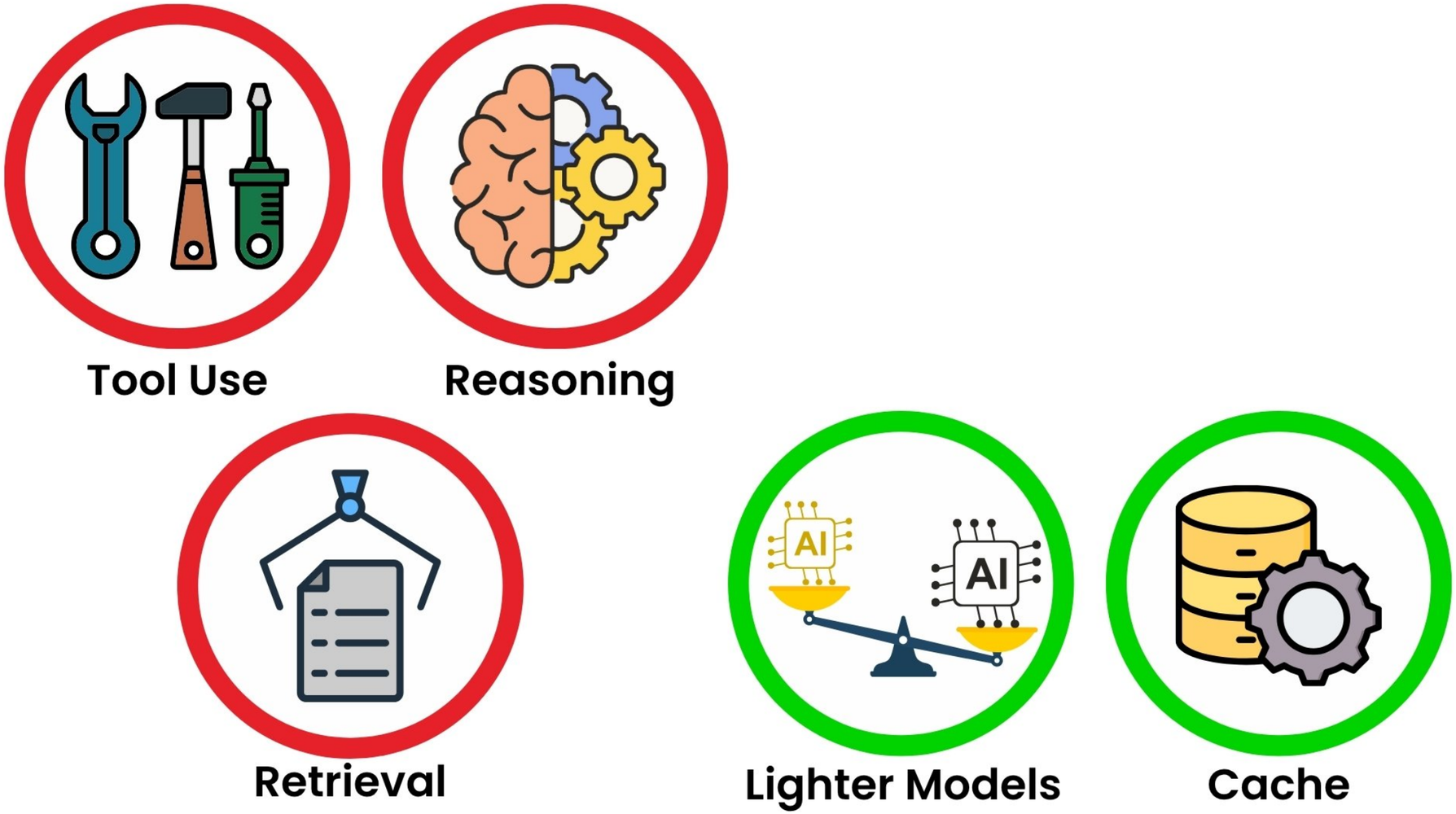
Reasoning

Retrieval

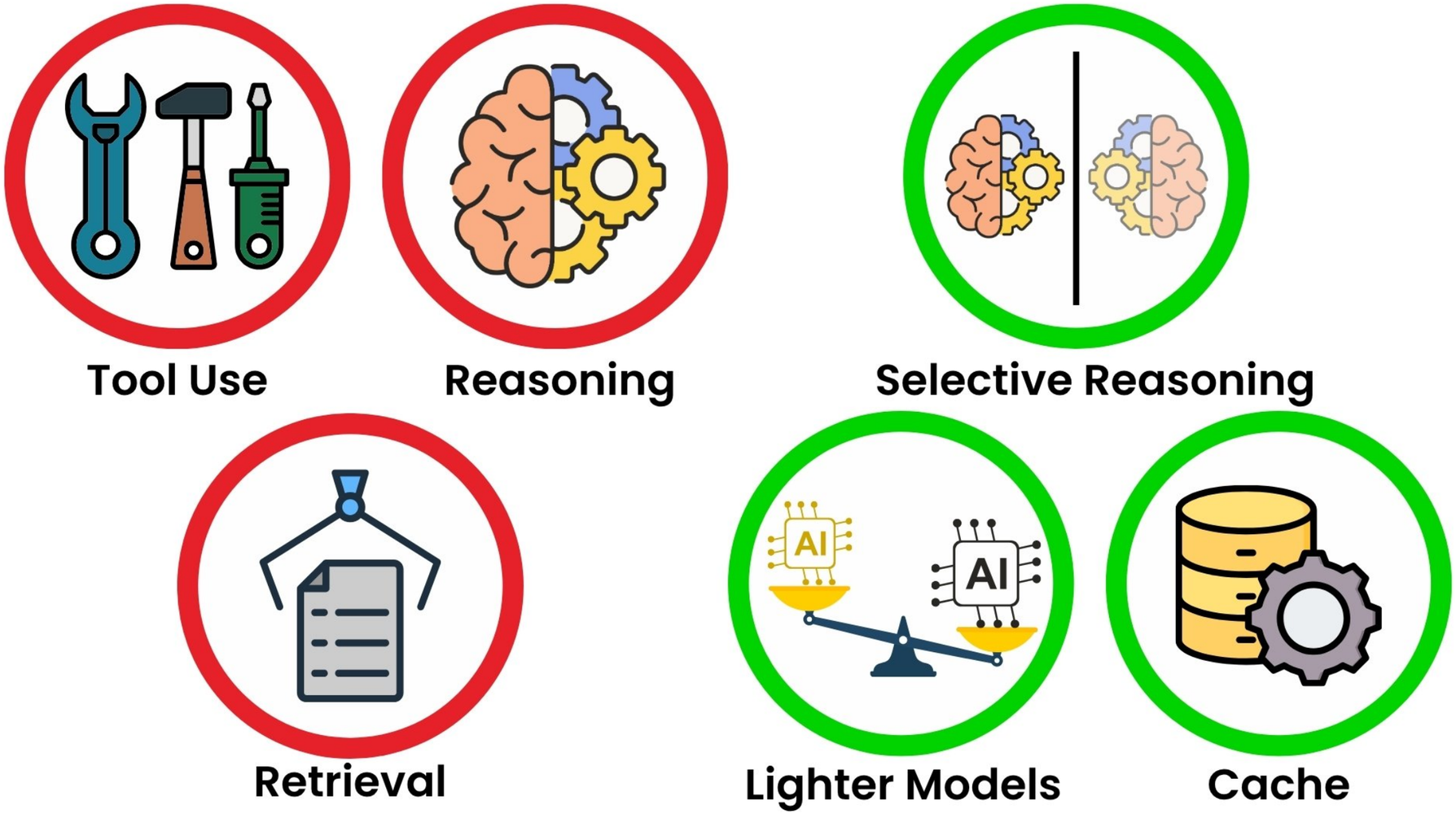


Cache

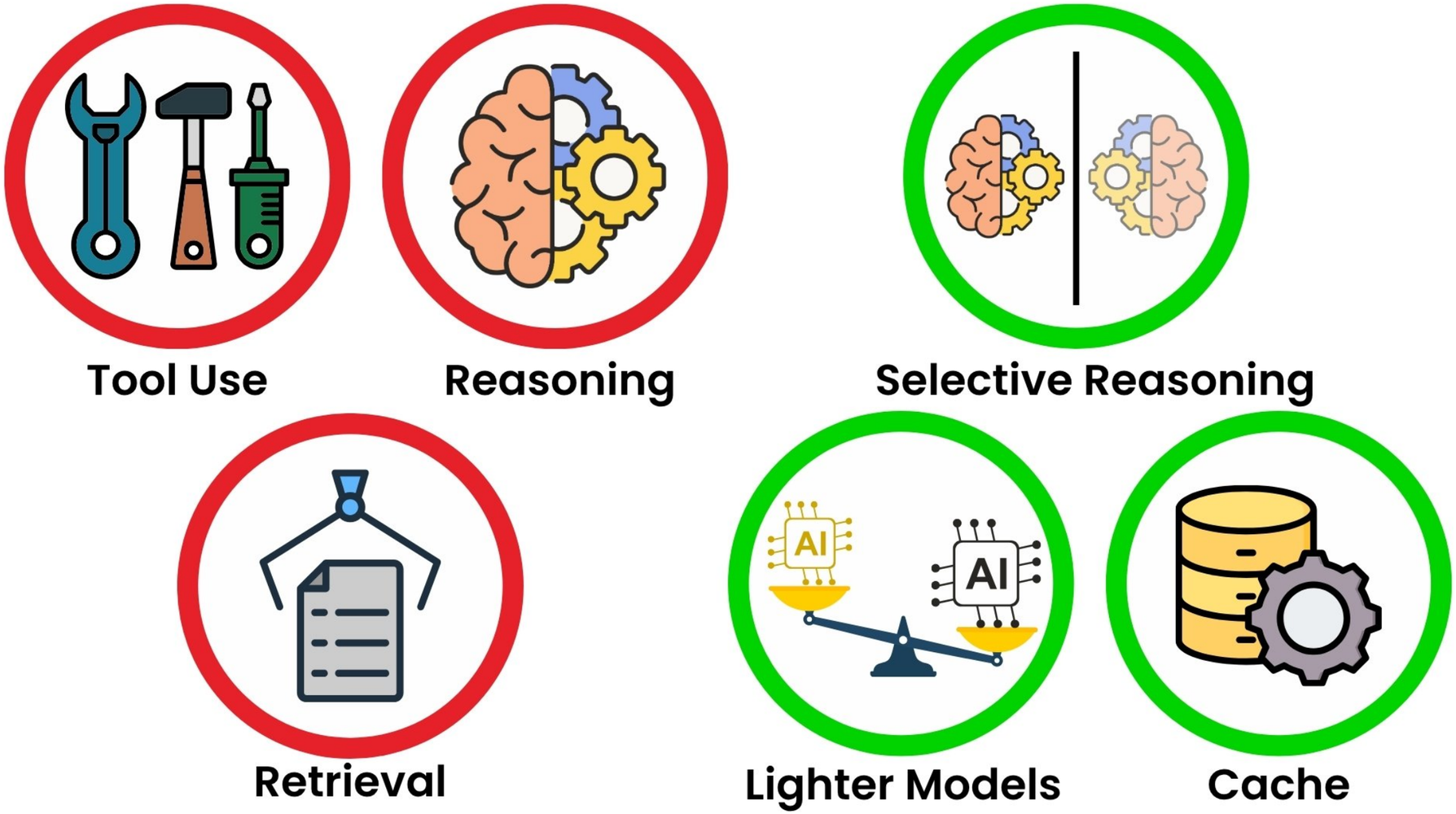
Failure mode #4 - Latency bottlenecks



Failure mode #4 - Latency bottlenecks



Failure mode #5 - Cost explosion



Failure mode #5 - Cost explosion

Let's practice!

BUILDING SCALABLE AGENTIC SYSTEMS