

What is an AI Agent?

INTRODUCTION TO AI AGENTS



Adel Nehme

VP of AI Curriculum, DataCamp

Course Learning Objectives

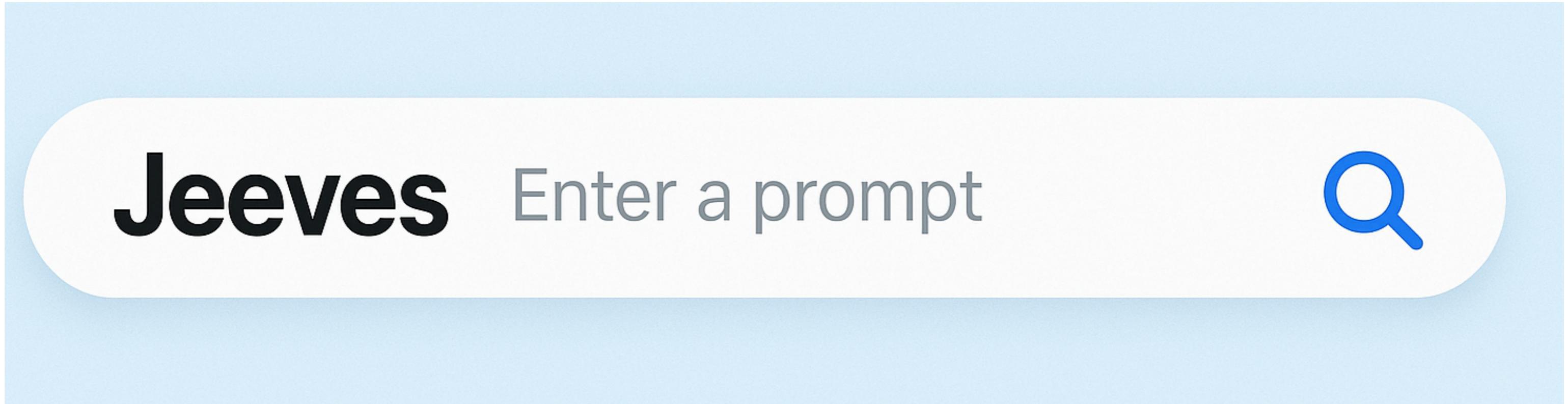
- Understand the core components that make up an AI agent
- Distinguish agents from other AI systems you might already know or use
- Use off-the-shelf agentic tools or even building your own

Jeeves: Our Travel AI Agent



¹ Image generated with GPT-4o

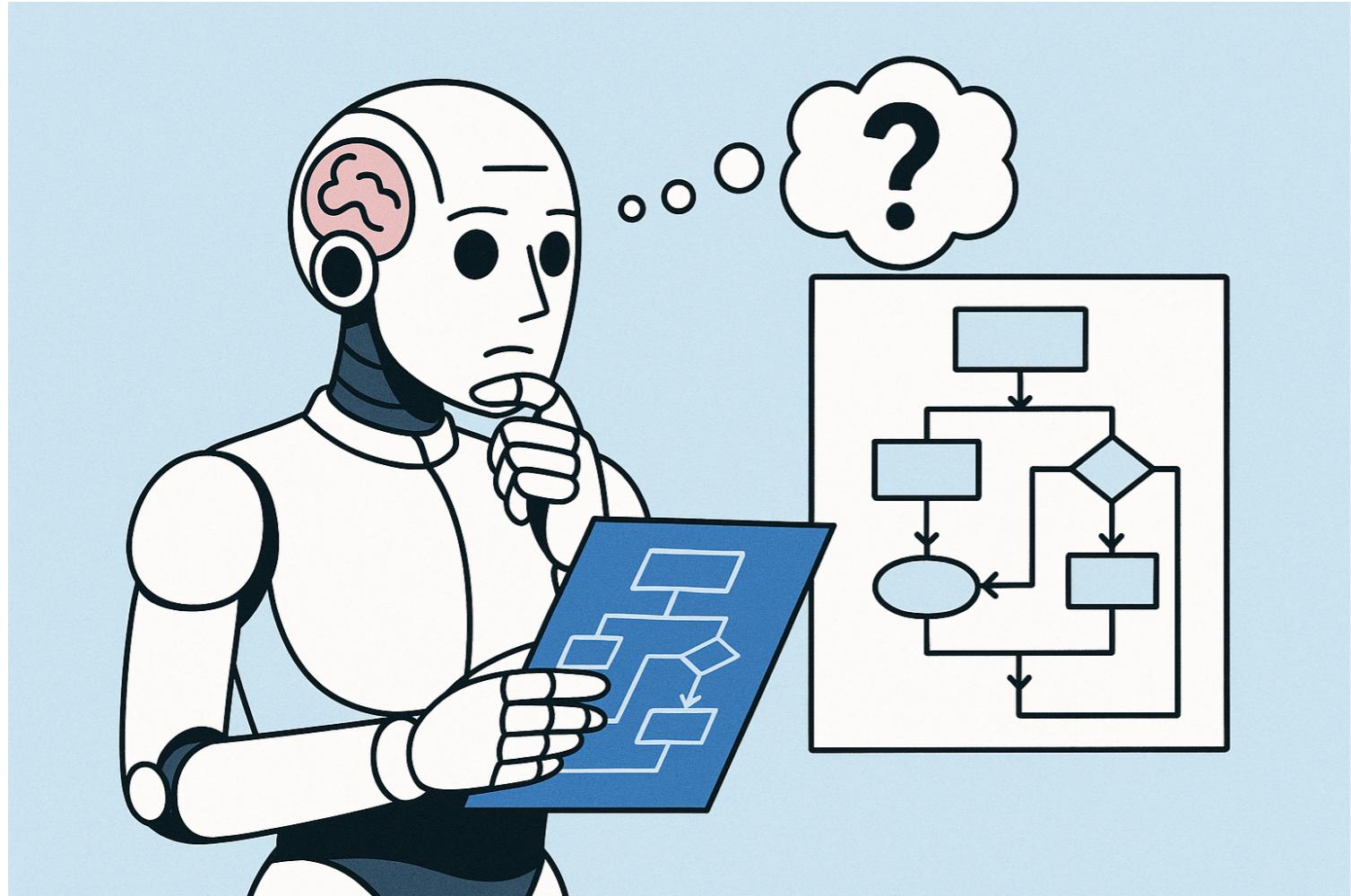
Jeeves: Our Travel AI Agent



Jeeves, I'm travelling to Tokyo on June 26 and staying there until July 12. Help organize my trip.

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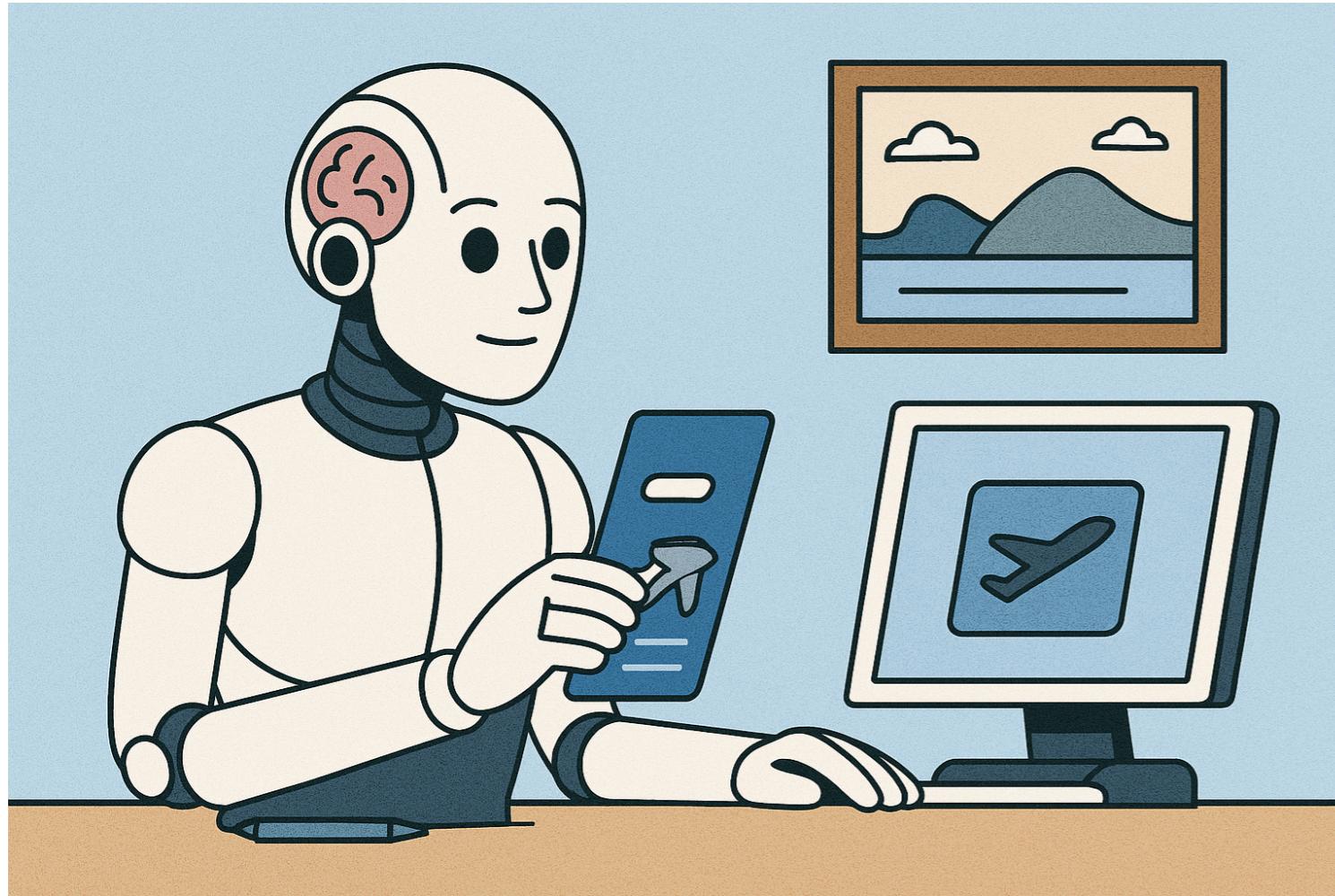
Reasoning and Planning



1. Access your itinerary and calendar
2. Identify where you'll need to stay based on your meeting schedule
3. Identify relevant flights and hotels
4. Communicate the plan back to you
5. And finally, organize your travels

¹ Image generated with GPT-4o

Taking Action



1. Your calendar and email to understand your itinerary and meetings
2. Documentation on your company travel policy to ensure compliance
3. Expedia and Booking.com to determine the best flights and hotels
4. Communicates plan, and books travel arrangements

¹ Image generated with GPT-4o

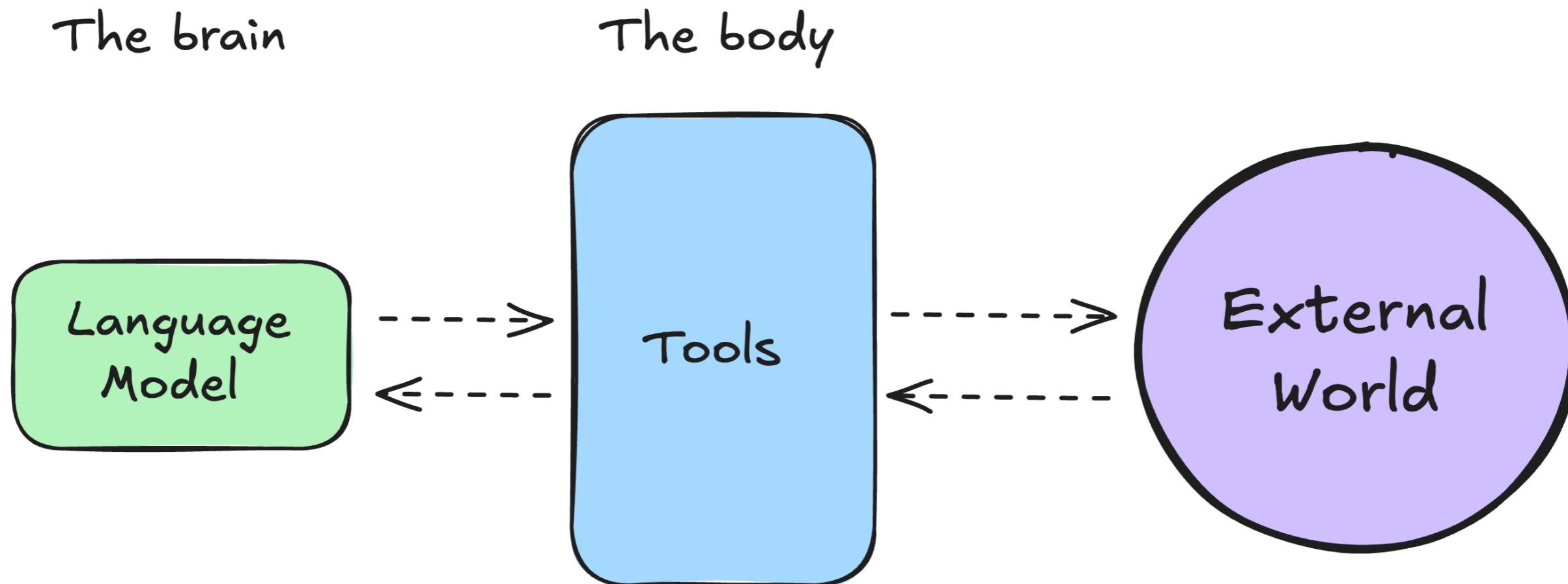
AI Agents: Reasoning, Planning, and Acting

An AI model capable of reasoning, planning, and acting on a set of actions by interacting with its environment.

¹ The Hugging Face Agents Course: <https://github.com/huggingface/agents-course>

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AI Agents: A Formal Definition

An agent is a system that leverages an AI model to interact with its environment to achieve a user-defined objective. It combines reasoning, planning, and the execution of actions (often via external tools) to fulfill tasks.

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The Spectrum of "Agency"

Level	Agency	Description	Examples
0	No agency	Systems that can only respond based on trained knowledge or perform discrete, pre-defined tasks	Chatbots with trained knowledge (e.g. GPT-4o), workflow automation systems
1	Basic routing	AI models that can route scenarios in workflows	A customer support workflow where an AI model routes a ticket based on its content
2	Tool-using agents	Systems that can utilize external tools	A travel AI agent that can book flights (e.g. Jeeves)
3	Autonomous agents	Systems that can perform multiple steps autonomously	Deep research tools that can perform multi-step reasoning and tool calling
4	Multi agent systems	Systems that can delegate workflows to multiple agents	Coding assistants that can ideate, generate, and push code to an existing codebase

Let's Practice!

INTRODUCTION TO AI AGENTS

What Makes an Agent Agentic?

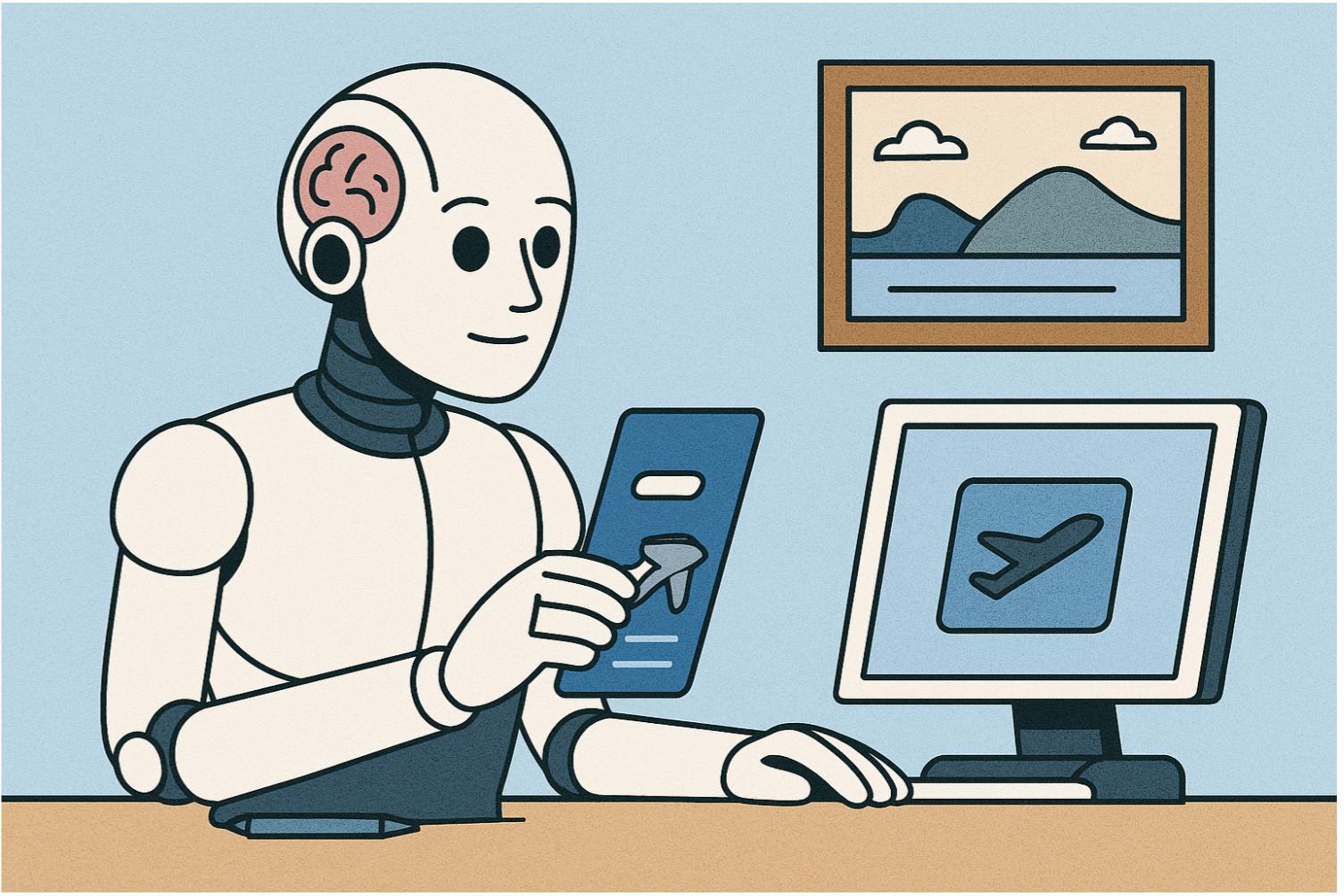
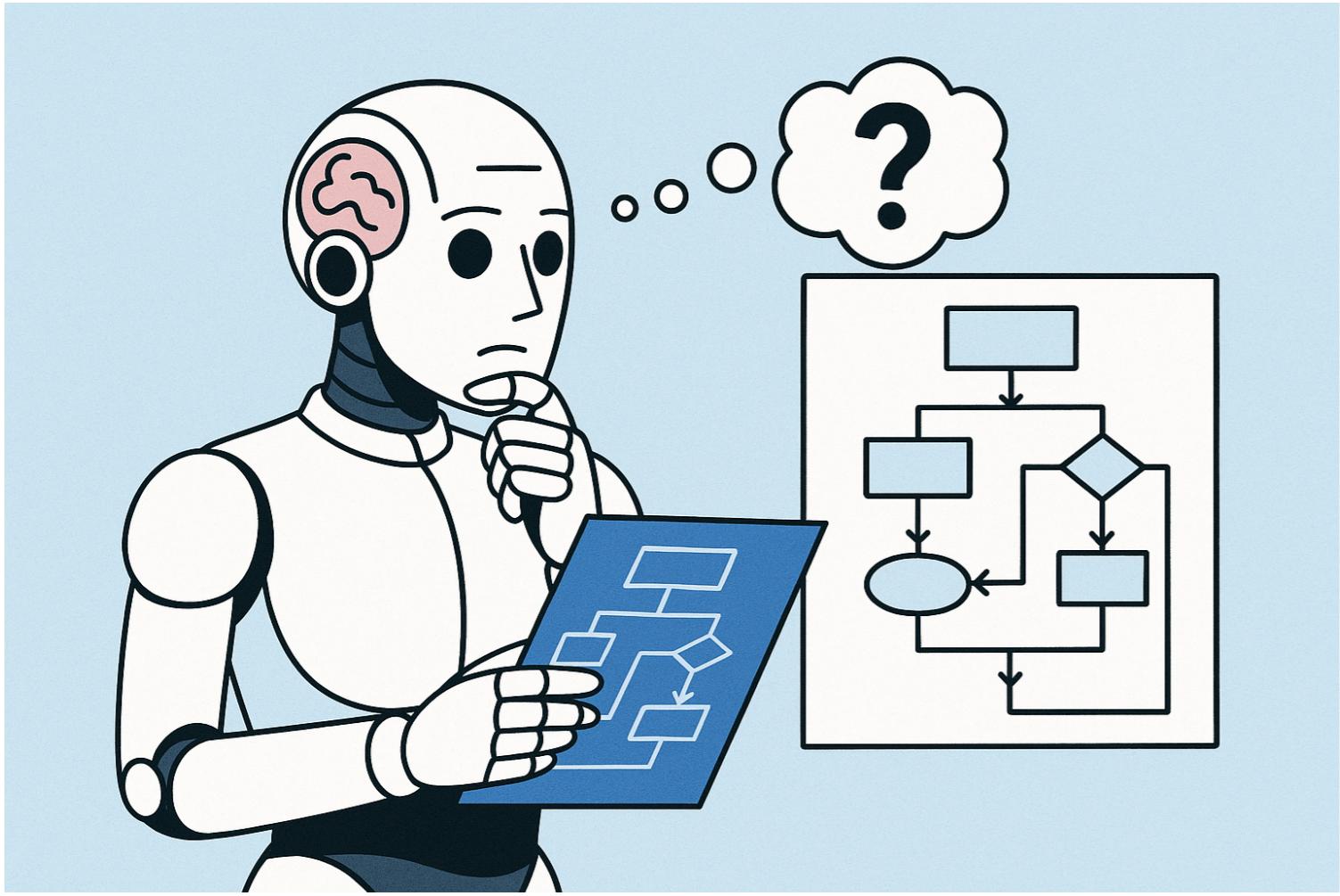
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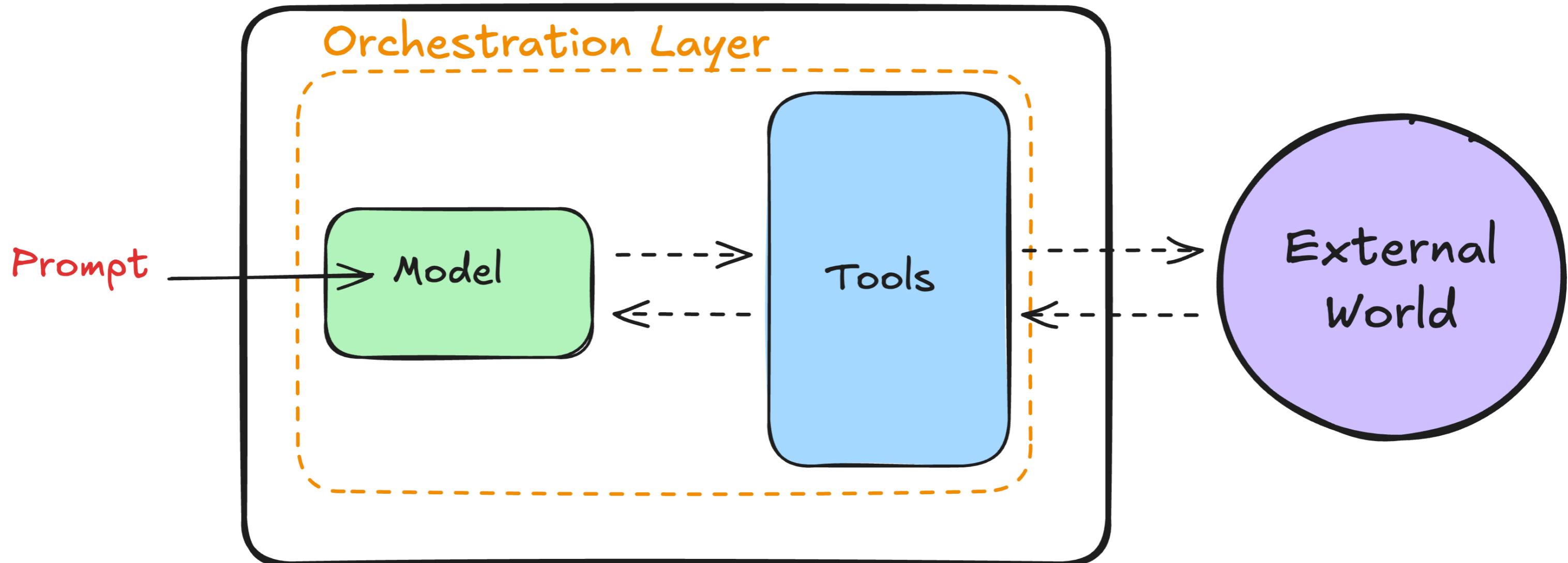
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Jeeves: Our AI Travel Agent



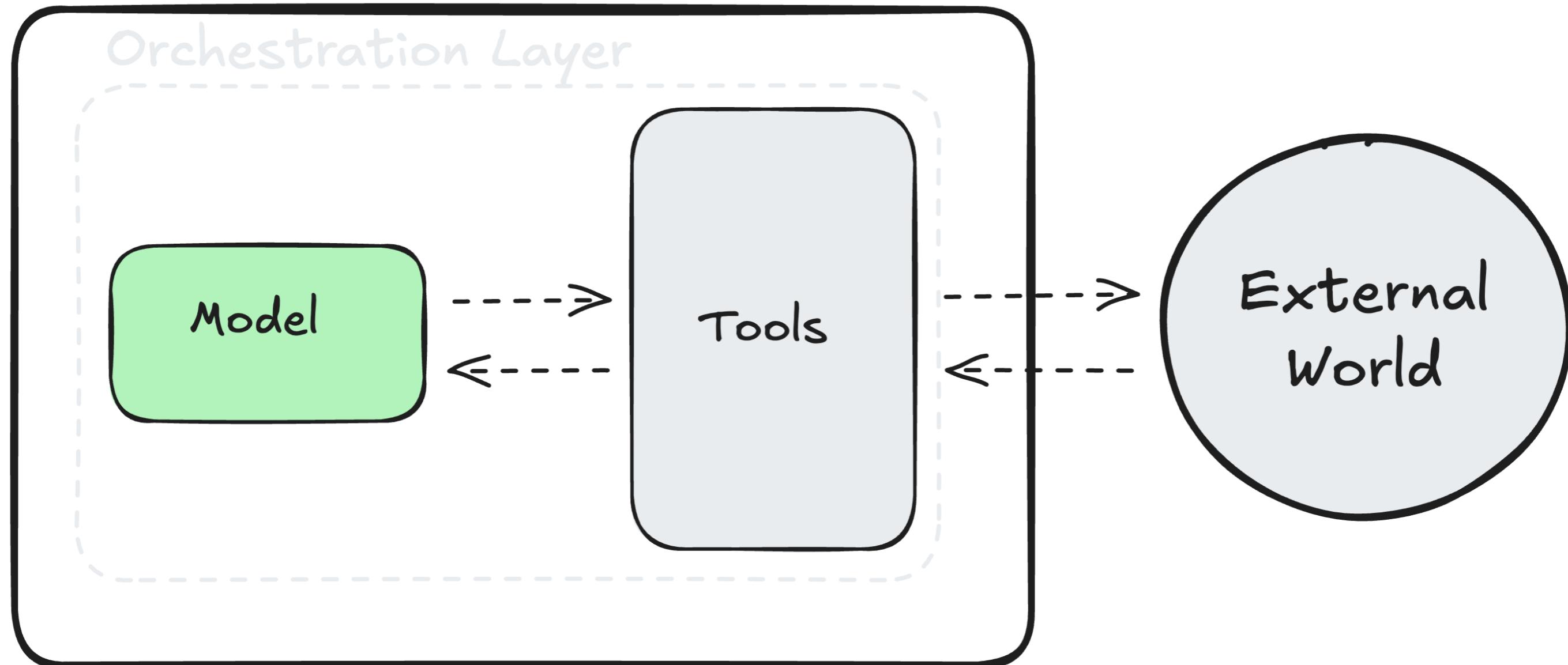
¹ Image generated with GPT-4o

The Agentic Trinity: Model, Tools, and Orchestration



¹ Wiesinger, J., Marlow, P., & Vuskovic, V. (n.d.). Agents.

The Agentic Trinity: Model



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The Agentic Trinity: Model

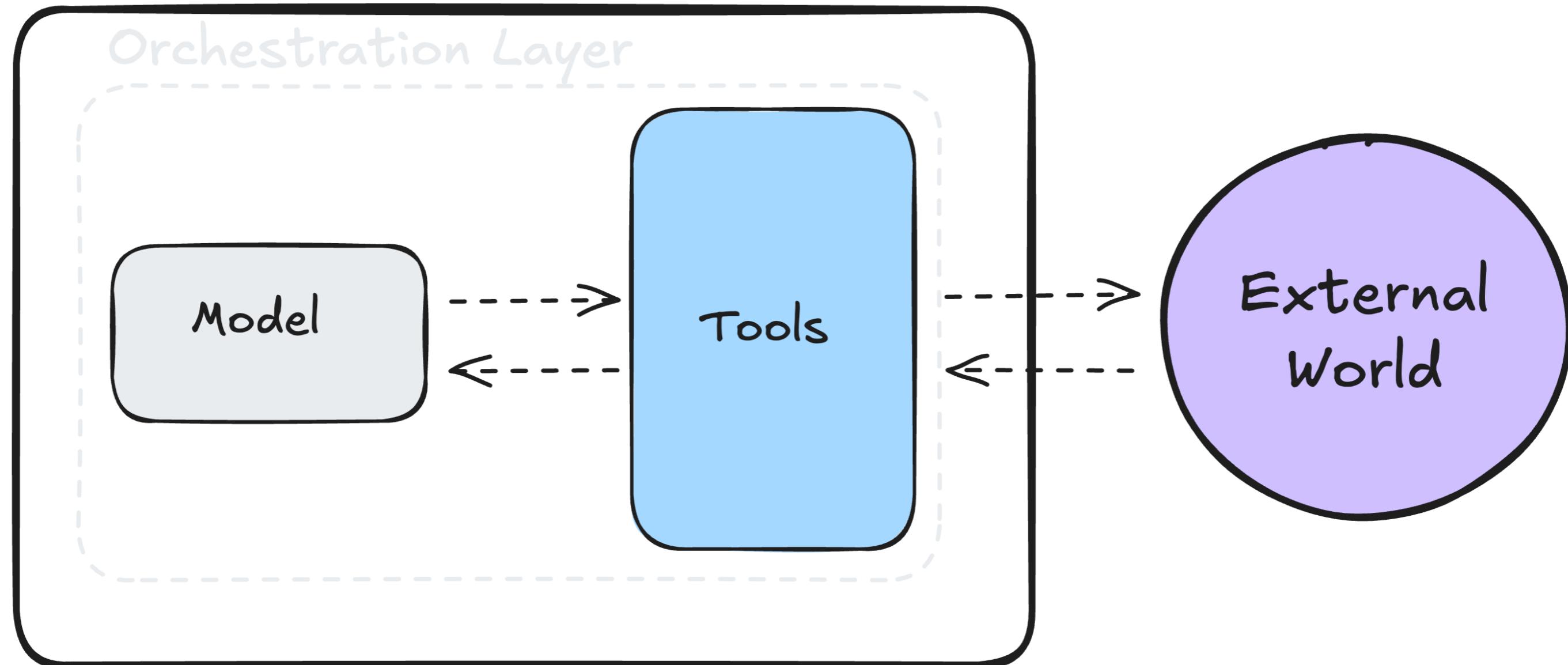
Jeeves, I am travelling to Tokyo on June 26 and staying there until July 12. Help organize my trip.

The Agentic Trinity: Model

Jeeves, I am travelling to Tokyo on June 26 and staying there until July 12. Help organize my trip.

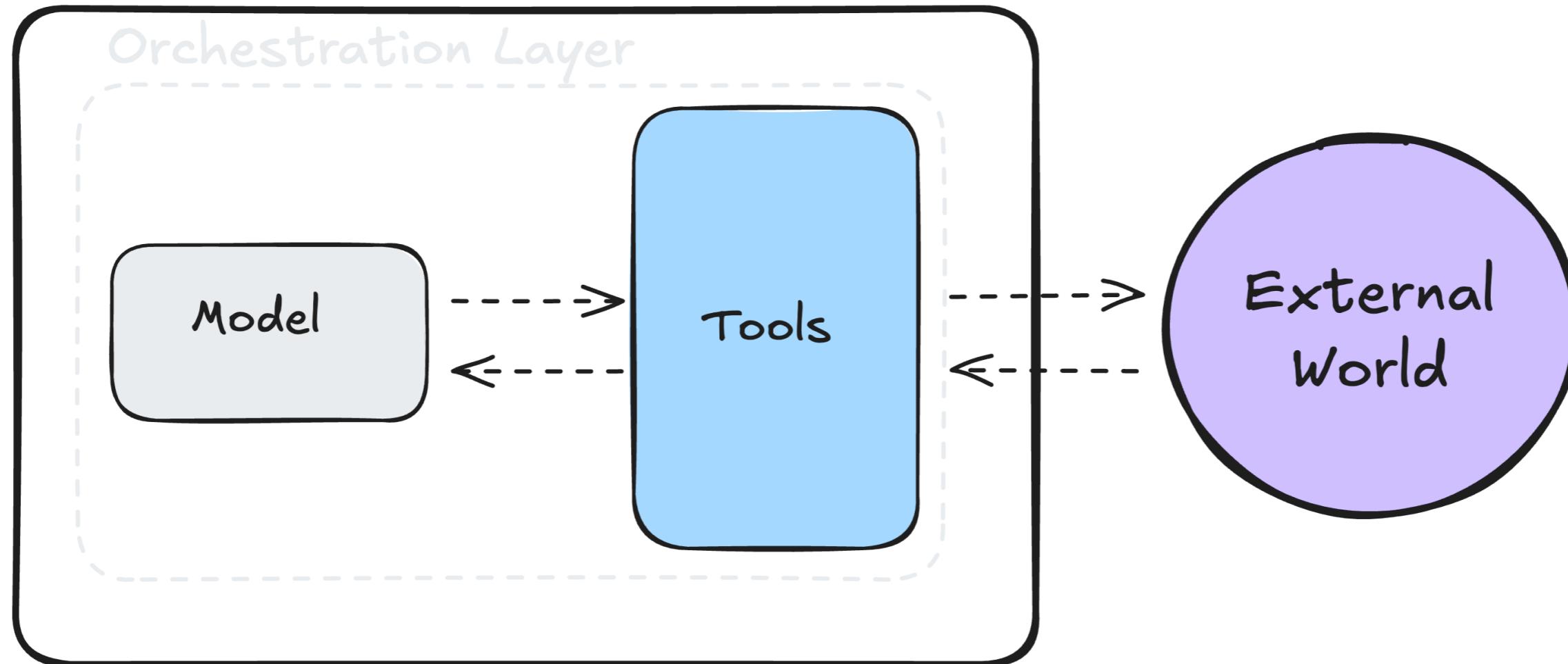
- "*I need to access your itinerary and calendar*"
- "*I need to access your email and calendar to see your meeting schedule*"
- "*I need to find flights that are compliant with company policy*"
- "*I need to find compliant hotels that are close to your meetings*"
- "*I need to communicate the travel arrangements in a digestible format*"

The Agentic Trinity: Tools



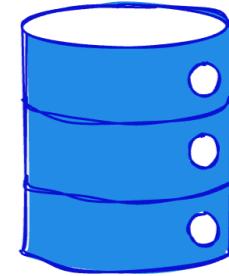
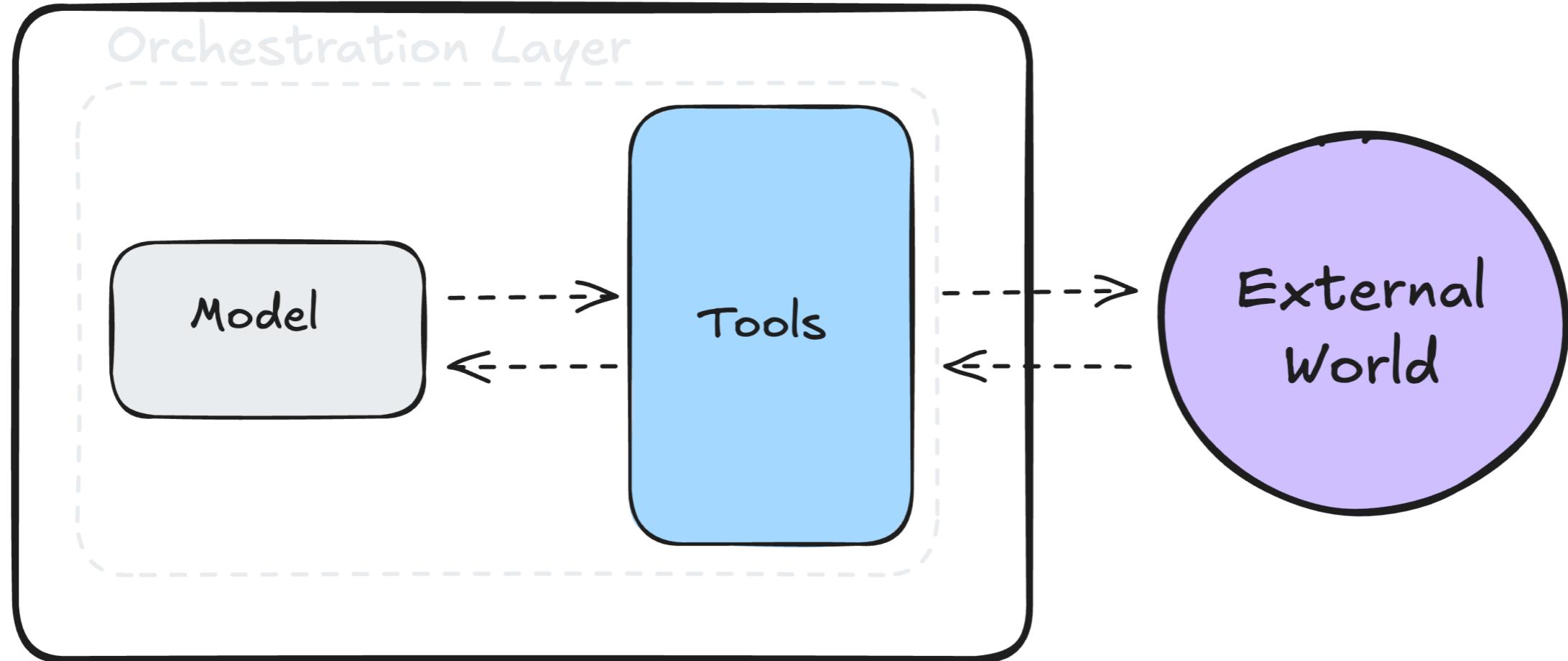
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The Agentic Trinity: Tools



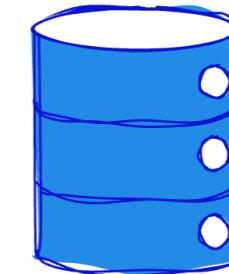
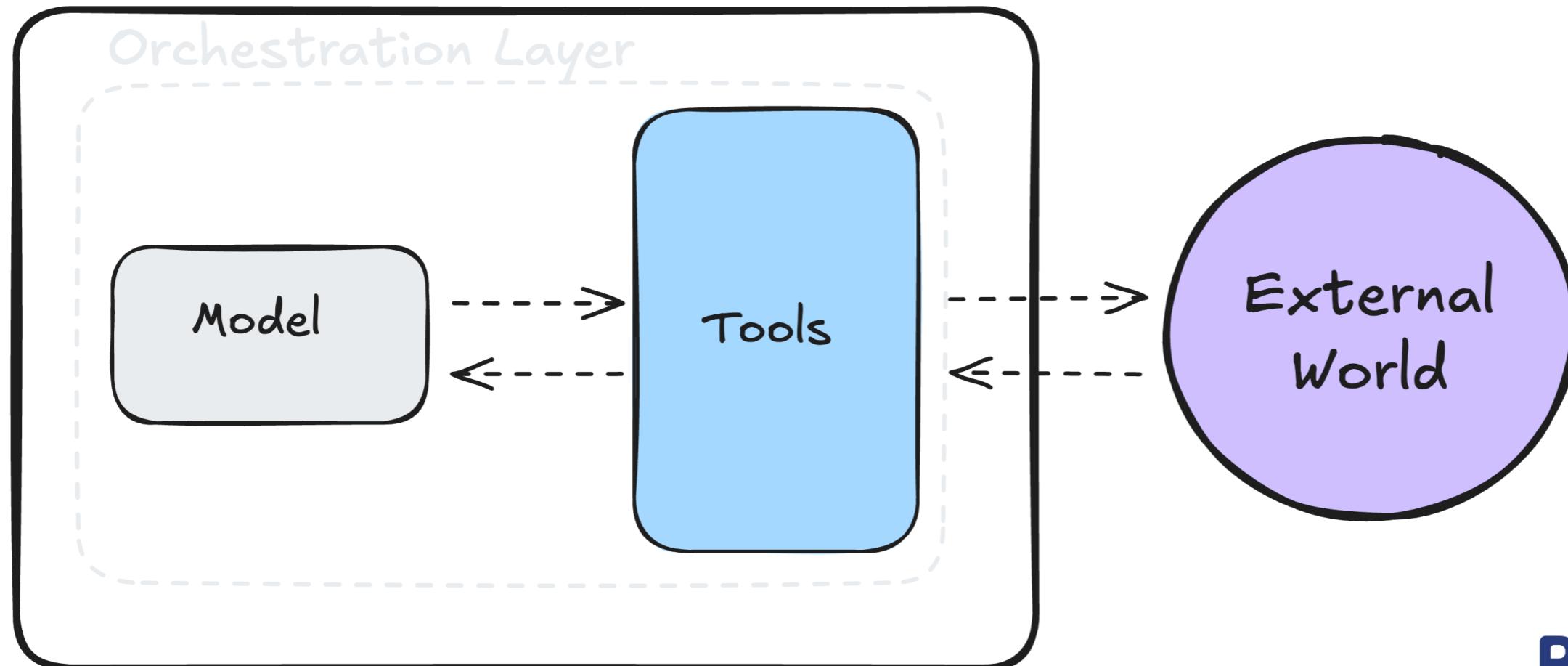
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The Agentic Trinity: Tools



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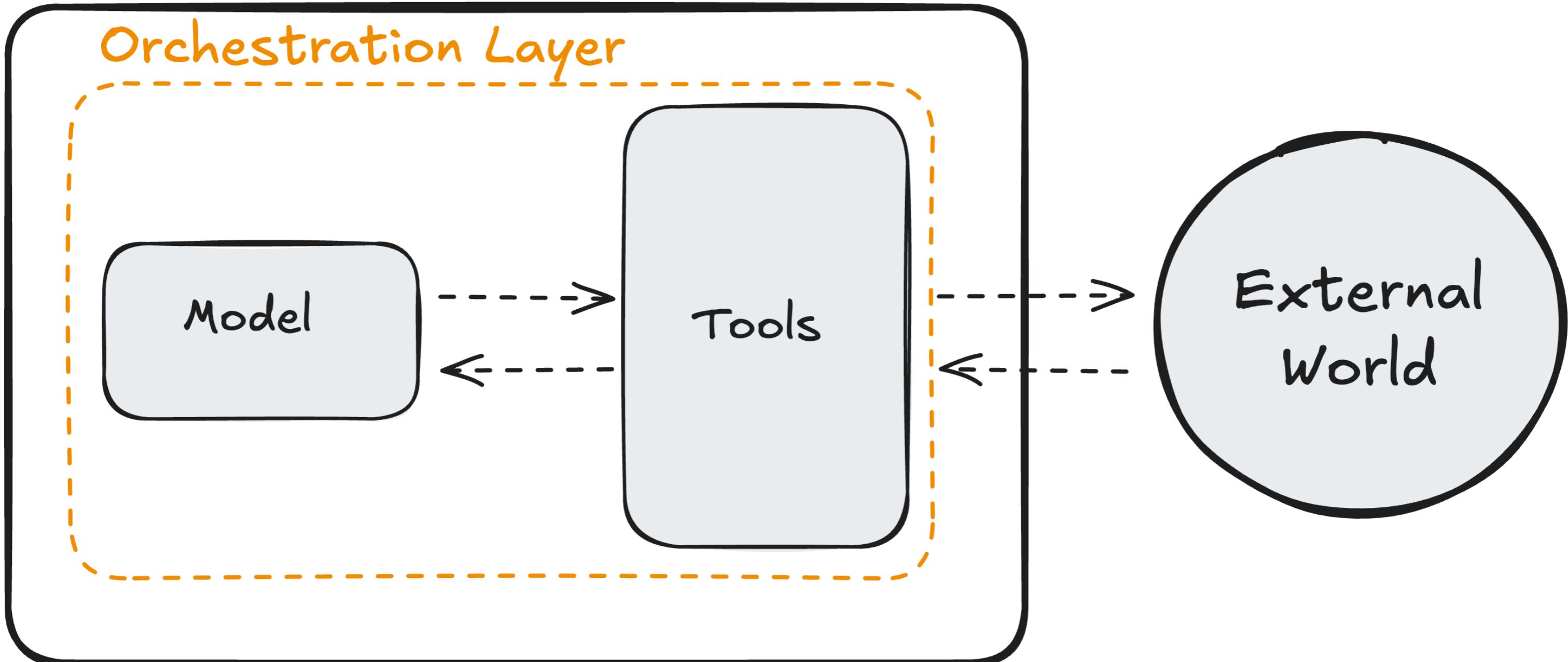
The Agentic Trinity: Tools



Booking.com

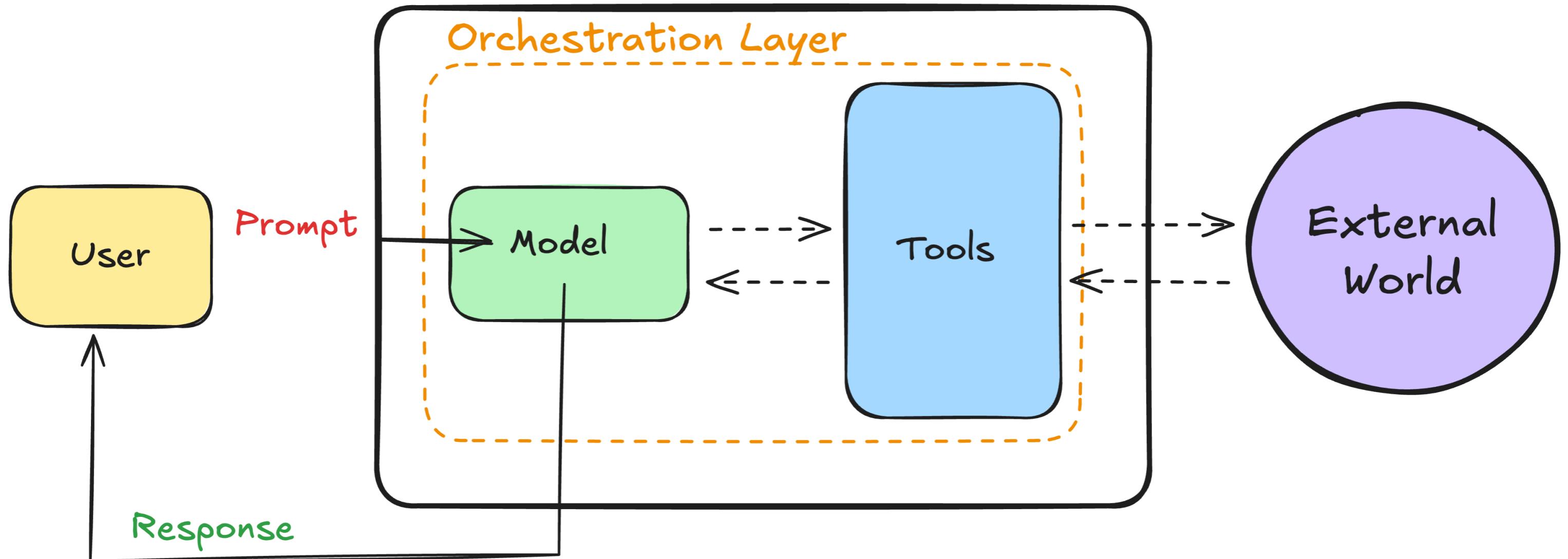
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The Agentic Trinity: Orchestration



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The Agentic Trinity: Orchestration



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Let's Practice!

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To Agent or Not to Agent?

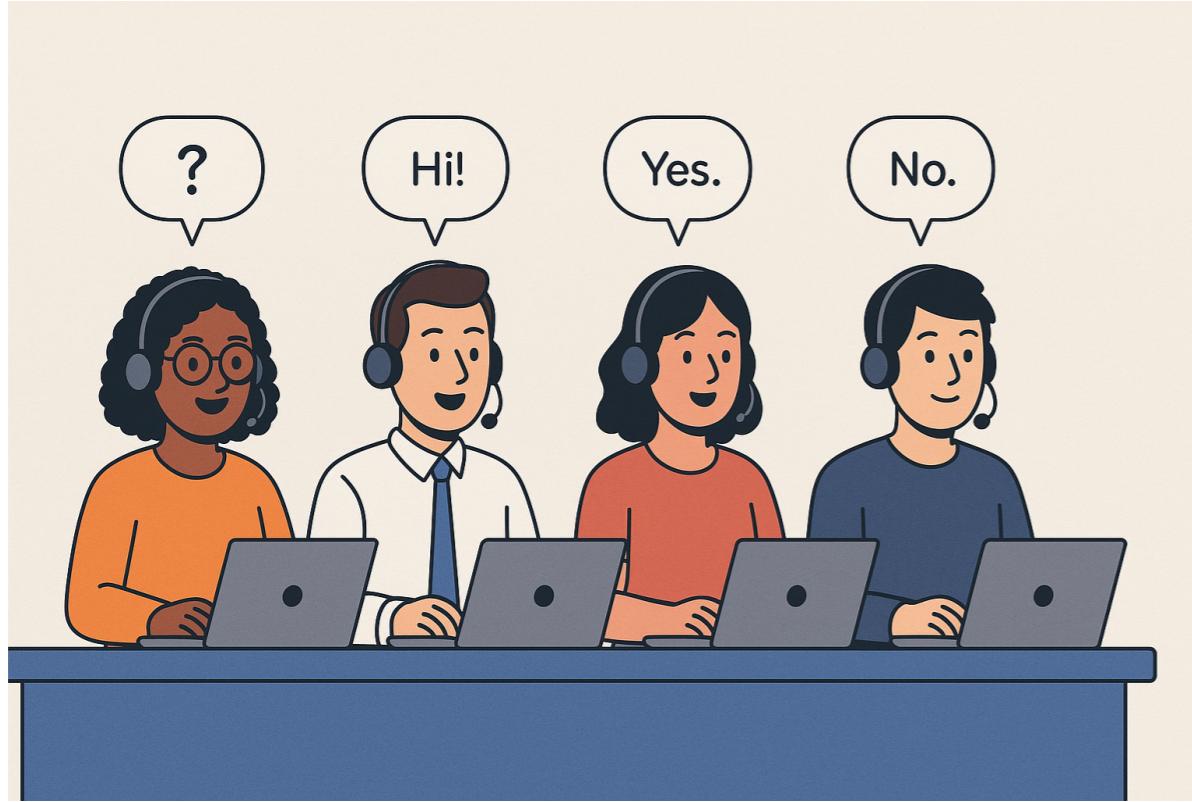
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A Tale of Two Customer Support Teams



- "*How do I track my order?*"
- "*How do I return an item?*"
- "*How do I change my shipping address?*"

- "*I was charged twice, but one order was cancelled, and I have store credit from a previous return that wasn't applied correctly*"

¹ Image generated with GPT-4o

The Tale of Customer Support Team A

- *"How do I track my order?"*
- *"How do I return an item?"*
- *"How do I change my shipping address?"*

Problem qualities

- They require simple decision-making
- They do not require accessing customer information and history
- They all have discrete, predictable answers

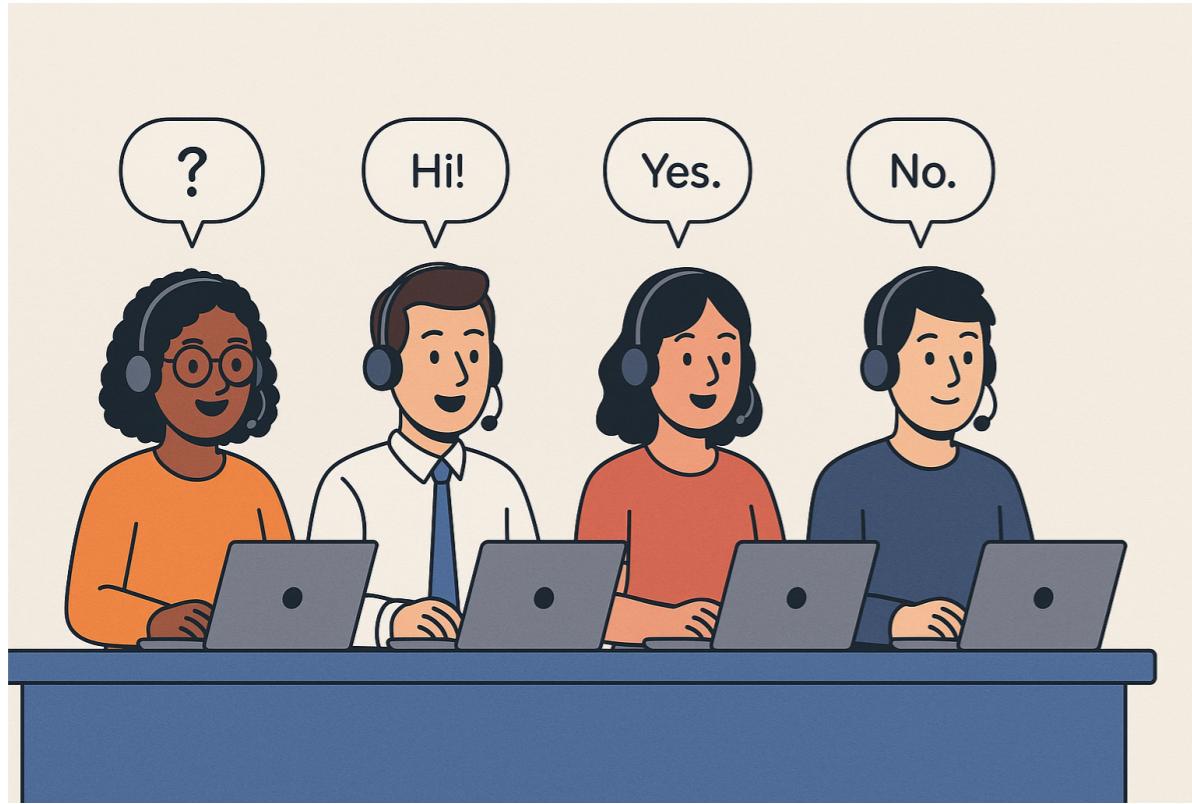
The Tale of Customer Support Team B

"I was charged twice, but one order was cancelled, and I have store credit from a previous return that wasn't applied correctly."

Problem qualities

- They require complex decision-making
- They require accessing customer information and history
- They require adaptive solutions

A Tale of Two Customer Support Teams



- A simple chatbot trained on pre-trained knowledge.
- No tool use or actions required.

- Agentic solution with tool access
- Can generate remediation strategies and update systems

¹ Images generated with GPT-4o

When to Use AI Agents

Criteria for using AI Agents

1. Require complex decision-making
2. Require heavy reliance on unstructured data
3. Have difficult to maintain rules
4. Require adaptive problem solving

Examples of agentic use cases

1. Autonomous customer support systems
2. Coding assistants that can read code bases, provide updates, and implement them automatically
3. A deep research assistant that can synthesize research

The AI Agents Tooling Ecosystem

The AI Agents Tooling Ecosystem

Off the shelf tools



The AI Agents Tooling Ecosystem

Off the shelf tools



Low-code / No-code tools



The AI Agents Tooling Ecosystem

Off the shelf tools



Low-code / No-code tools



AI agent frameworks



The AI Agents Tooling Ecosystem

Off the shelf tools



Focused on specific domains
Easy to use
Not customizable

Low-code / No-code tools



Can expand to multiple domains
Accessible
Customizable to a degree

AI agent frameworks



Scalable to all domains
Higher barrier to entry
Highly customizable

Build vs Buy: A Framework

Off-the-Shelf Tools

Tackling a specific domain or use-case (e.g. AI-assisted coding)

Mature, well-tested solution already exists in market

Want to minimize maintenance overhead

Build vs Buy: A Framework

Off-the-Shelf Tools	Low-Code/No-Code Platforms
Tackling a specific domain or use-case (e.g. AI-assisted coding)	Need some customization but not complete control
Mature, well-tested solution already exists in market	Workflows are moderately complex but follow common patterns
Want to minimize maintenance overhead	Want business users to modify the agent without engineering help
	Need to integrate with existing systems quickly

Build vs Buy: A Framework

Off-the-Shelf Tools	Low-Code/No-Code Platforms	Agent Frameworks (Build)
Tackling a specific domain or use-case (e.g. AI-assisted coding)	Need some customization but not complete control	Use case involves proprietary systems
Mature, well-tested solution already exists in market	Workflows are moderately complex but follow common patterns	Handling sensitive data
Want to minimize maintenance overhead	Want business users to modify the agent without engineering help	Agent is core to competitive advantage
	Need to integrate with existing systems quickly	No existing solution meets specialized requirements
		Need complete control over agent's behavior and evolution

Let's Practice!

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