

Understanding the AIS Problem Space

What problems are we solving? a non-technical presentation

We often got stuck at the beginning of the discussion!

AI chatbot

AI assistant

AI copilot

AI agent

Autonomous agent

Agentic workflow

AI operator

AI.....

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AI.....

Because we are confused by these definitions

We often got stuck at the beginning of the discussion!

chatbot
assistant
copilot
agent

agent
workflow
operator

But we do understand these words!

We often got stuck at the beginning of the discussion!

AI chatbot: refers to the modality of communication

AI assistant

AI copilot

AI agent

Autonomous agent

Agentic workflow

AI operator

AI.....

We often got stuck at the beginning of the discussion!

AI chatbot

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AI copilot

refers to the relation to human owners

AI agent

Autonomous agent

Agentic workflow

AI operator

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Autonomous agent

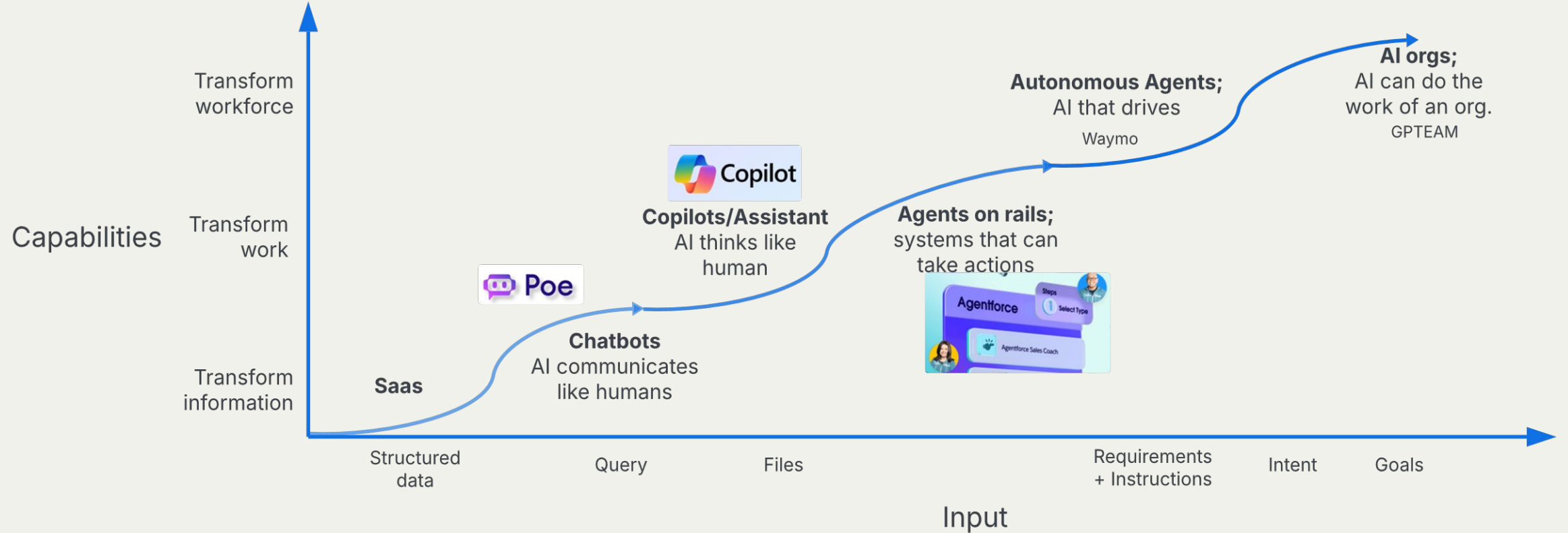
Agentic workflow

AI operator

AI.....

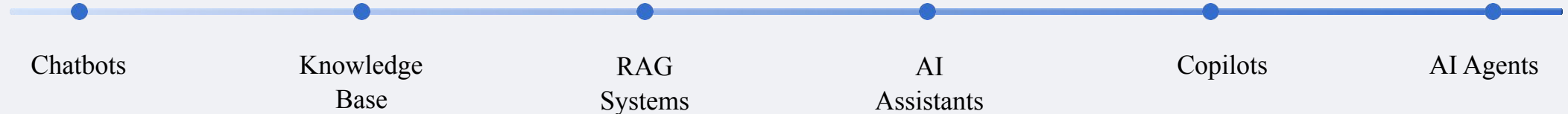
These are hardly technical terms!

As AI technologies evolve, the level of AI autonomy and agency will continue to increase. Types of AI techs will proliferate.

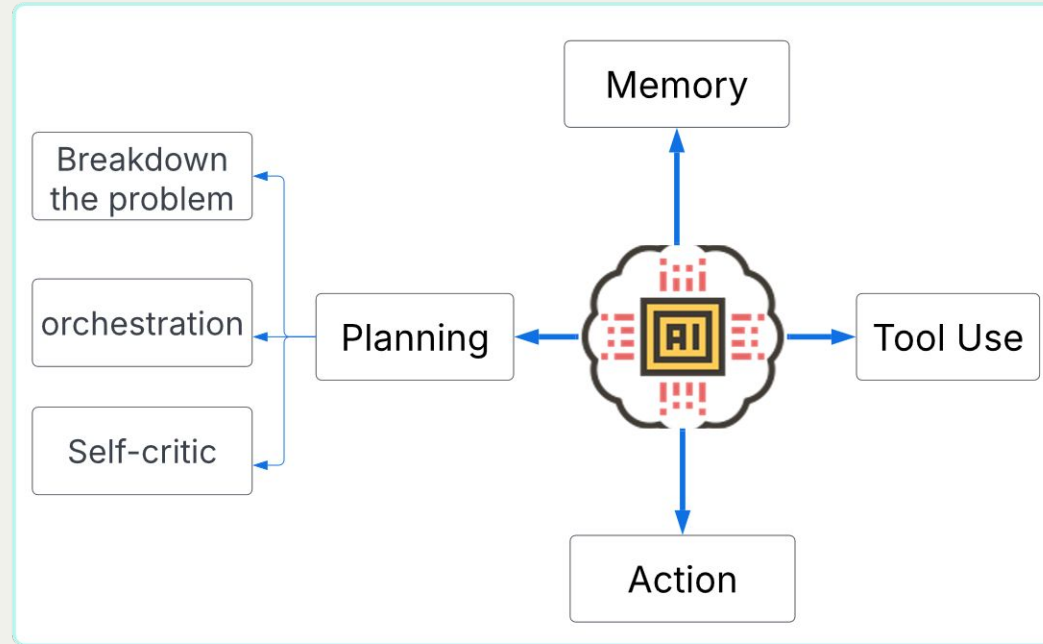


The AI Technology Spectrum

- AI technologies exist on a spectrum from simple to complex
- Each technology serves different purposes and solves different problems
- Technologies often build upon each other's capabilities
- Understanding **commonality** is more important than the delineation



They all come from a simple building unit



AI Tech: The Gradient of Cognitive Architecture

	Approach	Use case	Reasoning	External memory	Execution	Planning	Example
Agents	Few-shot prompting	Q&A	✓	✗	✗	✗	ANTHROPIC
	RAG	Search	✓	✓	✗	✗	🍀 Sana
		Synthesis	✓	✓	✗	✗	📊 EvenUp
		Generation	✓	✓	✗	✗	🐙 GitHub Copilot
	Advanced RAG	Tool use	✓	✓	✓	✗	omni
	Decisioning agent	Decisioning	✓	✓	✓	✓	🏢 Anterior
	Agent on rails	Task automation	✓	✓	✓	✓	🌿 SIERRA
	General AI agent	Process automation	✓	✓	✓	✓	🍀 Cognition

Future Trends & Convergence

- Increasing autonomy across all AI technologies
- Blurring boundaries between assistants, copilots, and agents
- Integration of RAG capabilities into agents for better decision-making
- Evolution toward multi-agent systems working collaboratively
- Improved reasoning capabilities through advanced AI techniques

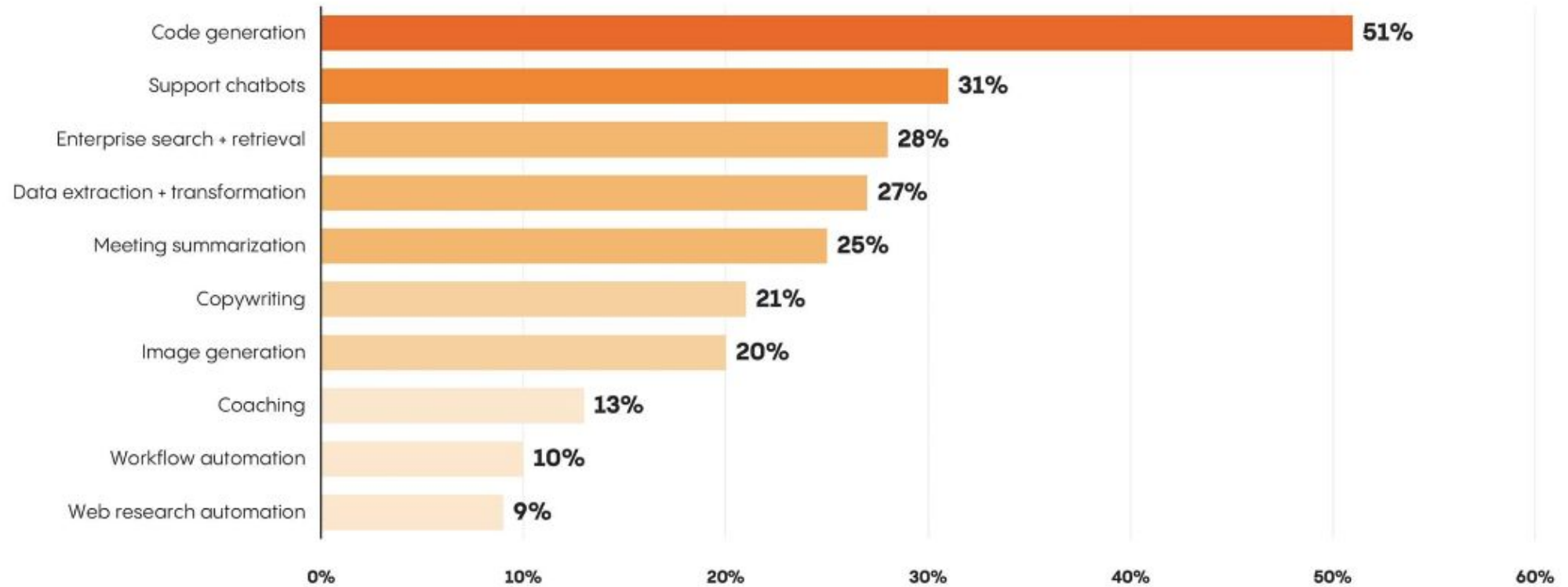


Convergence of Technologies

All AI technologies will increasingly incorporate elements from each other, leading to integrated systems combining the best capabilities of each approach.

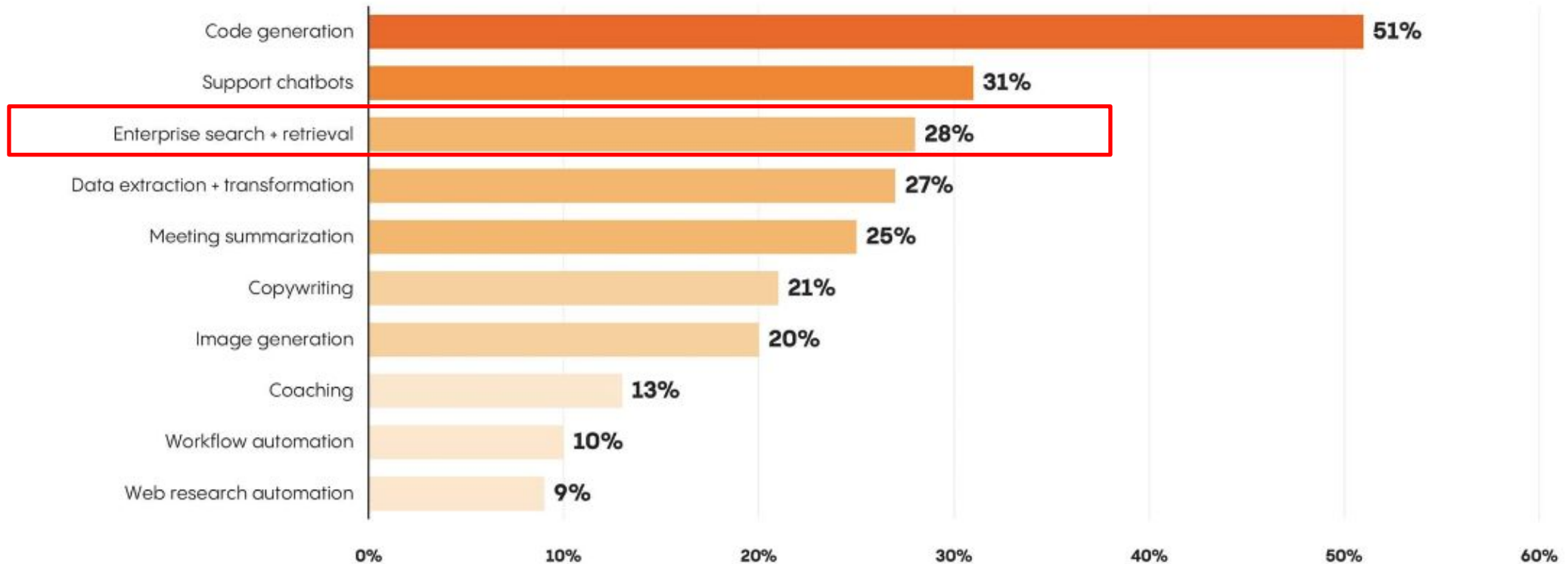
AI Use Case

Dominant Generative AI Use Cases



AI Use Case For Navigate: Search + Retrieval

Dominant Generative AI Use Cases



Selected AI Use Case Problem For Navigate: Data Access Control

Relevance of selected responsible AI risks for organizations by region

Source: Global State of Responsible AI report, 2024 | Chart: 2024 AI Index report

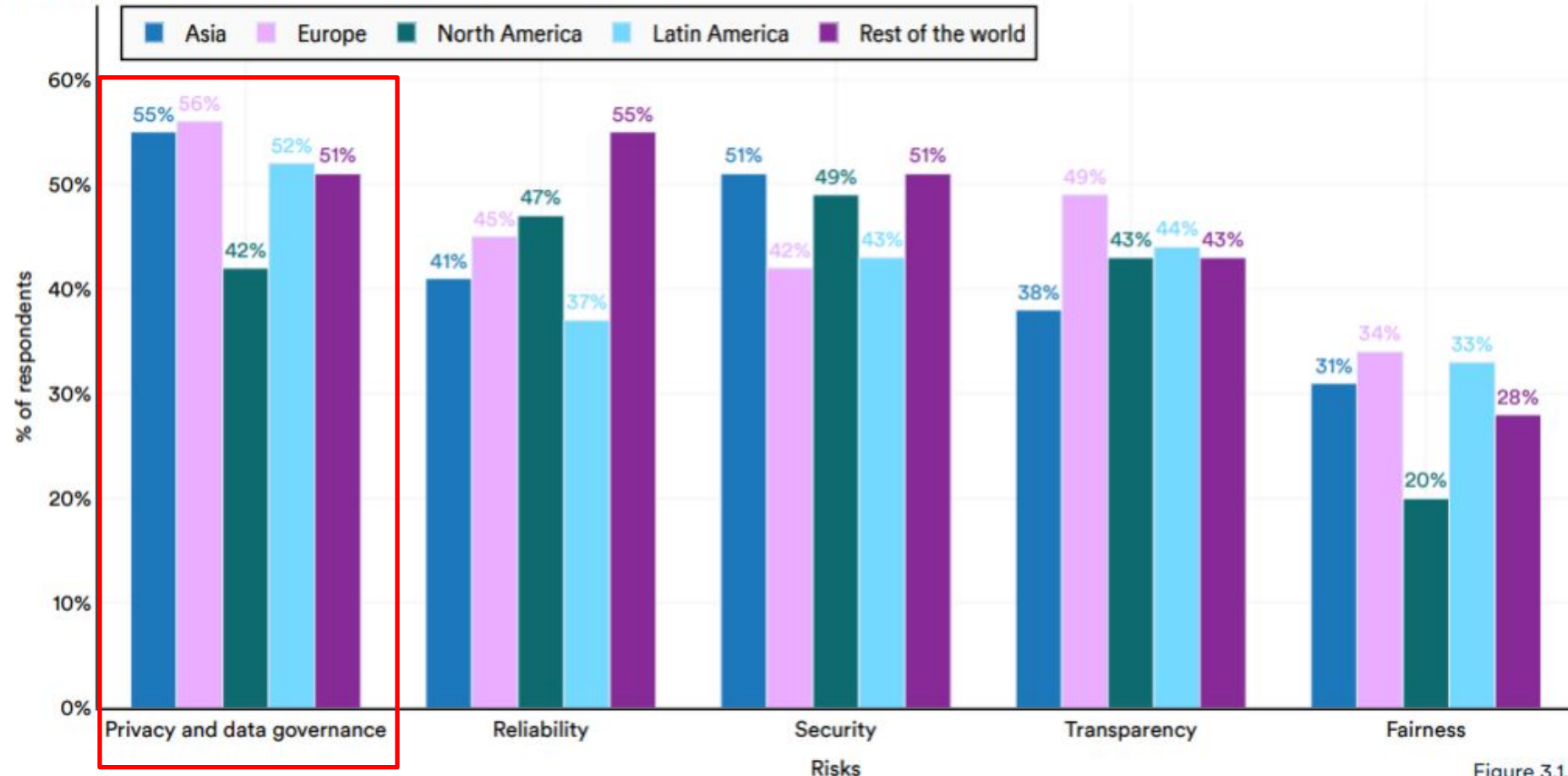
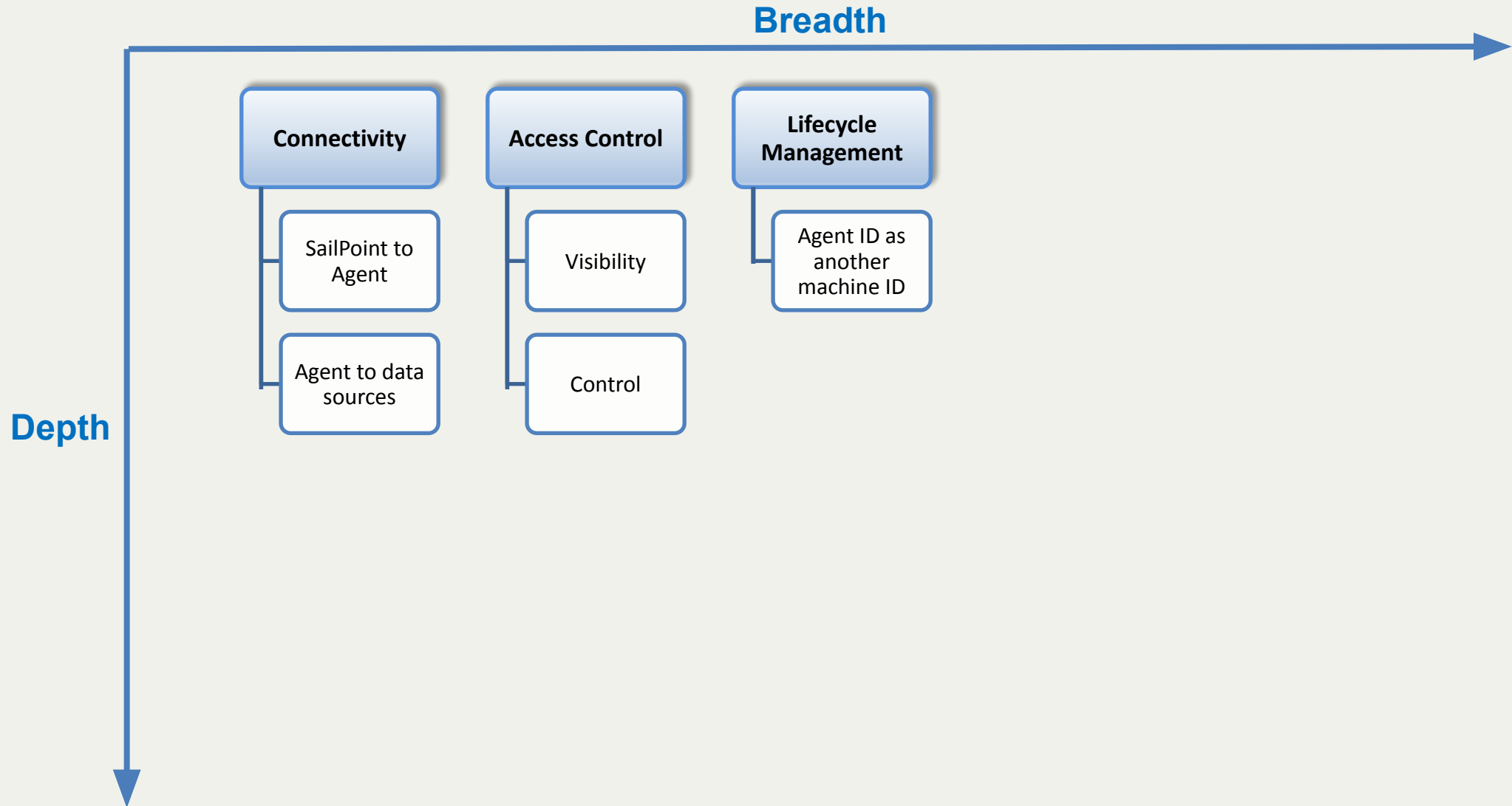


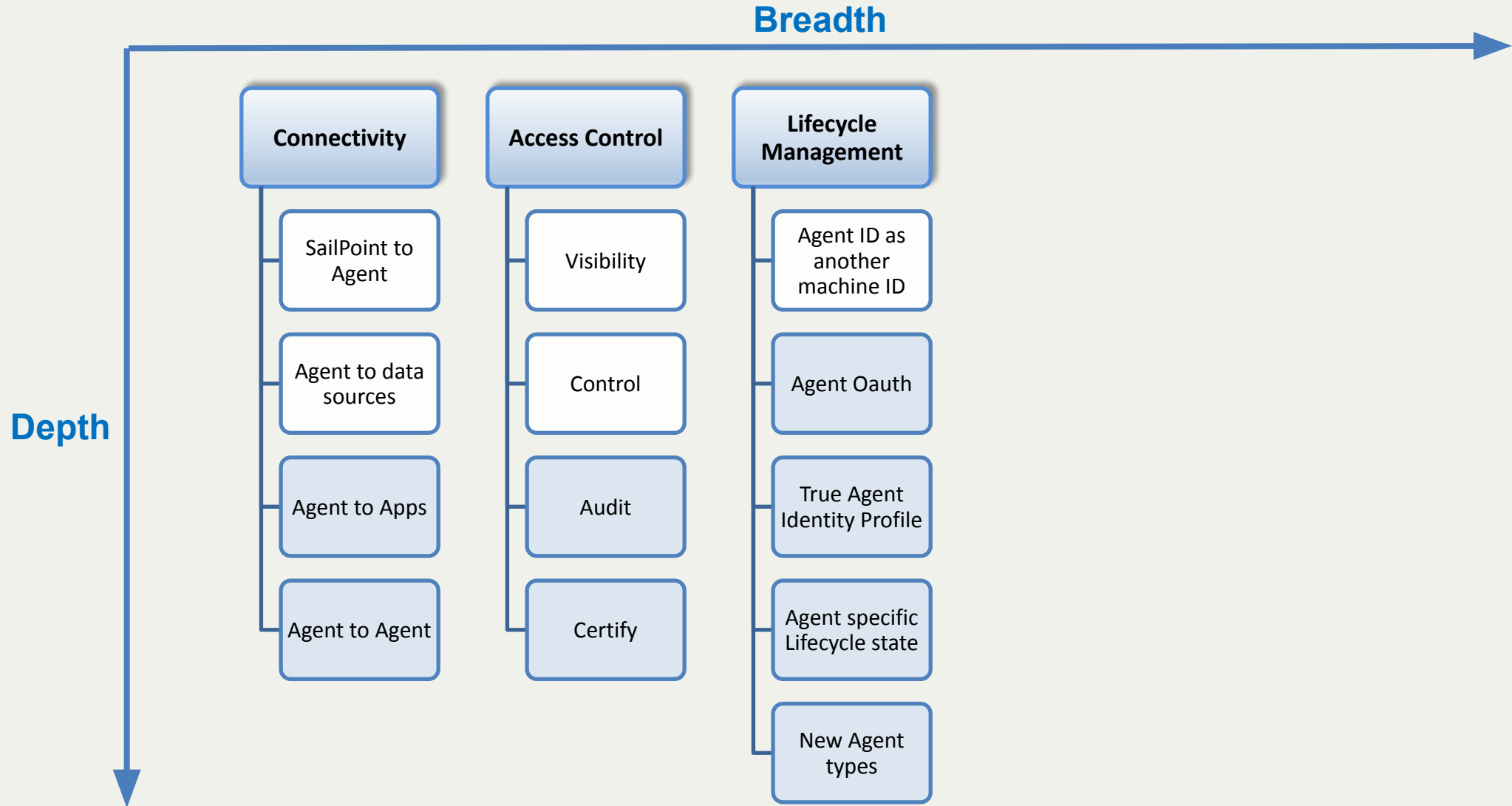
Figure 3.1.5

Note: Not all differences between regions are statistically significant.

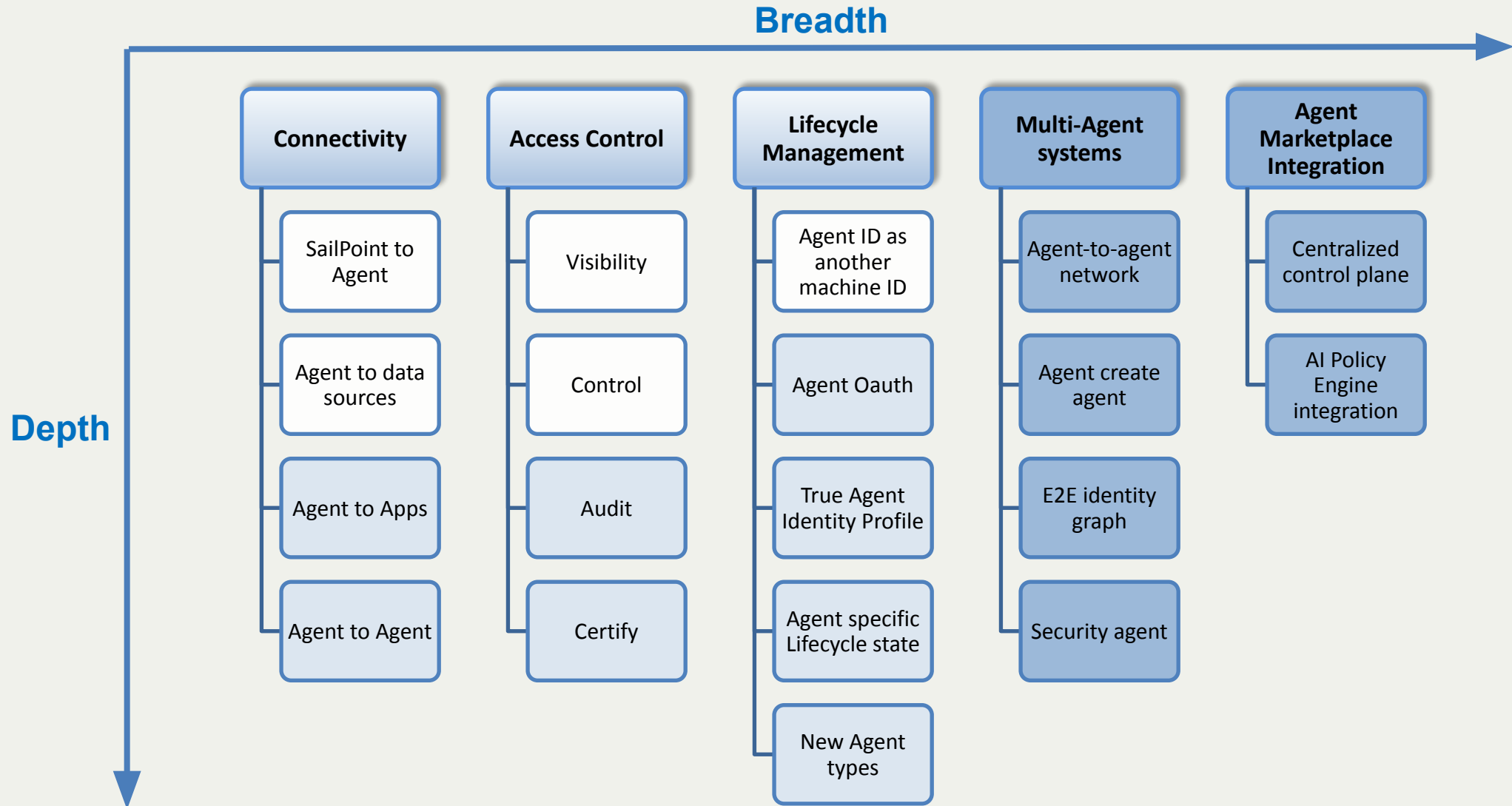
Feature Map: Navigate – Use Case 1



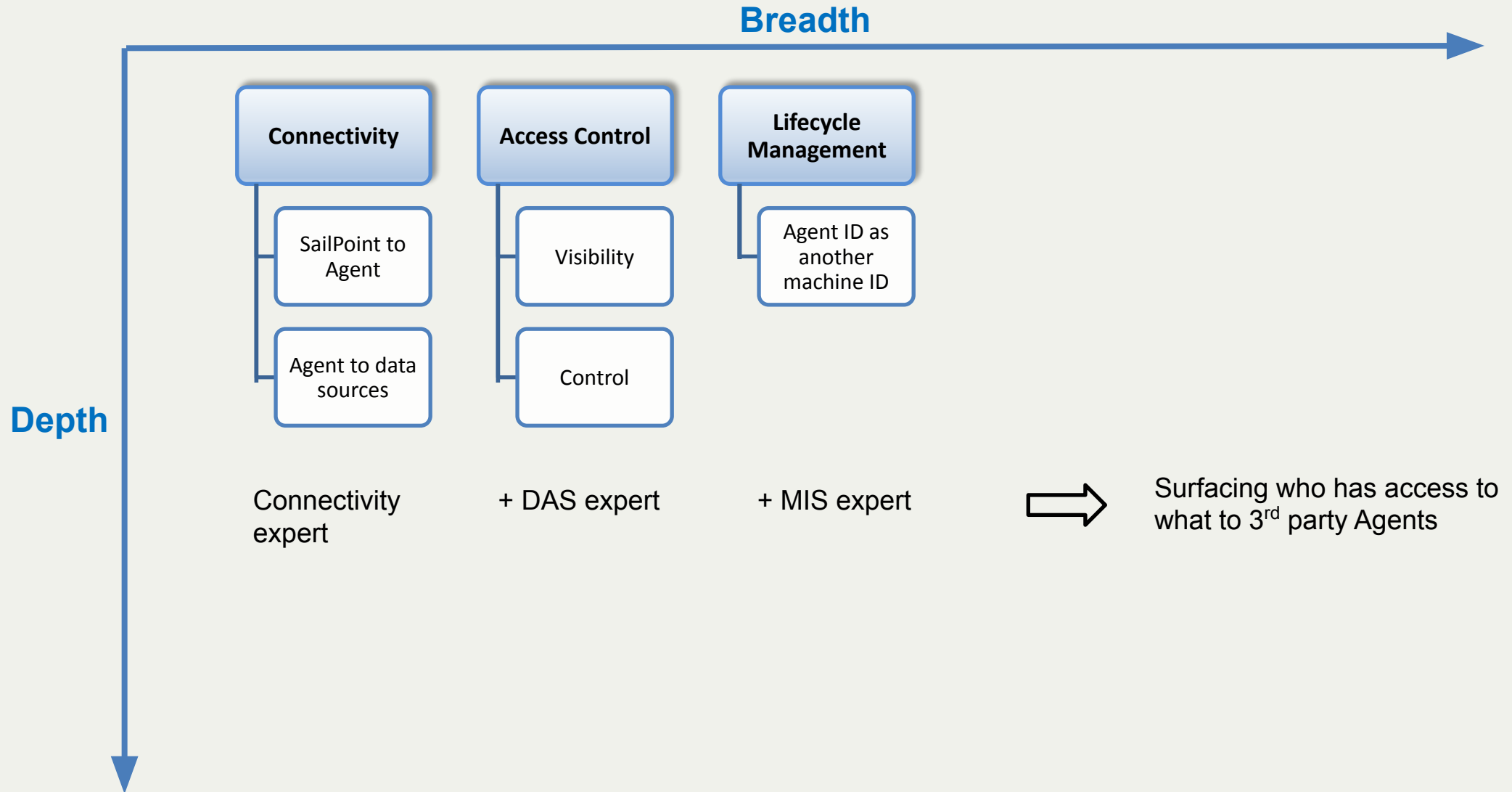
Navigate Quick Follows: Full Featured Non-networking Agent Identity Security



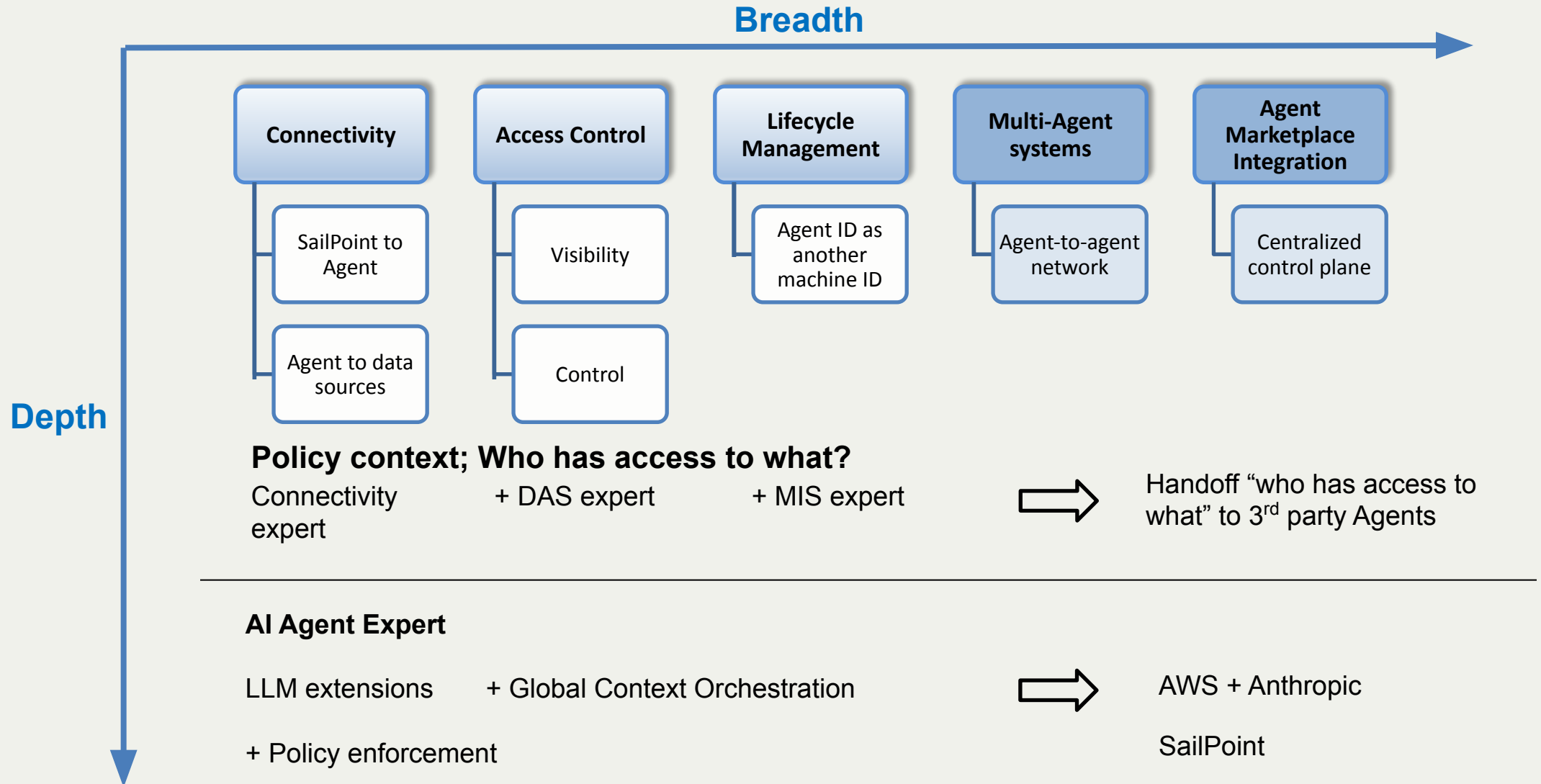
Future Roadmap: Agent Networking & Agent Marketplace



Solving the problem: What do we need? (For Navigate Use Case 1)



Solving the problem: What do we need? (For Navigate Use Case 1)



Product Demo

Appendix

Introduction to AI Technologies

- AI technologies are evolving rapidly with overlapping terminology
- Understanding the differences is crucial for strategic implementation
- This presentation will clarify the distinctions between key AI technologies
- We'll explore capabilities, use cases, and business impact of each technology

AI Agents

Copilots

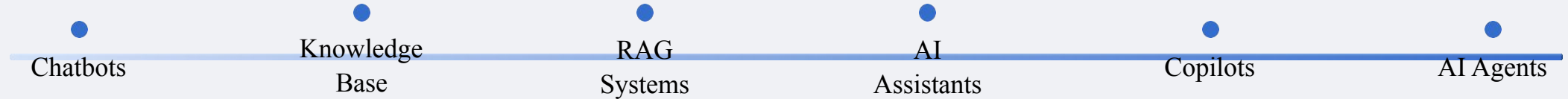
AI Assistants

RAG
Systems

Chatbots

The AI Technology Spectrum

- AI technologies exist on a spectrum from simple to complex
- Each technology serves different purposes and solves different problems
- Technologies often build upon each other's capabilities
- Understanding where each fits helps with strategic implementation decisions

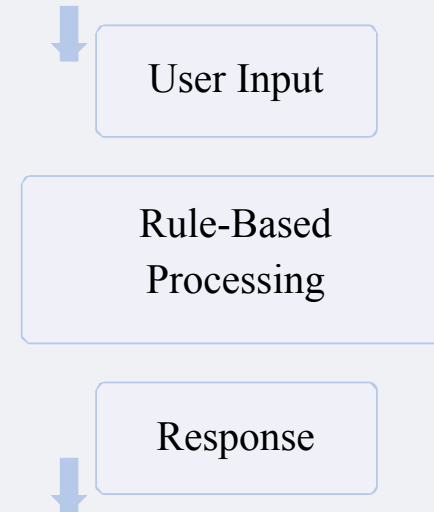


Examples

Type	Key Features	Primary Use Cases	Examples
AI Agent	<ul style="list-style-type: none">- Autonomous decision-making- Proactive goal pursuit- Tool orchestration- Iterative planning and reasoning	Complex workflows (e.g., supply chain management, fraud detection)	IBM Watson, OpenAI Codex[6][7]
AI Assistant	<ul style="list-style-type: none">- Personalization- Multitasking- General-purpose support	Daily productivity tasks (e.g., reminders, search assistance)	Siri, Google Assistant[3][4]
Chatbot	<ul style="list-style-type: none">- Rule-based interactions- Conversational interface- Limited scope	Customer support (e.g., FAQs, troubleshooting)	Zendesk, Drift[3][4]
Copilot	<ul style="list-style-type: none">- Collaborative augmentation- Human-in-the-loop- Task-specific expertise	Assisting in professional/creative tasks (e.g., coding, writing)	GitHub Copilot, Atom Assist[3][5]

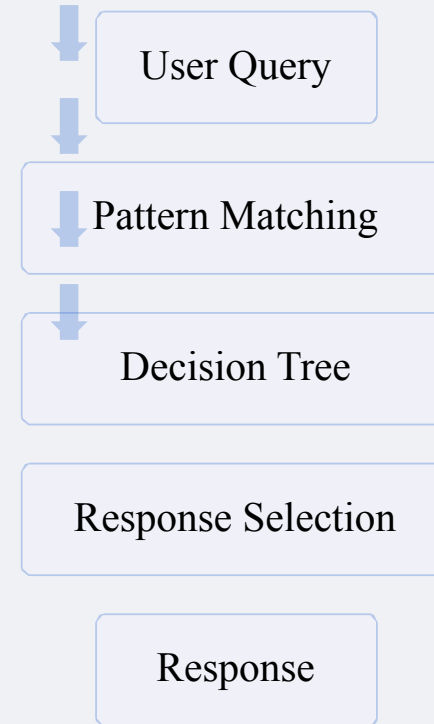
Starting Simple: What is a Chatbot?

- Chatbots: Conversational interfaces designed for specific interactions
- Follow predefined patterns and decision trees
- Limited to scripted responses and simple query handling
- Examples: Customer service bots, FAQ bots, simple virtual assistants



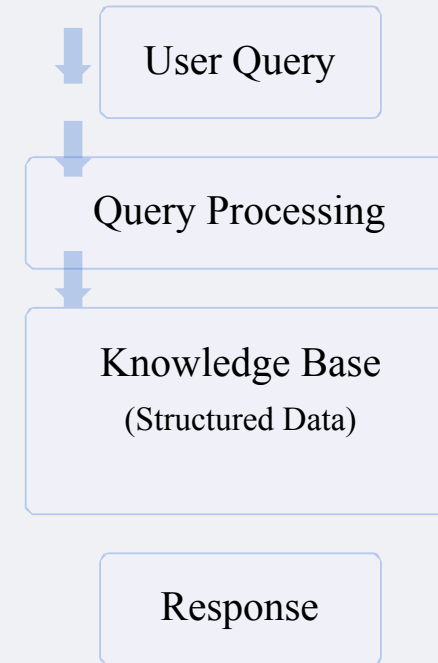
Non-AI Chatbot Architecture

- Simple rule-based or pattern-matching systems
- Predefined conversation flows and decision trees
- Limited or no memory of previous interactions
- Typically domain-specific with narrow capabilities

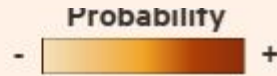


Knowledge Base Systems

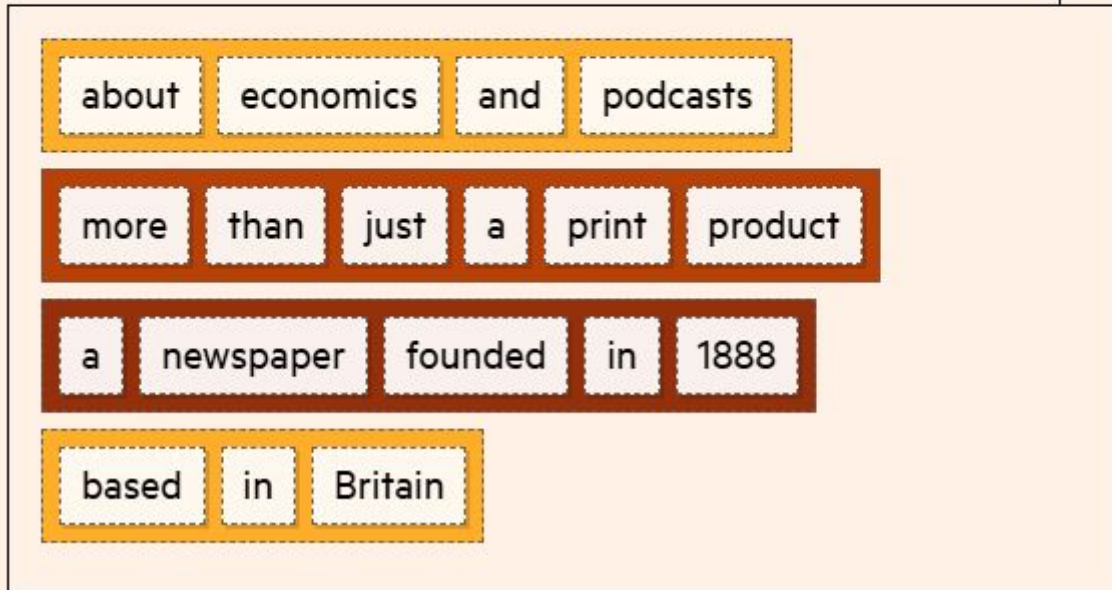
- Structured repositories of information
- Designed for predictable, static queries
- Provide consistent, accurate responses within their domain
- Limited to information explicitly stored in the system



What is LLM?



The Financial Times is ...

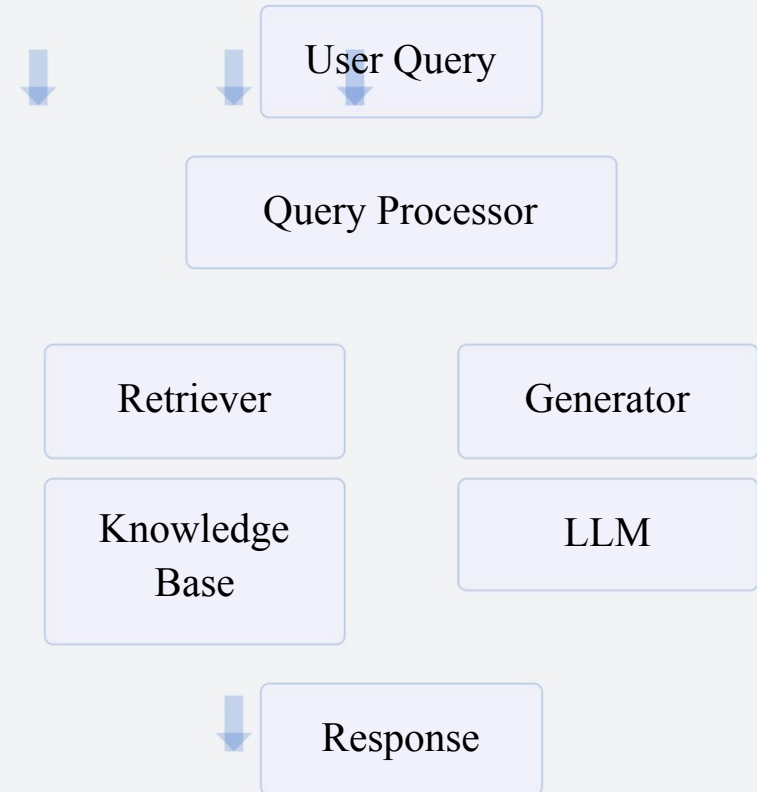


At its simplest, the model's aim is now to predict the next word in a sequence and do this repeatedly until the output is complete.

<https://ig.ft.com/generative-ai/>

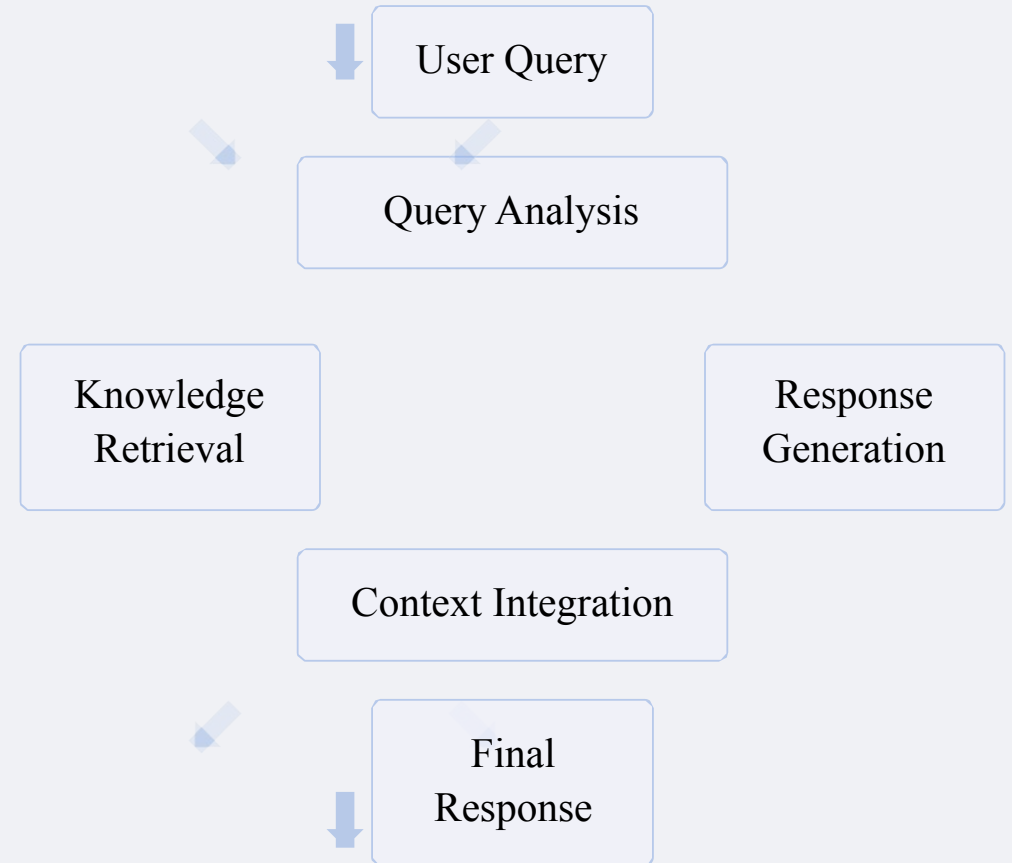
Retrieval-Augmented Generation (RAG)

- Enhances LLMs by retrieving relevant information from knowledge sources
- Combines **retrieval-based methods** with generation capabilities
- Reduces hallucinations by grounding responses in factual information
- Provides more accurate and contextually relevant responses



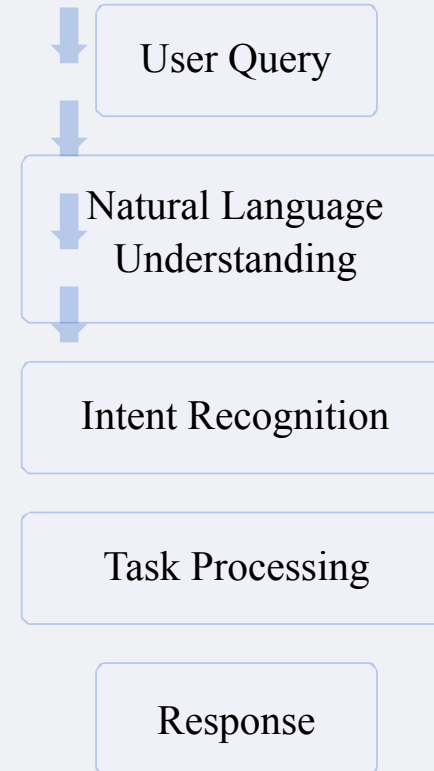
RAG Architecture Explained

- **Retriever:** Searches knowledge base for relevant information
- **Generator:** Uses retrieved information to craft responses
- **Knowledge Base:** External repository of information
- **Query Processing:** Analyzes user input to determine information needs



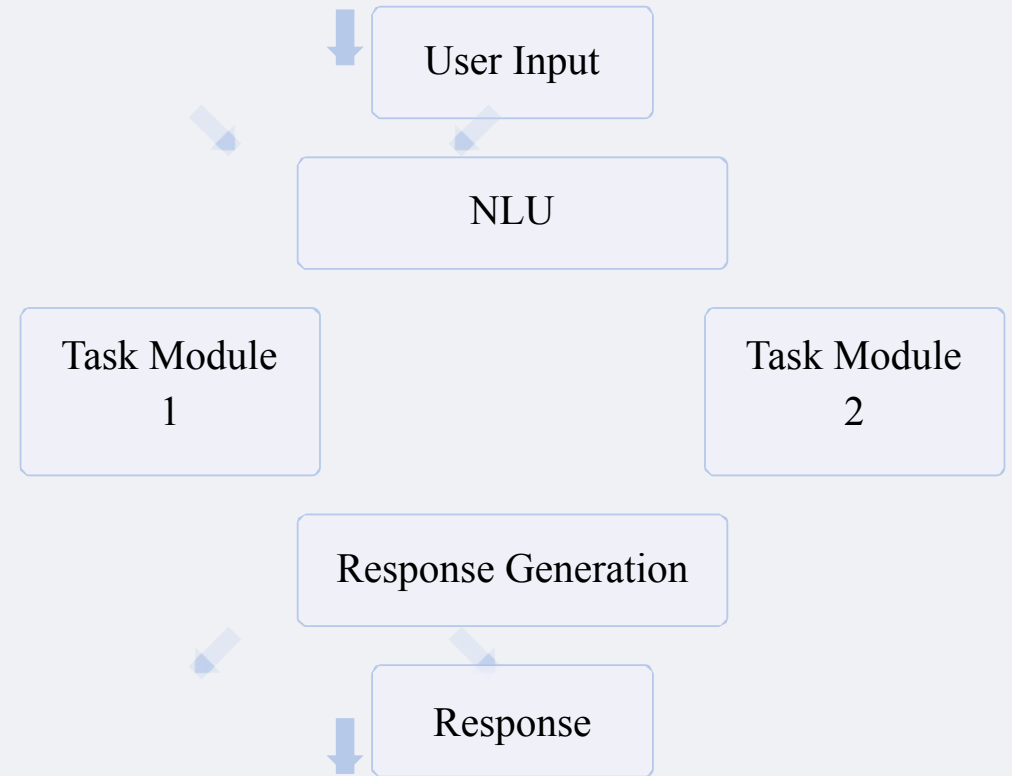
AI Assistants: Beyond Simple Chatbots

- Reactive systems that respond to user queries and perform specific tasks
- More sophisticated than chatbots with broader capabilities
- Can understand context and maintain some conversation history
- Examples: Siri, Alexa, Google Assistant, customer support assistants



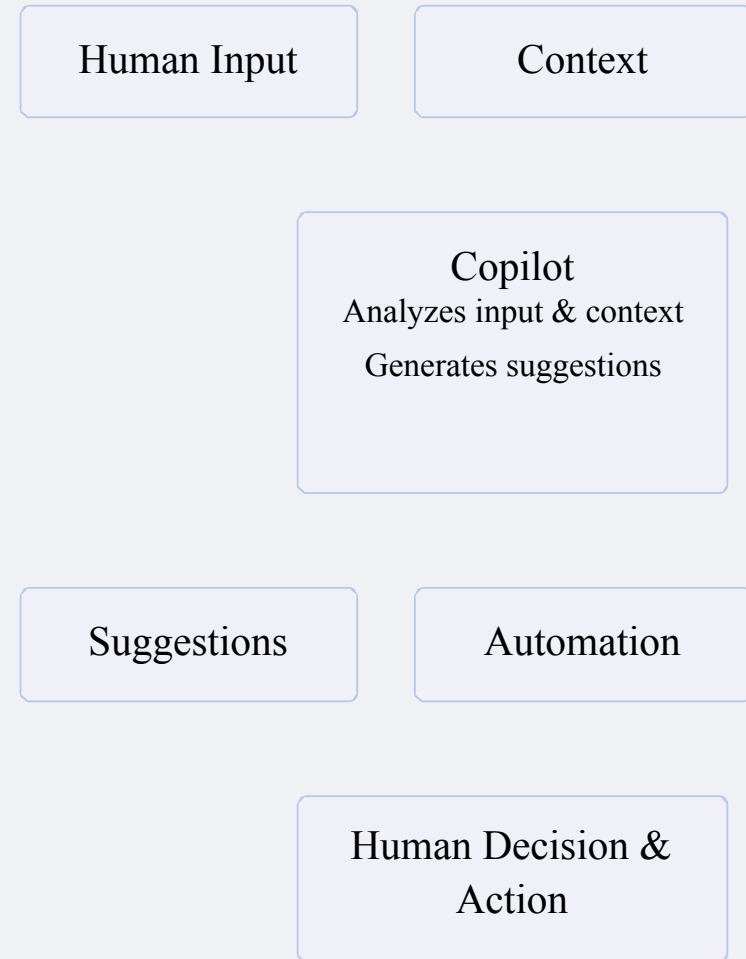
AI Assistant Architecture

- Natural Language Understanding (NLU) for interpreting user requests
- Task-specific modules for different functions
- Limited reasoning capabilities
- Requires explicit instructions to perform actions



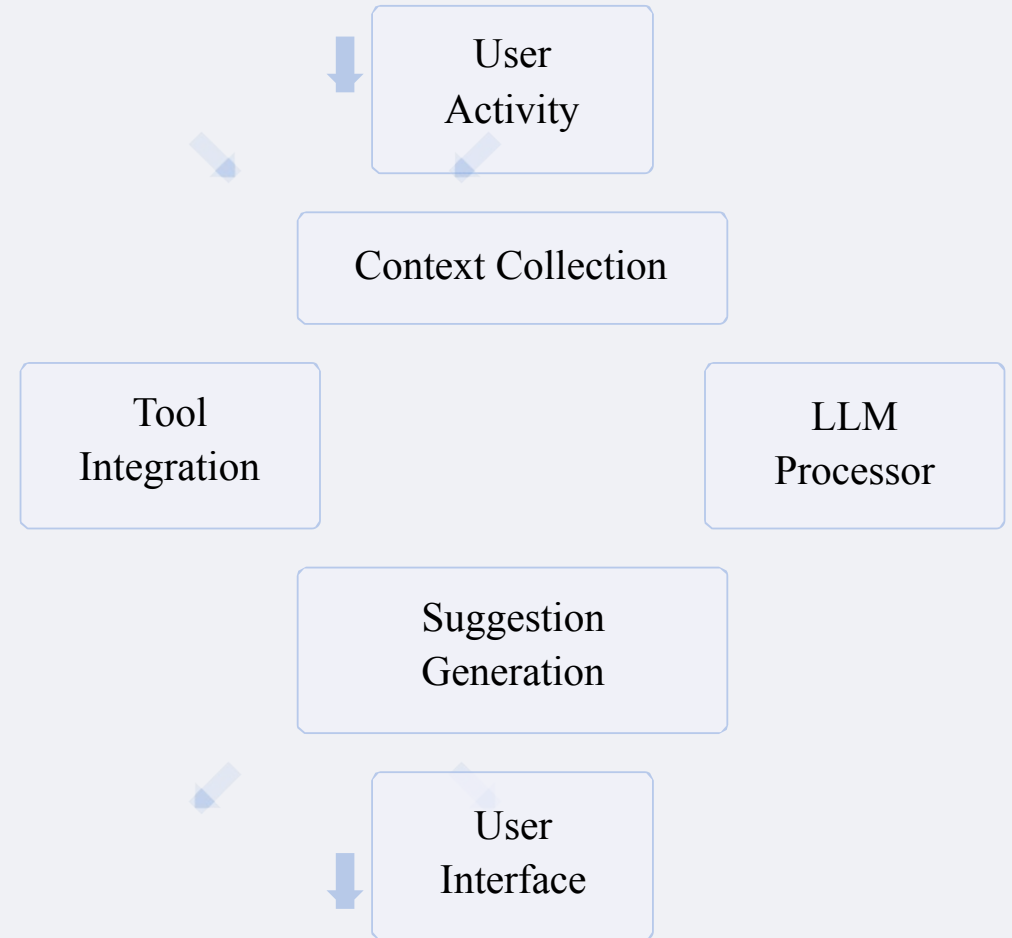
AI Copilots: Collaborative Intelligence

- Support users by providing recommendations and automating tasks
- Work alongside humans rather than independently
- Enhance human capabilities rather than replacing them
- Examples: Microsoft Copilot, GitHub Copilot, coding assistants



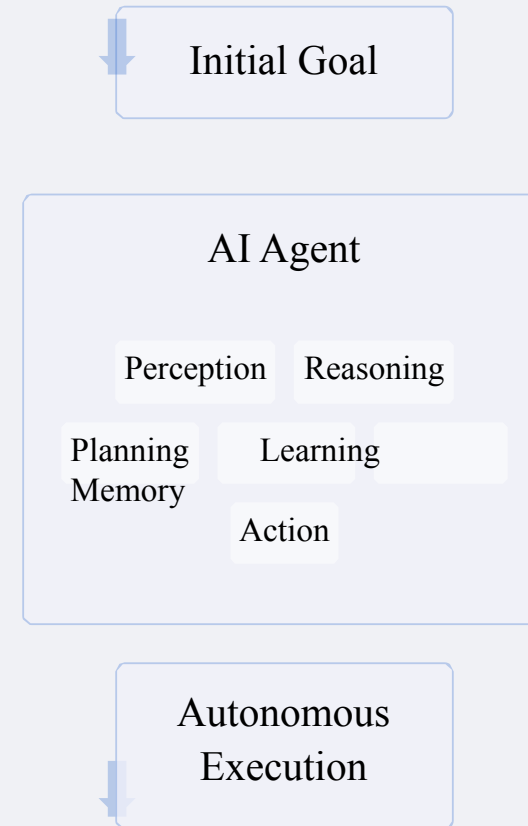
Copilot Architecture

- Context-aware suggestion systems
- Integration with existing tools and workflows
- Learning from user behavior and preferences
- Balancing automation with human control



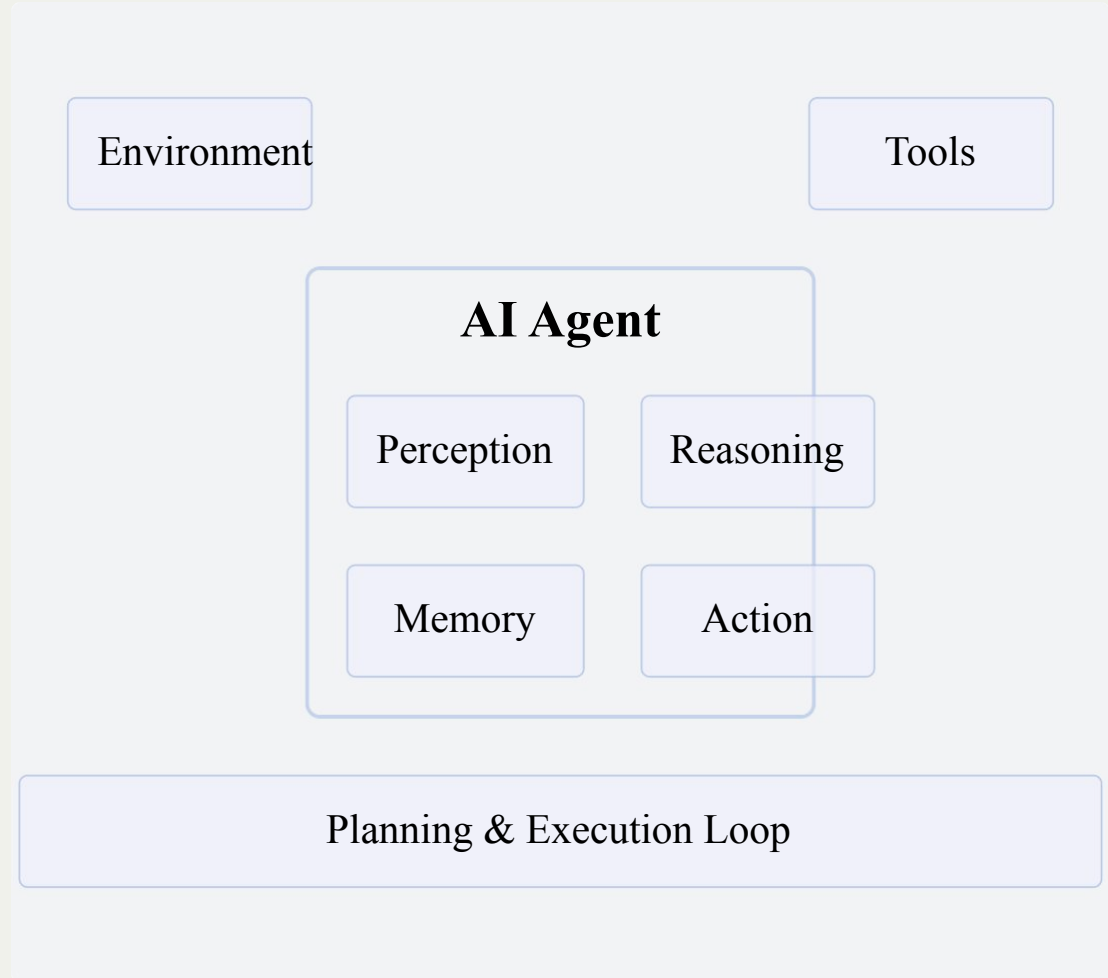
AI Agents: The Next Evolution

- Autonomous systems that perceive environments, make decisions, and take actions
- Goal-oriented behavior with ability to plan and execute multi-step tasks
- Can operate independently after initial prompt
- Examples: Autonomous workflow automation, intelligent process automation



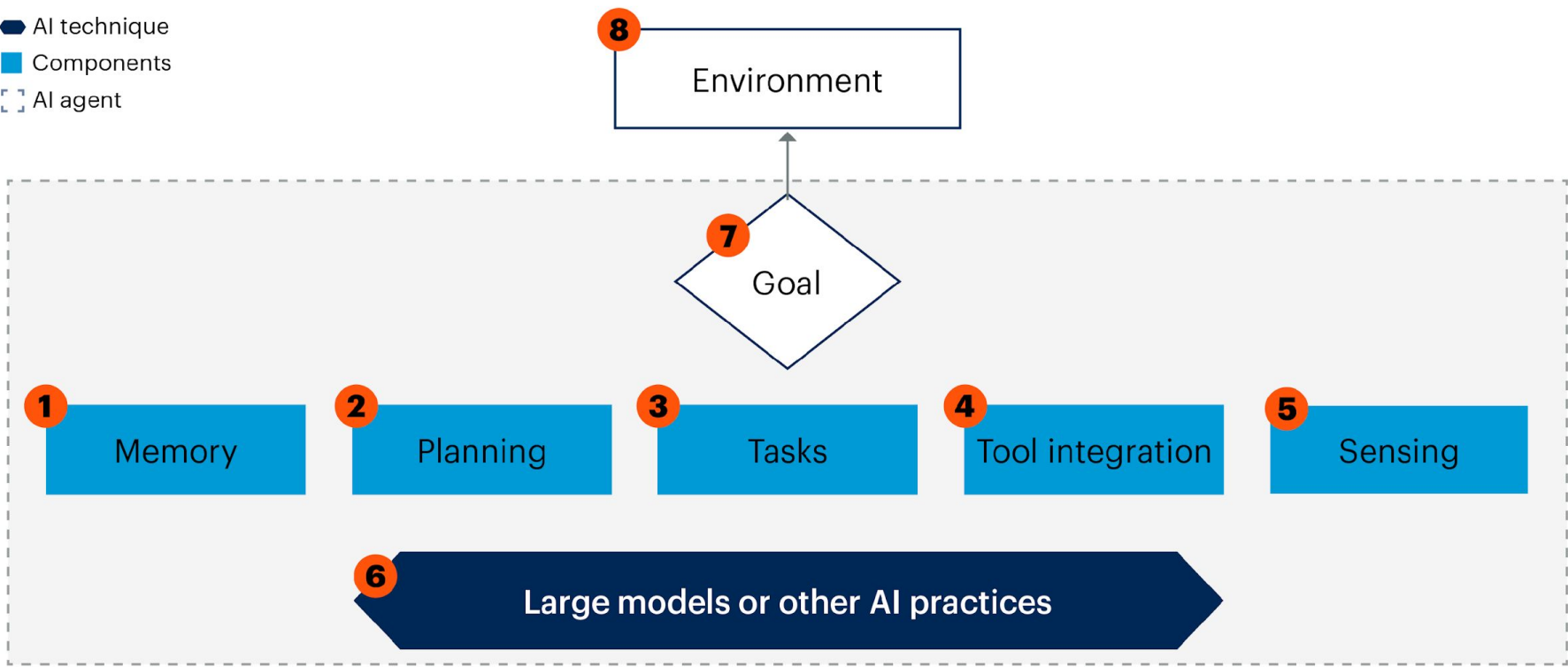
AI Agent Architecture

- Perception: Gathering and interpreting data from environment
- Reasoning: Internal decision-making mechanisms
- Action: Executing decisions through various tools and interfaces
- Memory: Storing and retrieving relevant information



Key Components for Building AI Agents

- AI technique
- Components
- AI agent

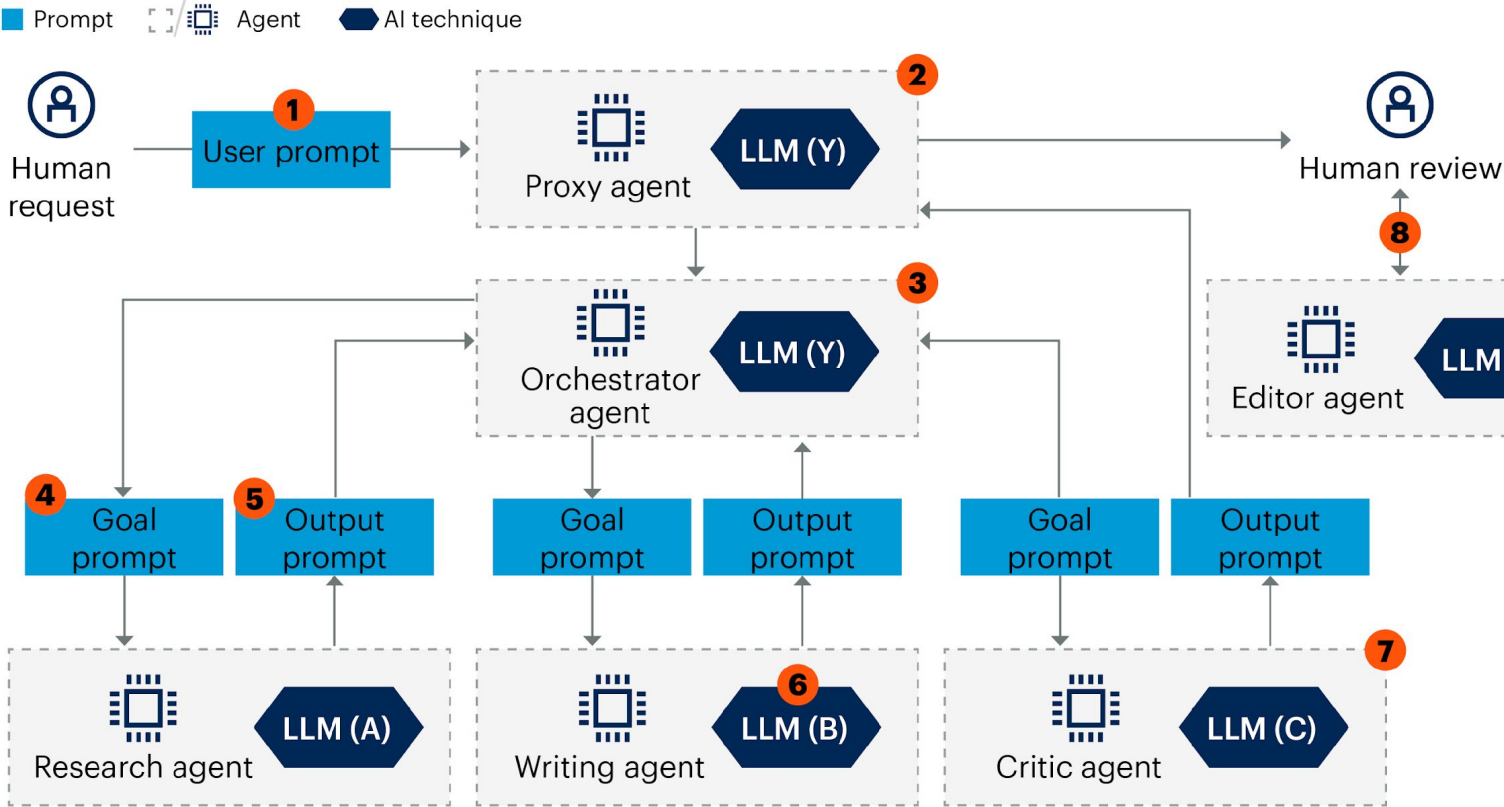


- | | |
|--|--|
| 1 The AI agent's short- and long-term memory | 5 Ability to perceive its surroundings |
| 2 Breaks down the goal into smaller tasks | 6 Large models, small models or other AI practices |
| 3 Current list of tasks for execution | 7 The overall task to be accomplished |
| 4 Agent interacts with various environments | 8 Physical or digital arena the agent will act in |

- 1.Memory: This acts as the AI agent's memory, storing past experiences and task-relevant preferences. It includes short-term memory for interprocess task coordination, long-term information and past actions, and, in some cases, social memory for MAS.
- 2.Planning: This process breaks down the overall goal into sub-goals or user preferences, and leverages historical data and past behavior (retained in memory) to optimize the execution. It includes a self-critique process that uses memory to evaluate past actions.
- 3.Tasks: This is the current list of tasks for the agent to execute and track each task.
- 4.Tool integration: This allows the agent to interact with external tools, including APIs, databases, software services, and hardware. It enhances its ability to manipulate and control its environment.
- 5.Sensing: This provides the agent with the ability to perceive its surroundings by gathering data from text, images, audio, video, and other sources. It includes environmental data or technical data.
- 6.Model(s): This includes large models, small models, or other AI practices that the agent uses to understand natural language, solve problems, and make decisions. Each individual task or sub-task may call to one or more models.
- 7.Goal: This is the overall task the agent is designed to accomplish.
- 8.Environment: This is the physical or digital arena the agent will act in (e.g., robotics or autonomous vehicles, web browsing, or a general-purpose web-client).

Source: Gartner
817826_C

AI Agent Blog Writer Multiagent System



1. User prompt: This example workflow begins with a user request to write a post on a given topic. AI agent workflows may be used to automate the creation of AI agents.
2. Proxy agent: Many AI agent designs and the merging of multiple agents may also include security steps such as guardrails and jailbreak detection.
3. Orchestrator agent: In this example, this agent controls the workflow. The orchestrator agent is aware of the capabilities of other agents. It coordinates the efforts and may check the work of other agents.
4. Goal prompt: In this graphic, the subgoal set by the orchestrator agent combined with the step of prompting the next agent to complete the task are typically in English, with each agent using a large number of instructions.
5. Output prompt: Subagents return their output (in this case, the subject) to the orchestrator agent for review, allowing the orchestrator to coordinate the next step.
6. LLM (B): Note that agents in a MAS may use the same LLM or be designed to work with an LLM or other AI technique that is best suited for the task(s) the agent is designed to accomplish.
7. Output: A common AI agent element is self-reflection or self-critique. In this workflow, the critic agent provides feedback on the notes and may view alternative content suggestions.
8. Collaboration: Humans and AI agents will create coworker relationships. In this workflow, the editor agent helps the human finalize the content.

- | | |
|--|--|
| 1 User requests to write a blog | 5 Subagents return their output |
| 2 Communicates with the human | 6 Agents in a MAS may use different LLMs |
| 3 Coordinates the capabilities of other agents | 7 Self-reflection or self-critique |
| 4 Subgoal is a prompt to the next agent | 8 Human and AI agent coworker relationship |

Types of AI Agents

Simple Reflex Agents

React only to current input without considering history or future states

Model-Based Agents

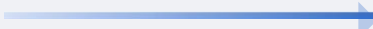
Maintain internal representation of the world to make better decisions

Goal-Based Agents

Work toward specific objectives using planning and searching

Utility-Based Agents

Maximize value of outcomes based on utility functions

Complexity  +

Simple
Reflex

Current input only

Model-
Based

World model

Goal-Based

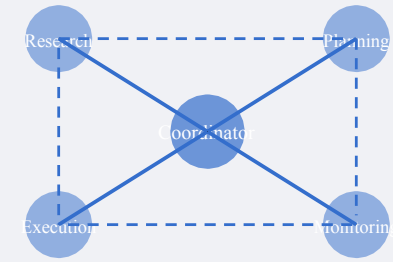
Objective-driven

Utility-
Based

Value optimization

Multi-Agent Systems

- Multiple agents working together to solve complex problems
- Specialized roles and responsibilities
- Communication and coordination between agents
- Greater capabilities than single agents working alone



Key Differences: Autonomy & Decision-Making

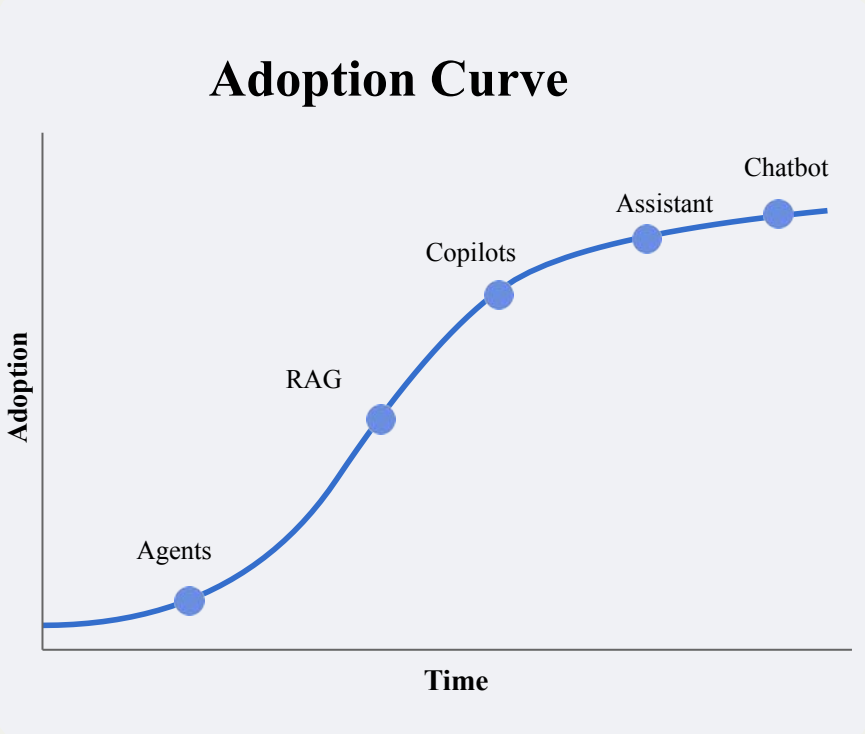
Technology	Autonomy Level	Decision-Making	User Involvement
Chatbots	Low	Rule-based, predefined flows	Continuous interaction required
AI Assistants	Medium-Low	Task-specific, explicit instructions	Direct commands needed
Copilots	Medium	Suggestions requiring approval	Collaborative decision-making
RAG Systems	None (information only)	Information retrieval, no actions	Depends on parent system
AI Agents	High	Independent planning and execution	Initial goals, minimal supervision

Key Differences: Capabilities & Complexity

Technology	Core Capabilities	Technical Complexity	Implementation Challenge
Chatbots	Simple query responses, guided conversations	Low	Simple rule definition
AI Assistants	Task completion, information retrieval, basic reasoning	Medium	NLU training, task integration
Copilots	Context-aware suggestions, workflow enhancement	Medium-High	Tool integration, context handling
RAG Systems	Enhanced information retrieval, factual grounding	Medium-High	Knowledge base management
AI Agents	Complex problem-solving, multi-step task execution, tool usage	High	Reasoning capabilities, autonomy controls

Technology Maturity & Adoption

Technology	Market Maturity	Years at Scale
Chatbots	Mature	10+ years
AI Assistants	Established	5-7 years
Copilots	Emerging	2-3 years
RAG Systems	Emerging	1-2 years
AI Agents	Nascent	<1 year at scale



Business Impact: Customer Experience

Technology	Customer Experience Impact	Typical Improvements
Chatbots	24/7 basic support, reduced wait times	Cost savings of 15-30%
AI Assistants	Personalized interactions, improved self-service	CSAT improvements of 10-20%
Copilots	Enhanced user productivity, reduced learning curves	20-30% faster task completion
RAG Systems	More accurate responses, reduced hallucinations	40% reduction in escalations
AI Agents	Proactive issue resolution, complex problem-solving	50% faster resolution times

Business Impact: Operational Efficiency

Technology	Operational Impact	Efficiency Gains
Chatbots	Automation of routine inquiries	30-40% reduction in simple support tickets
AI Assistants	Streamlined workflows	20-25% productivity improvements
Copilots	Faster task completion, reduced training needs	15-30% efficiency improvement
RAG Systems	Enhanced knowledge access	30-50% faster information retrieval
AI Agents	End-to-end process automation	40-60% reduction in manual interventions

Real-World Example: Customer Support

Technology	Example Response
Chatbot	"I can help with basic account questions and common issues."
AI Assistant	"Based on your account history, I recommend adjusting your plan to save \$50/month."
Copilot	"Here's a draft response to the customer's complaint. Would you like to edit it before sending?"
RAG System	"According to our latest policy updated yesterday, you're eligible for an immediate refund."
AI Agent	"I've detected an issue with your service, created a ticket, scheduled a technician, and sent you confirmation details."

Real-World Example: Enterprise Operations

Technology	Example Response
Chatbot	"Here are the steps to reset your password."
AI Assistant	"I can help you draft an email to the IT department about your issue."
Copilot	"Based on this error message, here's the likely solution. Should I apply it?"
RAG System	"Based on our internal documentation, this error indicates a network configuration problem."
AI Agent	"I've identified the server outage, rerouted traffic, notified the team, and started recovery procedures."

Implementation Considerations

Technology	Implementation Complexity	Cost	Key Considerations
Chatbots	Low	\$	Clear conversation flows, limited scope
AI Assistants	Medium	\$\$	NLU training, task integration
Copilots	Medium	\$\$-\$\$\$	Existing tool integration, context awareness
RAG Systems	Medium-High	\$\$-\$\$\$	Knowledge base management, retriever quality
AI Agents	High	\$\$\$-\$\$\$\$	Governance, safety guardrails, monitoring

Future Trends & Convergence

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Convergence of Technologies

All AI technologies will increasingly incorporate elements from each other, leading to integrated systems combining the best capabilities of each approach.

Key Takeaways

- AI technologies exist on a spectrum from simple chatbots to autonomous agents
- Each technology has distinct capabilities suited for different business needs
- Consider maturity, complexity, and governance when selecting AI technologies
- Start with focused use cases and evolve your strategy as technologies mature
- The future will see increasing convergence of these technologies

Questions?

References & Further Reading

- ♦ DigitalOcean: "RAG, AI Agents, and Agentic RAG: An In-Depth Review" (www.digitalocean.com/community/conceptual-articles/rag-ai-agents-agentic-rag-comparative-analysis)
- ♦ Medium: "RAG vs. Agents: A Comparison and When to Use Each" (medium.com/@talhaouy.me/rag-vs-agents-a-comparison-and-when-to-use-each-1972383bcd24)
- ♦ LinkedIn: "ChatBots vs AI Assistants vs AI Agents: What's the Difference?" (www.linkedin.com/pulse/chatbots-vs-ai-assistants-agents-whats-difference-nilesh-divekar-rmrxf)
- ♦ Mindset.ai: "AI Agents vs. Chatbots, Workflows, GPTs: A Guide To AI Paradigms" (www.mindset.ai/blogs/ai-agents-vs-other-ai-paradigms)
- ♦ MarkTechPost: "RAG, AI Agents, and Agentic RAG: Comparative Analysis" (www.marktechpost.com/2024/09/22/rag-ai-agents-and-agentic-rag-an-in-depth-review-and-comparative-analysis-of-intelligent-ai-systems/)