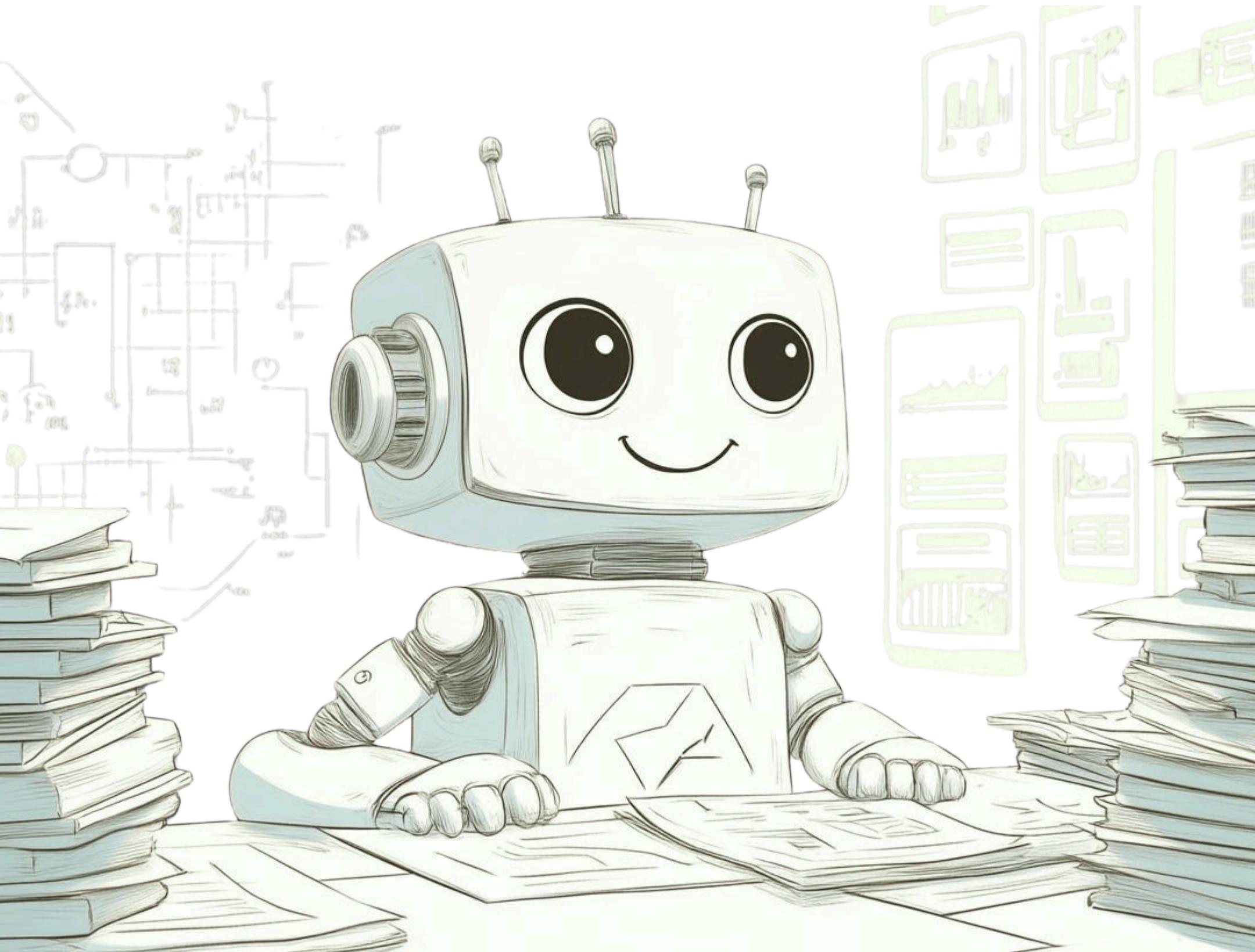




Greg Coquillo
Product Leader at
AWS

TOP 10 TYPES OF AI AGENTS EXPLAINED IN A NUTSHELL

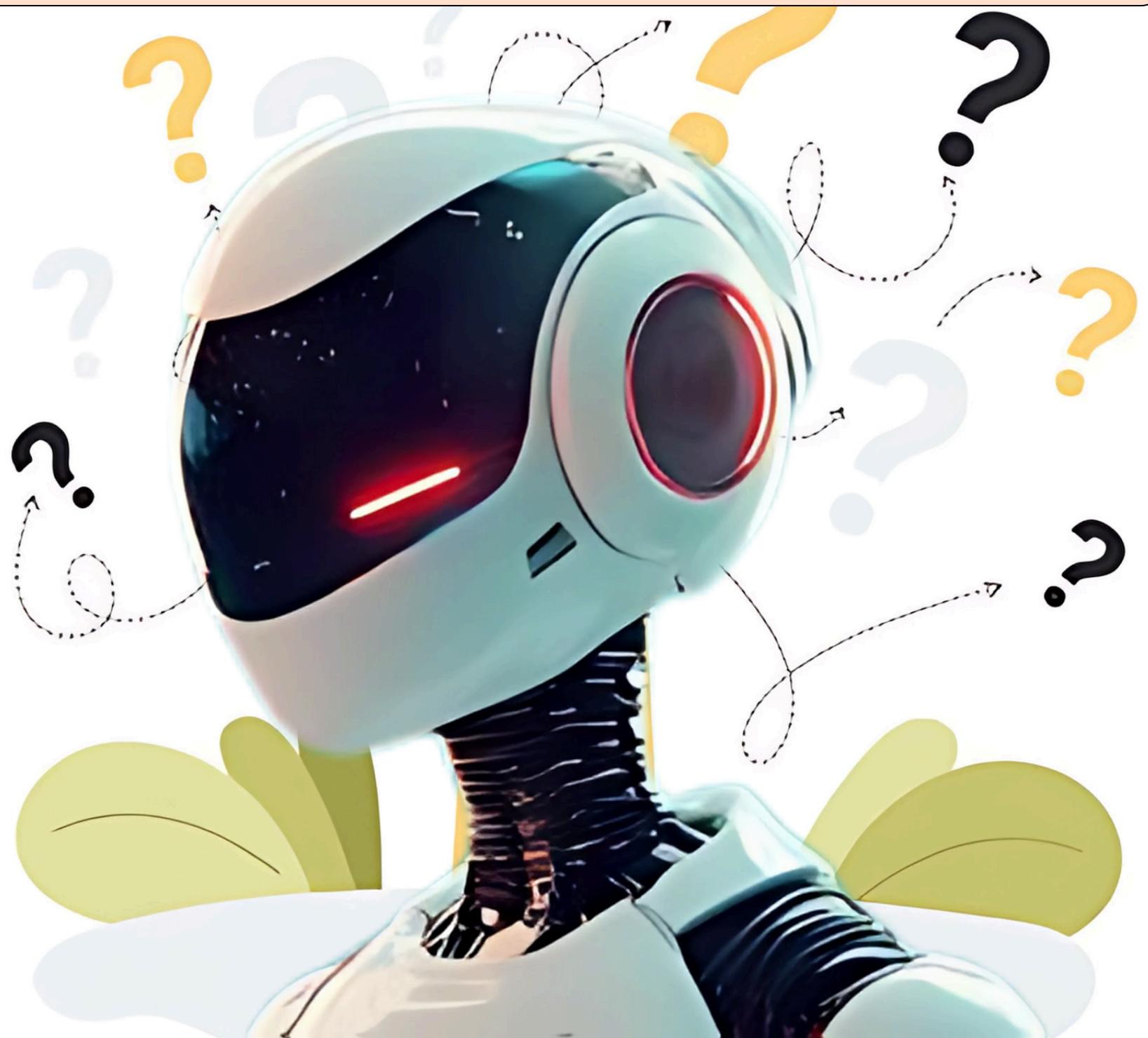




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What Are AI Agents?

AI agents are intelligent systems that perceive their environment, analyze information, and take actions to reach specific goals. They can range from simple rule-followers to complex self-learning machines, and they're the backbone of intelligent automation.



Simple Reflex Agents

These agents respond instantly to environmental inputs based on a set of hardcoded rules. They don't store any history or learn from experience.

Behavior



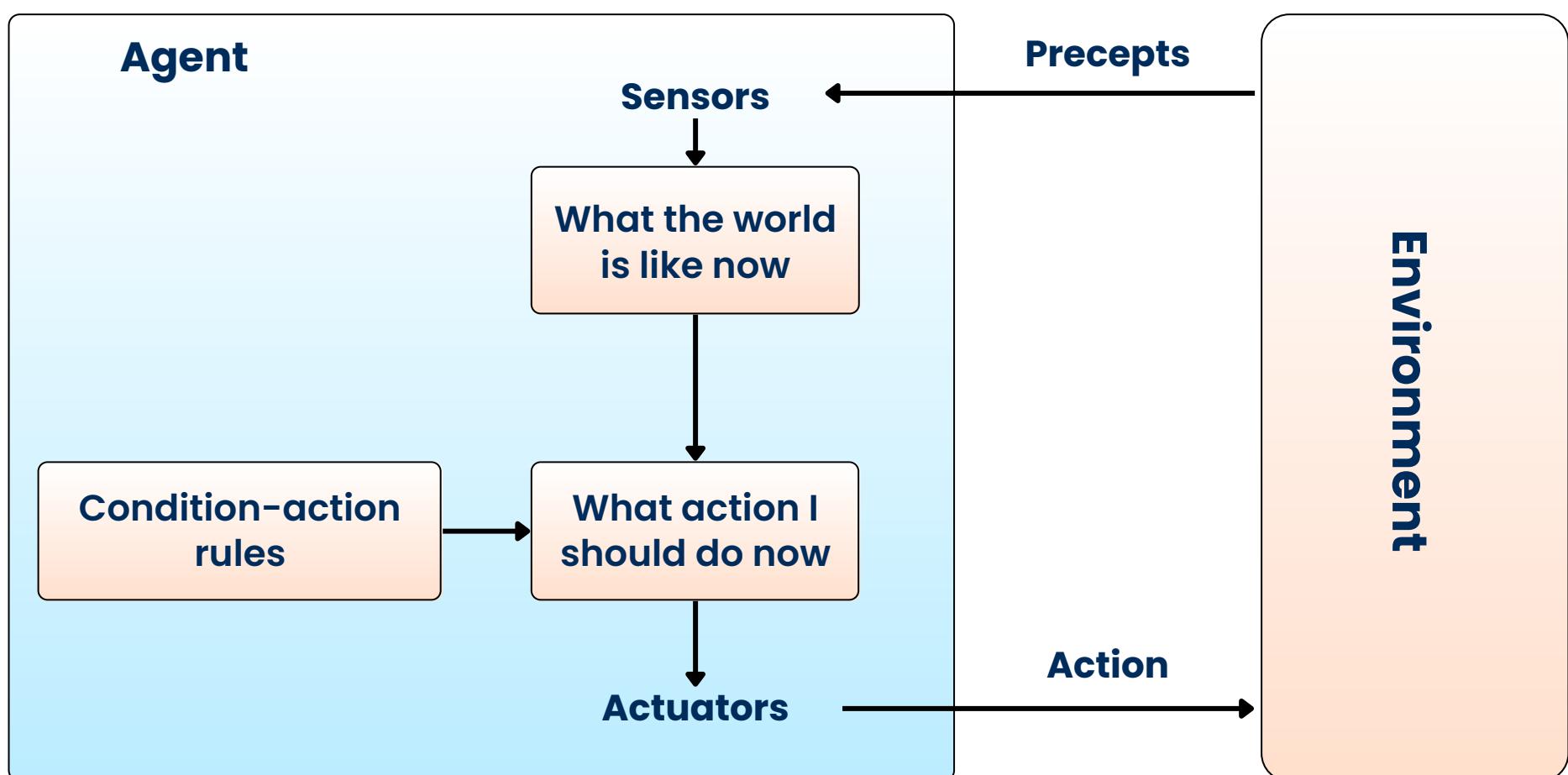
If condition A is true,
then do action B.

Limitation



Can't handle unfamiliar
or complex situations.

Example: An automatic door that opens when it detects motion.

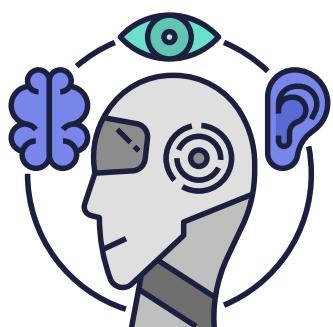


Diagrammatic Representation

Model-Based Reflex Agents

Unlike simple reflex agents, these maintain an internal model of the world. They use this model to interpret partially observable environments and make smarter decisions.

Behavior



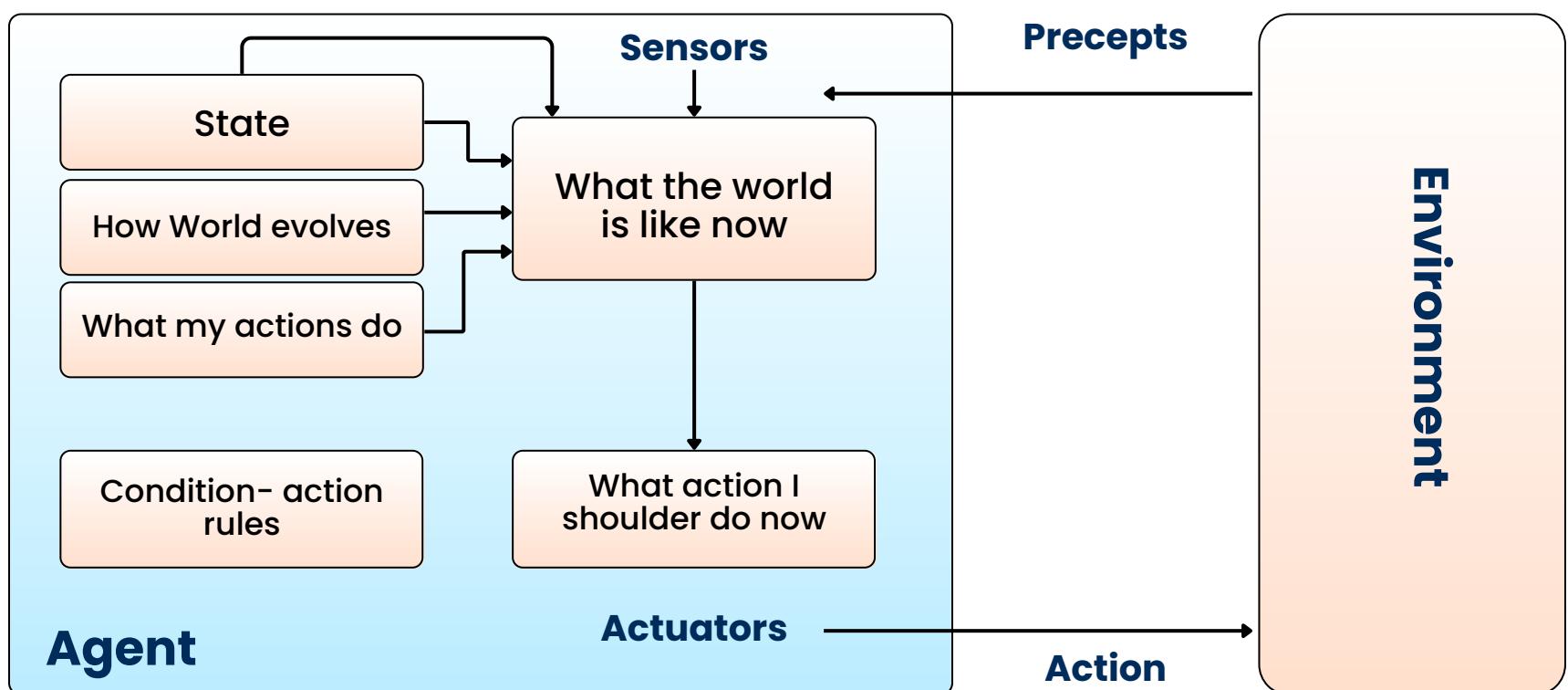
Uses both current perception and internal memory.

Limitation



Can infer hidden aspects of the environment.

Example: A smart thermostat adjusting based on time, temperature history, and user behavior.



Diagrammatic Representation



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Goal-Based Agents

These agents are built to pursue defined goals and make decisions by evaluating possible future states. They don't just react—they plan.

Behavior



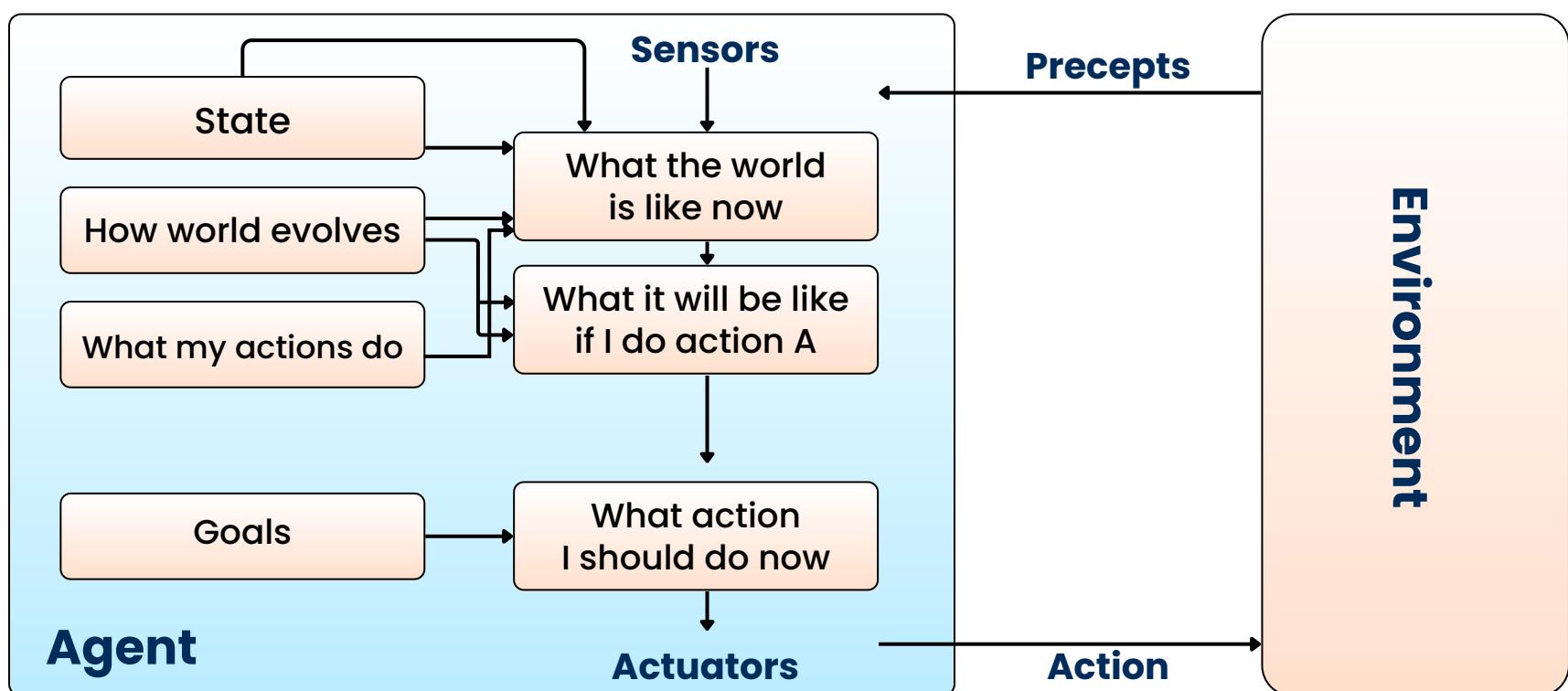
Chooses actions that bring it closer to its goal.

Limitation



Flexible and purposeful decision-making.

Example: A GPS app finding the optimal route to your destination.



Diagrammatic Representation



Utility-Based Agents

Going beyond goals, these agents evaluate how good an outcome is. They use utility functions to select actions that provide the maximum satisfaction or benefit.

Behavior



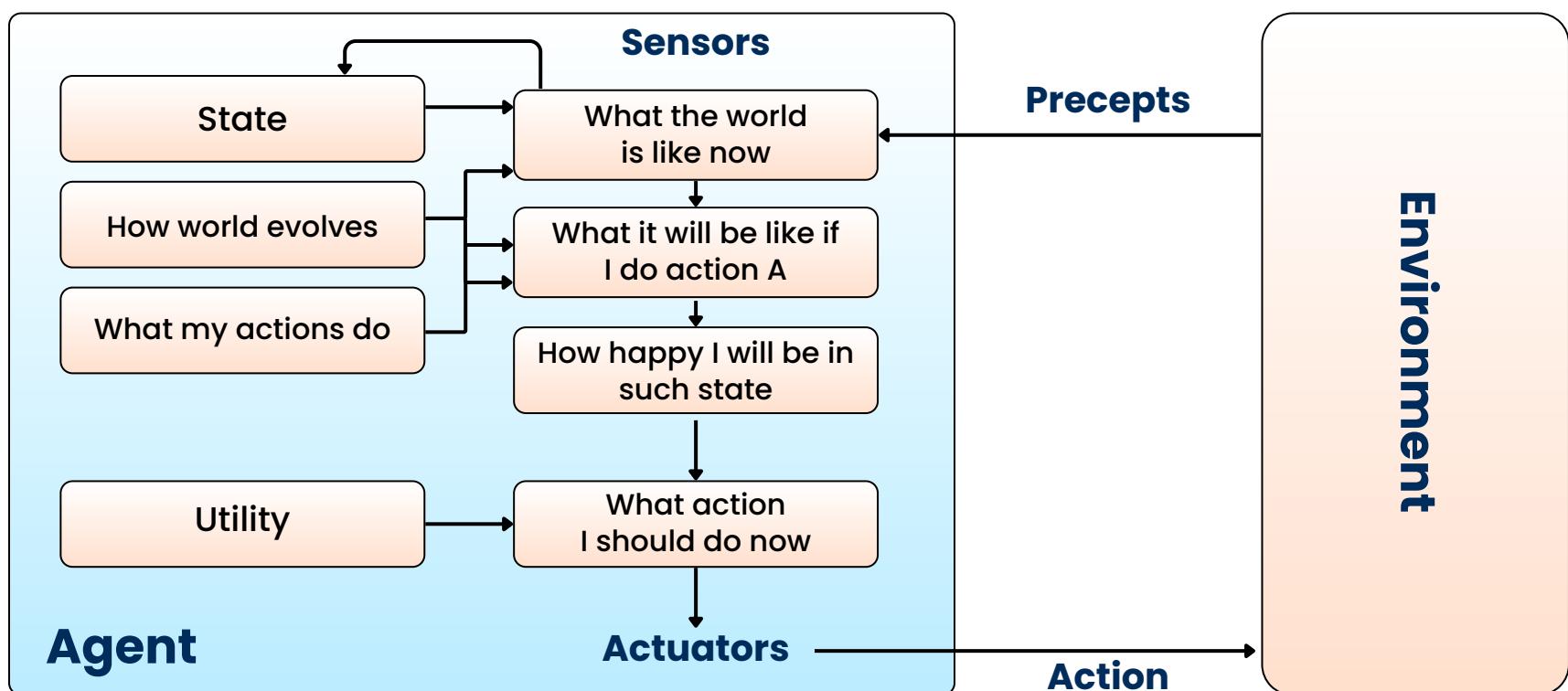
Compares multiple actions for best overall utility.

Limitation



Handles conflicting goals and preferences.

Example: A stock trading bot choosing the most profitable investment option under current market conditions.



Diagrammatic Representation



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Learning Agents

These agents improve their performance over time by learning from past actions and adapting to new situations. They modify internal components based on success and failure.

Behavior



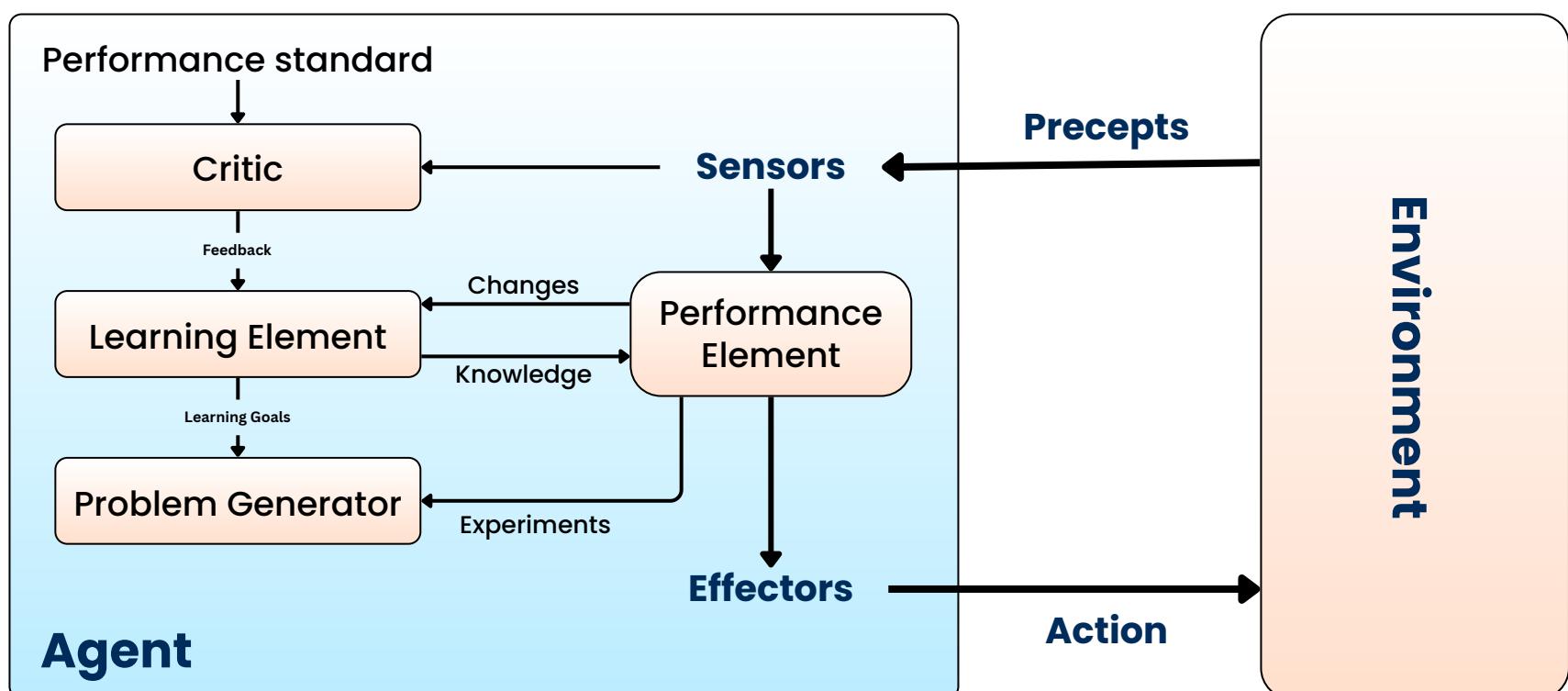
Trial and error with feedback loops.

Limitation



Self-improving without manual reprogramming.

Example: A customer support chatbot that learns from interactions to give more accurate responses.



Diagrammatic Representation



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Multi-Agent Systems

This is a group of intelligent agents that interact within an environment. They may cooperate, compete, or coordinate to achieve shared or individual goals.

Behavior



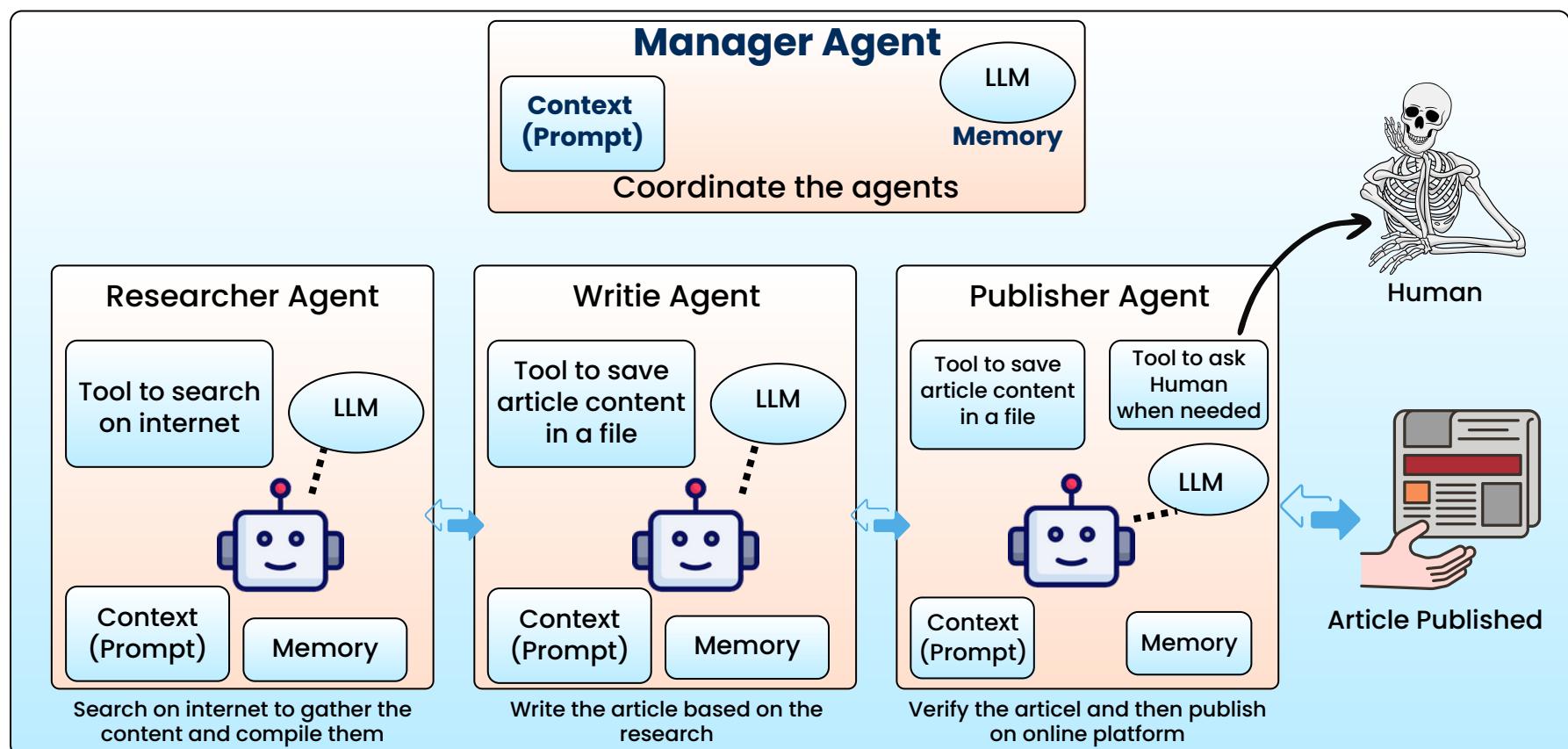
Communication and collaboration among agents.

Limitation



Solves complex problems that a single agent cannot.

Example: A swarm of drones working together for search and rescue missions.



Diagrammatic Representation



Reactive Agents

These are fast, lightweight agents that act only on immediate percepts, without reasoning or memory. They're designed for real-time, responsive behavior.

Behavior



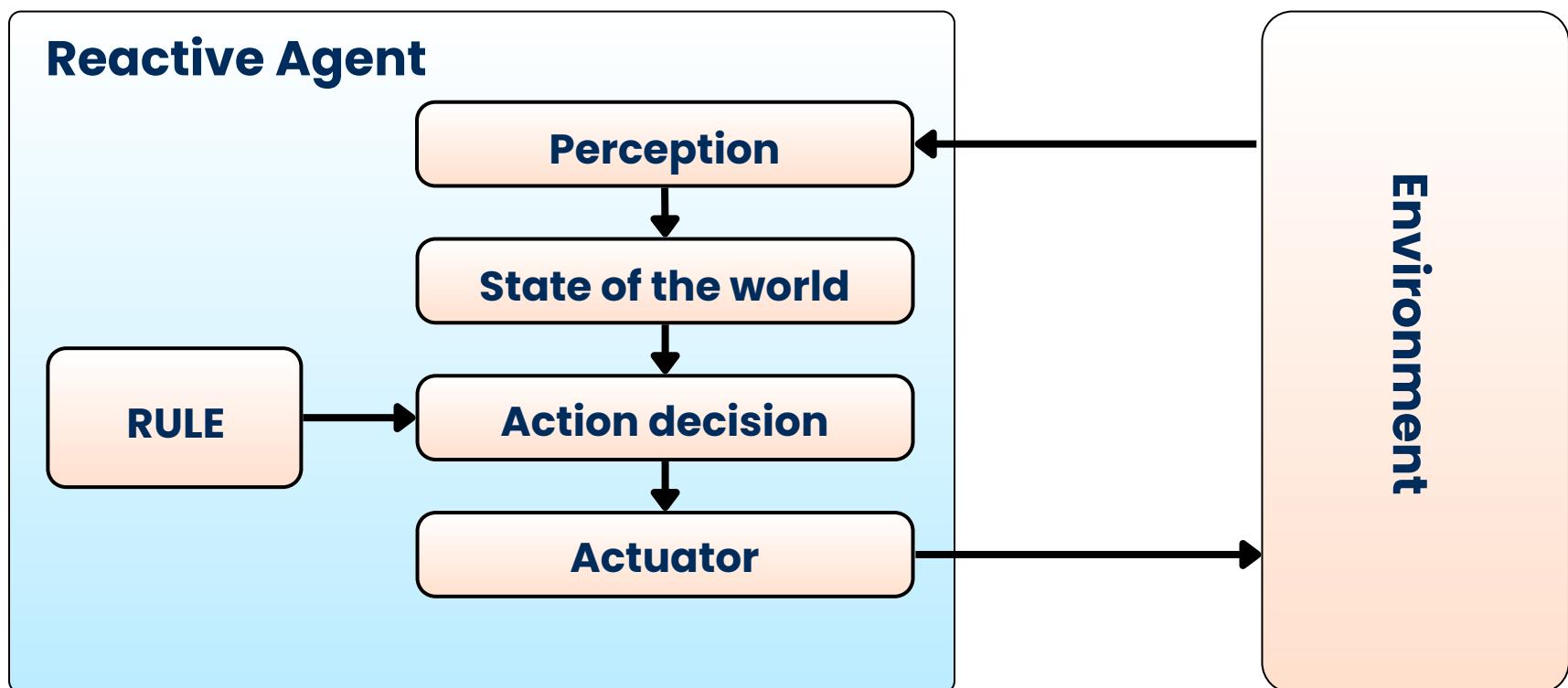
Stimulus-response without internal model.

Limitation



High-speed reaction in dynamic environments.

Example: A robot vacuum that changes direction upon hitting an obstacle.



Diagrammatic Representation



Deliberative Agents

These agents perform high-level reasoning and maintain a deep understanding of their environment. They evaluate potential consequences and develop action plans accordingly.

Behavior



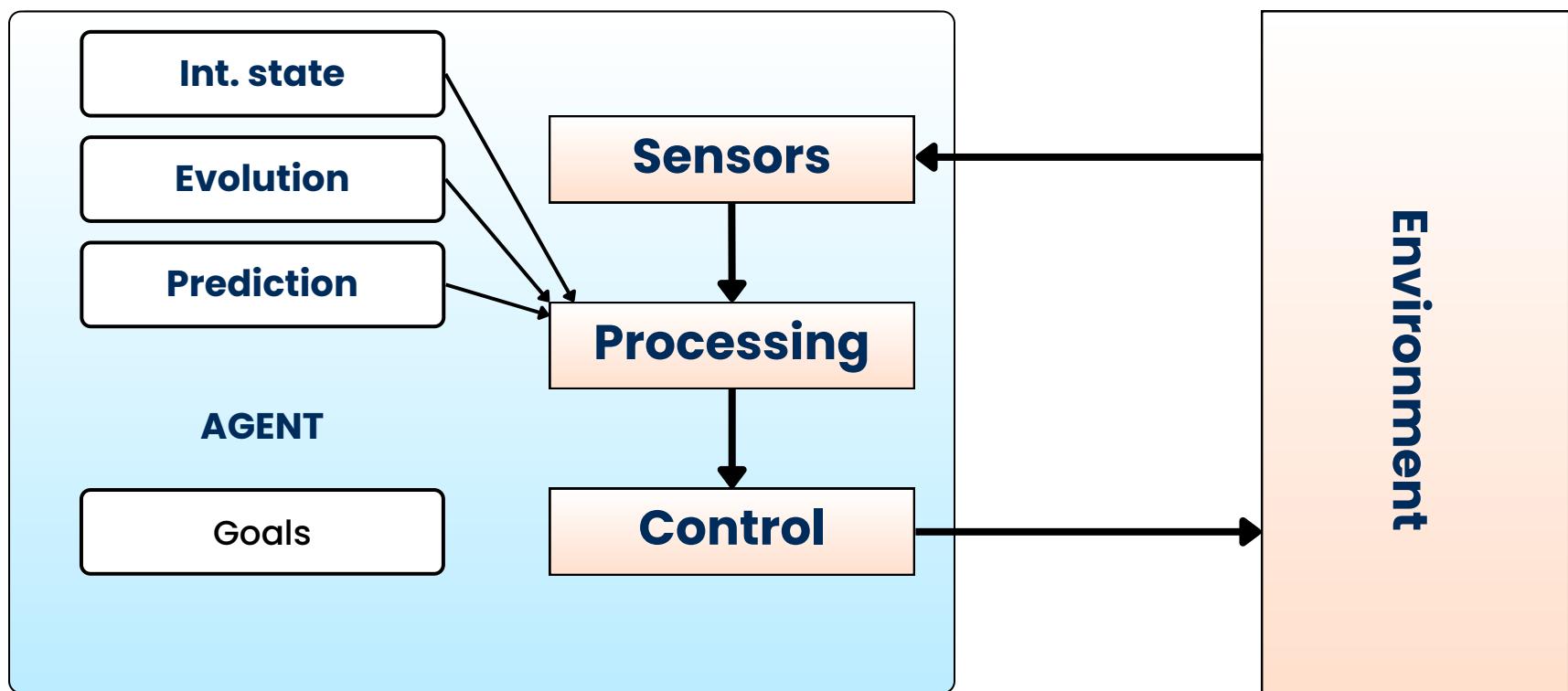
Thinks, plans, and then acts.

Limitation



Handles complex environments and long-term goals.

Example: AI in a strategy game that plans several moves ahead.



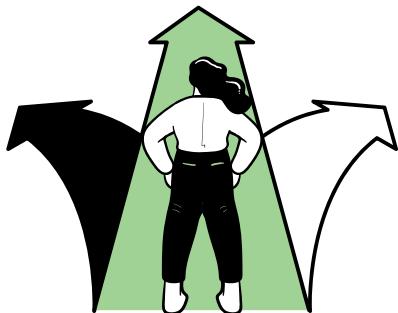
Diagrammatic Representation



Autonomous Agents

These agents operate completely independently, making decisions and adapting to their environment without human intervention. They combine reasoning, learning, and planning.

Behavior



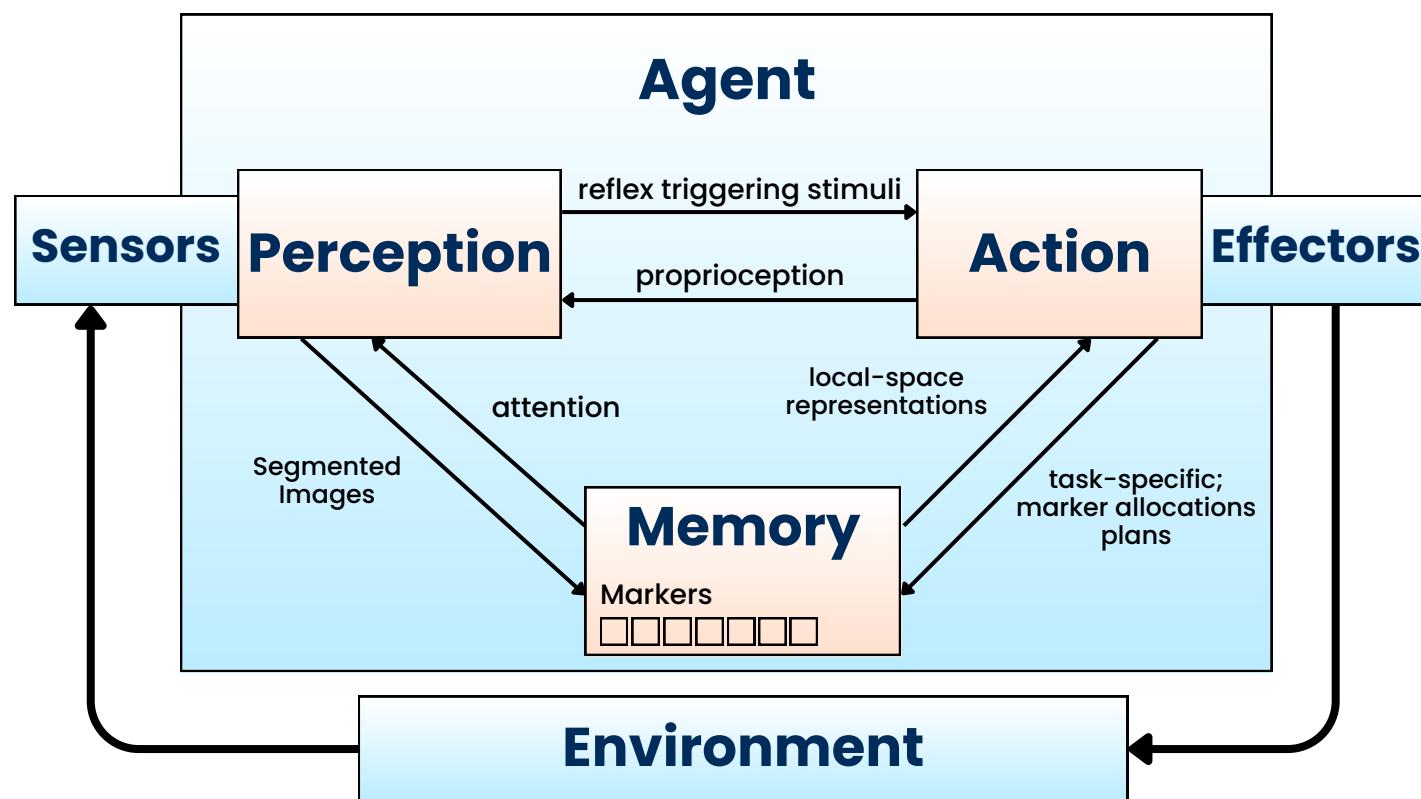
Self-directed with minimal supervision.

Limitation



Can operate in unpredictable or remote settings.

Example: A self-driving car navigating through city traffic on its own.



Diagrammatic Representation



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Adaptive Agents

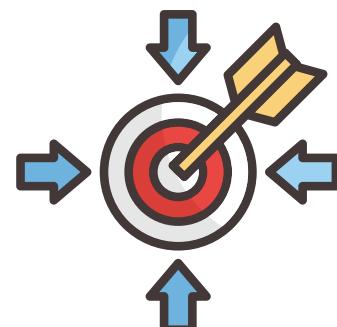
These agents dynamically adjust their behavior in response to changes in their environment or task demands. They are designed to thrive in constantly evolving conditions.

Behavior



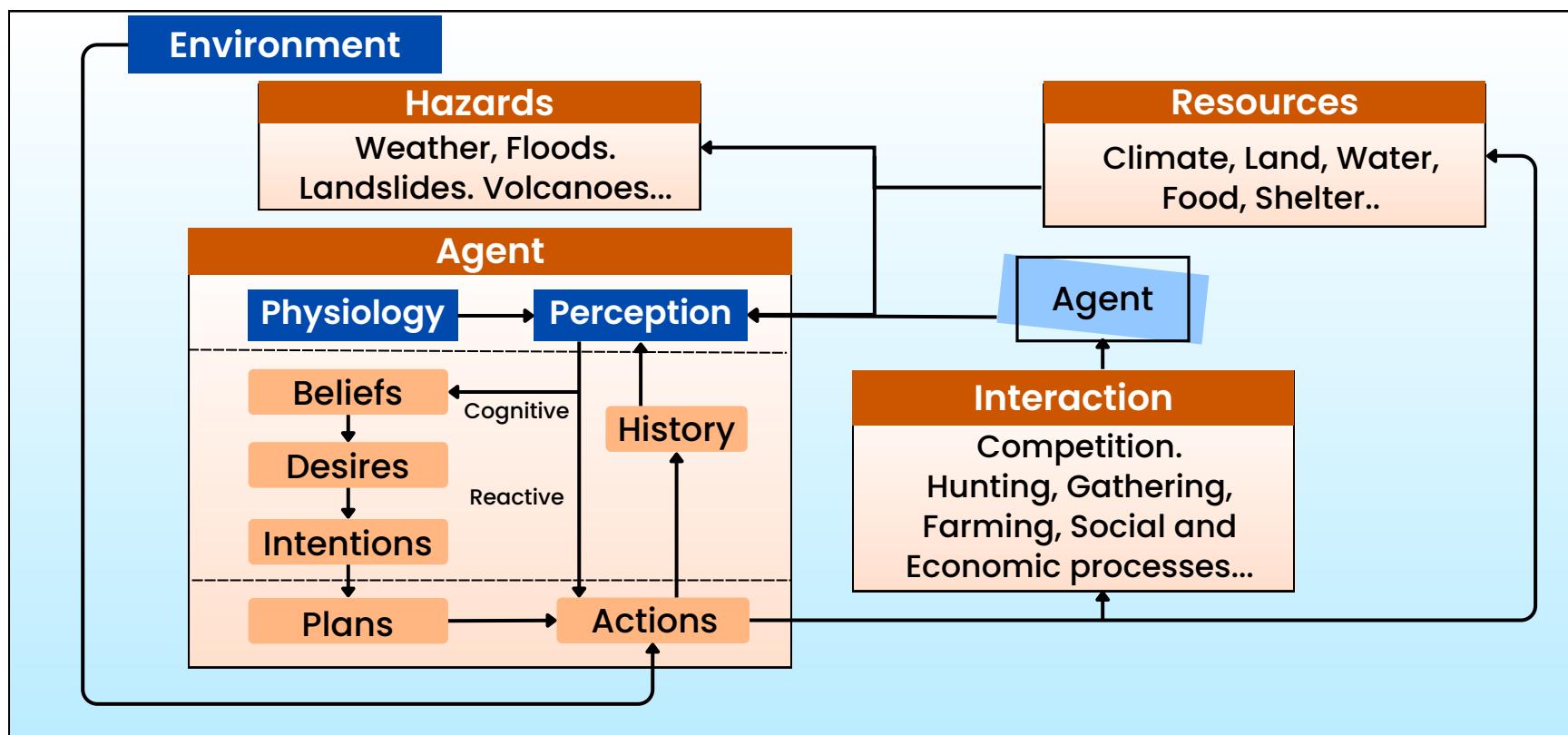
Monitors environment, updates strategies on the fly.

Limitation



Continuously aligns actions with changing goals or data.

Example: An AI ad engine adapting in real-time based on user interaction trends.



Diagrammatic Representation



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