

# Agentic AI Components

## Overview

**Agentic AI** refers to intelligent systems that can autonomously plan, reason, act, and adapt to achieve user-defined goals through coordinated use of reasoning, memory, and external tools.

It integrates five major components:

- **Brain (LLM)**
- **Orchestrator**
- **Tools**
- **Memory**
- **Supervisor**

Together, these enable both autonomous and human-in-the-loop workflows.

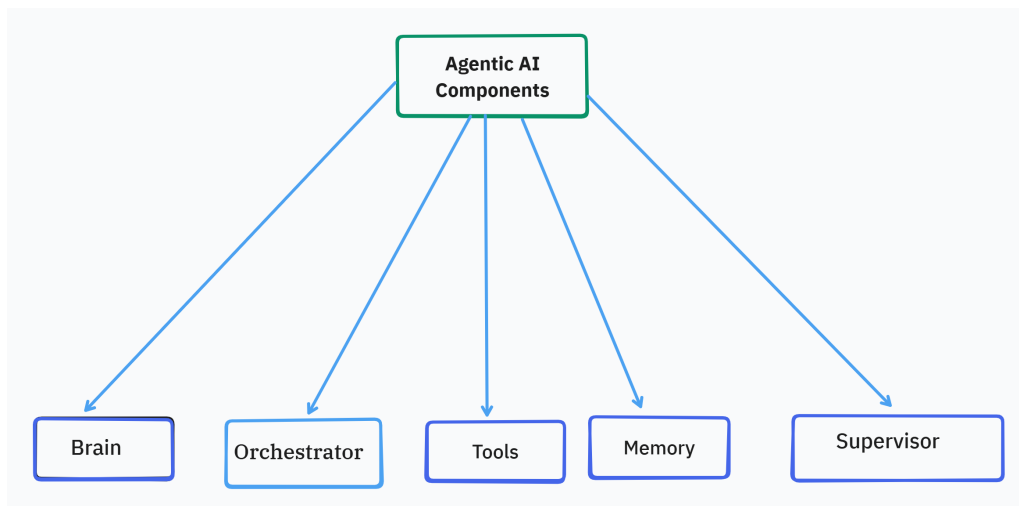


Figure 1: **Agentic AI Components Overview:** The architecture shows how the Brain (LLM), Orchestrator, Tools, Memory, and Supervisor interconnect to form a complete agentic system.

## 1. Brain (LLM)

The **Brain** is the Large Language Model (LLM) that drives reasoning, goal understanding, and communication. It acts as the *cognitive center* of the agent.

1. **Goal Interpretation:** Understands user instructions and translates them into structured objectives.
2. **Planning:** Decomposes high-level goals into subgoals and ordered executable steps.
3. **Reasoning:** Makes logical decisions, resolves ambiguities, and evaluates trade-offs between different strategies.
4. **Tool Selection:** Determines which external tool(s) are best suited for the next step.
5. **Communication:** Generates coherent and contextually accurate responses for humans or other AI agents.

## 2. Orchestrator (Execution Manager)

The **Orchestrator** acts as the manager, coordinating all tasks, controlling flow, and ensuring smooth execution.

1. **Task Sequencing:** Determines the logical order of actions (e.g., Step 1 → Step 2 → Step 3).
2. **Conditional Routing:** Dynamically redirects workflow based on outcomes (e.g., if a tool fails, retry or escalate).
3. **Retry Logic:** Handles failures gracefully with controlled retries and exponential backoff.
4. **Looping and Iteration:** Enables repetitive or continuous behavior (e.g., check job status until results are found).
5. **Delegation:** Decides whether to pass tasks to tools, the LLM, or human supervisors.

### 3. Tools (External Interfaces)

**Tools** enable the agent to interact with the external world beyond its internal reasoning capabilities.

1. **External Actions:** Perform operations like API calls, sending emails, posting updates, or triggering workflows.
2. **Knowledge Base Access:** Retrieve factual or domain-specific data through retrieval-augmented generation (RAG), search APIs, or vector databases to enhance grounding and accuracy.

### 4. Memory (Context & State)

**Memory** enables continuity, context-awareness, and long-term learning within the agentic system.

1. **Short-Term Memory:** Stores active session context, including recent user messages, tool calls, and immediate reasoning steps.
2. **Long-Term Memory:** Maintains persistent records across sessions such as user preferences, prior tasks, and long-term objectives.
3. **State Tracking:** Tracks the progress of workflows—what has been done, what’s pending, and what’s next (e.g., “Job Description posted”, “Offer sent”).

### 5. Supervisor (Human & Safety Layer)

The **Supervisor** ensures safety, ethical compliance, and human oversight in the agent’s actions.

1. **Approval Requests (Human-in-the-Loop):** Seeks human confirmation before executing critical or high-risk actions (e.g., sending job offers).
2. **Guardrails Enforcement:** Monitors and blocks actions that violate ethical, safety, or compliance constraints.
3. **Edge Case Escalation:** Detects uncertainty or conflicting information and escalates decisions to human operators.

## Summary

**Agentic AI** integrates cognition (*Brain*), coordination (*Orchestrator*), execution (*Tools*), memory persistence (*Memory*), and ethical oversight (*Supervisor*) into a cohesive system. This multi-layered architecture enables AI agents to act autonomously yet responsibly—blending automation with human alignment.