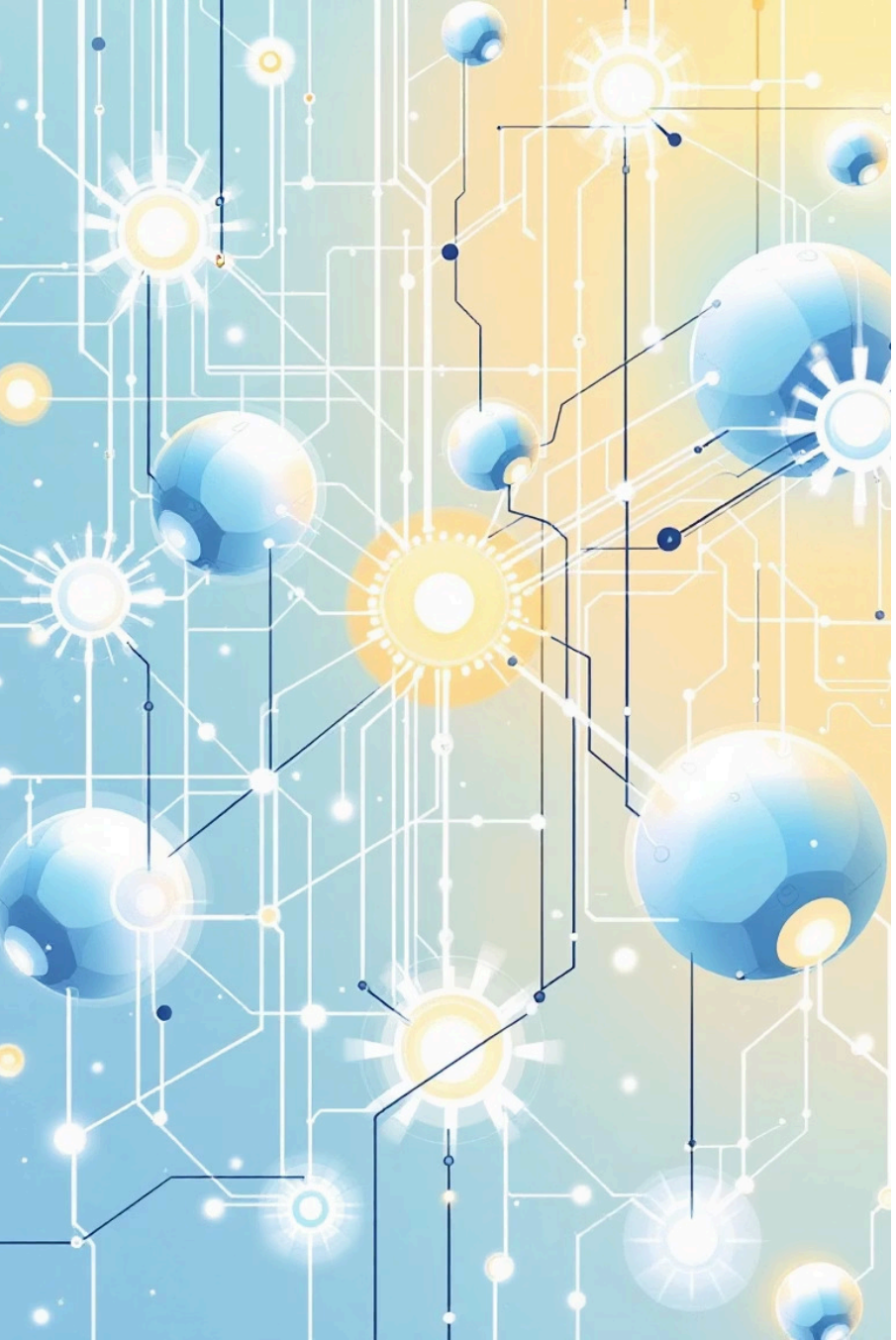


# Multi-Agentic AI Systems

Coordinating multiple AI minds to solve complex tasks—like an intelligent orchestra where each agent contributes specialized expertise.

# What is Multi-Agentic AI?

Systems composed of multiple intelligent agents working collaboratively to achieve complex tasks.

Each agent is an **autonomous unit**—often an LLM-based function or expert—contributing specialized domain knowledge.

# Why Use Multi-Agentic Systems?

### Modularity

Independent, loosely coupled agents simplify development, testing, and maintenance.

### Specialization

Agents fine-tuned for specific tasks deliver expert-level performance over generalists.

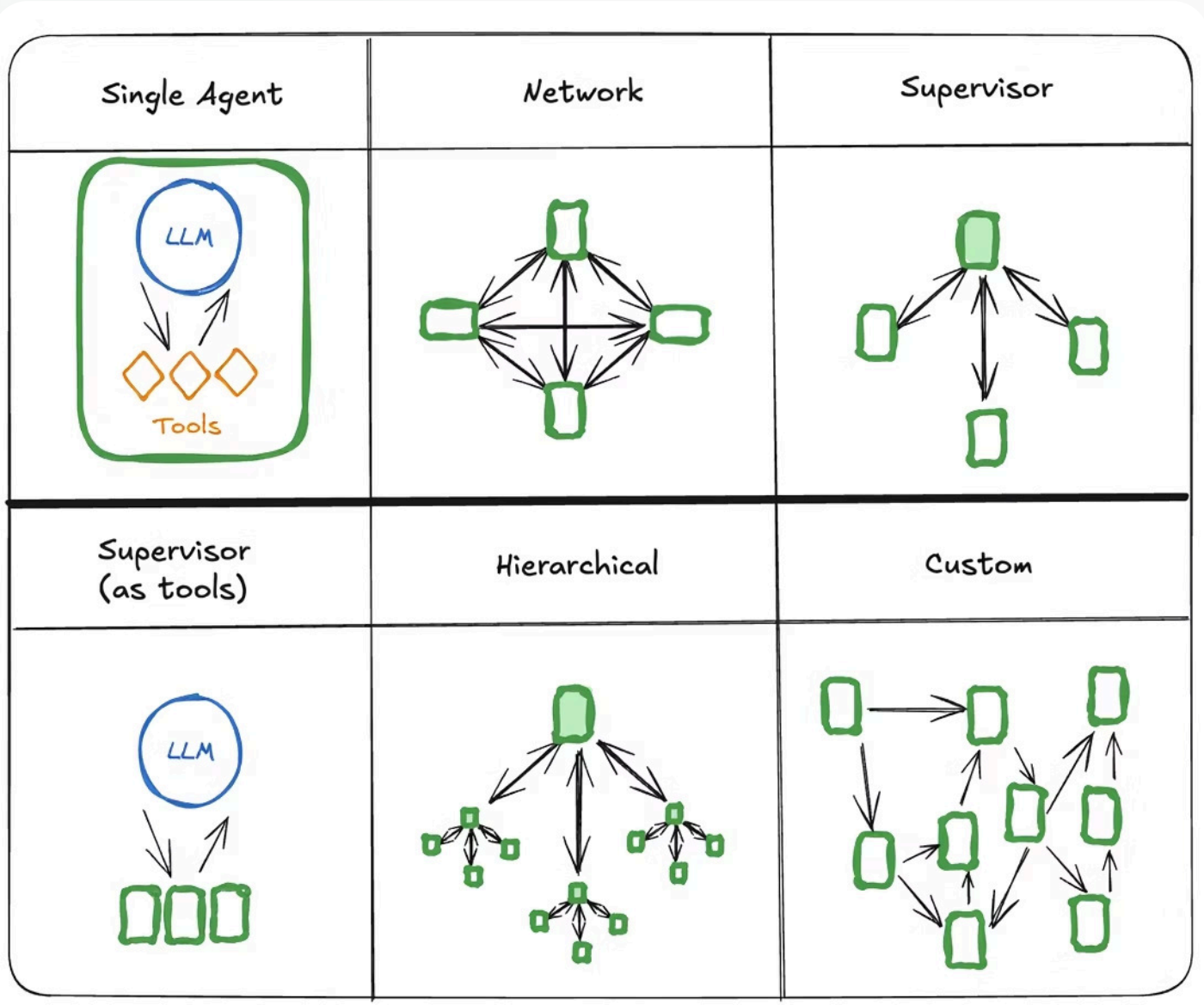
### Explicit Control

Define how agents interact—no hidden abstractions or function-call chaos.

# Network Architecture

Every agent can communicate with every other agent.

**Flexible and democratic**—agents decide who to call next based on task outcomes. Perfect for decentralized workflows.



# Advanced Architectures

### Tool-Calling Supervisor

Agents implemented as tools with LLM-based smart supervisor using function calling.

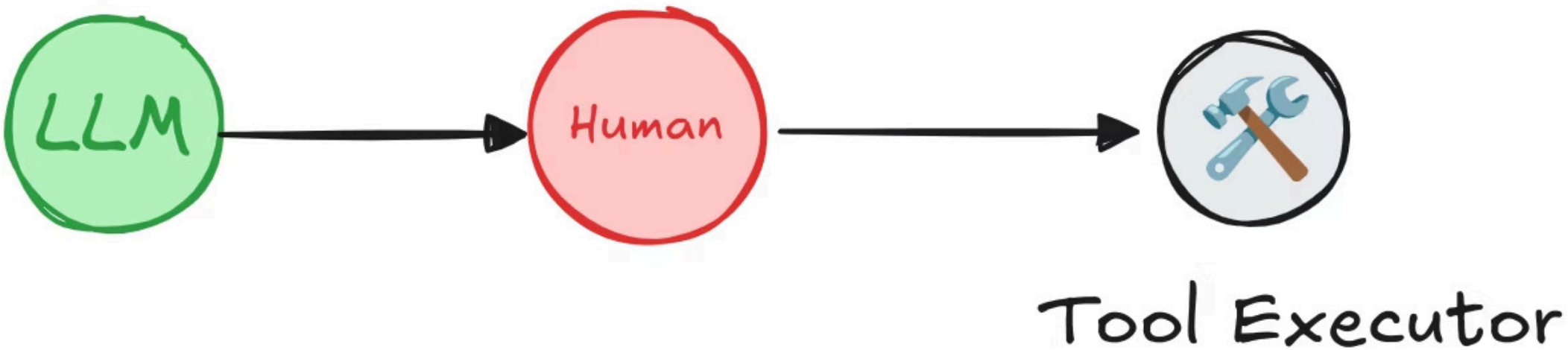
### Hierarchical

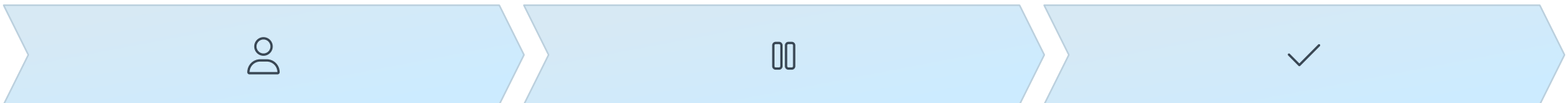
Multi-level delegation where supervisors control other supervisors for complex domains.

### Custom Workflows

Partial connectivity with deterministic and dynamic components for domain-specific needs.

# Human in the Loop Integration





### Pre-Execution

Human reviews task plans before execution begins.

### Mid-Execution

Dynamic breakpoints pause for human intervention when needed.

### Post-Execution

Human reviews results and provides feedback or updates.

# Dynamic Interrupts & State Editing

### Breakpoints

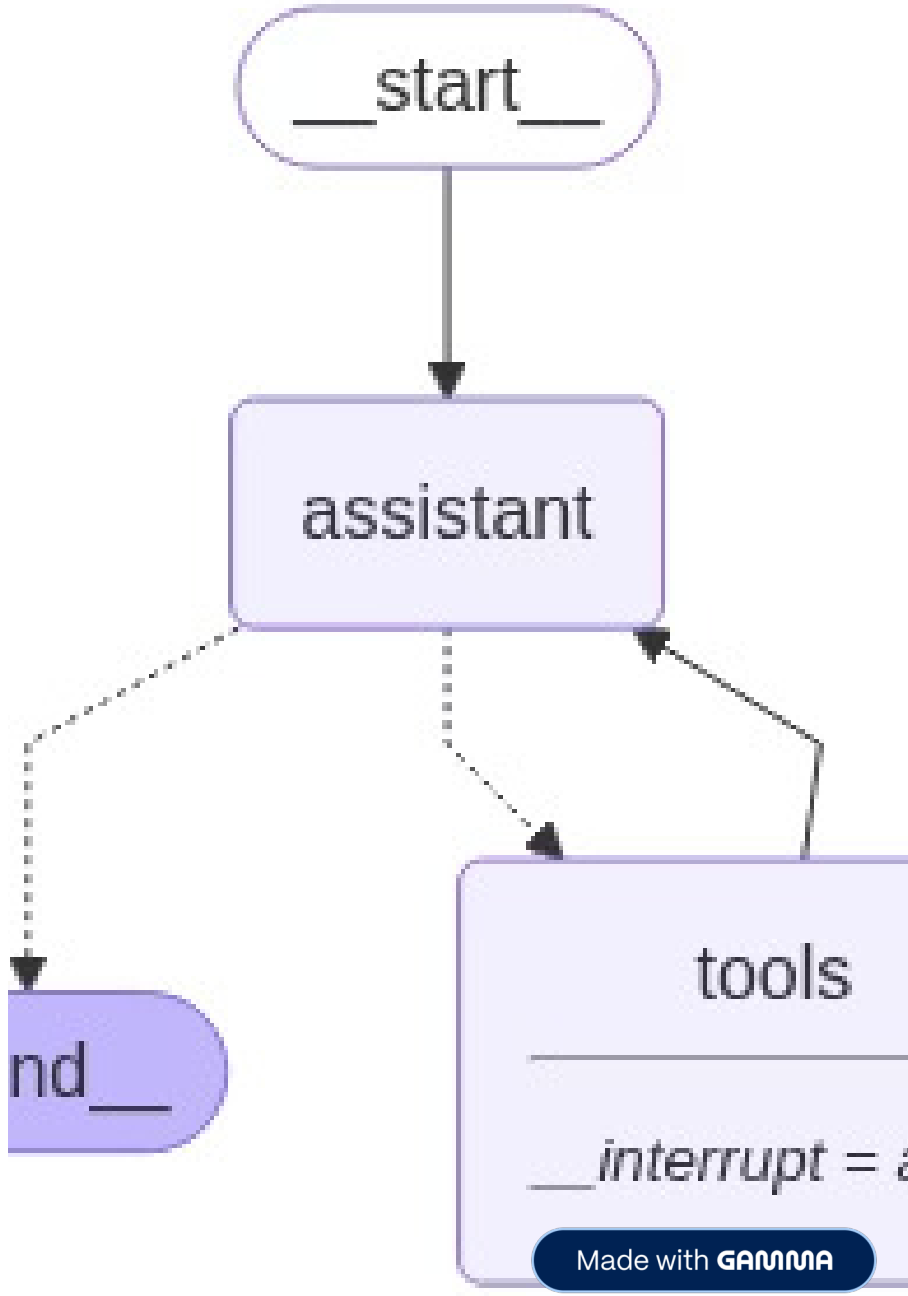
Conditional halts based on system state—like debug breakpoints in code.

Execution pauses when specific conditions are met for human review.

### Command Primitive

Humans can edit current system state mid-execution.

**Low-friction collaboration** enhances accuracy in high-stakes domains.



# Real-World Applications

### Customer Service

Specialized agents handle different query types with human escalation.

### Research Assistants

Domain experts coordinate to synthesize information across disciplines.

### Autonomous Simulations

Agents model complex systems through distributed intelligence.

# Key Takeaways

### Collaboration is Power

Multi-agentic AI enables scalable division of cognitive labor.

### Architecture Matters

Choose network, supervisor, hierarchical, or hybrid based on your use case.

### Human Oversight Essential

Strategic integration ensures safety, adaptability, and alignment.