

Executive Guide

Multi-Agent AI Systems: Why Domain Expertise Beats Orchestration

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Executive Summary

Even the smartest agents fail without the right context. The success of our multi-agent system came from the precision of the domain knowledge built into every step.

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We built one. It works in production. And the lesson we took away is almost the opposite of the fashionable one: the orchestration was the easy part. The hard part, and the part that made it work, was domain expertise.

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What the system does

Without going into client-specific detail: a coordinated set of agents that move a complex, document-heavy workflow from raw inputs to a defensible written output. Each agent has a narrow role — extract, structure, draft, critique, verify, format. The orchestrator routes work between them and decides when the output is good enough to surface to a human.

What we expected to be hard

The orchestration. Routing logic. Agent-to-agent handoffs. State management. Failure recovery. We expected those to be where the project lived or died.

What was actually hard

The context each agent needed to do its job well. Not the model — any modern model is capable enough for the role. The knowledge we gave the model. The vocabulary, the examples, the implicit rules a domain expert applies without thinking. That was where weeks of work went, and it was where the output quality lived.

The agents were the cheap part. The domain knowledge we gave them was the expensive part — and the part that made the system useful.

The general lesson

If you are looking at a multi-agent architecture and the working assumption is that the cleverness lives in the orchestration, you are probably going to be disappointed.

The cleverness lives in how precisely you have captured the domain. Multi-agent systems are a way to apply domain knowledge at scale. They are not a substitute for having it. The teams that win with this architecture are the teams who spend their time on the knowledge layer — not the wiring diagram.

Key takeaways

- Multi-agent orchestration is the easy half. Domain knowledge is the hard half.
- Each agent's value comes from the context it has, not the model behind it.
- Invest in vocabulary, examples and rules — not just routing logic.
- Multi-agent is a way to apply expertise at scale, not a substitute for having it.

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