

Mastering the Microsoft Agent Framework

Building Enterprise AI Agents with .NET

Design and build enterprise AI agents using the Microsoft Agent Framework with .NET and C#. For the first time, developers can design, orchestrate, and deploy intelligent agents that automate real-world business workflows within the Microsoft ecosystem. The book introduces the architecture and runtime model of the Microsoft Agent Framework, covering key concepts such as agent lifecycles, tool invocation, workflows, and contextual memory. Readers will learn how to build modular AI agents that integrate with services such as Azure AI Foundry, Microsoft Copilot Studio, and Microsoft 365 Copilot to create scalable enterprise automation solutions.

Focus on hands-on development through 20 real-world enterprise agent projects, including DevOps automation agents, enterprise productivity assistants, security monitoring agents, and data intelligence systems. Each project includes architecture explanations, step-by-step .NET and C# code, and Azure deployment guidance, with a GitHub repository providing the full source code.

What You Will Learn:

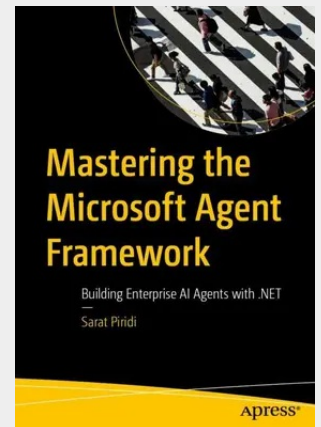
- Designing secure, scalable, and multi-region AI architectures
- Implementing observability, security controls, and responsible AI frameworks in enterprise environments
- Integrating data fabric, orchestration, and automation into unified AI ecosystems

Who This Book is For:

This book is for developers looking to build AI agents with the .NET framework.

Design and build enterprise AI agents using the Microsoft Agent Framework with .NET and C#. The Microsoft Agent Framework is Microsoft's foundation for building AI agents on .NET. It unifies the ideas that started in Semantic Kernel and AutoGen and adds what a production system actually needs. This book teaches it from the ground up, one working agent per chapter, from your first conversational agent to agents that call each other and run in the cloud. You start simple: deploy a model, connect your first agent, and understand how models, providers, and credentials fit together. Then you add the capabilities that make an agent genuinely useful. You give it tools so it can call your code. You give it memory so it remembers, both within a conversation and after a restart. You ground it in your own documents so it answers from real sources, with citations. And you put a human in the loop, so risky actions happen only after someone approves them. From there, the book goes further. You connect your agent to outside tools and data through the Model Context Protocol, and package reusable capabilities as skills. You learn to coordinate several agents at once: running them in sequence, in parallel, handing off between them, or letting them collaborate in a group. Then you make agents production-ready, adding guardrails, tracing what they do with OpenTelemetry and Azure Application Insights, and measuring their quality with evaluation. Finally, you connect agents to each other and host them on Azure, and close with a chapter of hard-won best practices for building agents that last. Everything in the book runs. Every code listing is a real program that builds and executes, and a companion GitHub repository gives you the complete source for every chapter. The book pins one framework version throughout, so the code works exactly as written instead of drifting out of date. Each chapter follows the same practical rhythm: here's the problem, here's the code, here's it running, and here's what to watch for in production.

What You Will Learn:- Deploy a model and give your agent tools to call your own code- Add memory, ground answers in your documents with retrieval, and require human approval for risky steps- Extend agents with the Model Context Protocol and reusable skills- Coordinate multiple agents: sequential, concurrent, handoff, group chat, and Maqentic orchestration- Add guardrails and trace agents with



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