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Building Smarter AI Agents: How Sequential Thinking MCP Transforms Complex Problem-Solving

6 min read · Jun 13, 2025



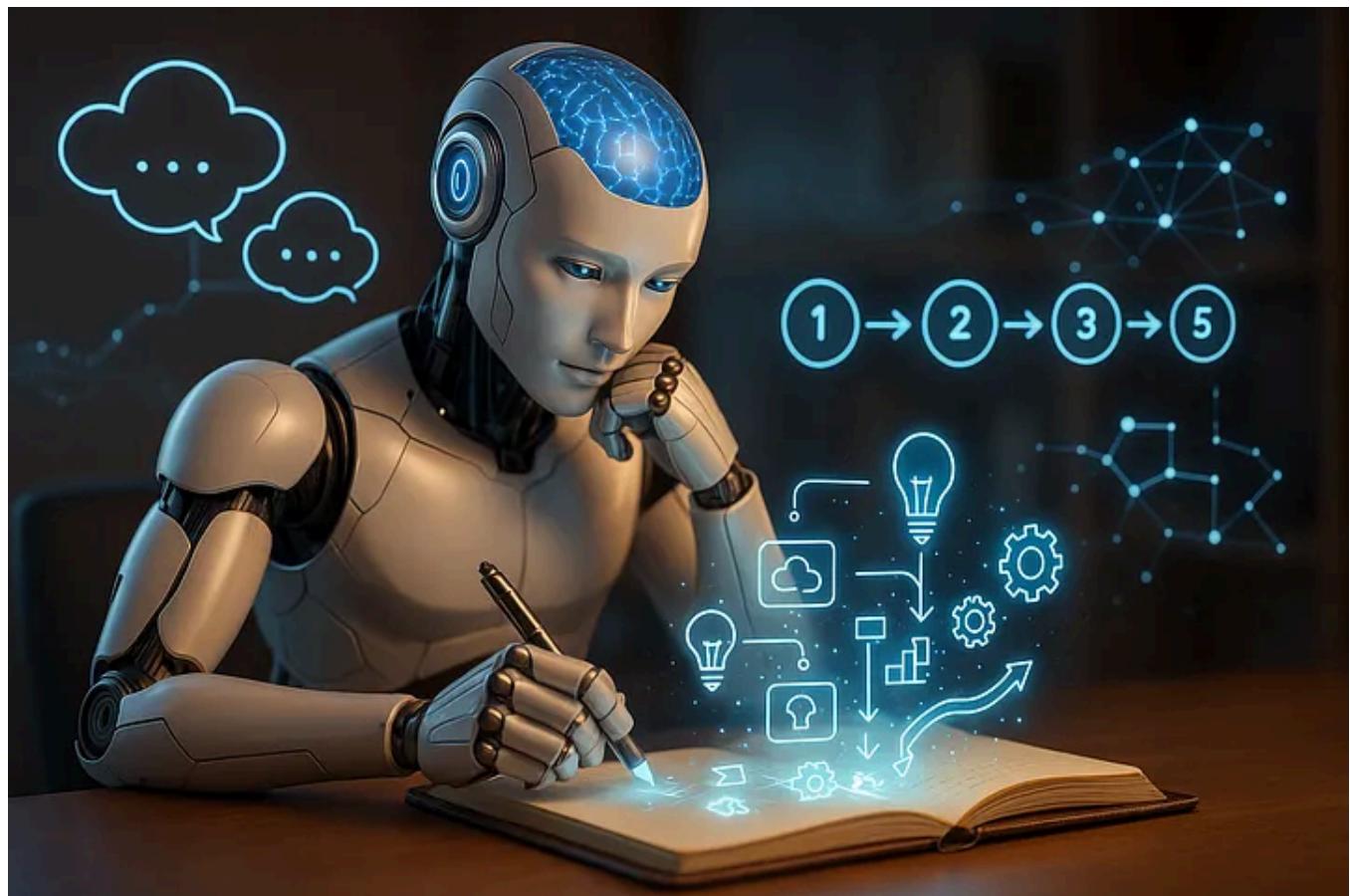
Micheal Lanham

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Give your AI agent a structured memory for step-by-step reasoning and watch it tackle complex tasks like a human expert

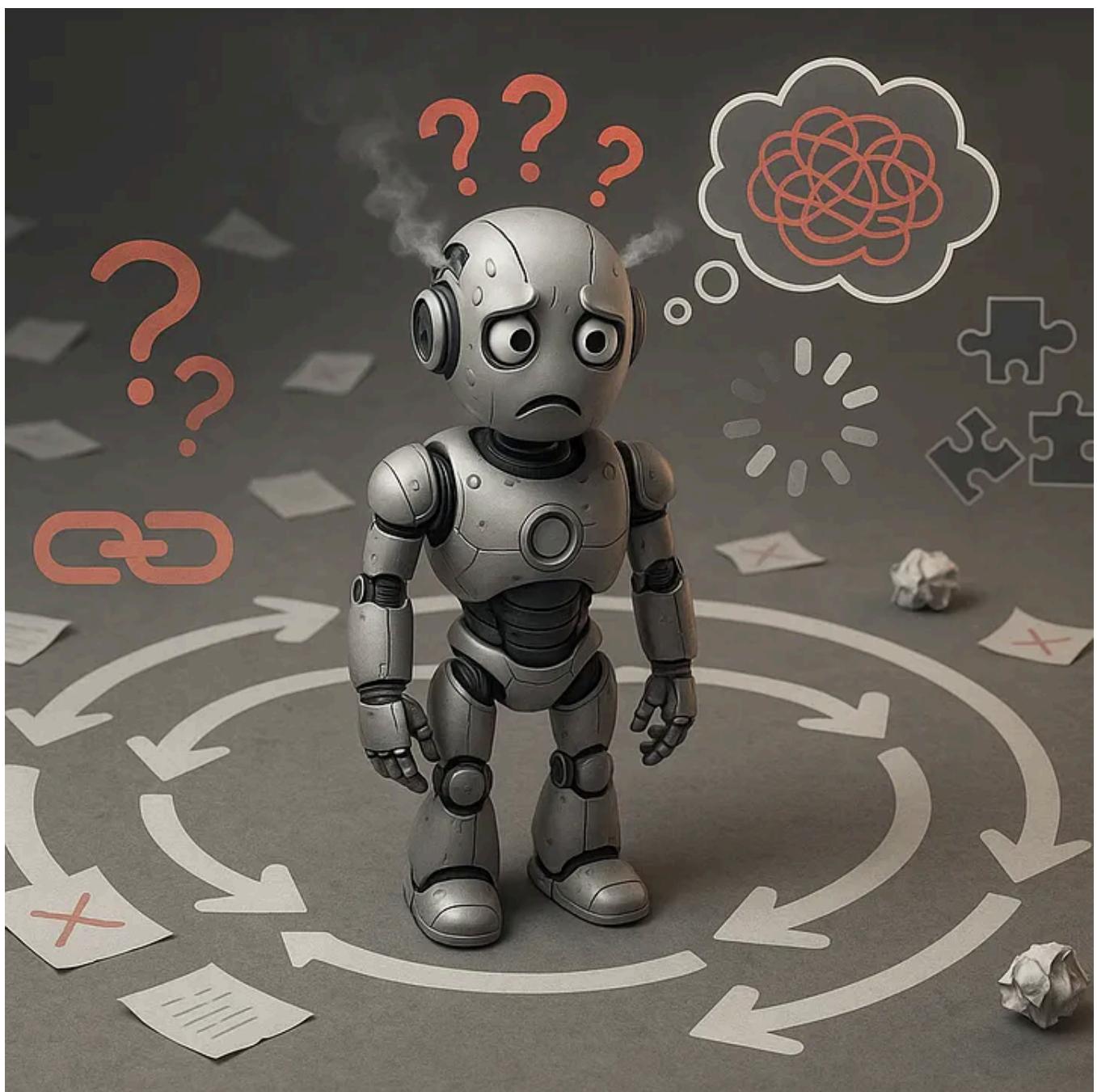
Have you ever watched an AI agent struggle with a complex problem, jumping

between ideas? Welcome back. You are signed into your member account today lack
the ability to do something until now.

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The combination of **Sequential Thinking MCP** (Model Context Protocol) with the **OpenAI Agents SDK** is changing how we build intelligent agents. Instead of scattered, inconsistent responses, your agent can now think like a methodical expert: breaking down problems, recording insights, and building on previous thoughts.

Let me show you how this works with a fascinating example: building an AI agent that can plan time travel.



The Problem: AI Agents Think in Circles

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```
# Traditional agent approach - no memory of reasoning steps  
agent_response = "Let me think about time travel..."  
Actually, let me reconsider...  
Wait, what was I analyzing again?"
```

This scattered thinking leads to:

- **Inconsistent reasoning** across complex tasks
 - **Lost context** when problems require multiple steps
 - **Repetitive analysis** of the same points
 - **Unreliable outputs** for mission-critical applications

The Solution: External Memory for AI Thoughts

Here's where Sequential Thinking MCP comes in. Think of it as giving your AI agent a sophisticated memory system.

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- **Records each thought with metadata (stage, sequence, importance)**
- **Organizes thinking into structured stages (Problem Definition → Research → Analysis → Synthesis → Conclusion)**
- **Provides summaries of the entire reasoning process**
- **Enables reflection on previous thoughts**

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Setting Up Your Thinking Agent

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Getting started is surprisingly straightforward. First, you'll need to install the required packages:

```
pip install openai-agents
pip install mcp-sequential-thinking
```

Then, let's create an agent that can think step-by-step:

```
import asyncio
from agents import Agent, Runner
from agents.mcp import MCPServerStdio

async def create_thinking_agent():
    # Launch the Sequential Thinking MCP server
    seq_server = MCPServerStdio(
        name="SequentialThinkingServer",
        params={
            "command": "mcp-sequential-thinking",
            "args": []
        }
    )
```

```
# On
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    name= "ThinkingAgent" ,
    instructions=(
        "You are a methodical problem-solver. Use Sequential "
        "Thinking tools to organize your analysis step-by-step."
    ),
    mcp_servers=[mcp]
)

return agent, mcp

# Ready to solve complex problems!
```

The Magic: How Thought Feedback Works

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The real power comes from the **feedback loop** between your agent and its external memory. Here's what happens behind the scenes:

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Your agent can now:

- 1. Record insights as they develop**
- 2. Retrieve summaries to maintain context**
- 3. Build systematically on previous thoughts**
- 4. Avoid repetition and circular reasoning**

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Real Example: Time Travel Planning Agent

Let's see this in action with a complex scenario: "*Devise a safe plan to travel to the year 2050 and back.*"

Here's how our thinking agent tackles this step-by-step:

```
# ... continuing from the previous context
# Define an agent that can use the Sequential Thinking MCP server
agent = Agent(
    name="TimeTravelPlanner",
    instructions=
        "You are a planning assistant. Think step-by-step, and use the
        \"Thinking tools (thought recording, summary) to organize your p
    ),
    mcp_servers=[mcp] # register the connected MCP server as a tool
)
# Define a user query for the agent to solve
user_query = "Devise a safe and efficient plan to travel to the year 20
result = await Runner.run(starting_agent=agent, input=user_query)
print(result.final_output)
```

The Results: Structured, Reliable Reasoning

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The difference is remarkable. Instead of scattered thoughts, you get:

Before (traditional agent):

“Time travel is complex... maybe wormholes? Actually, what about... wait, let me think about this differently...”

After (Sequential Thinking MCP):

“Time Travel Plan Analysis:

Problem Definition: Safe bidirectional time travel to 2050 **Research:** Evaluated 3 theoretical methods

Analysis: Relativistic travel most feasible **Synthesis:** Detailed 30-year mission plan

Conclusion: Actionable recommendations with safety protocols”

Advanced Features: Memory Management

With the Sequential Thinking MCP server integrated, the agent can **capture its thoughts and feed them back into its context** in a loop, as illustrated earlier. The MCP server provides three main functions:

- `process_thought` – Records a new thought (with parameters like the thought content, who it was from, and when it was recorded). The thought is stored in a database and can be retrieved later. This allows the agent to keep a record of its thoughts and analyze them later.
- `generate_summary` – Produces a summary of the entire thinking process so far (e.g. how many thoughts recorded, and a timeline of stages completed). This is useful for the agent to recall or reflect on the overall progress.
- `clear_history` – Resets/clears the stored thoughts, starting a fresh thinking session.

Why This Matters for Your Projects

This approach transforms AI agents from **reactive responders** into **systematic thinkers**. Perfect for:

- Strategic planning agents that need consistent logic
- Research assistants handling multi-step analysis
- Decision support systems requiring audit trails
- Educational tutors that model good reasoning
- Creative projects needing structured ideation

Common Pitfalls to Avoid

Don't over-structure simple tasks. Not every query needs five-stage analysis:

```
# ❌ Overkill for simple questions  
"What's 2+2?" → [Problem Definition] → [Research] → [Analysis]...  
  
# ✅ Use structured thinking for complex problems  
"How should we reorganize our engineering team?" → Sequential analysis
```

Handle connection failures gracefully:

```
try:    Welcome back. You are signed into your member account
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        pass
except ConnectionError:
    # Fallback to regular agent without MCP
    agent = Agent(name="FallbackAgent", instructions="...")
```

Getting Started Today

Ready to build smarter agents? Here's your next step:

1. **Install the tools** (`pip install openai-agents mcp-sequential-thinking`)
2. **Start with a complex problem** your current agents struggle with
3. **Implement the thought loop** as shown above
4. **Compare results** with traditional agent approaches

The combination of OpenAI Agents SDK and Sequential Thinking MCP isn't just a technical improvement — it's a fundamental shift toward AI that thinks like we do:

methodically systematically and with memory

Your agent

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difference.

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Want to dive deeper? The complete code examples and advanced configurations are available in the OpenAI Agents SDK documentation. Have you built thinking agents for your projects? Share your experiences in the comments below.

Tags: #ArtificialIntelligence #OpenAI #AgentDevelopment #MachineLearning
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Micheal Lanham

Ai Agents In Action

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Written by Micheal Lanham

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Micheal Lanham is a proven software and tech innovator with 20 years of experience developing games, graphics and machine learning AI apps.

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Bgerby

What are your thoughts?

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