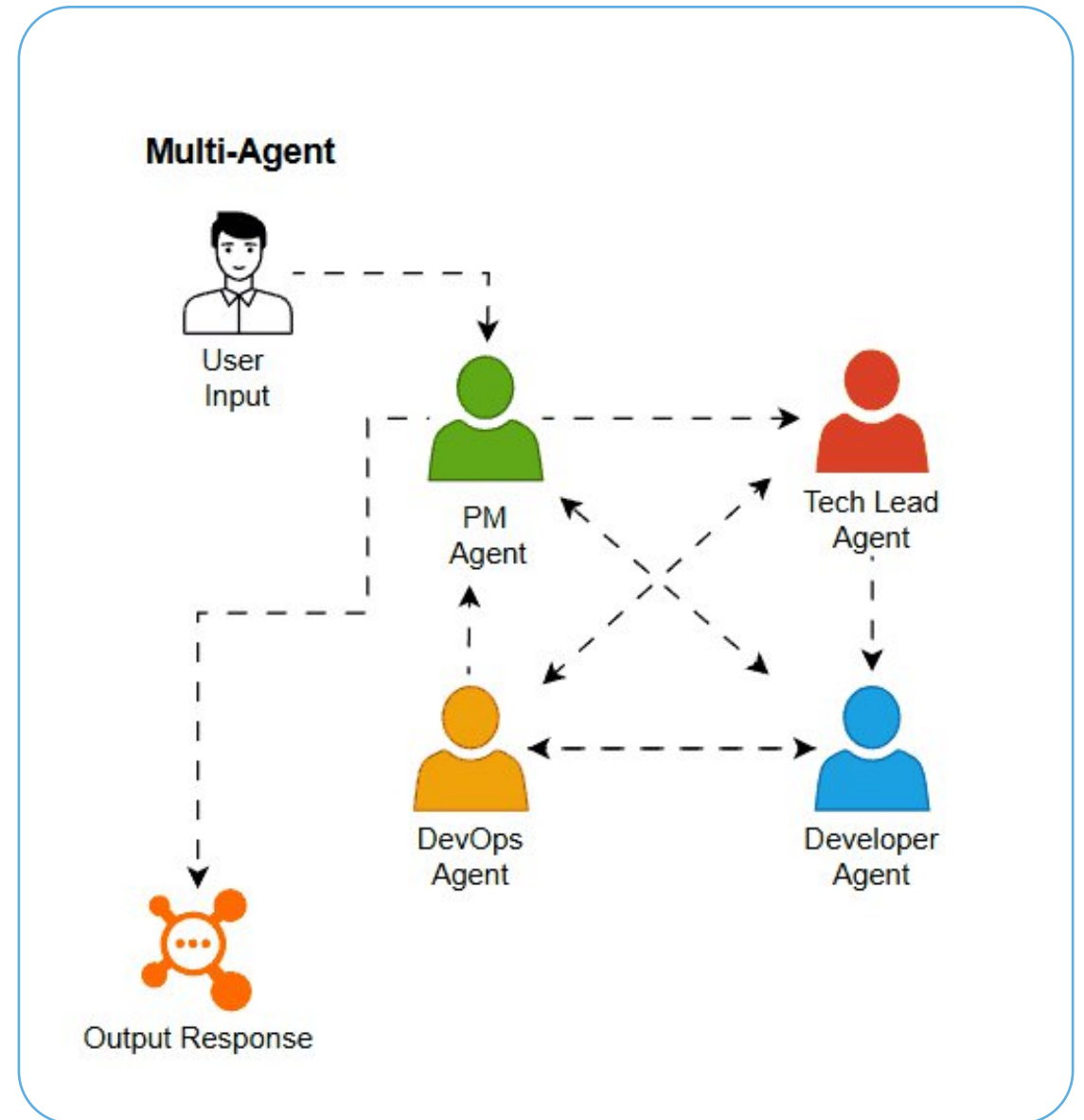


Building Multi-Agent Workflows



Google Developer Groups

Keval Patel
@kmpatel100



Introduction



GUJARAT UNIVERSITY
“योग: कर्मसु कौशलम्”
Estd. 1949

Bachelors Degree in Physics



ST. CLAIR
COLLEGE

Data Analytics for Business

REALIQ

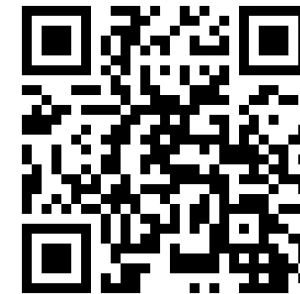
Founder

Keval Patel
@kmpatel100



Build with AI 2025

Google Developer Groups



LinkedIn

Agenda

1. AI Agents 101
2. Why Multi-Agent Workflows?
3. Why Gemini + n8n?
4. Other Tools in the Space
5. Building Your First Multi-Agent Workflow (Hands-On)
6. Testing, Debugging, Q&A

What is an AI Agent?

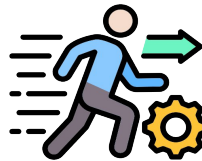
- Autonomous program that can perform tasks and achieve goals (*often on behalf of a user*)
- **Core Components:**



Inputs



Reasonings



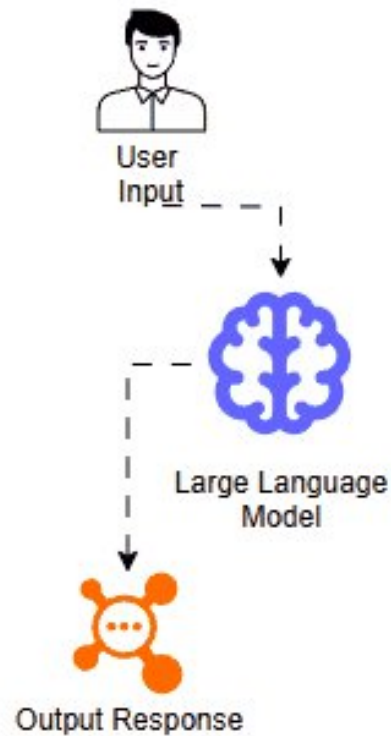
Actions



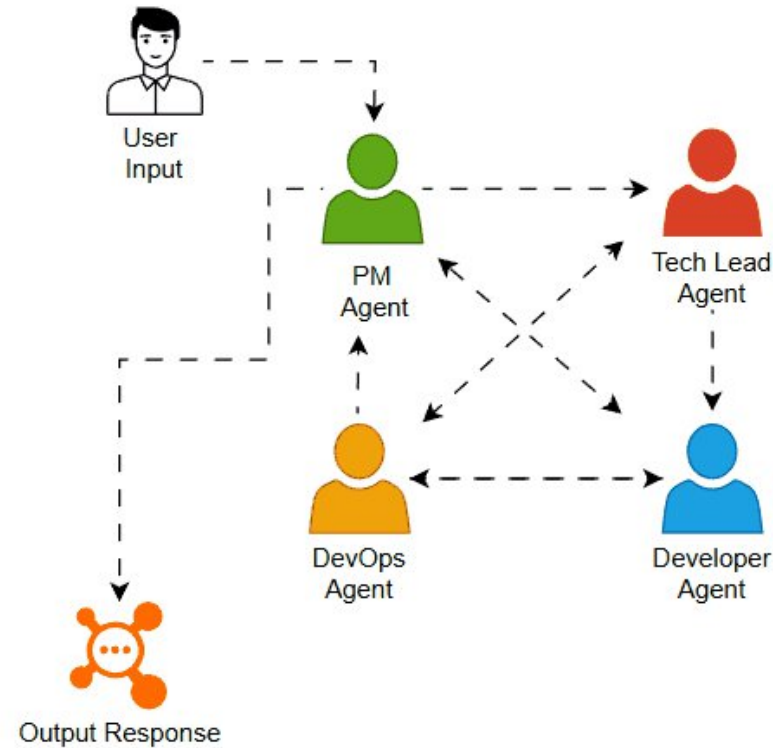
Outputs

Common Type of Agents

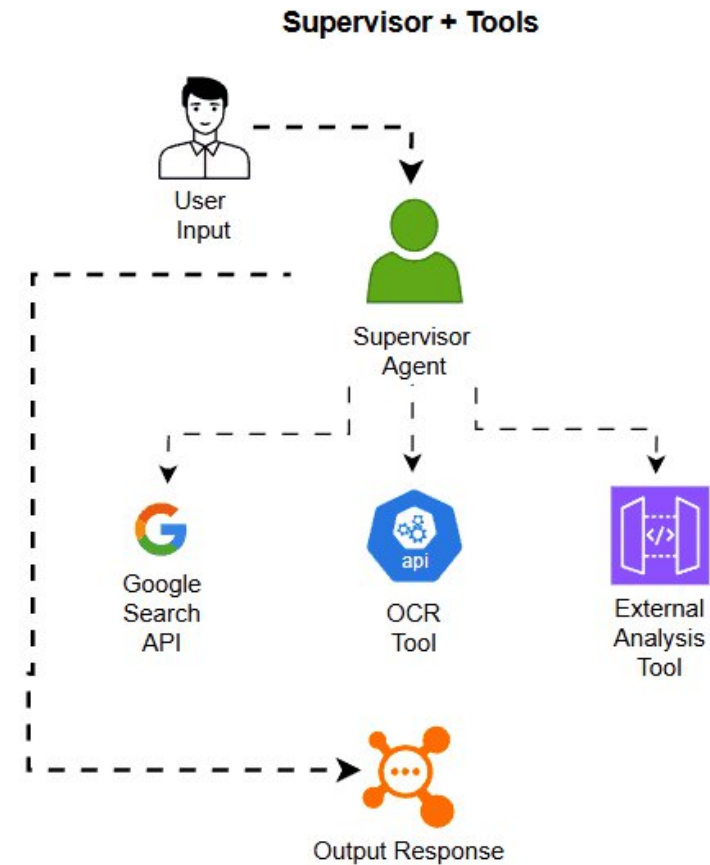
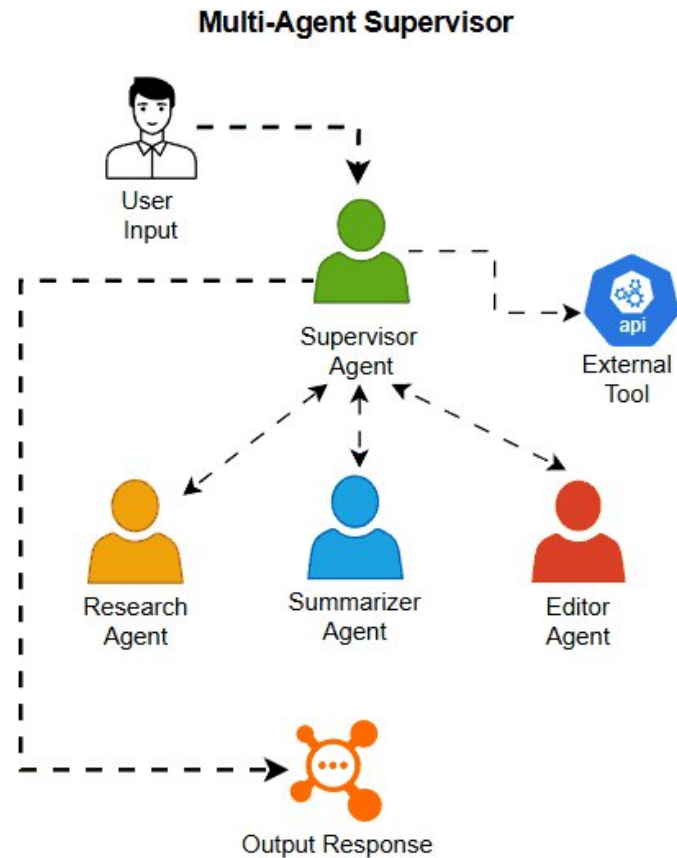
Single Agent



Multi-Agent



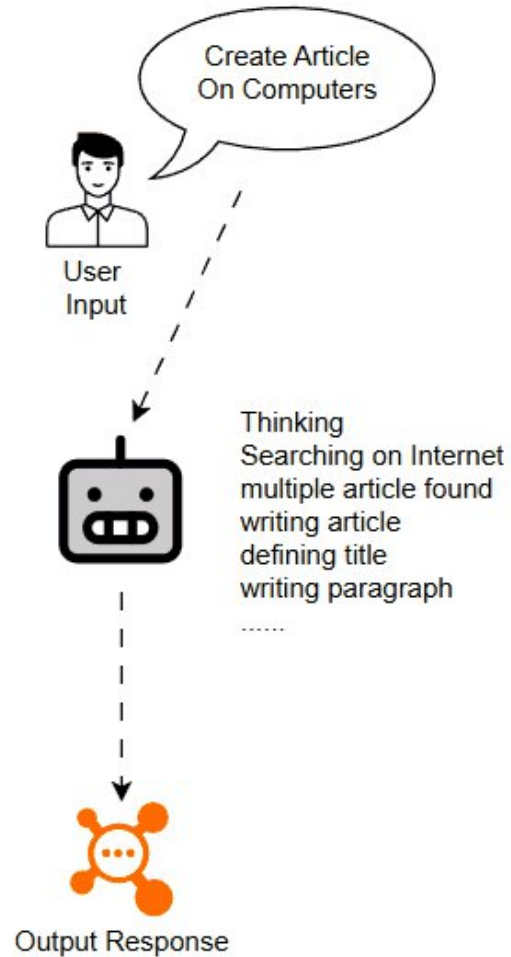
Common Type of Agents



Why Multi-Agent Workflows?

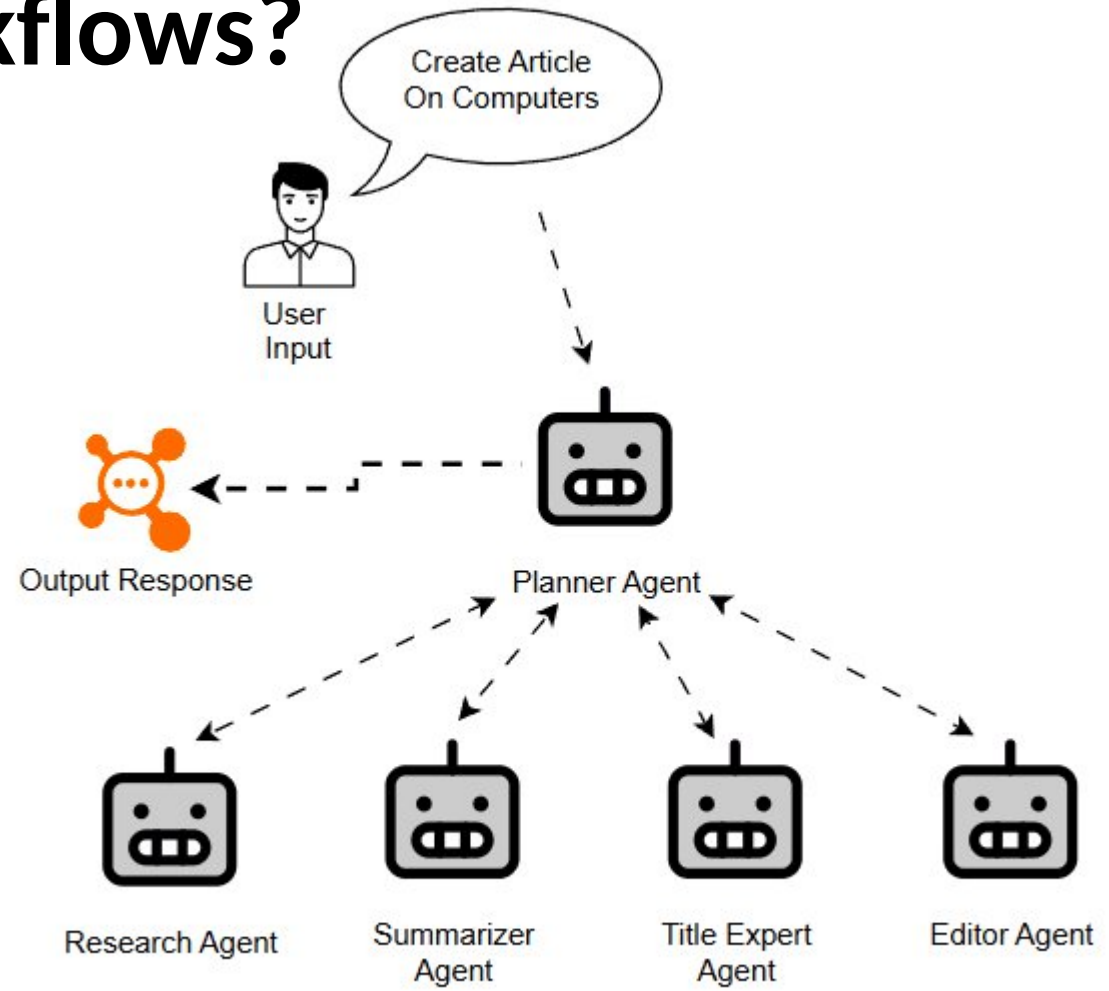
Specialization

Using Single Agent for everything?



Why Multi-Agent Workflows?


Specialization

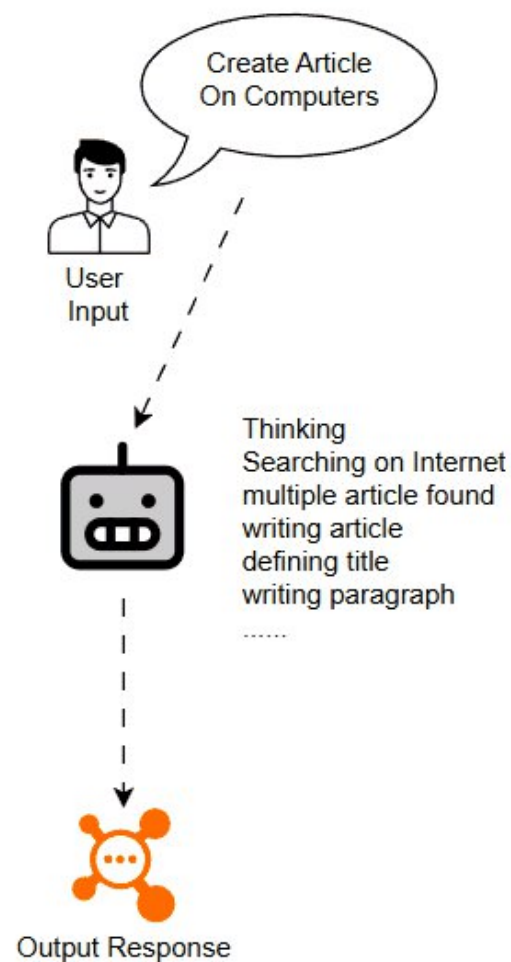


Why Multi-Agent Workflows?

Cost and Scalability

Prices per 1M tokens.

	Batch	Flex	Standard	Priority
MODEL	INPUT	CACHED INPUT	OUTPUT	
	\$1.25	\$0.125	\$10.00	
	\$0.25	\$0.025	\$2.00	
	\$0.05	\$0.005	\$0.40	
	\$1.25	\$0.125	\$10.00	
	\$2.00	\$0.50	\$8.00	
	\$0.40	\$0.10	\$1.60	

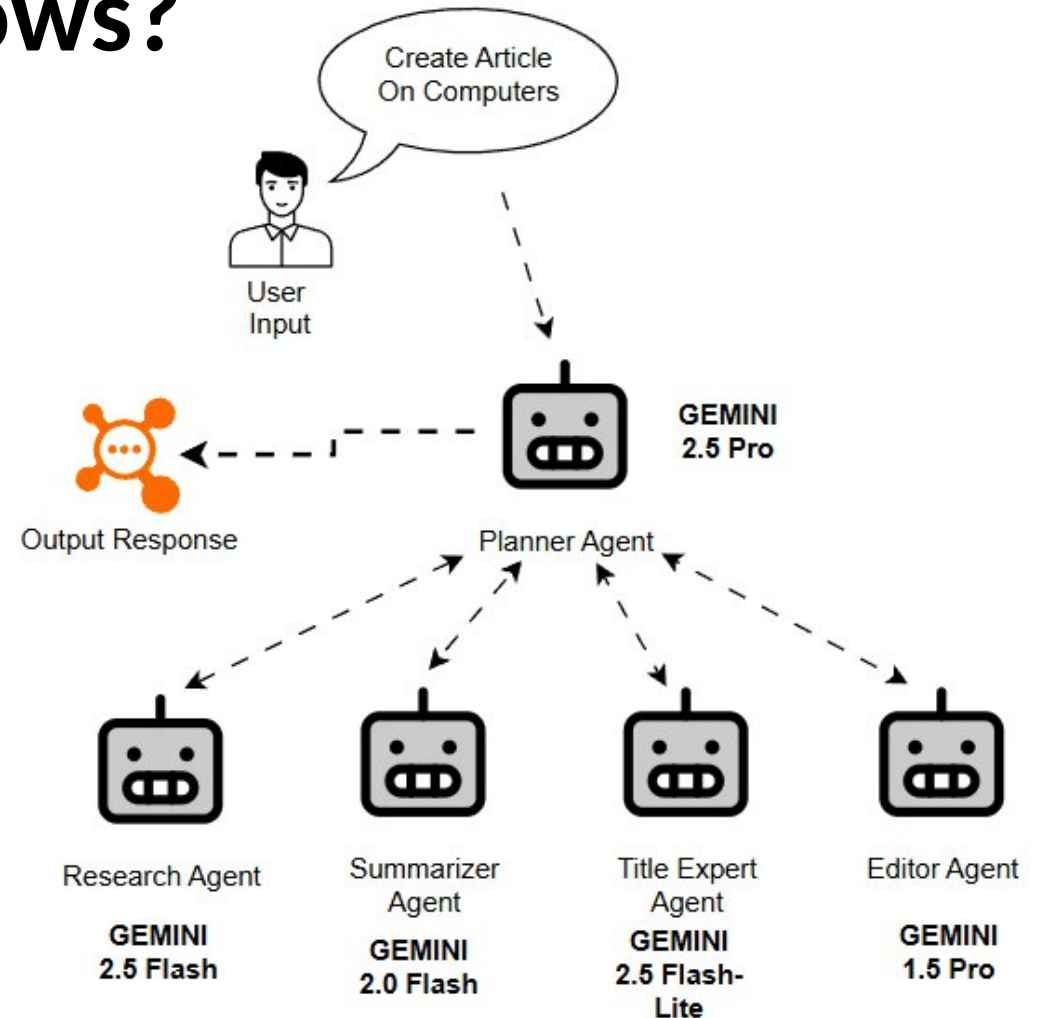


Why Multi-Agent Workflows?

Cost and Scalability

Cost-effective models for lighter tasks
e.g. Writing a Title

State-of-the-art model for complex tasks
e.g. research and searching online

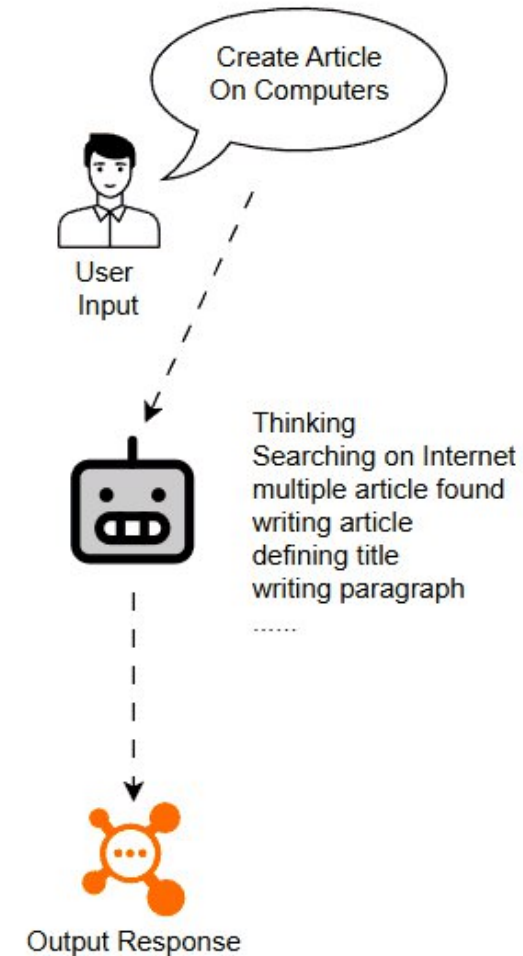
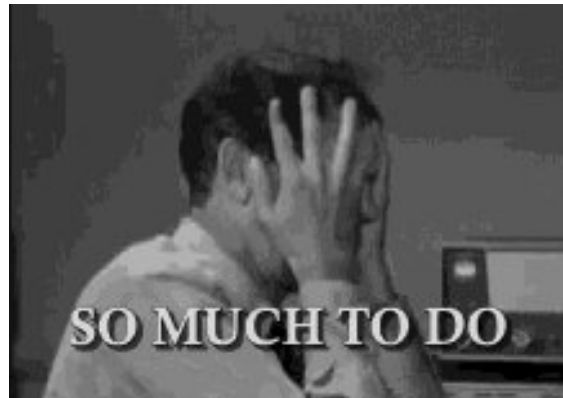


Why Multi-Agent Workflows?

Modular design

Single agent is performing all the tasks

- data gathering
- Summarization
- Translation
- Title
- Content
- Editing
- Reviewing
- publishing



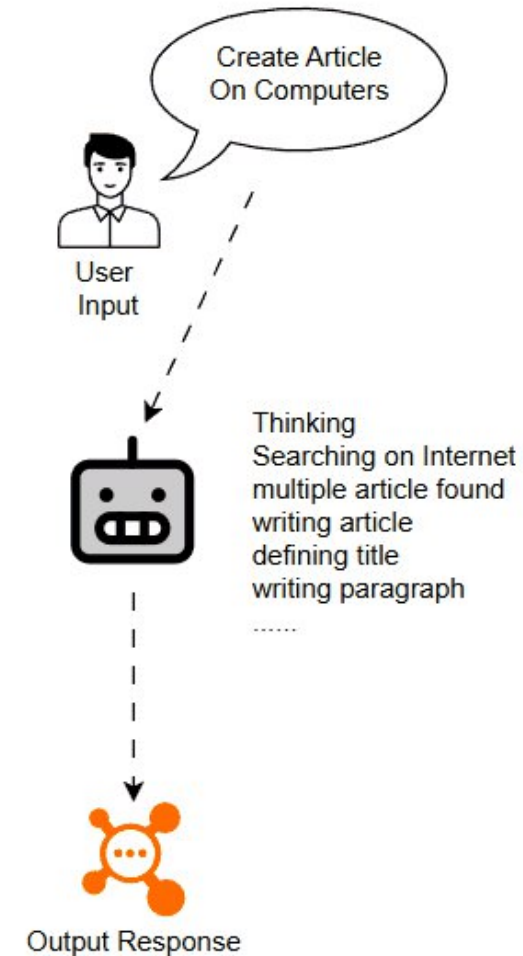
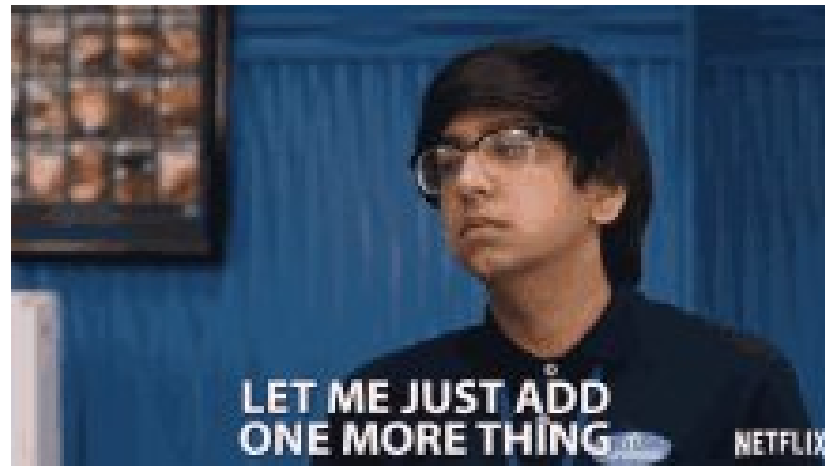
Why Multi-Agent Workflows?

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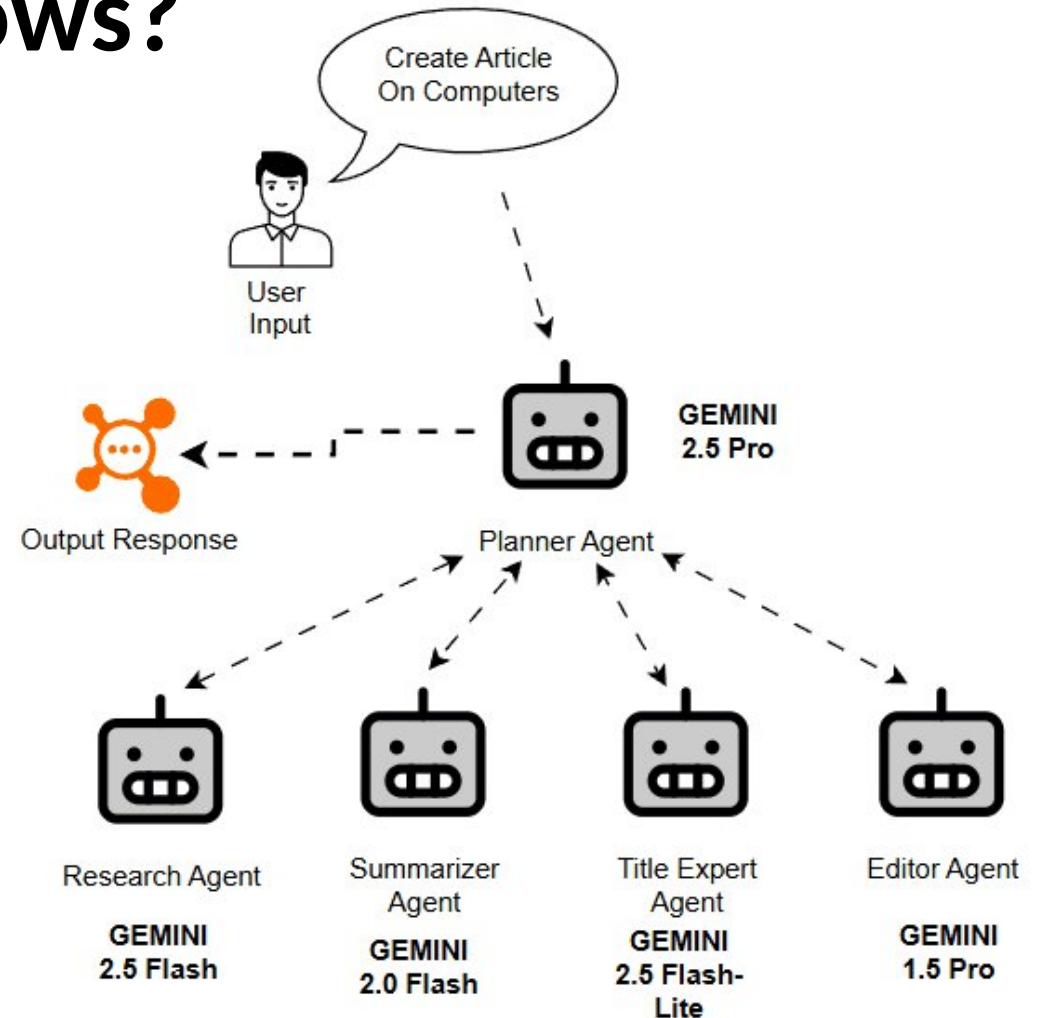
Include citations



Why Multi-Agent Workflows?

Modular design

Adding one more agent is easier than rewriting the entire prompt from scratch



Why Multi-Agent Workflows?

1 Person vs Full orchestra



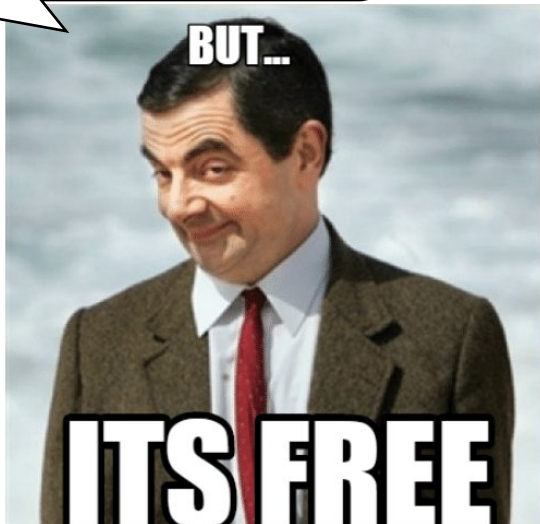
VS



Why Google Gemini?

Generous free tier

It might be using your data for training new models





Free of charge *	
The Gemini API "free tier" is offered through the API service with lower rate limits for testing purposes. Google AI Studio usage is completely free in all available countries .	
RATE LIMITS **	15 RPM (requests per minute) 1 million TPM (tokens per minute) 1,500 RPD (requests per day)
INPUT PRICING	Free of charge
OUTPUT PRICING	Free of charge
CONTEXT CACHING	Free of charge, up to 1 million tokens of storage per hour
TUNING PRICE	Input/output prices are the same for tuned models. Tuning service is free of charge.
USED TO IMPROVE OUR PRODUCTS	<u>Yes</u>
Try it now in Google AI Studio	

*Rate limit changes according to model

Google AI Studio

Google AI Studio

[Get API key](#)[Studio](#)[Dashboard](#)[Documentation](#)

Chat

Stream

Generate Media

Build

History

Enable save


Chat Prompt

Welcome to AI Studio

+


Run Ctrl ↵

What's new




Native speech generation

Generate high quality text to speech with Gemini




Live Audio Generation

Livestream Audio to Audio Dialog for real-time conversational experiences



Native image generation

Interleaved text-and-image generation with the new Gemini 2.0 Flash



Explore and co-develop apps

See Gemini in action with interactive, open source examples

Run settings

Gemini 2.5 Pro Preview 05-06

Token count0 / 1,048,576

Temperature1

Tools

Structured output

Edit

Code execution

Function calling

Edit

Grounding with Google Search

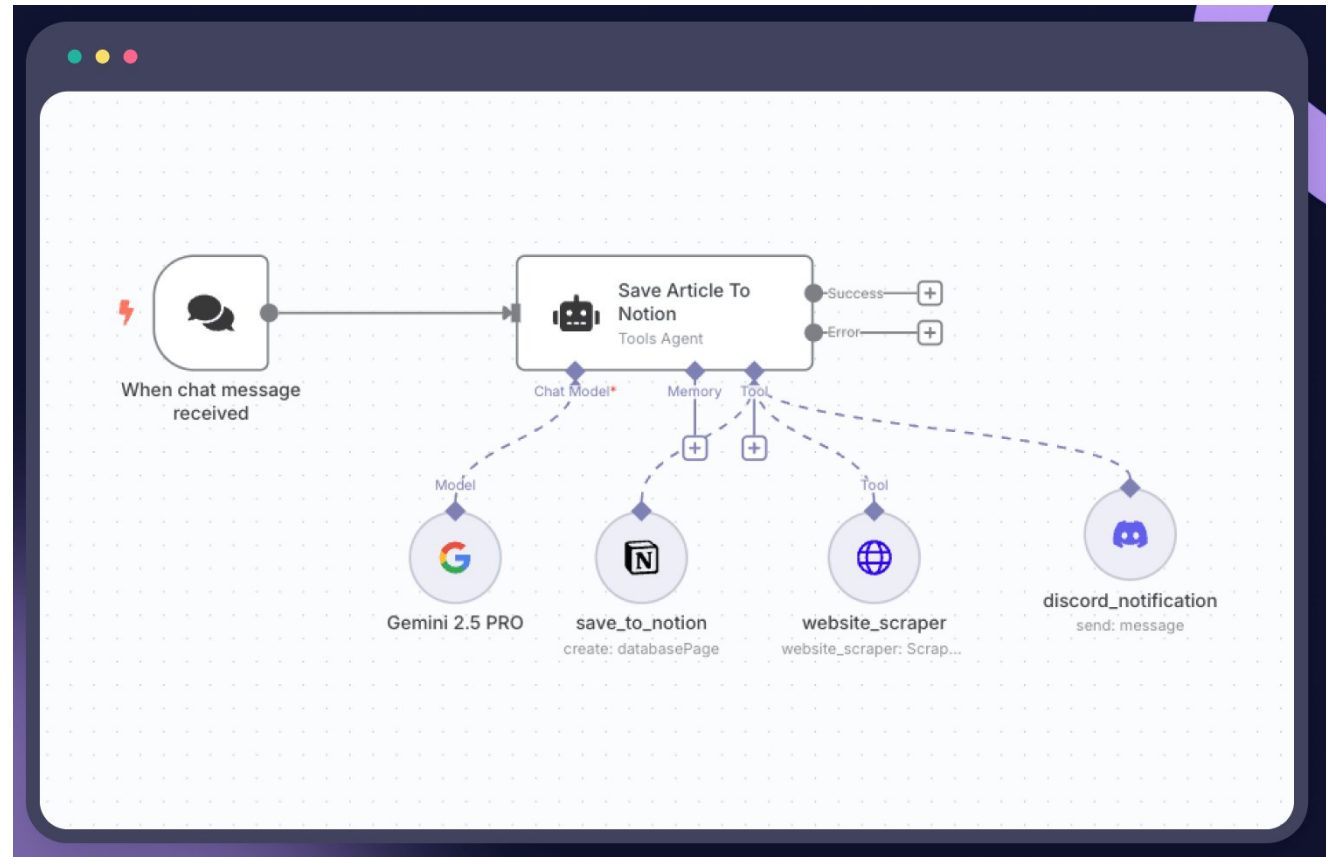
URL context

Advanced settings

This experimental model is for feedback and testing only. No production use.

Quick intro to n8r

- *Open-source workflow automation*
- *Connect APIs, databases, AI models*
- *Drag-and-drop interface*

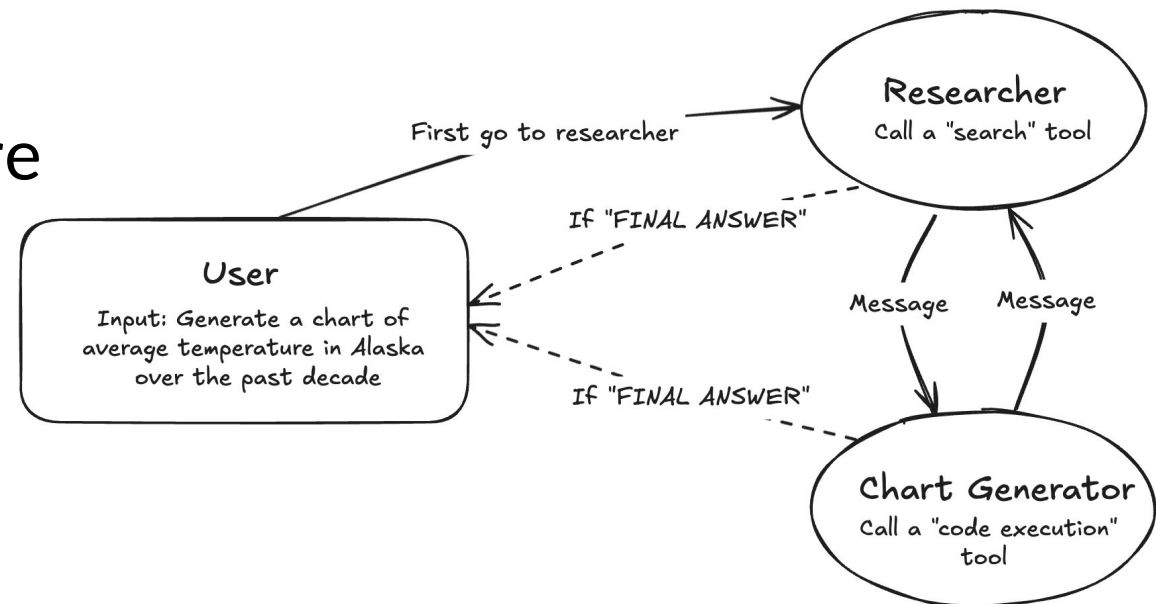


Other Tools You Could Use



Designing Multi Agent Workflows

- Define goal or outcome
- List the skills or subtasks need to achieve the goal
- Assign Agent roles
- Decide Multi-Agent architecture
- Connect tools



Writing Prompts for Multi-Agent Workflows

1. Start With Agent Role and Scope

- **Role** - who/what the agent is
- **Goal** - what it must accomplish
- **Scope** - what it should not do



Example:

Role: You are expert in creating a newsletter pipeline.

Goal: Produce a weekly issue with 5 to 7 items.

Rules: never fabricate facts, include sources for every claim, keep total reading time under 6 minutes.

Writing Prompts for Multi-Agent Workflows

2. Give Clear Input and Output Formats

- Tell the agent exactly what data it will get.
- Tell it how to respond, ideally in **JSON** so it's machine-readable.

Example:

You will receive a JSON object with link_number and Link.

Respond ONLY in JSON format:

```
{"title": "", "url": "", "summary": "", "published": "", "tags": []}
```



Writing Prompts for Multi-Agent Workflows

3. Use Style and Tone Instructions

- Keep tone consistent across agents:
 1. Professional but friendly
 2. One question at a time for conversational agents
 3. Concise summaries for data-heavy agents



4. Include Guardrails

- Multi-agent systems can go off track so, add boundaries:
 1. No fabrication of unavailable data
 2. Escalate to supervisor when unsure
 3. Never leave role



Prerequisites

- Docker Desktop
- Ngrok account
- Google Account
- Basic API knowledge
- Internet connection

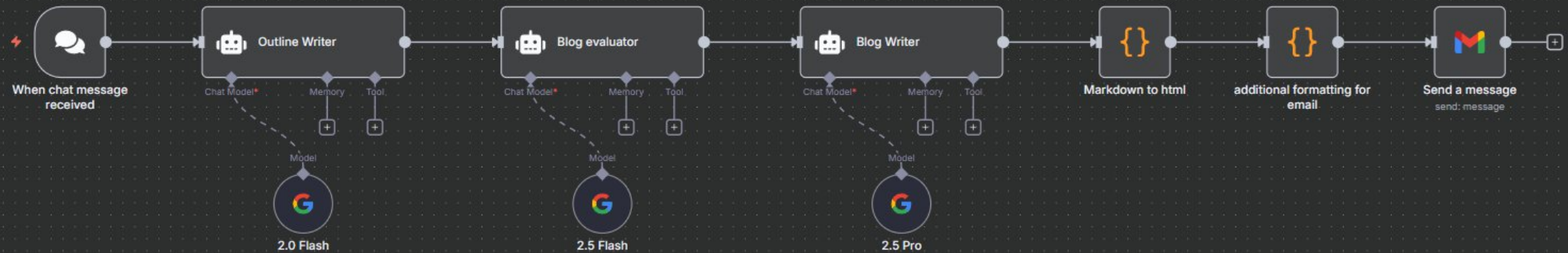


ngrok



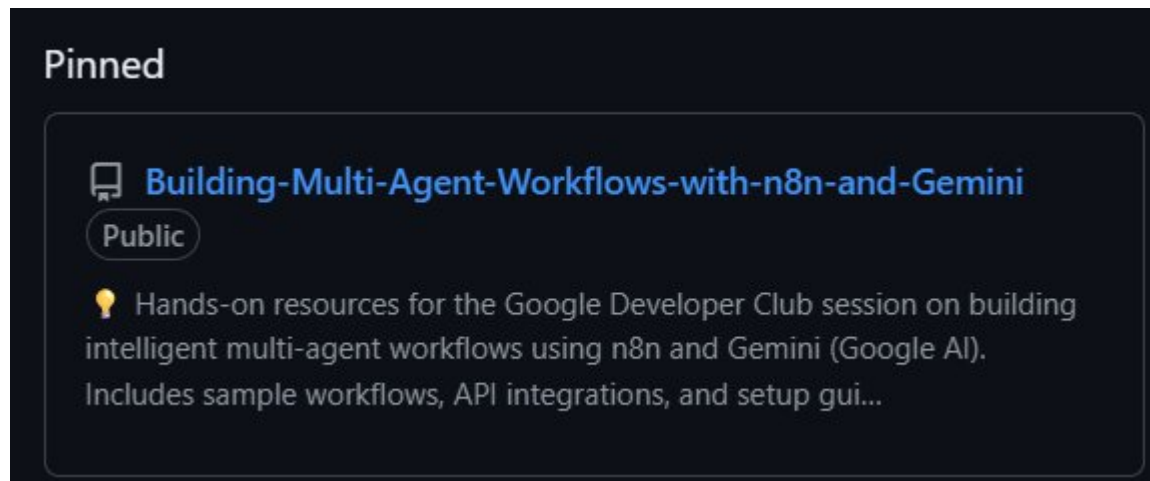
Prompt Chaining in Multi-Agent Workflows

- ✓ Reduces Complexity - Each agent focuses on a single, well-defined task
- ✓ Improves Accuracy - Mistakes are easier to catch and fix at each stage
- ✓ Increases Flexibility - Swap or add agents without rebuilding the whole workflow
- ✓ Enhances Specialization - Agents become experts in specific tasks, boosting reliability
- ✓ Simplifies Debugging - Fix only the weak link instead of redoing the entire process



Building First Multi-Agent workflow

1. Go to github.com/kmpatel100
2. Select first pinned repository



Created With
Gemini
Imagen 3

