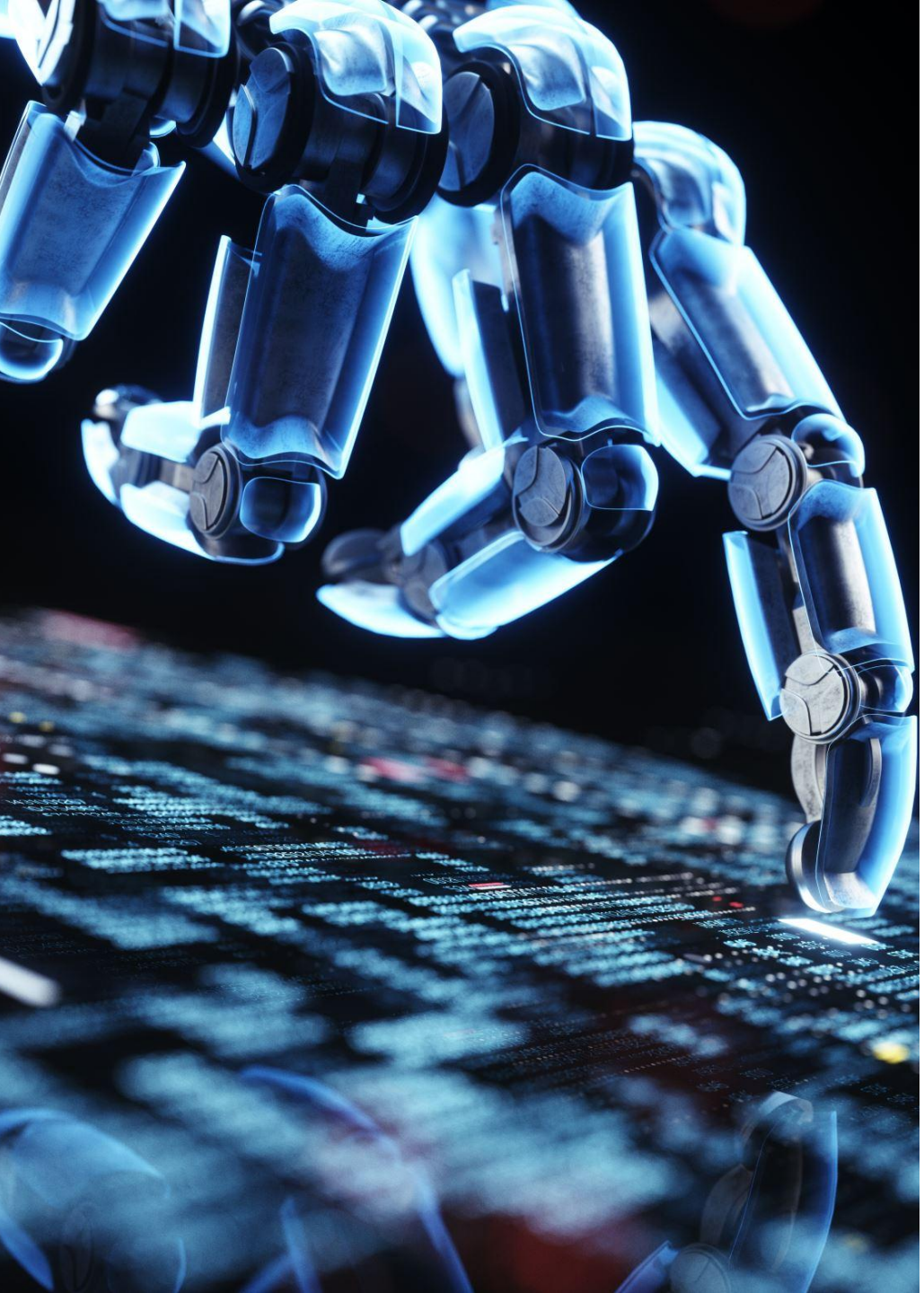
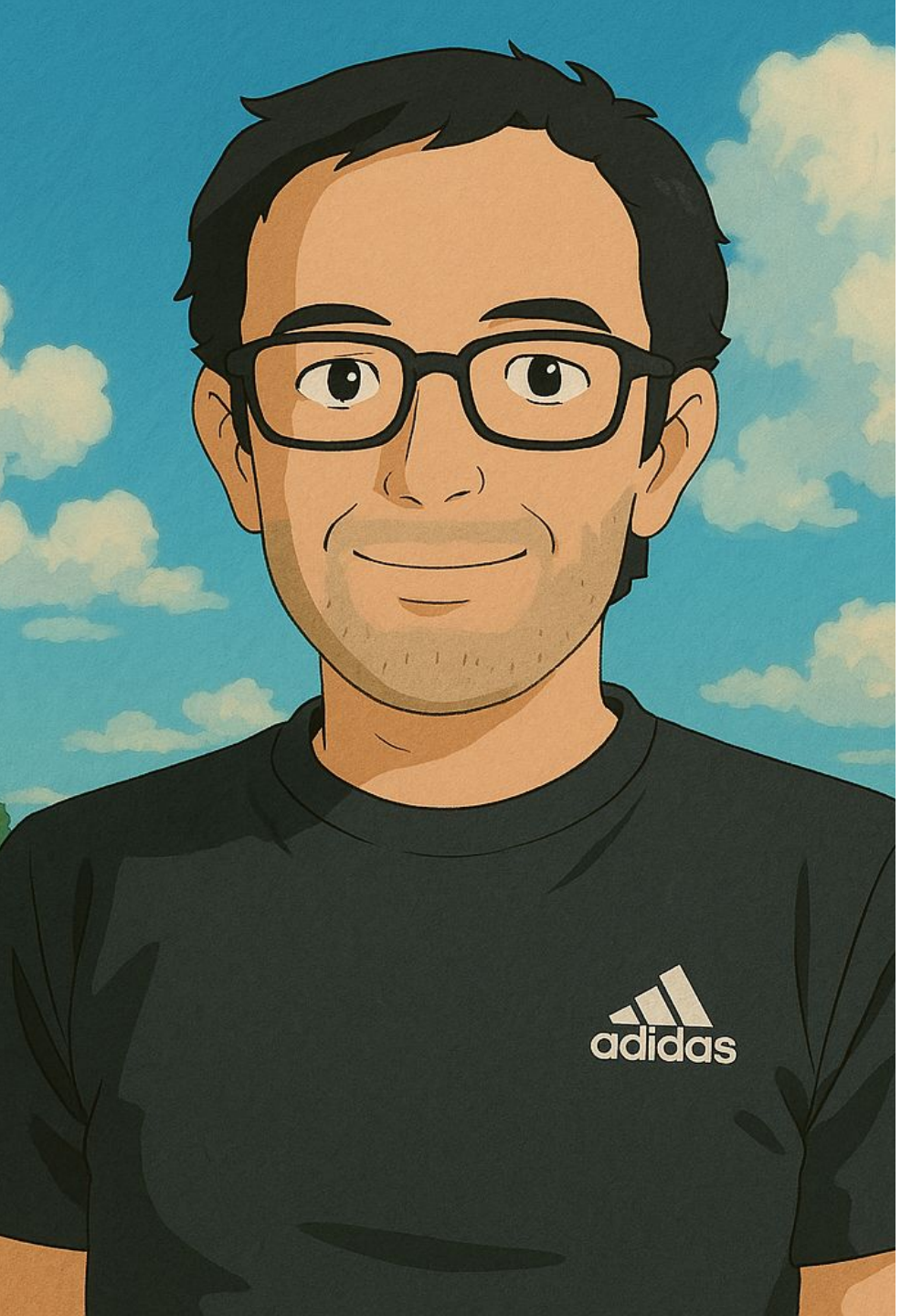


BUILDING END-TO-END KNOWLEDGE GRAPHS WITH MODEL CONTEXT PROTOCOL (MCP) AND NEO4J

WITH

CLAUDE DESKTOP
GEMINI CLI



ABOUT ME

- Manjunath Janardhan, Principal AI Engineer at MSG Global
- 20+ years of software engineering experience
- Patent Holder
- Speaker, Medium Articles, YouTuber (3 channels).
- Key expertise areas: Gen AI, Microservices & Cloud.

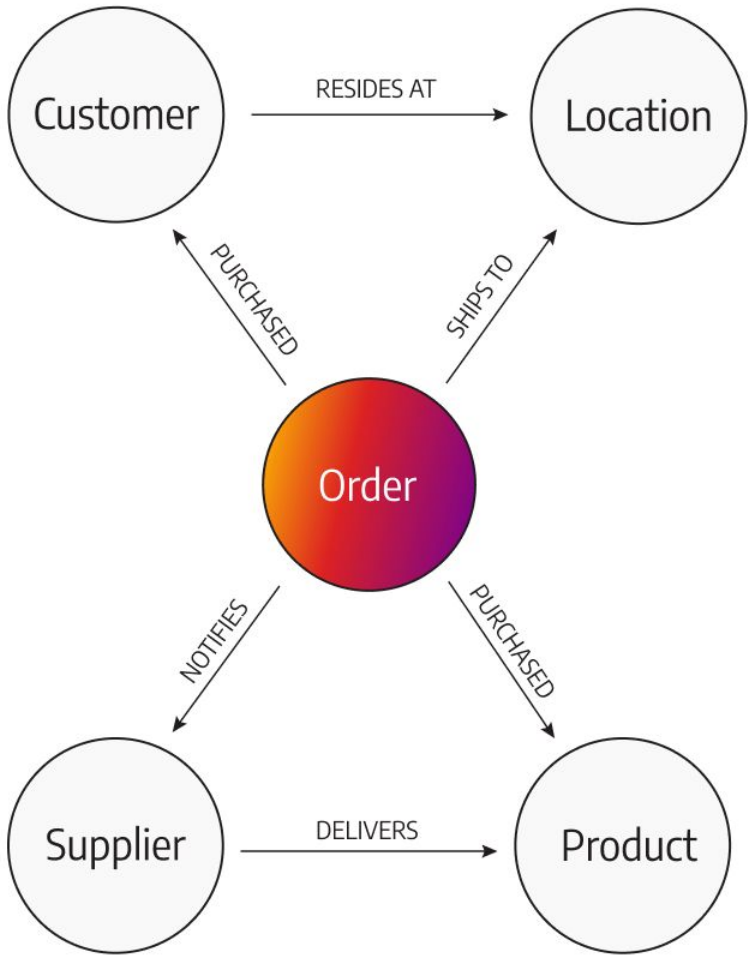
AGENDA

- End-to-End Live Demo with Claude Desktop
- Graph DB and Relational DB
- Knowledge Graph
- Standard RAG & Graph RAG
- SQL vs Cypher
- Agents
- Model Context Protocol (MCP)
- End-to-End Live Demo with Gemini CLI
- Resource and Article (Neo4j + MCP + Claude)

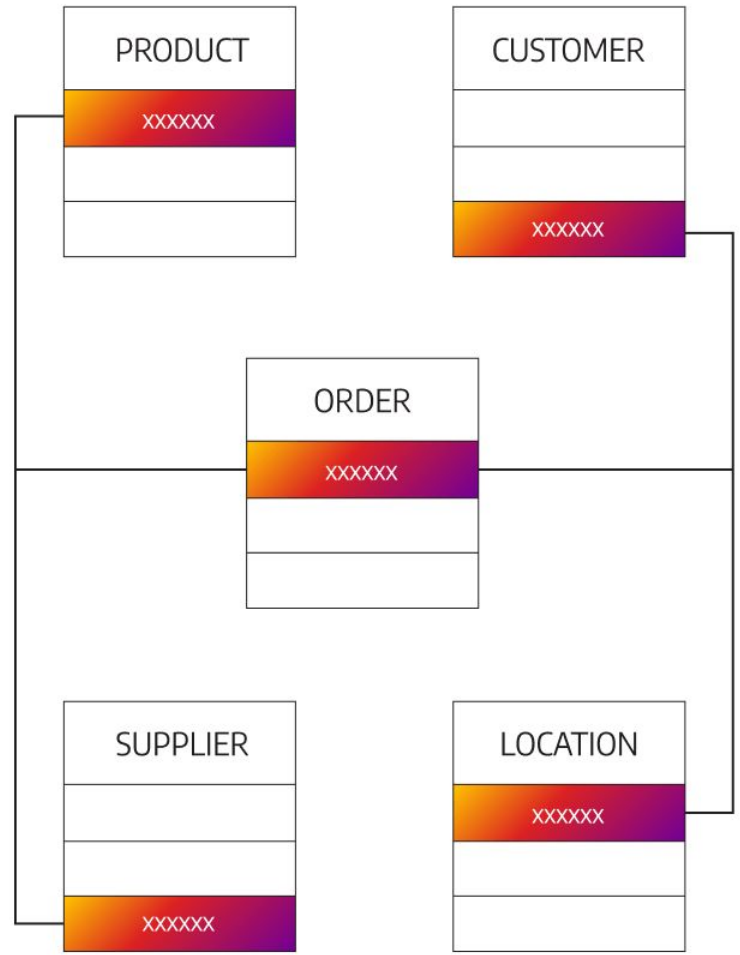
DEMO

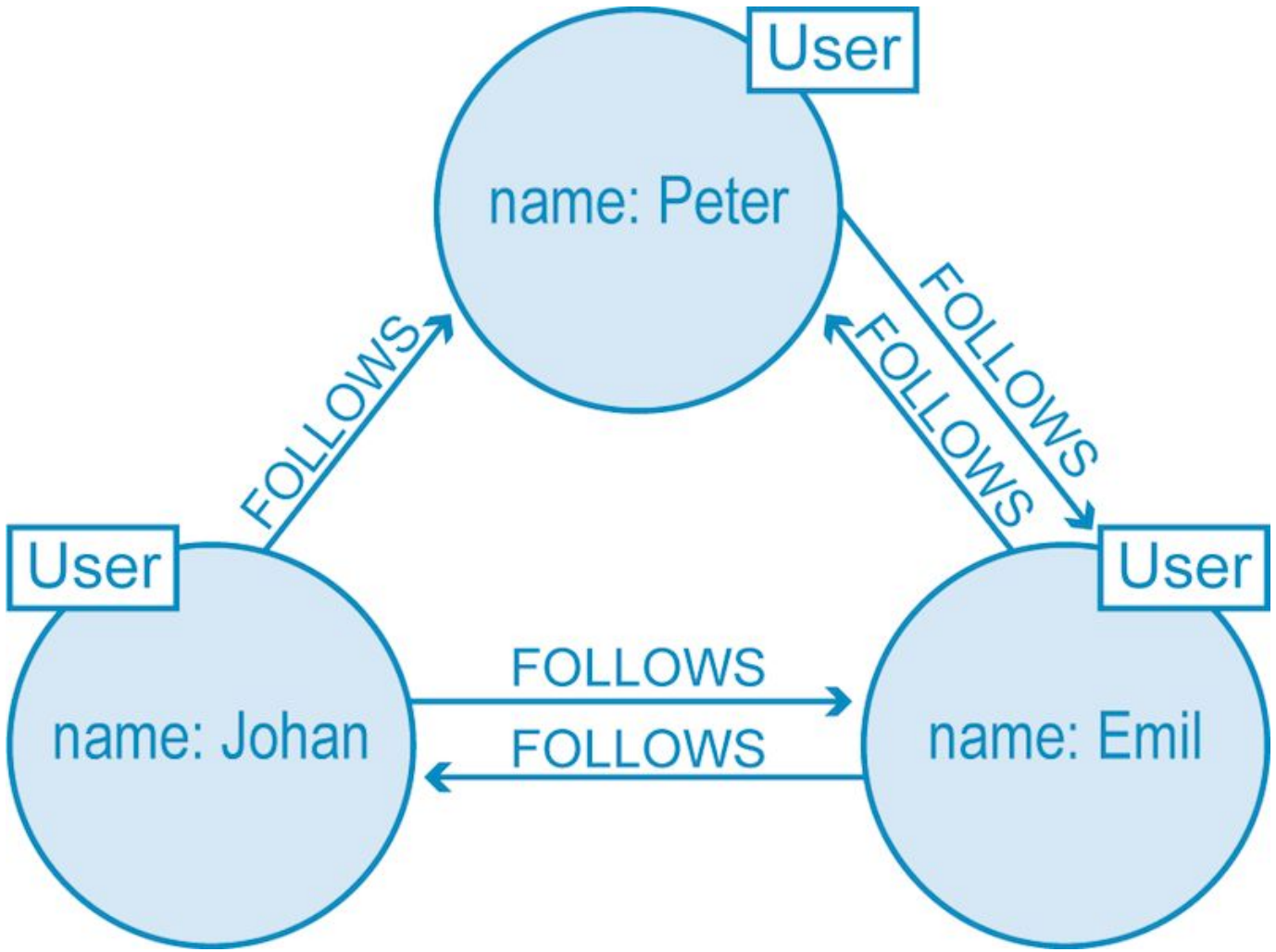
- NEO4J + MCP + Claude Desktop

GRAPH DB



RELATIONAL DB




User
name: Peter
FOLLOWS
FOLLOWS
FOLLOWS
FOLLOWS
User
User
name: Johan
name: Emil
FOLLOWS
FOLLOWS

SQL	Cypher
In SQL, this is how you order items by price and return the 10 most expensive items:	The statement is similar in Cypher, except for the pattern matching part:

```
SELECT p.ProductName, p.UnitPrice
FROM products as p
ORDER BY p.UnitPrice DESC
LIMIT 10;
```

```
MATCH (p:Product)
RETURN p.productName, p.unitPrice
ORDER BY p.unitPrice DESC
LIMIT 10;
```

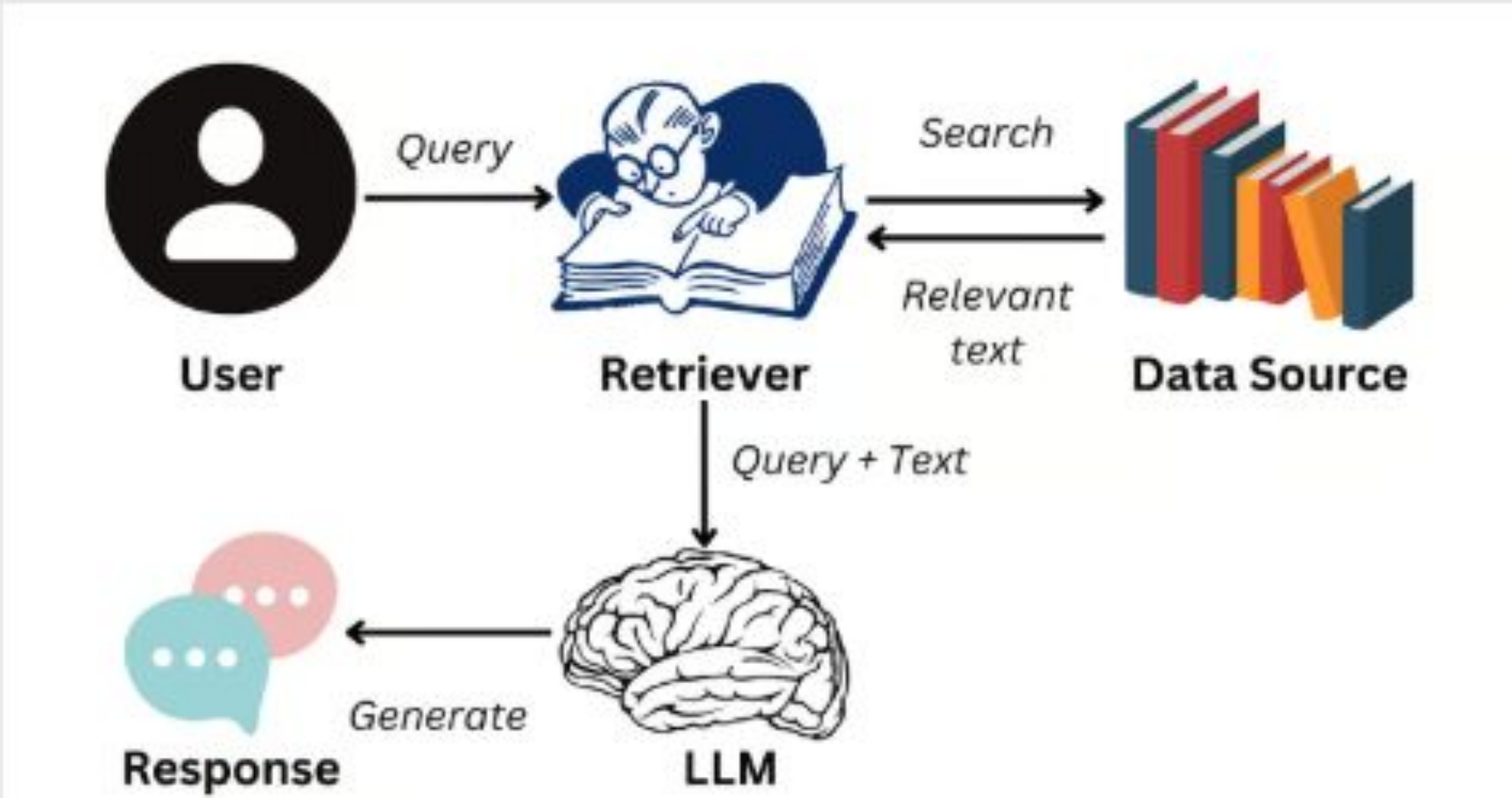
SQL	Cypher
In SQL, you can filter data using the `WHERE` clause:	In Cypher, the `WHERE` clause belongs to the `MATCH` statement:

```
SELECT p.ProductName, p.UnitPrice
FROM products AS p
WHERE p.ProductName = 'Chocolade';
```

```
MATCH (p:Product)
WHERE p.productName = 'Chocolade'
RETURN p.productName, p.unitPrice;
```

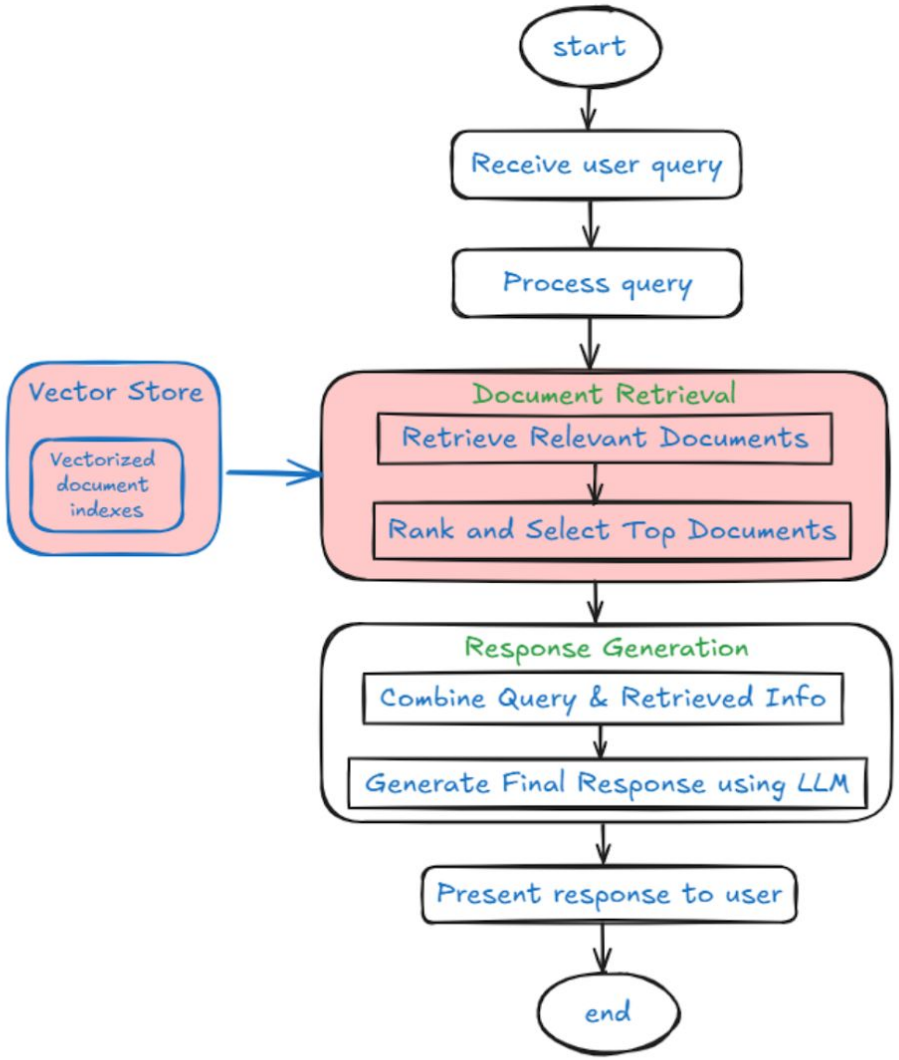
A shorter option is to use the label `productName` to specify the product in the `MATCH` statement:

```
MATCH (p:Product {productName:'Chocolade'})
RETURN p.productName, p.unitPrice;
```

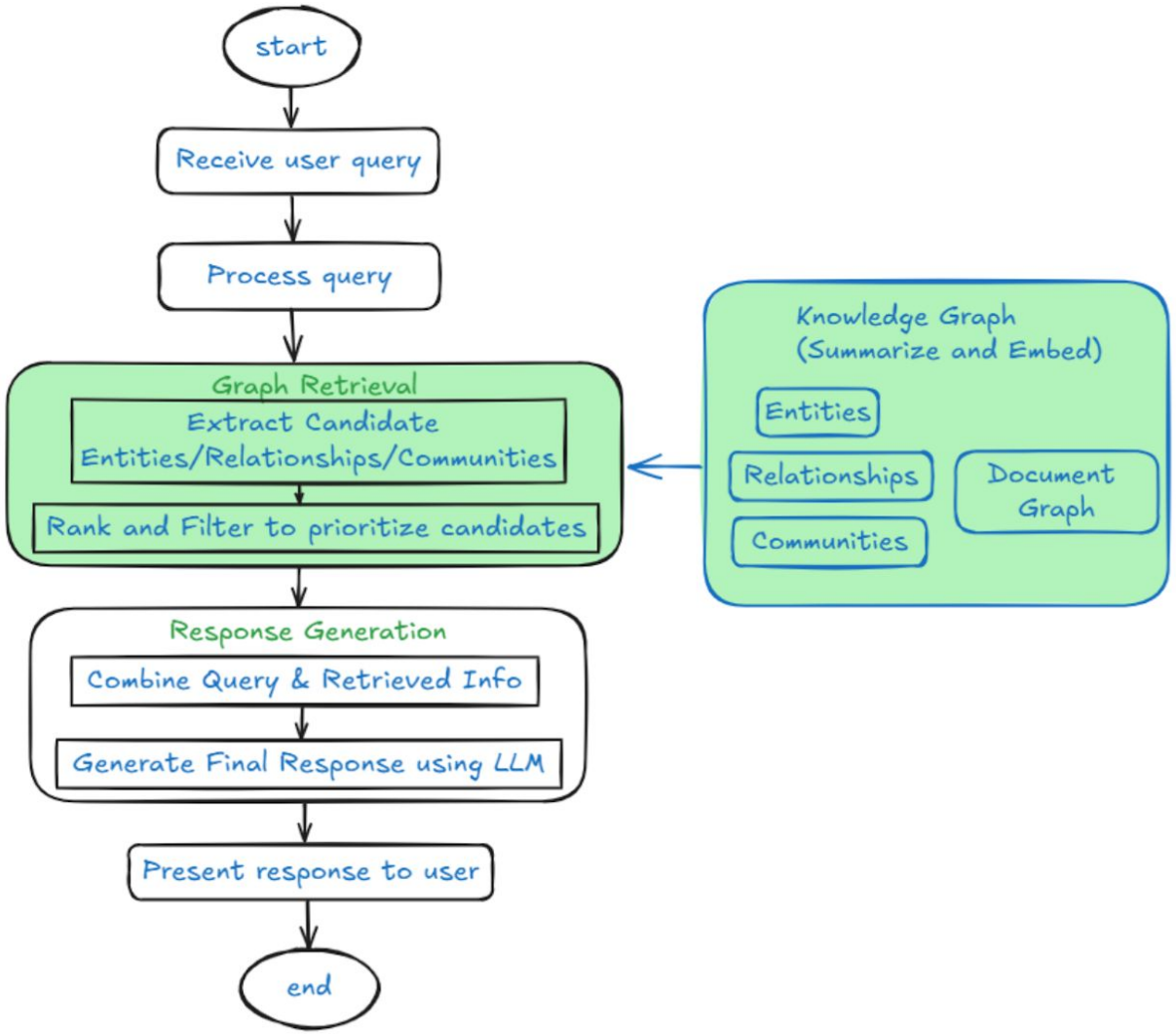


RAG (RETRIEVAL AUGMENTED GENERATION)

Standard RAG



GraphRAG



What is an agent ?

AUTONOMOUS SYSTEM
Operats indepeidently, minimal human intervention

PERCEIVES ENVIRONMENT
Sensors, Input mechanisns, data collection

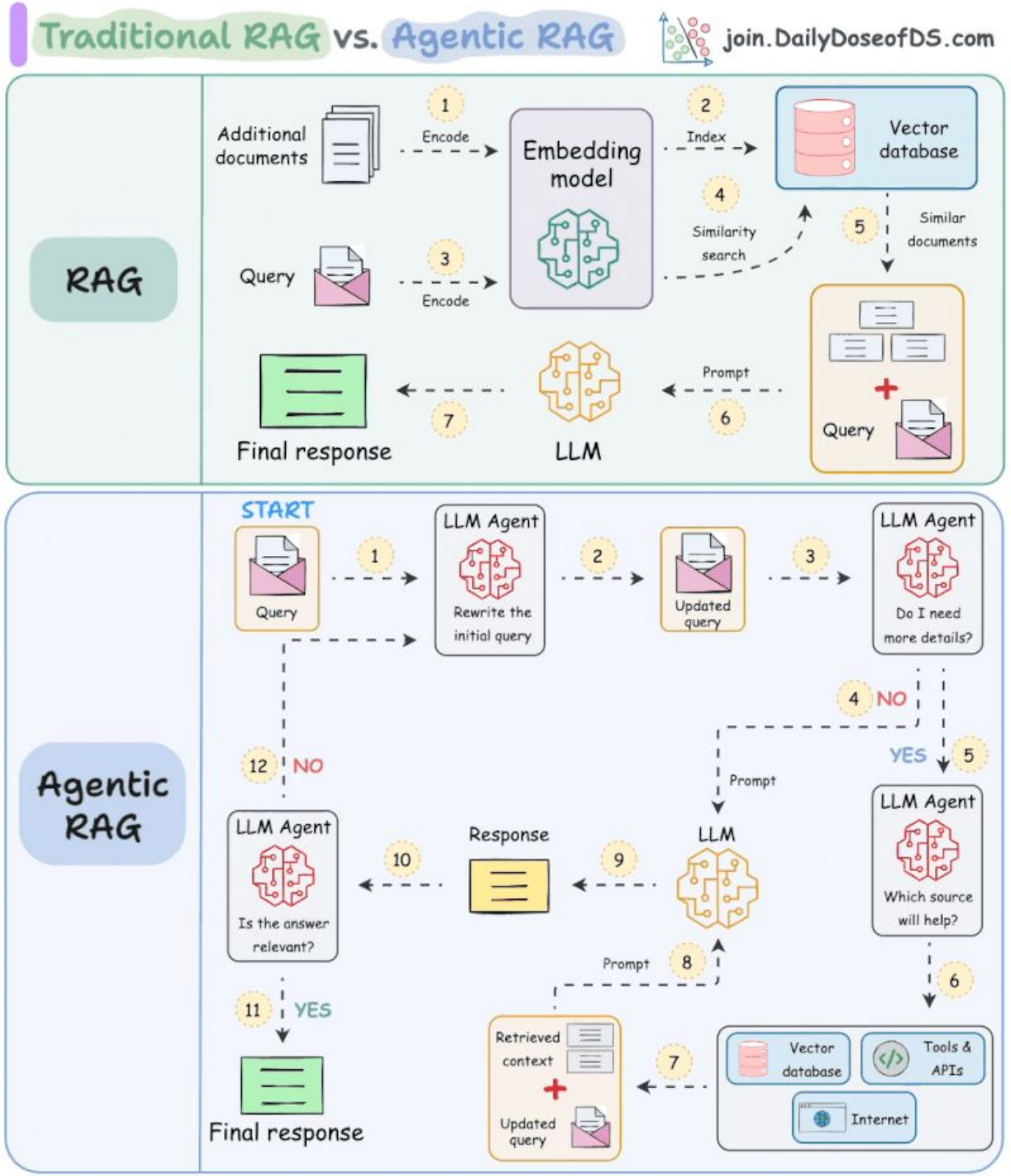
PERCEIVES ENVIRONMENT
Sensors/ input mechanisns, data collection

AI Agent

PROCESSSES INFORMATION
Analyis & decision making. Uses ML, Logi, rules or or logic

TAKES ACTIONS
Executes tasks, use actors, APis, or software

ACHIEVES GOALS
Optimiztion, seli-learning, self-learning, & adaptation


Traditional RAG vs. Agentic RAG
join.DailyDoseofDS.com
RAG
Additional documents
1
Encode
Embedding model
2
Index
Vector database
Query
3
Encode
4
Similarity search
5
Similar documents
Query
Prompt
6
LLM
7
Final response
Agentic RAG
START
Query
1
LLM Agent
Rewrite the initial query
2
Updated query
3
LLM Agent
Do I need more details?
4
NO
YES
5
LLM Agent
Which source will help?
Prompt
LLM
6
Prompt
8
Retrieved context
Updated query
7
Vector database
Tools & APIs
Internet
Response
9
LLM Agent
Is the answer relevant?
10
12
NO
11
YES
Final response

Function and tool Calling – Need for a Standard

OpenAI

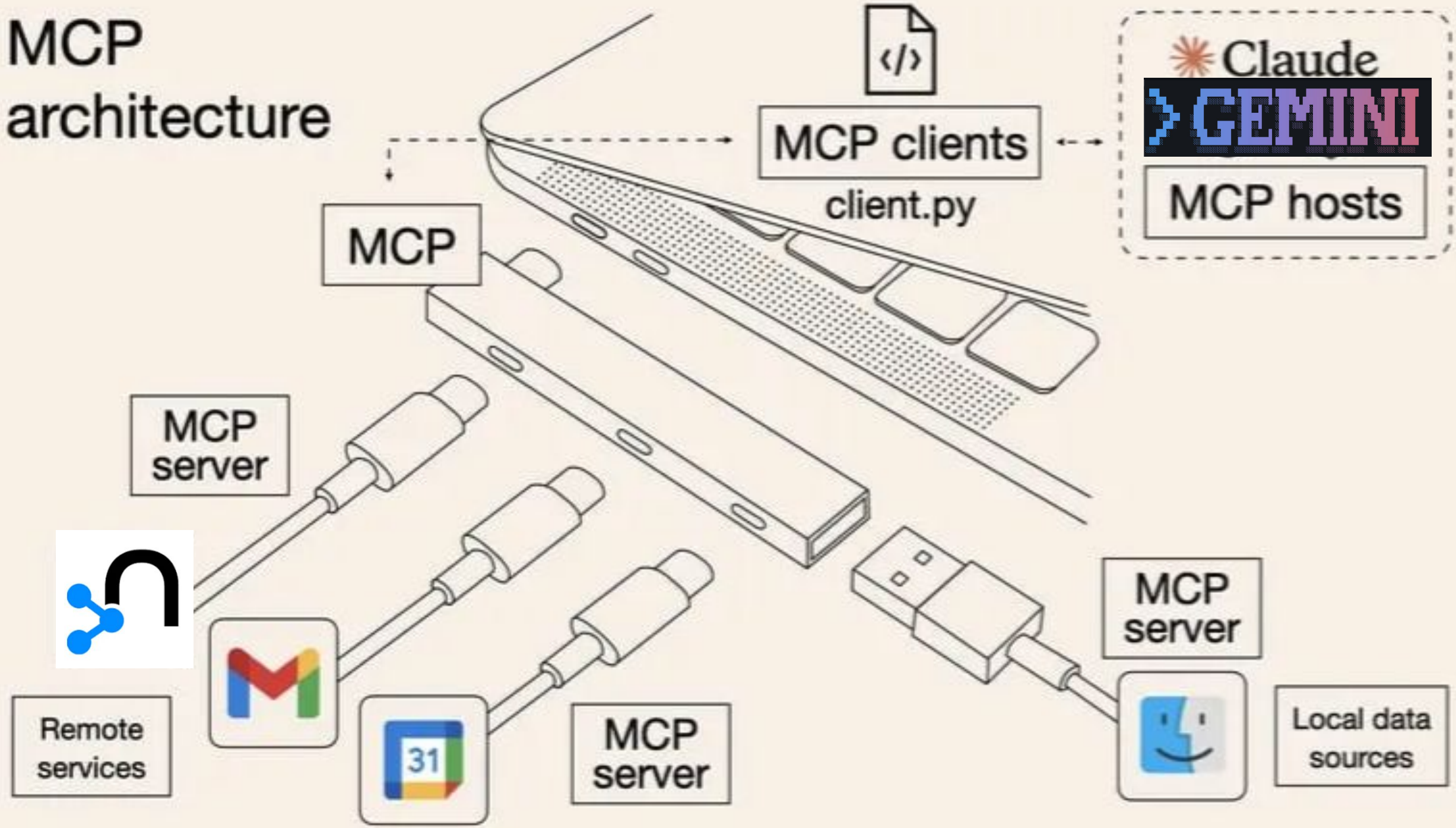
Gemini

AI

MCP

Standard Protocol on how to use tools

MCP architecture

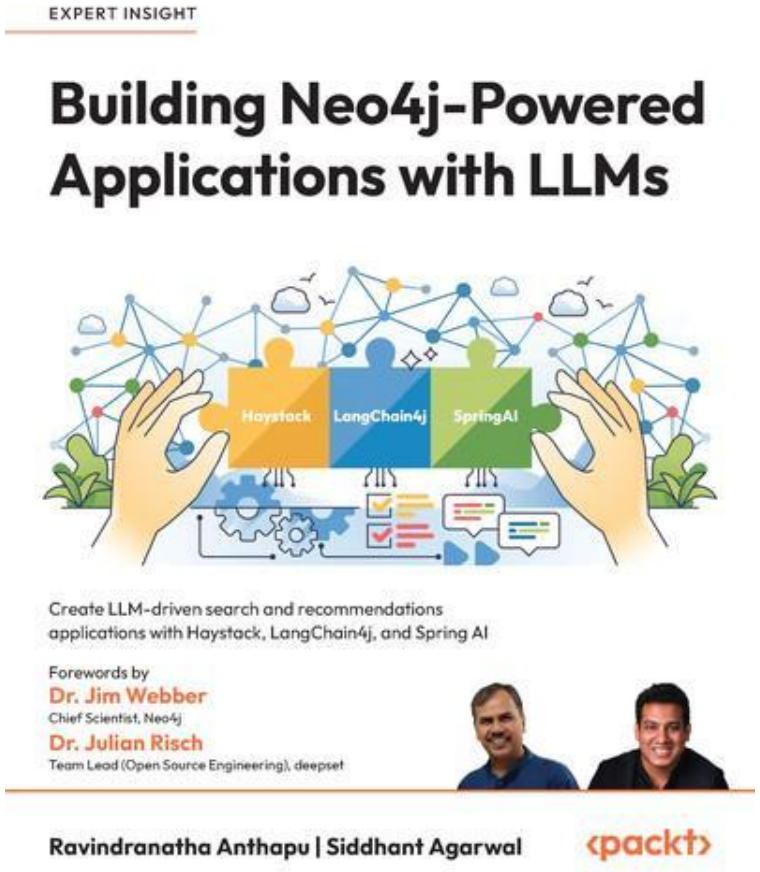


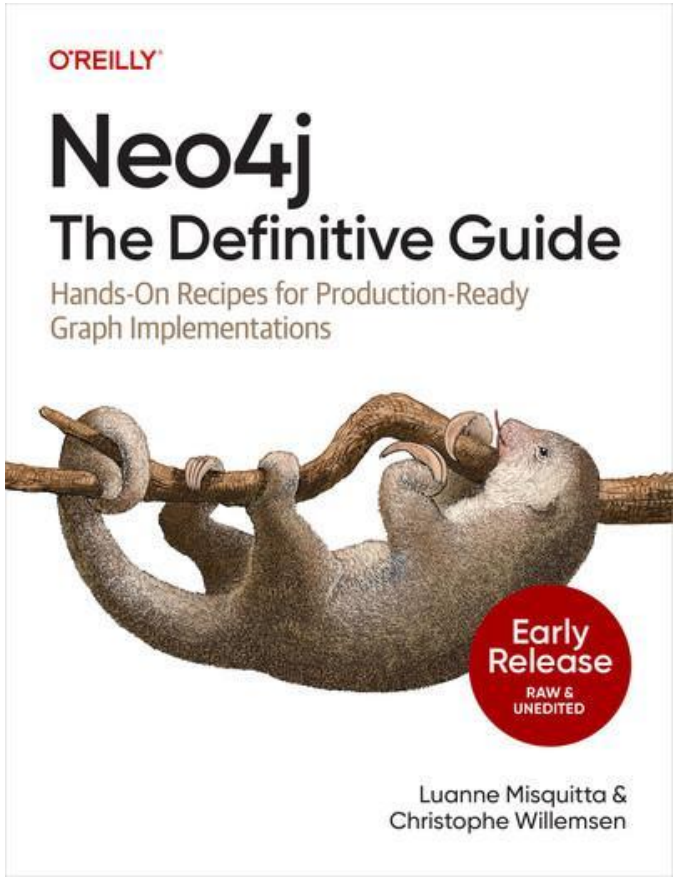
DEMO

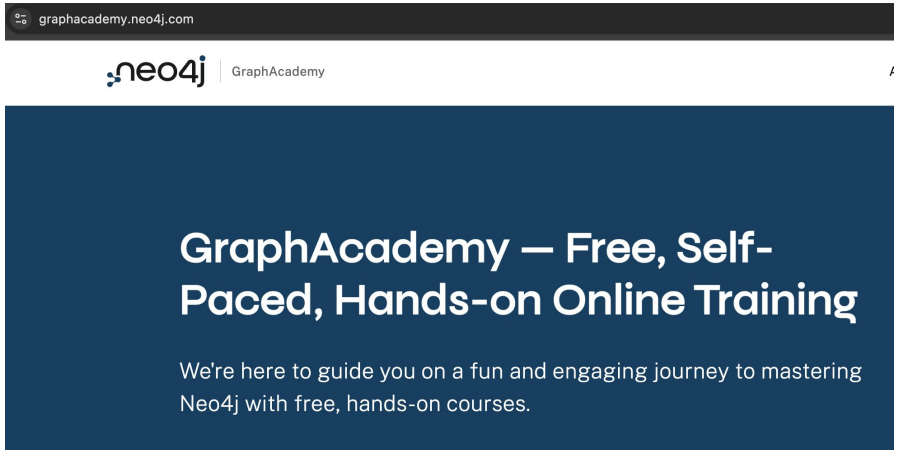
- NEO4J + MCP + GEMINI CLI

Q&A AND RESOURCES

RECOMMENDED







Blog Post
bit.ly/WSO4_BLOG

THANK YOU

LinkedIn

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