



Weaviate

# Building AI Agents with Vector Databases

The Future of Data & AI: Agentic AI Conference



**Scott Askinosie M.S. Ph.D.**  
**M.S. Ph.D.**  
Technical Trainer

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*(on the internet)*  
Starts with Search



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Merci Karine, bénévole dans un refuge pour animaux.

Amazon Stars

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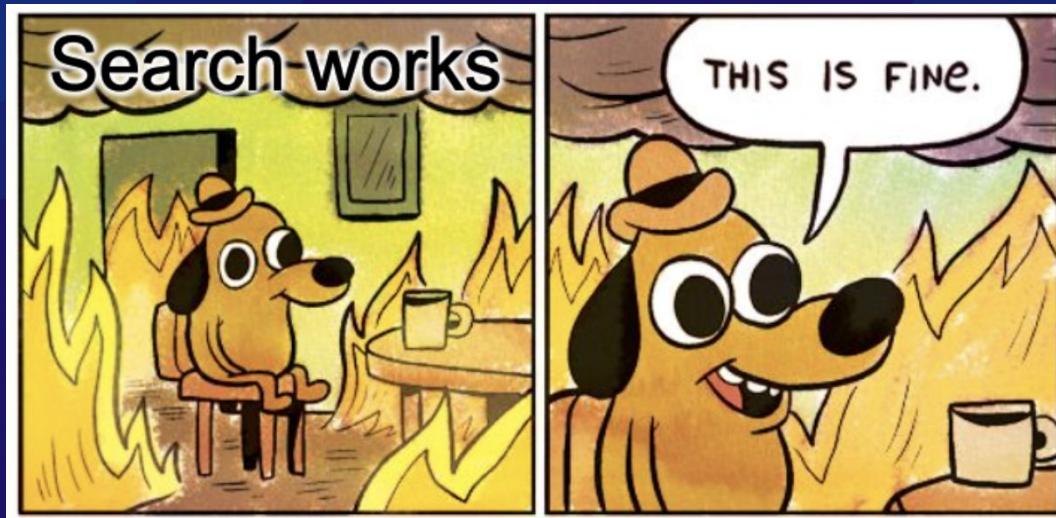
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# What is the problem?



# What is the problem?



# The challenges of traditional search

Why do airplanes fly?



[Why you should fly with ExpensiveAir's airplanes!](#)

...fly with ExpensiveAir's modern fleet of **airplanes** to over 4 destinations. Why do you hesitate? Book now!



# The challenges of traditional search (the keywords match)

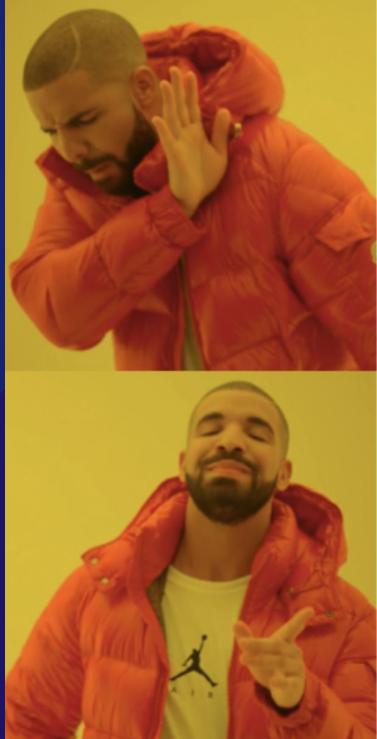
Why do airplanes fly?



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# In summary



You  
asked how  
planes fly

Fly with  
expensive  
airlines



# Semantic Search to the rescue!

Why do airplanes fly?



## [Dynamics of Flight - NASA](#)

Airplane wings are shaped **to make air move faster over the top of the wing**. When air moves faster, the pressure of the air decreases.



# In summary



# How does this work?



# How does this work?

*“You don’t need to understand it,  
but it is pretty cool”* 😊



# How does this work?

*“You don’t need to understand it,  
but it is pretty cool”* 😎



# Machine Learning models



[ 0.23, 0.45, ..., 0.84, 0.23 ]



# Vector Embeddings

“Fly with ExpensiveAir’s modern fleet of airplanes to over 4 destinations. Why do you hesitate? Book now!”



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[ 0.23, 0.45, ..., 0.84, 0.23 ]

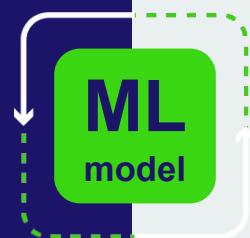
[ 0.26, 0.31, ..., 0.12, 0.44 ]



# Vector Embeddings

“Fly with ExpensiveAir’s modern fleet of airplanes to over 4 destinations. Why do you hesitate? Book now!”

Airplane wings are shaped to make air move faster over the top of the wing. When air moves faster, the pressure of the air decreases.

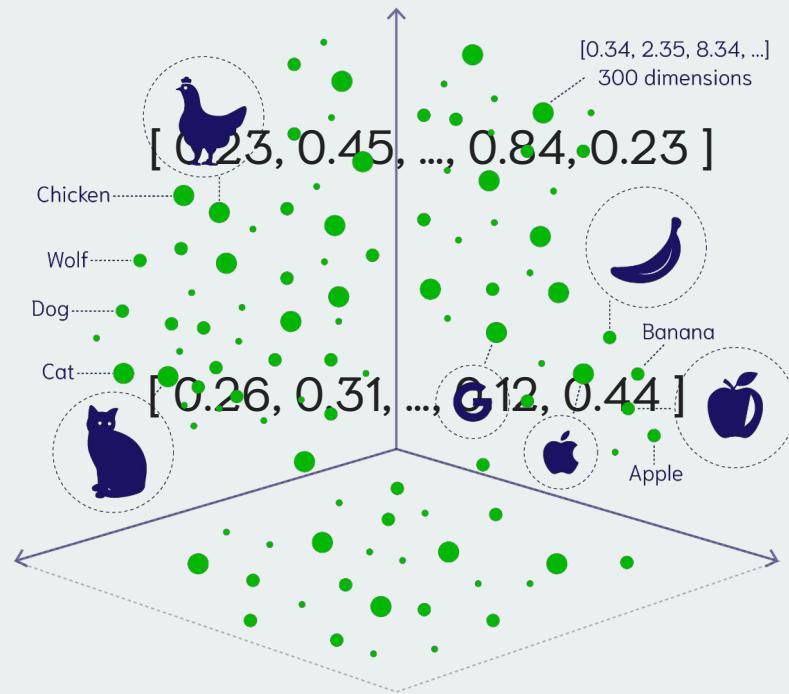


[ 0.23, 0.45, ..., 0.84, 0.23 ]

[ 0.26, 0.31, ..., 0.12, 0.44 ]

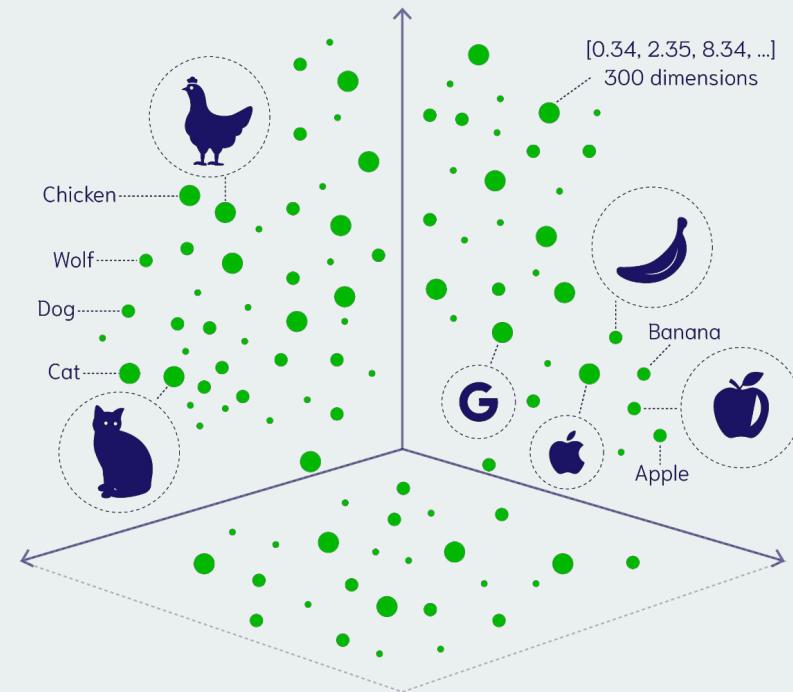


# Vector Space



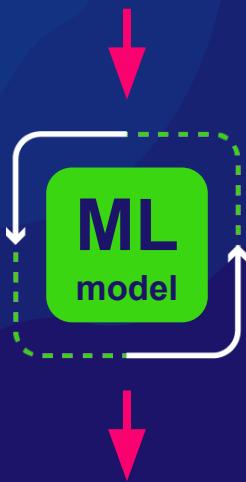
# Vector Search

Why do airplanes fly?

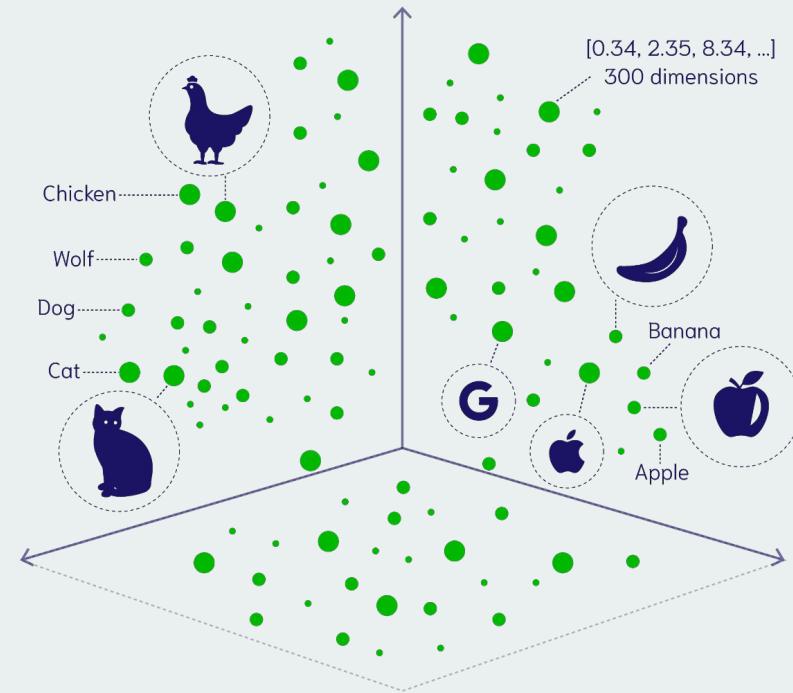


# Vector Search

Why do airplanes fly?



[ 0.24, 0.36, ..., 0.16, 0.46 ]

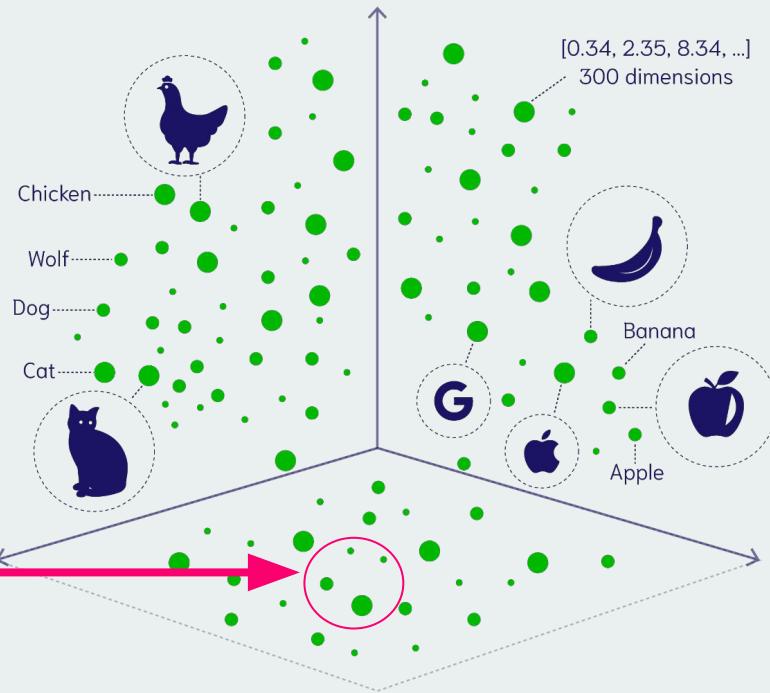


# Vector Search

Why do airplanes fly?



[ 0.24, 0.36, ..., 0.16, 0.46 ]



# Vector Search

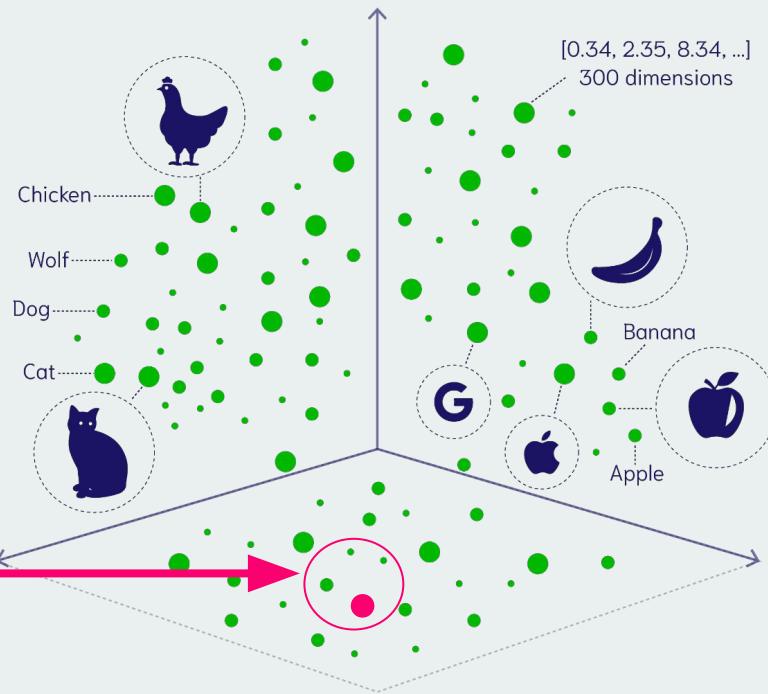
Why do airplanes fly?



[ 0.24, 0.36, ..., 0.16, 0.46 ]

[ 0.26, 0.31, ..., 0.12, 0.44 ]

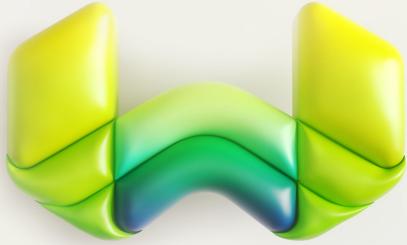
The NASA article



# **LESSON 1**

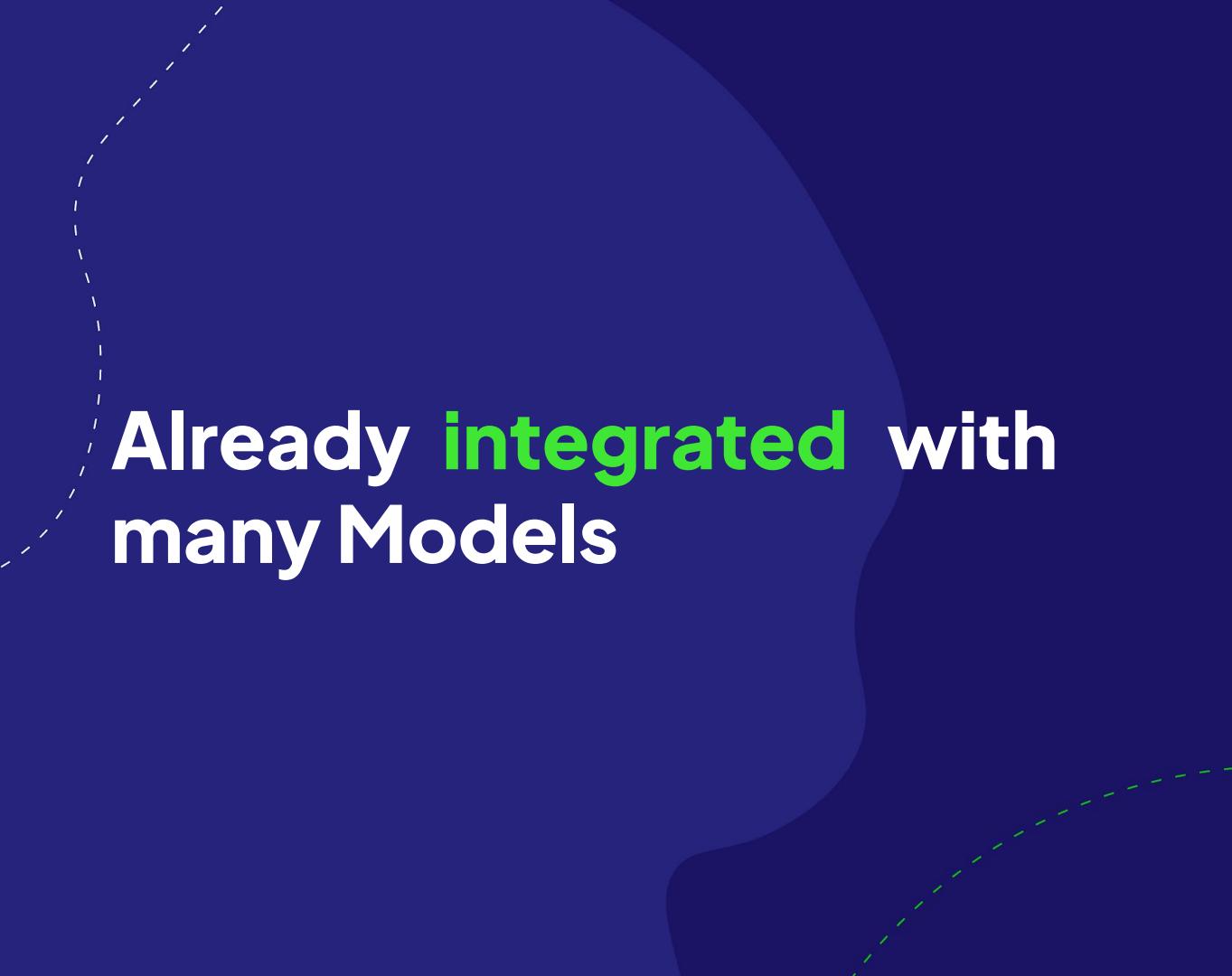
## **end-to-end**





# Weaviate

The AI Native Vector Database



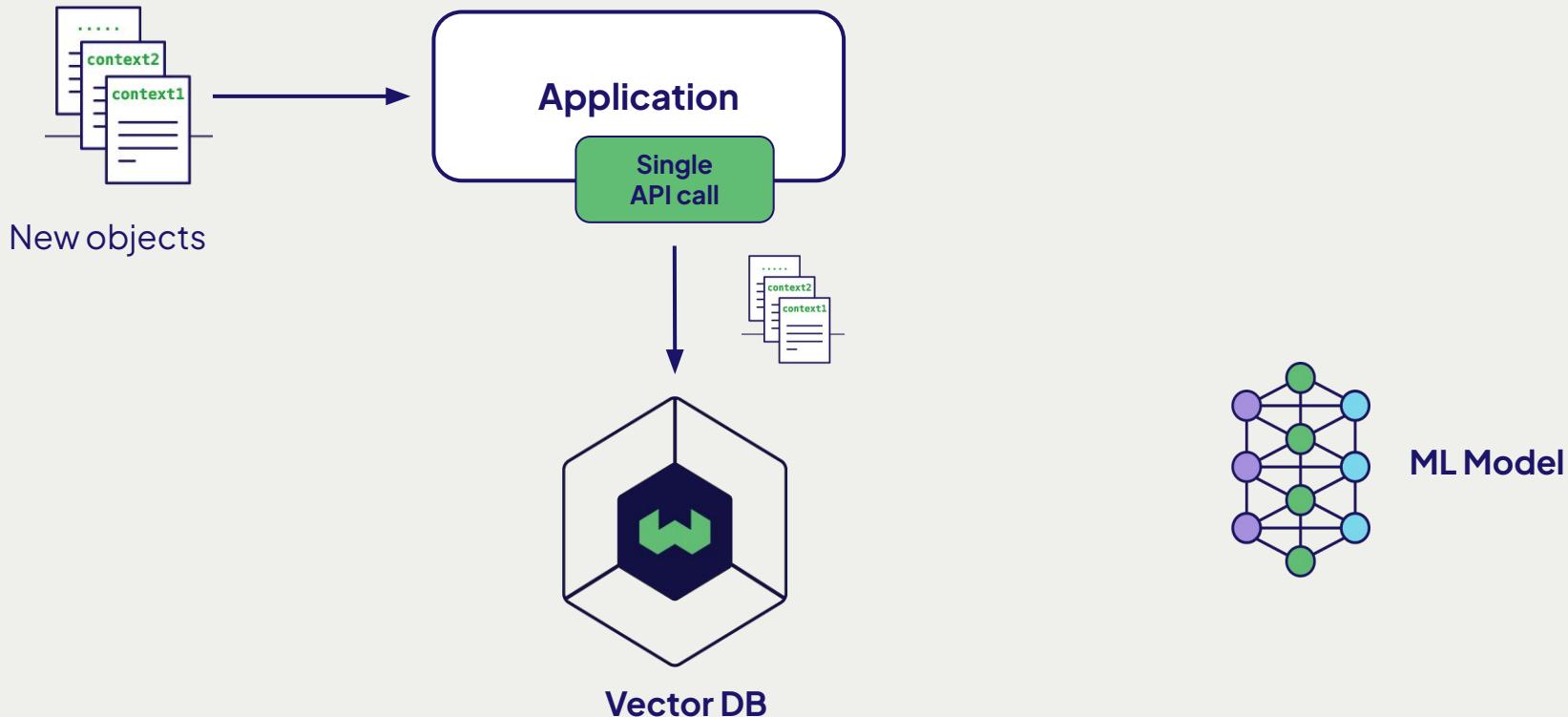
# Already **integrated** with many Models

## Model provider integrations

- Anthropic >
- Anyscale >
- AWS >
- Cohere >
- Google AI >
- Hugging Face (API) >
- Jina AI >
- Mistral >
- OctoAI >
- OpenAI >
- Azure OpenAI >
- Voyage AI >
- GPT4All (locally hosted) >
- Hugging Face (locally hosted) >
- Meta ImageBind (locally hosted) >
- Ollama (locally hosted) >

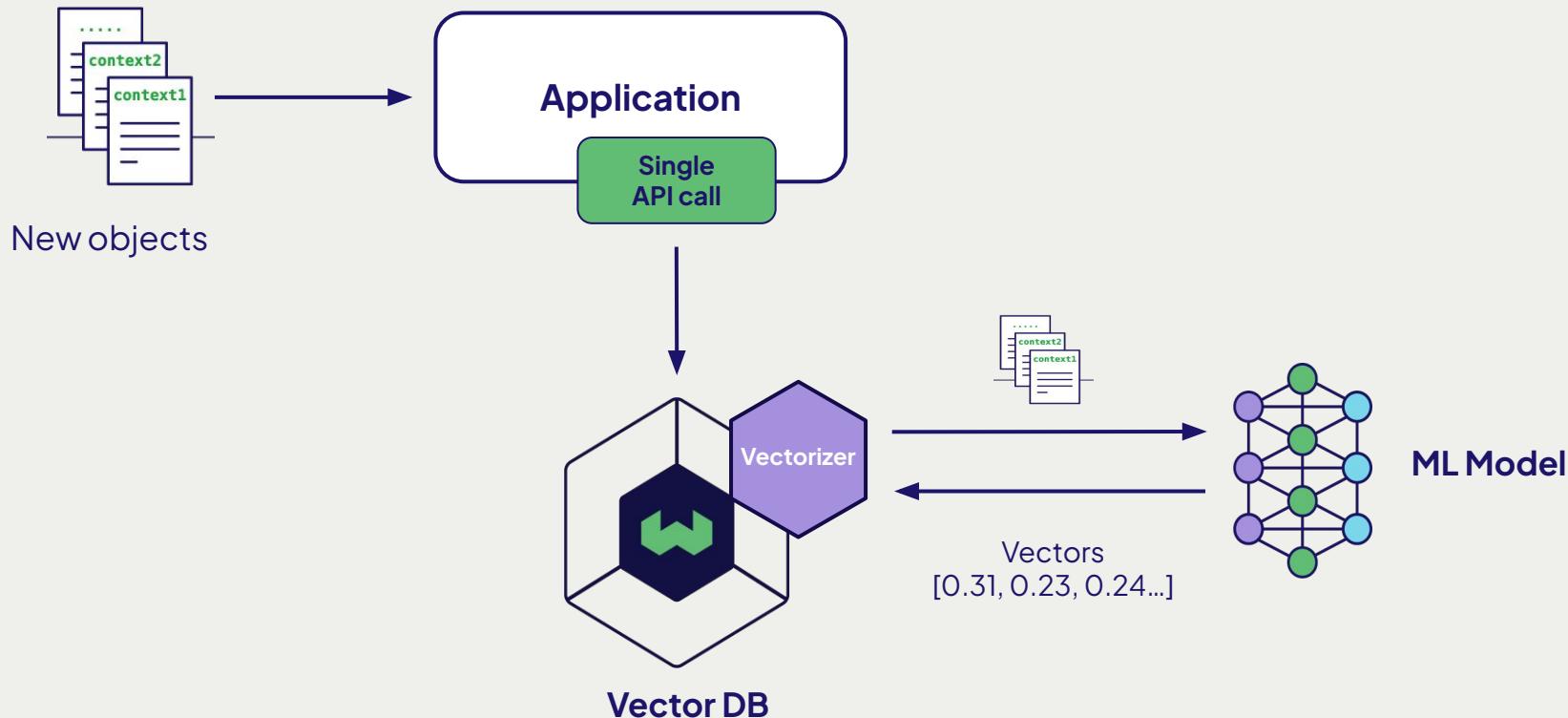


# Data operations (i.e. data import)



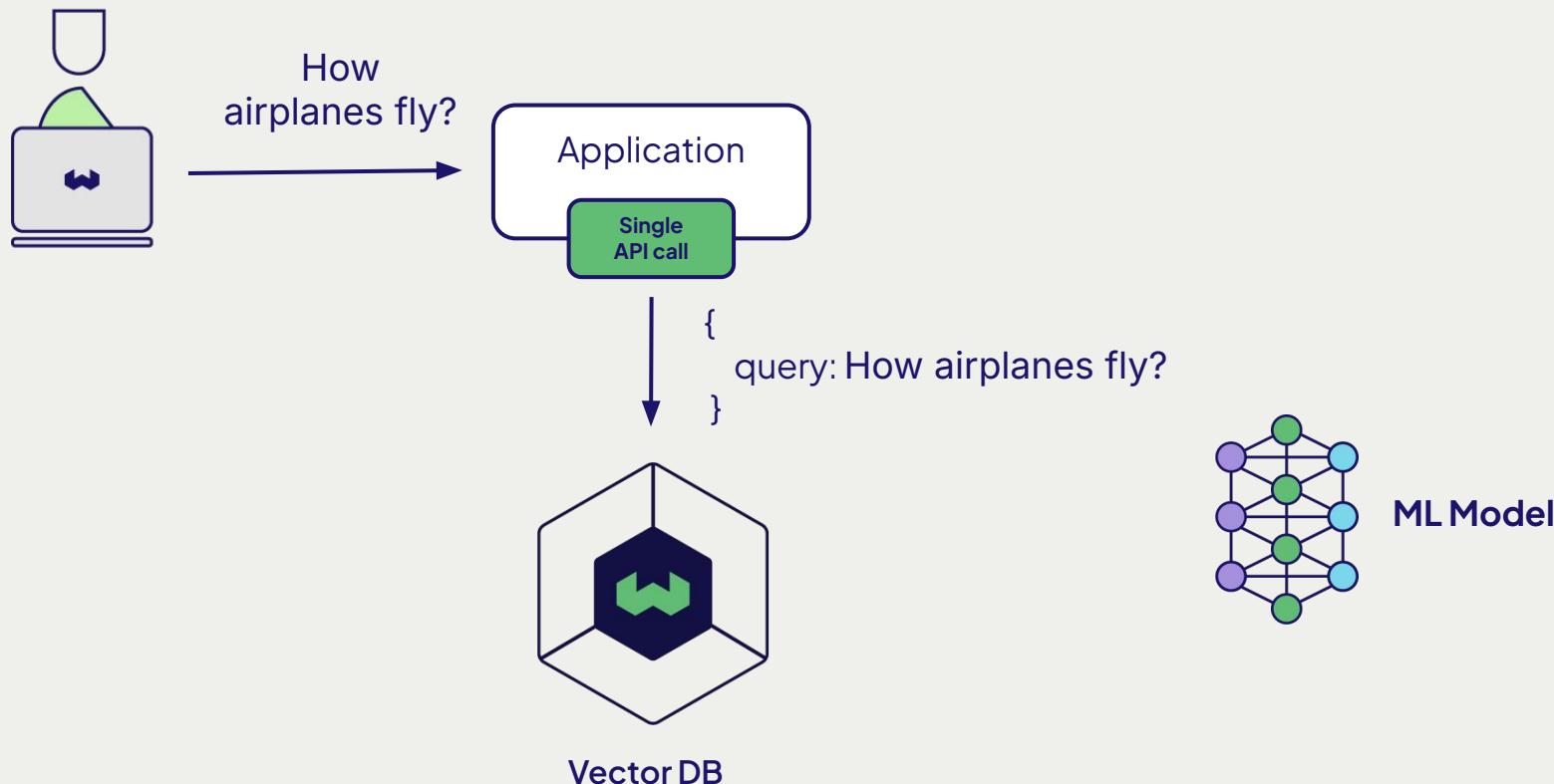


# Data operations (i.e. data import)



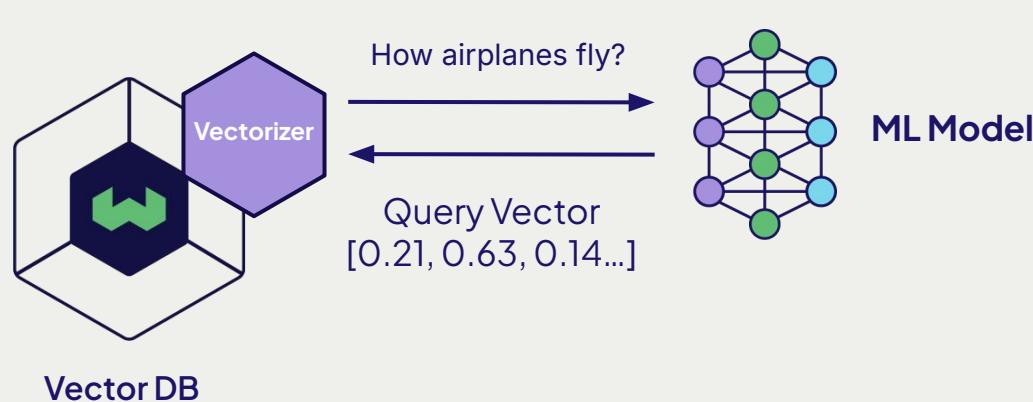


# Query



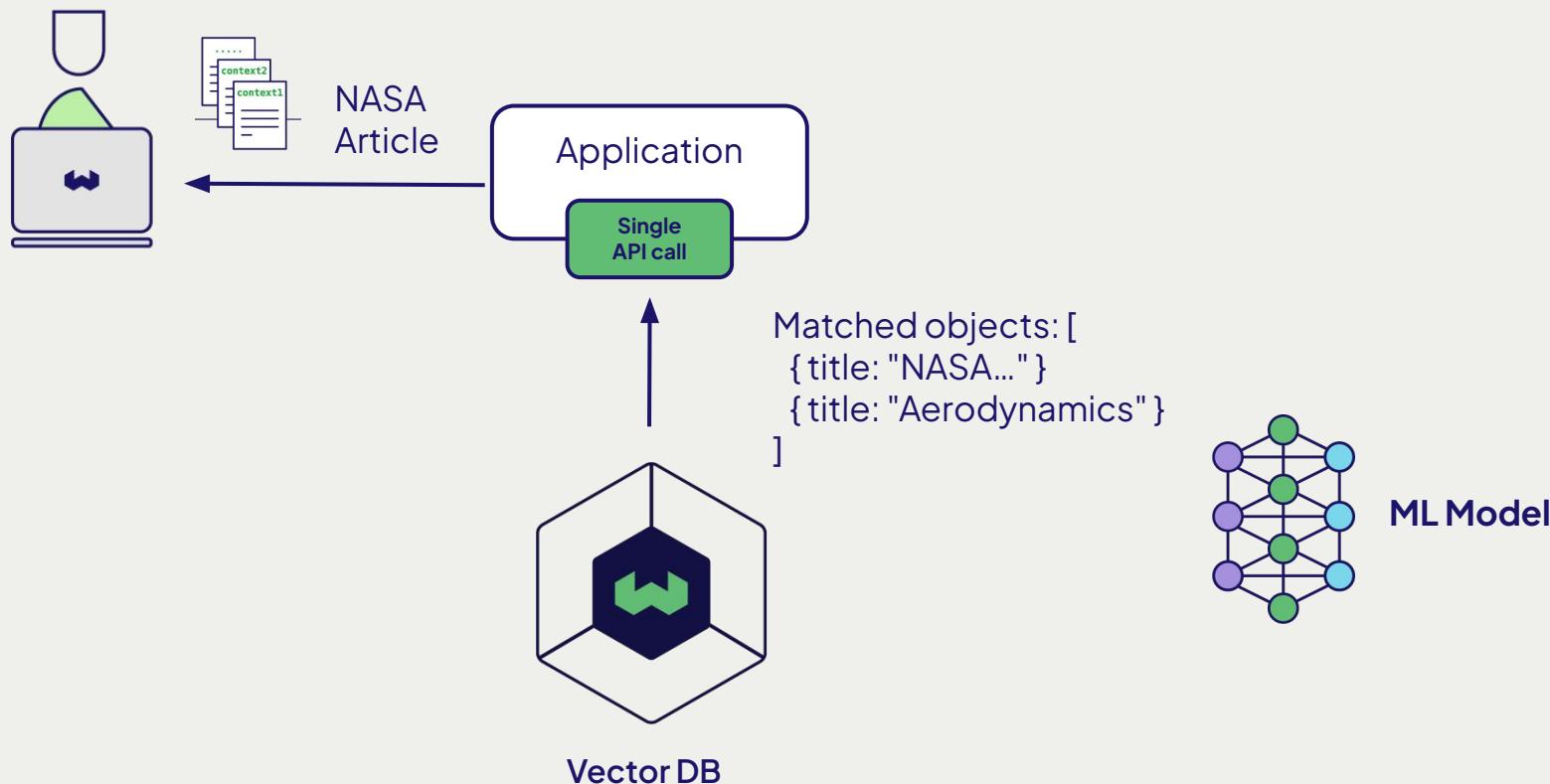


# Query





# Query



# Hands on

Part 1  
Hands on with vector DBs



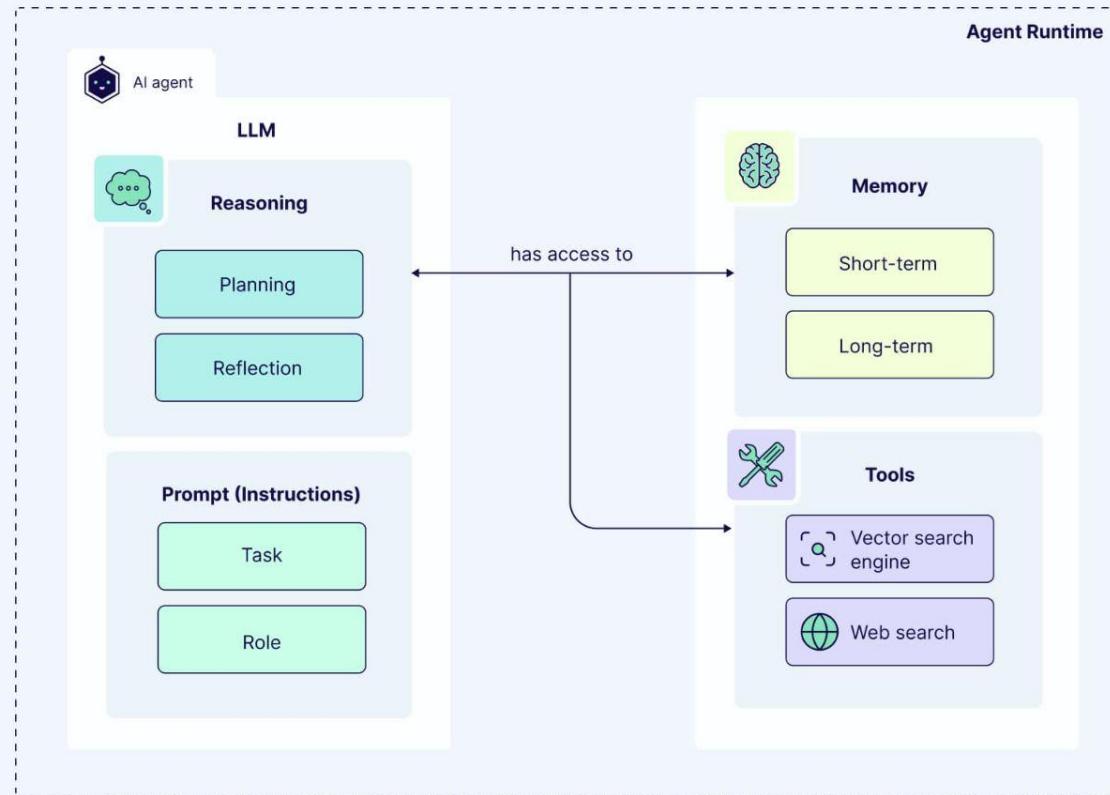
# **LESSON 2**

# **Agents**



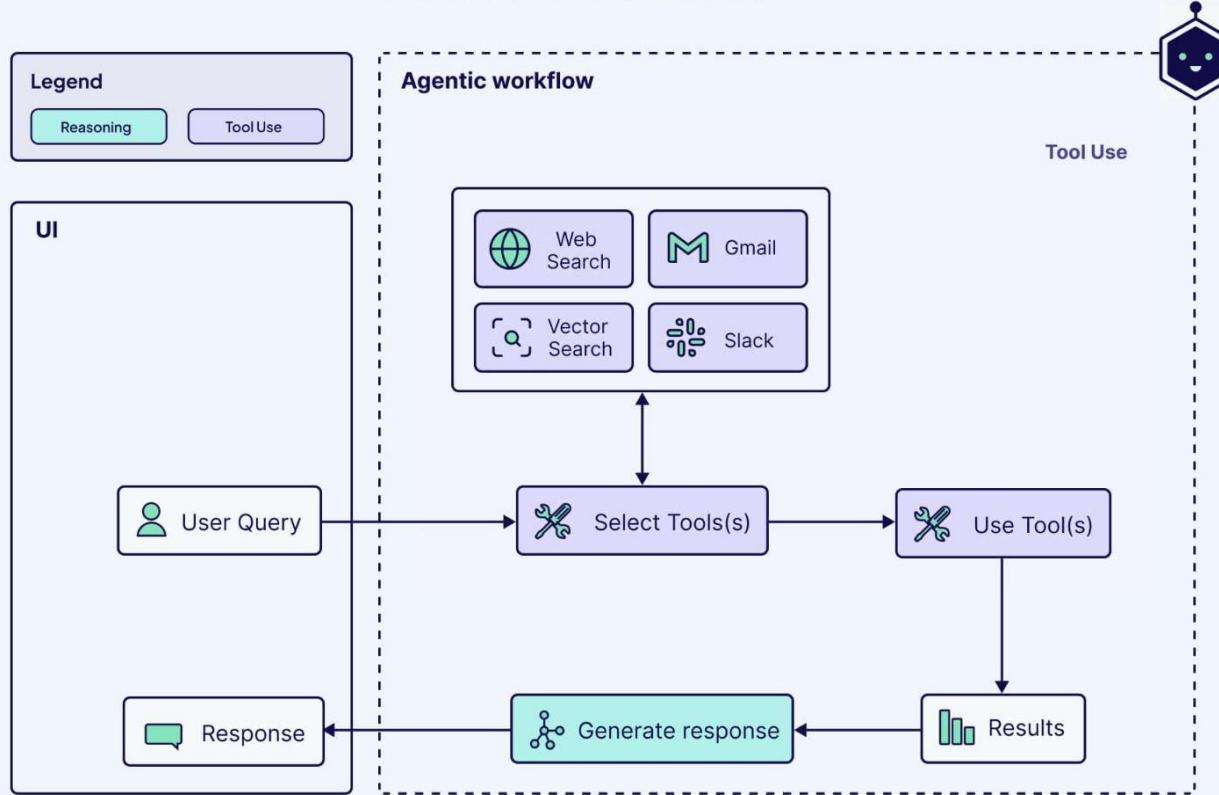


# Components of AI Agents



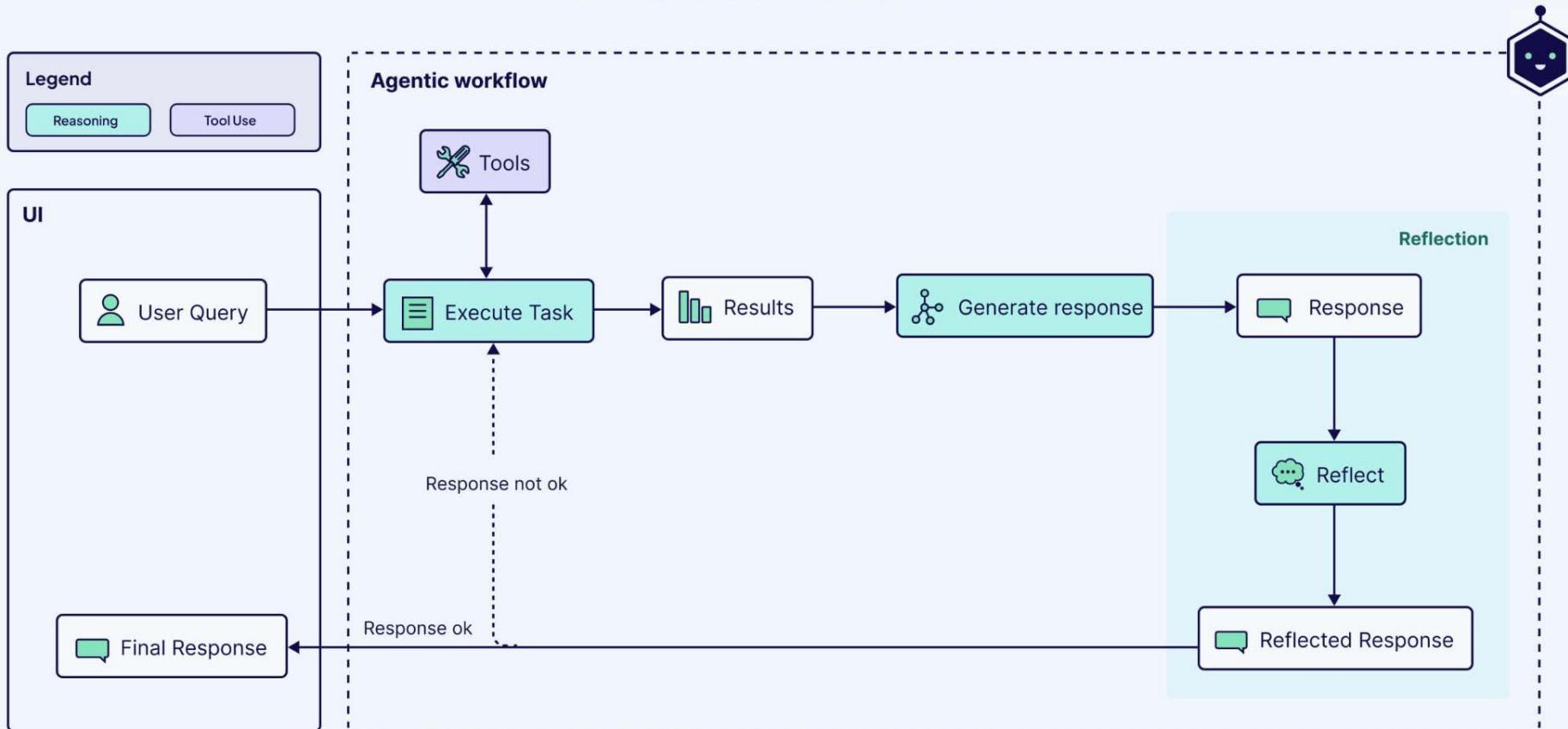


# Tool Use Pattern



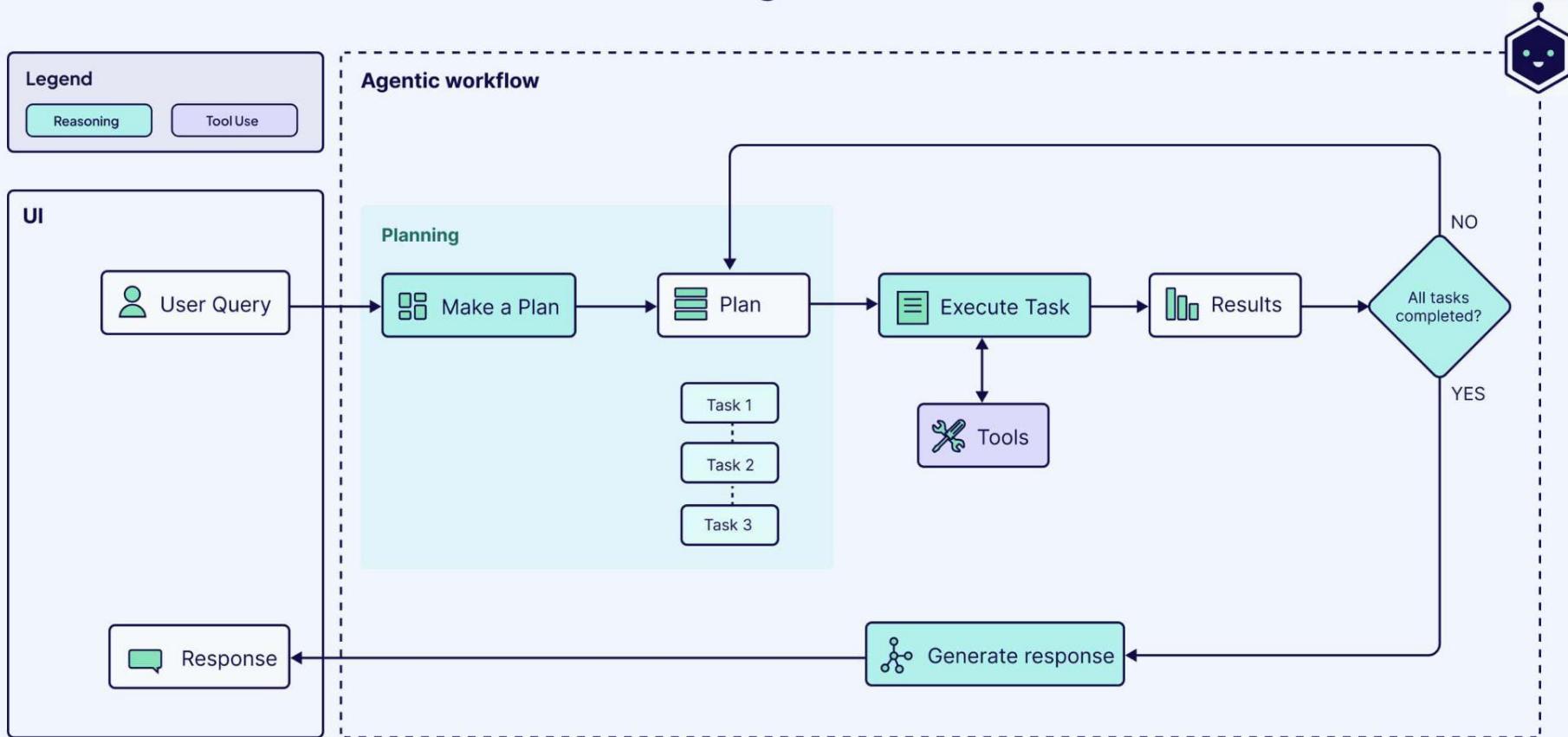


# Reflection Pattern





# Planning Pattern



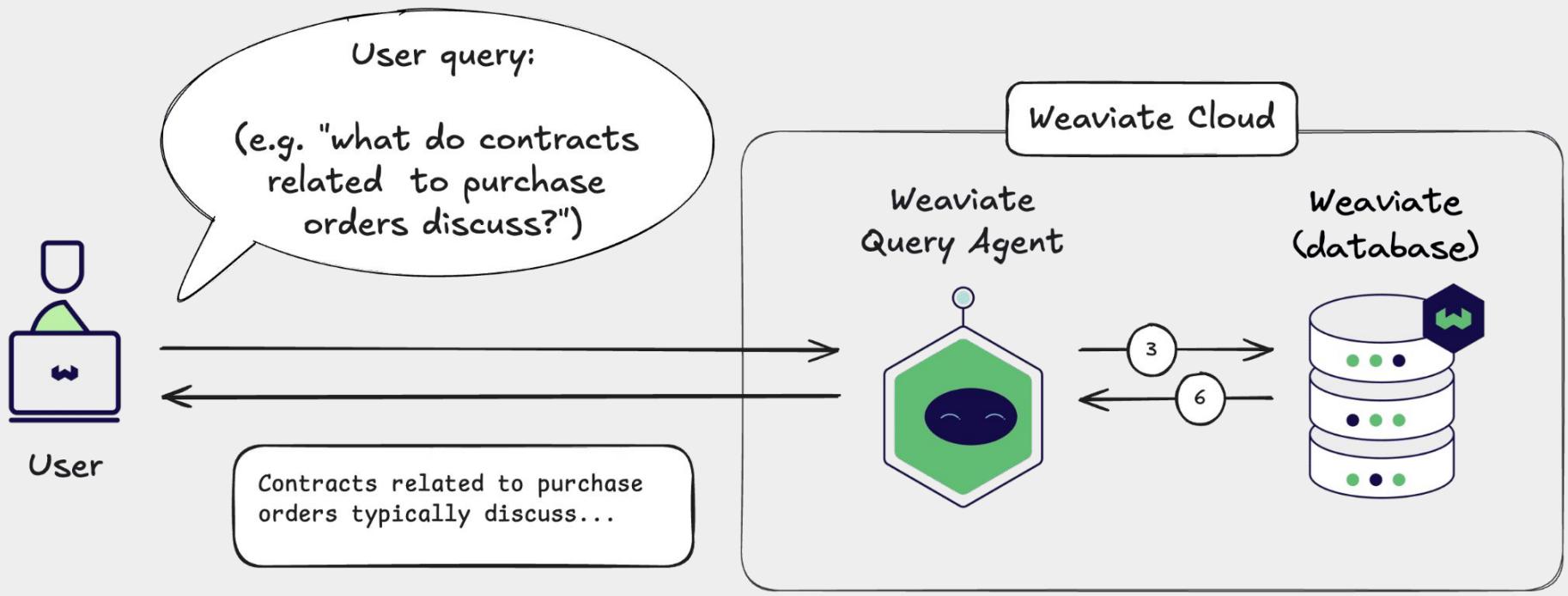
# Hands on

Part 2

Let's build some agents!



# BONUS- The Weaviate Query Agent

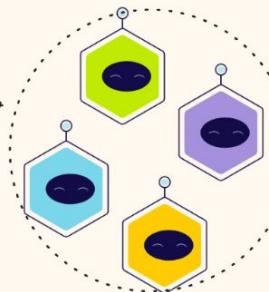


The Weaviate  
Query Agent is...

Actually a team of specialized agents  
under-the-hood.



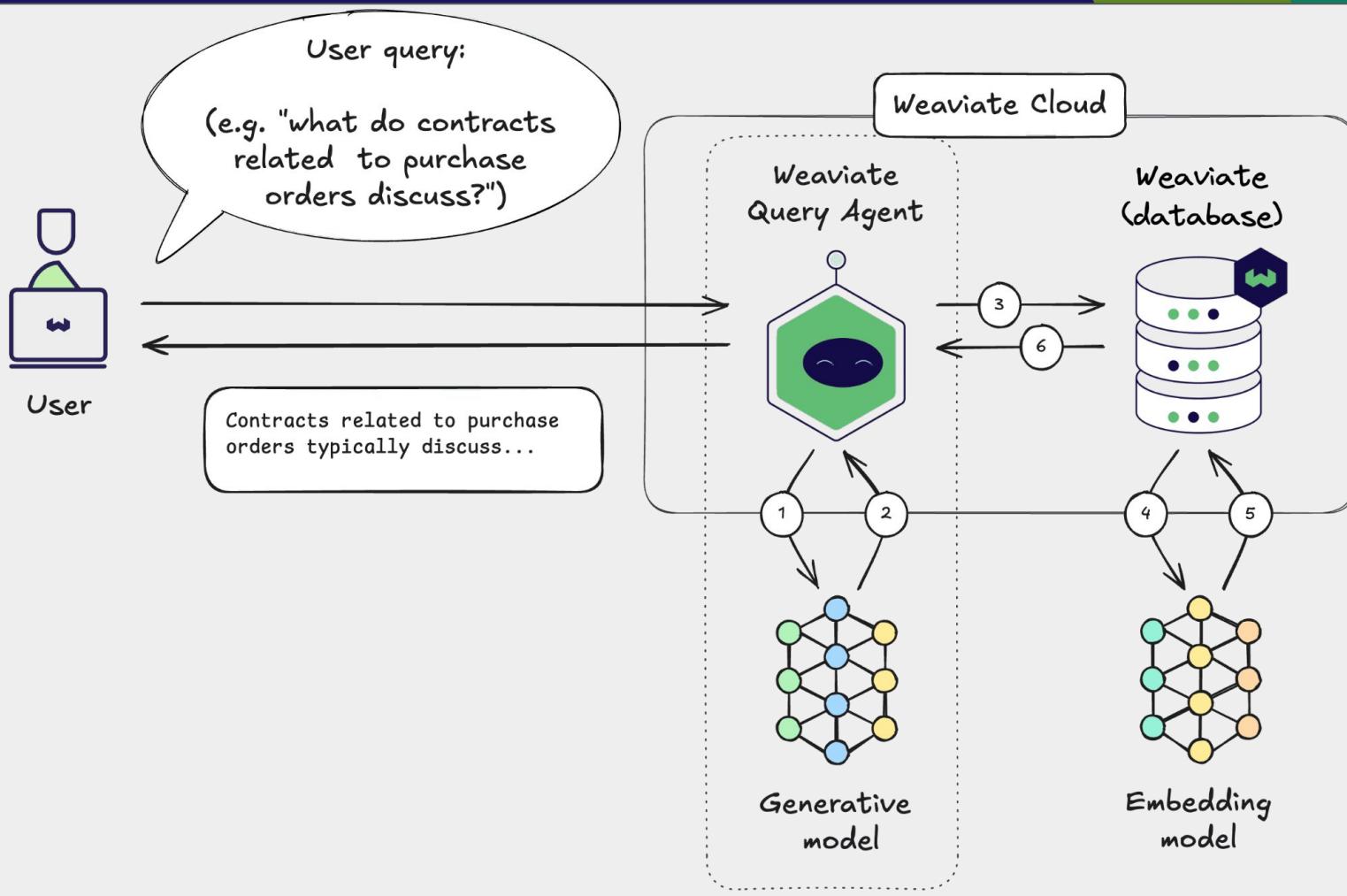
INFO



They work together to retrieve the right information from your Weaviate instance, and answer your question.

For example, they might:

- Determine which part of your database to search, and construct the query
- Evaluate the search results & additional context to provide the answer



# Hands on

Part 3

A comprehensive Vector DB  
Agent

(There is no way we will have  
time for this part)





# Summary

# **Summary:**

- **How Vector DBs work**
- **Types of searches with Vector DBs**
- **What makes an agent**
- **How agents work (under the hood)**
- **Building our own agents**
- **Agentic vector database querying**
- **Weaviates new Query Agent**

