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R+AI: Use RAG from your database to gain insights into the R Consortium

A simple R wrapper for RAG with Autonomous AI Database Select AI

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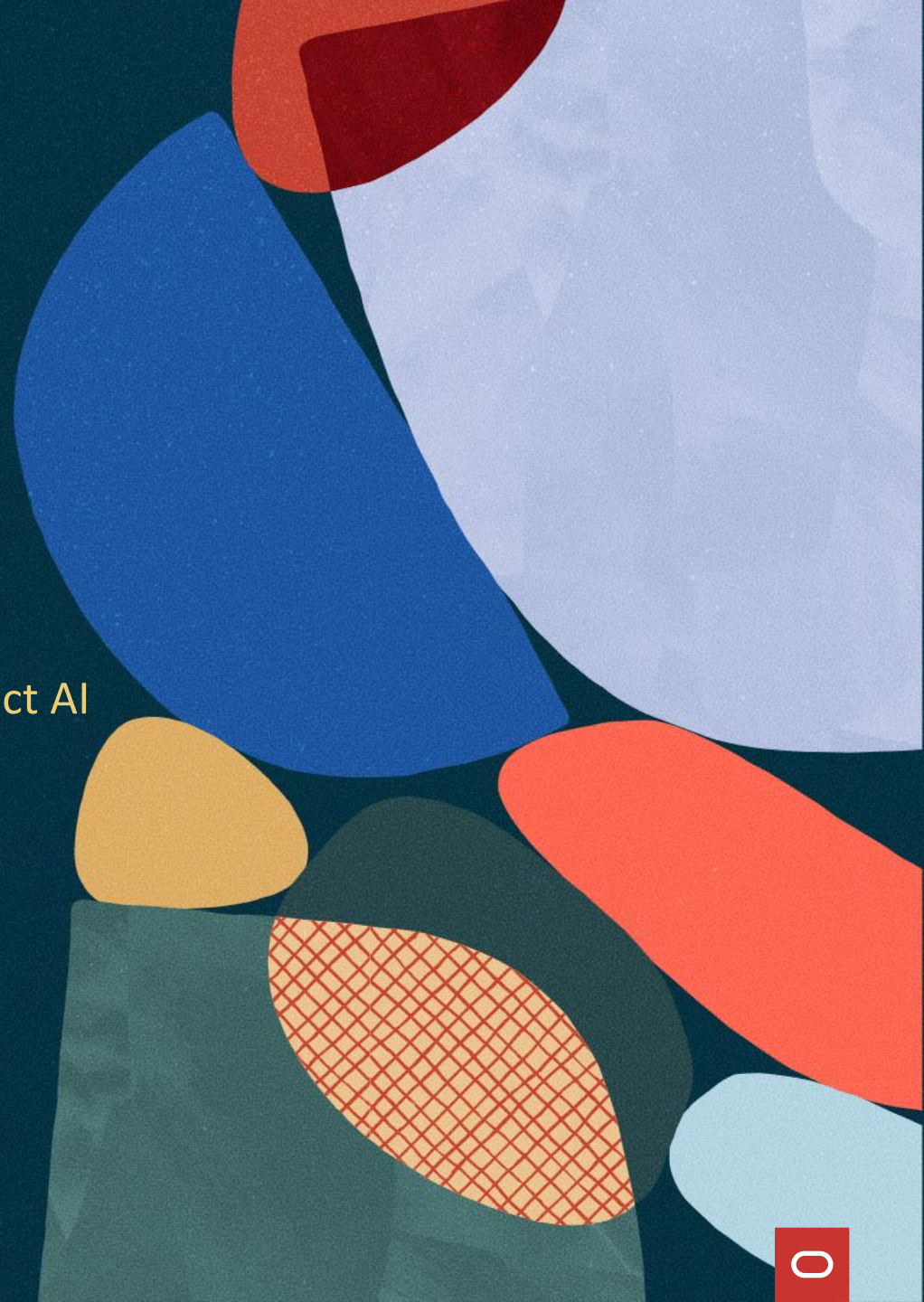


https://r-consortium.org/blog/

A resource for the R community and the R Consortium

Goal: use as authoritative material for answering community questions

Our corpus for illustrating RAG from your database via R

LLMs and search engines often don’t have the latest information

Use generative AI and semantic similarity search for enhanced responses

Retrieval Augmented Generation (RAG)

Combine the strengths of retrieval-based AI and generative AI

Give the LLM new and trusted knowledge without fine-tuning

Benefits

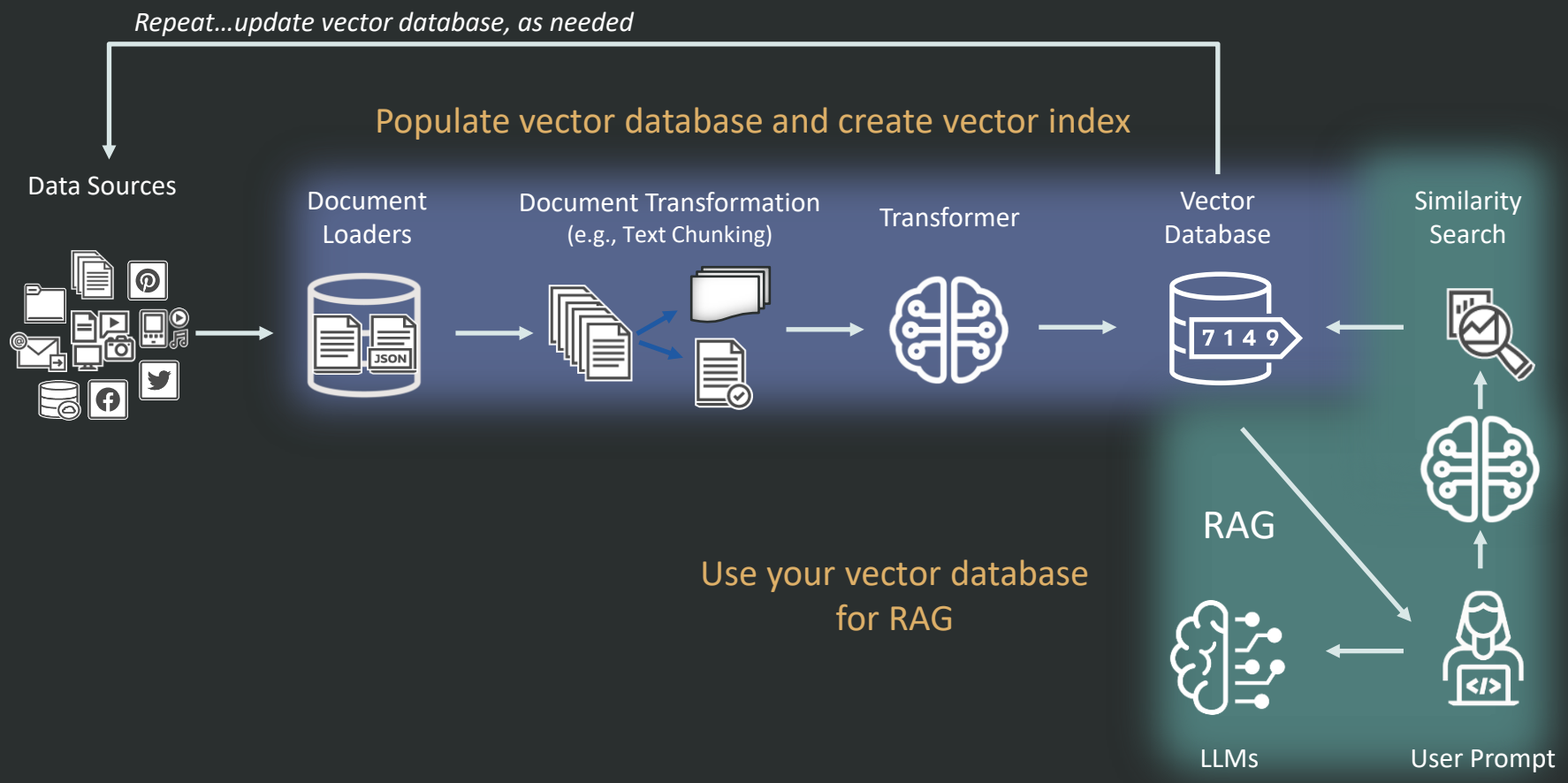
- Increased accuracy – reduced hallucinations
- Specificity – more relevant responses
- Efficiency – faster/easier than LLM fine-tuning
- Transparency – cite sources to verify information
- Adaptability – dynamically update information
- Security – no fine-tuning LLM with private data

Retrieval – find information most relevant to a user's prompt, typically from a private knowledgebase or vector database

Augmented – use this information to "augment" or enhance the user's prompt before sending it to the LLM

Generation – the LLM generates a response informed by the retrieved data for more accurate, relevant, and context-aware answers

Implementing RAG from scratch - typical RAG pipeline



Use Select AI from R to enable RAG on your data

Create an AI profile

Create the vector index

Start asking questions…

```
R> result <- rag(connection, profile, prompt, ...)
```

An AI profile supporting RAG is a configuration object that specifies the AI provider and AI models (LLM and transformer) that Select AI will use.

It encapsulates metadata, credentials, and behavior settings.

AI Profile

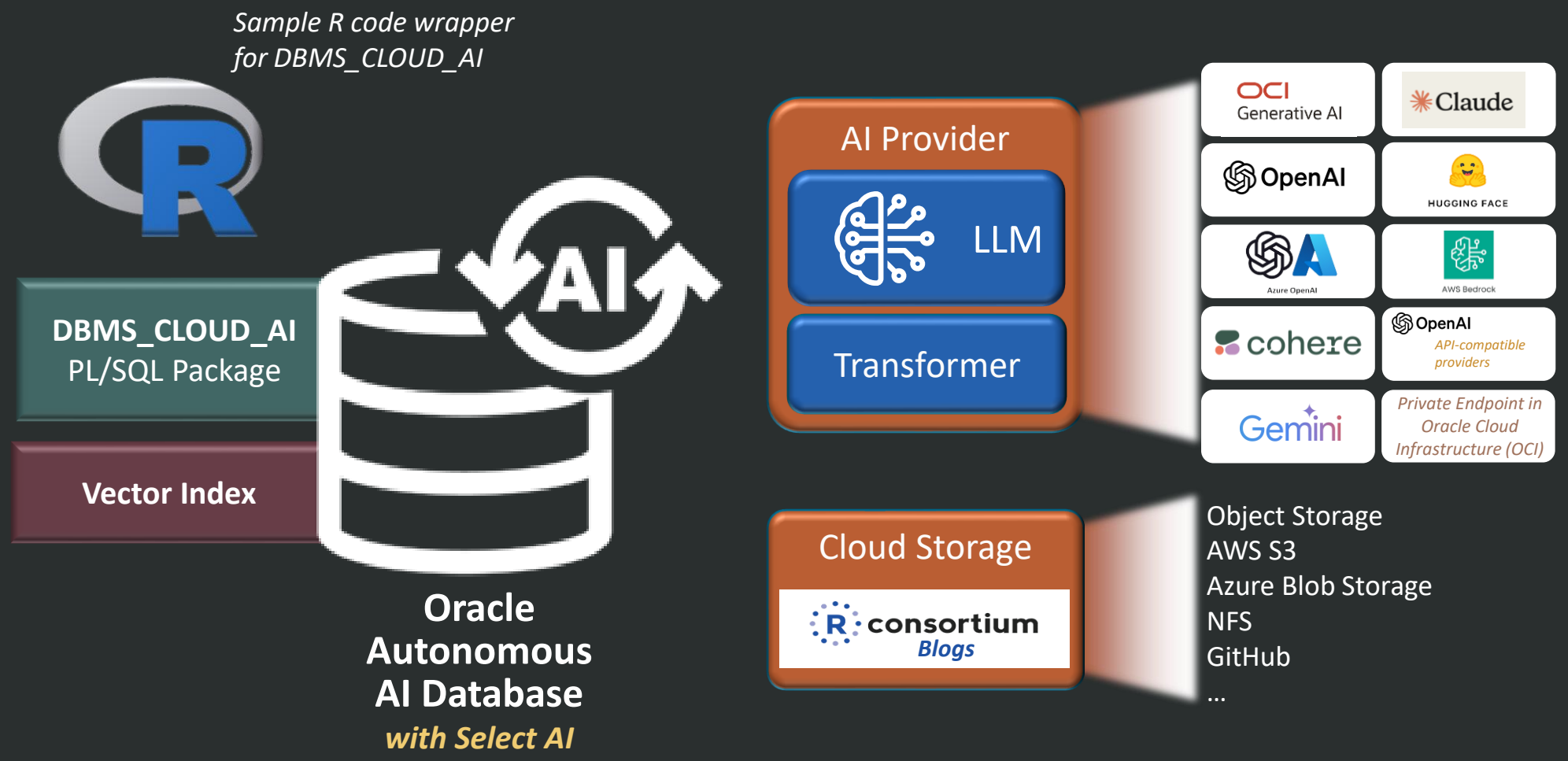
- Profile name
- Provider
- Credential name
- Vector index name
- Model
- Embedding model
- Enable sources

A vector index organizes and stores vectors to enable efficient similarity search and retrieval of related data in support of RAG

Vector Index

- Index name
- Profile name
- Vector database provider
- Location
- Object storage credential name
- Refresh rate

Demonstration architecture



Ask questions about the R Consortium using RAG

Example creating AI profile object from PL/SQL and with R wrapper

```
BEGIN
  DBMS_CLOUD_AI.create_profile(
      profile_name => 'OCI_GENAI_RAG',
      attributes   => '{
          "provider": "oci",
          "model": "meta.llama-4-
          "embedding_model": "coh
          "credential_name": "OCI
          "vector_index_name": "M
          "enable_source_offsets"
          "conversation": true }'
      description  => 'Supports R
END;
```

```
library(ROracle)

createAIProfile <- function(con,
                            profileName,
                            provider,
                            credentialName,
                            vectorIndexName,
                            enableSourceOffsets = TRUE) {

  # Create new AI profile with specified parameters
  create_query <- paste0("BEGIN
    DBMS_CLOUD_AI.CREATE_PROFILE(
      profile_name => '", profileName, "',
      attributes   => '{\"provider\": \"", provider, "\",
                        \"credential_name\": \"", credentialName, "\",
                        \"vector_index_name\": \"", vectorIndexName, "\",
                        \"enable_source_offsets\": ", tolower(as.character(enableSourceOffsets)), "
                       }');
  END;")

  dbExecute(con, create_query)
}
```

View R wrapper code

Select AI supports a wide range of functionality and use cases

SQL Query

Ask natural language questions about your database data

Assist database developers in writing SQL queries against their application data

Assist database developers to understand SQL queries – step by step

Return structured query results in text to present to users

Chatbot

Generate content with simple or complex custom prompts easily from your database, e.g., email generation, sentiment analysis

RAG

Ask questions and get more relevant and accurate responses by using content from your trusted, private documents

SDG

Create “realistic” data in database tables to support, e.g., testing/debugging applications and interfaces

Agents

Build interactive and autonomous agents that perform tasks and use tools

For more information on Select AI…

Select AI Website

Autonomous AI Database Select AI

R Sample Code

See the sample R wrapper code

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Blogs

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Announcing Oracle Autonomous Database Select AI Feedback for enhanced SQL query generation

Build Chatbots using the Oracle Autonomous Database Select AI Conversation Management API

Documentation

Getting Started with Select AI
DBMS_CLOUD_AI Package
DBMS_CLOUD_AI_AGENT Package

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Develop apps using GenAI, Autonomous AI Database, and React
Develop AI RAG Apps with Autonomous AI Database Select AI

Videos

Get Started with Select AI on Autonomous AI Database
Simplify Developing RAG Applications

Thank you

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