

The background of the image is a photograph of a large, multi-story building with a prominent central dome and many windows, situated behind a line of trees. In the foreground, there is a body of water with a sailboat and more trees. The entire image has a dark blue overlay.

# ODTUG Kscope25

dallas - ft worth   june 15 - 19

**Welcome**

A decorative bar at the bottom of the image consisting of several overlapping geometric shapes in shades of blue, green, yellow, and orange.



 @eaespinoza0

# Supercharging APEX with Oracle 23ai

## Enhance User Experience with Smart AI Tools

Erik Espinoza  
Solutions Architect





# Why User Experience (UX) matters?

Users expect intuitive, responsive, and intelligent applications

AI tools enable smart and more personalized interfaces



# Why APEX or Oracle 23ai?

- Native support for AI features
  - Use natural language to interact with your data
  - Similarity searching (Vector store)
- Seamless integration with APEX components
  - The new Search region type
  - The new Generate Text Dynamic Action
  - The new Show AI Assistant Dynamic Action
  - Declarative support for Vector Stores
- Brings "smart touch" to your apps

# System Prompt, Vector Store, Embeddings, Cosine ... what is all this?

- In simple terms, a **system prompt** is like giving your AI assistant a **job description** and **set of rules** before it starts working. It's **not visible to the end user**, but it shapes how the AI behaves.
- A **vector store** is like a **specialized search engine** that finds things based on **meaning** rather than exact words.
- **Embeddings** are how AI turns words, sentences, or other data into **numbers** — specifically, into **vectors** (ordered lists of numbers). These numbers capture the **meaning** of the data in a way that computers can understand and compare.
- **Cosine search** (or **cosine similarity**) is a method to compare **how similar two vectors are** based on the **angle between them**, not their length.
- **RAG (Retrieval-Augmented Generation)** is an AI pattern that **combines search and generation**. It helps large language models (like ChatGPT) give **more accurate and up-to-date answers** — even if they weren't trained on specific information.



# Oracle 23ai Features – Embeddings

- Let's you **store and search vector embeddings** (like those from OpenAI or Hugging Face) in Oracle Database.
- Enables **AI-powered similarity search** (e.g., find similar documents, images, invoices).
- Ideal for **semantic search, recommendation systems, or AI-enhanced applications.**

```
SELECT t.*
FROM ap_invoice_embeddings t
ORDER BY vector_distance(vector_embedding,
                        vector_embedding(
                            ALL_MINILM_L12_V2 USING 'mechanical parts' AS DATA),
                        COSINE)
FETCH FIRST 10 ROWS ONLY;
```

# Oracle 23ai Features – Select AI

- Allows you to run **natural language queries** (e.g., “Show me all orders over \$100”) directly in SQL.
- Oracle uses an **LLM (like OpenAI)** to convert plain English into optimized SQL automatically.
- Useful for **non-technical users** or **chatbot integrations**.

```
select ai 'how many invoices were received this month';
```

```
select ai chat 'what is the most expensive item we purchased this month?';
```

# APEX AI Features

## Generative AI

### Generative AI



AI Attributes

AI Configurations

AI Services

## Vector Providers



### Vector Providers

Manage Vector Providers that are used to get an embedding for a text string.



# APEX AI Features – Vector Providers

\* Provider Type  ?

\* Name  ?

\* Static ID  ?

?

\* Provider Type  ?

\* AI Provider  ?

\* Name  ?

\* Static ID  ?

?

# APEX AI Features – Search Configurations

- Allows an APEX application to define declaratively configurations to be used in components that support similarity search out-the-box.
- There are specific PL/SQL APIs available that leverage this configurations if you have more custom use cases through the **APEX\_SEACH** API.

\* Name: demo\_conversations

\* Search Type: ☐ Standard ☒ Oracle Vector Search ☐ Oracle Text ☐ Oracle Ubiquitous Search ☐ List

\* Vector Provider: demo\_all\_minilm\_l12\_v2

Source Type: **Table** SQL Query

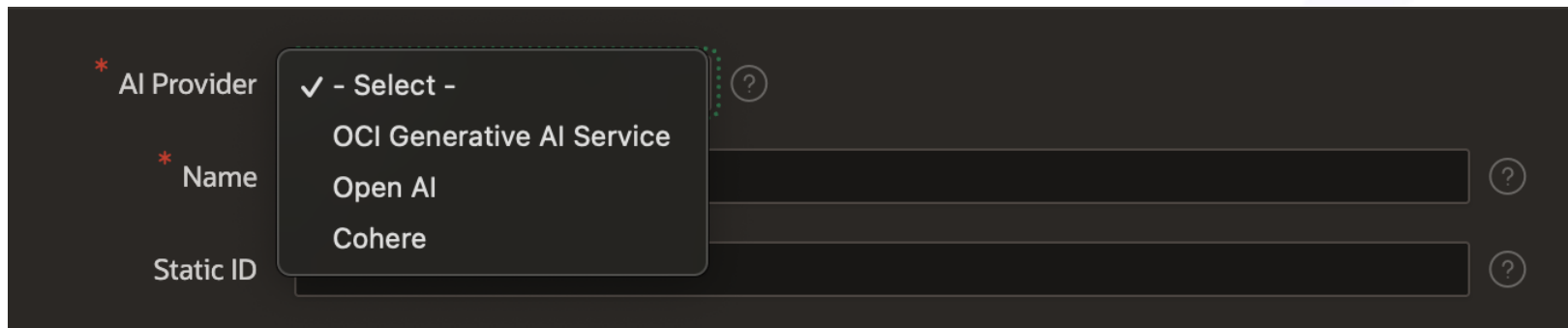
Table / View Owner: DEMO

\* Table / View Name:

- Select Value -

DEMO\_CHAT\_CONVERSATION (table)

# APEX AI Features – Generative AI



The screenshot shows a configuration form for APEX AI. It has three fields: 'AI Provider' (marked with a red asterisk), 'Name' (marked with a red asterisk), and 'Static ID'. The 'AI Provider' dropdown menu is open, showing options: '✓ - Select -', 'OCI Generative AI Service', 'Open AI', and 'Cohere'. Each field has a help icon (a circle with a question mark) to its right.

- Support for an abstraction to commercial LLM providers such as OCI Generative AI and OpenAI.
- Configured services available through the PL/SQL API APEX\_AI
- Stored at Workspace level, available to other applications.
- Generative AI services are included in your application export

[Learn more at APEX Documentation](#)



# APEX AI Features – Retrieval Augmented Generation (RAG)

The screenshot shows the 'RAG Source' configuration window in APEX. It has a dark theme and a tabbed interface with tabs for 'Show All', 'Identification', 'Description', 'Source', 'Advanced', 'Server-Side Condition', 'Security', 'Configuration', and 'Comments'. The 'Identification' tab is active. It contains a form with the following fields:

- Name:** A text input field with a red asterisk and a help icon.
- Description:** A text area with a label 'Description' and a help icon.
- Source:** A section containing a 'Type' dropdown menu with a red asterisk and a help icon. The dropdown is open, showing three options: 'SQL Query' (selected with a checkmark), 'Function Body', and 'Static'.
- SQL Query:** A text input field with a red asterisk and a help icon.

At the top right of the window are 'Cancel' and 'Create' buttons.

Allows APEX Applications to provide context to the AI model for improved generation.

Sources used by Generative AI to improve response quality, such as:

- SQL Queries
- PL/SQL Functions
- Static

# APEX AI Features – AI Configurations

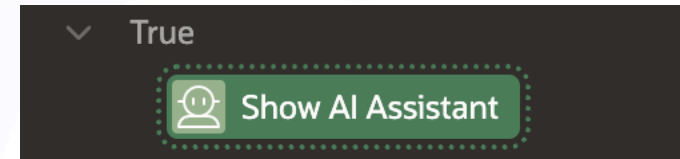
Allows APEX Applications to define many system prompts for specialized use cases, to associate specific RAG sources and contextualize this for specific pages or reports in your application.

## Generative AI Configuration

Show All   Identification   Subscription   **Generative AI**   RAG Sources   Advanced   Comments

# APEX AI Features – Show AI Assistant Dynamic Action

- What it is
  - Conversational UX/UI in APEX
- Use Cases
  - Help Desk
  - Guided Navigation
  - Form Assistants
- Tools
  - Large Language Model Service
  - APEX AI Dynamic Action

A screenshot of the APEX configuration page for the 'Show AI Assistant' dynamic action. The page has a dark theme. At the top, there is a search bar labeled 'Filter'. Below it, there are several sections, each with a checkbox and a title: 'Identification', 'Generative AI', 'Appearance', 'Initial Prompt', and 'Use Response'. Each section contains configuration options. For 'Identification', there is a 'Name' field and an 'Action' dropdown set to 'Show AI Assistant'. For 'Generative AI', there is a 'Configuration' dropdown set to 'gold-cup-2025-config'. For 'Appearance', there is a 'Display As' dropdown set to 'Inline' and a 'Container Selector' field set to '#ai-agent'. For 'Initial Prompt', there is a 'Type' dropdown set to 'None'. For 'Use Response', there is a 'Type' dropdown set to 'None'.



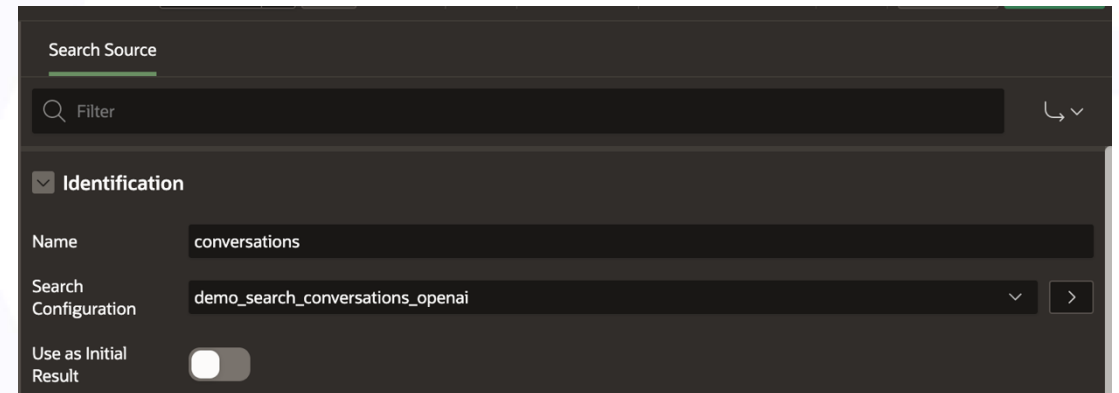
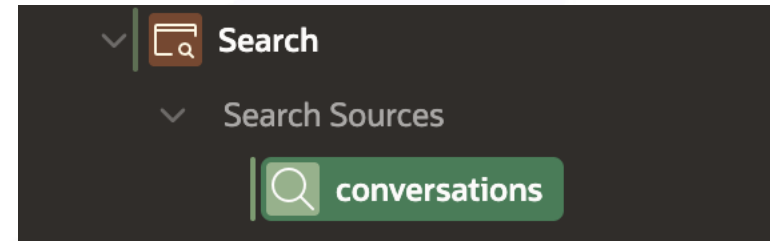
# APEX AI Features – Generate Text Dynamic Action

- What it is
  - Generative Text
- Use Cases
  - Translation
  - Generation of Product Descriptions
  - Summarization
- Tools
  - Large Language Model Service
  - APEX AI Dynamic Action

The screenshot shows the configuration for a 'Generate Text With AI' dynamic action. The interface is dark-themed with a sidebar on the left containing a tree view with 'Dynamic Actions', 'On SUBMIT - Click', and 'True'. The main panel is titled 'Generate Text With AI' and contains several sections: 'Identification' with fields for 'Name' and 'Action' (set to 'Generate Text With AI'); 'Generative AI' with a 'Configuration' dropdown set to 'demo\_transation\_assitant'; 'Input Value' with 'Type' set to 'Item' and 'Item' set to 'P2\_PROMPT\_MESSAGE'; and 'Use Response' with 'Type' set to 'Item' and 'Item' set to 'P2\_AI\_RESPONSE'. Each section has a collapse/expand icon on the right.

# APEX AI Features – Search

- What it is
  - Similarity Search
- Use Cases
  - Search with Natural Language
- Tools
  - Vector Store
  - APEX AI Region



# Step by Step – Grants

Just need a few grants before get started

```
GRANT EXECUTE ON DBMS_CLOUD TO DEMO;  
GRANT DB_DEVELOPER_ROLE TO DEMO;  
GRANT EXECUTE ON DBMS_CLOUD_AI TO DEMO;  
GRANT CREATE MINING MODEL TO DEMO;
```



## Step by Step – Cloud Credentials

This is how the database AI features will be able to communicate with LLM services such as OCI Generative AI's models or OpenAI's model's.

```
BEGIN
  DBMS_CLOUD.create_credential(
    credential_name => 'MY_CREDENTIAL',
    user_ocid => 'ocid1.user. ...',
    tenancy_ocid => 'ocid1.tenancy. ...',
    private_key => q'~-----BEGIN PRIVATE KEY-----
...
...
-----END PRIVATE KEY-----
OCI_API_KEY~',
    fingerprint => 'aa:bb:33 ...');
END;
/
```

# Step by Step – Load Embedding Model

Loading a local embedding model allows the database to create embeddings faster for text, reduces latency and improves speed.

Use **DBMS\_VECTOR** to load the embedding model.

```
DECLARE
  model_source BLOB := NULL;
BEGIN
  model_source := DBMS_CLOUD.get_object(credential_name => 'MY_CREDENTIAL',
    object_uri => 'https://objectstorage.us-ashburn-1.oraclecloud.com/n/<namespace>/b/<bucket name>/o/<filename>.onnx');
  DBMS_VECTOR.load_onnx_model('<model name>', model_source);
END;
/
```

# Step by Step – Create a table with VECTOR data type

The support for the new type VECTOR allows to store embeddings along with your data to enable similarity searching.

```
CREATE TABLE my_content(  
  content_id NUMBER,  
  content BLOB,  
  content_embedding VECTOR  
);
```



# Step by Step – Query Data using Similarity Search

The support for the new type **VECTOR** allows to store embeddings along with your data to enable similarity searching.

```
SELECT *  
  FROM my_content  
 ORDER BY vector_distance(content_embedding,  
                           vector_embedding(ALL_MINILM_L12_V2 USING 'Your natural language query' AS DATA),  
                           COSINE) ASC  
FETCH FIRST 10 ROWS ONLY;
```

# Step by Step – Enabling SELECT AI with OCI Generative AI

Create a profile which saves the configuration needed for Oracle 23ai to use OCI Generative AI service to enable SELECT AI

```
BEGIN
  DBMS_CLOUD_AI.CREATE_PROFILE(
    profile_name      => '<PROFILE_NAME>'
    ,attributes       => json_object(
      'credential_name' VALUE '<CREDENTIAL_NAME>'
      , 'model'         VALUE '<MODEL_NAME>'
      , 'provider'       VALUE 'oci'
      , 'object_list'    VALUE json_array(
        json_object(
          'owner' VALUE '<SCHEMA_NAME>'
        )
      )
      , 'object_list_mode' VALUE 'all'
    )
    ,status           => 'enabled'
  );
END;
/
```

# Step by Step – Use SELECT AI

Before you can run any SELECT AI statement you MUST tell your SESSION which AI profile to use.

```
BEGIN
  DBMS_CLOUD_AI.SET_PROFILE('<PROFILE_NAME>');
END;
/
```

```
SELECT AI 'how many vendors are there in the database?';
```

Yes, you don't need **FROM DUAL!**



# Any Questions?

✉ erik.espinoza@ViscosityNA.com

🐙 @<username>



All Viscosity hosted **webinar recordings** and **conference sessions slide decks** will be posted to **[www.OraPub.com](http://www.OraPub.com)** for free and paid members!



### Ready for some cool Oracle stuff?

It's easy to get what you want.

Just enter your current membership login, or become a free or paid member today!

- ✓ **Free tools** for the Oracle DBA
- ✓ **Free presentations** that give you great insights
- ✓ **Free public webinars** that are how-to and fun
- ✓ **How-to webinars just for paid members** and we have 80+ of them!
- ✓ **Video seminars for paid members** that go in-depth into the Oracle DB

LOGIN

NOT A MEMBER YET?



# Follow Us Online!



Facebook.com/ViscosityNA



LinkedIn.com/company/Viscosity-North-America



@ViscosityNA



Viscosity North America



@Viscosity\_NA





# ODTUG Kscope25

dallas - ft worth    june 15 - 19



**Don't Forget To Fill Out Your Evals**