

# Solution Overview

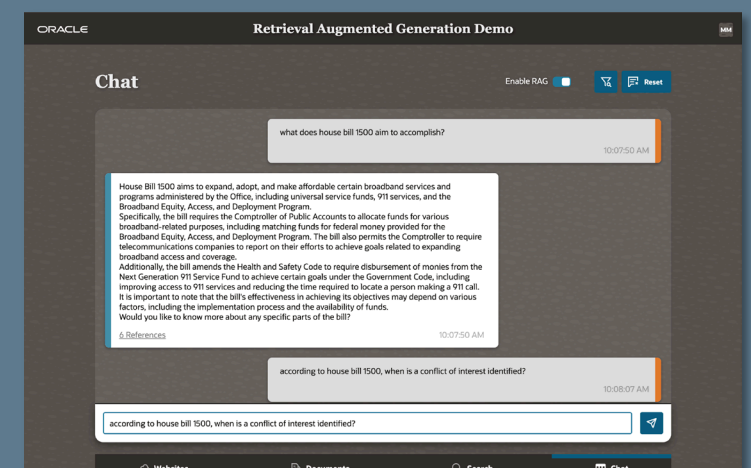
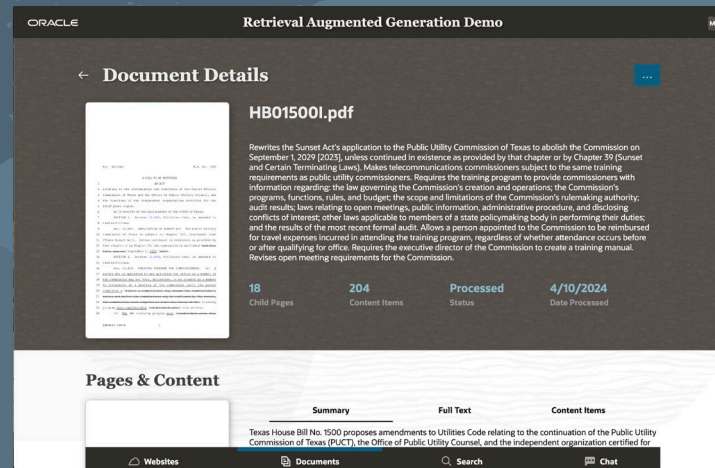
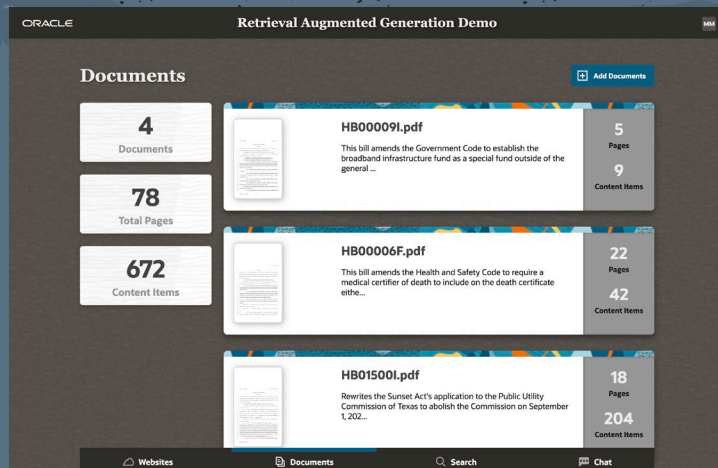


Legislation Analysis using Generative AI

# Legislation Analysis using Generative AI

## Overview

The solution allows users to ingest documents and use OCI's GenAI service to parse and optimize the content, generate summaries of the document and its pages, and generate vectors for supporting Retrieval Augmented Generation (RAG) with chat, storing them in a vector database. Users can view documents; their summaries and the individual page summaries for quick review. Users can also chat with the documents, asking questions in a conversational manner; the solution uses Retrieval Augmented Generation to provide a fluent conversational interface for in depth analysis.



# Legislation Analysis using Generative AI

## Problem

- Quickly reviewing a bill can be difficult and time consuming
  - The format of the document can be a challenge
  - Wording, verbiage, and language used can be difficult to understand
- Users need to perform analysis quickly with accuracy
  - Discussing sections and addendums to sections
  - Contrasting impact across statutes, legislation, and other documents
  - Extracting meaning, searching, summarizing

## Approach

- Use GenAI to optimize documents; format content, rewrite legal speak, normalize format
- Use GenAI to generate vectors to support Retrieval Augmented Generation and chat
- Use GenAI to generate summaries of documents and their pages
- Make it all searchable and discoverable

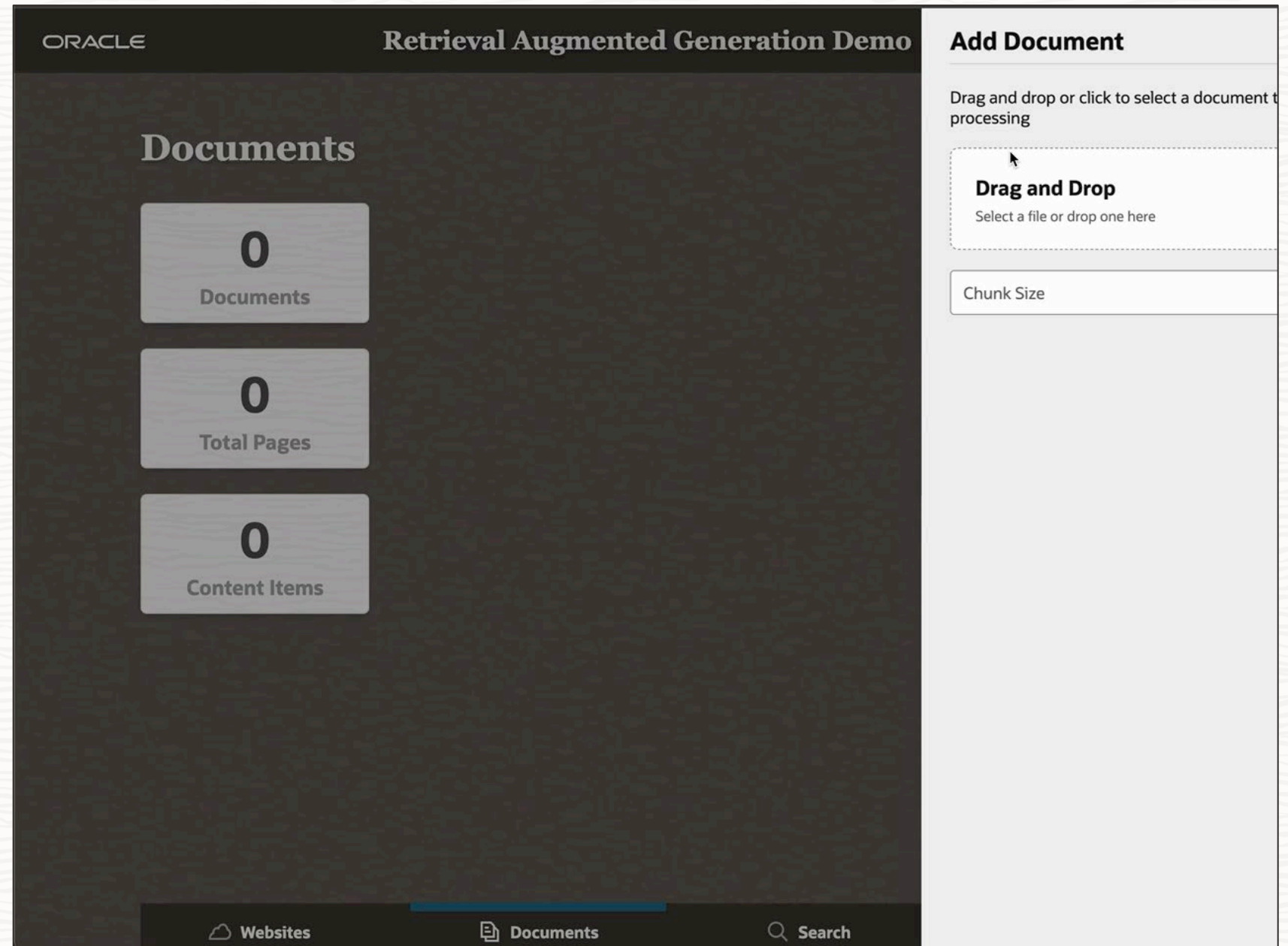
# Solution Demo



Legislation Analysis using Generative AI

# Ingesting a Document

- The user clicks "Add Documents", and drags a file to be uploaded.
- The document is uploaded and processed; a summary of the entire document is generated from GenAI, a summary of each page will be generated from GenAI, and screenshots for each page will be generated.





# Reviewing a Document

- The user selects the document they've uploaded when its finished processing
- The GenAI services has summarized the whole document, screenshots have been generated for each page, and the GenAI service has summarized each page.
- Users can easily come up to speed on a document; the full text of each page is also available
- GenAI is also used to help process the content in the document (next)

The screenshot displays the Oracle Retrieval Augmented Generation Demo interface. At the top, the Oracle logo and the title "Retrieval Augmented Generation Demo" are visible, along with a user profile icon labeled "MM". The main section is titled "Documents" and features a summary of document statistics: 1 Document, 18 Total Pages, and 199 Content Items. A detailed view of a document titled "HB01500I.pdf" is shown, including a thumbnail of the document page and a summary: "This bill amends the Utilities Code to require the Public Utility Commission of Texas (PUC) to establish a training program, ...". To the right of the document details, it shows 18 Pages and 199 Content Items. An "Add Documents" button is located in the top right corner. At the bottom, there is a navigation bar with icons and labels for "Websites", "Documents" (which is highlighted), "Search", and "Chat".

Document	Pages	Content Items
1 Document	18 Pages	199 Content Items

**HB01500I.pdf**  
This bill amends the Utilities Code to require the Public Utility Commission of Texas (PUC) to establish a training program, ...

# GenAI for Processing Data

- GenAI can also be used for processing data. The legislation contains line numbers, redactions, and legal speak.
- We can ask the LLM to remove the line numbers, fix spacing and formatting, and to rewrite the content to reduce (or remove) the legal speak
- This step is invisible to the user; it is a task that would formerly have required code. We can ask the LLM to perform document parsing, processing, and optimization, saving us time and effort.

W.B. No. 1100

1 15 of each odd-numbered year, the commission shall prepare a

2 written report that includes:

3 (i) suggestions regarding modification and

4 improvement of the commission's statutory authority and for the

5 improvement of utility regulation in general, including the

6 regulation of water and sewer services under Chapter 13, Water Code,

7 that the commission considers appropriate for protecting and

8 furthering the interest of the public;

9 (ii) a report on the scope of competition in the

10 electric and telecommunications markets that includes:

11 (A) an assessment of:

12 (i) the effect of competition on customers in both competitive

13 and non-competitive electric markets;

14 (ii) the effect of competition on the rates and availability of electric services for residential and

15 small commercial customers;

16 (B) an assessment of the effect of competition on:

17 (i) customers in both competitive and non-competitive telecommunications markets, with a

18 specific focus on rural markets;

19 (ii) the rates and availability of telecommunications services for residential and business

20 customers, including any effect on universal service;

21 (C) a summary of commission action over the preceding two years that reflects changes in the

22 scope of competition in the electric and telecommunications markets.

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Summary

Full Text

Content Items

Sure, here is a rewritten version of the provided text:

Every odd-numbered year, the commission shall prepare a written report that includes:

Suggestions regarding the modification and improvement of the commission's statutory authority and for the improvement of utility regulation in general, including the regulation of water and sewer services under Chapter 13 of the Water Code, that the commission considers appropriate for protecting and furthering the interest of the public.

A report on the scope of competition in the electric and telecommunications markets that includes:

(i) The effect of competition and industry restructuring on customers in both competitive and non-competitive electric markets.

(ii) The effect of competition on the rates and availability of electric services for residential and small commercial customers.

(B) An assessment of the effect of competition on:

(i) Customers in both competitive and non-competitive telecommunications markets, with a specific focus on rural markets.

(ii) The rates and availability of telecommunications services for residential and business customers, including any effect on universal service.

(C) A summary of commission action over the preceding two years that reflects changes in the scope of competition in the electric and telecommunications markets.

Is there anything else I can help you with regarding this text?

W.B. No. 1100

1 15 of each odd-numbered year, the commission shall prepare a

2 written report that includes:

3 (i) suggestions regarding modification and

4 improvement of the commission's statutory authority and for the

5 improvement of utility regulation in general, including the

6 regulation of water and sewer services under Chapter 13, Water Code,

7 that the commission considers appropriate for protecting and

8 furthering the interest of the public;

9 (ii) a report on the scope of competition in the

10 electric and telecommunications markets that includes:

11 (A) an assessment of:

12 (i) the effect of competition on customers in both competitive

13 and non-competitive electric markets;

14 (ii) the effect of competition on the rates and availability of electric services for residential and

15 small commercial customers;

16 (B) an assessment of the effect of competition on:

17 (i) customers in both competitive and non-competitive telecommunications markets, with a

18 specific focus on rural markets;

19 (ii) the rates and availability of telecommunications services for residential and business

20 customers, including any effect on universal service;

21 (C) a summary of commission action over the preceding two years that reflects changes in the

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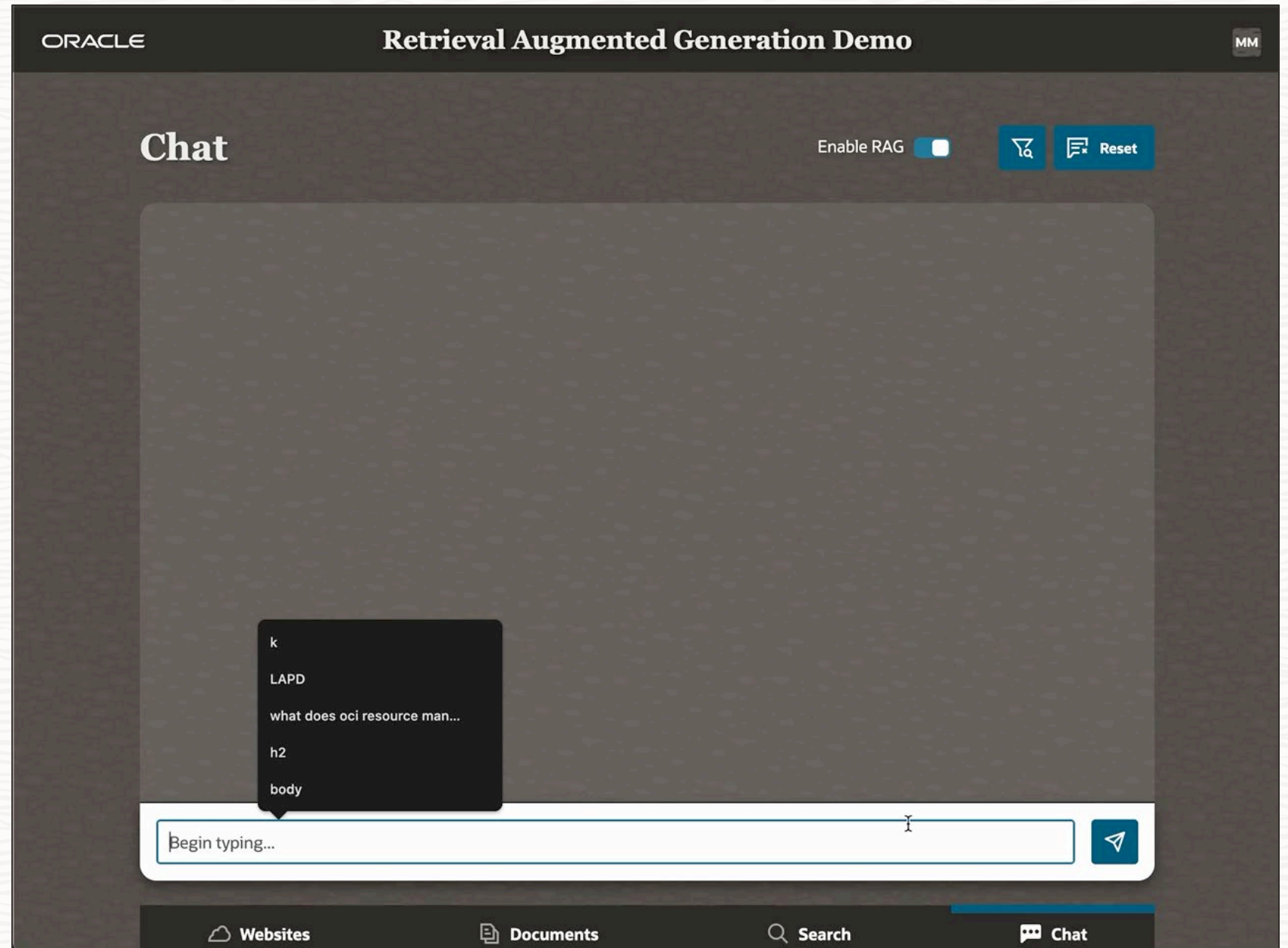
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# Chat with the Document

- Users can have a natural language conversation with the content of one, or many documents.
- Questions from the user will invoke a semantic search against the vector database, and use the GenAI to generate the response.
- The advantage of Retrieval Augmented Generation (RAG) is that the source of the information is cited, it is referenced in the response. This helps provide accurate dependable result, reducing LLM hallucination.





# Vector Search Security

- A vector search introduces the ability to evaluate the user's roles and permissions, to limit the set of returned documents.
- This provides a different context to the GenAI services based on the level of access the user has, altering the response
- This allows users with more privileged access a broader set of information, and/or restricted documents
- This information is never shared with Oracle, and allows customers full governance and security of private or proprietary data

The screenshot shows the Oracle Retrieval Augmented Generation Demo interface. At the top, the Oracle logo and "Retrieval Augmented Generation Demo" are displayed. A "Chat" header is on the left, and "Enable RAG" with a toggle switch is on the right. Below the header, the chat area contains three paragraphs of text about the Public Utility Commission of Texas (PUCT). The first paragraph states that PUCT is an entity overseeing utility services and is scheduled for abolition in 2029. The second paragraph describes the commission's members and their training requirements. The third paragraph asks if the user wants to know more about PUCT's functions. Below the text, there are three references listed: "HB01500I.pdf / page 1", "HB01500I.pdf / page 18", and "HB01500I.pdf / page 5". Each reference is accompanied by a small thumbnail image of the document page. At the bottom of the chat area, there is a text input field with the placeholder "Begin typing..." and a send button. The bottom navigation bar includes icons and labels for "Websites", "Documents", "Search", and "Chat".

ORACLE Retrieval Augmented Generation Demo

Chat

Enable RAG

The Public Utility Commission of Texas (PUCT) is an entity that oversees the state's utility services, including electricity, telecommunication, and water providers. It is subjected to abolition on September 1, 2029, unless its existence is continued by the Texas Sunset Act or Chapter 39.

The Commission comprises appointed members who undergo training to ensure their familiarity with utility services and related laws. Notably, PUCT members are prohibited from voting or participating in meetings until they complete the required training successfully.

Would you like to know more about the functions of the Public Utility Commission of Texas?

[5 References](#) 4:45:42 PM

HB01500I.pdf / page 1

HB01500I.pdf / page 18

HB01500I.pdf / page 5

Begin typing...

Websites Documents Search Chat

## Additional Analysis

- We can ask the GenAI to provide analysis based on the contents of the vector database; this utilizes the LLMs ability to understand language and provide summarization and analysis based on the results of the query.
- LLMs are great at performing analysis of data; comparing, contrasting, summarizing, etc. An analyst can ask different questions to perform in depth analysis across one or more documents.
- Next we will contrast multiple documents.

The screenshot shows the Oracle Retrieval Augmented Generation Demo interface. At the top, the Oracle logo and "Retrieval Augmented Generation Demo" title are visible. A "Chat" header is on the left, and "Enable RAG" with a toggle switch and a "Reset" button are on the right. The chat history shows a previous message from the AI about improving Commission communications, with a timestamp of 4:49:45 PM and a link to "5 References". The current user message asks, "what is the broadband infrastructure fund outlined in house bill 9?", with a timestamp of 4:49:59 PM. The AI's response explains that the fund is a special fund outside the general revenue fund, used for broadband and telecommunication projects in rural areas, with a timestamp of 4:49:59 PM and a link to "4 References". At the bottom, there is a search bar with the same question and a "Send" button. The bottom navigation bar includes icons for "Websites", "Documents", "Search", and "Chat".

ORACLE Retrieval Augmented Generation Demo MM

Chat

Enable RAG ☐ Reset

improving the effectiveness of Commission communications

- The Texas Utilities Code

If you provide more information about what you would like to know, I can attempt to answer your question.

[5 References](#) 4:49:45 PM

what is the broadband infrastructure fund outlined in house bill 9? 4:49:59 PM

The broadband infrastructure fund is a special fund outside of the general revenue fund of the state treasury. It is for monies from legislative appropriations, dedicated fees, interest earned, depository interest, and grants.

It is for the purpose of funding broadband and telecommunication services projects throughout the state, specifically in rural and underserved areas. This ultimately aims to connect more communities to reliable and affordable broadband, promoting various opportunities like economic development, telehealth, remote learning, and civic engagement.

Is there anything else regarding this fund or Texas House Bill No. 9 that I can help explain or answer?

[4 References](#) 4:49:59 PM

what is the broadband infrastructure fund outlined in house bill 9?

Websites Documents Search Chat

# Multiple documents

- We can also ask the GenAI services to compare or contrast multiple documents, or extract specific information from each
- Here we are asking the GenAI services to provide a contrast between two bills, specific to a particular organization that they both mention

The screenshot shows the Oracle Retrieval Augmented Generation Demo interface. At the top, the Oracle logo and "Retrieval Augmented Generation Demo" are displayed. A "Chat" header is on the left, and "Enable RAG" with a toggle switch and a "Reset" button are on the right. The chat history shows a user asking about the state of Texas regarding fund allocation and financial implications of House Bill 9. The system response includes a "References" link and a timestamp of 4:55:11 PM. A second user question asks who is impacted by the broadband infrastructure fund and what the impact is, with a timestamp of 4:55:25 PM. The system response provides a detailed paragraph about the fund's goals and impact, followed by a "References" link and a timestamp of 4:55:25 PM. A text input field at the bottom contains the placeholder "Begin typing..." and a send button. A bottom navigation bar includes "Websites", "Documents", "Search", and "Chat" tabs.

ORACLE Retrieval Augmented Generation Demo MM

Chat

Enable RAG ☒ Reset

state of Texas regarding the allocation of funds for these various programs. Would you like me to provide more information regarding the financial implications of House Bill 9?

[6 References](#) 4:55:11 PM

who is impacted by the changes outlined by the broadband infrastructure fund? what is that impact?

4:55:25 PM

The fund aims to provide reliable and affordable broadband service to promote economic development and opportunities in rural and underserved areas of Texas. It impacts anyone residing in these areas, including individuals and businesses, by enhancing their connectivity and online accessibility. The fund will primarily assist those in rural areas who might otherwise have limited options for high-speed internet connectivity. The funding will help provide broadband access to communities and organizations that require advanced telecommunications services to k...omy. The bill o...d regarding the Office of Broadband Development LAPD...e Fund, the Universal Service Fund, and funding f...services. Would yo...these specific impacts?

[6 Referen](#) h2 body 4:55:25 PM

Begin typing...

Websites Documents Search Chat



# Technical Information



Legislation Analysis using Generative AI

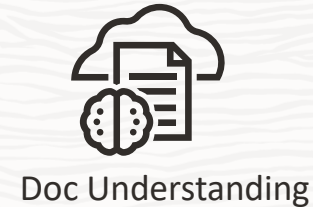


# Legislation Analysis using Generative AI

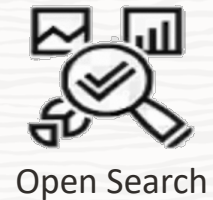
## Architecture 1: OpenSearch and Oracle Autonomous Database



A summary for each document is produced on-demand using the OCI Generative AI services, Content is rewritten and formatted for readability, GenAI is used to support Retrieval Augmented Generation



Documents are analyzed, OCR is applied to the contents, and tables are extracted from documents



Open Search is used as a vector database, facilitating Semantic Search and Retrieval Augmented Generation; documents can be quickly searched using a search engine like interface



Document metadata and information is stored in Oracle Database

# Legislation Analysis using Generative AI

## Architecture 2: Oracle Database 23ai



Generative AI

A summary for each document is produced on-demand using the OCI Generative AI services, Content is rewritten and formatted for readability, GenAI is used to support Retrieval Augmented Generation



Doc Understanding

Documents are analyzed, OCR is applied to the contents, and tables are extracted from documents

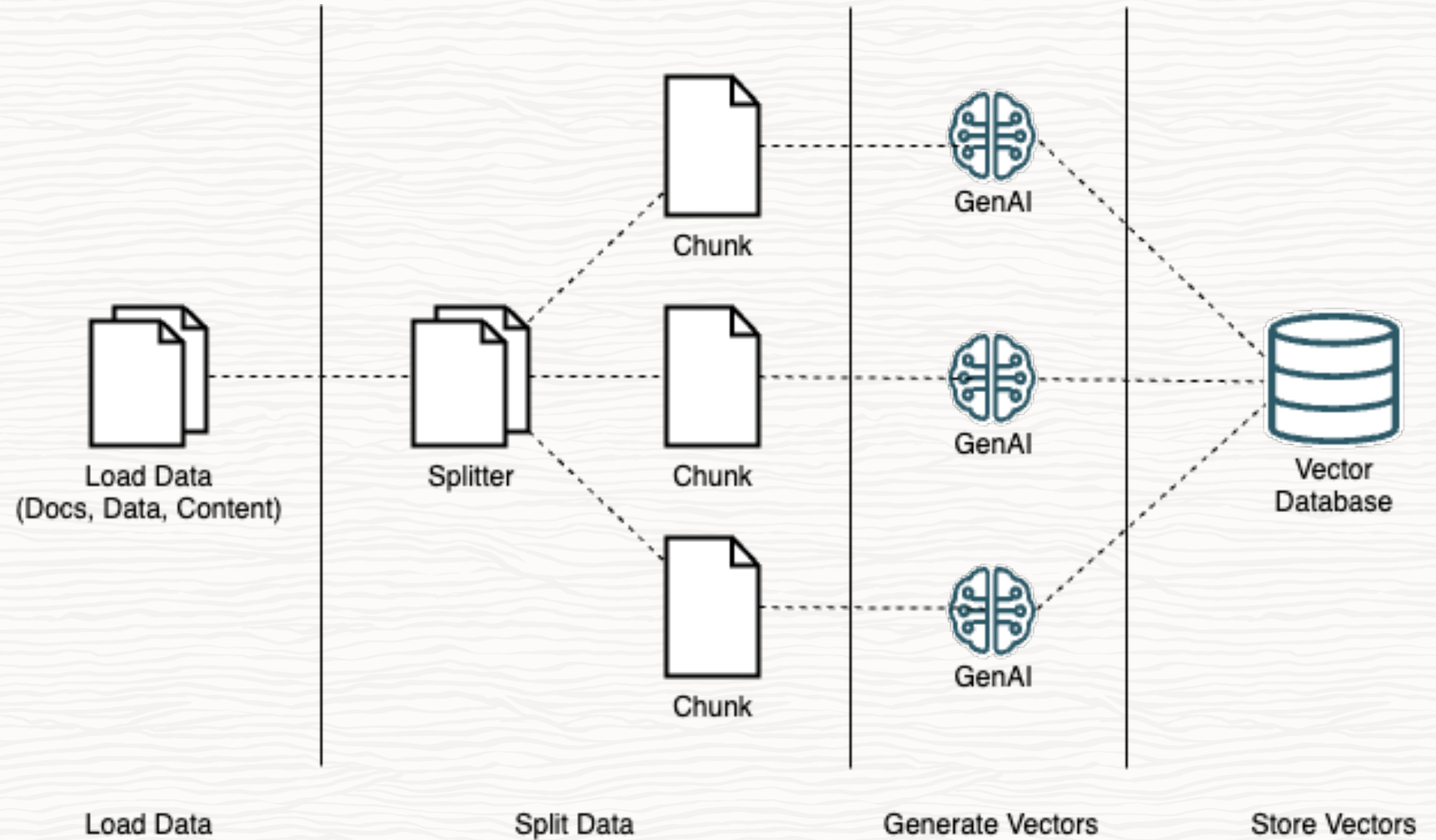


Oracle Database  
23ai

Document metadata and information is stored in Oracle Database, along with using the Vector Database capabilities in 23ai to store the vectors generated from the content. 23ai also provides Semantic Search capabilities which is used as part of the Retrieval Augmented Solution; documents and content can quickly be searched contextually.

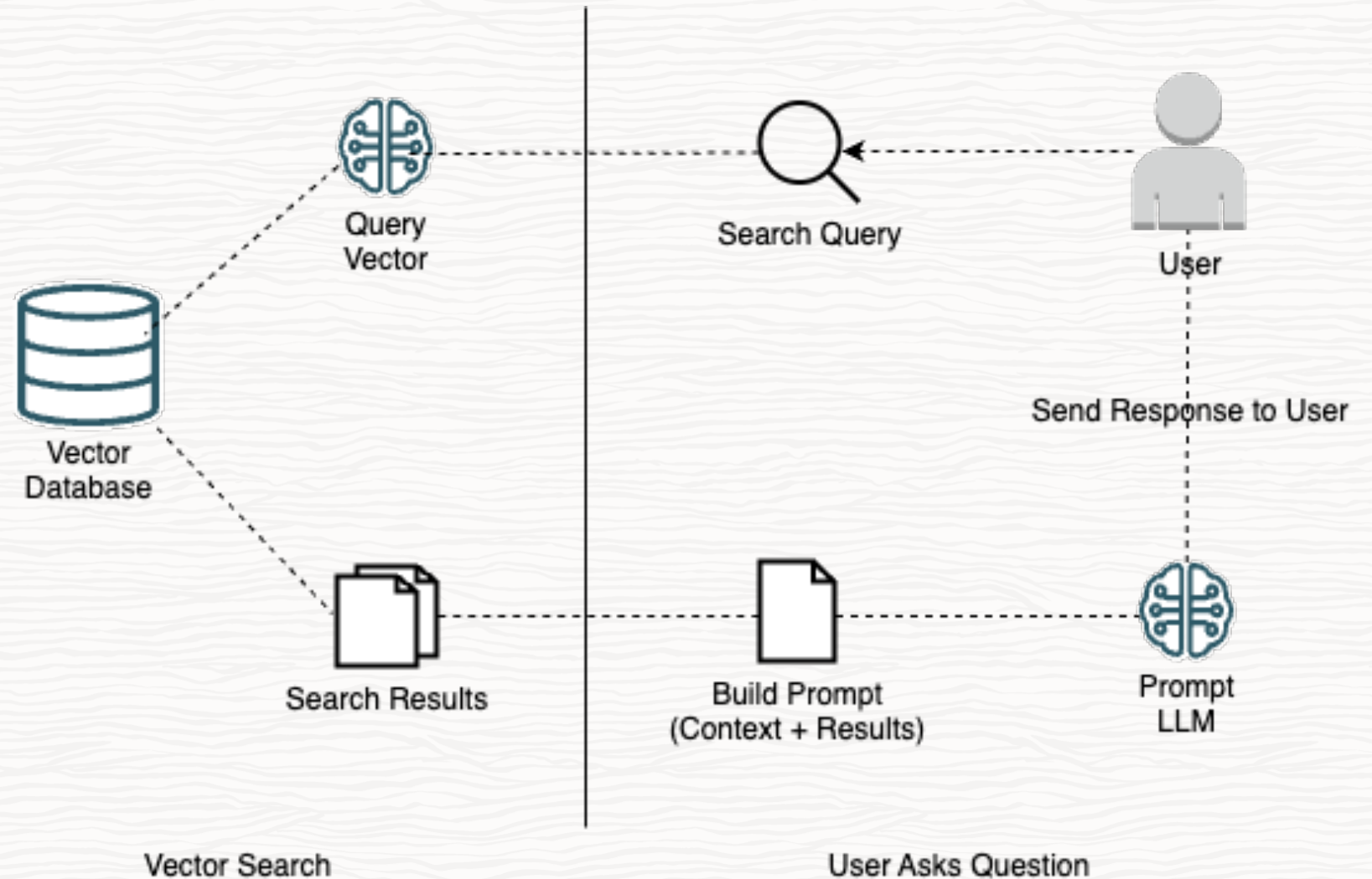
# Solution Architecture – Ingesting Data

Data is ingested into the Vector Database. This can be documents, data, Content, etc. Data is split into small chunks to facilitate semantic search, and vectors are generated using the OCI GenAI service



# Solution Architecture – Semantic Search

The user asks a question, the question is converted to a query vector, a vector search is performed and the most relevant search results are returned. These results are used to build a prompt for the LLM. The LLM is prompted, and the response is returned to the user





# Additional Resources

Oracle Database 23ai

<https://www.oracle.com/database/23ai/>

OCI Generative AI

<https://docs.oracle.com/en-us/iaas/Content/generative-ai/overview.htm>

OCI Managed Open Search Service

<https://docs.oracle.com/en-us/iaas/Content/search-opensearch/home.htm>