

# Building a search engine for your APEX app

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# Dimitri Gielis

- Founder & CEO of **United Codes**
- 23+ years of Oracle Experience (OCP & APEX Certified)
- Oracle ACE Director
- “APEX Developer of the year 2009” by Oracle Magazine
- “Oracle Developer Choice award (ORDS)” in 2015
- Author Expert **Oracle APEX**
- Presenter at Conferences



www.united-codes.com



APEX Office Print



APEX Media Extension



APEX Project Eye



Plug-ins Pro



APEX Office Edit

A search engine  
exists out of two  
components

```
graph LR; A[1 or more Search Configurations] --- B[a Search Page]
```

1 or more  
Search  
Configurations

a Search Page

# Shared Components > Search Configurations

 **APEX**   **App Builder** ▾   SQL Workshop ▾   Team Development ▾   Gallery

Search

   **dimi**  
p\_dimi

↑ Application 179 \ Shared Components \ **Search Configurations**

**Search Configurations**   Utilization   History

 ▾

Go

Actions ▾

Reset

Copy

Create >

| Label ↑ ▾ | Type     | Updated     | Updated By | Subscribed From | Subscribers |
|-----------|----------|-------------|------------|-----------------|-------------|
| Standard  | Standard | 10 days ago | DIMI       |                 |             |

1 - 1

**Search Configurations**  
**Search Configurations** contain information about a searchable data source. They can be referenced from *Search* regions to add declarative searches in your application. Searches can be based on Local data source, REST Enabled SQL Service, REST Data Source, pre-defined Oracle Text or Oracle APEX List.  
[Learn More ...](#)

# Create Search Configuration

## Create Search Configuration

Detail

A **Search Configuration** contains information about the searchable *Data Source*, the functionality used for search, as well as display properties.

\*

 Name

\*

 Search Type 

☒ Standard

☐ Oracle Text

☐ List

Cancel

Next >

# Create Search Configuration: Standard

## Create Search Configuration

✓

●

Source

Data Source **Local Database** REST Enabled SQL Service REST Data Source ?

\* Source Type ☒ Table ☐ SQL Query ?

\* Table / View Owner P\_DIMI ?

\* Table / View Name ?

< Cancel

Next >

# Create Search Configuration: Standard

## Create Search Configuration

✓

✓

●

Column Mapping

\* Primary Key Column

- Select Column -

?

\* Title Column

- Select Column -

?

Description Column

- Select Column -

?

Icon Source

Initials

Icon Class

Icon Class Column

?

<

Cancel

Create Search Configuration

# Edit Search Configuration

- Search Query Prefix
- Static ID
- Subscription
- Source
- Text Index Column
- Text Index Function
- Column Mapping
- Icon and Display
- Link
- Server-Side Condition
- Authorization Scheme
- Build Option

Application 179 \ Shared Components \ Search Configurations \ Edit

Search Configuration: Standard

Cancel Delete **Apply Changes**

Show All Settings Subscription Source Column Mapping Icon and Display Link Server-Side Condition Advanced

### Settings

Search Type: **Standard**

Label: Standard

Search Query Prefix:

Static ID: standard

### Subscription

Reference Master Configuration From:

This is the "master" copy of this Search Configuration.  
No Search Configurations subscribe to this configuration.

### Source

Data Source: Local Database REST Enabled SQL Service REST Data Source

Source Type: **Table** SQL Query Function Body Returning SQL

Table / View Owner: - Panning Schema -

Table / View Name: EMP\_TRAVEL\_REQUEST

Where Clause:

Order By Clause:

Searchable Column(s): REQ\_ID (Number) NO\_OF\_DAYS (Number) ESTIMATED\_COST (Number)

EMP\_NO (Varchar2) TRAVEL\_TYPE (Varchar2) UPDATED\_BY (Varchar2) STATUS (Varchar2)

### Column Mapping

Primary Key Column: REQ\_ID (Number)

Title Column: EMP\_NO (Varchar2)

Custom Column 1:

Badge Column:

Primary Key Column 2: - Select Column -

Subtitle Column: - Select Column -

Custom Column 2: - Select Column -

Score Column: - Select Column -

Description Column: TRAVEL\_TYPE (Varchar2)

Custom Column 3: - Select Column -

Last Modified Column: - Select Column -

### Icon and Display

Icon Source: Initials

Default Result Row Template:

Result CSS Classes:

No Results Found Message:

Maximum Rows to Return:

### Link

Link Type: - No Target -

### Server-Side Condition

Condition Type: - No Condition Specified -  
Expression exists never none

### Advanced

Authorization Scheme: - No Authorization Required -

Build Option: - No Build Option -

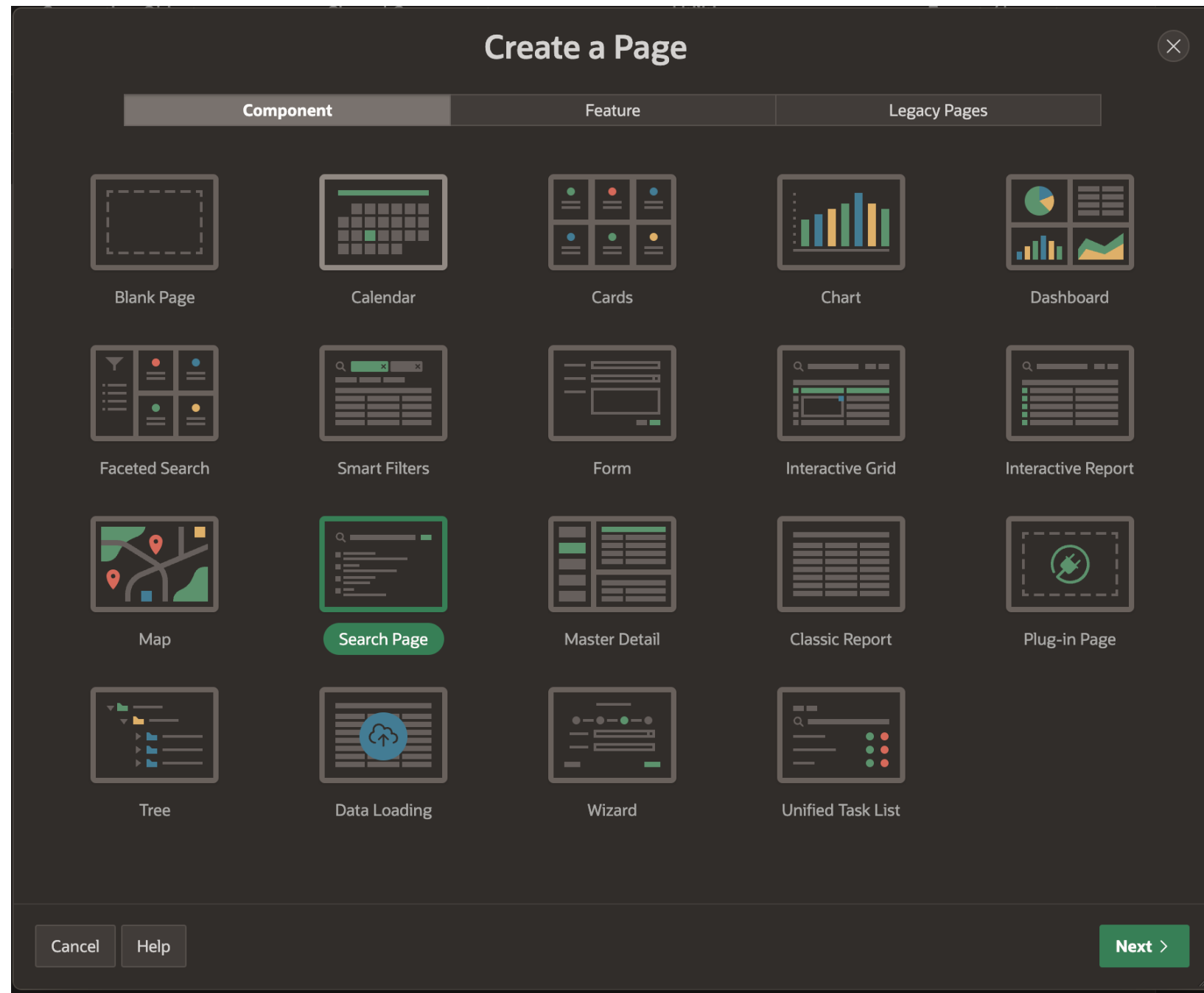
Comments:

Created: 10 days ago - DIMI  
Updated: 10 days ago - DIMI

Search Configuration contains information about a searchable data source. They can be referenced from Search regions to add declarative searches in your application. Searches can be based on Local data source, REST Enabled SQL Service, REST Data Source, pre-defined Oracle Text or Oracle APEX List. [Learn More ...](#)

[Return To Page](#)

# Search Page



# Create Search Page

Create Search Page

Page Definition

\* Page Number

5

?

\* Name

?

Page Mode

Normal

Modal Dialog

Drawer

?

Search Configurations

|                          | Label              | Search Type |
|--------------------------|--------------------|-------------|
| <input type="checkbox"/> | Oracle Text        | Oracle Text |
| <input type="checkbox"/> | Standard Customers | Standard    |
| <input type="checkbox"/> | Standard Travel    | Standard    |

1 - 3

▶

Navigation

<

Cancel

Create Page

Example

## Search



**Illumina Biotech**

Life Sciences



**A-Frame Aerospace**

Aerospace & Defense



**Carlton Closets**

Consumer Goods



**Logistics 36**

Engineering & Construction



**Cyphria**

Life Sciences



**Make Good**

Education & Research



**Organic Farms**

Wholesale Distribution

# 100% customizable

Page 5: Search 2

Pre-Rendering

Components

- Breadcrumb Bar
  - Breadcrumb
    - Search Field and Smart Filters

P5\_SEARCH
- Body
  - Search Results
    - Search Sources
      - Standard Customers
      - Standard Travel

Post-Rendering

RegionAttributes

Filter

Settings

- Search Page Item

P5\_SEARCH
- Search as You Type☒
- Minimum Characters

No minimum (0)
- Lazy Loading☒
- Use Pagination☒
- Results per Page

15
- Show Result Count

No
- Custom Layout☐
- Last Modified Format Mask
- Overall Sort

- Select -
- No Query Entered Message
- No Results Found Message

Search Source

Filter

Identification

- Name

Standard Customers
- Search Configuration

Standard Customers
- Use as Initial Result☐

Layout

- Sequence

10

Appearance

- Override Label
- Maximum Results

Icon and Badge

- Icon CSS Classes

Server-side Condition

- Type

- Select -

Configuration

- Build Option

- Select -

Comments

- Comments

Audit Information

- Changed By

DIMI
- Changed On

16-Apr-2023 14:46:50

# Custom Layout with Template Directives

{... /}

For example

- {if ?ICON\_VALUE/}
- {case ICON\_TYPE/}

Use Pagination ☒

Results per Page 15

Show Result Count No

Custom Layout ☒

Result Row Template

```
<div class="a-ResultsItem &RESULT_CSS_CLASSES!ATTR.">
  {if ?ICON_VALUE/}
  {case ICON_TYPE/}
  {when INITIALS/}
    <div class="a-ResultItem-initials u-color-var">&ICON_VALUE.</div>
  {when URL/}
    <div class="a-ResultItem-image">
  </div>
  {when CLASS/}
    <div class="a-ResultItem-icon u-color-var"><span class="fa &ICON_VALUE!ATTR." aria-hidden="true"></span>
  </div>
  {endcase/}
  {endif/}
  <div class="a-ResultsItem-content">
    <div class="a-ResultsItem-header">
      {if ?LINK/}
        <span class="a-ResultsItem-title"><a href="&LINK!ATTR.">&TITLE.</a></span>
      {else/}
        <span class="a-ResultsItem-title">&TITLE.</span>
      {endif/}
      {if ?BADGE/}<span class="a-ResultsItem-badge">&BADGE.</span>{endif/}
    </div>
    {if ?SHORTTITLE/}<div class="a-ResultsItem-subTitle">&SHORTTITLE </div>{endif/}
  </div>
</div>
```

Last Modified

Format Mask

Overall Sort - Select -

No Query Entered Message

No Results Found Message

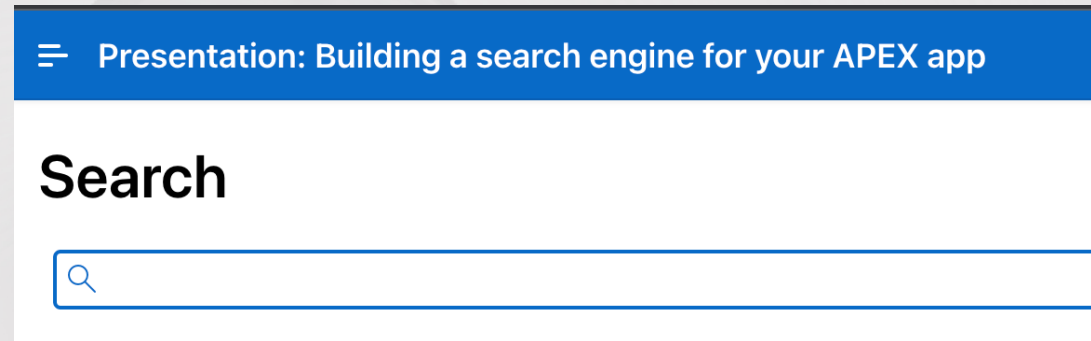
# Multiple Search Configurations

One Search  
Region

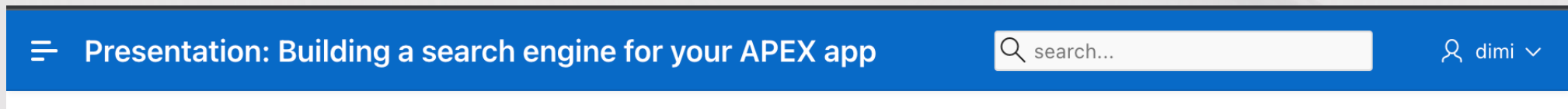
Multiple  
Search  
Regions

# Search Position

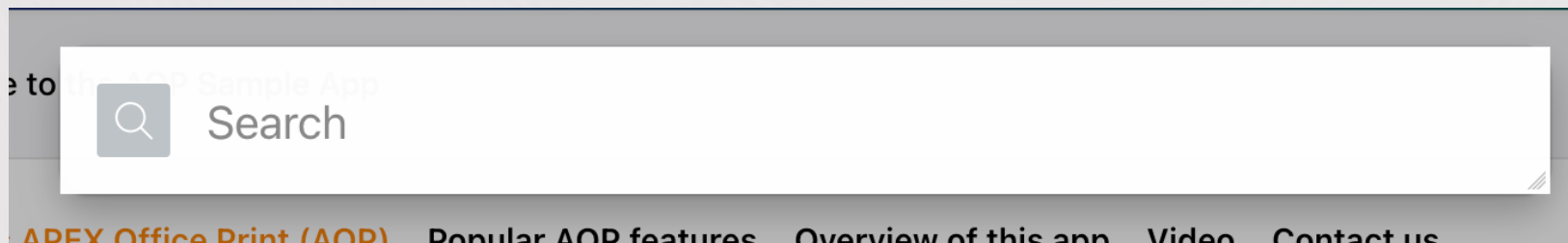
- Search in Breadcrumb Region (default)



- Search next to Page Title / Navigation Bar



- Search as Spotlight Search





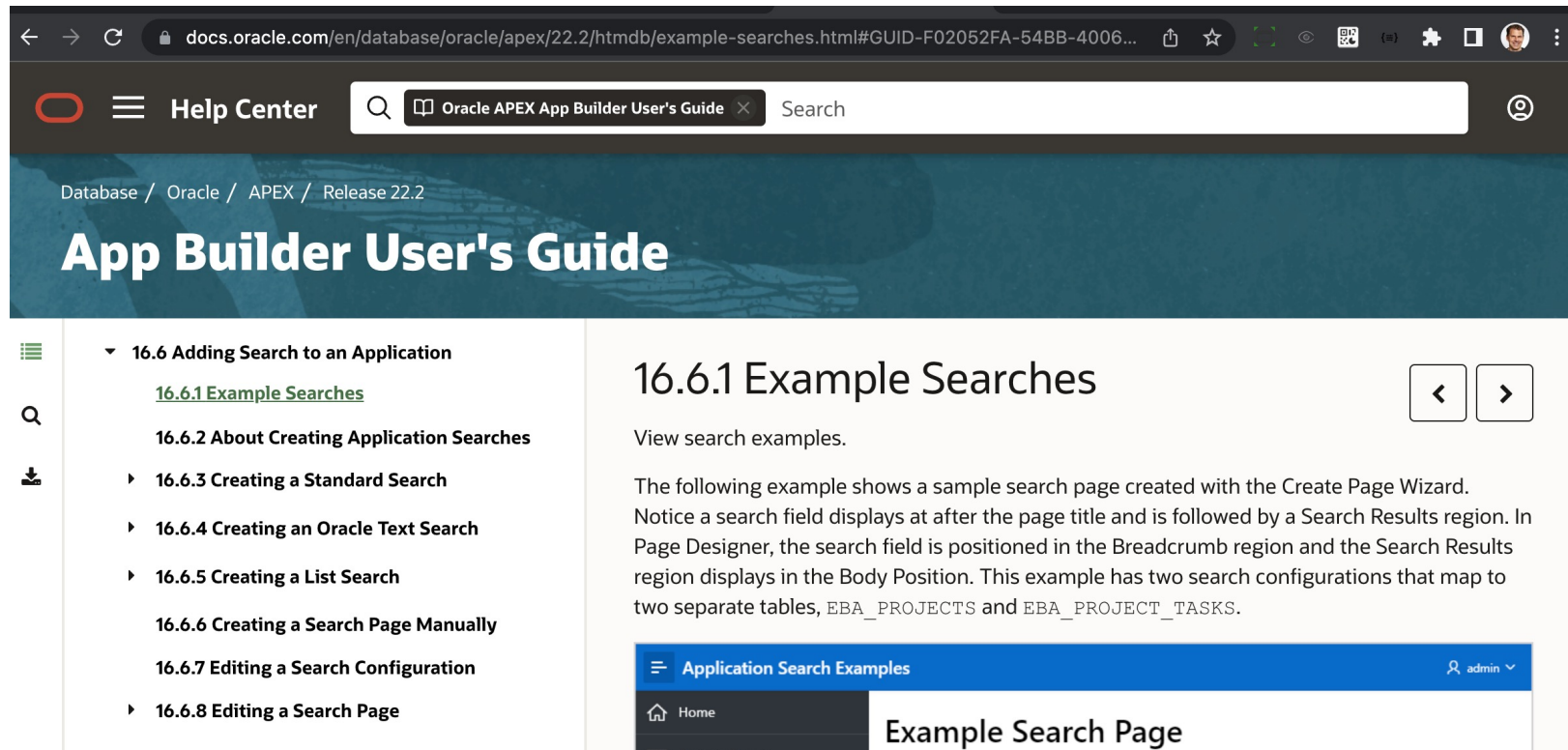
# Demo

Creating a search



Understanding the building  
blocks

# Review documentation



The screenshot shows a web browser displaying the Oracle APEX App Builder User's Guide. The browser's address bar shows the URL: [docs.oracle.com/en/database/oracle/apex/22.2/htmdb/example-searches.html#GUID-F02052FA-54BB-4006...](https://docs.oracle.com/en/database/oracle/apex/22.2/htmdb/example-searches.html#GUID-F02052FA-54BB-4006...). The page header includes the Oracle logo, a hamburger menu, the text "Help Center", a search bar with the text "Oracle APEX App Builder User's Guide", and a user profile icon. Below the header, a breadcrumb trail reads "Database / Oracle / APEX / Release 22.2". The main heading is "App Builder User's Guide". On the left, a sidebar contains a table of contents for section 16.6, "Adding Search to an Application", with sub-items: "16.6.1 Example Searches" (highlighted), "16.6.2 About Creating Application Searches", "16.6.3 Creating a Standard Search", "16.6.4 Creating an Oracle Text Search", "16.6.5 Creating a List Search", "16.6.6 Creating a Search Page Manually", "16.6.7 Editing a Search Configuration", and "16.6.8 Editing a Search Page". The main content area is titled "16.6.1 Example Searches" and includes a "View search examples." link. The text describes a sample search page created with the Create Page Wizard, noting the placement of the search field and Search Results region. It mentions two search configurations mapping to tables `EBA_PROJECTS` and `EBA_PROJECT_TASKS`. Below the text is a preview of the "Example Search Page", which has a blue header "Application Search Examples" with a user "admin" and a "Home" link.

Database / Oracle / APEX / Release 22.2

## App Builder User's Guide

- 16.6 Adding Search to an Application
  - [16.6.1 Example Searches](#)
  - 16.6.2 About Creating Application Searches
  - 16.6.3 Creating a Standard Search
  - 16.6.4 Creating an Oracle Text Search
  - 16.6.5 Creating a List Search
  - 16.6.6 Creating a Search Page Manually
  - 16.6.7 Editing a Search Configuration
  - 16.6.8 Editing a Search Page

### 16.6.1 Example Searches

View search examples.

The following example shows a sample search page created with the Create Page Wizard. Notice a search field displays at after the page title and is followed by a Search Results region. In Page Designer, the search field is positioned in the Breadcrumb region and the Search Results region displays in the Body Position. This example has two search configurations that map to two separate tables, `EBA_PROJECTS` and `EBA_PROJECT_TASKS`.

**Application Search Examples** admin

Home

#### Example Search Page

<https://docs.oracle.com/en/database/oracle/apex/22.2/htmdb/example-searches.html>

# PL/SQL API

```
APEX_SEARCH.SEARCH (  
    p_search_static_ids      IN wwv_flow_t_varchar2,  
    p_search_expression      IN VARCHAR2,  
    p_apply_order_bys       IN VARCHAR2          DEFAULT 'Y',  
    p_return_total_row_count IN VARCHAR2          DEFAULT 'N' )  
    RETURN wwv_flow_t_search_result_table pipelined;
```

# PL/SQL API

```
select config_label, title, subtitle, badge
  from table( apex_search.search(
                    p_search_static_ids => apex_t_varchar2( 'PRODUCTS', 'CUSTOMERS' ),
                    p_search_expression => 'oracle APEX',
                    p_apply_order_bys   => 'N' ) );
```

| CONFIG_LABEL | TITLE             | SUBTITLE               | BADGE |
|--------------|-------------------|------------------------|-------|
| -----        | -----             | -----                  | ----- |
| Products     | APEX vacation app | Subscription Based App |       |
| Products     | APEX time entry   | On-Premises License    |       |
| :            |                   |                        |       |
| Customers    | John Doe Corp     | Software Development   | 5000  |
| Customers    | Development Corp  | Software Development   | 1000  |
| :            |                   |                        |       |

# APEX Views

| View  | Comment                                                                      | Parent View                   |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------|
| APEX_APPL_PAGE_SEARCH_SOURCES                                                          | Stores the meta data for Search Configuration usages within a search region. | APEX_APPLICATION_PAGE_REGIONS |
| APEX_APPL_SEARCH_CONFIGS                                                               | Stores the meta data for Search Configurations of an application.            | APEX_APPLICATIONS             |

```
select r.search_source_id, r.page_id, r.page_name, r.region_name, r.search_config_label
       from apex_appl_page_search_sources r
       where r.application_id = 179
```

```
select s.static_id, s.label, s.search_type, s.search_source
       from apex_appl_search_configs s
       where s.application_id = 179
```

# Debug & Trace

| Elapsed | Execution | Message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Level | Graph       |
|---------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|
| 0.46968 | 0.00050   | initialize_search<br>p_search_id=>82838539197956788,p_search_expression=>lu,p_apply_order_by=>true,p_use_as_initial_result=>false,p_return_total_row_count=>false,p_                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8     | <div></div> |
| 0.47018 | 0.00041   | fetch_meta_data p_search_id=>82838539197956788                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 8     | <div></div> |
| 0.47059 | 0.00055   | Searching on Standard Customers with query (lu)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4     | <div></div> |
| 0.4714  | 0.00051   | search using query: lu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4     | <div></div> |
| 0.47165 | 0.00143   | get_comp_parameter_values<br>p_region_id=>p_page_process_id=>p_jet_chart_series_id=>p_app_process_id=>p_shared_lov_id=>p_module_sync_step_id=>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 8     | <div></div> |
| 0.47308 | 0.00047   | fetched 0 component parameter values for search configuration id 82838539197956788                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 9     | <div></div> |
| 0.47355 | 0.00064   | open_query_context<br>p_location=>LOCAL,p_table_name=>EBA_CUST_CUSTOMERS_V,p_sql_query=>p_function_body=>p_where_clause=>p_order_by_clause=>p_parameters.count=>0,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8     | <div></div> |
| 0.47420 | 0.00094   | generate_sql_query p_query_type=>TABLE,p_owner=>p_table_name=>EBA_CUST_CUSTOMERS_V,p_sql_query=>p_function_body=>p_target_database=>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8     | <div></div> |
| 0.47514 | 0.00041   | Generated Component SQL Query:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4     | <div></div> |
| 0.47554 | 0.00057   | <pre>select l,*<br/>  from (select *<br/>        from(select /*+ qb_name(apesinner) */x from(select x,* from "EBA_CUST_CUSTOMERS_V" x<br/>              )l<br/>              )l where l=1<br/>        and (((upper("ROW_ID")like upper(apesf1)) or (upper("CUSTOMER_NAME")like upper(apesf1)) or (upper("STATUS")like upper(apesf1)) or<br/>            (upper("CATEGORY")like upper(apesf1)) or (upper("ISSUANCE NAME")like upper(apesf1)) or (upper("REFERENCEABLE")like upper(apesf1)) or<br/>            (upper("NUMBER_OR_USAGE")like upper(apesf1)) or (upper("SUPPLYMAN")like upper(apesf1)) or (upper("WEB_SITE")like upper(apesf1)) or<br/>            (upper("PRODUCT_USAGE")like upper(apesf1))))))</pre> | 4     | <div></div> |
| 0.47593 | 0.00046   | open_query_context p_columns.count=>0,p_parse_as_schema_override=>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8     | <div></div> |
| 0.47639 | 0.00035   | parse_sql_statement: p_names.count=>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 9     | <div></div> |
| 0.47654 | 0.00048   | ...ignore: apesf1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 9     | <div></div> |
| 0.47722 | 0.00038   | prepare_array_statement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 8     | <div></div> |
| 0.47760 | 0.00071   | statement line cnt: 8, statement characters: 585                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8     | <div></div> |
| 0.47831 | 0.00038   | inject_diagnostics_hint                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 8     | <div></div> |
| 0.47869 | 0.00032   | SQL Statement prepared/rewritten: line count=0, first index=907, last index=1084, characters=419, found binds=0<br>select /*qb_name(apesf1)*/i,*<br>from (select *<br>from(select /*+ qb_name(apesinner) */x from(select x,* from "EBA_CUST_CUSTOMERS_V" x                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 9     | <div></div> |

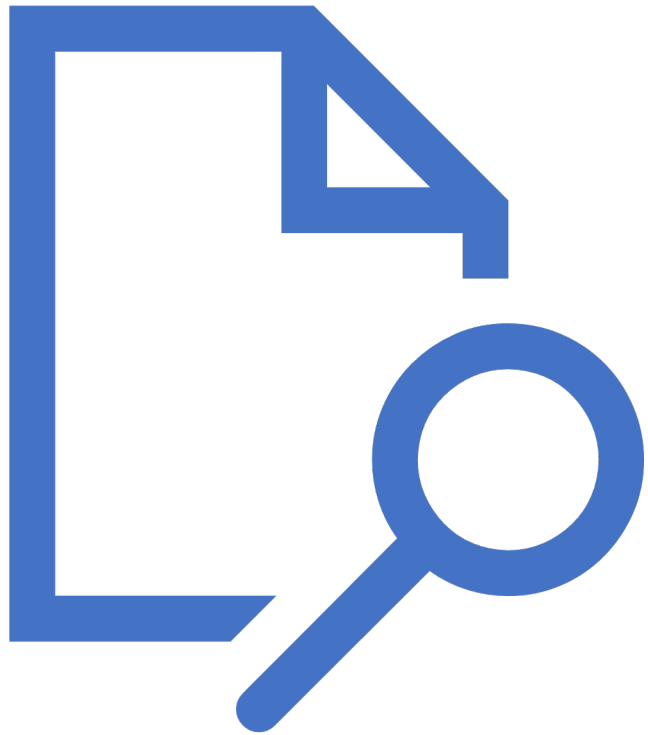
| Elapsed | Execution | Message                                                                                                                                                                                                                                                                                                                                                                                             | Level | Graph       |
|---------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|
| 1.04149 | 0.00038   | close_context context_type=1                                                                                                                                                                                                                                                                                                                                                                        | 8     | <div></div> |
| 1.04187 | 0.00041   | close_context                                                                                                                                                                                                                                                                                                                                                                                       | 8     | <div></div> |
| 1.04228 | 0.00032   | initialize_search<br>p_search_id=>74641386217272136,p_search_expression=>lu,p_apply_order_by=>true,p_use_as_initial_result=>false,p_return_total_row_count=>false,p_                                                                                                                                                                                                                                | 8     | <div></div> |
| 1.04260 | 0.00029   | fetch_meta_data p_search_id=>74641386217272136                                                                                                                                                                                                                                                                                                                                                      | 8     | <div></div> |
| 1.04289 | 0.00030   | Searching on Standard Travel with query (lu)                                                                                                                                                                                                                                                                                                                                                        | 4     | <div></div> |
| 1.04319 | 0.00037   | search using query: lu                                                                                                                                                                                                                                                                                                                                                                              | 4     | <div></div> |
| 1.04356 | 0.00167   | get_comp_parameter_values<br>p_region_id=>p_page_process_id=>p_jet_chart_series_id=>p_app_process_id=>p_shared_lov_id=>p_module_sync_step_id=>                                                                                                                                                                                                                                                      | 8     | <div></div> |
| 1.04523 | 0.00032   | fetched 0 component parameter values for search configuration id 74641386217272136                                                                                                                                                                                                                                                                                                                  | 9     | <div></div> |
| 1.04554 | 0.00036   | open_query_context<br>p_location=>LOCAL,p_table_name=>EMP_TRAVEL_REQUEST,p_sql_query=>p_function_body=>p_where_clause=>p_order_by_clause=>p_parameters.count=>0,p_                                                                                                                                                                                                                                  | 8     | <div></div> |
| 1.04591 | 0.00049   | generate_sql_query p_query_type=>TABLE,p_owner=>p_table_name=>EMP_TRAVEL_REQUEST,p_sql_query=>p_function_body=>p_target_database=>                                                                                                                                                                                                                                                                  | 8     | <div></div> |
| 1.04640 | 0.00032   | Generated Component SQL Query:                                                                                                                                                                                                                                                                                                                                                                      | 4     | <div></div> |
| 1.04671 | 0.00033   | <pre>select l,*<br/>  from (select *<br/>        from(select /*+ qb_name(apesinner) */x from(select x,* from "EMP_TRAVEL_REQUEST" x<br/>              )l<br/>              )l where l=1<br/>        and (((upper("EMP_NO")like upper(apesf1)) or (upper("TRAVEL_TYPE")like upper(apesf1)) or (upper("UPDATED_DT")like upper(apesf1)) or<br/>            (upper("STATUS")like upper(apesf1))))</pre> | 4     | <div></div> |
| 1.04704 | 0.00039   | open_query_context p_columns.count=>0,p_parse_as_schema_override=>                                                                                                                                                                                                                                                                                                                                  | 8     | <div></div> |
| 1.04744 | 0.00036   | parse_sql_statement: p_names.count=>0                                                                                                                                                                                                                                                                                                                                                               | 9     | <div></div> |
| 1.04780 | 0.00038   | ...ignore: apesf1                                                                                                                                                                                                                                                                                                                                                                                   | 9     | <div></div> |
| 1.04888 | 0.00052   | prepare_array_statement                                                                                                                                                                                                                                                                                                                                                                             | 8     | <div></div> |
| 1.04939 | 0.00044   | statement line cnt: 8, statement characters: 314                                                                                                                                                                                                                                                                                                                                                    | 8     | <div></div> |
| 1.04983 | 0.00042   | inject_diagnostics_hint                                                                                                                                                                                                                                                                                                                                                                             | 8     | <div></div> |
| 1.05025 | 0.00031   | SQL Statement prepared/rewritten: line count=0, first index=907, last index=1084, characters=138, found binds=0                                                                                                                                                                                                                                                                                     | 9     | <div></div> |

|         |         |                                                                                                                           |   |             |
|---------|---------|---------------------------------------------------------------------------------------------------------------------------|---|-------------|
| 1.02824 | 0.00043 | populate_buffer p_columns_values_row=>p_context.query_result.has_more=>true                                               | 8 | <div></div> |
| 1.02867 | 0.00172 | fetch_rows                                                                                                                | 8 | <div></div> |
| 1.03039 | 0.00045 | 2 rows fetched                                                                                                            | 9 | <div></div> |
| 1.03085 | 0.00045 | get_columns count=>18                                                                                                     | 8 | <div></div> |
| 1.03129 | 0.00119 | next_row<br>query_result.buffered_row_count=>2,query_result.returned_row_count=>0,query_result.current_array_idx=>0,query | 8 | <div></div> |

Query 1

Query 2

Show Buffer



Getting more out of search

## Oracle Text

# Oracle Text

- Full text index and search engine within the Oracle database
- Search within documents
- Linguistic and fuzzy / error-tolerant search
- XML / JSON search capabilities
- Performance on large amount of data
- Relevance-ranking based on token frequency (scores)

# Oracle Text

- Create a text index

```
create index eba_project_tasks_ctx  
on eba_project_tasks(description)  
indextype is ctxsys.context;
```

- Use the index

```
select *  
  from eba_project_tasks  
 where contains(description, 'web') > 0
```

# Oracle Text Queries

- Combine Query Terms

... where contains(text, 'dog AND cat') >0

- Use Wild Cards

... where contains(text, 'do% AND c\_t') >0

- Powerful Name Searching

... where contains(text, 'NDATA(name, lary elisn)') >0

- Fuzzy matching

... where contains(text, '?apeks') >0

- Multi Lingual Stemming

... where contains(text, '\$runs') >0

# Oracle Text Queries

- NEAR Operator  
... where contains(text, 'near(dog, cat), 4') >0
- Search within Sections or Paragraphs (XML!)  
... where contains(text, 'dog WITHIN TITLE') >0
- Thesaurus support  
... where contains(text, 'SYN(dog,[thes])' >0)

Search customers and all contacts of  
that customer



# Oracle TEXT Index on plain relational data ...?

- Oracle TEXT wants to index *documents*
- Oracle TEXT **datastore preference** determines where these come from
  - DIRECT\_DATASTORE (indexed column) is the default
  - FILE\_DATASTORE, URL\_DATASTORE for external sources
  - MULTICOLUMN\_DATASTORE grabs data from other table columns
  - **USER\_DATASTORE** for a "PL/SQL" source
- **We can turn relational data to a "virtual" document with PL/SQL**

# Create a User Data Store on relational data

```
create or replace procedure eba_cus_search_uds (rid in rowid, tlob in out nocopy clob)
is
begin
    for r in (select c.customer_name, c.summary, t.name, t.title
              from eba_cust_customers c
              join eba_cust_contacts t on c.id = t.customer_id
              where c.rowid = rid)
    loop
        tlob := tlob || ' ' ||
            '<CUST_NAME>' || r.customer_name || '</CUST_NAME>' ||
            '<CUST_DESC>' || r.summary || '</CUST_DESC>' ||
            '<CONT_NAME>' || r.name || '</CONT_NAME>' ||
            '<CONT_DESC>' || r.title || '</CONT_DESC>';
    end loop;
end eba_cus_search_uds;
```

# Create preference and index

```
begin
```

```
    ctx_ddl.create_preference('EBA_CUS_SEARCH_IDX_DST', 'USER_DATASTORE');
```

```
    ctx_ddl.set_attribute('EBA_CUS_SEARCH_IDX_DST', 'PROCEDURE', 'P_DIMI.EBA_CUS_SEARCH_UDS');
```

```
end;
```

```
/
```

```
create index eba_cust_customers_idx on eba_cust_customers (customer_name)
```

```
indextype is ctxsys.context parameters ('sync (on commit) datastore EBA_CUS_SEARCH_IDX_DST');
```

# Demo

## Oracle Text search

# Find all Oracle Text indexes

```
select *  
  from all_indexes  
 where ityp_owner = 'CTXSYS'  
    and ityp_name in ('CONTEXT', 'CTXCAT',  
                      'CTXRULE', 'CTXXPATH',  
                      'CONTEXT_V2')
```

# What was indexed?

See tables

| Tables                               |
|--------------------------------------|
| <input type="text" value="DR"/>      |
| DR\$AOE_DEFAULT_FILES_TEXT_IDX\$I    |
| DR\$AOE_DEFAULT_FILES_TEXT_IDX\$K    |
| DR\$AOE_DEFAULT_FILES_TEXT_IDX\$N    |
| DR\$AOE_DEFAULT_FILES_TEXT_IDX\$U    |
| DR\$AOE_DEFAULT_VERSIONS_TEXT_IDX\$I |
| DR\$AOE_DEFAULT_VERSIONS_TEXT_IDX\$K |
| DR\$AOE_DEFAULT_VERSIONS_TEXT_IDX\$N |
| DR\$AOE_DEFAULT_VERSIONS_TEXT_IDX\$U |
| DR\$AOE_FILES_CUSTOM_TEXT_IDX\$I     |
| DR\$AOE_FILES_CUSTOM_TEXT_IDX\$K     |
| DR\$AOE_FILES_CUSTOM_TEXT_IDX\$N     |
| DR\$AOE_FILES_CUSTOM_TEXT_IDX\$U     |
| DR\$EBA_CUST_CUSTOMERS_IDXS\$I       |
| DR\$EBA_CUST_CUSTOMERS_IDXS\$K       |
| DR\$EBA_CUST_CUSTOMERS_IDXS\$N       |
| DR\$EBA_CUST_CUSTOMERS_IDXS\$U       |
| DR\$EBA_PROJECT_TASKS_CTX\$I         |
| DR\$EBA_PROJECT_TASKS_CTX\$K         |

# Oracle Database 23c

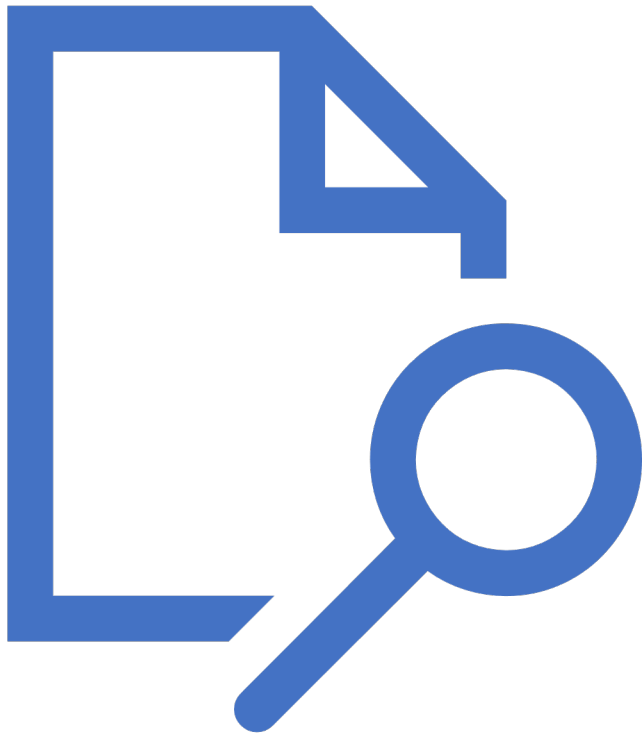
## Ubiquitous Database Search

1/ Create index

```
DBMS_SEARCH.CREATE_INDEX(index_name=>'SEARCH_PRODUCTS');
```

2/ Add data sources

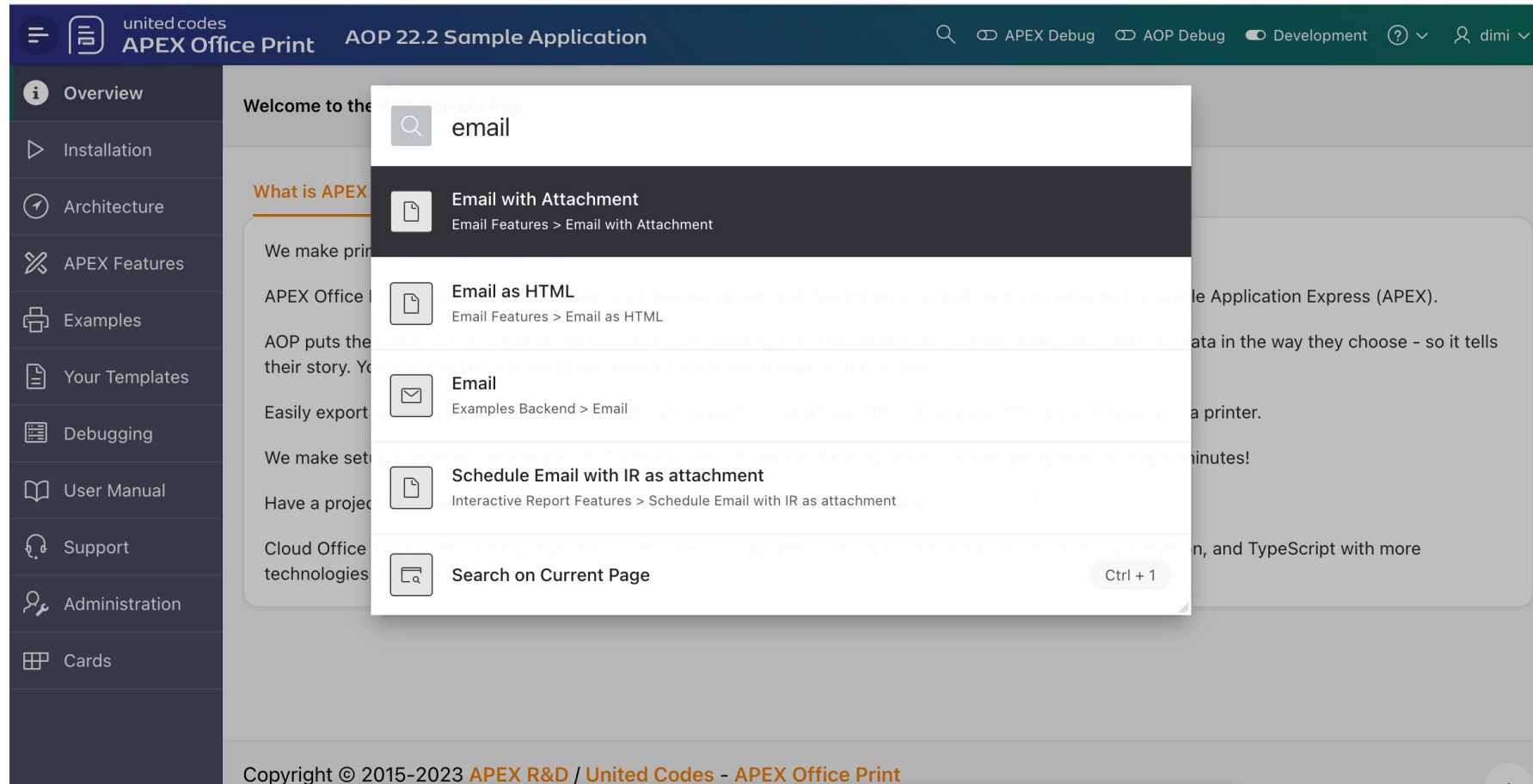
```
DBMS_SEARCH.ADD_SOURCE(index_name =>'SEARCH_PRODUCTS', source_name => 'SHIPMENTS');
```



Dynamic search

# APEX Meta-data Lists

# AOP Sample Application



Online Demo: <https://www.apexofficeprint.com/>

Using: <https://github.com/Dani3lSun/apex-plugin-spotlight>

# Demo

Lists & APEX Meta-  
data



# References

- Oracle APEX Documentation

<https://docs.oracle.com/en/database/oracle/apex/22.2/htmldb/adding-search-to-an-application.html>

- Creating and Querying Oracle Text Indexes

<https://www.oracle.com/webfolder/technetwork/tutorials/obe/db/12c/r1/appdev/text/CreateIndexes/CreatingTextIndexes.html>

- Indexing Text in Object Storage

<https://blogs.oracle.com/datawarehousing/post/indexing-text-object-storage>

# Q&A

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