



# Database Programming with PL/SQL

9-3

Review of the Data Dictionary



# Objectives

This lesson covers the following objectives:

- Describe the purposes of the Data Dictionary
- Differentiate between the three types of Data Dictionary views
- Write SQL `SELECT` statements to retrieve information from the Data Dictionary
- Explain the use of `DICTIONARY` as a Data Dictionary search engine

# Purpose

- Imagine that you have created many procedures and/or functions, as well as tables and other database objects.
- It's hard to remember all their names, isn't it?
- The Data Dictionary remembers this information for you.

# What Is the Data Dictionary?

- Every Oracle database contains a Data Dictionary.
- All database objects, such as tables, views, users and their privileges, procedures, functions, and so on are automatically registered in the Data Dictionary when they are created.
- If an object is later altered or dropped, the Dictionary is automatically updated to reflect the change.
- Think of the Dictionary as an automatically-managed master catalog of everything in the database.

# How Can You Read the Dictionary?

There are two classes of tables from which you can `SELECT` to view information from the Dictionary:

- The `USER_*` tables contain information about objects that you own, usually because you created them.
- Examples: `USER_TABLES`, `USER_INDEXES`.
- The `ALL_*` tables contain information about objects that you have privileges to use.
- These include the `USER_*` information as a subset, because you always have privileges to use the objects that you own.
- Examples: `ALL_TABLES`, `ALL_INDEXES`.

# How Can You Read the Dictionary?

A third class of tables you can `SELECT` to view information from the Dictionary are normally only available to the Database Administrator:

- The `DBA_*` tables contain information about everything in the database, no matter who owns them.
- Examples: `DBA_TABLES`, `DBA_INDEXES`.



# Viewing Information in the Dictionary

- Although you are not allowed to modify the dictionary yourself, you can `DESCRIBE` and `SELECT` from Dictionary tables.
- For example, to see information about all the tables that you have privileges to use:

```
DESCRIBE ALL_TABLES
```



# Viewing Information in the Dictionary

- The output from this shows that many columns of data are held about each table.
- You decide you only want to see the name and owner, so you enter:

```
SELECT table_name, owner FROM ALL_TABLES;
```



# Another Example

- Suppose you want to see all the objects that you own. You could `SELECT ...` from `USER_TABLES`, then from `USER_INDEXES`, then from `USER_SEQUENCES`, then from ... for each type of object.
- But, it is easier to use `USER_OBJECTS`, which shows all the objects of every type:

```
SELECT object_type, object_name FROM USER_OBJECTS;
```



# Another Example

- Remember that you can use WHERE conditions, ORDER BY, GROUP BY, and so on with the Dictionary tables, just like regular tables.
- Suppose you want to see how many objects of each type you own:

```
SELECT object_type, COUNT(*) FROM USER_OBJECTS  
GROUP BY object_type;
```



# Using the Super-View DICTIONARY

- Several hundred Dictionary tables exist and no one can remember the names of all of them.
- You don't have to!
- A super-view called `DICTIONARY` (or `DICT` for short) lists all the Dictionary tables.
- You can use `DICT` like an Internet search engine to show the names and descriptions (comments) of a relevant subset of Dictionary tables.
- The next slide shows how to do this.



# Using the Super-View DICTIONARY

- First try:

```
SELECT COUNT(*) FROM DICT WHERE table_name LIKE 'USER%';
```

- You see that there are more than a hundred USER\_\* tables.
- Can you remember which one of them shows you information about which table columns are indexed?
- Most people can't.



# Using the Super-View DICTIONARY

- You can reasonably assume that all Dictionary tables that describe indexes have names containing the substring 'IND'.
- So:

```
SELECT * FROM DICT WHERE table_name LIKE 'USER%IND%';
```

- Now you can see that the table you want is USER\_IND\_COLUMNS.



# Viewing the Dictionary using Application Express

- The Object Browser in Application Express provides an easier way to see much of the Dictionary information.
- To use it, go to SQL Workshop -> Object Browser -> Browse and click the desired object type.



# Viewing the Dictionary using Application Express

- Much easier, isn't it?
- So why do you still need to know about the `USER_*` and `ALL_*` tables?
- The Object Browser does not show everything:
  - It shows only the objects that you own, not other objects that you are allowed to use.
  - It shows only a subset of information about each object.
  - It does not show all the possible object types.



# Terminology

Key terms used in this lesson included:

- ALL\_\* tables
- Data Dictionary
- DBA\_\* tables
- USER\_\* tables

# Summary

In this lesson, you should have learned how to:

- Describe the purposes of the Data Dictionary
- Differentiate between the three types of Data Dictionary views
- Write SQL `SELECT` statements to retrieve information from the Data Dictionary
- Explain the use of `DICTIONARY` as a Data Dictionary search engine

