Module 4
Materialized View Processing and Design

Lesson 2: Materialized view definition and processing

Lesson Objectives

- Write statements to create materialized views
- Explain processing requirements for materialized views
- Reflect on the complexity of materialized view processing

Comparison of Traditional and Materialized Views

- **Traditional views**
  - Derived when used
  - Simplification
  - Visible
  - Simple processing
- **Materialized views**
  - Stored and periodically refreshed
  - Performance improvements
  - Invisible
  - Substantial processing

Materialized View Example

- Sum of dollar sales after 2014 by store state and year
- Mapping with a SELECT statement
- Materialization properties
- Storage options

```
CREATE MATERIALIZED VIEW MV1
 BUILD IMMEDIATE
 REFRESH COMPLETE ON DEMAND
 ENABLE QUERY REWRITE AS
 SELECT StoreState, TimeYear,
        SUM(SalesDollar) AS SUMDollar1
  FROM SSSales, SSStore, SSTimeDim
  WHERE SSSales.StoreId = SSStore.StoreId
        AND SSSales.TimeNo = SSTimeDim.TimeNo
        AND TimeYear > 2014
  GROUP BY StoreState, TimeYear;
```
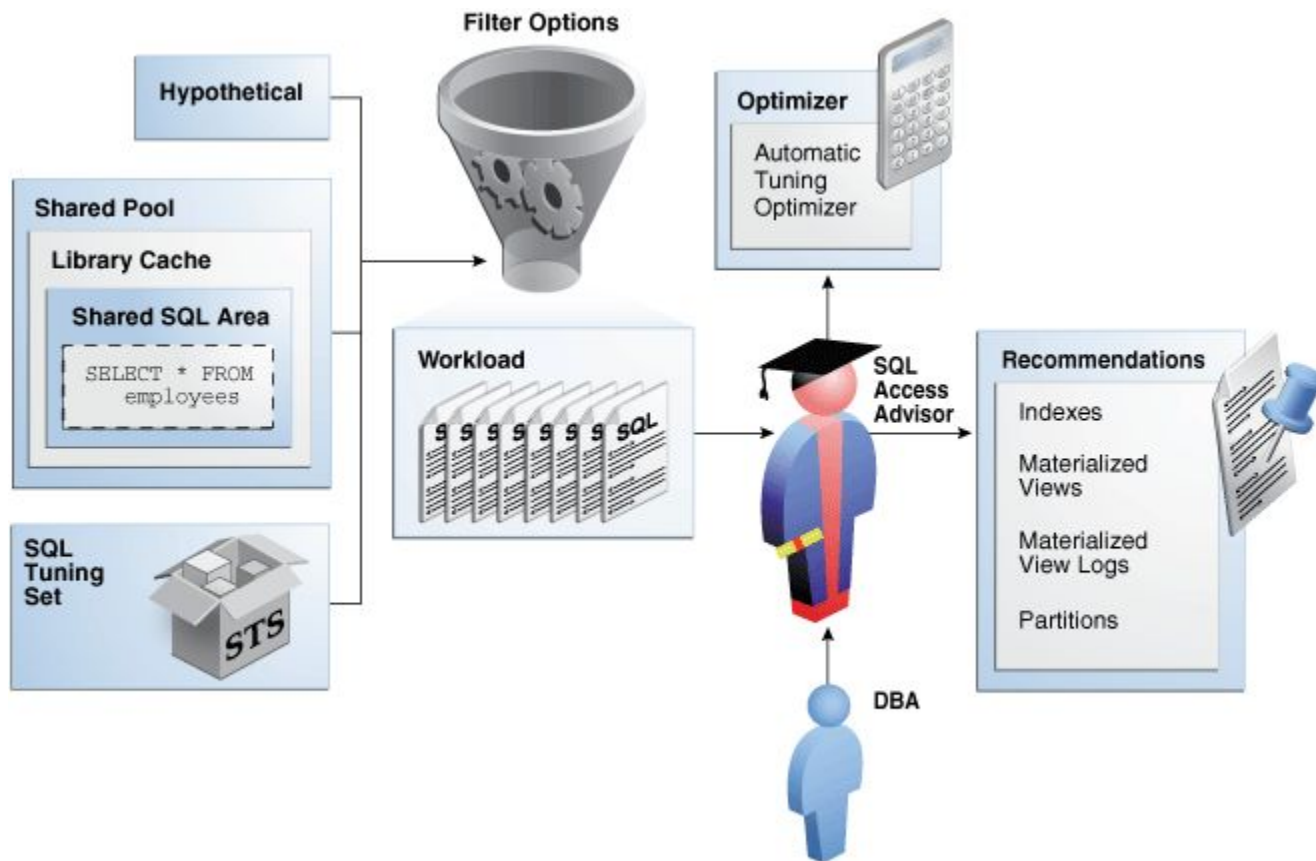
Materialized View Processing

- **Rewrite**
  - Match query to MVs
  - Evaluate rewritten query

- **Design**
  - Specify workload
  - Search large space
  - Evaluate choices

- **Refresh**
  - Frequency
  - Method

Oracle SQL Access Advisor

Information Systems Program

Usages of the SQL Access Advisor

Design choices

- Choose materialized views, indexes, and partitions
- Manage workloads and recommendations

Advice

- Make a materialized view fast refreshable
- Change a materialized view so that query rewrite is possible

Workload Specification

- Collected from executed SQL statements using the Automatic Workload Repository
  - SQL statement
  - Number of executions
  - Resource consumption (CPU time, disk reads, and optimizer cost)
  - Rows retrieved
  - Priority
- Filter by resource consumption, priority, users, and columns

Additional Problems

- MV2
  - USA store sales by store state, year, and month
  - Sum of dollar sales

- MV3
  - Canadian store sales before 2015 by store city, year, and month
  - Sum of dollar sales

- Other options
  - Build immediate
  - Refresh complete
  - Enable query rewrite

Summary

- Stored, derived data for improved query performance

- Complex processing

- Major DBMS innovations