Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

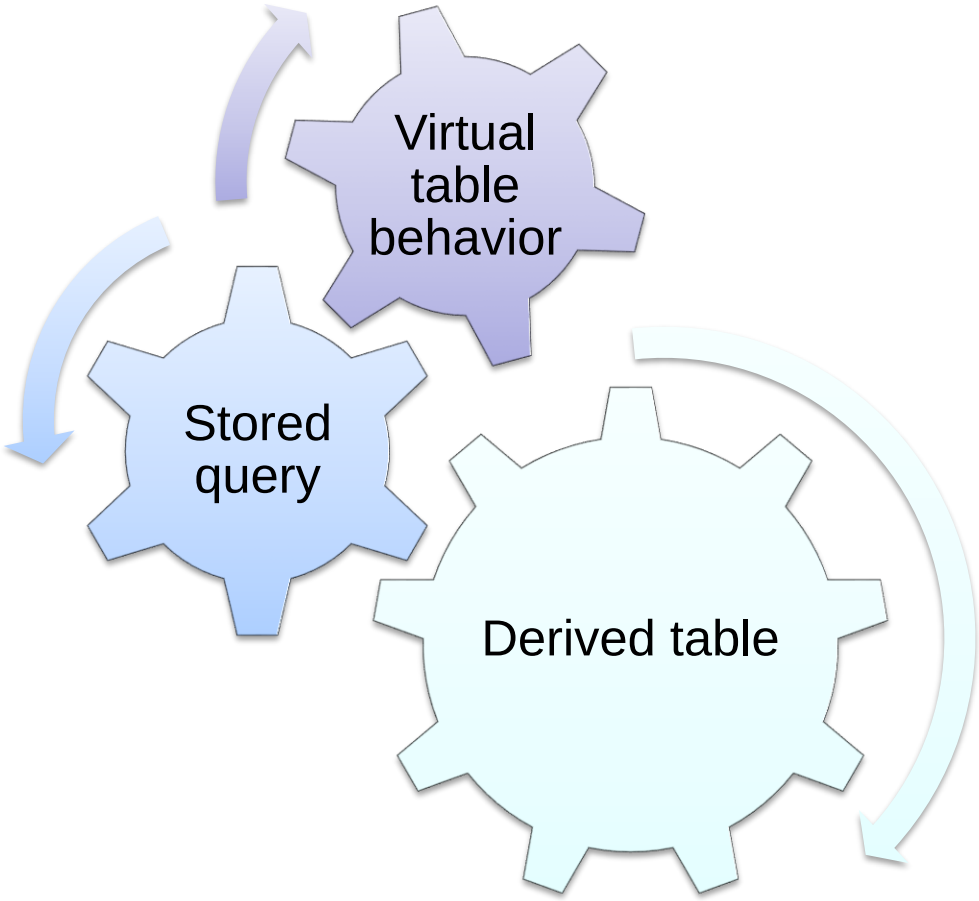
Module 4
Materialized View Processing and Design

Lesson 1: Background on Traditional Views

Lesson Objectives

- Write statements to create traditional views
- Explain query modification process
- Reflect on usage of traditional views in data warehouse applications

Basics of Traditional Views



View Advantages

- Reduce impact of database definition changes
- Simplify application development
- Flexible unit of security
- Incur little performance overhead

View Definition Example

- Connex product sales, cost, and units in 2018 to 2020
- Display selected item, time, and sales columns

Example 1: Basic view definition

```
CREATE VIEW Connex20182020Sales_View AS
 SELECT SSItem.ItemId, ItemName, ItemCategory,
        ItemUnitPrice, SalesNo, SalesUnits,
        SalesDollar, SalesCost, TimeYear,
        TimeMonth, TimeDay
  FROM SSItem, SSSales, SSTimeDim
  WHERE ItemBrand = 'Connex'
    AND TimeYear BETWEEN 2018 AND 2020
    AND SSItem.ItemId = SSSales.ItemId
    AND SSTimeDim.TimeNo = SSSales.TimeNo;
```


View Definition with Row Summaries

- Sum of Connex product sales and cost in 2018 to 2020
- Display selected item and time columns along with sum of sales and cost

Example 2: Extended view definition

```
CREATE VIEW Connex20182020SumSales_View AS
 SELECT SSItem.ItemId, ItemName, ItemCategory,
        ItemUnitPrice, TimeYear, TimeMonth,
        SUM(SalesDollar) AS SumSalesDollar,
        SUM(SalesCost) AS SumSalesCost
  FROM SSItem, SSSales, SSTimeDim
  WHERE ItemBrand = 'Connex'
    AND TimeYear BETWEEN 2018 AND 2020
    AND SSItem.ItemId = SSSales.ItemId
    AND SSTimeDim.TimeNo = SSSales.TimeNo
  GROUP BY SSItem.ItemId, ItemName, ItemCategory,
        ItemUnitPrice, TimeYear, TimeMonth;
```


Using Views

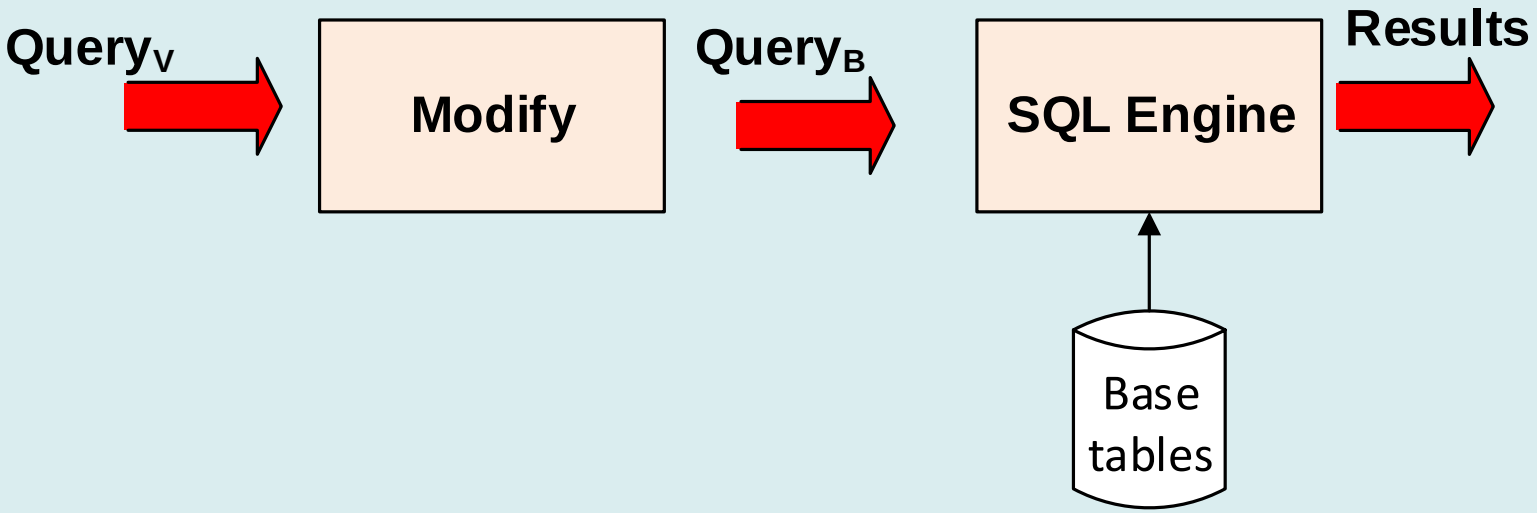
Example 3: Query using Connex20182020Sales_View

```
SELECT ItemName, ItemCategory, ItemUnitPrice,
       SalesUnits, SalesDollar, SalesCost,
       TimeYear, TimeMonth, TimeDay
 FROM Connex20182020Sales_View
 WHERE ItemUnitPrice < 100
   AND TimeYear BETWEEN 2019 AND 2020;
```

Example 4: Query using Connex20182020SumSales_View

```
SELECT ItemName, ItemCategory, ItemUnitPrice,
       TimeMonth, SumSalesDollar, SumSalesCost
 FROM Connex20182020SumSales_View
 WHERE TimeYear = 2018;
```


Query Modification Process



Query$_V$: query that references a view

Query$_B$: modification of Query$_V$ such that references to the view are replaced by references to base tables.

Query Modification Example

- Replace view name in the FROM clause
- Append WHERE conditions from the view definition

Example 5: modified query for Example 3

```
SELECT ItemName, ItemCategory, ItemUnitPrice,
       SalesUnits, SalesDollar, SalesCost,
       TimeYear, TimeMonth, TimeDay
 FROM SSItem, SSSales, SSTimeDim
 WHERE ItemUnitPrice < 100
   AND ItemBrand = 'Connex'
   AND TimeYear BETWEEN 2019 AND 2020
   AND SSItem.ItemId = SSSales.ItemId
   AND SSTimeDim.TimeNo = SSSales.TimeNo;
```


Additional Problems

- Create view
  - Colorado customer sales in 2018
  - Display customer, item, and time columns in the result
- Query using the view
  - Denver, CO sales in second half of 2018
  - Display customer, item number, and time columns
- Modified query using base tables
  - Replace view name with base tables
  - Combine conditions

Summary

- Stored query behaving like a base table
- Simplification and unit of security
- CREATE VIEW statement using a SELECT statement
- Efficient modification process