



Business School  
UNIVERSITY OF COLORADO DENVER

Information Systems Program

# Module 1

## Data Warehouse Concepts and Architectures

### Lesson 3: Motivation and characteristics



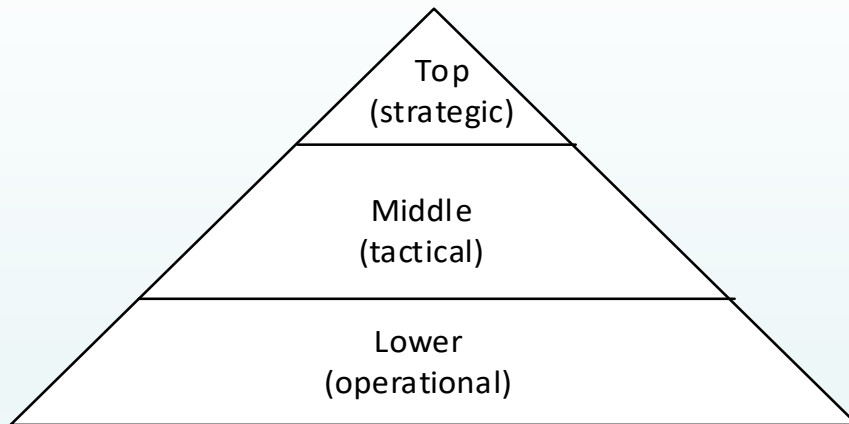
# Lesson Objectives

- Discuss historical factors
- Explain data warehouse characteristics
- Compare/contrast characteristics for operational databases versus a data warehouses



# Decision Making Hierarchy

## Decision making hierarchy



## Typical decisions

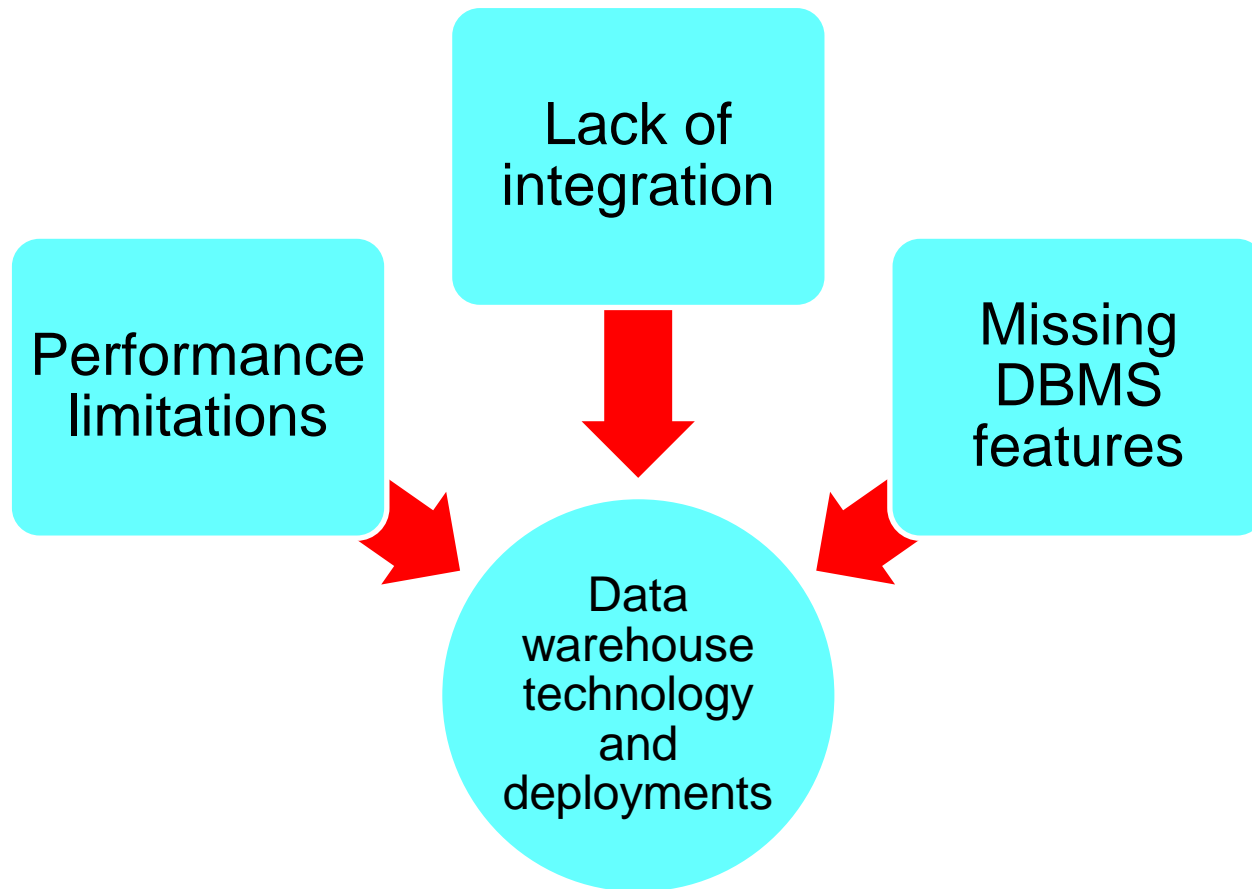
Identify new markets,  
choose store locations

Choose suppliers,  
forecast sales

Resolve order delays,  
schedule employees



# Technology and Deployment Limitations



# Data Warehouse Characteristics

- Essential part of infrastructure for business intelligence
- Logically centralized repository for decision making
  - Populated from operational databases and external data sources
  - Integrated and transformed data
  - Optimized for reporting and periodic integration



# Comparison of Processing Environments



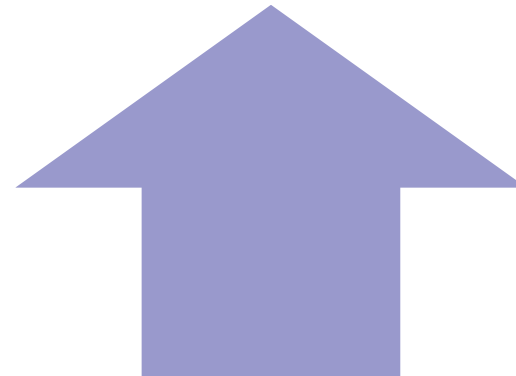
## Transaction processing

- Primary data from transactions
- Daily operations and short term decisions



## Business intelligence processing

- Transformed secondary data
- Medium and long-term decisions



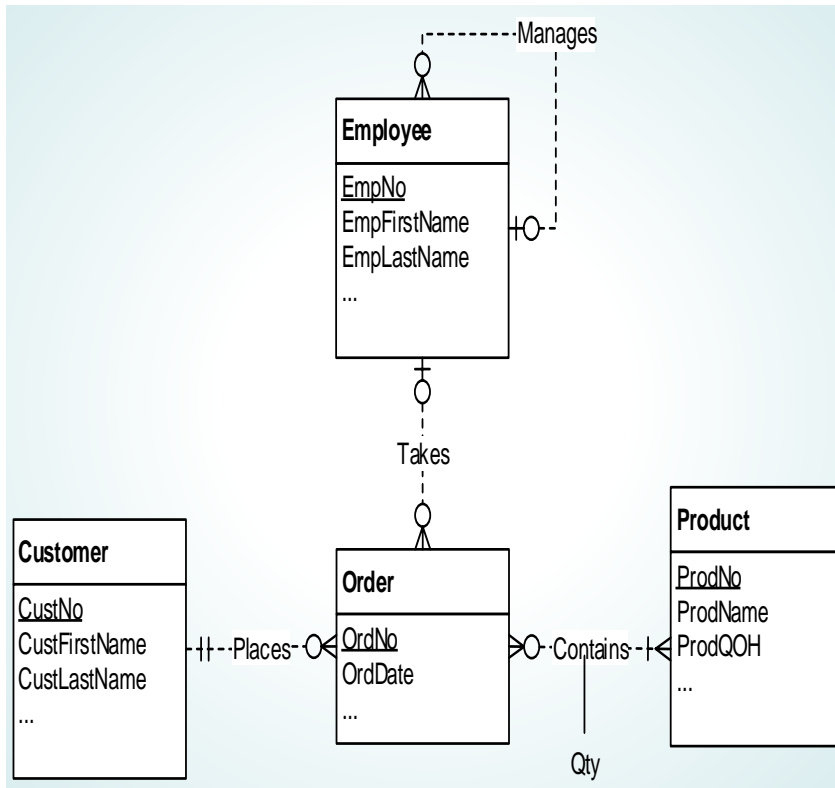
# Data Comparison

| Characteristic      | Operational Database | Data Warehouse  |
|---------------------|----------------------|---|
| Currency            | Current              | Historical  |
| Details level       | Individual           | Individual and summary                                      |
| Orientation         | Process              | Subject   |
| Records per request | Few                  | Thousands   |
| Normalization level | Mostly normalized    | Normalization relaxed                                       |
| Update level        | Highly volatile      | Mostly refreshed (non volatile)                             |
| Data model          | Relational           | Relational (star schemas) and multidimensional (data cubes) |

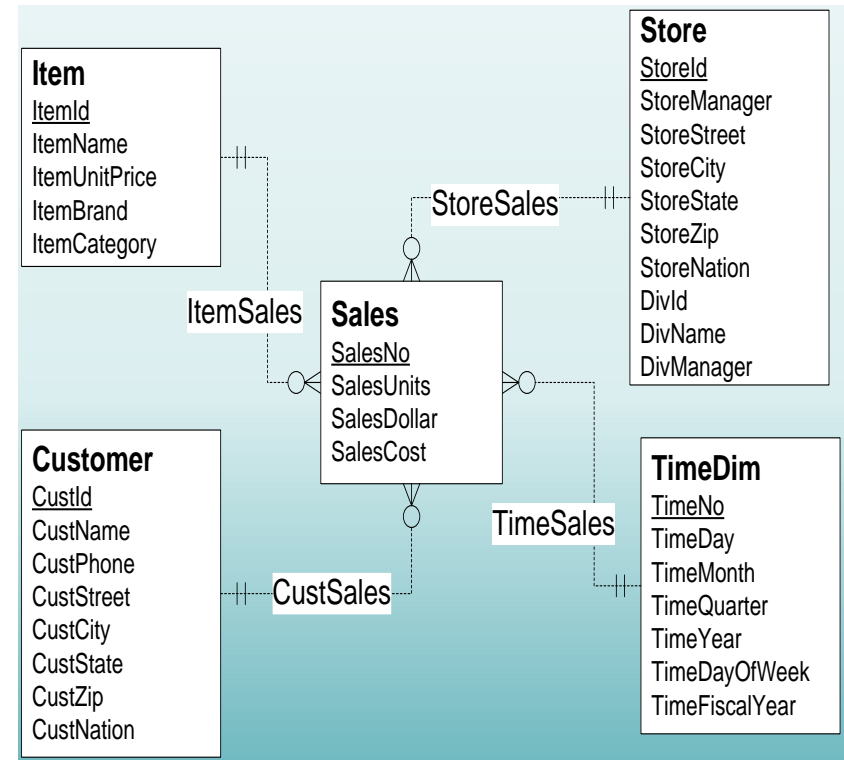


# Schema Comparison

## Operational database



## Data warehouse





# Summary

- Historical reasons for data warehouse development
- Key characteristics of data warehouses
- Differences between operational databases and data warehouses

