



DW and BI Data Modeling

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Module 0. About the Course (6 min)

Module 1. Introduction to Data Modeling (75 min)

- *Data Modeling Overview*
 - Three Levels of Data Models
 - Conceptual Data Model
 - Logical Data Model
 - Physical Data Model
 - Workflow
 - Where Do We Use Data Models?
- *Entity-Relationship Modeling Overview*
 - Building Blocks
 - Entity & Attribute Types
 - Relationship Cardinality
 - Relationship Types
 - Identifying Relationship
 - Non-Identifying Mandatory Relationship
 - Non-Identifying Optional Relationship
 - Many-to-Many Relationship
 - Recursive Relationship
 - ER Model Example
 - Keys
 - Referential Integrity
- *Normalization*
 - Levels of Normalization
 - Normalizing an Entity
 - 1NF – Eliminate Repeating Groups
 - 2NF – Eliminate Redundant Data
 - 3NF – Eliminate Columns Not Dependent on Key
 - Why Normalize (3NF) ?

Module 2. Dimensional Modeling Basics (88 min)

- *What is Dimensional Modeling ?*
- *Facts*
 - Keys
 - Granularity
 - Types of Facts (or Measures)
- *Dimensions*
 - Hierarchy
 - Keys
 - Attributes
- *Schemas*
 - Star Schema
 - Snowflake
 - Multi-dimensional
 - Multi-Fact Star Models
- *Entity-Relationship vs. Dimensional Modeling*
 - Comparing Approaches
 - Why Do These Structures Matter?
 - Example



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- *Purpose of Dimensional Modeling*
 - Mapping to a Business Report
 - Mapping to a OLAP Analysis or Excel
- *Fact Tables*
 - Types of Fact Tables
 - Comparison of Fact Tables
 - Conforming Dimensions
 - Conforming Facts
- *Dimensional Modeling Vocabulary*
 - Importance of Terminology
 - Degenerate Dimensions
 - Calendar Dimension
 - Calendar Dimension Benefits
 - Time Dimension
 - Date & Time Across Time Zones
 - Role Playing Dimensions
 - Role Playing Dimensions Approaches
 - Event Tables
 - Event Table Example
 - Consolidated Fact Tables

Module 3. Advanced Dimensional Modeling (84 min)

- *Hierarchies*
 - Balanced Hierarchies
 - Ragged Hierarchies
 - Unbalanced Hierarchies
 - Recursive Pointer
 - Bridge Table
 - Bridge Table Navigation
- *Slowly Changing Dimensions*
 - Type 1: Overwrite Existing Data (Row)
 - Type 2: Create New Row
 - Hybrid Approach
 - Type 3: Add a New Attribute
- *Rapidly Changing Dimensions*
 - Mini-Dimension
 - Approaches
- *Causal Dimensions*
- *Multi-Valued Dimensions*
 - Bridge Table Approach
- *Snowflaking*
 - Snowflaking Revised
 - Hierarchical
 - Outtrigger Tables
- *Junk Dimensions*
 - Solution Approaches
- *Value Band Reporting*
 - Approaches
- *Heterogeneous Products*
 - Solution Approaches



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- *Hot Swappable Dimensions*
- *Too Few or Too Many Dimensions*
- *Benefits of Dimensional Modeling*