Dimensional Modeling: Kimball Fundamentals & Advanced Techniques

Why Attend

Excellence in dimensional modeling remains the keystone of a well-designed data warehouse/business intelligence (DW/BI) system.

The Data Warehouse Toolkit (Kimball/Ross) established an extensive portfolio of dimensional techniques and vocabulary, including conformed dimensions, slowly changing dimensions, junk dimensions, bridge tables, periodic and accumulating snapshot fact tables, and the list goes on.

In this course, you will learn practical dimensional modeling techniques covering fundamental to advanced patterns and best practices. Concepts are illustrated through real-world industry scenarios, conveyed via a combination of lectures, through a combination of lectures, class exercises, small group workshops, and individual problem solving.

Bringing DecisionWorks onsite enables everyone on the team to get on the same page with a common vocabulary and understanding of core techniques. The result is more effective and efficient education with lower travel cost and lost productivity, plus less downstream "tire spinning" within the team.

Who Should Attend

This course is primarily intended for DW/BI team members who've had prior exposure to dimensional modeling. The first day is appropriate for anyone on the team, including project managers, data warehouse architects, data modelers, database administrators, business analysts, and ETL or BI application developers and designers. The pace picks up on the second day when more advanced concepts are discussed.

Instructor

Margy Ross, co-author of *The Data Warehouse Toolkit* and several other *Toolkit* books with Ralph Kimball. She's focused on dimensional modeling for over three decades and previously co-instructed with Ralph for Kimball University. Margy's taught dimensional modeling concepts to nearly 15,000 students worldwide.

Course Overview

Day 1 • Introductions
- • Dimensional Modeling Fundamentals
- • "Basics" Case Study
- • "Beyond the 1st Business Process" Case Study
- • Slowly Changing Dimension Basics
- • Design Workshop

Day 2 • Design Review Exercise
- • More on Dimension Tables
- • "Design Enhancement" Case Study
- • More on Fact Tables
- • Dimensional Modeling Process
- • Client-Specific Workshop
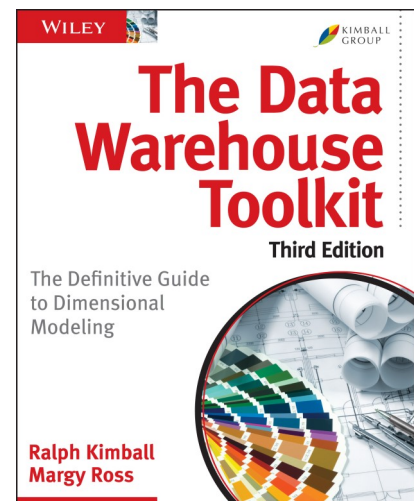
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DAY 1

Introductions
• Course agenda and assumptions

Dimensional Modeling Fundamentals
• Role of dimensional modeling in various DW/BI architectures
• Fact and dimension table characteristics
• Benefits of dimensional modeling

Retail Sales "Basics" Case Study
• 4-step process for designing dimensional models
• Importance of business requirements and data realities
• Fact table granularity
• Transaction fact tables
• Degenerate dimensions
• Denormalized dimension table hierarchies
• Dealing with null values
• Surrogate keys for dimensions
• Date and time-of-day dimension considerations
• Centipede fact tables with too many dimensions
• Star versus snowflake schemas
• Factless fact tables

Inventory "Beyond the 1st Business Process" Case Study
• Implications of business processes on data architecture
• Periodic snapshot fact tables
• Semi-additive facts
• Conformed dimensions – identical and shrunken roll-ups
• Enterprise Data Warehouse Bus Architecture and matrix for master data and integration
• Exercise: Translate business requirements into DW bus matrix
• Opportunity/stakeholder matrix

Slowly Changing Dimensions
• Basic Type 1, 2 and 3 techniques

Order Management "Design" Workshop
• Drilling across fact tables
• Consolidated cross-process fact tables
• Dimension table role-playing
• Complications with operational header/line data and design patterns to avoid
• Junk dimensions for miscellaneous transaction indicators
• Accumulating snapshot fact tables
• Comparison of three fundamental fact table grains

DAY 2

Course Registration "Design Review" Exercise
• Common design flaws and mistakes to avoid
• Checklist for conducting design reviews
• Bridge tables for multivalued attributes

More on Dimension Tables
• Type 0
• Type 4 mini-dimension for large, rapidly changing dimensions
• Advanced techniques to deliver current and point-in-time attribute values (Type 5, 6 and 7)
• Bridge tables for correctly weighted versus "impact" reports
• Bridge table alternatives
• Slightly ragged dimension hierarchies
• Bridge tables for variable depth ragged hierarchies
• Freeform text comments
• Generic abstract dimensions
• Aggregated facts as dimension attributes
• Time series of dimension tags
• Outrigger dimension tables
• Supertypes and subtypes for heterogeneous products
• Audit dimensions

Transportation "Design Enhancement" Case Study
• Schema enhancements to embellish existing design for changing requirements
• Multiple time zones
• Design trade-offs

More on Fact Tables
• Fact table surrogate keys
• Allocated facts at different levels of detail
• Multiple currencies or units of measure
• Timespan fact tables with row effective and expiration dates
• Value banding facts
• Simultaneous facts and dimension attributes
• Fact table normalization
• Detailed implementation bus matrix

Dimensional Modeling Process
• Business process prioritization
• Process flow, tasks and deliverables

Client Specific Workshop
• Development of client-centric preliminary DW bus matrix or discussion of client-specific questions

Decision Works