

Mastering Relational and Dimensional Data Warehouse Design

Course Summary

Description

This course provides students with the skills necessary to design a successful data warehouse using both relational and dimensional data modeling techniques.

Topics

- Introduction
- Fundamental Relational Concepts
- Understanding the Business Model
- Developing the Model
- Creating and Maintaining Keys
- Modeling the Calendar
- Modeling Hierarchies
- Modeling Transactions
- Data Warehouse Optimization
- Accommodating Business Change
- Maintaining the Models
- Deploying the Relational Solution
- Comparison of Data Warehouse Methodologies

Audience

This course is targeted at technical staff, team leaders and project managers who need to understand how to design a data warehouse using both relational (Bill Inmon style) and dimensional (Ralph Kimball style) data warehousing design techniques.

Prerequisites

Students should have some knowledge of how to design a data base through at least third normal form (3NF) as well as some knowledge of how to code Structured Query Language (SQL).

Duration

Three days

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Course Outline

- I. Introduction**
 - A. Overview of Business Intelligence
 - B. BI Architecture
 - C. What Is a Data Warehouse?
 - D. The Multipurpose Nature of the Data Warehouse
 - E. Characteristics of a Maintainable Data Warehouse Environment
 - F. The Data Warehouse Data Model
 - G. Impact on Data Mart Creation
- II. Fundamental Relational Concepts**
 - A. Why Do You Need a Data Model?
 - B. Relational Data Modeling Objects: Subject, Entity, Attribute, and Relationships
 - C. Types of Data Models: Subject Area, Business, System, and Technology Models
 - D. Relational Data Modeling Guidelines
 - E. Normalization of the Relational Data Model
- III. Understanding the Business Model**
 - A. Business Scenario
 - B. Subject Area Model
 - C. Considerations for Specific Industries
 - D. Subject Area Model Development Process
 - E. Subject Area Model for Zenith Automobile Company
 - F. Business Data Development Process
- IV. Developing the Model**
 - A. Select the Data of Interest
 - B. Add Time to the Key
 - C. Add Derived Data
 - D. Determine Granularity Level
 - E. Summarize Data
 - F. Merge Entities
 - G. Create Arrays
 - H. Segregate Data
- V. Creating and Maintaining Keys**
 - A. Inconsistent Business Definition of Customer
 - B. Inconsistent System Definition of Customer
 - C. Inconsistent Customer Identifier Among Systems
 - D. Inclusion of External Data
 - E. Customers Uniquely Identified Based on Role
 - F. Customer Hierarchy Not Depicted
 - G. Key From a System of Record
 - H. Key From a Recognized Standard
 - I. Surrogate Keys
 - J. Differences in a Dimensional Model
 - K. Maintaining Dimensional Conformance
- VI. Modeling the Calendar**
 - A. Calendar Types: Fiscal, 4-5-4, Thirteen Month Fiscal
 - B. The Billing Cycle and Factory Calendars
 - C. Calendar Elements: Day of the Week, Holidays, Holiday Season, and Seasons
 - D. Calendar Time Span
 - E. Time and the Data Warehouse
 - F. Date Keys
 - G. Case Study: Simple Fiscal Calendar
 - H. Case Study: A Location Specific Calendar
 - I. Case Study: A Multilingual Calendar
 - J. Case Study: Multiple Fiscal Calendars
 - K. Case Study: Seasonal Calendars
- VII. Modeling Hierarchies**
 - A. Hierarchies in Business
 - B. Hierarchy Depth and Parentage
 - C. Balanced Versus Ragged Hierarchies
 - D. History
 - E. Case Study: Retail Sales Hierarchy
 - F. Case Study: Sales and Capacity Planning
 - G. Case Study: Retail Purchasing
 - H. Case Study: The Combination Pack
 - I. Transforming Structures: Making and Flattening a Recursive Tree

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Course Outline (cont'd)

VIII. Modeling Transactions

- A. Business Transactions
- B. Snapshot Interfaces
- C. Delta Interfaces
- D. Database Transaction Logs
- E. Delivering Transaction Data
- F. Case Study: Sales Order Snapshots
- G. Case Study: Transaction Interface

IX. Data Warehouse Optimization

- A. Optimizing the Development Process
- B. Data Clustering
- C. Table Partitioning
- D. Enforcing Referential Integrity
- E. Index-Organized Tables
- F. Indexing Techniques: B-Tree and Bitmap Indexes
- G. Vertical Partitioning
- H. Denormalization
- I. Subtype Clusters

X. Accommodating Business Change

- A. The Changing Data Warehouse
- B. Modeling for Business Change
- C. Implementing Business Change

XI. Maintaining the Models

- A. Governing Models and Their Evolution
- B. Model Coordination
- C. Managing Multiple Modelers
- D. Roles and Responsibilities
- E. Collision Management

XII. Deploying the Relational Solution

- A. Data Mart Chaos
- B. Conform the Dimensions
- C. Create the Data Warehouse Data Model
- D. Convert by Subject Area
- E. Convert One Data Mart At a Time
- F. Build New Data Marts
- G. Build the Architecture From One Data Mart
- H. Choosing the Right Migration Path

XIII. Comparison of Data Warehouse Methodologies

- A. Multidimensional Architecture
- B. Corporate Information Factory Architecture
- C. Comparison of the CIF and MD Architectures