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

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