The Dimensional Model Refactored: New Techniques for the 21st Century

Course Outline

Module 1
Introduction

- Dimensional Models
  - Definition
  - Uses
  - Business-oriented Process Measurement
  - Kinds of Stars
  - Slowly Changing Dimensions
- History of the Dimensional Model
  - Foundation for Data Marts and OLAP
  - Popularized in the 1990's
- BI & Analytics Today
  - Multiple Service Families
  - Governance and Quality
  - Self-service
  - Agile Development
  - Big Data and New Sources
  - New Technology
  - Organizational Changes
- Death of the Dimensional Model?

Module 2
Modern Data Architecture

- Data Architecture with Purpose
  - Yesterday's Data Architecture
  - Data Store Functions and Characteristics
- Data Architecture Without Purpose
  - A Box Labeled "Hadoop"
  - A Box Labeled "Data Lake"
- Modernizing the 'Back Room'
  - Non-relational Storage and Integration
- Enabling Discovery and Self-Service
  - Unlocking Big Data
  - Intake and Exploration
  - Archive or Deploy
  - Dimensional View of Consumable Assets
  - Directory of Resources: The Data Catalog
- Changes to the 'Front Room'
  - Data Marts and NoSQL
  - Logical vs. Physical Perspectives
  - Data Warehouse and NoSQL
  - Logical vs. Physical Integration
- Rounding Out Your Data Architecture
- The Data Pipeline
- Virtualization
  - Virtualization Concepts
  - Business View
  - Connecting to Non-Relational Sources
  - Extending the Data Warehouse or Data Mart
  - Prototyping
  - Virtualizing Data Stores

    - Virtual Data Marts
    - Virtual Data Warehouse

Module 3
Dimensional Design and Big Data

- Tapping into Big Data
    - Understanding NoSQL Technology
    - Changing Nature of Data Modeling
    - Beyond Production Data Sets
    - New Data for the Warehouse
- Data Warehouse Augmentation Techniques
    - New Facts
    - Behavioral Dimensions
    - Attribute-value Pairs
- Data Warehouse Extension Techniques
    - Application Extends Data Mart
    - Virtualization Extends Data Mart
- Analytics-Friendly Design Techniques
    - A New Consumer
    - Granular Data
    - Variety of Attributes
    - Weak Identifiers
    - Dimension History
    - Missing Data

Module 4
Rethinking the Dimensional-centric Perspective

- Value of the Dimensional Model
    - Information
    - Dimensional Models and BI
    - The “Dimensional First” Point of View
- Modern Data Management
    - New Audiences
    - New Processes
    - New Goals
    - New Vocabularies for Describing Data
    - Expanded Data Architecture
- Implications of Modern Architecture
    - Data Marts Still Exist
    - Cleansing and Master Data
    - Performance Management
    - Analytics and Data Science
    - Production Data Sets
- Dimensional First?
    - Applicability of the Dimensional Model
    - “Dimensional First” no longer Applies

Module 5
Rethinking Conformed Dimensions and Project Scope

- Traditional Enterprise Scope
    - Broad Scope
    - Conformed Dimensions
    - Ensuring Fit
- The Dangers of Enterprise Scope

    - Previous Failures: The 1980's
    - The Myth of Conformity
    - Time-to-value
- Driving Scope with Business Priorities
    - Stand-alone Data Marts
    - Managing Scope
    - Managing Risk

Module 6
Rethinking Best Practices of Dimensional Design

- Defensive Design
    - Design Future-proof Models
    - Best Practices Address Uncertainty
- Impact of Traditional best Practices
    - Set Grain at Lowest Level Possible
    - Include all Applicable Dimension Tables
    - Include as Many Dimension Attributes as Possible
    - Paying for an Unspecified Need
- Refocusing on Business Value
    - Reconsidering Design Practices
    - Impact of Future-Proof Models
    - Targeted Design Practices
- Managing Risk
    - Striking the Correct Balance
    - The Debt Matrix
    - Making Balanced Choices

Module 7
Refactoring Techniques

- Refactoring Overview
    - Evaluating Impacts
    - Classifying Impacts
- Low Impact Changes
    - Adding a Fact
    - Adding a Dimension Attribute
    - Adding a Dimension Table
    - Adding Current Values
- High Impact Changes
    - Adding Historic Values
    - Changing Grain
- Very High Impact Changes
    - Conforming Dimensions
- Impact Summary

Module 8
Streamlining Requirements & Design

- Traditional BI Requirements
    - Linear Process
    - Data Model Focus
    - Division of Labor
- Modern Requirements
    - Rethinking What is Needed
    - Iterative Process
    - Collaborative Development

    - Practical Products
    - Actionable Requirements
    - Requirements for Modern BI
- Requirements Process
    - Overview
    - Preparation
    - Business Needs Discovery
    - Interviewing Business SME's
    - Source Discovery
    - Recording Requirements
    - Business Validation
    - Technical Validation
- Using the Requirements
    - Implementation-ready
    - Technology Agnostic Requirements

Module 9
Templates for Actionable Requirements

- Templates
    - Purpose and Recommendations
- Business Information Needs
    - Subject Area Template
    - BDM Diagram
    - Hierarchy Diagram
    - Metric Template
    - Conformance Matrix
- Top Level Design
    - Star Template
    - Dimension Template
    - Conformance Bus
- Customizing the Templates

Module 10
Summary and Conclusion

- Summary of Key Points
- Recommended Resources

Appendix
Template Worksheets

- Using the Templates
- Worksheets: Business Information Needs
    - Subject Area Definition
    - BDM Diagram
    - Business Hierarchy
    - Metric Definition
    - Conformance Matrix (Business)
- Worksheets: Top-Level Design
    - Star
    - Dimension
    - Conformance Matrix