DATA MODEL FOR POWER BI

Course ID : POWER-BI-XDM

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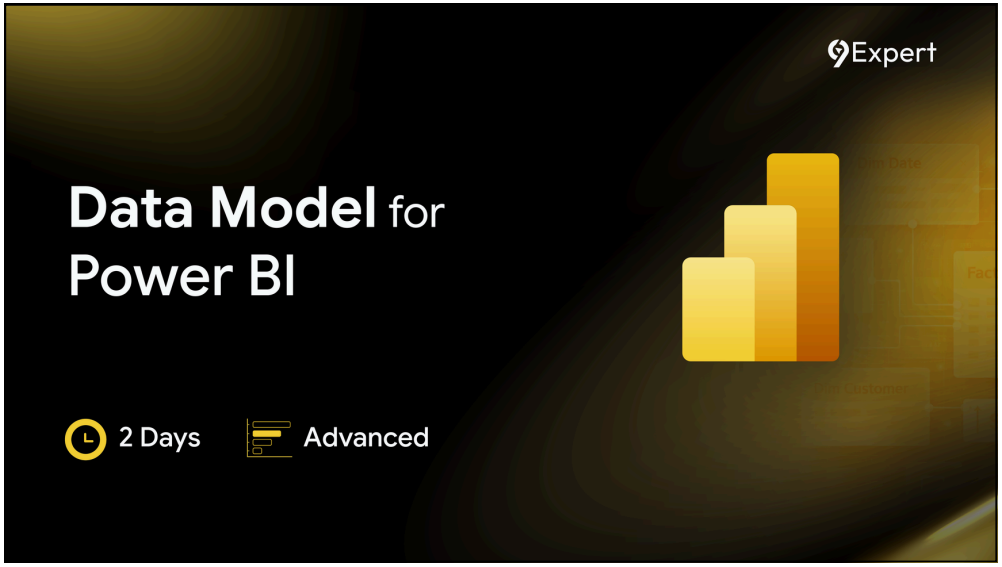

Duration: 2 Days

(12 Hours) 09:00 AM – 04:00 PM

Price: 8,900 THB

* (excluding VAT 7%)
* Eligible for 200% tax deduction

Training Schedule

www.9experttraining.com

Category: Power Platform, Business, Data

The Data Model is a core component of Power BI, enabling seamless integration and relationships between multiple tables. This course is designed to enhance participants' expertise in building and managing data models within Power BI, combining theoretical concepts with hands-on practice. Participants will learn techniques to optimize performance and improve the flexibility of data models, reinforced through real-world case studies and practical applications.

Objectives

1. Understanding the structure and key components of Power BI Desktop
2. Learning how the VertiPaq engine operates and applying methods to optimize processing performance
3. Designing dimensional models and managing relationships accurately and efficiently
4. Working with date and time data, including creating a Date Dimension to support organizational time-based analysis

Objectives

5. Practicing the use of external tools such as Tabular Editor and DAX Studio
6. Creating and customizing attribute hierarchies and explicit measures using DAX in a professional manner
7. Applying best practices in building and maintaining data models

Target Audience

1. Chief Data Officers (CDOs)
2. Business Analytics Professionals
3. Data Analysts
4. Directors and Managers

Prerequisites

1. Prior experience with Microsoft Power BI, along with an interest in designing and developing efficient data models for organizational reports and dashboards.
2. Basic understanding of measures and the ability to write Data Analysis Expressions (DAX), such as SUMX and CALCULATE.
3. Fundamental knowledge of data transformation using Power Query.

System Requirements

1. Windows 10 or Windows 11
2. Microsoft Power BI Desktop (free download)
3. DAX Studio (latest version recommended)
4. Tabular Editor (latest version recommended)

TRAINING TOPICS

DAY 1 Morning Session 9:00 AM – 12:00 PM

1. Understanding the Power BI Semantic Model

- Reviewing Power BI Desktop Components
  - Data Shaping with Power Query
  - Semantic Model
  - Visualization
- Understanding the Vertipaq Engine
  - In-memory Columnar Storage
  - Calculations and Data Access
  - Formula Engine: Handling DAX or MDX Queries
  - Storage Engine
  - Performance considerations:
    - Dictionary Compression
    - Value Encoding
    - Run-Length Encoding (RLE)
- Workload on Semantic Models
- Dimensional Modeling and Relationships
  - Fact Tables
  - Best practices for Implicit Measures
  - Dimension Tables
  - Best practices for Dimension Attributes
  - Building Attribute Hierarchies on Dimension Tables
  - Hiding unused Attributes and Implicit Measures

- Disabling Default Summarization
- Data Sorting
- Creating Explicit Measures on Fact Tables Using DAX
- Introduction to Calculation Groups

- Additional Best Practices
  - Avoid using Calculated Columns in DAX to create new Measures. Instead, define explicit measures directly to improve efficiency and reduce memory usage.

2. Using Tools to Enhance Model Efficiency

- Power BI Desktop Interface for Semantic Models
  - Managing Relationships
  - Configuring Essential Properties
  - Exploring DAX Query View
- Microsoft Fabric Interface after Publishing
  - Semantic Model Use Cases
- External Tools
  - Tabular Editor
  - DAX Studio

DAY 1 Afternoon Session 1:00 PM – 4:00 PM

3. Dimensional Model and Relationships

- Understanding Dimensional Models
  - Fact Tables
  - Measures
  - Dimension Tables
  - Attributes
  - Attribute Hierarchies
- Bus Matrix
  - Using a Bus Matrix to visualize and interpret the model structure
- Data Granularity Techniques
  - Adjusting granularity (e.g., from daily to monthly levels)
  - Adding new Dimensions (e.g., Time, Branch) for business-specific analysis
- Importance of Relationships
  - Choosing appropriate Cardinality and cross-filter Direction
  - Hands-on exercises for creating Relationships and performing accurate calculations
- Additional Best Practices
  - Use Integer Keys for Dimensions tables to optimize memory and performance
  - Avoid combining Many-to-Many and Bi-Directional relationships to prevent complexity
- Designing Dimension Tables
  - Attribute types:
    - Hierarchy attributes
    - Segmentation or Slicer attributes
  - Case Study: Integrating multiple calendars (e.g., Fiscal Year, Gregorian Calendar) into a single Date Dimension with clearly separated columns
  - Ensuring Dimension Key consistency for accurate aggregation
- Slowly Changing Dimension (SCD)
  - Type 1 and Type 2 approaches

- Case Study: Tracking sales territory changes for accurate reporting
- Exercises: Preparing a Type 2 SCD using Power Query and alternative approaches

- Considerations for Date Dimensions
  - Auto-generated vs. manually created Date Dimensions
  - Marking custom Date Tables and disabling Auto Date/Time
  - Handling supported granularity levels
  - Using Time Intelligence functions effectively
- Common Dimension Types
  - Role-Playing Dimensions
  - Case Study: Using a single Date table for multiple contexts (Order Date vs. Ship Date)
  - Managing Inactive Relationships with DAX exercises
- Additional Best Practices
  - Disable the IsAvailableInMDX property for unused Attributes to improve performance
  - Avoid long text members or high-cardinality attributes, as they may degrade performance

DAY 2 Morning Session 9:00 AM – 12:00 PM

4. Creating Attribute Hierarchies in Dimension Tables

- Types of Hierarchies
  - Natural Hierarchies
  - Unnatural Hierarchies
- Case Study
  - Building multiple Hierarchies within a Date Dimension for flexible multi-level analysis
- Hands-On Exercises
  - Creating Hierarchies in a Date Dimension
  - Building Hierarchies in other Dimension Tables
- Special Dimension Types
  - Parent-Child Dimensions
  - Using PATH functions in DAX for Parent-Child Hierarchies:
    - Calculating depth levels
    - Displaying nested structures

5. Hiding Unused Attributes and Implicit Measures

- Practical Guidelines
  - Hide Dimension Keys (Primary and Foreign Keys)
  - Hide Attributes already included in Hierarchies
  - Hide Implicit Measures that are replaced with explicit measures
  - Hide unused Attributes and Measures

DAY 2 Afternoon Session 1:00 PM – 4:00 PM

6. Sorting Data

- Why Sorting Matters in Dimension Tables
- Default Sorting Options
- Sorting by Another Column
  - Improving visualizations by defining custom sorting rules

7. Removing Summarization from Implicit Measures

- Best Practices
  - Remove summarization from Implicit Measures and replacing them with well-defined explicit Measures
  - Remove summarization from Dimension Attributes and Keys

8. Case Studies in Building Explicit Measures

- Business-Oriented Examples
  - Creating Explicit Measures to address common reporting requirements
- Calculation Groups
  - Combining measures for improved reusability and performance efficiency
- Further Learning
  - Recommended advanced courses to deepen DAX expertise
- Additional Best Practices
  - Applying structured naming conventions and consistent design patterns to enhance clarity and maintainability

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