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2093-Implementing Business Logic with MDX in Microsoft SQL Server 2000/2005

Two days—Instructor-led

Introduction

This course provides students with the knowledge and skills necessary to use multidimensional expressions (MDX) to add calculated members and other dynamically calculated values to a Microsoft SQL Server 2000/2005 Analysis Services cube by using SQL Server 2000/2005.

At Course Completion

At the end of the course, students will be able to:

- Understand and use multidimensional terminology.
- Add calculated members to a cube.
- Use MDX member functions to navigate within a hierarchy.
- Use MDX time functions to compare values over time.
- Use MDX set functions in a query statement.
- Use functions to manipulate sets of members.
- Use functions to aggregate values from a set of members.
- Apply MDX to make a cube change dynamically.
- Calculate formulas for specific blocks of cells.
- Control the order of calculations within a cube.
- Apply MDX in common customer and sales applications.
- Apply MDX in common financial applications.

Course Materials

The course materials are yours to keep.

You will be provided with the following software for use in the classroom:

- Microsoft SQL Server 2000/2005

Course Outline

Module 1: OLAP Review

The following topics are covered in this module:

- OLAP Databases
- OLAP Definitions
- Warehouse Data Flow

At the end of this module, you will be able to demonstrate a working knowledge of OLAP concepts and terminology. This includes:

- Understanding the basic elements of online analytical processing (OLAP) databases.
- Understanding the basic definitions and structures of an OLAP cube.
- Understanding how data flows through an organization's analytical processes.

Module 2: MDX Foundations

The following topics are covered in this module:

- The Role of MDX
- MDX Member Names
- Using the Calculated Member Builder
- Working with Calculated Members

At the end of this module, you will be able to build simple calculated members. This includes:

- Understanding the role of MDX in the overall flow of information through a data warehouse and the two specific functions that it performs.
- Understand MDX object and member naming conventions.
- Using the Calculated Member Builder for building simple calculated members.

- Understanding the characteristics of calculated members compared with stored members.

Module 3: Using MDX Expressions

The following topics are covered in this module:

- Using MDX Expressions
- Displaying Member Information
- Displaying Family Tree Relatives
- Working with Member Properties
- Using Conditional Expressions

At the end of this module, you will be able to create very simple multidimensional expressions. This includes:

- Creating MDX expressions in calculated members and manipulating the expressions by using numeric and string constants.
- Displaying information about a member-particularly the name of the member and the name of the level of the member.
- Displaying information about the parent or other ancestor of a member.
- Displaying the member property associated with a member, and using the value in an arithmetic expression.
- Creating and using simple and complex conditional expressions.

Module 4: Retrieving Values from a Cube

The following topics are covered in this module:

- Understanding Multidimensional Coordinates
- Retrieving a Value from a Cube
- Percent of Total Calculations
- Growth Calculations

At the end of this module, you will be able to apply tuples for retrieving values from a cube and creating practical calculations. This includes:

- Understanding basic concepts of multidimensional coordinates, including how to retrieve values from a cube by specifying a member from a single dimension.
- Defining a tuple and using tuple expressions to retrieve values with two or

more dimensions.

- Using tuple expressions to retrieve values for calculating percentages of a total.
- Using tuple expressions to retrieve values for period-to-period growth percentages.

Module 5: Creating Simple MDX Queries

The following topics are covered in this module:

- Understanding MDX Query Statements
- Creating Simple MDX Query Statements

At the end of this module, you will be able to create simple MDX query statements that generate a report. This includes:

- Understanding MDX query statement terminology.
- Writing simple MDX query statements.

Module 6: Creating and Manipulating Sets

The following topics are covered in this module:

- Using Set Creation Functions
- Using Set Manipulation Functions
- Using Subquery Set Functions
- Working with Dimension Interactions

At the end of this module, you will be able to use sets of members to create new sets. This includes:

- Using functions to create a set.
- Using functions to manipulate a set.
- Creating a set from subqueries.
- Manipulating dimension interactions by using advanced functions.

Module 7: Using Aggregation Functions

The following topics are covered in this module:

- Understanding Aggregation Functions
- Using Time Set Functions
- Calculating a Trend

At the end of this module, you will be able to summarize multiple retrieved values from a set into a single value. This includes:

- Creating temporary calculated members.
- Understanding and creating calculated members from aggregation functions.
- Understanding and using Time Set Functions.
- Understanding how to calculate a trend.

Module 8: Case Study - Implementing Budget Allocations

The following topics are covered in this module:

- Allocating Values from a Grand Total
- Allocating Values from a Subtotal
- Allocating Values Across Multiple Dimensions

At the end of this module, you will be able to apply multiple MDX concepts and functions in a single, complex project. This includes:

- Allocating values from a grand total across a dimension.
- Allocating values from an intermediate level across a dimension.
- Creating a calculated member that allocates values across three dimensions.

Module 9: Using Calculated Cells

The following topics are covered in this module:

- Using Calculated Cells

At the end of this module, you will be able to use calculated cells in a cube. This includes:

- Retrieving revenues from the Sales cube by using the LookupCube function.