



transforming performance through learning

## **Microsoft Business Intelligence End to End with SQL Server 2008 R2 and SharePoint 2010 - QASQLBI10**

### **Course Details**

Days 5  
Course code QASQLBI10

### **Course Outline**

#### **Overview**

Business intelligence solutions provide the infrastructure that enables users at all levels of a business to make better decisions based on more accurate and up-to-date information. This workshop focuses on teaching IT professionals the best practices and skills required to successfully design, build and operate a business intelligence solution using SQL Server 2008 R2 Integration Services, Analysis Services, Reporting Services, PerformancePoint Monitoring/Analytics and ProClarity.

#### **Who should attend**

This workshop - style course is designed for IT professionals who are interested in learning how to implement Business Intelligence solutions on the Microsoft BI Stack. Basic knowledge of common business requirements for a BI solution is assumed and some experience with SQL Server is required.

#### **Prerequisites**

- Basic knowledge of Business Intelligence
- Knowledge of relational database systems
- Delegates will gain the most from this course if they are experienced with SQL Server database to the level of Microsoft course M2779 or M6232. However, as minimum requirement, delegates should have a good working knowledge of T-SQL to level of M50027 or M2778

#### **Course outline**

Module 1 : Business Intelligence Overview  
Module 2 : Designing Business Intelligence Solution  
Module 3 : Creating the Data Warehouse (SQL)  
Module 4 : Loading the Data Warehouse (SSIS)  
Module 5 : Creating the Analysis Cube (SSAS)

Module 6 : Enhancing the Analysis Cube (SSAS)  
Module 7 : Producing the User Interface  
Module 8 : Creating reports with Reporting Services (SSRS)  
Module 9 : Creating dashboards with Excel PowerPivot  
Module 10 : Creating dashboards with PerformancePoint Services

## **Detailed Outline**

### **Module 1 : Business Intelligence Overview**

This module will introduce the course concepts and the Microsoft Business Intelligence stack (Line-of-business -&gt; SSIS -&gt; Data Warehouse -&gt; SSAS -&gt; SSRS / ProClarity / PerformancePoint / SharePoint).

Includes a discussion of the BI burger.

## **Sections**

### **Define terms and products**

- Business intelligence (BI)
- Extract Transform and Load (ETL)
- SQL Server Integration Services (SSIS)
- SQL Server Analysis Services (SSAS)
- SQL Server Reporting Services (SSRS)
- PerformancePoint Services for SharePoint
- ProClarity
- SharePoint
- Master Data Management (MDM)

### **Evaluating BI requirements**

Phased delivery

### **Documenting requirements**

High level requirements i.e. reports / scorecards / charts / analytical data

### **Demonstrations**

- Examine a sample requirement and identify which products are best suited to the requirement.
- Examining a sample requirement
  - o Identify source data systems
  - o Identify collisions / overlap from source data systems
  - o Discuss ways of joining data (i.e. MDM)
  - o Identify destination requirements i.e. reports, scorecards and charts
  - o Identify transformations required for making data the correct format and data type.

### **Labs**

Identify software requirements for solutions

- Three business requirements that the delegates need to identify which Microsoft products are needed to fulfil requirement
  - o Group exercise (2-3 per team)
  - o Notes about assumptions and decisions to be made during exercise
  - o Show and tell (if appropriate to class)

## **Module 2 : Designing Business Intelligence Solution**

### **Sections**

- Reviewing requirements
  - o Identify each products role in the BI solution
- Discuss whether to use a staging database
- Discuss use of slowly changing dimensions (SCD)
- Introduce temporal / rapidly changing dimensions (RCD)
- Discuss use of surrogate keys
- Discuss data warehousing techniques
- Discuss timely delivery of data from source to destination (daily, hourly, real-time)
- Discuss data warehouse schema design with advantages and disadvantages
  - o Star
  - o Snowflake
  - o Normalised
  - o Combination
- Discuss designing a time dimension
  - o Surrogate key

## **References**

- Ralph Kimball
  - o Data Warehouse Design
- Richard T Snodgrass
  - o Temporal Databases / RCD

## **Demonstrations**

- Design a simple data warehouse using 4-5 tables (1 fact)
- Design a time dimension

## **Labs**

- Documentation of requirements
- Map source data onto output requirements
- Flow of data from line of business to user interface

## **Module 3 : Creating the Data Warehouse**

### **Sections**

- Table design
  - o Partitioned tables
  - o Primary and foreign keys
  - o Data types
  - o Logging and error tables
- Index considerations
  - o Clustered
  - o Non-clustered
  - o Disabling and rebuilding indexes

### **References**

- Ralph Kimball

### **Demonstrations**

- Create base objects
- Create partitioned tables (using multiple file groups for the fact table)
- Index maintenance

## **Labs**

- Create data warehouse database
- Create the dimension tables
- Create the fact tables with partitioning
- Create logging and error recording tables
- Create indexes on the fact and dimension tables

## **Module 4 : Loading the Data Warehouse**

### **Sections**

- SSIS basics
  - o Packages
  - o Control Flow
  - o Data Flow
  - o Transformations
  - o Data Sources
  - o Data Destinations
- Configurations
- Logging
- Lookups
- Fast-load and table partitioning
- Using switch and merge
- Late arriving data
- Change Data Capture (CDC - SQL 2008 sources only)
- Package design
- Transactions
- Checkpoints

### **Demonstrations**

- SSIS package basics
  - o Control flow

- o Data flow
- o Logging
- o Control flow
- o Execute SQL task
- o Caching task
- o Data flow task
- o Transformations
- o Change data capture (CDC)
- o Logging
- o Configuration
- o Variables
- o Lineage

### **Labs**

- Design and create a SSIS package structure
- Design the dimension load process using slowly changing dimension transformation (SCD)
- Add control and data flow items
- Use SSIS for lineage, logging, configurations and variables
- Create data flow for each dimension table
- Create data flow for each fact table

## **Module 5 : Creating the Analysis Cube**

### **Sections**

- Data source views
  - o Friendly names
  - o Relationships
  - o Calculated columns
  - o Named queries
- Dimensions
  - o Time
  - o Parent-Child
  - o Multiple table (snowflake)
  - o Unary Operator
- Dimension Attributes
  - o Key values and display values

- o Attribute relationships
- Measures
  - o Data type design
  - o Aggregations (Additive / Semi-Additive / Non-Additive)
- Cubes
  - o Producing the base cube
  - o Dimensions usage and relationships
- Best practice warnings

### **Demonstrations**

- Create a catalog database
- Create a data source (DS)
- Create a data source view (DSV)
  - o Add named query
  - o Add calculated column (full name, quarter with year, month with year)
- Create dimensions
  - o Time
  - o Product-&gt; Product Subcategory -&gt; Product Category
  - o Geography
  - o Customers
  - o Resellers

### **Labs**

- Designing dimensions for usability to required design
- Design cube using dimensions
- Set properties for measures

## **Module 6 : Enhancing the Analysis cube**

### **Sections**

- Cubes
  - o Calculated measures
  - o Calculated members
  - o Names sets (Dynamic / Static)
  - o Key Performance Indicators (KPI)

- o Perspectives
- o Actions
- o Partitions
- o Storage design
- o Designing aggregations
- o User-based optimisation (UBO)
- o Partition slice alignment
- o Security Roles
- o Processing design

### **Demonstrations**

- One per item in section above

### **Labs**

- Create calculated measures (profit, profit%)
- Create calculated members (total sales amount)
- Create named sets (Europe : [France],[UK],[Germany])
- Create KPI (profit% > 30%)
- Create actions (Drillthrough)
- Design partitions to correlate to the table partitioning and slices
- Design perspectives for Internet and Reseller sales departments
- Implement security roles for Internet and Reseller departments
- Update SSIS control flow to include processing for SSAS dimensions and cubes

## **Module 7 : Producing the User Interface**

### **Sections**

- Best Tool for the job
- Infrastructure design
- Where to use SSRS , PAS, PerformancePoint

## **Module 8 : Creating reports with Reporting Services**

## **Sections**

- Show differences between BIDS and Report Builder 2.
- Creating a report
- Tools
  - o Tablix
  - o Gauges
  - o Charts
- Related reports
- Parameters
- Deploying
  - o Standalone SSRS
  - o SharePoint Integrated

## **References**

- Stephen Few
  - o Show Me The Numbers
- Edward Tufte
  - o Quantitative Evidence

## **Demonstrations**

- Create a report using a tablix that shows sales by product category for a particular region (parameterised).
- Create a report that holds a bar chart showing sales by regions
- Link bar chart report to tablix report passing the selected region as a parameter.

## **Labs**

- Create a report to show sales for regions compared to last year
  - o Allow drillable (region -&gt; country -&gt; city)
  - o Use groups and Tablix
  - o Create simple gauge report for sales this year against last year's sales (+10%) by region
  - o Create a report for sales per product by country (parameterised) for link to SSAS action and implement as action (PDF format)

## **Module 9 : Creating dashboards with Excel PowerPivot**

## **Sections**

- Describe positioning of Microsoft PowerPivot
- Designing pages
- Saving and publishing PowerPivot views
- Introduce slicers

## **References**

- Stephen Few
  - Show Me The Numbers
- Edward Tufte
  - Quantitative Evidence

## **Demonstrations**

- Produce a variety of views such as chart, grid, Performance map, perspective and decomposition tree.
- Demonstrate creating a slicer using the background

## **Labs**

- Excel Powerpivot working with multiple sources (SSAS, text file and Access)

## **Module 10 : Creating dashboards with PerformancePoint Services**

### **Sections**

- Dashboard design best practice
- Data Sources
- Reports
  - Analytic Chart
  - Analytic Grid
  - SSRS Report
  - ProClarity Page
  - Scorecard
  - Strategy Map
- Dashboard
  - Filters

- o Relating published elements
- o Deploying to SharePoint Services (WSS or MOSS)

### **References**

- Stephen Few
  - o Dashboard Design
  - o Show Me The Numbers
- Edward Tufte
  - o Quantitative Evidence

### **Demonstrations**

- Create each of the elements and deploy to SharePoint

### **Labs**

- Show dashboard design to best practice (ref. Stephen Few "Information Dashboard Design")
- Create a data source from SSAS cube created earlier
- Create an analytic chart and grid, include parameters, for sales over time
- Create a KPI for sales against last year
- Create a scorecard using the KPI and include multiple target columns for target, score and indicator
- Create a summary dashboard holding overview reports and scorecard
- Introduce filters into the dashboards and relate published reports to filters
- Publish dashboards to SharePoint

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