Practical Self-Service BI with Excel 2013

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Length:	1 Day
Language(s):	English
Audience(s):	Analysts, Reporters, Developers, and Other Information Workers
Level:	200-300
Technology:	Microsoft Office Excel 2013
Type:	Course
Delivery Method:	Instructor-led (classroom)

Course Description

Analysis Services Maestro and SQL Server MVP and Business Intelligence Architect Bill Pearson leads this full-day, hands-on introduction to using Excel 2013 to deliver self-service business intelligence. The focus of the course is to help those unacquainted with the BI features that debut in Excel 2013 to become familiar with the assembly of data from diverse sources into models that deliver BI upon demand, and to leverage new features for enhanced analysis and reporting.

Participants will gain exposure to accessing and relating data, and to employing the Data Analysis Expressions (DAX) language, to construct and share PowerPivot applications that support analysis and reporting throughout the enterprise. Moreover, we will overview other BI-related features, including Data Mining and the exciting new Power View reporting capabilities.

Intended Audience

Information workers (business- or IT-based) involved in analysis and reporting of data, intermediate - to - advanced Excel users, practitioners that want to gain familiarity with Excel 2013 PowerPivot, Data Mining, Power View and other BI features to build compelling analysis and reporting applications to deliver self-service BI

Course Objectives

Upon completion of this course, attendees will be able to:

- Assemble and relate data from diverse sources into an Excel 2013 PowerPivot model to support self-service business intelligence
- Employ DAX functions to create basic calculations within the PowerPivot data model
- Construct PowerPivot applications that support enterprise analysis and reporting
- Understand concepts surrounding, and potential uses of, the new Data Mining capabilities introduced in Excel 2013
- Gain exposure to the impressive Power View reporting and analysis capabilities that debut in Excel 2013

Prerequisites

Attendees with the following will benefit the most from this course:

- Basic familiarity with the Microsoft Windows operating system
- Exposure to Excel PivotTables and PivotCharts

- Exposure to standard Excel functions
- Exposure to basic relational database concepts

Module 1: Installation and Overview

In this module we overview the course layout, and preview the objectives of the individual modules. We then walk through enabling the PowerPivot and other self-service BI add-ins that install with Excel 2013, discussing related details.

After completing this module, attendees will:

- Understand objectives of the course and background of the instructor
- Understand the need for Self-service business intelligence, and how PowerPivot for Excel 2013 supports same
- Understand how to enable PowerPivot and other self-service BI features in Excel 2013
- Understand navigation of PowerPivot windows in Excel 2013
- Understand how the PowerPivot components work within an Excel 2013 workbook
- Gain an end-to-end understanding of the steps involved in the creation of a rudimentary PowerPivot application

Module 2: Building the Basic PowerPivot Data Model

In this module we learn the detailed steps of constructing a PowerPivot data model, beginning with the import of diverse data sources into PowerPivot, and the establishment of relationships between data from different sources. We next get hands-on exposure to querying PowerPivot data from an Excel PivotTable. We also emphasize the importance of data quality considerations (population accuracy and completeness, etc.) in the models we construct.

Activity: Load Data from Various Sources

Load data from:

- Text Files
- SQL Server
- Excel, via Copy and Paste
- Analysis Services
- Other sources (discussion)

Activity: Inspect and Cleanse Data

- Inspect data for population accuracy and completeness
- Identify need for cleansing and plan approach(es)

Activity: Establish Relationships

- Inspect imported data for the presence of pre-existing relationships
- Establish Relationship between different data sources

Activity: Query Data

- Establish a PivotTable to query PowerPivot data
- Set up a "dashboard" with axes, slicers, filters and other components to support querying underlying PowerPivot data

After completing this module, attendees will:

- Be aware of the data sources that can be imported into PowerPivot
- Be able to import data sources into PowerPivot
- Establish relationships between data imported from different sources into PowerPivot
- Be able to query PowerPivot data from within a PivotTable
- Grasp the importance of data quality considerations that can arise when building PowerPivot data models (population accuracy and completeness, etc.)

Module 3: Working with PowerPivot and Excel 2013 PivotTables, and an Introduction to DAX

In this module we examine the key components of a PowerPivot BI solution, and gain an understanding of how these components work together to deliver effective self-service business intelligence. As a part of our practical exercises surrounding these components, we gain an introduction to the Data Analysis Expressions (DAX) language, learning how to employ rudimentary DAX functions in the creation of calculations at two important levels in the PowerPivot solutions we construct.

 We explore the navigation of the PowerPivot Window and how to create calculated columns, discussing the nature and effective use of these calculations as a part of our examination. We shift our focus to Excel 2013 PivotTables (and, by reference, PivotCharts) that support PowerPivot models, initially exposing enhancements over standard Excel PivotTables and PivotCharts, so that we gain an understanding of the role that PowerPivot plays as a source to Excel 2013 PivotTables. We gain experience accessing calculations we have created in the underlying PowerPivot window from within a PivotTable. We then create calculations at the PivotTable level via calculated fields.

We discuss the differences in PowerPivot calculated columns and PivotTable calculated fields, and learn when to employ each for optimal performance and understandability of our Excel 2013 PowerPivot BI solutions. Finally, we introduce the concept of evaluation context, and examine its importance within our PowerPivot BI applications.

Activity: Navigate the PowerPivot Window and Create Calculated Columns

- Examine imported data tables, and discuss general planning of calculation placement
- Using DAX, create basic calculated columns in PowerPivot
- Observe the nature and utility of a calculated column

Activity: Navigate an Excel 2013 PivotTable, Understand Enhancements for PowerPivot, and Create Calculated Fields

- Access, and examine in detail, an Excel 2013 PivotTable within the workbook, focusing upon basic features as well as enhancements to support PowerPivot data sources
- Access previously created PowerPivot calculated columns from the PivotTable
- Using DAX, create basic calculated fields in the PivotTable
- Explore the important CALCULATE() function
- Observe the nature and utility of a calculated field
- Note the differences between PowerPivot calculated columns and PivotTable calculated fields, and the optimal employment of each in overall BI application design.

Activity: Examine Evaluation Context in Action

- Create basic calculations while exposing new DAX functions
- Evaluate context in Filter, Row and Relationship scenarios
- Modify / update context

After completing this module, attendees will:

- Be able to navigate the PowerPivot window
- Understand the component roles within PowerPivot BI of the:
    - PowerPivot window and PivotTables / PivotCharts
    - Data Analysis Expressions (DAX) language
- Work with Power Pivot Calculated Columns:
    - By creating basic calculated columns in PowerPivot using DAX …
    - … while understanding the nature and uses of a calculated column
- Be able to create a PivotTable in the Excel 2013 workbook, understanding :
    - Potential uses
    - The enhancements to PowerPivot PivotTables over their standard Excel counterparts
- From the PivotTable, be able to:
    - Access previously created PowerPivot calculated columns
    - Create basic calculated fields using DAX
- Understand the nature and utility of a Calculated Field:
    - The differences between PowerPivot calculated columns and PivotTable calculated fields
    - The optimal employment of each in overall BI application design
- Understand the importance of Evaluation Context, and be able to apply this knowledge in the design, creation and use of PowerPivot BI applications in Excel 2013.

Module 4: Build a Practical Excel 2013 PowerPivot Application – Part 1

In this module we begin the end-to-end creation of a working PowerPivot application, wherein we gain practical experience with several basic steps involved in generating support for a working reporting solution. In this part, we introduce more DAX functions as we create "support tables" that, in combination, will serve as a **highly useful "takeaway" template** for attendees to employ in kick-starting PowerPivot applications in their own business environments.

Activity: Classic Table: Calendar

- Preview table layout to grasp how it acts as a platform for attributes and date calculations
- Create Date table
- Create Typical Calendar Calculations using DAX
  - Periods-to-date
  - Parallel Periods
  - Variances / Deltas
  - Custom Aggregations

After completing this module, attendees will:

- Understand the reusable utility of support tables within an Excel 2013 PowerPivot BI application
- Be able to create a Calendar table (or use the "jump-start" template) in applications they create in their respective business environments
- Have gained exposure to, and practice with, DAX functions in creating popular time-related calculations

Module 5: Build a Practical Excel 2013 PowerPivot Application – Part 2

In this module we continue the end-to-end creation of a practical Excel 2013 PowerPivot application we began in Part 1. In this part, we introduce additional DAX functions, using and extending components we built in Part 1 to complete the PowerPivot model. We also gain practical exposure to handling other real-world accounting and finance concepts.

Activity: Classic Table: Working Days

- Preview table layout to grasp how it supports the PowerPivot application
- Add further support logic via a "Working Days" table
- Create more calculated columns using DAX

Activity: Add Time Intelligence via Calculated fields in a PivotTable

- Year-to-Date
- Prior Time Periods
- Rolling Totals
- Other: Average, Sharing Calculations, Variances, and More

After completing this module, attendees will:

- Have gained further exposure to support tables that can be leveraged to support PowerPivot applications
- Have gained familiarity with a second support table that can be used as a "jump-start" template in applications they create in their respective business environments
- Have gained further exposure to, and practice with, DAX functions in creating time-intelligence and other calculations

Module 6: Going Industrial Strength: Upgrading a PowerPivot Model to SSAS Tabular

In this module we overview the steps required to "upgrade" an Excel PowerPivot model to an SSAS 2012 Tabular model using SQL Server Data Tools ("SSDT"). We discuss motivations behind moving to SSAS 2012 Tabular, including PowerPivot model size becoming a challenge for the client environment, both from the perspective of processing and querying optimization. We then undertake a walkthrough of the steps required to convert a model designed in PowerPivot into a server-level Tabular model, including the creation and configuration of an SSAS 2012 Tabular Project with SSDT, together with the importation of an Excel PowerPivot model into the project as a Tabular model. Moreover, we examine the contents of the new SSAS 2012 Tabular Project, gaining an understanding of the purposes of the constituent files and objects. Finally, we gain exposure to the deployment and navigation of the SSAS 2012 Tabular Project, as well as its use as a data source for reports and PivotTables.

Activity: Get Started with SQL Server Data Tools (SSDT)

- Gain access to SSDT and briefly overview its uses
- Gain familiarity of SSDT from the perspective of SSAS 2012 Tabular Projects

Activity: Create a New SSAS 2012 Tabular Project

- Create a new Project in SSDT
- Discuss the templates / project options within the creation process

Activity: Configure the New SSAS 2012 Tabular Project

- Understand the configuration of various properties within the new project to prepare it to house a Tabular model
- Understand the configuration of Tabular model – specific properties

Activity: Import the PowerPivot Model into the SSAS 2012 Tabular Project

- Discuss options for a creating an SSAS 2012 Tabular Project, including the creation of an empty project from which to build a model from scratch, via importation of an Excel PowerPivot model, or via importation of an SSAS 2012 Tabular database already deployed on a server
- Create a Tabular model via the import of an existing Excel PowerPivot model

Activity: Anatomy of the New SSAS 2012 Tabular Project

- Become familiar with the "file inventory" associated with an SSAS 2012 Tabular Project in SSDT
- Understand the purpose of each of the SSDT files supporting SSAS 2012 Tabular Project

Activity: Deploy and Navigate the New SSAS 2012 Model

- Deploy the metadata for the new SSAS 2012 Tabular database from SSDT to the development server
- Process the model, understanding automatic and manual options
- Inspect the newly deployed SSAS 2012 Tabular database, ascertaining readiness for querying via basic test queries
- Employ the new SSAS 2012 Tabular database as a report data source

After completing this module, attendees will:

- Understand reasons for "upgrading" a PowerPivot model to an SSAS Tabular model
- Be able to create a new SSAS 2012 Tabular Project using SSDT
- Understand how to configure an SSAS 2012 Tabular Project using SSDT
- Be able to import a PowerPivot data model into an SSAS 2012 Tabular Project
- Understand the components of an SSAS 2012 Tabular Project
- Be able to Deploy and Navigate the newly created SSAS 2012 Tabular Project
- Be able to source the SSAS 2012 Tabular Project with previously created reports and PivotTables

Module 7: Data Mining in Excel 2013

The Excel 2013 Data Mining Add-in enables us to harness the power of SQL Server predictive analytics in Excel and Visio. Table Analysis Tools make it possible for us to gain insight with a couple of clicks. Moreover, we can leverage the Data Mining Client for full-lifecycle data mining, and then visualize our models in Visio.

In this module, we introduce the capabilities supported by the Data Mining add-in for Excel 2013, and gain insight as to innovative ways we can employ Excel 2013 Data Mining in our respective work environments.

Activity: Getting Started with Data Mining in Excel 2013

- General overview of Data Mining in Excel 2013

- Enabling Data Mining in Excel 2013

Activity: Manipulating Data with Data Mining in Excel 2013

- Use Table Analysis Tools to leverage SQL Server data mining models within Excel
- Employ the Data Mining Client to create, test, explore and manage data mining models within Excel

After completing this module, attendees will:

- Have gained exposure to general Data Mining concepts and objectives
- Have become familiar with the components of the Data Mining for Excel 2013 add-in
- Have gained practice enabling and using the Data Mining for Excel 2013 add-in
- Have gained insight to innovative uses for Data Mining in Excel 2013

Module 8: Using Power View in Excel 2013

Power View is an end user reporting technology that was released with SQL Server Reporting Services 2008 R2, and works within SharePoint 2010 Enterprise. Like PowerPivot, Power View is an add-in that comes in the box with Excel 2013 – an add-in that simply needs to be enabled to allow end users to create highly visual reports within a web browser in an ad-hoc fashion.

In this module, we introduce the new Power View reporting capabilities in Excel 2013. We examine ways we can use Power View's numerous visualization features to explore, analyze and report upon our data. We will discuss ways that we can "tune" our data models to optimize, from the perspective of both performance and aesthetics, what Power View can deliver. Moreover, we'll get hands-on exposure to creating data visualizations, as well as assembling various visualizations into reports that provide insight into our data via user-friendly, interactive solutions.

Activity: Getting Started with Power View in Excel 2013

- General overview of the Power View architecture
- Enabling Power View in Excel 2013
- Evaluating the data model upon which Power View will report

Activity: Creating Excel 2013 Workbook Reports with Power View

- Creating and using Power View Sheets
- Putting the Power View List to work
- Combining Power View Visualizations
- Working with other Power View features
    - Pie charts
    - Color themes and backgrounds

- Configurable data region font size
- Pictures
- Background Images
- URLs
- Map visualizations

After completing this module, attendees will:

- Have gained insight to the capabilities of Power View in Excel 2013 for analysis and reporting
- Have gained practice enabling and using Power View in Excel 2013
- Have created Excel 2013 Workbook Reports with Power View, leveraging many Power View features with Excel 2013 data

A working set of the objects created in the session, together with reference files, will be provided to attendees, for prospective reference in working with Excel 2013 BI in their own environments.

Course Hardware and Software Requirements

<u>**NOTE:**</u> *Passive attendance can certainly be useful.* However, to obtain maximum benefit through active participation in the course, it is highly recommended that attendees bring along a laptop loaded with the following:

- Windows 7 / 8, Windows XP (SP3)
- 1GB RAM minimum (with 2GB RAM recommended)
- Microsoft Excel 2013 (from Office 2013 Professional Plus) installed with PowerPivot, Power View and Data Mining Add-Ins Enabled
- Microsoft SQL Server 2008 R2 / 2012 installed, or available for connection
- AdventureWorksDW2008R2 / 2012 and AdventureWorks2008R2 / 2012 database engine samples
- Adventure Works DW 2008R2 / 2012 Analysis Services samples installed
- Connectivity available to processed Adventure Works DW 2008R2 / 2012 Analysis Services database sample

Please contact instructor with questions: wep3@islandtechnologies.com

About the Instructor

Bill Pearson, SSAS Maestro and SQL Server MVP, CPA, CITP, CGMA, CMA, CIA, MCDBA, MCSE, is a consultant, author, mentor and business intelligence architect who has been working with business intelligence for over 18 years, and with the integrated Microsoft Business Intelligence solution since its inception. Bill has been awarded the Microsoft Most Valuable Player multiple times for his technical experience implementing Microsoft BI, as well as his contributions to various communities as an author and speaker. Bill's recent series' include the *Stairway to MDX* and *Stairway to PowerPivot and DAX* columns at SQLServerCentral.com, and he presents regularly at SQL Saturdays and other, diverse events worldwide.