



# Analyzing Data with Microsoft Power BI & PowerPivot for Excel

Course ISI-1516      Two Days      Instructor-Led, Hands-On

## Introduction

This two-day, instructor-led course will teach you how to design data models for maximum efficiency and effectiveness.

How can you use Excel and Power BI to gain real insights into your information? As you examine your data, how do you write a formula that provides the numbers you need? The answers to both of these questions lie with the data model. This book introduces the basic techniques for shaping data models in Excel and Power BI. It's meant for readers who are new to data modeling as well as for experienced data modelers looking for tips from the experts. If you want to use Power BI or Excel to analyze data, the many real-world examples in this book will help you look at your reports in a different way—like experienced data modelers do. As you'll soon see, with the right data model, the correct answer is always a simple one!

This course is appropriate for Excel and Power BI users who want to exploit the full power of their favorite tools and for BI professionals seeking new ideas for modeling data

## At Course Completion

In this course, students will learn the following:

- Gain an understanding of the basics of data modeling, including tables, relationships, and keys
- Familiarize yourself with star schemas, snowflakes, and common modeling techniques
- Learn the importance of granularity
- Discover how to use multiple fact tables, like sales and purchases, in a complex data model
- Manage calendar-related calculations by using date tables
- Track historical attributes, like previous addresses of customers or manager assignments
- Use snapshots to compute quantity on hand
- Work with multiple currencies in the most efficient way
- Analyze events that have durations, including overlapping durations
- Learn what data model you need to answer your specific business questions

## Prerequisites

Attendees should have an understanding of Microsoft Excel and Power BI

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## **Course Materials**

The student kit includes a comprehensive workbook.

## **Course Outline**

### **Module 1: Introduction to data modeling**

- Working with a single table
- Introducing the data model
- Introducing star schemas
- Understanding the importance of naming objects

### **Module 2: Using header/detail tables**

- Introducing header/detail
- Aggregating values from the header
- Flattening header/detail

### **Module 3: Using multiple fact tables**

- Using denormalized fact tables
- Filtering across dimensions
- Understanding model ambiguity
- Using orders and invoices

### **Module 4: Working with date and time**

- Creating a data dimension
- Understanding automatic time dimensions
- Using multiple date dimensions
- Handling date and time
- Time-intelligence calculations
- Handling fiscal calendars
- Computing with working days
- Handling special period of the year
- Working with weekly calendars

### **Module 5: Tracking historical attributes**

- Introducing slowly changing dimensions
- Using slowly changing dimensions

### **Module 6: Using snapshots**

- Using data that you cannot aggregate over time
- Aggregating snapshots
- Understanding derived snapshots

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- Understanding the transition matrix

## **Module 7: Analyzing date and time intervals**

- Introduction to temporal data
- Aggregating with simple intervals
- Intervals crossing dates
- Modeling working shifts and time shifting
- Analyzing active events
- Mixing different durations

## **Module 8: Many-to-many relationships**

- Introducing many-to-many relationships
- Understanding the bidirectional pattern
- Understanding non-additivity
- Cascading many-to-many
- Temporal many-to-many
- Reallocating factors and percentages
- Materializing many-to-many
- Using the fact tables as a bridge
- Performance considerations

## **Module 9: Working with different granularity**

- Introduction to granularity
- Relationships at different granularity
- Analyzing budget data
- Using DAX code to move filters
- Filtering through relationships
- Hiding values at the wrong granularity
- Allocating values at a higher granularity

## **Module 10: Segmentation data models**

- Computing multiple-column relationships
- Computing static segmentation
- Using dynamic segmentation
- Understanding the power of calculated columns: ABC analysis

## **Module 11: Working with multiple currencies**

- Understanding different scenarios
- Multiple source currencies, single reporting currency
- Single source currency multiple reporting currencies
- Multiple source currencies, multiple reporting currencies