Data Modeling & Visualization

with Power BI

Duration: 5 Days

Course Objectives

* Get an understanding of Power BI and how it works in different scenarios
* Get an understanding of Data Modeling and calcuations in Power BI
* Understand calculation contexts in DAX
* Create measures, fields and tables in the Power BI data model
* Understanding and performing various Time Intelligence calculations in DAX
* Visualize and analyze data, derive insights from Excel spreadsheets, local databases or external sources like Salesforce Data, Azure SQL Database & SQL server analysis tabular data

Target Audience

* BI and Analytics Professionals
* MIS and Reporting Professionals
* Project Managers
* Mid-level Functional Managers
* Data Analysts
* Students

Lab Setup

1. Microsoft Power BI Desktop
2. Operating System: Windows 7 / 8 / 10

# Program Outline

# Day 1

Session 1: Introduction to Power BI

* Introduction to and need for Power BI
* Architecture
* Components of Power BI
* Power BI workflow

Session 2 & 3: ETL Operations with Power Query

* Connecting to different sources
* Power Query interface
* Recording & storing transformations
* Evaluate and transform column data types
* Rounding off numbers
* Removing rows & columns
* Fill blank cells
* Splitting columns
* Pivot / Unpivot data
* Merge & Append queries
* Configure data loading
* Resolve data import errors
* Managing / changing data sources

**🖳** *Practical*: Connect with and transform tables from the Reseller Sales dataset

Session 4: Basic Data Modeling in Power BI

* Adding tables to the model
* Creating Relationships – Autodetect and Manual

**🖳** *Practical*: Examine the Reseller Sales data model and table relationships

# Day 2

Session 1: Advanced Transformations in Power Query

* Merge Queries
* Append Queries
* Pivot / Unpivot Data

**🖳** *Practical*: Merge DimProductCategory & DimProductSubcategory tables into DimProduct

**🖳** *Practical*: Append the FactInternetSales table to the FactResellerSales table

**🖳** *Practical*: Unpivot the UN Population dataset

Session 2 & 3: Writing Functions in M Language (Power Query)

* Creating columns from examples
* Creating custom columns using M functions
  + Text functions
  + Date functions
  + Miscellaneous formulas & calculations
* DAX or M?

**🖳** *Practical*: Create date keys & join keys in Power Query

**🖳** *Practical*: Create tag columns in Power Query using the If statement

Session 4: Data Modeling in Power BI, Creating and Modifying Relationships

* Define the appropriate level of data granularity
* Editing relationships
* Relationship cardinality
* Active vs. Inactive relationships
* Role-playing dimensions
* Managing Parameters

**🖳** *Practical*: Create and modify relationships in the data model

**🖳** *Practical*: Create a measure using an inactive relationship

# Day 3

Session 1, 2 & 3: Creating Power BI Visuals & Reports

* The Report view
* Different visual types
* Fields and Visualization panes
* Creating & modifying visuals
* Formatting visuals & visual elements
* Changing the sort order
* Adding filters
* Drilling up / down
* Creating hierarchies

**🖳** *Practical*: Create and modify visuals in Report view

Session 4: Slicing & Dicing Data and Visual Interactions

* Inserting slicers for text, numbers & dates
* Cross-filtering visuals
* Editing interactions between visuals
* Slicers and the Data Model

**🖳** *Practical*: Set filters and edit interactions between visuals in Report view

# Day 4

Session 1: Understanding DAX

* Data types in DAX
* Use of Naming convention in DAX
* Row & Filter context
* Calculated Columns and Measures

Session 2 & 3: DAX functions for Calculated Columns and Measures

* Aggregation, Counting & Logical DAX functions
* Iterator functions – SUMX, COUNTX, etc.
* Lookup functions – RELATED, LOOKUPVALUE
* Conditional Calculations with CALCULATE & FILTER functions
* AND & OR conditions in CALCULATE
* Other DAX functions as required
* Building tables using DAX
* Time Intelligence Calculations with DAX
  + CALENDAR & CALENDARAUTO function
  + Understanding time intelligence
  + Aggregations over time
  + Handling Previous and Next periods
    - PREVIOUS / NEXT [DAY/MONTH/QUARTER/YEAR]
    - DATEADD, DATESINPERIOD, DATESBETWEEN
  + Aggregations till date / Running totals
    - TOTALxTD vs. DATESxTD functions
* Handling user-level security (Row-Level Security)
  + DAX functions for Parent-Child hierarchies and RLS

Session 4: DAX Practical

**🖳** *Practical*: Add Calculated Columns and Measures to the data model

# Day 5

Session 1 & 2: Publishing and Sharing Reports

* Reports vs. Dashboards
* Publishing a Report and Accessing a Published Report
* Data Centralization
  + Creating Dataflows
  + Building reports from dataflows & datasets
  + Centralising & certifying datasets
  + Connecting to ADF/ADLS/BYODB
* Advanced dashboard tiles
  + Adding custom links to a dashboard
  + Adding the web content & video widget; Real-time streaming dashboard tiles
* Power Automation and PowerApps integration
* Sharing Reports – Workspaces, Dashboards, and Apps
* Setting up a Gateway
* Schedule Refresh

**🖳** *Practical*: Publish a Report and create Dashboard tiles in Power BI Service

Session 4: Case Study Discussion