Getting Started With SSAS 2012 Tabular

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Objectives

- Overview of Tabular
- Analysis Services Tabular from 10,000 Feet
- Analysis Services Options: SSAS Multidimensional or SSAS Tabular?

Overview of Tabular

- Why Tabular Now?
- Objectives of Tabular

Why Tabular Now?

- **"Streamlined" BI Model that**
  - Offers simplicity and efficiency
  - Promotes rapid BI development
  - Lends itself to both Personal and Organizational BI projects
  - Supports an "upgrade" path
- **To leverage hardware and other advances**
- **To feed the demand for self-service BI**

Objectives of Tabular

A mantra in two parts …

- Simplicity of Use
- “High performance by default”

Simplicity of Use …

- **Targets business information workers**
- **Assumes no expert technical skills / knowledge**
- **More intuitive entity representation**
- **Relational concepts (tables, relationships, etc.)**
  … versus Multidimensional constructs (cubes, dimensions, etc.)
- **Straightforward Business Logic Layer (Excel-formula-like DAX)**
- **Data Access Layer – easy import from many sources without in-depth query / scripting knowledge**
- **Simplified Data Reporting and Analysis**
  - Familiar Excel PivotTable / PivotChart or Power View
  - Less reporting authoring experience required

“High Performance by Default”

- Less ongoing requirement for “special tuning”
- In-memory data base (xVelocity) that leverages column-based storage
- A great fit for data that is typically analyzed “by columns”
- Leverages recent and upcoming hardware advances
- DAX is optimized for modern multi-core processors

Caveat …

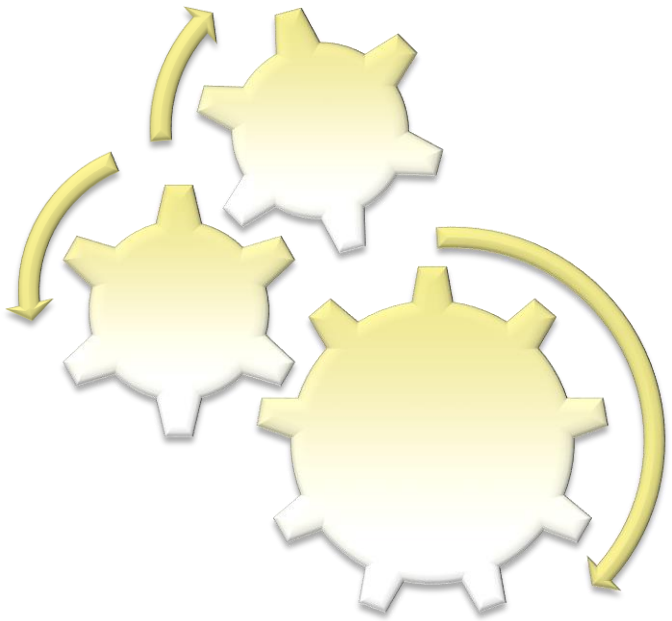
Keep in mind that Tabular is less-feature-rich and scalable than MultiDimensional …

Analysis Services Tabular from 10,000 Feet

The Steps:

- **Create a New Tabular Model Project**
- **Add Data**
- **Basic Preparation: Rename Columns & Mark Date Table**
- **Create Relationships**
- **Create Calculated Columns**
- **Create Measures**
- **Perform Analysis in the Tabular Model**
- **Deploy the Tabular Model**

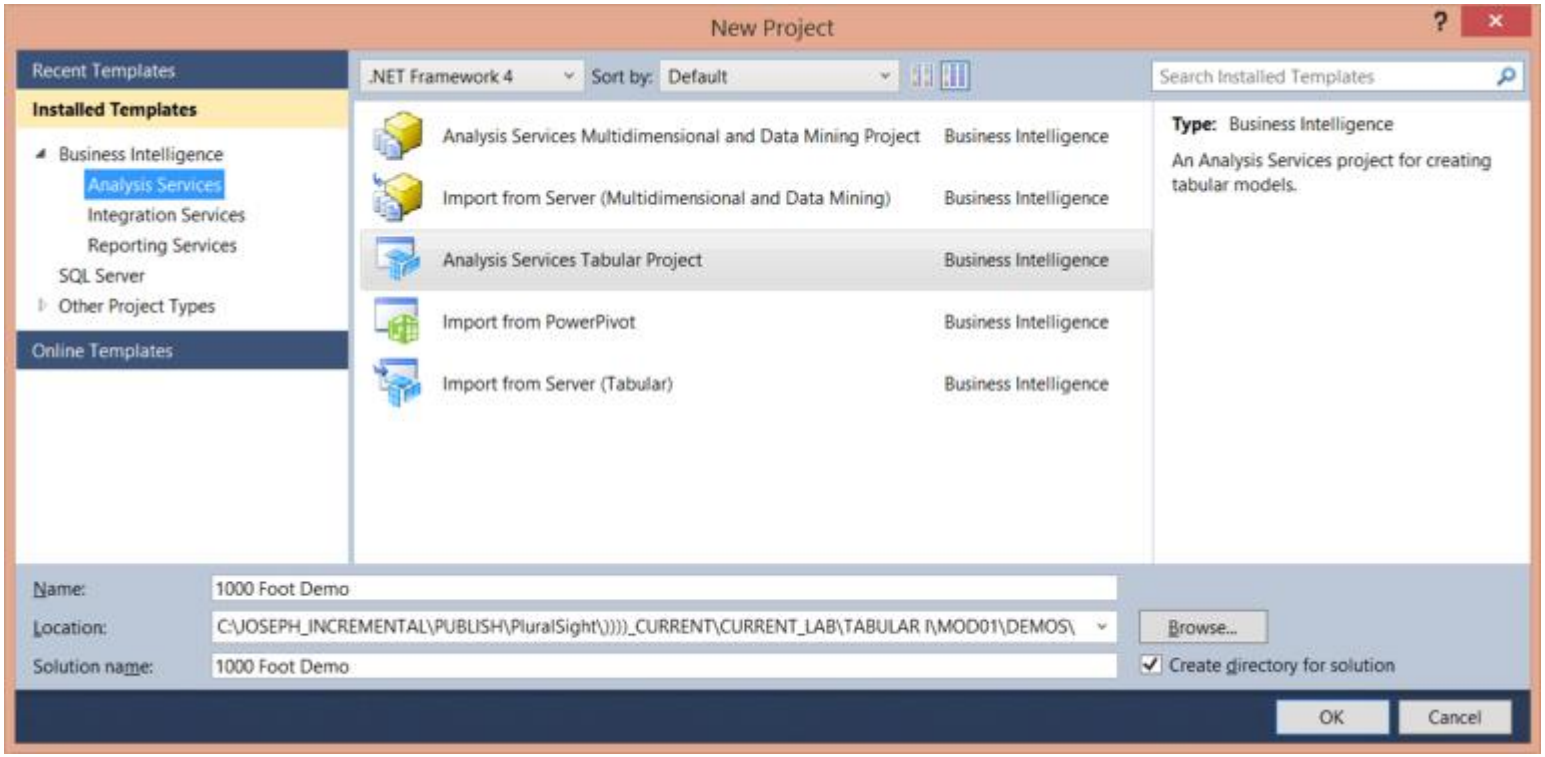
Steps in Building the Tabular Model



Let's Take a Look:

We'll do a high-level walkthrough of each these steps …

Create a New Tabular Project



Add Data

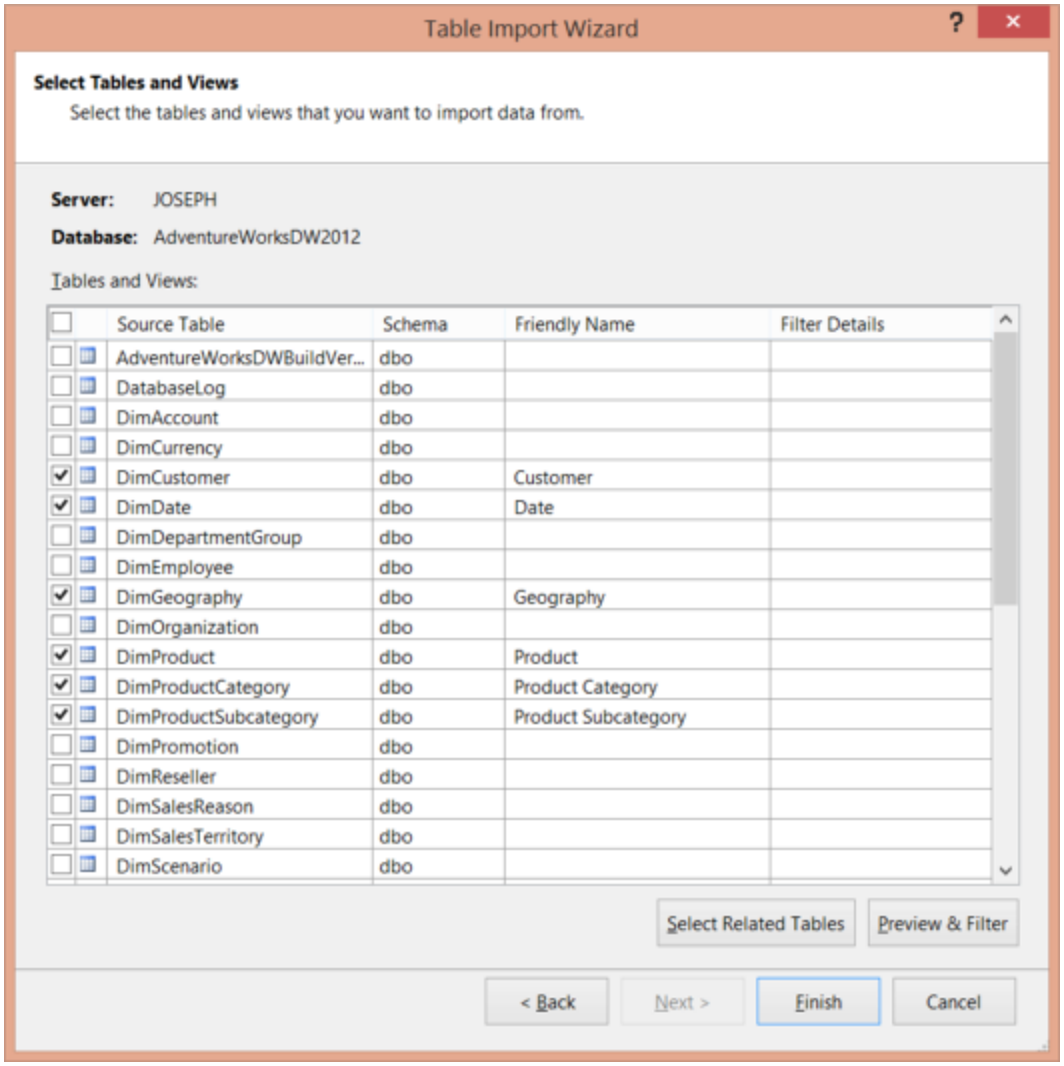
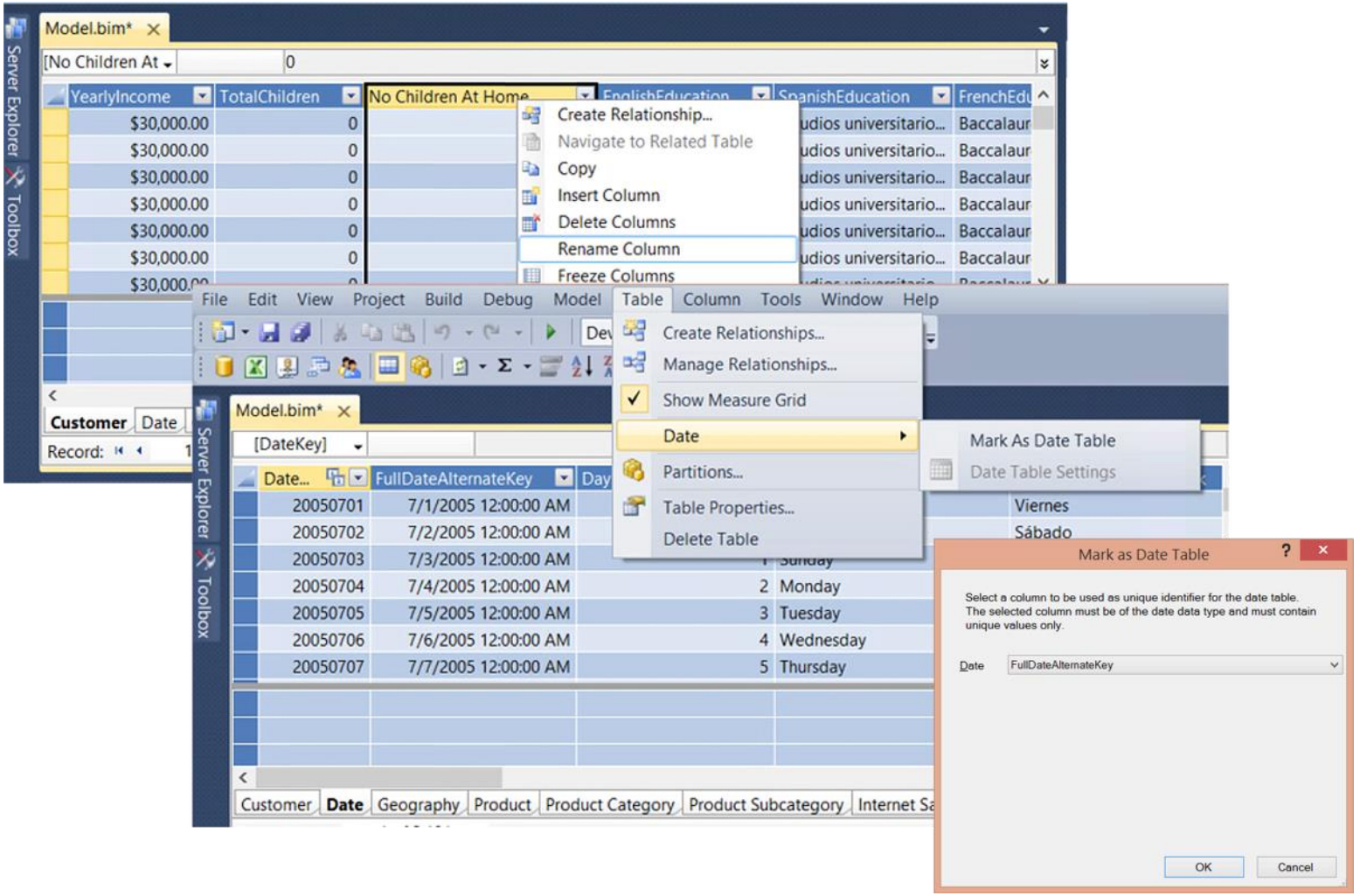
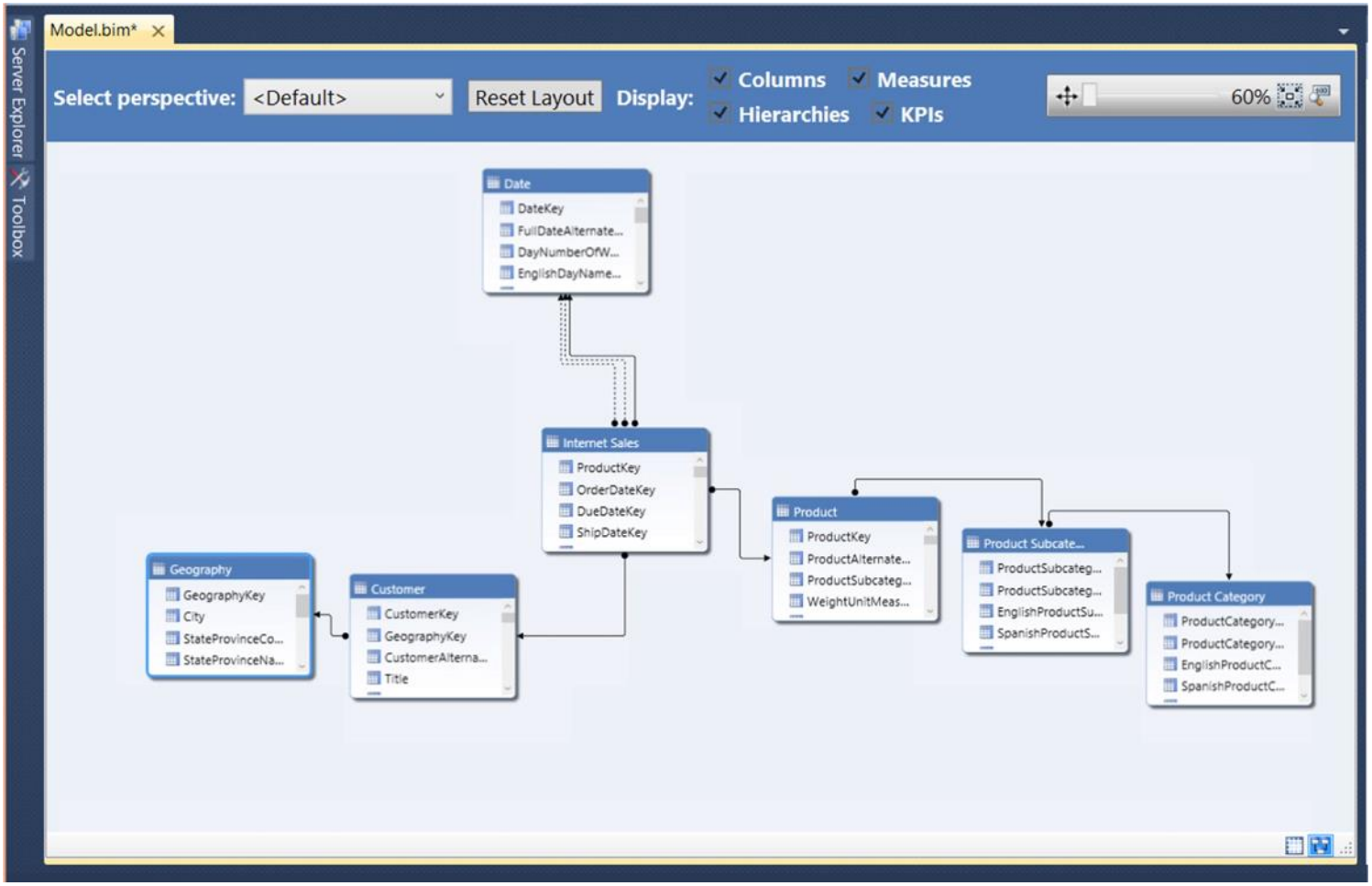


Table Import Wizard
Select Tables and Views
Select the tables and views that you want to import data from.
Server: JOSEPH
Database: AdventureWorksDW2012
Tables and Views:
Source Table | Schema | Friendly Name | Filter Details
AdventureWorksDWBuildVer... | dbo
DatabaseLog | dbo
DimAccount | dbo
DimCurrency | dbo
DimCustomer | dbo | Customer
DimDate | dbo | Date
DimDepartmentGroup | dbo
DimEmployee | dbo
DimGeography | dbo | Geography
DimOrganization | dbo
DimProduct | dbo | Product
DimProductCategory | dbo | Product Category
DimProductSubcategory | dbo | Product Subcategory
DimPromotion | dbo
DimReseller | dbo
DimSalesReason | dbo
DimSalesTerritory | dbo
DimScenario | dbo
Select Related Tables
Preview & Filter
< Back
Next >
Finish
Cancel

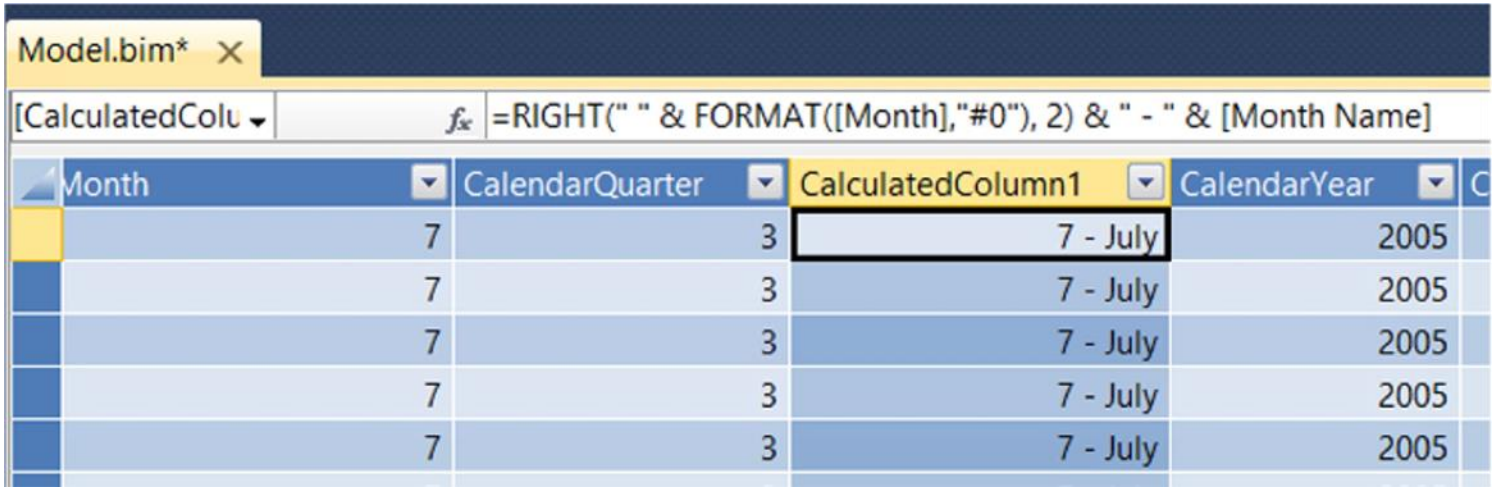
Basic Preparation



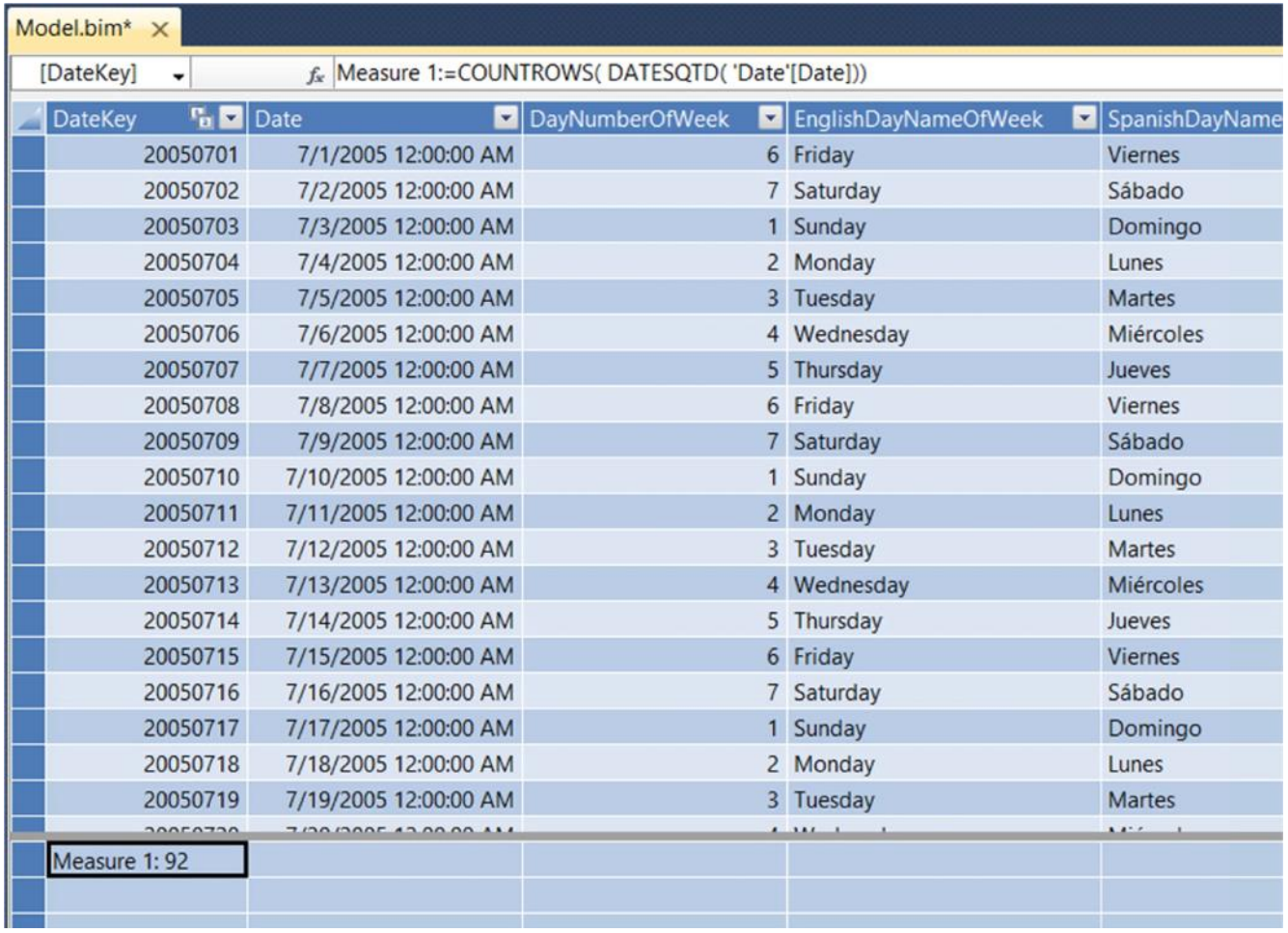
Create Relationships



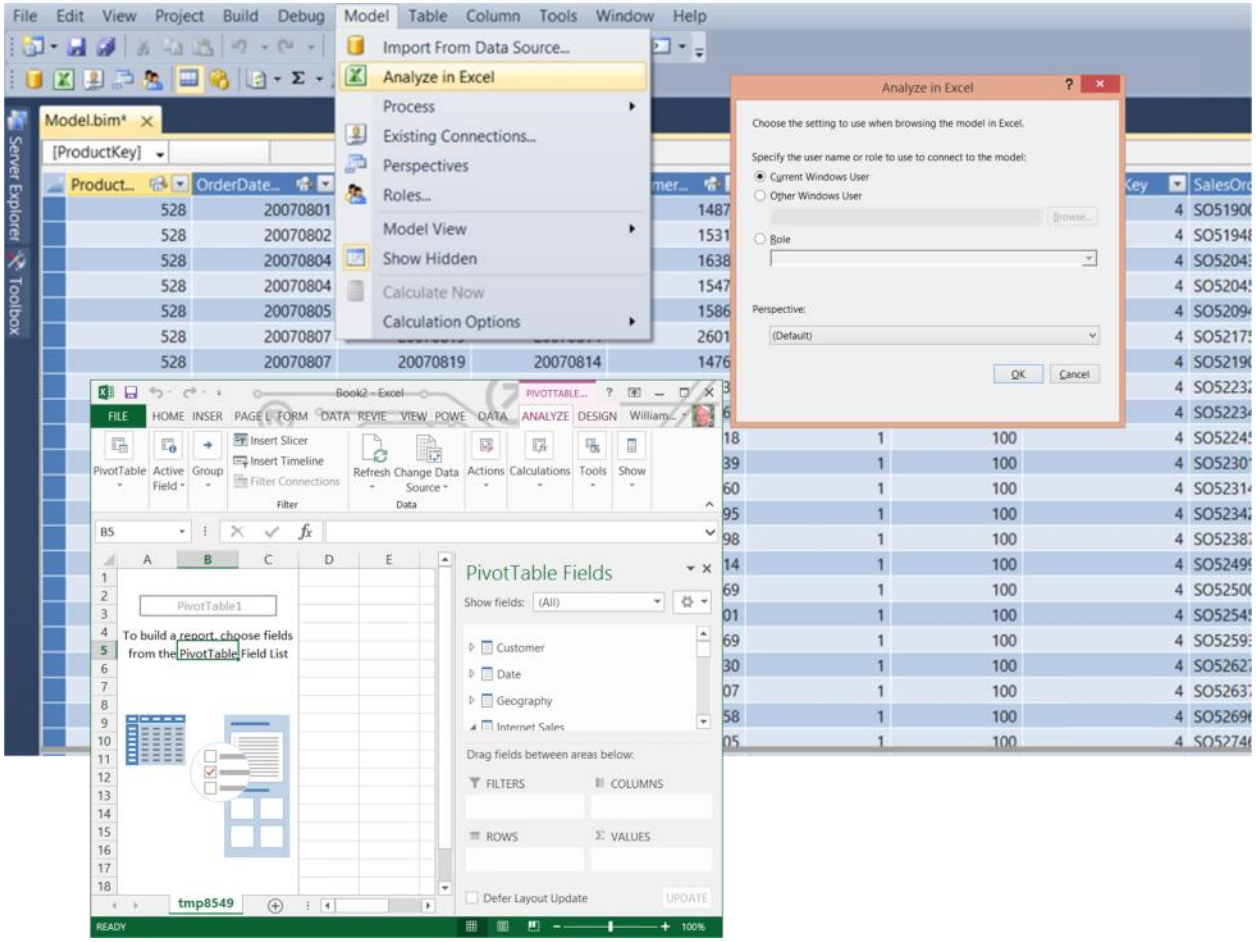
Create Calculated Columns



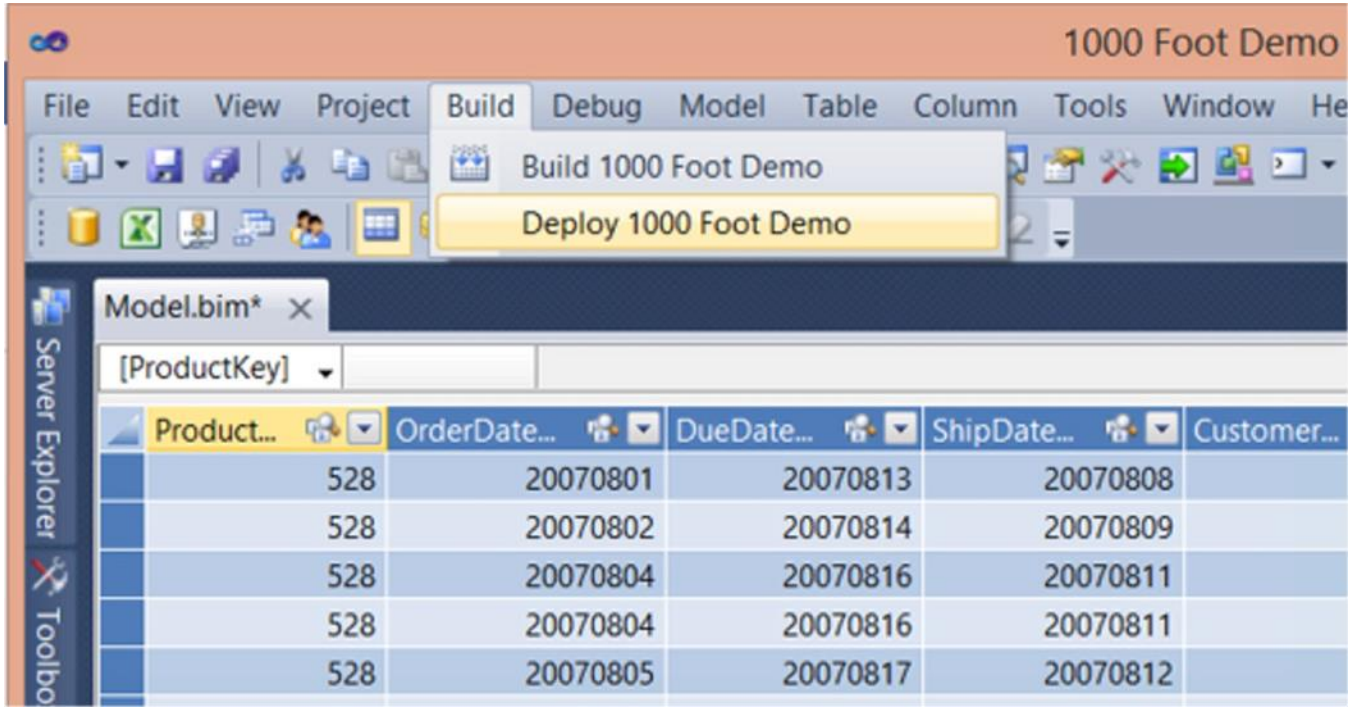
Create Measures



Perform Analysis in the Tabular Model



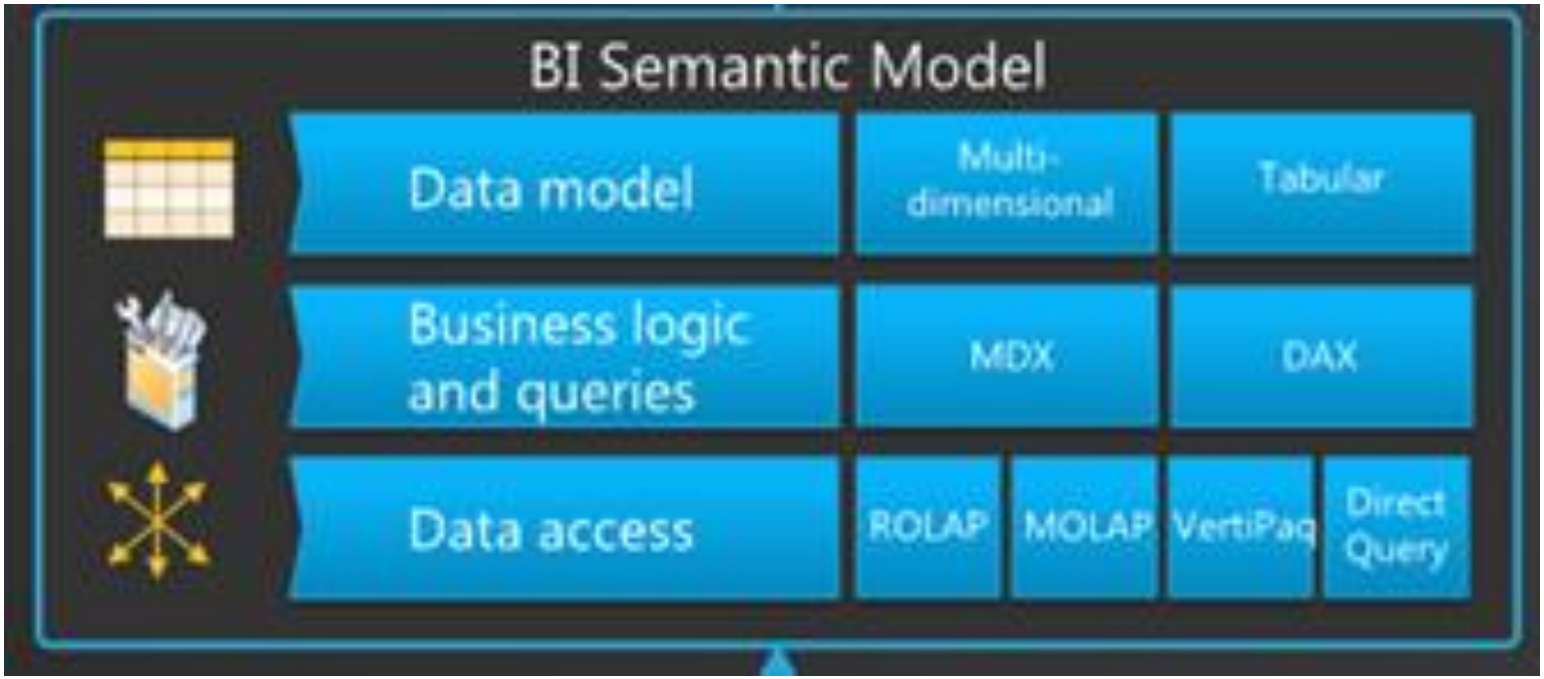
Deploy the Tabular Model



Analysis Services Options: SSAS Multidimensional or SSAS Tabular?

- Architectural Comparison, Layer-by-layer
- Making the Choice

Architectural Comparison, Layer-by-Layer



Architectural Comparison
Data Access Layer

Component	MultiDimensional	Tabular
Data Sources	Relational (single DB ideal)	Relational, Multidimensional, Flat files, SSRS, OData
Primary Storage	Disk	RAM
Storage Modes	MOLAP, ROLAP, HOLAP, Proactive caching	xVelocity, DirectQuery
Aggregations	Yes	N/A
Partitions	Parallel or serial processing	Serial processing

Architectural Comparison
Business Logic Layer

Component	MultiDimensional	Tabular
Constructional Elements	Calculated members, Scope assignments, Named sets	Calculated columns, Calculated measures
Expression Language	MultiDimensional eXpressions (MDX)	Data Analysis Expressions (DAX)
Extensions	.NET Stored Procedures	No

Architectural Comparison
Data Model Layer

Component	MultiDimensional	Tabular
Foundational Schema	MultiDimensional (Cubes, Dimensions)	Relational (Tables, Columns)
Consumer Constructs	KPI's, Actions, Perspectives, Translations	KPI's, Drill-through action (default), Perspectives
Aggregation Options	Sum, Average, Min, Max, Count, DistinctCount, Semi-Additive	Sum, Average, Min, Max, Count, DistinctCount
Definable Entity Relationships	Regular, Role-playing, Many-to-many, Parent-child, Referenced, Data-mining	Regular, Role-playing (via DAX), Many-to-many (via DAX)

Making the Choice

- **General Considerations, Layer-by-layer**
  - Data Access
  - Business Logic
  - Data Model

General Considerations: Data Access Layer

- **With the exception of Distinct Count calculations, don't expect dramatic performance gains moving from Multidimensional to Tabular**

  (MultiDimensional caches in memory, too …)

- **Tabular may perform better, in general, than a sub-optimally designed cube**
- **While both models support partitioning, Tabular partitions within a table sequentially, and may therefore be much slower with large tables**
- **High cardinality (many unique values) columns in the underlying data will reduce xVelocity compression ratio, so performance may not be better than via Multidimensional, if we cannot eliminate such columns**
- **When working with a single data warehouse, MultiDimensional shines**
- **When multiple sources exist, or there is a need to bring external data into the model, Tabular shines**

General Considerations: Data Access Layer (cont'd) …

- PowerPivot / Tabular dominates as a rapid prototyping / design tool
- When estimating Tabular memory requirements, account for at least twice the size of the disk footprint to allow memory for data refreshment, etc.
- Tabular models deployed to a dedicated Analysis Services server support basic paging, where memory is paged to disk under memory pressure
- MultiDimensional offers extensive paging support, and is designed to scale to terabytes of data

General Considerations: Business Logic Layer

- **MultiDimensional uses Calculated Members / Measures in the manner that Tabular uses Measures to deliver aggregations**
  - Dynamically evaluated
- **Tabular exposes Calculated Columns, defined via DAX, that materialize expression results**
  - (nearest parallel in MultiDimensional: Named Calculations in the Data Source View)
- **Tabular does not support the Scope Assignment capability found in Multidimensional**
  - This means a Calculated Measure must be created for EVERY column (such as Sales YTD, Order Quantity QTD, etc.) that needs a custom aggregation
  - Poses challenges from both usability and maintenance perspectives
- **Many other Business Logic layer considerations**
  - Capabilities of MDX vs DAX, etc.

General Considerations: Data Model Layer

- **MultiDimensional is more sophisticated and mature, and carries a steeper learning curve**
- **Novice users may find Tabular easier (relationally architected)**
- **Options in MultiDimensional that have no Tabular equivalent may require consideration (and even, perhaps, drive choices):**
  - Custom rollup
  - Default members
  - Discretized attributes
  - Unary operators
  - Attribute types
  - Visibility of hierarchy levels
  - Many other properties and settings

Getting Started With SSAS 2012 Tabular Summary

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  - Objectives of Tabular
- **Analysis Services Tabular from 10,000 Feet**
- **Analysis Services Options: SSAS Multidimensional or SSAS Tabular?**
  - Architectural Comparison, Layer-by-layer
  - Making the Choice