

# MS SSAS & Business Value: Should I choose Tabular or Multidimensional

Wylie Blanchard  
IT Consultant; Database Technology

# About Great Tech Pros

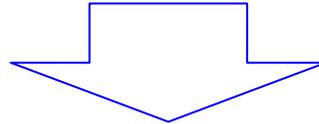
- Great Tech Pros was founded in 2012
- Specialties include:
  - IT Consulting
  - Database Administration, Management
  - Data Analysis
  - Website Design and Development
  - Professional Training and Presentations
- Visit us at [www.GreatTechPros.com](http://www.GreatTechPros.com)

# Speaker:



# Wylie Blanchard

- SQL Server Database Consultant
- MCSE: SQL Server Data Platform
- MCSE: Data Management and Analytics
- Website: [WylieBlanchard.com](http://WylieBlanchard.com)
- LinkedIn: [in/WylieBlanchard](https://in.linkedin.com/in/WylieBlanchard)
- Twitter: [@WylieBlanchard1](https://twitter.com/WylieBlanchard1)



- Pizza Connoisseur (self proclaimed)

# Presentation Summary

Determine which model presents the right business value for your company's analytical needs.

In this session we'll discuss the difference between SSAS Tabular and SSAS Multidimensional modes, feature differences as well as the benefits and cons to utilizing both modes in MS SQL Server 2016.

# Agenda

- Business Intelligence (BI) Semantic Model
- Data Model
- Business Logic & Queries
- Supported Data Sources
- Security Features
- Key Business Considerations

# What You Should Know

- This is not an overview
- How relational databases work
- Business Analytics
- How does your company uses BI
- How do you want to deliver BI
- What solution is the business solving

# BI Semantic Model

3rd party applications



Reporting Services



Excel



Power Pivot



SharePoint Insights



# BI Semantic Model



**Data Model**

Tabular

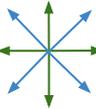
Multidimensional



**Business Logic & Queries**

DAX

MDX



**Data Access**

Vertipaq

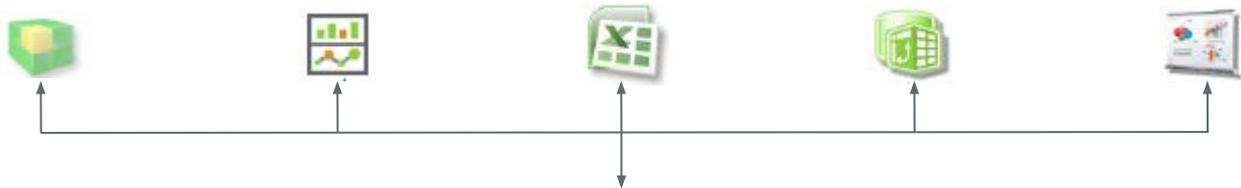
Direct Query

ROLAP

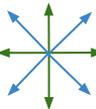
MOLAP

Courtesy: [“The BI semantic model, MDX, DAX, and you”](#)

# Data Model



## BI Semantic Model



<b>Data Model</b>	Tabular		Multidimensional	
<b>Business Logic &amp; Queries</b>	DAX		MDX	
<b>Data Access</b>	Vertipaq	Direct Query	ROLAP	MOLAP

# Model Types

- PowerPivot
- PowerPivot for SharePoint
- Tabular Model
- Multidimensional Model

# Model Types

<b>Model Type</b>	<b>Business Use</b>
<b>Power Pivot</b>	Personal BI
<b>Power Pivot for SharePoint</b>	Team BI
<b>Tabular</b>	Server / Enterprise
<b>Multidimensional</b>	Server / Enterprise

# Model Features and Differences

	<b>Power Pivot</b>	<b>Tabular</b>	<b>Multidimensional</b>
Actions	No	No	Yes
Aggregations	No	No	Yes
Calculated Column	Yes	Yes	No
Calculated Tables	No	Yes	No
Custom Assemblies	No	No	Yes
Display folders	No	Yes	Yes
Drillthrough	Yes	Yes (depends on client application)	Yes
Linked objects	No	Yes (linked tables)	Yes

# Model Features and Differences

	Power Pivot	Tabular	Multidimensional
Many-to-many relationships	No	No (but there is <u>bi-directional cross filters</u> at 1200 and higher compatibility levels)	Yes
Parent-child Hierarchies	Yes	Yes (via DAX)	Yes
Partitions	No	Yes	Yes
Perspectives	Yes	Yes	Yes
Row-level Security	No	Yes	Yes
Object-level Security	No	Yes	Yes
Translations	No	Yes	Yes
Writeback	No	No	Yes

# Supported Data Sources

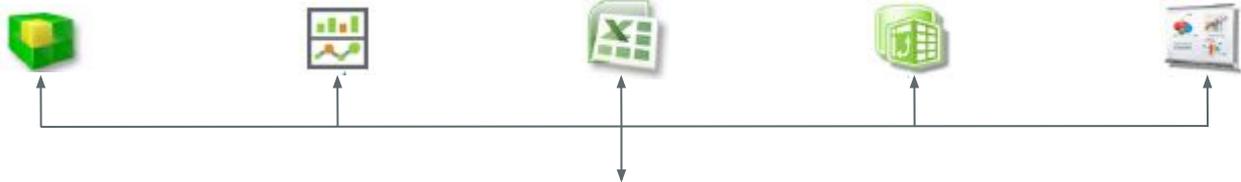
## Tabular

- Microsoft Access 2010 and later
- Microsoft SQL Server 2008 and later
- Oracle 9i and later.
- Teradata, Informix, IBM DB2, Sybase
- Text files
- Power Pivot workbook
- Microsoft Excel files
- Analysis Services cube 2008+
- [And more](#)

## Multidimensional

- Microsoft Access 2010 and later
- Microsoft SQL Server 2008 and later
- Oracle 9i and later
- Teradata, Informix, IBM DB2, Sybase
- [Learn more](#)

# Business Logic & Queries



## BI Semantic Model



<b>Data Model</b>	Tabular		Multidimensional	
<b>Business Logic &amp; Queries</b>	DAX		MDX	
<b>Data Access</b>	Vertipaq	Direct Query	ROLAP	MOLAP

# Row Level Transformations

- Tabular
  - Created with Calculated Columns
  - Evaluation occurs with every record
  - No ETL
- Multidimensional
  - Performed before Data is loaded
  - Performed when model is queried
  - Transformation can be applied using MDX

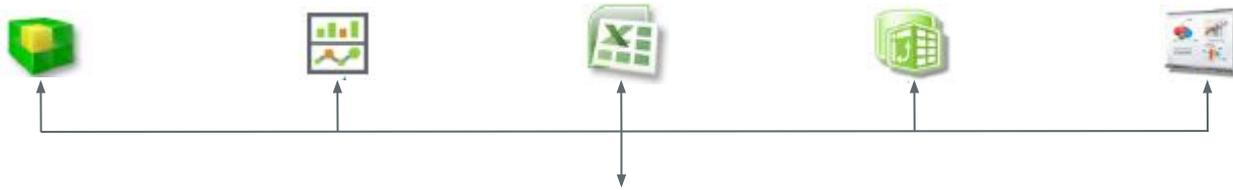
# Aggregate Values

- Tabular
  - Measures
  - Data stored In-Memory
  - Aggregates calculated at query time
- Multidimensional
  - Measures
  - Aggregated bottom to up across hierarchies
  - Uses native cube functions

# Calculations

- Tabular
  - Uses DAX to create calculations
  - Filter
- Multidimensional
  - Uses MDX to create calculations
  - Scope

# Data Access



## BI Semantic Model



**Data Model**

Tabular

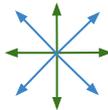
Multidimensional



**Business Logic & Queries**

DAX

MDX



**Data Access**

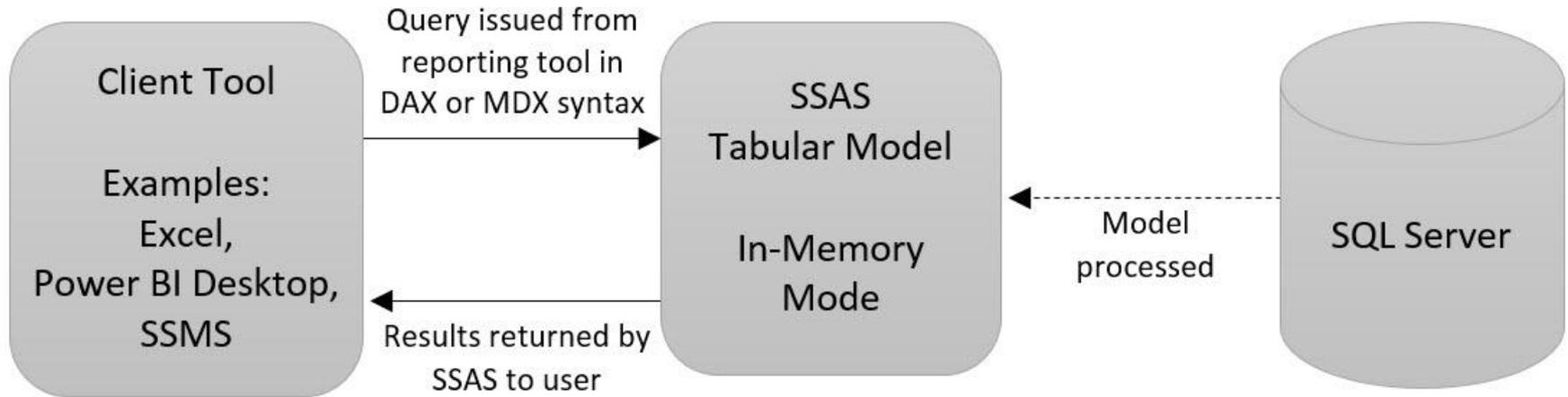
Vertipaq

Direct Query

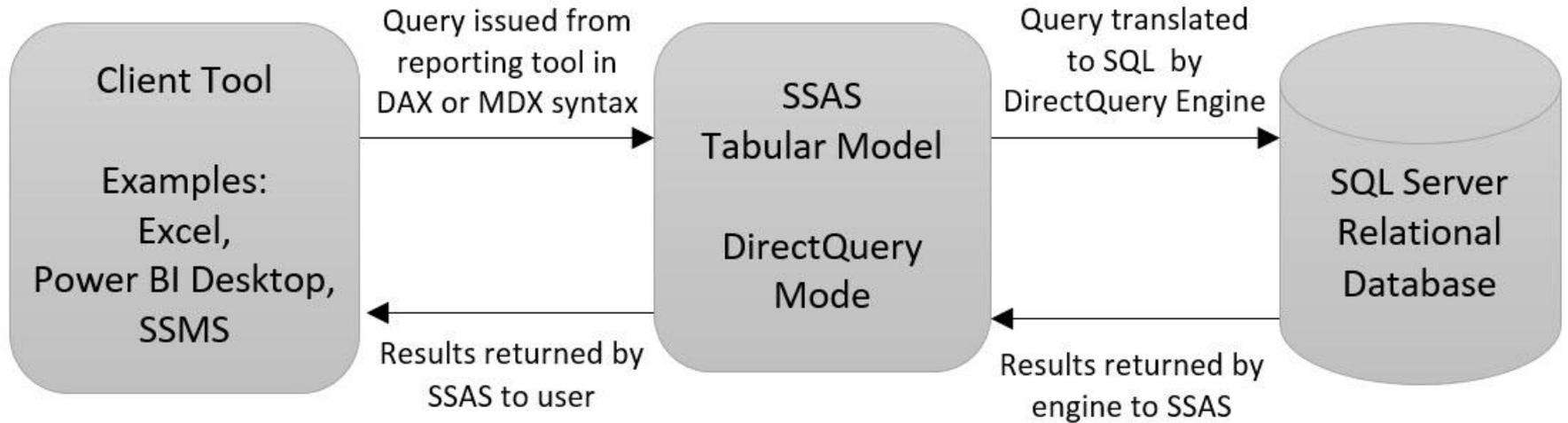
ROLAP

MOLAP

# Vertipaq (In-Memory) - Tabular



# DirectQuery - Tabular



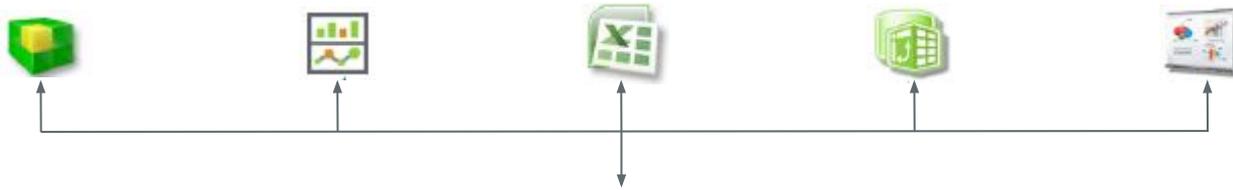
# Multidimensional Storage Modes

Storage Mode	Data Storage	Aggregation Storage	Query Performance	Latency
<b>MOLAP</b>	Cube	Cube	High	High
<b>HOLAP</b>	Relational Data	Cube	Medium	Low
<b>ROLAP</b>	Relational Data	Relational Data	Low	Low

# Multidimensional: MOLAP vs ROLAP

Storage Mode	Schema	Database Size	Access
<b>MOLAP</b>	Cube	Small to Medium	Predetermined Dimensions
<b>ROLAP</b>	Star Schema	Medium to Large	Support Adhoc Requests

# Data Access



## BI Semantic Model



**Data Model**

Tabular

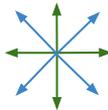
Multidimensional



**Business Logic & Queries**

DAX

MDX



**Data Access**

Vertipaq

Direct Query

ROLAP

MOLAP

# Security Features

# Security Features

- Power Pivot
  - File Level using SharePoint Permissions
- Tabular model
  - Row Level security using role-based permissions
  - Object Level (for 2017)
- Multidimensional model databases
  - Dimension and cell-level security
  - Using role-based permissions

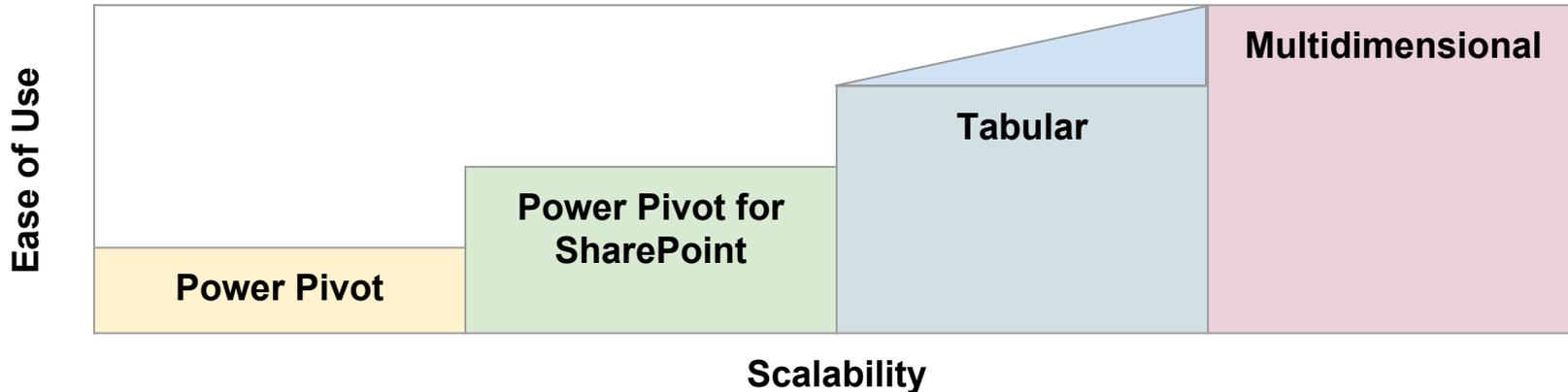
# Key Business Considerations

# Tabular

- Ease of Use
- Power Pivot
- Power BI
- Start w/ Data
- Data Sources

# Multidimensional

- Scalability
- Writeback
- Actions
- Start w/ Model
- Dimensional Model



# Thank You

## Feedback

- [GreatTechPros.com/feedback](https://GreatTechPros.com/feedback)
- [WylieBlanchard.com/feedback](https://WylieBlanchard.com/feedback)

# Resources / Recommended

- Comparing tabular and multidimensional solutions - <https://docs.microsoft.com/en-us/sql/analysis-services/comparing-tabular-and-multidimensional-solutions-ssas>
- The BI semantic model, MDX, DAX, and you - <https://blogs.msdn.microsoft.com/cathyk/2011/10/17/the-bi-semantic-model-mdx-dax-and-you/>
- SSAS Tabular vs. SSAS Multidimensional – Which One Do I Choose? – <http://falconteksolutionscentral.com/?p=734>
- Understanding the SQL Server 2012 BI Semantic Model (BISM) - <https://www.mssqltips.com/sqlservertip/2818/understanding-the-sql-server-2012-bi-semantic-model-bism/>
- Object-level security (Tabular 2017) - <https://docs.microsoft.com/en-us/sql/analysis-services/tabular-models/object-level-security>
- Comparing Tabular and Multidimensional Solutions (SSAS) - [https://msdn.microsoft.com/en-us/library/hh212940\(v=sql.120\).aspx](https://msdn.microsoft.com/en-us/library/hh212940(v=sql.120).aspx)

# Resources / Recommended

- Image Source: The BI semantic model, MDX, DAX, and you - <https://blogs.msdn.microsoft.com/cathyk/2011/10/17/the-bi-semantic-model-mdx-dax-and-you/>
- Image Source: <http://www.sqlchick.com/entries/2016/3/20/overview-ssas-tabular-directquery-mode-sql-server-2016>
- Microsoft Business Intelligence Stack Essential Training - <https://www.lynda.com/Excel-tutorials/Microsoft-Business-Intelligence-Stack-Depth/172384-2.html>
- Learning Microsoft Business Intelligence Stack - <https://www.lynda.com/Excel-tutorials/Microsoft-Business-Intelligence-Stack-Fundamentals/169623-2.html>
- Analysis Services Fundamentals - <https://www.pluralsight.com/courses/ssas-basic>
- Advanced Analysis Services - <https://www.pluralsight.com/courses/ssas-adv>