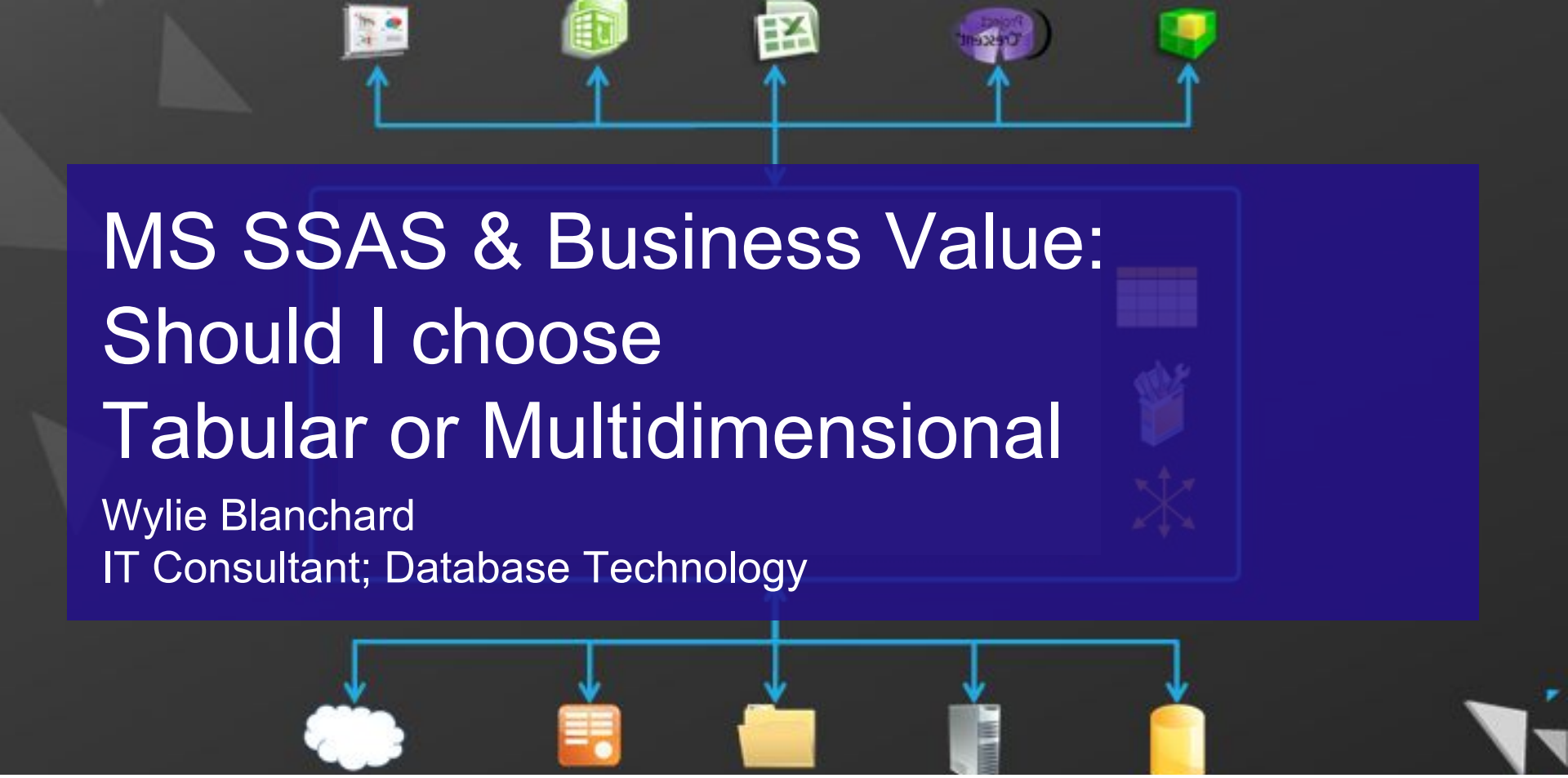

MS SSAS & Business Value: Should I choose Tabular or Multidimensional

Wylie Blanchard
IT Consultant; Database Technology

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- Great Tech Pros was founded in 2012
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  - Data Analysis
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Speaker: Wylie Blanchard

- **SQL Server Database Consultant**
  - MCSE: SQL Server Data Platform
  - MCSE: Data Management and Analytics
- **Website: WylieBlanchard.com**
- **LinkedIn: in/WylieBlanchard**
- **Twitter: @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

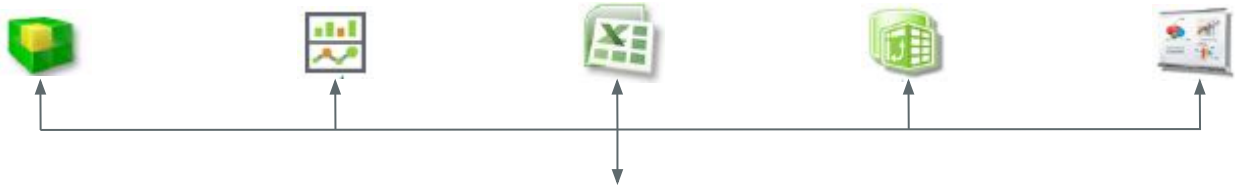
3rd party applications

Reporting Services

Excel

Power Pivot

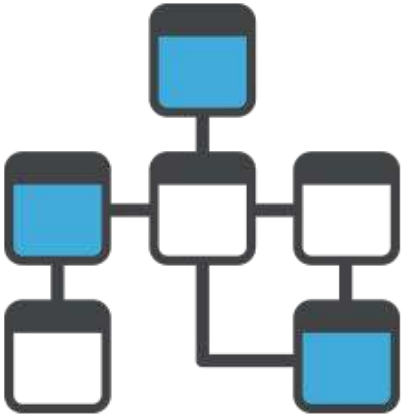
SharePoint Insights



BI Semantic Model

Data Model	Tabular		Multidimensional	
Business Logic & Queries	DAX		MDX	
Data Access	Vertipaq	Direct Query	ROLAP	MOLAP

Data Model



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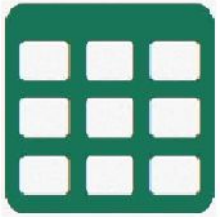
Tabular

Power Pivot for Excel

Power Pivot for SharePoint



Analysis Services Tabular

Multidimensional

Analysis Services Multidimensional

Model Features and Differences

	Power Pivot	Tabular	Multidimensional
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 bi-directional cross filters 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

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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

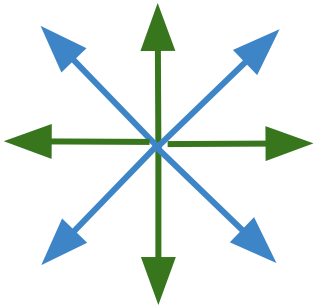
Aggregate Values

- 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



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Vertipaq (In-Memory) - Tabular

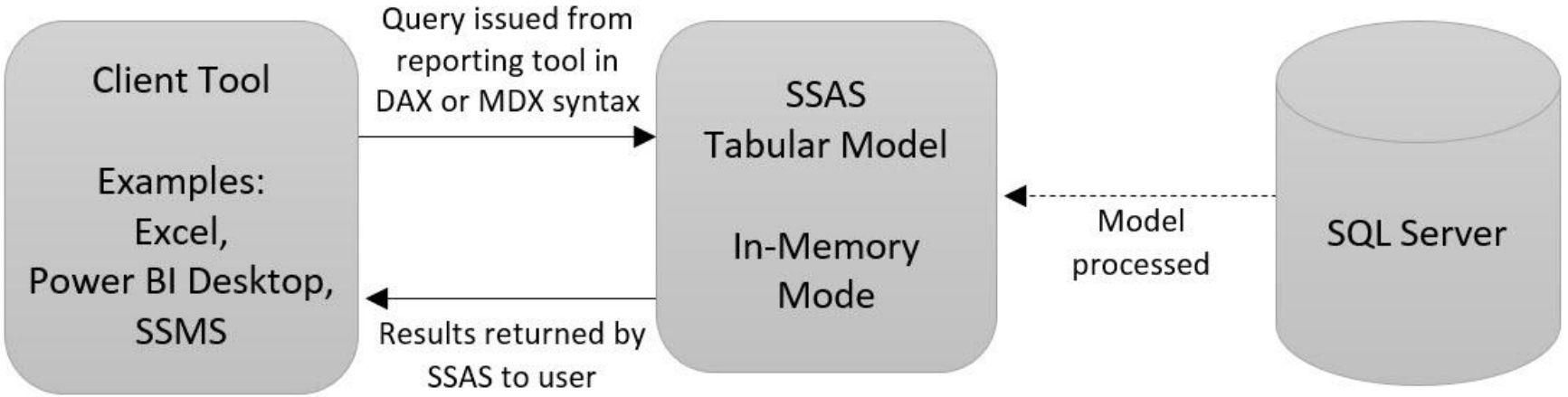


Image courtesy of SQLChick

DirectQuery - Tabular

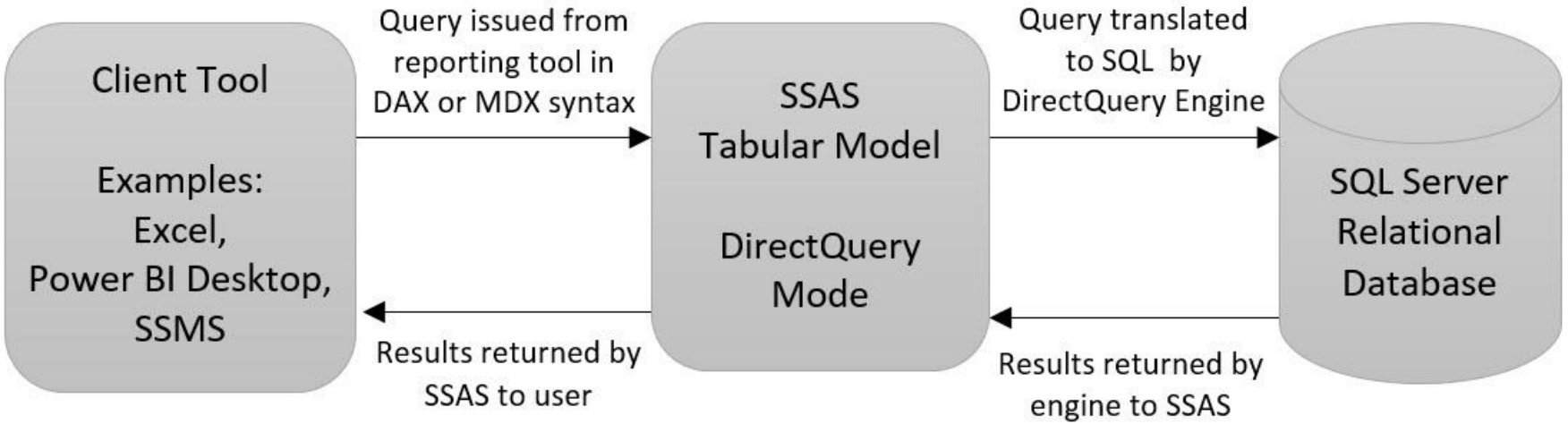


Image courtesy of SQLChick

Multidimensional Storage Modes

Storage Mode	Data Storage	Aggregation Storage	Query Performance	Latency
MOLAP	Cube	Cube	High	High
HOLAP	Relational Data	Cube	Medium	Low
ROLAP	Relational Data	Relational Data	Low	Low

Multidimensional: MOLAP vs ROLAP

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

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

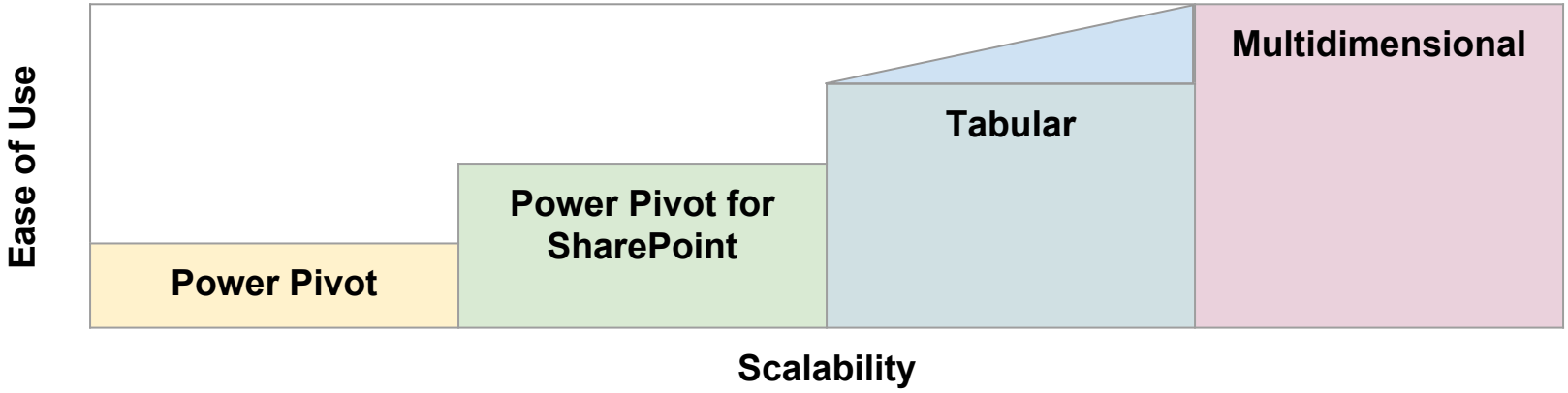
Key Business Considerations

Tabular

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

Mutidimensional

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



Thank You

Feedback

- GreatTechPros.com/feedback
- 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/

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