

Report Model (SMDL) Alternatives in SQL Server 2012

A Guided Tour of Microsoft®
Business Intelligence

Technical Article

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Report Model (SMDL) and Features for Comparison

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Applies To: SQL Server 2012 Service Pack 1 and later, Report Models from SQL Server 2005 and later

NOTE: Microsoft recently renamed PowerPivot (no space) to Power Pivot (with a space). Throughout this document, the new Power Pivot name will be used.

Report Models, based on Semantic Model Definition Language (SMDL), were introduced as an ad hoc reporting feature with SQL Server Reporting Services 2005. They enabled users to create their own reports in an Office-like drag and drop tool, Report Builder, without requiring them to have technical knowledge of the underlying data source. Many organizations saw this as an opportunity to empower their business users to create their own reports. However, "Semantic modeling language (SMDL) report models are deprecated. Although you can continue to use existing report models as data sources in SQL Server 2012 Reporting Services reports you should consider updating your reports to remove their dependency on report models."¹

Users who have become dependent on Report Models for their reporting needs will have some decisions to make when migrating to SQL Server 2012 and/or future versions of SQL Server. The purpose of this article is to consolidate those options into a single source to make it easier to make an informed decision.

Report Models and all Alternatives presented will be measured according to their support for the following features. Many of these features are key benefits of Report Models. Others are supported by at least one of the Alternatives presented. These features will be useful in comparing Alternatives to each other to determine which would be best in your environment. Below is a comparison of Report Models with each of the features chosen. For each Alternative presented later, a similar summary table is presented comparing that Alternative with Report Models. Each table is followed by a more detailed analysis of each feature.

TABLE 1: FEATURES FOR COMPARISON WITH REPORT MODEL

	Report Model
Support For Drag-and-Drop Data Selection	✓
Support For "Real-Time" Reporting	✓
Item-Level Security	✓
Row-Level Security	✓
Perspectives	✓
Supported Reporting Services Report Data Source	✓
Supported Excel Data Source	
Excellent Performance Returning Summary (Aggregated) Data	
Excellent Performance Returning Detail Data	
No Hard Upper Limit On Data Volume	✓
Support More Than One Data Source	
Supported in Standard Edition of SQL Server 2012	✓

Drag-and-Drop Data Selection

Users can create their own datasets by dragging and dropping fields from an organized list of options without having technical knowledge of the underlying data source(s). In addition, they can do so without syntactic knowledge of any query languages. This strength of Report Models was the primary driver in the selection of all Alternatives presented.

Support for “Real-Time” Reporting

“Real Time” here refers to having the data returned be just as current as the data in the source. For example, if your source is a data warehouse that is updated each night at 3am via an ETL (Extract, Transform, Load) process, then the data returned will be as current as the last execution of the ETL. Report Models do not store ANY data rows; they are just metadata layers. Therefore, data returned via a Report Model is always as current as the source.

Item-Level Security

Security can be applied to individual objects. This means that you can control what fields, tables, etc., are present to users for creating their datasets. For example, you can configure your Report Model so that only certain personnel in the Finance department can see fields related to budget forecasting. Those fields would be invisible to those without the proper rights to use them.

Row-Level Security

Security can be applied to data rows based on field values within those rows. While Item-Level Security controls what options are available, Row-Level Security controls what results can be returned for the objects selected. For example, we could ensure that sales representatives can only see the history for their own sales based on the Sales Rep field value attached to the Sales order records.

Perspectives

You can create alternate presentations of your Report Model that contain a subset of the objects contained in the full model. These alternative presentations are called Perspectives. For example, if your Report Model has 14 Entities but the Accounting department only ever uses four of those Entities, you can create a Perspective that includes only those four Entities. This allows users in the Accounting department to choose that Perspective and focus on what they need without the clutter of Entities that are not useful to them. It is very important to understand that Perspectives are an organizational tool only; they do NOT provide any level of security whatsoever.

Supported As Reporting Services Report Data Source

Report Models are supported as data sources for SQL Server Reporting Services reports. This support includes reports created in Business Intelligence Development Studio (BIDS) as well as Report Builder. This means that users can create reports that can support the full functionality of Reporting Services reports, such as Subscriptions.

Supported As Excel Data Source

While Report Models cannot be used as the data source for Excel pivot tables and charts, many of the Alternatives presented can. This means that users can work directly with data in the Excel environment they are used to and, often, prefer. While some of the Alternatives presented live directly in Excel, for others Excel is merely the user interface for working with data. Microsoft has been investing heavily in expanding Excel's capabilities as a data exploration/analytics platform. This started with Power Pivot in Excel 2010 and carries through to amazing features of Excel 2013 like Power View. The recently announced Power BI² suite of Office 365 takes this to even greater heights with features like Power Map and Power Query.

Excellent Performance Returning Summary (Aggregated) Data

Report Models are known much more for ease of use than for high performance. As such, it would be inappropriate to list Excellent performance as a feature supported by Report Models. Many of the Alternatives presented store data in a manner designed for returning aggregated results quickly and efficiently. In the case of Analysis Services Multidimensional Cubes, these aggregated results can even be pre-calculated so that the answers are stored and ready when called for. For Analysis Services Tabular models, detail data is stored in server side memory so data retrieval, even while aggregating that data on the fly, is very fast.

Excellent Performance Returning Detail Data

Again, Report Models are built for ease of use, not performance.

No Hard Upper Limit on Data Volume

As Report Models are metadata layers only, they do not store any data rows at all. Therefore, Report Models have no hard cap on the amount of data they can query. However, the Alternatives presented can/do store data rows and some have upper limits on their size imposed upon them by their technology.

Support for More Than One Data Source

One limitation of Report Models is that they can have one and only one source. Even though they are built on top of the same Data Source View (DSV) structure as an Analysis Services Multidimensional Cube, a Report Model will only use a DSV with ONE source database. However, all of the Alternatives presented allow the consolidation of data from many different sources to use in your analysis. Some of these sources include databases, text files, and even the Azure Data Marketplace.

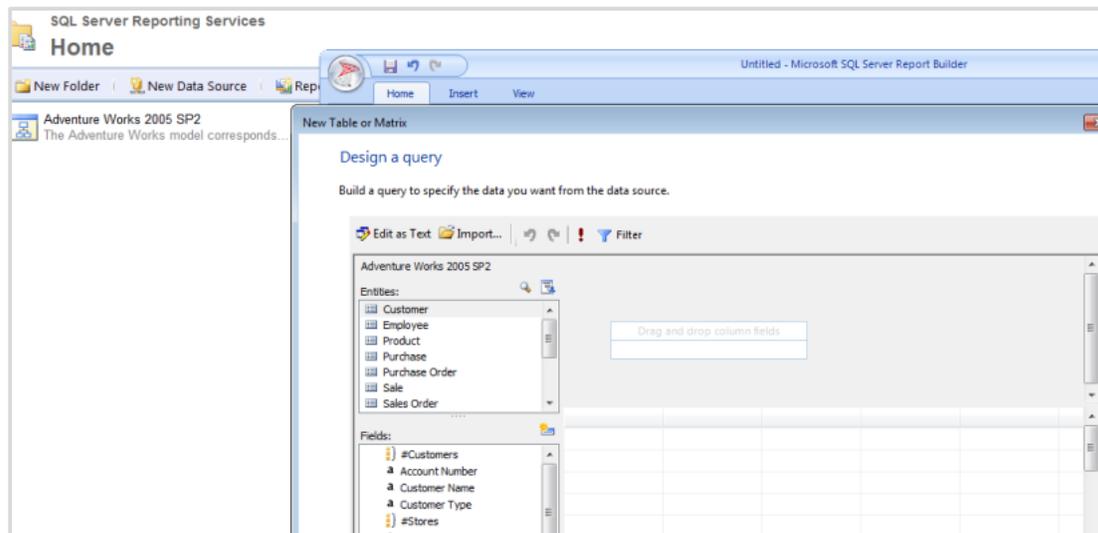
Supported in Standard Edition of SQL Server 2012

While there are features of Report Models that are Enterprise-only, you can use Report Models with the Standard Edition of SQL Server. However, some of the Alternatives presented require either Enterprise Edition or Business Intelligence Edition (a new Edition in SQL Server 2012).

Alternative 1: Deploy Existing Report Model into Reporting Services 2012 Instance

You can deploy existing Report Models from Business Intelligence Development Studio (BIDS) into instances of Reporting Services (SSRS) 2012. Given that Report Models themselves have changed very little since they were first introduced, even Report Models from SQL 2005 can be uploaded into Reporting Services 2012.

FIGURE 1: SSRS 2005 SP2 REPORT MODEL DEPLOYED TO SSRS 2012



Since you would be continuing to use your existing Report Model, the benefits would be the same as those listed in Table 1 on Page 4. However, you need to be aware of some limitations of this approach:

- You cannot modify Report Models using SQL Server Data Tools (SSDT, the SQL Server 2012 successor to BIDS)³. In order to continue to make modifications to these models, you will need to continue to use BIDS.
- If your Report Model is sourced from a SQL Server 2012 Database, Named Queries in your Data Source View (DSV) may be impacted in the following ways:
 - You will no longer be able to modify Named Queries you already have
 - You will no longer be able to create Named Queries
 - NOTE: The Microsoft Connect entry reporting this problem also indicates a workaround⁴.

The support for deploying Report Models into the latest version of Reporting Services may not continue in future. It would be advisable to consider this a temporary stop-gap measure while you work on converting your Report Models to one of the Alternatives below.

Alternative 2: SQL Server Analysis Services Multidimensional Model (Cube)

You can replace your existing Report Model with an Analysis Services Multidimensional Cube. Cubes, the traditional OLAP (Online Analytical Processing) construct, provide very fast response and great flexibility in querying business data. They have been around for many years and have achieved a great level of maturity in their features. One advantage of this maturity is that it tends to be relatively easy to find skilled and knowledgeable developers to help you implement and maintain a Cube.

NOTE: While a Cube and its Dimensions are technically separate structures, they are typically referred to holistically as a Cube.

TABLE 2: REPORT MODEL - ANALYSIS SERVICES MULTIDIMENSIONAL (CUBE)

	Report Model	SSAS Multidimensional Cube
Support For Drag-and-Drop Data Selection	✓	✓
Support For "Real-Time" Reporting	✓	✓
Item-Level Security	✓	✓
Row-Level Security	✓	✓
Perspectives	✓	✓*
Supported Reporting Services Report Data Source	✓	✓
Supported Excel Data Source		✓
Excellent Performance Returning Summary (Aggregated) Data		✓
Excellent Performance Returning Detail Data		
No Hard Upper Limit on Data Volume	✓	✓
Support More Than One Data Source		✓
Supported in Standard Edition of SQL Server 2012	✓	✓

* While SSAS Multidimensional Cubes are supported in Standard Edition of SQL Server Analysis Services 2012, the use of Perspectives in Cubes requires Enterprise Edition or Business Intelligence Edition.

Drag-and-Drop Data Selection

Cubes support drag-and-drop data selection in a number of tools, including Excel, Reporting Services and third party tools. Like Report Models, the user-friendly experience is a hallmark of Cubes.

Support for “Real-Time” Reporting

Cubes support “Real-Time” reporting via ROLAP⁵ (Relational Online Analytical Processing) storage mode. In this mode, all data, including pre-calculated aggregates, is stored in the relational database as opposed to multidimensional storage. Cubes in ROLAP mode act as a metadata layer in the same manner as a report model. Keep in mind that this mode sacrifices performance in favor of getting fresher data. You should carefully consider whether the fresher data is worth the cost to performance and thoroughly test your solution if you choose to use ROLAP.

Item-Level Security

Security in the Multidimensional world is based on membership in Roles. Users in a Role inherit the rights granted to the Role. Items that can be secured range from the Cube itself, to Dimensions, Attributes, and even down to the Cell, the lowest unit granularity in a Cube. Each of these objects supports varying levels of rights, making security as simple or robust as you need it to be.

Row-Level Security

Security can be applied to the Members (discrete values) stored within Cells in the Cube. While this concept is more closely coupled with Item-Level Security in Cubes than it is in Report Models, the functionality of Row-Level Security found in the Report Model is certainly supported in a Cube.

Perspectives

Cubes support Perspective in a fashion essentially identical to Report Models. Like in Report Models, a Perspective in a Cube provides NO security, only organizational convenience.

Supported As Reporting Services Report Data Source

Cubes are often used as data sources for Reporting Services reports. When using Reporting Services, you can use the drag-and-drop query designer for creating your datasets, which will write the necessary Multidimensional Expressions (MDX) statements for you, or you can write your own MDX.

Supported As Excel Data Source

Excel is perhaps the most common tool used for working with Analysis Services Multidimensional Cubes. This has been a popular method for years. The increased functionality that has been added in Excel 2010 and most particularly Excel 2013 makes this even better.

Excellent Performance Returning Summary (Aggregated) Data

Cubes are fantastic performers at returning summary data, particularly in the MOLAP (Multidimensional Online Analytical Processing⁵) storage mode, in which ALL data and pre-aggregated values are stored in the multidimensional format. This format is specifically designed for getting data out quickly and efficiently, with a special ability to aggregate data. For this reason, the MOLAP storage mode is the most common mode used.

Excellent Performance Returning Detail Data

While Cubes are very efficient at returning summary data, they have a more difficult time returning detail rows. Their storage structure makes returning detail rows inefficient and expensive in terms of resources. While returning detail rows is not impossible for Cubes, they are poor enough at this task that listing it as supported is not appropriate. NOTE: Through the use of Actions⁶, you can still get to the detail you may need by launching a Reporting Services report, for example, and passing your current Cube context to the Report via Report Parameters. However, this does mean you are leaving the Cube behind when accessing your detail data..

No Hard Upper Limit on Data Volume

Regardless of the storage mode used for your cube, they have no hard limit on the amount of data the technology itself can hold. Rather, it is limited only by available disk storage. Yahoo has an Analysis Services Cube that "produces 24 terabytes of data each quarter, making it the largest known SQL Server Analysis Services cube in the world."⁷

Support for More Than One Data Source

The Data Source View (DSV) upon which a Cube is based can pull from many different sources at the same time. This support includes relational database sources on SQL Server, Azure, Access, Parallel Data Warehouse, Oracle, Teradata, and more. This ability of the DSV to bring in many sources into a single working model is why Analysis Services Multidimensional Model has sometimes been referred to as the Unified Dimensional Model (UDM).

Supported in Standard Edition of SQL Server 2012

The use of Analysis Services Multidimensional Cubes does not require Enterprise Edition or Business Intelligence Editions of SQL Server 2012. However, there are some features, like Perspectives, that are only supported on those versions.

Alternative 3: Power Pivot for Excel

Power Pivot was first introduced as a free add-in for Microsoft Excel 2010. Power Pivot is an analysis tool with astounding power and flexibility that lives right inside Excel, an application that so many end users know and love. It allows users to import data from a large variety of sources into the xVelocity[®] storage engine (formerly known as Vertipaq) residing in memory as part of the Excel workbook. xVelocity makes the data highly compressed and super-fast to retrieve. Power Pivot also introduced a new expression language into the Business Intelligence lexicon: Data Analysis Expressions (DAX). Based upon the expression syntax already familiar to Excel users, DAX adds remarkable flexibility and power. Since DAX is intended for use with tabular data that most people are already accustomed to, the learning curve for DAX tends to be far shallower than that of MDX, while still offering many of the advanced features that MDX users already enjoy. Not only is Power Pivot great for business users, it is also a fantastic means for Data Professionals to experiment with different data models or even create Proof of Concept models for a larger BI project.

TABLE 3: REPORT MODEL - POWER PIVOT FOR EXCEL

	Report Model	Power Pivot for Excel
Support For Drag-and-Drop Data Selection	✓	✓
Support For "Real-Time" Reporting	✓	
Item-Level Security	✓	
Row-Level Security	✓	
Perspectives	✓	§
Supported Reporting Services Report Data Source	✓	
Supported Excel Data Source		✓
Excellent Performance Returning Summary (Aggregated) Data		✓
Excellent Performance Returning Detail Data		✓
No Hard Upper Limit On Data Volume	✓	✓ ⚠
Support More Than One Data Source		✓
Supported in Standard Edition of SQL Server 2012	✓	✓

§ While Perspectives can be created in a Power Pivot for Excel model, they cannot be consumed in Power Pivot for Excel. They will, however, be usable in a PivotTable should that model be published into SharePoint or imported into Analysis Services Tabular.

⚠ While the 64-bit version of Excel has no hard upper limit (except for the RAM available on the local machine), the 32-bit version of Excel does.

Drag-and-Drop Data Selection

Once tables and fields have been added to the Power Pivot model (which is very simple to do), users of the model then drag and drop fields they want into their pivot tables/charts.

Support for “Real-Time” Reporting

Since the data within the Power Pivot model must be refreshed manually, we cannot consider Power Pivot for Excel to support “Real-Time” reporting. While SSAS Multidimensional Cubes have the ROLAP storage method, where all queries are passed through to the source, Power Pivot for Excel does not have this functionality.

Item-Level Security

Users of a Power Pivot for Excel workbook can access every table and field contained within that model. There is no native support for securing individual objects.

Row-Level Security

All rows residing within a Power Pivot for Excel workbook are accessible to anyone who has access to the workbook itself. Securing rows within the model is not natively supported.

Perspectives

While you can create Perspectives in Power Pivot for Excel, there is not a way to consume them directly in this model⁹. The use of Perspectives created in Power Pivot for Excel is supported only when the model is published into SharePoint (Power Pivot for SharePoint, Alternative #4) or imported into an Analysis Services Tabular Model (Alternative #5).

Supported As Reporting Services Report Data Source

Power Pivot for Excel workbooks are not supported as data sources for Reporting Services reports.

Supported As Excel Data Source

Power Pivot for Excel models are support as sources for PivotTables/Charts in Excel 2010 and later. Also, Power View, which was added to Excel 2013, can use Power Pivot models in Excel 2013 as a data source.

Excellent Performance Returning Summary (Aggregated) Data

Power Pivot for Excel models are outstanding performers at returning summary data. The xVelocity engine stores data in a highly compressed, efficient manner. In addition, the entire working set of data for the model is stored in memory. There is no need for the engine to choose which data gets pulled from disk into the memory cache for best performance. In essence, ALL of the data is in memory cache.

Excellent Performance Returning Detail Data

The same architecture that makes Power Pivot for Excel models return summary data with blazing speed also does the same for detail data. While returning many detail rows will still be a bit slower than returning a handful of counts related to those detail rows, Power Pivot for Excel can still perform this task quite well.

No Hard Upper Limit On Data Volume

The 32-bit version of Excel 2013 supports a maximum address space of 2GB, which is shared by Excel itself, the workbook and any add-ins that are running. Essentially, this translates to a total workbook size of between 500 and 700 MB¹⁰. With the 64-bit version of Excel 2013, file size is limited only by the available RAM on the local machine.

Support For More Than One Data Source

Power Pivot for Excel supports a vast array of data sources, including relational databases like SQL Server, Oracle, and Informix. In addition, you can get data from data feeds like Reporting Services reports and the Azure Data Marketplace. You can also pull data from Excel workbooks and text files.

Supported in Standard Edition of SQL Server 2012

Use of Power Pivot for Excel does not have requirements specific to editions of SQL Server.

Alternative 4: Power Pivot for SharePoint

A Power Pivot for Excel workbook can be uploaded into a Power Pivot for SharePoint instance. Once that occurs, working with the uploaded workbook will consume server resources instead of client resources. In addition, when users access this workbook, rather than working directly with Excel, they use Excel Services running in SharePoint. This means that users who do not have Excel installed on their client machines can work with Power Pivot for SharePoint. A workbook uploaded in this manner also becomes subject to the security of the SharePoint instance, making it easier to control access to the workbook.

TABLE 4: REPORT MODEL - POWER PIVOT FOR SHAREPOINT

	Report Model	Power Pivot for SharePoint
Support for Drag-and-Drop Data Selection	✓	✓
Support for "Real-Time" Reporting	✓	
Item-Level Security	✓	
Row-Level Security	✓	
Perspectives	✓	✓
Supported Reporting Services Report Data Source	✓	✓
Supported Excel Data Source		✓
Excellent Performance Returning Summary (Aggregated) Data		✓
Excellent Performance Returning Detail Data		✓
No Hard Upper Limit On Data Volume	✓	
Support More Than One Data Source		✓
Supported in Standard Edition of SQL Server 2012	✓	

Drag-and-Drop Data Selection

Once tables and fields have been added to the Power Pivot model (which is very simple to do), users of the model then drag and drop fields they want into their pivot tables/charts.

Support for “Real-Time” Reporting

The data in Power Pivot for SharePoint can be refreshed automatically on a schedule. However, since the data within the Power Pivot model must be refreshed, we cannot consider Power Pivot for Excel to support “Real-Time” reporting. While Cubes have the ROLAP storage method, where all queries are passed through to the source, Power Pivot for SharePoint does not have this functionality.

Item-Level Security

Users who have access to a Power Pivot for SharePoint workbook can access every table and field contained within that model. There is no native support for securing individual objects within the model.

Row-Level Security

All rows residing within a Power Pivot for SharePoint workbook are accessible to anyone who has access to the workbook itself. Securing rows within the model is not natively supported.

Perspectives

You can create and use Perspectives in Power Pivot for SharePoint¹¹. NOTE: This requires SharePoint 2013.

Supported As Reporting Services Report Data Source

Power Pivot for SharePoint workbooks are supported as data sources for Reporting Services reports¹².

Supported As Excel Data Source

Power Pivot for SharePoint models are supported as sources for PivotTables/Charts in Excel 2010. Also, Power View, which was added to Excel 2013, can use Power Pivot models as a data source.

Excellent Performance Returning Summary (Aggregated) Data

Power Pivot for SharePoint models are outstanding performers at returning summary data. The xVelocity engine stores data in a highly compressed, efficient manner. In addition, the entire working set of data for the model is stored in memory. There is no need for the engine to choose which data gets pulled from disk into the memory cache for best performance. In essence, ALL of the data is in memory cache.

Excellent Performance Returning Detail Data

The same architecture that makes Power Pivot for SharePoint models return summary data with blazing speed also does the same for detail data. While returning many detail rows will still be a bit slower than returning a handful of counts related to those detail rows, Power Pivot for SharePoint can still perform this task quite well.

No Hard Upper Limit on Data Volume

The largest file that can be uploaded to SharePoint is 2GB. This is also the maximum size file that can be rendered in Excel Services in SharePoint. Note that these values are not the default, they must be modified by the SharePoint Administrator to reach this level.

Support for More Than One Data Source

Power Pivot for SharePoint supports a vast array of data sources, including relational databases like SQL Server, Oracle, and Informix. In addition, you can get data from data feeds like Reporting Services reports and the Azure Data Marketplace. You can also pull in data from other Power Pivot for SharePoint workbooks.

Supported in Standard Edition of SQL Server 2012

Use of Power Pivot for SharePoint requires either Enterprise Edition or Business Intelligence Editions of SQL Server 2012.

Alternative 5: Analysis Services Tabular Model

Building on the popularity and great functionality of Power Pivot, SQL Server 2012 introduced a new flavor of Analysis Services: Tabular. Using the same xVelocity storage engine as Power Pivot, Analysis Services Tabular brings the power of the Tabular models in Power Pivot into the Enterprise environment, adding better security and scalability. It is important to note that many of the features that are not natively supported by SSAS Tabular can be overcome through the use of DAX expressions.

TABLE 5: REPORT MODEL - ANALYSIS SERVICES TABULAR MODEL

	Report Model	Analysis Services Tabular Model
Support For Drag-and-Drop Data Selection	✓	✓
Support For "Real-Time" Reporting	✓	✓
Item-Level Security	✓	
Row-Level Security	✓	✓
Perspectives	✓	✓
Supported Reporting Services Report Data Source	✓	✓
Supported Excel Data Source		✓
Excellent Performance Returning Summary (Aggregated) Data		✓
Excellent Performance Returning Detail Data		✓
No Hard Upper Limit On Data Volume	✓	✓
Support More Than One Data Source		✓
Supported in Standard Edition of SQL Server 2012	✓	

Drag-and-Drop Data Selection

Tabular Models support drag-and-drop construction of datasets through tools like Excel, Power View, and even Reporting Services reports.

Support for “Real-Time” Reporting

Akin to the ROLAP storage mode of Analysis Services Multidimensional, Tabular models include support for Direct Query mode, in which all queries are passed directly to the data source. Direct Query mode does have some limitations¹³.

Item-Level Security

Analysis Services Tabular does not currently support Item-Level Security within the model. You cannot limit who can see what tables or columns within the model natively.

Row-Level Security

Row-Level Security in Tabular allows you to configure Roles with Windows logins/groups as members. You can then use DAX to configure the permissions for each Role.

Perspectives

Perspectives can be created to make larger models easier to use.

Supported As Reporting Services Report Data Source

Tabular models are supported as Reporting Services data sources.

Supported As Excel Data Source

Using a Tabular Model as a data source in Excel is a very similar experience to using a Cube in Excel. This includes the use of Power View in Excel 2013.

Excellent Performance Returning Summary (Aggregated) Data

Just like with Power Pivot, the xVelocity in-memory storage engine provides excellent performance at returning Summary data.

Excellent Performance Returning Detail Data

While returning many detail rows will still be a bit slower than returning a handful of counts related to those detail rows, Tabular Models still perform this task quite well. This can be a key consideration when deciding whether to use Analysis Services Multidimensional Cubes or Tabular Models.

No Hard Upper Limit on Data Volume

Tabular Models do not have a hard limit on their supported size except for the RAM available on the server. That said, it is recommended that you design your Tabular Models to take up as little space as you can while still providing your users with the data they need.

Support for More Than One Data Source

Tabular Models support a vast array of data sources, including relational databases like SQL Server, Oracle, and Informix. In addition, you can get data from data feeds like Reporting Services reports and the Azure Data Marketplace. You can also pull data from Excel workbooks and text files.

Supported in Standard Edition of SQL Server 2012

Tabular Models require either Enterprise Edition or Business Intelligence Edition of SQL Server 2012.

Wrapping Up

While Report Models are not the way of the future, there is a buffet of options you can use to maintain similar or better functionality within your organization. Each of the alternatives presented has benefits beyond the feature set of Report Models.

TABLE 6: REPORT MODEL - ALL ALTERNATIVES

	Report Model	SSAS Multidimensional Model - Cube	Power Pivot for Excel	Power Pivot for SharePoint	SSAS Tabular Model
Support For Drag-and-Drop Data Selection	✓	✓	✓	✓	✓
Support For "Real-Time" Reporting	✓	✓			✓
Item-Level Security	✓	✓			
Row-Level Security	✓	✓			✓
Perspectives	✓	✓*	§	✓	✓
Supported Reporting Services Report Data Source	✓	✓		✓	✓
Supported Excel Data Source		✓	✓	✓	✓
Excellent Performance Returning Summary (Aggregated) Data		✓	✓	✓	✓
Excellent Performance Returning Detail Data			✓	✓	✓
No Hard Upper Limit On Data Volume	✓	✓	✓ †		✓
Support More Than One Data Source		✓	✓	✓	✓
Supported in Standard Edition of SQL Server 2012	✓	✓	✓		

* While SSAS Multidimensional Cubes are supported in Standard Edition of SQL Server Analysis Services 2012, the use of Perspectives in Cubes requires Enterprise Edition or Business Intelligence Edition.

§ While Perspectives can be created in a Power Pivot for Excel model, they cannot be consumed in Power Pivot for Excel. They will, however, be usable in a PivotTable should that model be published into SharePoint or imported into Analysis Services Tabular.

† While the 64-bit version of Excel has no hard upper limit (except for the RAM available on the local machine), the 32-bit version of Excel does.

Citations/Further Reading

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12	Creating a Reporting Services Report Using Power Pivot Data	http://technet.microsoft.com/en-us/library/gg413489.aspx
13	Analysis Services Tabular Direct Query Mode	http://msdn.microsoft.com/en-us/library/hh230898.aspx

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**Report Model (SMDL) Alternatives
in SQL Server 2012**
A Guided Tour of Microsoft® Business
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