Welcome to the topic on Semantic Layer Content for SAP HANA modeling for SAP Business One.
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- Describe the available content in the semantic layer
- Deploy existing content as the basis for customized models

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Before we explore how existing semantic layer content can be useful to you in more quickly developing and deploying models for queries and dashboards, let’s take a moment to be clear on the definition of a semantic layer.

A semantic layer is a business representation of raw data that helps end users access data autonomously using common business terms for reporting and analytics purposes. In other words, SAP has created a number of models that are ready to deploy and use. The measures and attributes in these models use the same labels as SAP Business One fields, so it is very easy for end users and report designers to determine what they need.
In general, semantic layers allow IT organizations to:
Guarantee Correct Results – by applying rules to define database complexity and ambiguity. These rules drive the generation of the SQL and guarantee that if two users ask for the same information, they will get the same results.
Guarantee Database Performance – by always generating the best SQL possible
Guarantee User Understanding and Acceptance – by allowing users to understand how modifying their query will result in different results, while at the same time giving them independence from IT. The #1 complaint from most business organizations is the amount of time it takes IT to build reports for them. They want the independence to be able to build their own reports and know that the results will be correct.
A semantic layer will be able to create sophisticated SQL and in many instances may need to generate multiple SQL statements in order to return the correct results (chasm trap/fan trap). The semantic layer must understand how to deal with database loops, complex objects, complex sets (union, intersect, minus), aggregate table navigation and shortcut joins.
Specifically the SAP Business One semantic layer provides views for easy analysis of Business One data with SAP HANA maintained by SAP. These views are open for a wide variety of reporting frontends and applications. With the semantic layer you can perform real time analysis based on the SAP HANA calculation engine.
In a previous topic we discussed the concepts of query views and reuse views. The SAP Business One semantic layer provides both query views and reuse views. Both types of views are designed to reduce your development effort for writing reports and dashboards.

The query views are designed to be consumed directly by an analytics client or in an application. These views are not designed for reuse in other views. A query view might be a cube with a star join or some other type of calculation view built for reporting and use in dashboards and KPIs.

Reuse views are designed to be used as building blocks in query views. Reuse views are well-structured, consistent and comprehensive.

There are two types of reuse views: Reuse Dimensions and Reuse Fact Cubes.

Reuse dimensions are based on master data and are designed to be reused in cubes as dimensions. A few examples are reuse views for business partners, items, and cost centers.

Reuse fact cubes are based on transactional data and designed for reuse in a query view.
Both query views and reuse views can be extended for customers. Additionally you can easily add user-defined fields and user-defined tables into the query and reuse views.
Here is an example of reuse view from the SAP Business One semantic layer. This is a business partner dimension.

All the business partner dimension reuse views are designed as calculation views based on the related tables for a type of master data.

Here we see a number of joins of the SAP Business One tables for Business Partner Master Data. The joins are brought together in a projection node. The semantics node is chosen in the graphic and on the right we see the details of the columns contained in this view.

On the left of the graphic, we can see that there are a large number of predefined reuse views for master data dimensions in the SAP Business One semantic layer. The master data views are found under the ADM folder.
Here is an example of reuse fact view. This view is designed for sales analytics and is based on tables from several transactions in the Sales – A/R module.

You could use this type of view as the basis for a query view for sales analytics. Again we see that tables have been joined together and each set of joins for a transaction are brought together in a projection. A union has been created for the projections and then it has been joined to business partner table OCRD.

In each fact table an aggregation is done at the end.
Here is an example of a query view for Sales Analytics from the SAP Business One semantic layer.

Notice how the query view is based on a projection from the Sales Analysis Fact reuse view. The projection is then joined in a star join with several other reuse views for master data dimensions, including the Business Partner reuse view we recently looked at.

This view will be very efficient because the aggregation for the transactions was done in the Sales Analysis Fact view before the join.
Here is a graphical look at how some of semantic layer views related.

At the bottom we see several reuse views that pertain to data in accounting transactions. Some of the reuse views are dimensions, such as the Business Partner view, the Account view, the Project View and the Currency view. Others are fact views for transactional data such as internal reconciliation view, journal entry posted view, and the journal entry item view.

On the top of the graphic we see three query views. Each query view contains some of the reuse views.

For example, if we look at the Accounting Aging Query (highlighted in yellow), we see it is made up of the reuse views (also highlighted in yellow) for Internal Reconciliation, Business Partner dimension and the Journal Entry posted views.

We can also see that a reuse view like the Business Partner view is used not only in one query view but in all three shown in this graphic, as well as many others such as the SalesAnalysis Query view we saw earlier.

In this way, reuse views are like “building blocks” for our query views. Using reuse views adds a great deal of flexibility and efficiency to modeling.
Now we step out to look at the big picture behind the concept of the reuse and query view models.

In this graphic the blue box represents the semantic layers in the SAP HANA database.

Inside the dotted lines in the blue box, we see the delivered models of the SAP Business One semantic layer with its reuse views and query views. These views are all based on tables from SAP Business One.

Outside the dotted line, we see query views that customers have created or have extended based on the delivered semantic views.

None of these views contain data from the physical tables in SAP Business One. Instead they are just models that structure the data for queries.

When the query is run, the data is pulled from the physical tables and made available to analytics clients or applications via ODBC, MDX and so on.
SAP delivers comprehensive semantic layer models for standard business scenarios in SAP Business One. Some examples of scenarios covered include G/L account balances, chart of accounts, balance sheets, profit and loss, cash flow, cost centers, tax, general ledger and sub ledgers, payables and receivables, average purchase or sales prices, on-time receipt and delivery statistics, customer open balance vs. credit limit, and project code view. There are many more scenarios available than those listed. Additional scenarios will come with future releases and patches.

Full documentation of delivered views for SAP Business One are available in the how-to-guide: How to Work with Semantic Layers. This document contains full details on all views available for each module. The link shown on the graphic will take you directly to the document in the PartnerEdge portal. Alternatively you can search in the portal by the name of the how to guide.
Semantic layer views that reflect scenarios in the same business area are grouped under a module and designed with view names that are easy to understand and linked to the scenario they reflect. Therefore, when you copy models from the semantic layer or create your own, you should also apply clear naming conventions when defining view names.

- Use only letters (a-z / A-Z), numbers (0-9) and underscore.
- Names may not start with a number.
- All names are to be written in upper camel case.
- Field names must not exceed 30 digits.
- View names shall not exceed 45 digits.
- The name of Query View must end with ‘Query’.
- Extended query views must start with Customer/Partner name.
Now let’s look at how to deploy semantic layer content as the basis for custom models. There are two paths for deploying semantic layer models to companies.

The SAP HANA Model Management gives you the option to deploy models. The Administration console allows you options to initialize, updated and re-initialize.
There is a wizard for adding user-defined fields and user-defined tables to semantic layer views.

This is useful because frequently user-defined fields and tables have been added to the SAP Business One client and these fields are an integral part of an employee’s daily work. Employees want to be able to see these fields in their reports and dashboards.

You can include the UDFs and UDTs in views via a wizard in the administration console. Once they have been added to a HANA view, the view can draw data from the user-defined fields as well as the standard fields of Business One tables. This means that employees can consume the UDFs via all the analytics tools, giving you the ability to leverage SAP HANA technology for customer specific information.
In the administration console, you can choose UDF Configuration for a specific schema (or company database). The *UDF Configuration in Semantic Layer window* allows you to see existing user-defined fields and choose to make them available to your semantic layer views.
Summary

Key points:

- SAP delivers comprehensive semantic layer models for standard business scenarios in SAP Business One.
- The semantic layer content is described in detail in *How to Work with Semantic Layers*.
- SAP recommends you make as much use as possible of semantic layer models. Copy and extend semantic layer models to meet customer needs.
- When copying, extending or creating views, use clear naming conventions.
- You can deploy semantic layer models in the Administration Console or via SAP HANA model management.
- You can easily customize the semantic layer to include user-defined fields and user-defined tables.

- The semantic layer content is described in detail in *How to Work with Semantic Layers*. We recommend you review what is available before creating your own custom models.
- SAP recommends you make as much use as possible of semantic layer models. You can copy and extend semantic layer models to meet customer needs.
- When copying, extending or creating custom views, use clear naming conventions to make view names easy to understand.
- You can deploy semantic layer models in the Administration Console or via the SAP HANA model management tool.
- You can easily customize the semantic layer to include user-defined fields and user-defined tables.