

# Introduction to SAP HANA Modeling for SAP Business One: Modeling Time Dimensions



Welcome to Modeling Time Dimensions for SAP Business One version for SAP HANA.

In this course, we use the Modeler perspective in the SAP HANA Studio to model a reuse view with a hierarchy in the semantic layer of the SAP Business One version for SAP HANA.

## Objectives

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At the end of this unit, you will be able to:

- Describe how to model a time dimension

At the end of this unit, you will be able to describe how to model a time dimension for SAP Business One.

## Business Example

To provide the analysis our sales manager needs, we will create:

- Dimensions for business partners and dates
- Cube for A/R invoices that includes the dimensions

### Star Schema Cube for Invoices

#### Dimension for Dates

Year  
Quarter  
Month  
Date Time Stamp

#### Data Foundation

Invoice Date  
Invoice Number  
Customer  
Invoice Total  
Tax Amount

#### Dimension for Business Partners

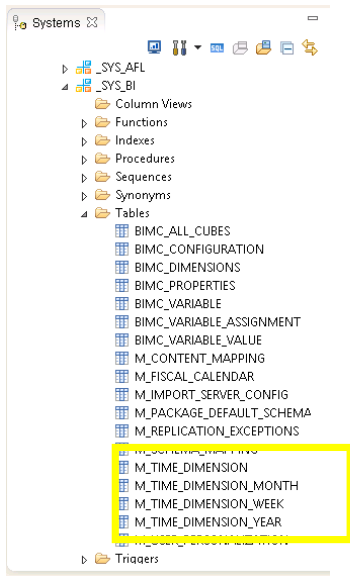
Business Partner  
BP Name  
BP Group

BP Group  
BP Group  
Name  
Country

Country  
Country  
Name

In the previous topic, we created a reuse view to model a dimension for business partners. Now we will create another reuse view for dates. Later we use the two reuse views as dimensions in a cube for invoices.

# Handling Dates in SAP HANA



- ❑ **SAP HANA does not use functions for dates**
- ❑ **SAP HANA comes with pre-built tables for time dimensions**
- ❑ **Tables located in the Catalog under `_SYS_BI` folder**
- ❑ **`M_TIME_DIMENSION` table contains time units for each `DateTimeStamp`.**

Unlike Microsoft SQL, SAP HANA SQL does not use functions for dates. Instead SAP HANA uses tables.

Conveniently, SAP HANA comes with pre-built tables for time dimensions. We can find these tables in the Catalog under the `_SYS_BI` folder.

One of the tables is the `M_TIME_DIMENSION` table. This table has entries for each `DateTimeStamp`. These entries are used to convert the stamp into units such as years, quarters, months, days and so on.

## M\_TIME\_DIMENSION contents

```
SELECT TOP 1000 * FROM "SYS_BI"."M_TIME_DIMENSION"
```

	DATETIMESTAMP	DATE_SQL	DATETIME_SAP	DATE_SAP	YEAR	QUARTER	MONTH	WEEK	WEEK_YEAR	DAY_OF_WEEK	DAY	
1	01.01.0001 00:00:00.0	01.01.0001	00010101000000	00010101	0001	01	01	01	0001	05	01	
2	31.12.9999 00:00:00.0	31.12.9999	99991231000000	99991231	9999	04	12	52	9999	04	31	
3	01.01.1900 00:00:00.0	01.01.1900	19000101000000	19000101	1900	01	01	01	1900	00	01	
4	01.01.1995 00:00:00.0	01.01.1995	19950101000000	19950101	1995	01	01	52	1994	06	01	
5	02.01.1995 00:00:00.0	02.01.1995	19950102000000	19950102	1995	01	01	01	1995	00	02	
6	03.01.1995 00:00:00.0	03.01.1995	19950103000000	19950103	1995	01	01	01	1995	01	03	
7	04.01.1995 00:00:00.0	04.01.1995	19950104000000	19950104	1995	01	01	01	1995	02	04	
8	05.01.1995 00:00:00.0	05.01.1995	19950105000000	19950105	1995	01	01	01	1995	03	05	
9	06.01.1995 00:00:00.0	06.01.1995	19950106000000	19950106	1995	01	01	01	1995	04	06	
10	07.01.1995 00:00:00.0	07.01.1995	19950107000000	19950107	1995	01	01	01	1995	05	07	
11	08.01.1995 00:00:00.0	08.01.1995	19950108000000	19950108	1995	01	01	01	1995	06	08	
12	09.01.1995 00:00:00.0	09.01.1995	19950109000000	19950109	1995	01	02	01	1995	00	09	
13	10.01.1995 00:00:00.0	10.01.1995	19950110000000	19950110	1995	01	02	01	1995	01	10	
14	11.01.1995 00:00:00.0	11.01.1995	19950111000000	19950111	1995	01	02	01	1995	02	11	
15	12.01.1995 00:00:00.0	12.01.1995	19950112000000	19950112	1995	01	02	01	1995	03	12	
16	13.01.1995 00:00:00.0	13.01.1995	19950113000000	19950113	1995	01	02	01	1995	04	13	
17	14.01.1995 00:00:00.0	14.01.1995	19950114000000	19950114	1995	01	02	01	1995	05	14	
18	15.01.1995 00:00:00.0	15.01.1995	19950115000000	19950115	1995	01	01	02	1995	06	15	
19	16.01.1995 00:00:00.0	16.01.1995	19950116000000	19950116	1995	01	01	03	1995	00	16	

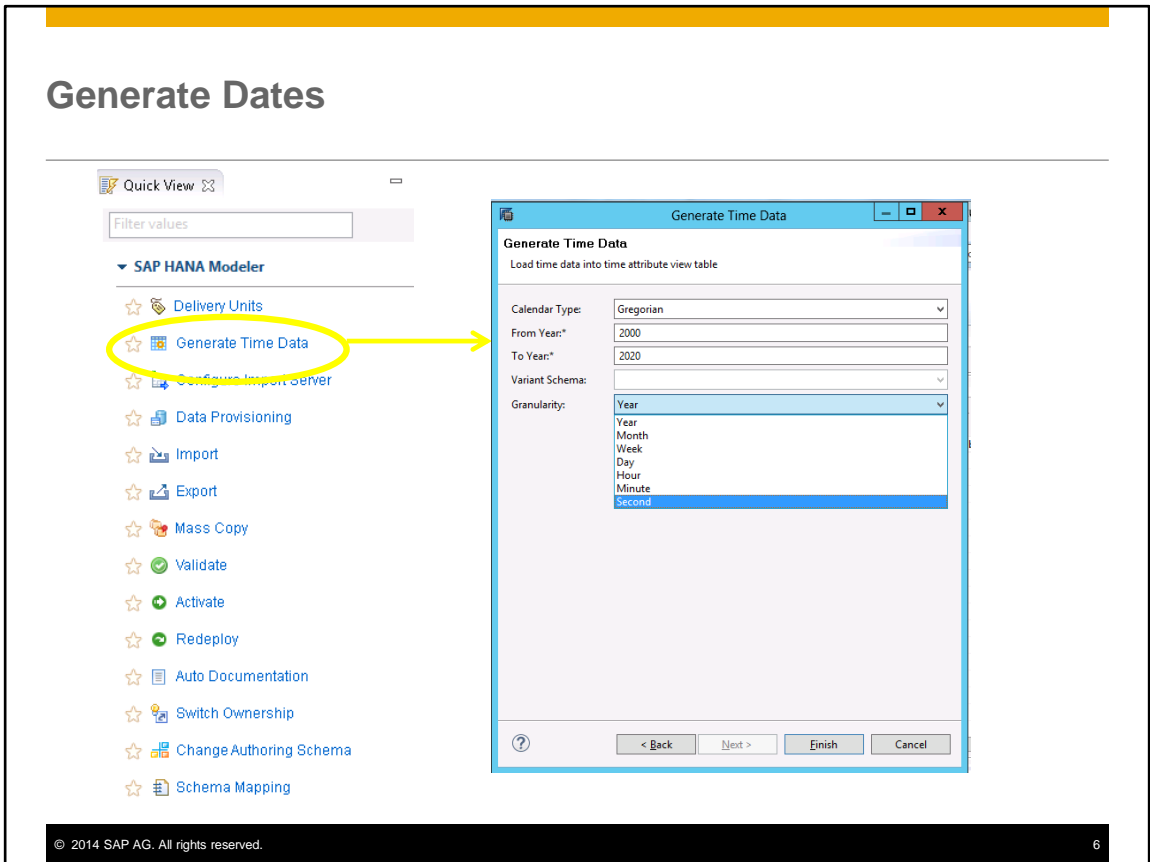
**View the contents of the table by choosing the context menu option:**

***Open Content***

You can view the M\_TIME\_DIMENSION table contents by choosing the context menu option: *Open Content*.

In the table you will see an entry for the DateTimeStamp and then entries that can be used to convert the date time stamp to units used in reporting.

# Generate Dates



You can generate data for this table for the range of dates you wish to use in your analysis. The option to Generate Time Data is found in the Quick Launch menu.

When you generate time data you specify not only the date range, but also the level of granularity.

## Creating Reuse View for Time

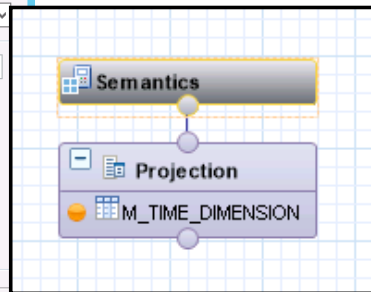
**Create an Information View**  
Select the required view type and enter the details

Name\*: OEC\_CA\_DIM\_DATE  
Label: Dimension for Posting Dates  
Package\*: tests.KSD  
View Type: Calculation View  
 Copy From:  
Subtype: Time  
Calculation View  
Type: Graphical  
Calendar Type: Gregorian  
Granularity: Second  
 Auto Create  
Year  
Month  
Week  
Date  
Hour  
Minute  
Second  
Finish Cancel

Subtype: Time

- Choose Calendar Type: Gregorian or Fiscal
- Choose Granularity

View automatically created from M\_TIME\_DIMENSION table.



Now that we know more about how dates are handled, we can look at how we can create a reuse view with a hierarchy for posting dates in our analysis.

The steps for creating this view are similar to what we did previously for the business partner dimension, however, there are a few different options for time dimensions.

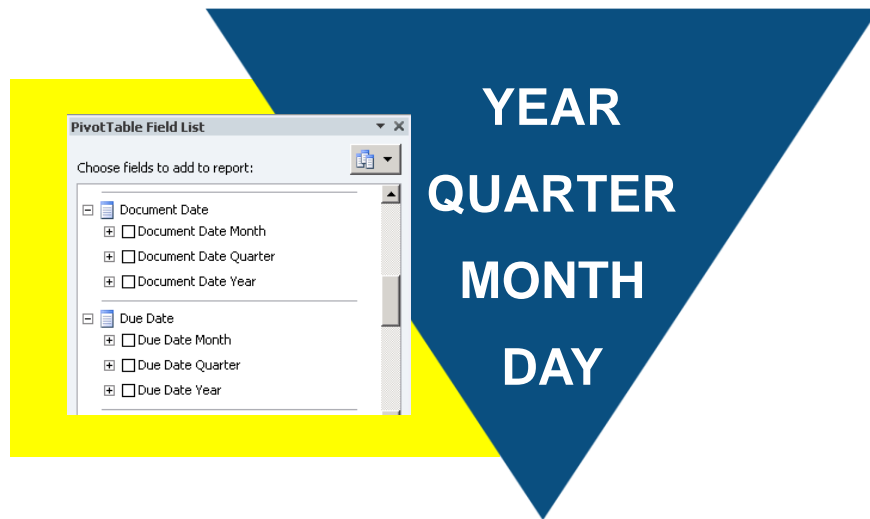
When we choose the Subtype Time, we have options for the Calendar Type: either Gregorian or Fiscal.

After choosing the Calendar Type you can choose the granularity from as large as “year” to as small as “second”.

Time views use the M\_TIME\_DIMENSION table by default. The view also will automatically create a hierarchy for you.

# Hierarchies

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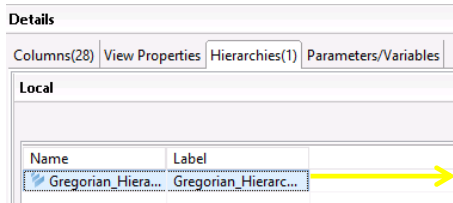
Typically in reports, we want to see data summarized by time periods such as years, months or days. We may want to see our revenues by geographical breakdowns like countries, regions and cities, or see our budget figures broken out by cost center levels. Hierarchies allow us to do this. They allow us to structure our reports and summarize by natural levels of attributes.

Hierarchies from SAP HANA can be used in multi-dimensional expression (MDX) queries presented in Microsoft Excel for interactive analysis.

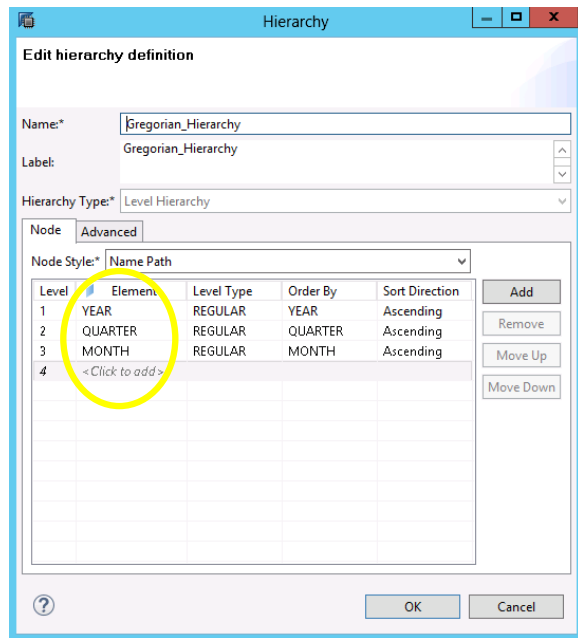


# Hierarchy Details

- **Gregorian Hierarchy automatically created**
- **View hierarchy definition**



- **You can add or remove levels within an hierarchy**



Here is a look at the hierarchy details for our time dimension. This is a hierarchy for Year, Quarter and Month.

When you use time dimension tables for a view, a hierarchy can be automatically created. Because we chose the Gregorian calendar, the Gregorian Hierarchy was automatically used. Hierarchies can also be created manually for other dimensions containing attributes.

The Hierarchy tab lists existing hierarchies for the view. You can view the hierarchy definition by choosing it.

You can add new levels to the hierarchy or remove levels. You can also change the order of the columns in a hierarchy.

Once a hierarchy is built, it can be reused and copied across models.

## Case Study – Create Reuse View for Posting Date

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### To create a reuse view for posting date

- ❑ **Physical table: M\_TIME\_DIMENSION**
- ❑ **Output:**
  - ❑ Posting Date
  - ❑ Posting Month
  - ❑ Posting Year
  - ❑ Hierarchy of Year-Quarter-Month

We will create a reuse view for the posting date based on a particular physical table automatically created by SAP HANA. We will build an attribute table based on the physical table for dates and times. The physical table M\_TIME\_DIMENSION is found in the system schema.

## Summary

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Key points about time dimensions and hierarchies:

- HANA SQL uses tables for converting dates from document datetimestamps rather than using date functions.
- SAP HANA provides tables with units for date conversion.
- When you create a view with a time dimension table, a hierarchy can be automatically created
- You can also create hierarchies manually
- Hierarchies allow you to reflect the natural relationship between attributes in a view for data aggregation.

HANA SQL uses tables for converting dates from document DateTimeStamps rather than using date functions as MS SQL does.

SAP HANA provides pre-built tables with units for date conversion. You can generate the data for these tables for the time period and granularity you choose.

When you create a view with a time dimension table, a hierarchy can automatically be created because the relationship between the columns in the table already exists.

You can also create hierarchies manually in your views, as well as add or remove columns from a hierarchy.

Hierarchies allow you to reflect the natural relationship between attributes in a view and to aggregate data according to that relationship.

**Thank you**

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This concludes the topic on modeling a time dimension.

Thank you for your time.

This concludes the topic on modeling a time dimension with a hierarchy for SAP Business One.  
Thank you for your time.

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