Understanding BEx Query Designer: Part-2 Structures, Selections and Formulas

Applies to:

SAP NetWeaver BW.

Summary

This document is the second installment of a 6 part Query Designer Training guide for Beginners. It deals with understanding designing the basic elements of a query, i.e. Structures, Selections, and formulas. This document will also be helpful to intermediate and advanced level users to learn some usually ignored but helpful facts about the Query Designer.

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The BEx Query Designer

Definition

It is an Independent desktop application for defining queries.

Use

You analyze the dataset of the Business Information Warehouse by defining queries for InfoProviders using the BEx Query Designer. By selecting and combining InfoObjects (characteristics and key figures) or reusable structures in a query, you determine the way in which you navigate through and evaluate the data in the selected InfoProvider.

Integration

You open the Query Designer from Start/Programs/Business Explorer/Query Designer.

You can also call up the BEx Query Designer from the following components:

- BEx Analyzer

- BEx Web Application Designer

- Crystal Reports (Crystal Reports $\geq$ 8.5 incl. CR add-ons for SAP)

Features

The BEx Query Designer contains the following functions:

- You can use the queries that you define in the query designer for OLAP reporting and also for tabular reporting.

- You can parameterize the queries by using variables for characteristic values, hierarchies, hierarchy nodes, texts, or formulas.

- You can select InfoObjects more precisely by:
  - ➢ · Restricting characteristics to characteristic values, characteristic intervals and hierarchy nodes
  - ➢ · Defining formulas
  - ➢ · Defining selections
  - ➢ · Defining reusable calculated and restricted key figures.
  - ➢ · Using local or reusable structures
  - ➢ · Defining exceptions
  - ➢ · Defining conditions

The most significant components of the query definition are the filter and navigation:

- The selections in the **filter** have a limiting effect on the whole query. When defining the filter, you select characteristic values from one or more characteristics or from a key figure. All of the InfoProvider data is aggregated using the filter selection of the query. The filter selection cannot be changed by navigation.

- For the **navigation** you select user-defined characteristics and determine the content of the rows and columns of the query. You use this selection to determine the data areas of the InfoProvider over which you want to navigate. The arrangement of the contents of the rows and columns also determines the default view of the query and the rows and columns axes in the results area.

  After it is inserted into the Web browser, a query is displayed in the default initial view. By navigating through the query, you can generate different views of the InfoProvider data, by dragging one of the user-defined characteristics into the rows or columns of the query, for example, or by filtering a characteristic according to a single characteristic value.

With the definition of a query, the InfoProvider data can be evaluated specifically and quickly. The more detail in which the query is defined, the quicker its execution and navigation.

Structures

Structures are objects that appear in the Query Designer and can be defined freely.

A structure forms the basic framework of the axes in a table (rows or columns). It consists of structural components. We differentiate between key figure structures and characteristic structures.

Structural components of key figure structures are always based on the key figure selections (basic key figures, restricted key figures, and calculated key figures). Characteristic structural components cannot contain key figure selections.

The set up of the structure determines the sequence and number of key figures or characteristic values in the columns and rows of the query. You can navigate through the structure in the executed query and set filters for it.

If you are using two structures (for example, a key figure structure in the columns and a characteristic structure in the rows), a table with fixed cell definitions is created.

There are two types of structures based on the types of components contained in the structure.
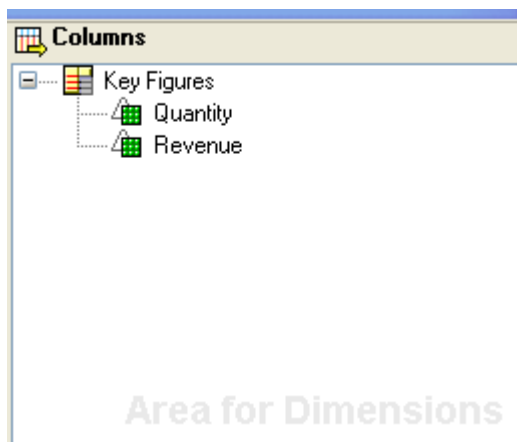
- ➢ Key Figure Structures
- ➢ Characteristic Structures

Key Figure Structures

Key figure structures include the components that are based on a key figure such as basic, formula, restricted, and calculated key figures. A key figure structure is automatically created in a query when you drag and drop key figures from the InfoProvider screen to the query rows/columns.

Each component included in a key figure structure should include a key figure. This means that you can include key figures, formula key figures, selection with key figures, restricted key figures (RKFs), and calculated key figures (CKFs) in a key figure structure. But a characteristic or a selection without a key figure can't be included in the key figure structure.

A structure appears in the Query Designer automatically if you move a key figure from the left selection window for InfoProvider objects into the rows or columns of the query definition. The structure that the system creates automatically is identified by the ⊞ symbol and contains the default name Key Figures as a proposal.


A maximum of 2 structures are allowed in a query definition, and only one of those can be a key figure structure.

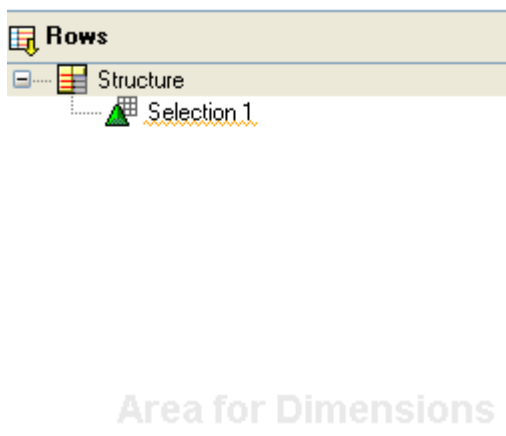## Characteristic Structures

Characteristic structures are optional in query definition and are used if you want to display a specific number of characteristic values in a specific sequence. To create a new structure, select Create New Structure from the context menu of the Rows area.
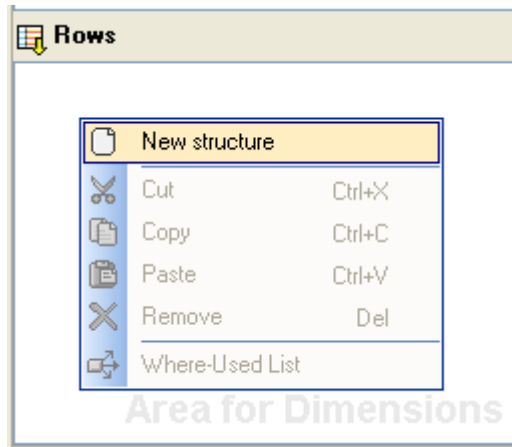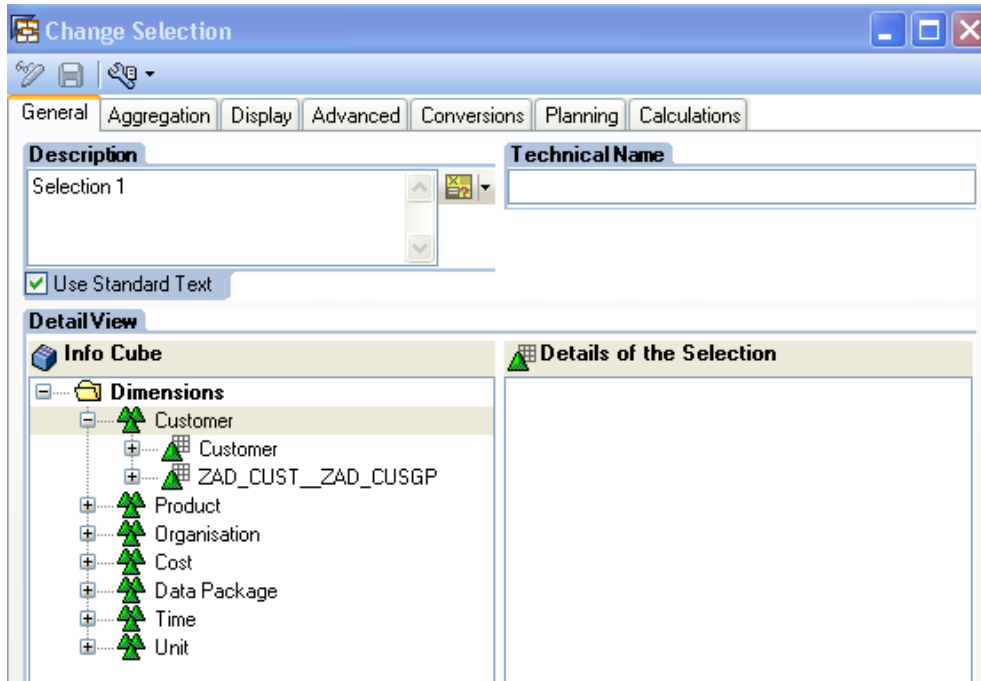
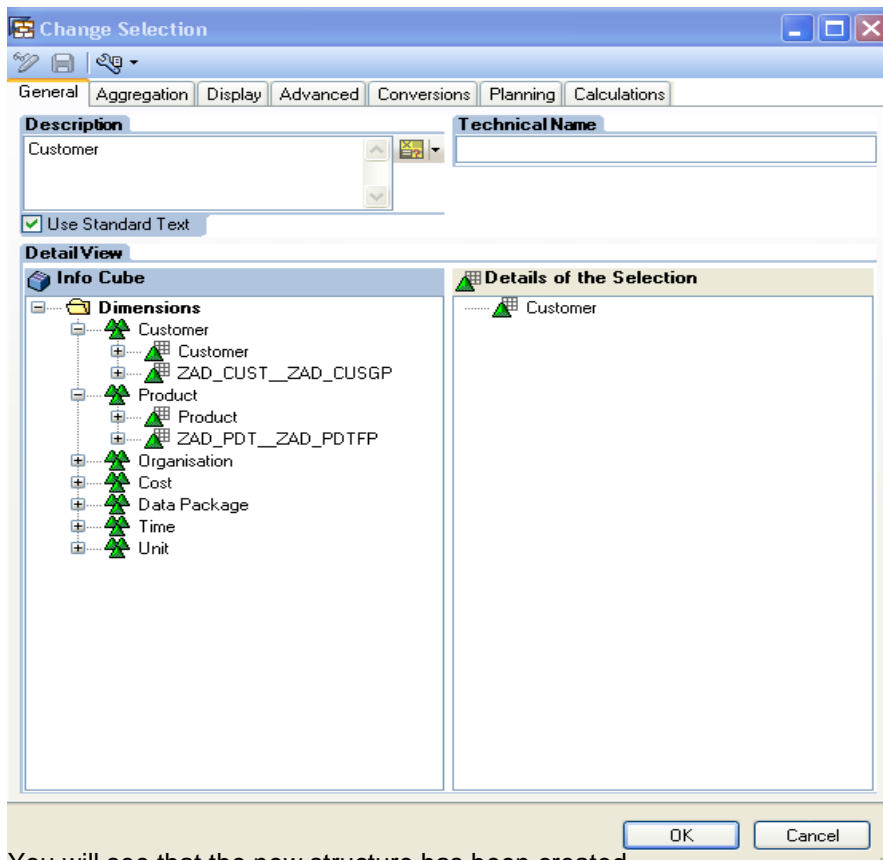Add structural components to the structure by selecting an option from the context menu.
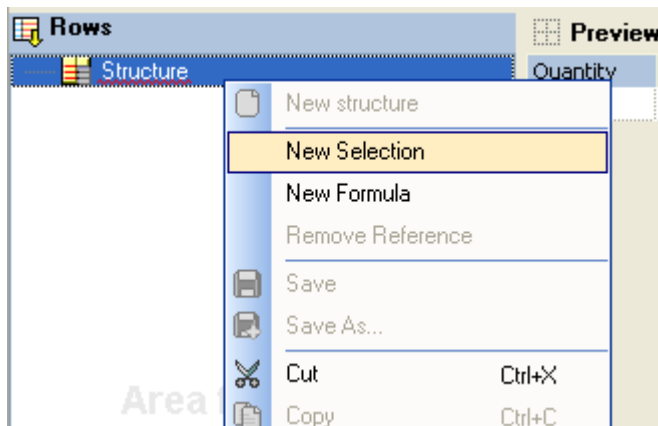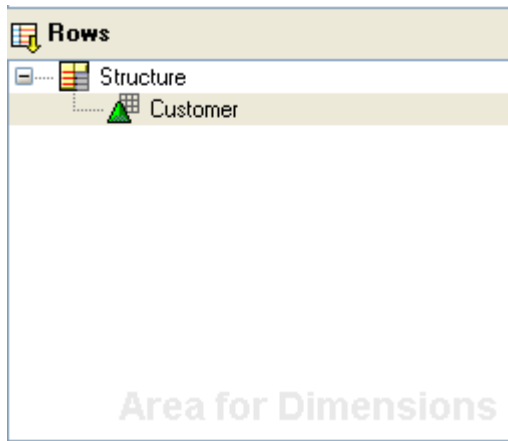
The new selection will appear.

Now, we have to define the new selection. For that, double click and open it.

The following pop-up appears.

Now drag and drop the required Characteristics to the 'Details of the Selection' Pane and press OK to confirm.


You will see that the new structure has been created.

When you use 2 structures in a query, you can additionally define a separate logic for each cell formed due to the intersection of the 2 structures. This logic will override the cell values generated implicitly from the intersection of the structures.

Click on the cell definition button (circled in red below) or use menu path View → Cells. This option is activated only when there are 2 structures in the query.
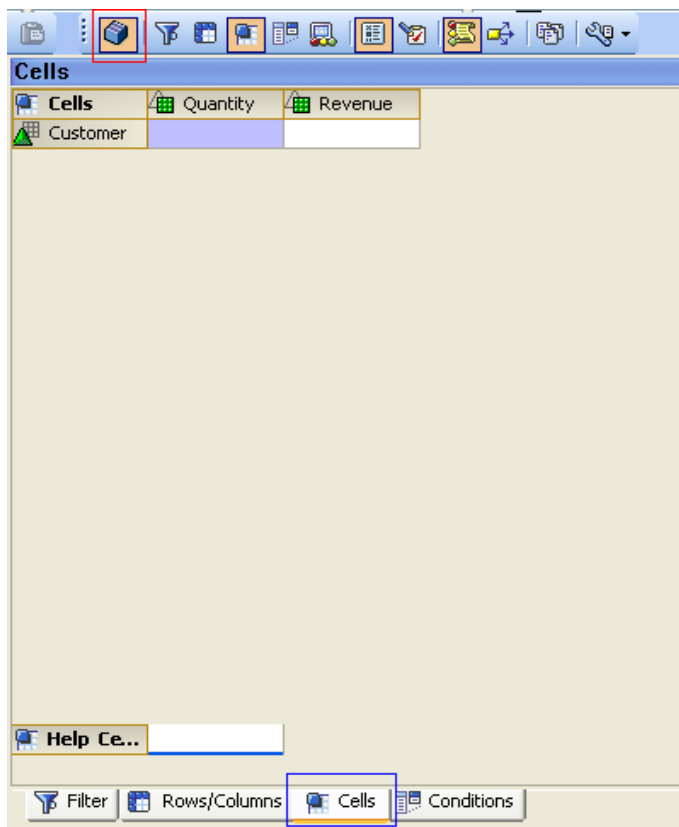

When cell definition is enabled, an additional Cells tab (circled in blue above) area is visible on the query designer layout.

Reusing Structures

Consider a scenario where an Organization uses a particular set of key figures most commonly in all the queries. You have used these key figures in a query and they are part of a KF structure. You can save this structure as a reusable component, which can be included in other queries on the same InfoProvider.

To save a structure, select Save As from the context menu as shown below.
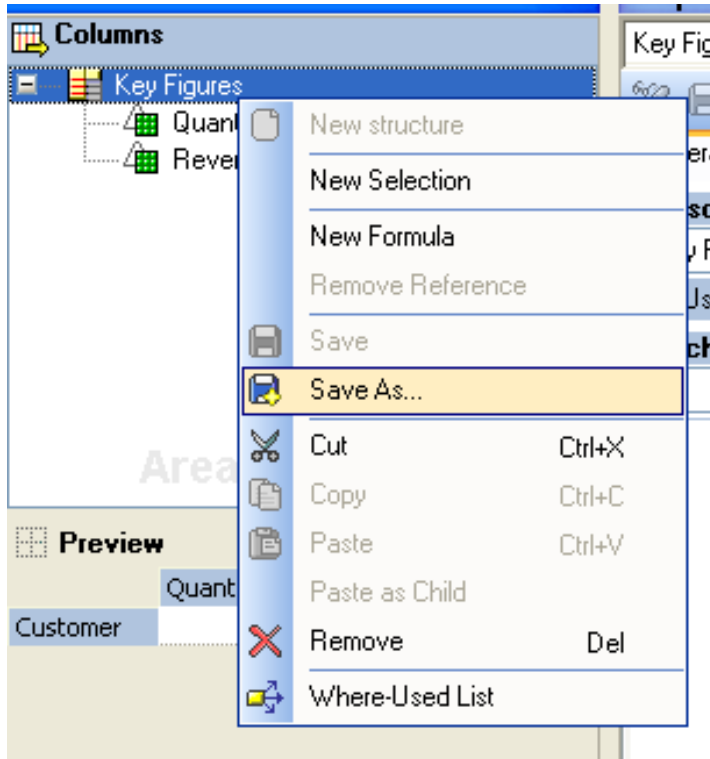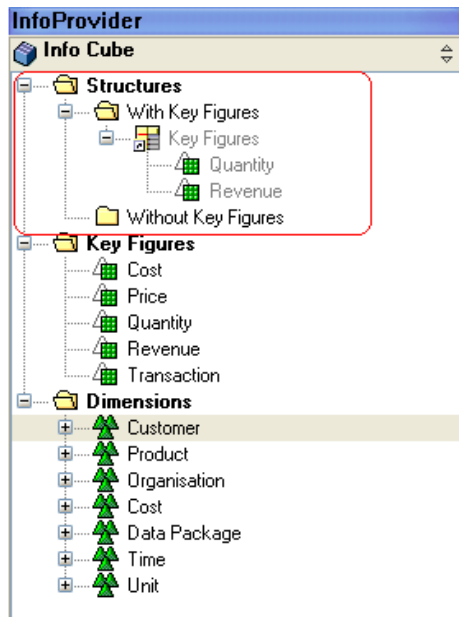


You will get the following pop-up
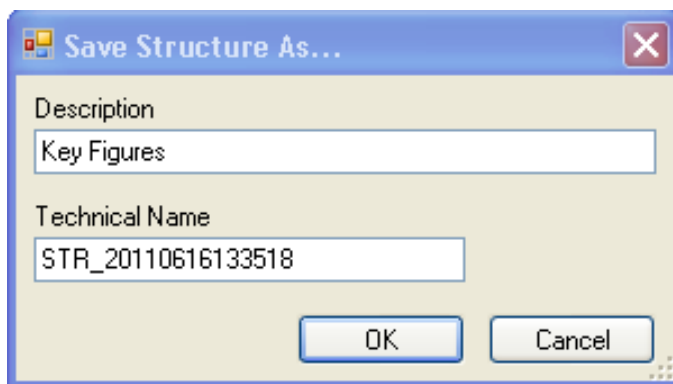
Save it after providing the appropriate technical name and description

Now, when you create a new query on the same InfoProvider, this saved structure is visible under the Structures folder in the InfoProvider Tab as shown below.

This can be directly pulled into the Rows/Columns area to use in the new query. However, if you make changes to this structure, those will be reflected in all the queries that use it.

So if you want to make some changes to this structure that are specific to only one query, you should detach the definition in the query by selecting Remove reference from the context menu as shown below.
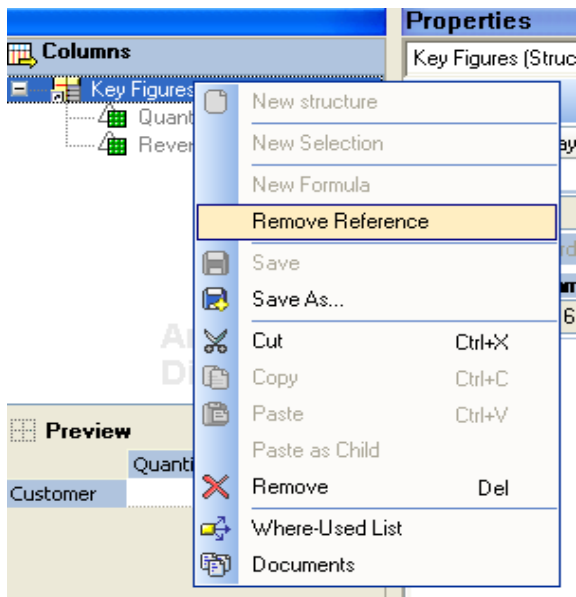
Reusable structures built for commonly used collections of key figures or characteristics can make query development easier and faster due to its reuse in multiple query.

Selections and Formulas

The characteristics and key figures from the InfoProvider can be directly dragged into the Rows/Columns area to define a query. But sometimes using the elements just as available in the InfoProvider isn't enough.

We will explain selections and formulas using the following example scenario:

There have to be two columns in the query depicting the revenues for the financial year 2001 and2002. Also, we need to add another column showing the percentage increase/decrease in revenue over the previous financial year. These requirements can be addressed only by using formulas in the query key figure structure.
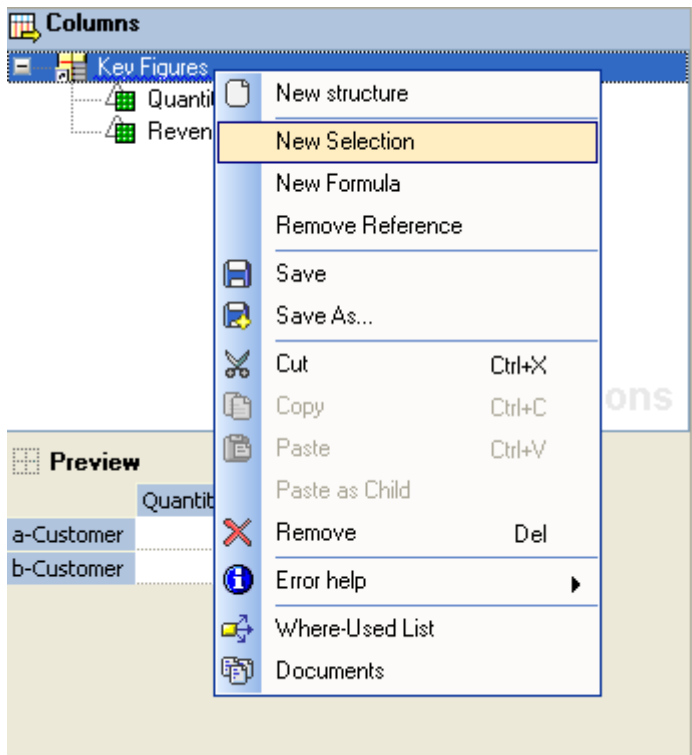
Selections

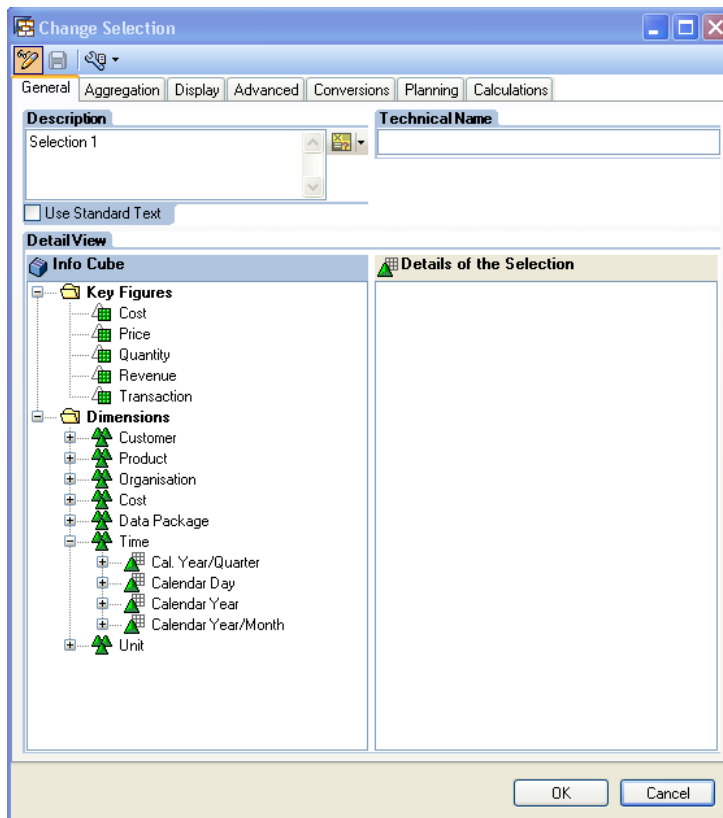To begin, get all of the characteristics needed to define the query in the rows and the key figures in the columns.

Now, to create a new selection, use the New Selection option from the context menu.
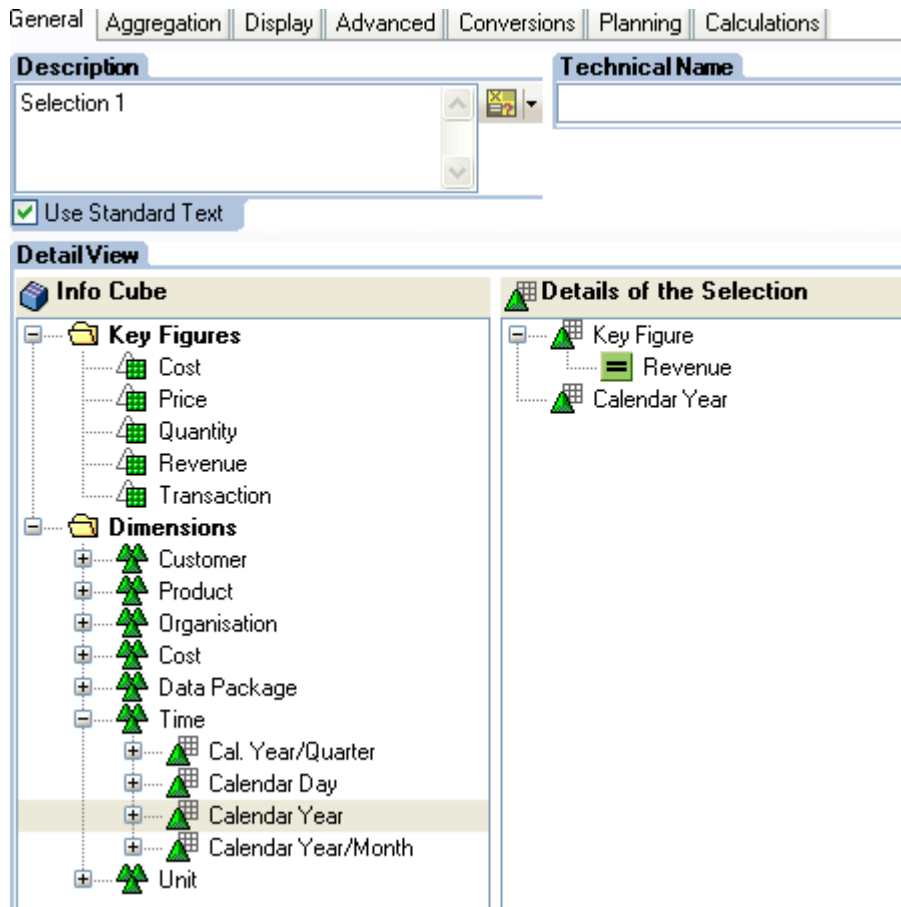

This will create a new selection component in the key figures structure as shown below.

You will get the following pop-up

In this case, we will drag and drop Revenue key figure and Calendar Year Characteristic.

Now we will restrict the Revenue on year 2001.

To do this, Right click on Calendar year and select restrict from the context menu as shown below.
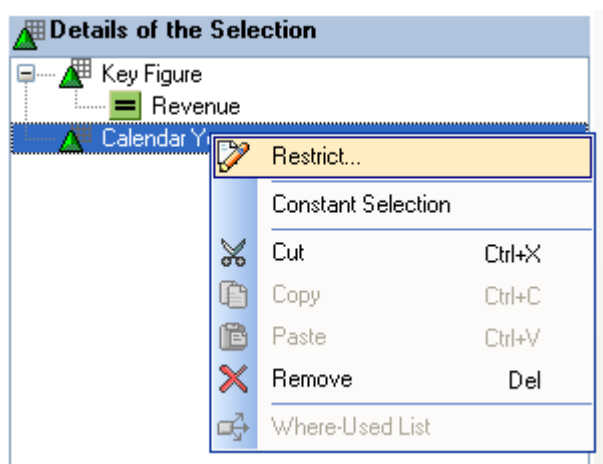
You will get the following pop-pop. Move the Year 2001 to the Chosen Selections as shown below.

Press Ok and the restriction will be complete as shown below.
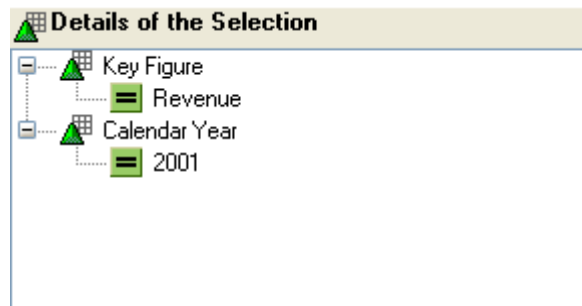
Save the selection after adding Revenue-2001 as the description.

The result is as shown below
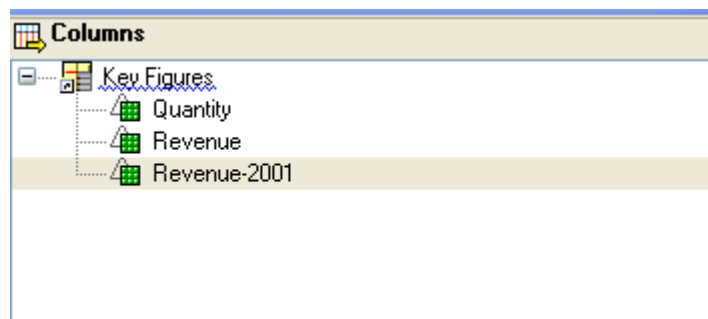
Similarly create another selection restricting Revenue key figure on year 2002.

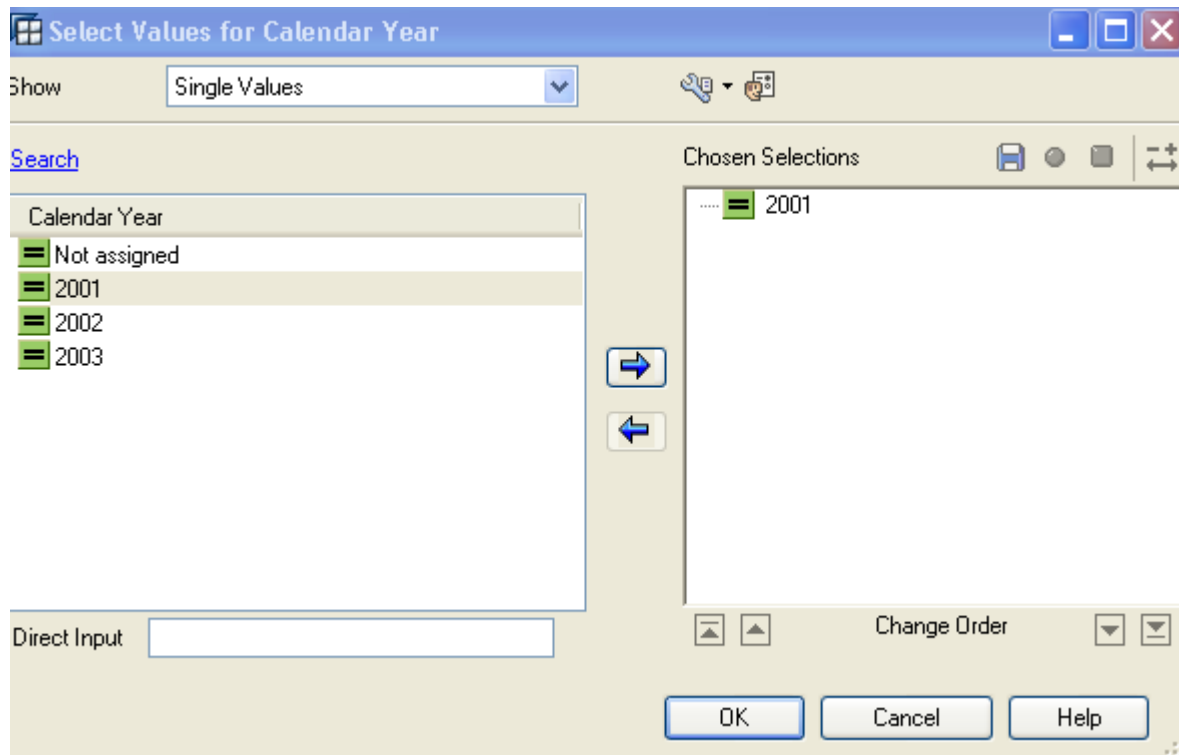The result is as shown below.

Formulas

The next requirement is to add a column to display the percentage growth from 2001 to 2002.

This computation can be done using the formula component in structure.

Continuing from the previous example, to create a new formula, select the option- New Formula from the context menu as shown below.
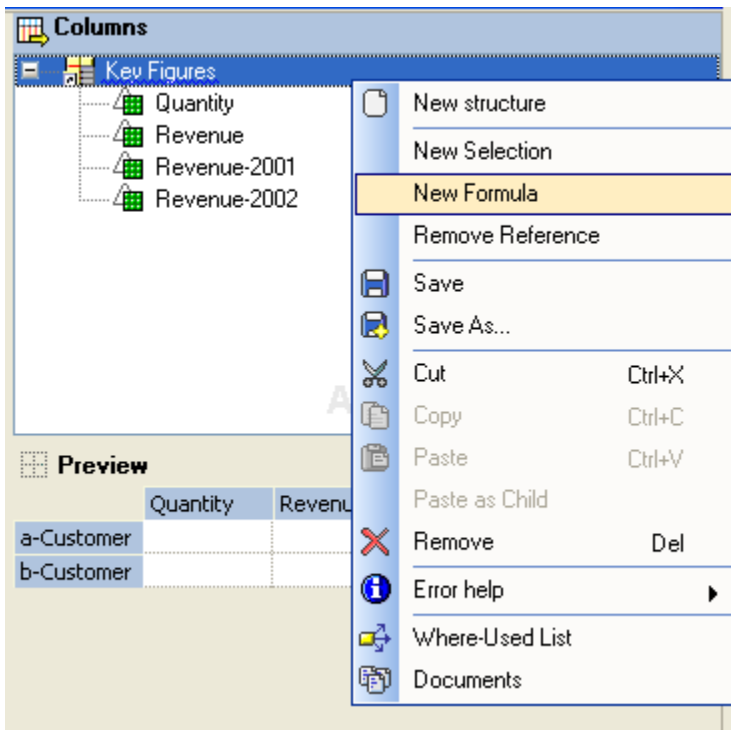
A new formula component appears as circled in red below.
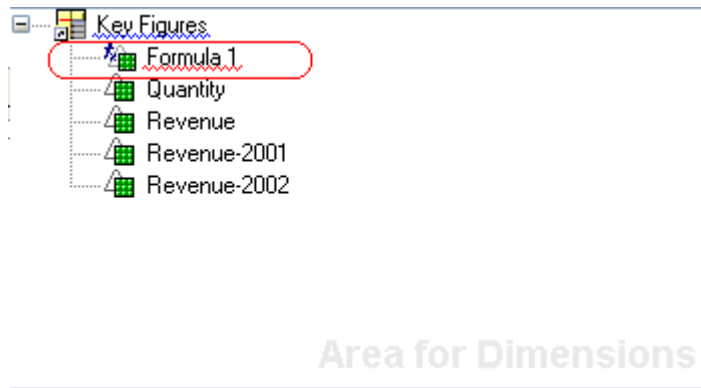
Double click on the formula component to bring up the following pop-up where we will define it.

The formula that will be used for calculating the growth percentage is :

((Revenue 2002 – Revenue 2001) / (Revenue 2001)) * 100 as shown below.

Use the NDIV0 function to handle the divide by 0 scenarios and return 0 as output in such cases.

Press ok and you will see the new fully defined formula component (circled in red below)

The query output is as follows:

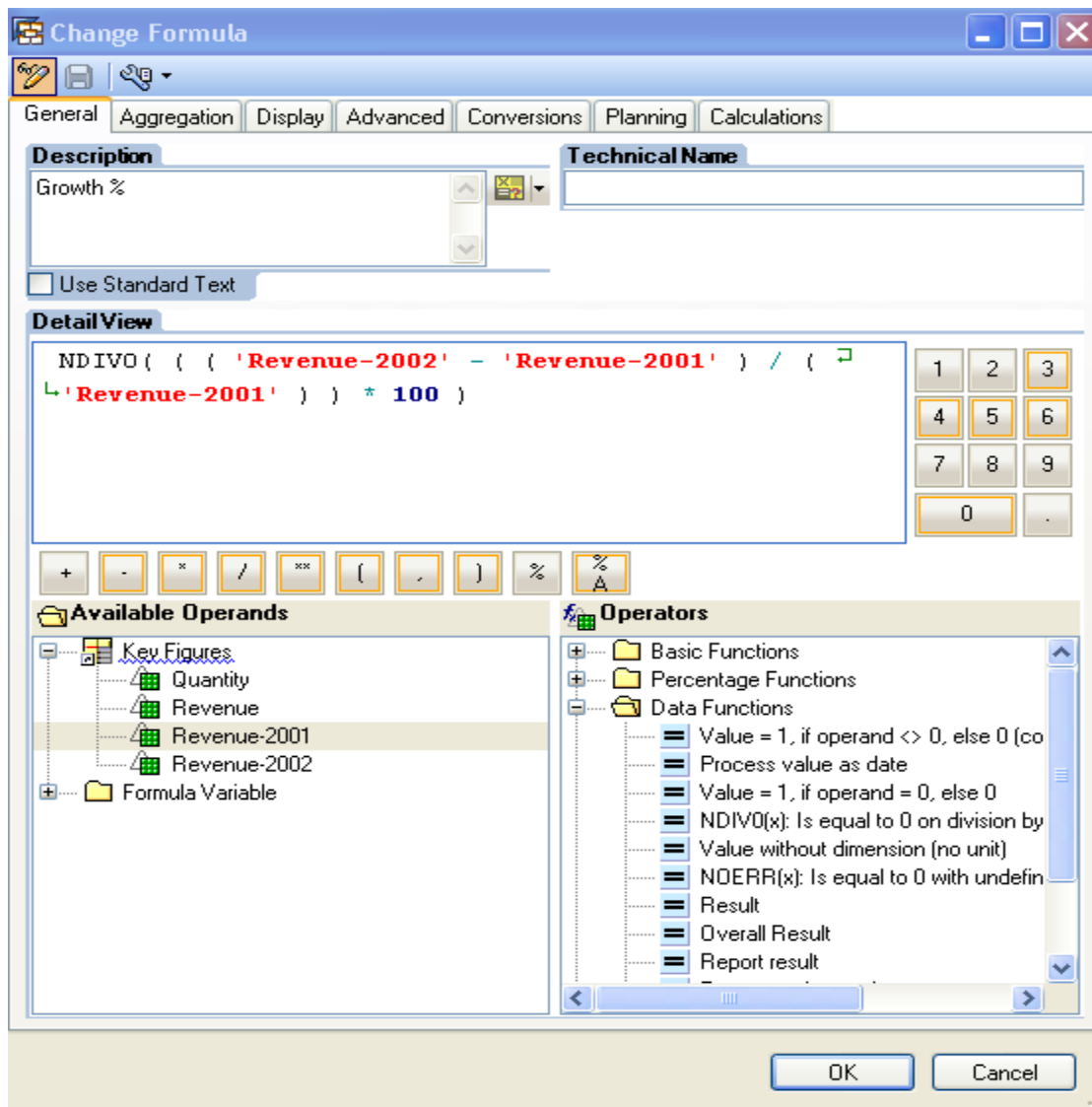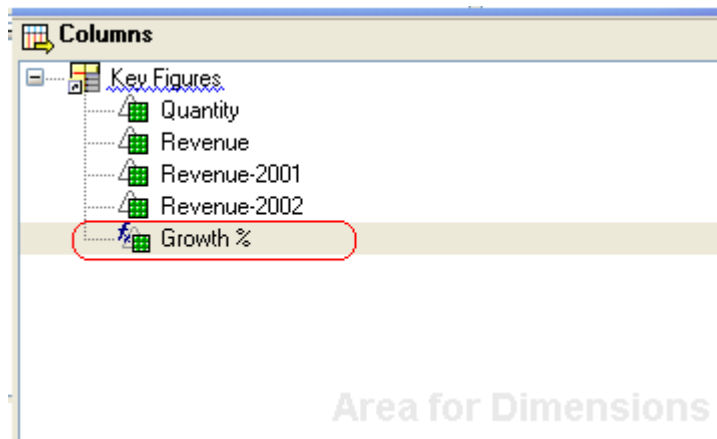| Customer	Product	Quantity	Revenue	Revenue-2001	Revenue-2002	Growth %
CU007	Coastal	11,383.000 ERR	63,836.200 EUR	63,836.200 EUR	31,918.100 EUR	-50.0000
	Skipper	9,982.000 ERR	12,011.600 EUR	12,011.600 EUR	6,005.800 EUR	-50.0000
	Inshore	5,786.000 ERR	22,070.400 EUR	22,070.400 EUR	11,035.200 EUR	-50.0000
	Offshore	5,578.000 ERR	36,526.500 EUR	36,526.500 EUR	18,263.250 EUR	-50.0000
	Wellingtons	5,164.000 ERR	8,486.400 EUR	8,486.400 EUR	4,243.200 EUR	-50.0000
	Result	42,229.000 ERR	153,349.900 EUR	153,349.900 EUR	76,674.950 EUR	-50.0000
CU003	Coastal	9,460.000 ERR	54,131.700 EUR	54,131.700 EUR	27,065.850 EUR	-50.0000
	Inshore	8,285.000 ERR	34,034.300 EUR	34,034.300 EUR	17,017.150 EUR	-50.0000
	Offshore	6,548.000 ERR	43,358.300 EUR	43,358.300 EUR	21,679.150 EUR	-50.0000
	Wellingtons	6,433.000 ERR	10,305.100 EUR	10,305.100 EUR	5,152.550 EUR	-50.0000
	Skipper	6,160.000 ERR	8,174.400 EUR	8,174.400 EUR	4,087.200 EUR	-50.0000
	Result	42,203.000 ERR	162,997.200 EUR	162,997.200 EUR	81,498.600 EUR	-50.0000
CU005	Inshore	11,333.000 ERR	47,967.400 EUR	47,967.400 EUR	23,983.700 EUR	-50.0000
	Skipper	7,306.000 ERR	8,833.300 EUR	8,833.300 EUR	4,416.650 EUR	-50.0000
	Coastal	7,152.000 ERR	40,917.500 EUR	40,917.500 EUR	20,458.750 EUR	-50.0000
	Wellingtons	5,437.000 ERR	8,684.500 EUR	8,684.500 EUR	4,342.250 EUR	-50.0000
	Offshore	4,852.000 ERR	31,982.000 EUR	31,982.000 EUR	15,991.000 EUR	-50.0000
	Result	41,787.000 ERR	151,602.900 EUR	151,602.900 EUR	75,801.450 EUR	-50.0000
CU001	Coastal	7,768.000 ERR	43,242.900 EUR	43,242.900 EUR	21,621.450 EUR	-50.0000
	Skipper	7,536.000 ERR	9,545.800 EUR	9,545.800 EUR	4,772.900 EUR	-50.0000
	Offshore	7,446.000 ERR	47,304.900 EUR	47,304.900 EUR	23,652.450 EUR	-50.0000
	Inshore	4,748.000 ERR	19,877.800 EUR	19,877.800 EUR	9,938.900 EUR	-50.0000
	Wellingtons	4,638.000 ERR	7,340.100 EUR	7,340.100 EUR	3,670.050 EUR	-50.0000
	Result	38,704.000 ERR	143,846.200 EUR	143,846.200 EUR	71,923.100 EUR	-50.0000
CU004	Coastal	7,823.000 ERR	45,395.000 EUR	45,395.000 EUR	22,697.500 EUR	-50.0000
	Skipper	6,411.000 ERR	7,792.200 EUR	7,792.200 EUR	3,896.100 EUR	-50.0000
	Inshore	6,056.000 ERR	23,256.900 EUR	23,256.900 EUR	11,628.450 EUR	-50.0000
	Wellingtons	5,830.000 ERR	9,823.600 EUR	9,823.600 EUR	4,911.800 EUR	-50.0000
	Offshore	4,813.000 ERR	31,817.100 EUR	31,817.100 EUR	15,908.550 EUR	-50.0000
	Result	35,550.000 ERR	128,783.100 EUR	128,783.100 EUR	64,391.550 EUR	-50.0000

Thus we have implemented and analyzed the concept of Selection and formulas.

Related Content

http://help.sap.com/saphelp_erp2004/helpdata/en/4d/e2bebb41da1d42917100471b364efa/content.htm

http://sapdocs.info/sap/bw-bi-bobj/sap-bex-query-designer/

http://help.sap.com/saphelp_nw04/helpdata/en/f1/0a569ae09411d2acb90000e829fbfe/content.htm

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