jedox.

Jedox Academy Training

Database Specialist

Willkommen – Welcome – Bienvenue – Bienvenidos

Добре дошли | Bun venit | Grüezi | Servus | Dobrodošli | Welkom | Välkomna | Wëllkomm | Sveiki atvykę | Velkommen
Tervetuloa | أهلاً و سهلاً | Laipni lūdzam | ようこそ |Mauya | 歡迎光臨 | Καλώς Ορίσατε | Benvenuti | Bem-vindos | Witajcie | ברוכים הבאים
Mabuhay | خوش آمدید | Vítáme vás | Isten hozta | Selamat datang | Benvingudes | स्वागत |Добро пожаловать! | Karibuni! | Hoşgeldiniz | Hoi |Bi xêr hatî

Language

English

Version 2024.1

Working with the material

Preparation: #1 – Contents of the training package

All the training material for this course can be found in a ZIP file. You will either receive the download link automatically a few days after a trainer-led course or you will find it on one of the first pages of the course in the Online Academy.

This ZIP file contains

• this PDF as the main source of the training in three languages (English, German, French)

Jedox.251.Database.Specialist.Training_EN/DE/FR.pdf

• a file with worksheets for use in Jedox Web

Jedox 251 Database Specialist Training.pb

• the standard training database in zipped form, including the translations for the web worksheets of the PB file

ACME_Data.zip

In a Jedox Academy instructor-led training course, the necessary environment is of course already prepared for each participant. The data distribution described here is necessary if you want to learn in the Online Academy on your own or if you want to review the course content in your environment after a training.

Log in to Jedox Web in your Jedox environment with your access data and carry out the following steps.

For the training database:
- Open the Modeler.
- Choose the “Upload database” command from the database menu (cog wheel).
- Select the file ACME_Data.zip and confirm the database name.

For the worksheets:
- Open the Designer.
- Select a suitable folder (or create a new one) and the “Import” command.
- Select the PB file and confirm the following steps.

Certain conventions apply within this material:

• New modules can be recognized by their numbering in the heading; on subsequent pages for the same module, its name appears in reduced size at the top right.

• The colored bars below the module name or above the page title indicate the type of section:

Beige: Theory ▪ Blue: Goal ▪ Magenta: Task ▪ Gray: Optional

• Icons in the margin indicate additional or particularly important information.

• The task icon prompts you to take action.

• In the extended form, it contains the cross-reference to the web worksheet of the same name in the Designer.

• Always open this file in the Designer before opening one of the worksheets:

This is used to set variables for the other worksheets. You can overwrite these there on the “sysTable” sheet with other values if this is necessary for your environment.

• Select your desired language for the worksheets.

Database Specialist - Topics

Definition of the target model

Modeler: Working with Dimensions

- *Creating dimensions manually*
- *Using the time editor*
- *Creating dimensions from prepared data*

Modeler: Working with Cubes

- *Filling a cube with source data in different formats*
- *Dealing with null values and empty strings*

1.0 Database concepts

Operational systems

Operational systems in companies are used to control and execute business processes. These are usually so-called ERP systems, which consist of combinable modules for various business divisions and tasks, e.g., for materials management, production (planning), finance and accounting, human resources, sales and marketing, etc.

These systems are characterized by the following features:

- Data management in relational database
  The data is stored in flat tables that are linked to each other via key fields. This structure reduces data redundancy. SQL is used as the query language, and the commands can become very complex.

- high level of detail of the data
  The purpose of these systems is to store every business transaction. However, this means that the level of detail is too high for many analysis purposes; trend determinations and decision preparation are difficult on this basis.

- Transaction-oriented
  Data consistency is provided by transaction criteria, i.e., it is ensured that business transactions only enter the system in their entirety. At the same time, encapsulation in transactions also allows optimization of response and data throughput times.

Analytical systems

Analytical systems are primarily used to provide data (mostly that of operational systems, possibly with additions from other sources) for various purposes such as reporting, analyses from flexible perspectives, and planning and budgeting. These form the group of OLAP systems (OLAP = Online Analytical Processing). In addition, there are systems for data mining, in which statistical methods are used to determine trends.

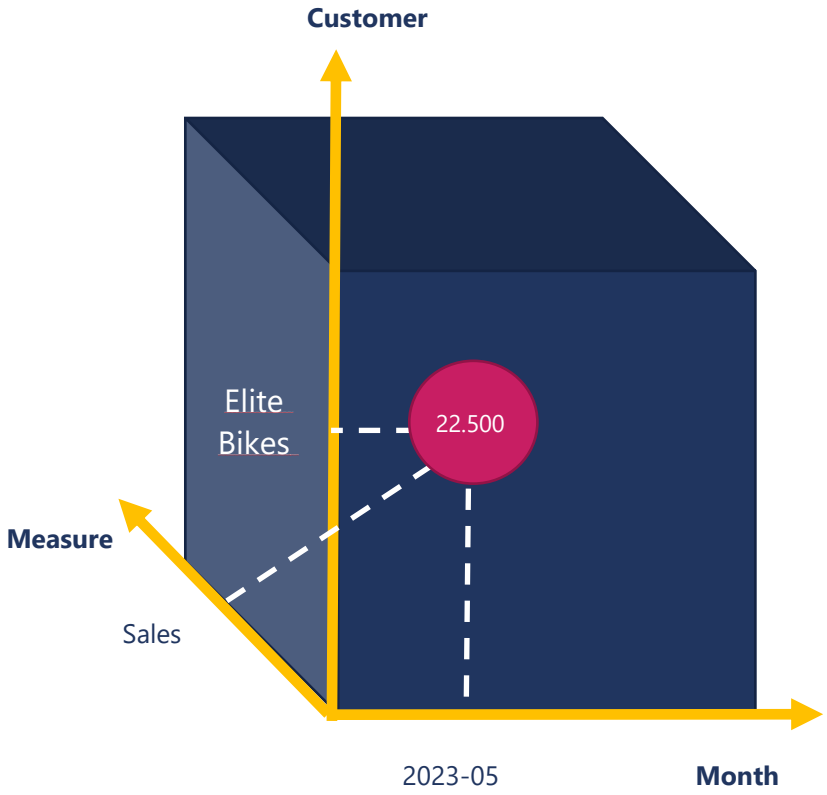
OLAP systems are distinguished between:

▪ ROLAP (= relational OLAP).
Here, storage takes place in a relational database, queries therefore provide data records as a result. These systems typically have better scalability but poorer performance than MOLAP systems.

▪ MOLAP (=multidimensional OLAP)
As a rule, data is already stored on an aggregated level (compared to the transactions) in a multidimensional database, which provides data points as query results. The design of the database usually already offers possibilities for operations such as summations, and typical analysis actions include slicing, dicing, drill-down, and roll-up.

Jedox terms – #1

Let's briefly recall some terms related to a Jedox database.



Attributes

Cubes

Elements

Dimensions

Hierarchies

Weight

Jedox terms – #2

1.0 Database concepts

Dimensions	are containers for similar objects such as all customers, all products, all accounts.
Elements	are the building blocks of the dimensions. Each element represents a specific characteristic of the objects represented by the dimension, e.g. a customer, a product or a product group, an account of the chart of accounts.
Hierarchies	represent a grouping of elements and aggregate their values. Elements at the lowest level of a hierarchy are the base elements on which values are stored. Elements with subordinate elements are consolidated elements that are calculated by the OLAP server when queried.
Weight	is a factor assigned to an element and used in each calculation of the parent element. By default this factor is 1 for an addition, by setting -1 it can become a subtraction, with a factor 0 this value is not added to the next higher level, with 0.001 a decimal shift of 3 digits can be achieved etc.
Attributes	provide elements with additional information, which can be displayed together with or instead of the element names in reports as well as used for filters or virtual dimensions.
Cubes	are data spaces formed by combining dimensions. The dimensions form the axes of the cube, each intersection of one element per dimension is a cube cell where a value can be stored.

1.1 Derivation of the target model

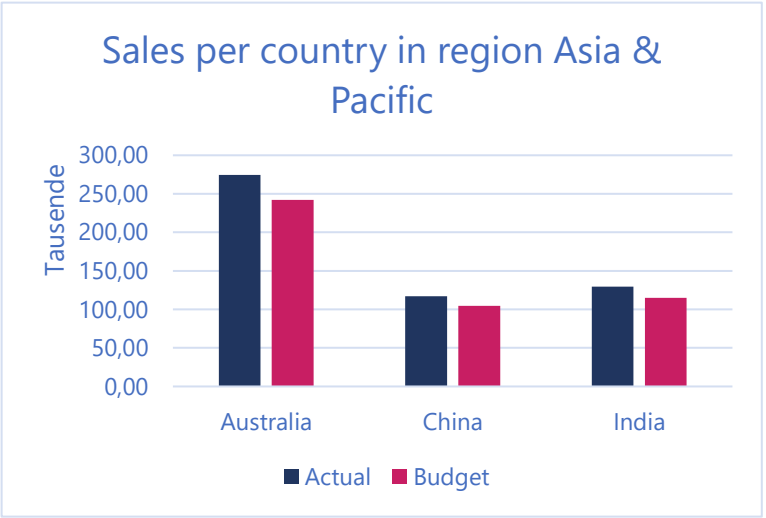
Starting point

Sales

	Actual	Budget	Variance	% Var.
Technical Parts	93.167,04	87.158,26	6.008,78	107%
Workout Emporium	181.389,30	154.801,90	26.587,40	117%
Australia	274.556,34	241.960,16	32.596,18	113%
Bike Dealers Association	9.636,56	8.595,20	1.041,36	112%
Certified Sports Supply	88.634,52	79.056,45	9.578,07	112%
Major Sport Suppliers	17.114,38	15.264,96	1.849,42	112%
Remote Bicycle Specialists	1.812,19	1.616,36	195,83	112%
China	117.197,65	104.532,97	12.664,68	112%
Extended Tours	18.580,13	15.783,16	2.796,97	118%
General Bike Corporation	3.064,29	2.733,16	331,13	112%
Petroleum Products	43.349,86	38.665,37	4.684,49	112%
Toy Manufacturing Inc	64.723,69	57.729,49	6.994,20	112%
India	129.717,97	114.911,18	14.806,79	113%

Australia	274.556,34	241.960,16	32.596,18	113%
China	117.197,65	104.532,97	12.664,68	112%
India	129.717,97	114.911,18	14.806,79	113%
Asia & Pacific	521.471,96	461.404,31	60.067,65	113%

(...)	Jul 2023	Aug 2023	Sep 2023	Q3 2023



Background

With Jedox, the Excel workbooks used so far are to be replaced as far as possible, including the one shown here.

As with other database applications, Jedox requires that a model is planned from the output side. Without knowledge of what is needed in terms of reports, the model cannot be designed.

In addition, existing dependencies between data and the definition of key figures, i.e. how they should be calculated, must be clarified.

Also keep in mind that BI systems are “living” systems that are subject to frequent adjustments to respond to changing or new issues, company structures, etc.

A good model should leave room for such adjustments without having to develop the entire application from scratch.

Therefore, you should also consider which evaluations and analyses you have not done so far because of the effort involved. Even if these are perhaps not implemented in the first project step, it can make sense to include them in the model considerations.

Additional input

We receive the following additional information from business users:

(1) Apart from sales revenues also costs of sales, sold quantities, margins etc. are analyzed.

(2) Customers are not only analyzed by regions but also by business types:

Bicycle Shops, Sports Outfitters, Department Stores, Manufacturers, Repair Shops, Tour Operators

(3) Comparable workbooks exist for the overview by products instead of customers (see right).

(4) In addition there are workbooks including distribution channels:

Fax/Phone/Mail, Online Shop, Walk-In

(3) Product analysis

	Jul 2023	Aug 2023	Sep 2023	Q3 2023
Off-Road-100 Blue 38	19.030,58	31.367,47	55.571,00	105.969,05
Off-Road-100 Red 42	34.965,17	986,17	11.062,22	47.013,56
(...)				
Mountain Bikes	351.408,80	450.798,21	615.373,20	1.417.580,21
Cross-150 Silver 52	260.526,87	418.641,28	336.056,52	1.015.224,67
Cross-250 White 44	25.251,29	118.921,20	44.786,13	188.958,62
(...)				
Road Bikes	2.524.090,82	3.640.376,58	2.600.262,77	8.764.730,17
(...)				
Bikes	2.886.601,69	4.098.782,76	3.230.611,63	##########
HL Trekking Handlebars	0,00	44,76	21,05	65,81
ML Cross Handlebars	325,71	346,01	578,77	1.250,49
(...)				
Handlebars	980,05	3.794,08	2.020,13	6.794,26
Front Brakes	54,65	0,00	0,00	54,65
Rear Brakes	30,98	0,00	148,50	179,48
Brakes	85,63	0,00	148,50	234,13
(...)				
Components	928.852,64	1.107.122,01	1.152.470,02	3.188.444,67

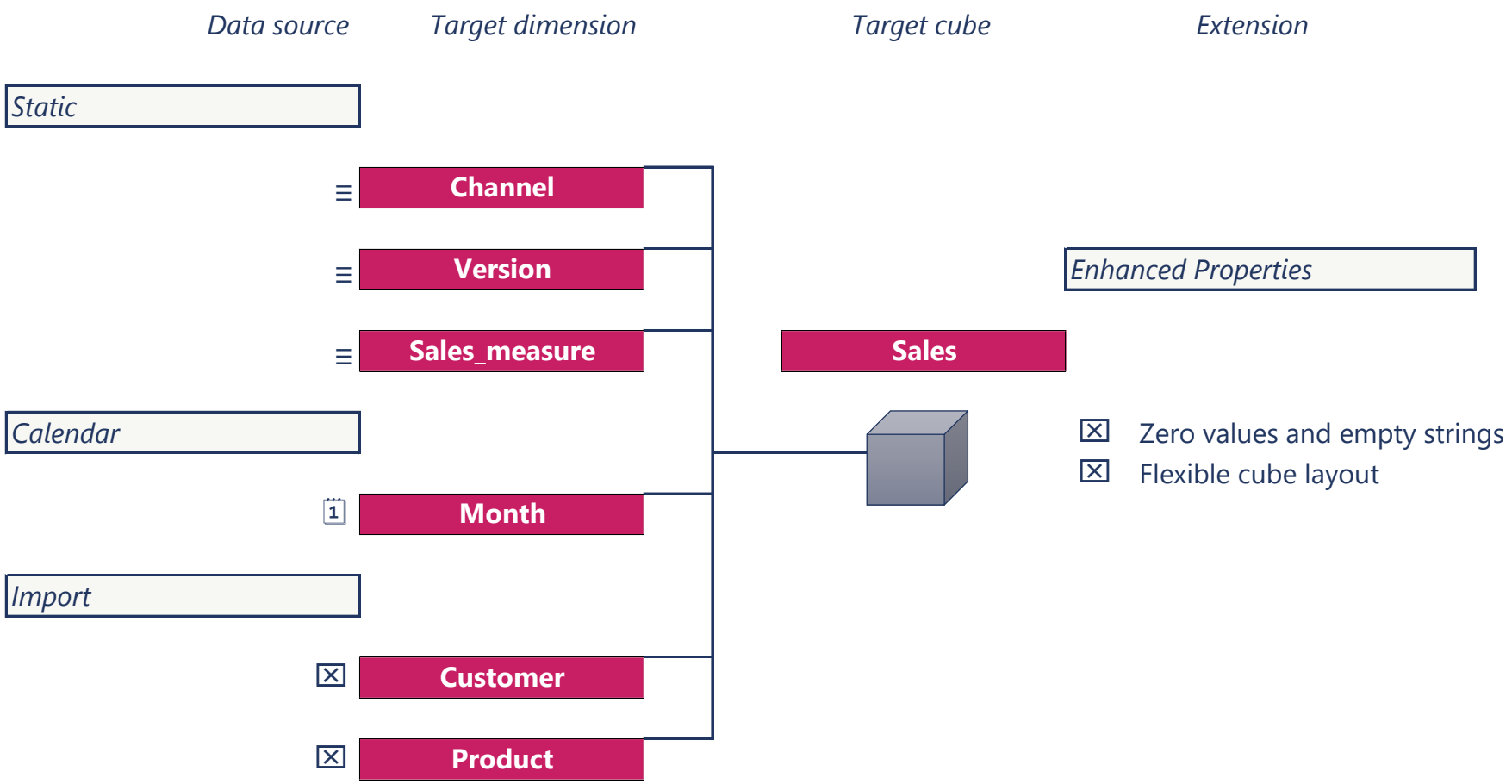
Overview target model

From the outlined reports and other specifications, the following information can be obtained for the data model:

Time	Analyses occur at the month and quarter level, probably also on year level even if this is not visible in the example reports.
Products	Together with product groups and subgroups, these make up a hierarchy.
Customers	Two hierarchies are necessary, by geography – using countries and regions – and by business types.
Distribution channels	These are not present in the sample reports but are mentioned explicitly by the users.
Versions	Distinctions are between at least the actual and budget values as well as the variance and percentage ratio between the two. Other types like forecasts are likely to be considered as well.
Measures	The sample reports only show sales revenues, but the additional specifications mention other necessary measures.

1.2 Target model

Model overview



Additional information

The database we will create in this course consists of the objects listed here.

While working your way through the course, you will repeatedly find control sheets on which the created components change from magenta to green after updating the workbook, if they correspond to the specifications from the material.

The first three dimensions are rather small and static in nature, we will create these without any special tools. For the month dimension we will use the time editor.

For the two largest dimensions, as well as for the cube, the data is provided in various formats in text files, which we will import using available methods.

In addition, there are (partly optional) modules for special topics, especially for the cube.

1.3 Create a new database

Create database

- Open the Modeler.
- Click “Create New Database”.
- Name the new database.

```
ACME_Data_POC
```

POC = Proof of Concept

A) In a training with Jedox Academy virtual training environment

- Append your user name, e.g.

```
_student01
```

B) In self-study or in a training course without Jedox Academy virtual training environment

- Expand the name for uniqueness if necessary.

Additional information

For database names some rules and restrictions apply:

- upper- and lowercase letters (A-Z, a-z) w/o diacritics
- figures (0-9), underscore (_), hyphen (-), period (.)
- period at the beginning is not allowed
- no spaces

Internationalization

Internationalization of a database allows users to specify not only database components in their respective language, but also, for example, filter criteria, if these are maintained in localized forms in attributes.

Depending on the component to be translated, settings have to be made in different places in the Modeler. To begin with a default language for the database needs to be defined in the advanced section of the database properties.

Language (database name)	
Default	▼ | English (en_US)

Other languages are added in the section “Internationalization” of the database properties.

Supported languages ⊕	
Code	Language
~	(Default Language)
en_UK	English (UK)

2.0 Goal: Static dimensions

Create a new dimension in the new OLAP database.

Channel

The individual sales channels should consolidate into a top element.

In addition, a technical element ishould be created to serve as a catch-all element for data that is not available at the distribution channel level.

Level	Element
1	**All Channels**
2	Fax/Phone/Mail
2	Online Shop
2	Walk-in
2	NA
2	Unassigned

Create another dimension in the new OLAP database.

Version

The dimension structure should automatically calculate the variance by consolidating the elements Actual and Budget with corresponding weight factors.

Level	Element	Weight
1	**Variance**	
2	Actual	1
2	Budget	-1
1	Forecast	
1	Mid-Term Planning	

2.0 Static dimensions

Create dimension – Dimension properties

- Expand the new database in the Modeler and open the context menu on “Dimensions” to create a new dimension:

Name	**Channel**
Description	**Distribution channels**
Template	**No template**

- Select the new dimension and choose the tab and the section for the following entries:

Properties
Internationalization

Language	Name Translation	Description Translation
(Default Language)	Channel	Distribution channels
English (UK)	Channel	Distribution channels

Create dimension – Elements

- Switch to the tab Elements

- To create a new element click on 

- Insert the following element names.

Element	Type	Parent element	Weight
All Channels	123		
Fax/Phone/Mail	123		
Online Shop	123		
Walk-in	123		
NA	123		
Unassigned	123		

If you confirm an element name by pressing the Enter key twice, a new input field for the next one opens immediately, so that you can enter all element names quickly one after the other.

- Choose all elements except “All Channels” and then “Add to additional parent” from the context menu.

- Select “All Channels” as the parent element and confirm the warning.

Create dimension – with template

▪ Create another dimension following this procedure with these settings:

Name	**Version**
Description	
Template	**Version**

Language	Name Translation	Description Translation
(Default Language)	Version	Datatypes
English (UK)	Version	Datatypes

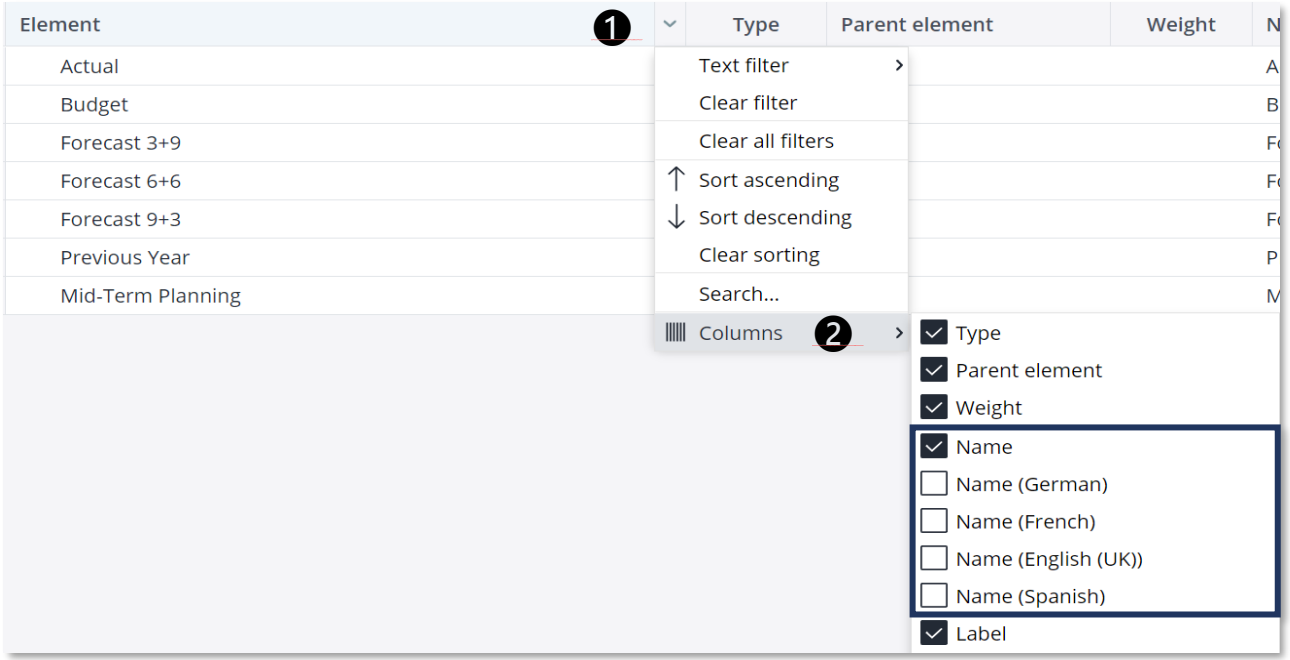
Templates create not only elements, but also attributes, depending on the dimension. They also set the database to use English, German, French and Spanish if these languages were not already selected under “Internationalization”.

Create dimension – Multilingualism

The additional languages are not directly visible in the language section of the database properties, but you can easily check their presence.

- To do this, point to any column header in the element table of the dimension and open the drop-down menu (1).
- Open the submenu “Columns” (2).

Here you can switch the attribute display on or off for all languages available in the database.



Adjust the elements from the template to the specification:

Element	Type	Parent element	Weight
Variance	123		
Actual	123	Variance	1
Budget	123	Variance	-1
Forecast	123		
Mid-Term Planning	123		

- Delete the elements “Forecast 9+3” and “Previous Year”.
- Rename one of the remaining Forecast elements to “Variance”, the other to just “Forecast”.

- Consolidate “Actual” and “Budget” into the “Variance” element and apply the correct weight.

- Optional: Overwrite the attribute values for “Name” and “Label” for “Variance” and “Forecast” with more suitable entries. (We do not need these values in the further course).

2.0 Check the result - Channel, Version

Dimension contents

2.0 Dimension.Static

“All Channels” and “Variance” should appear as consolidated elements in bold.

The remaining elements of the dimension “Channel” should show a green highlighted 1 in the first column.

“Actual” and “Budget” should follow “Variance” and show a green highlighted 1 and -1 respectively.

If you have placed these two elements in reverse order under “Variance”, the weightings will be highlighted in red. However, if the values are correct, this is not a problem for the further course.

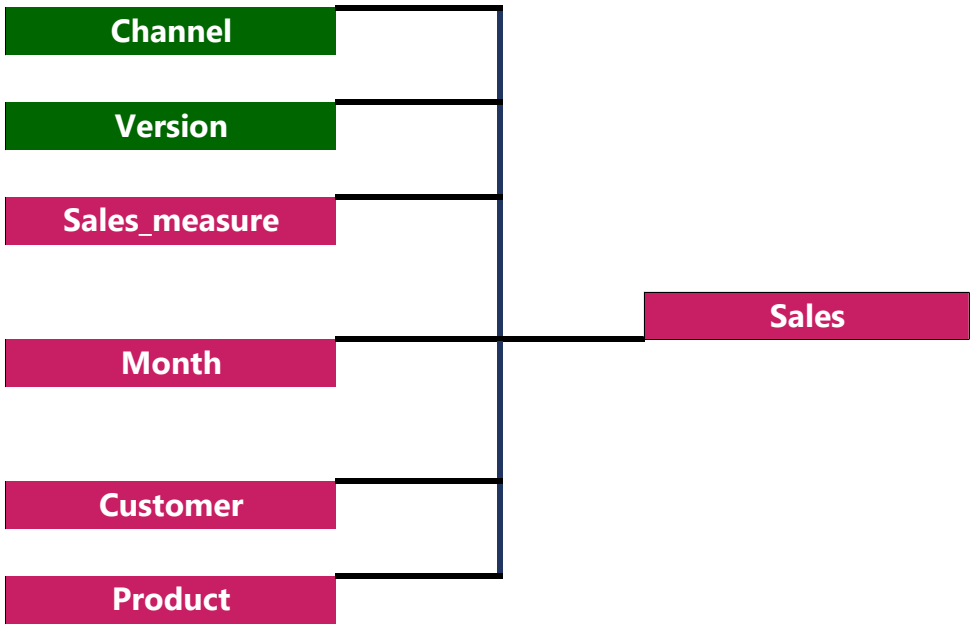
Channel

w	cc	Element
	1	
	5	**All Channels**
1	0	Fax/Phone/Mail
1	0	Online Shop
1	0	Walk-In
1	0	NA
1	0	Unassigned
	0	
	0	
	0	
	0	
	0	
	0	
	0	
	0	
	0	
	0	

Version

w	cc	Element
	1	
	2	**Variance**
1	0	Actual
-1	0	Budget
	0	Forecast
	0	Mid-Term Planning
	0	
	0	
	0	
	0	
	0	
	0	
	0	
	0	
	0	
	0	

If you have created the dimensions with correct names and in the given order, then these two objects will be set to green in the stylized model.



2.1 Goal: Static dimension with attributes

Create another dimension in the new OLAP database.

All measure elements are located on top level except for sales and cost of sales which are used to calculate the gross profit by using consolidation and the appropriate weight factors.

Provide alternative phrases for the additional language.

Sales_measure

Level	Element	Weight	Language
			English (UK)
1	Quantity		Qty
1	**Gross Profit**		Gross Margin
2	Sales	1	Sales Revenue
2	Cost of Sales	-1	Cost of Goods Sold
1	Price		Price
1	# of Orders		No of Orders
1	Comment		Comment

2.1 Static dimension with attributes

Create dimension

- In the same manner as before, create another dimension with these settings:

Name	**Sales_measure**
Description	**Sales measures**
Template	**No template**

Language	Name Translation	Description Translation
(Default Language)	Sales_measure	Sales measures
English (UK)	Sales measure	Sales measures

Naming convention

Here are some hints for naming database objects that have proven useful in practice:

▪ Use one specified language for naming, in a multilingual environment usually English, in a monolingual environment the appropriate language.
▪ Avoid acronyms and abbreviations.
▪ Separate words by space, avoid underscores, CamelCase and similar constructs as they are harder to read.

Especially for dimensions consider the following:

▪ The dimension name should reflect the finest level of detail (i.e. the base elements) of the dimension, because this level is always the same and thus unique even across multiple parallel hierarchies.
▪ Use common terms like Version, Month, Customer.
▪ Use the singular form of the terms and not the plural one, because dimension names are often used as a filter for single choice (“version equals budget”) or as a breakdown concept (“sales by customer”).
▪ If the dimension is the measure dimension for a cube, name it like the cube with an appended “_measure” (as an exception to the recommendation to avoid underscores).

Create dimension – Elements

The dimension should have this structure at the end:

Element	Type	Parent element	Weight
Quantity	123		
Gross Profit			
Sales	123	Gross Profit	1
Cost of Sales	123	Gross Profit	-1
Price	123		
# of Orders	123		
Comment	abc		

Instead of entering the element names manually, they can also be copied.

- Select the element names in the copy template and copy them to the clipboard.
- Switch to the Modeler using the tab

Elements

- Paste the content of the clipboard with CTRL+V.
- Generate the consolidation and adjust the weights.
- Change the type of the “Comment” element to “string”.

Translate element names – #1

The translation of element names is handled by attributes which must first be defined.

- Switch to the tab **Properties**
- To create a new attribute click on: 

Attribute	Type
Name	abc

- Switch to the tab **Elements**
- Point to any column header, open the menu with the down arrow and select **Columns | Name (English (UK))**

Translate element names – #2

2.1 Static dimension with attributes

The following alternative phrases should be used for the elements.

Element	Type	Parent element	Weight	Name	Name (English (UK))
Quantity	123			Quantity	Qty
Gross Profit				Gross Profit	Gross Margin
Sales	123	Gross Profit	1	Sales	Sales Revenue
Cost of Sales	123	Gross Profit	-1	Cost of Sales	Cost of Goods Sold
Price	123			Price	Price
# of Orders	123			# of Orders	No of Orders
Comment	abc			Comment	Comment

Similar to the element names, the attribute values can also be transferred via copy & paste.

- Select the attribute values for both languages in the copy template and copy them to the clipboard.
- Select the corresponding attribute cells in the Modeller and paste the values.

Make sure that the values to be copied are not in merged cells. These will practically disintegrate into the individual cells again when pasted and the action will fail. This applies to copying from Excel as well as from the Designer.

2.1 Check the result - Sales_measure

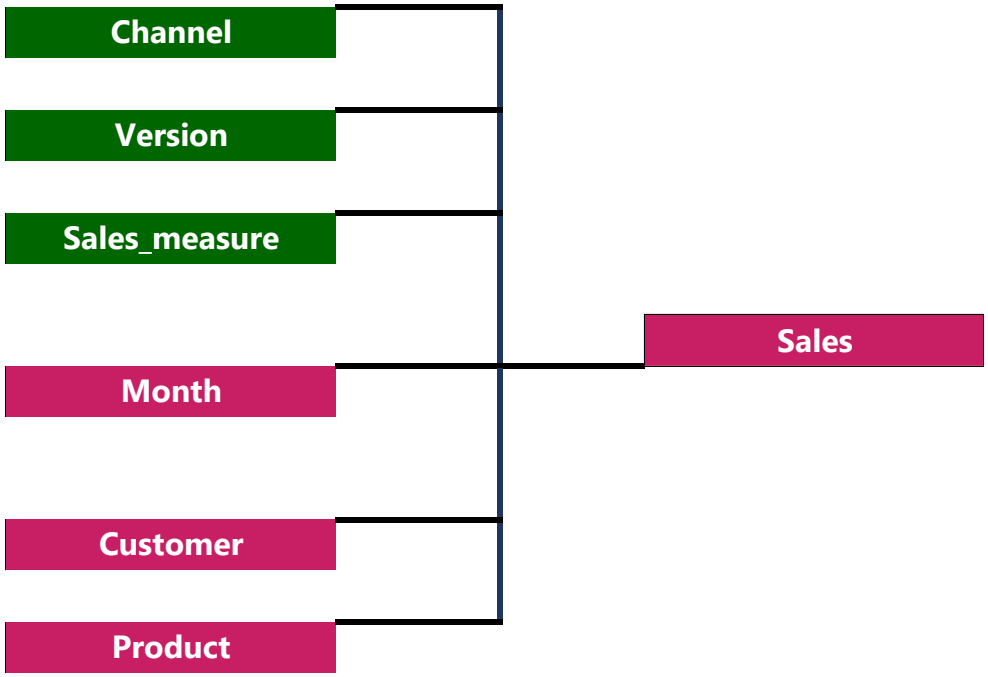
Dimension content

2.1 Dimension.Attributes

Analogous to the version dimension, you should see “Gross profit” as a consolidated element in bold and “Sales” and “Cost of sales” below it with a green highlighted 1 or -1.

If you only have a different element order with otherwise correct assignment and weighting, this is also okay.

		Sales_measure		
	1			
w	cc	Element	Name (en_US)	Name (en_UK)
	0	Quantity	Quantity	Qty
	2	**Gross Profit**	Gross profit	Gross Margin
1	0	Sales	Sales	Sales Revenue
-1	0	Cost of Sales	Cost of sales	Cost of Goods Sold
	0	Price	Price	Price
	0	# of Orders	# of orders	No of Orders
	0	Comment	Comment	Comment
	0			
	0			
	0			
	0			
	0			


Channel
Version
Sales_measure
Sales
Month
Customer
Product

2.2 Goal: Time dimension

Hierarchy calendar year

Dimension	Attributes				
Month	Name	Description	PreviousMonth	PreviousYear	(...)
All Months	All Months				
2023	2023	2023		2022	
2023-~	2023 (entry)	2023 (data entry)			
2023-00	2023 (OB)	2023 (opening balance)			
2023-Q1	Qtr 1	Quarter 1		2022-Q1	
2023-01	Jan	January	2022-12	2022-01	
2023-02	Feb	February	2023-01	2022-02	
2023-03	Mar	March	2023-02	2022-03	
2023-Q2	Qtr 2	Quarter 2		2022-Q2	
2023-04	Apr	April	2023-03	2022-04	
2023-05	May	May	2023-04	2022-05	
2023-06	Jun	June	2023-05	2022-06	
(...)					

Hierarchy requirements

Sales data should be stored by month, quarter and year, so the dimension must provide the elements for these three levels.

In addition, there are elements for special periods, e.g. a period 0 for opening balances or an input element at year level for data that is not available at month level.

A set of attributes is intended to provide alternative formatting of element periods on the one hand, and to provide comparison periods on the other.

In addition, as will be seen in the next section, a cumulative view of the months of a year should be available and a fiscal year that differs from the calendar year should be taken into account.

Dimension	Attributes				
Month	Name	Description	PreviousMonth	PreviousYear	(...)
All Months_YTD	All Months (YTD)				
2023_YTD	2023 (YTD)			2022_YTD	
2023-~	2023 (entry)	2023 (data entry)			
2023-00	2023 (OB)	2023 (opening balance)			
2023-01	Jan	January	2022-12	2022-01	
2023-02	Feb	February	2023-01	2022-02	
(...)					
2023-01_YTD	Jan (YTD)	January (year-to-date)	2022-12_YTD	2022-01_YTD	
2023-01	Jan	January	2022-12	2022-01	
(...)					
2023-05_YTD	May (YTD)	May (year-to-date)	2023-04_YTD	2022-05_YTD	
2023-01	Jan	January	2022-12	2022-01	
2023-02	Feb	February	2023-01	2022-02	
2023-03	Mar	March	2023-02	2022-03	
2023-04	Apr	April	2023-03	2022-04	
2023-05	May	May	2023-04	2022-05	
(...)					
All Fiscal Periods	All Months (FY)	All Months (fiscal year)			

2.2 Time dimension

Generate a simple month dimension

- In the same manner as before, create another dimension with these settings:

Name	**Month**
Description	
Template	**Month**

Language	Name Translation	Description Translation
(Default Language)	Month	Periods
English (UK)	Month	Periods

The template generates a simple structure for one year with some attributes. This structure can be adjusted for the desired purposes in various ways with the help of the Time Editor.

A dimension created with either the template “Month” or “Day” automatically gets the Time Editor. If the time dimension is initially created without a template, this editor can be activated by assigning the type “Time dimension” to the dimension.

- Switch to the tab
- Open the section

Properties
Advanced

Here, each dimension can be assigned a type. With the exception of the type "Business", these assignments cannot be undone. The types are needed in the connection with business logic as well as in the context of the predefined Jedox Models, both of which are not covered in this course.

This basic dimension should be extended gradually. After each change in definition, check the effects on elements and hierarchies. Apply the respective settings and let the dimension update with the “Rebuild dimension” mode.

Version 1

Extend the period to cover the years:	2022 – 2025
Choose the following settings:	Levels Year-Quarter-Month
	☑ Additional Data Element on Year level (yyyy-~)
	☐ Additional global data element

Version 2

Add a cumulative view to the periods:	Current Year Hierarchies
	☑ Year-To-Date
	☑ Full Parallel Hierarchies

Version 3

Include a fiscal year:	Fiscal Year Start
	April

Version 4

Add special periods:	☑ Opening period (yyyy-00)
	14 Special Periods

Notes on settings

The settings for the levels that display "Month_YTD" below Month are intended specifically for source systems that do not provide individual month values, but instead always provide accumulated values when a specific month is queried. Instead of the complex calculation of these values down to the individual months in an ETL process, for example, one uses a time hierarchy that handles this correctly with the help of consolidation factors.

The additional data elements can hold data that cannot or should not be broken down to the periods actually used by the dimension.

The special periods allow adding a period 0 for opening balances and up to four periods for year-end entries. If the dimension does not have hierarchy(s) for a fiscal year that is different from the calendar year, all of these periods will be added to the calendar hierarchies in the appropriate place. In case of hierarchy(ies) for a different fiscal year, the periods 13 to 16 are only generated there, since they are not needed as accounting periods in the calendar year.

2.2 Check the result - Month

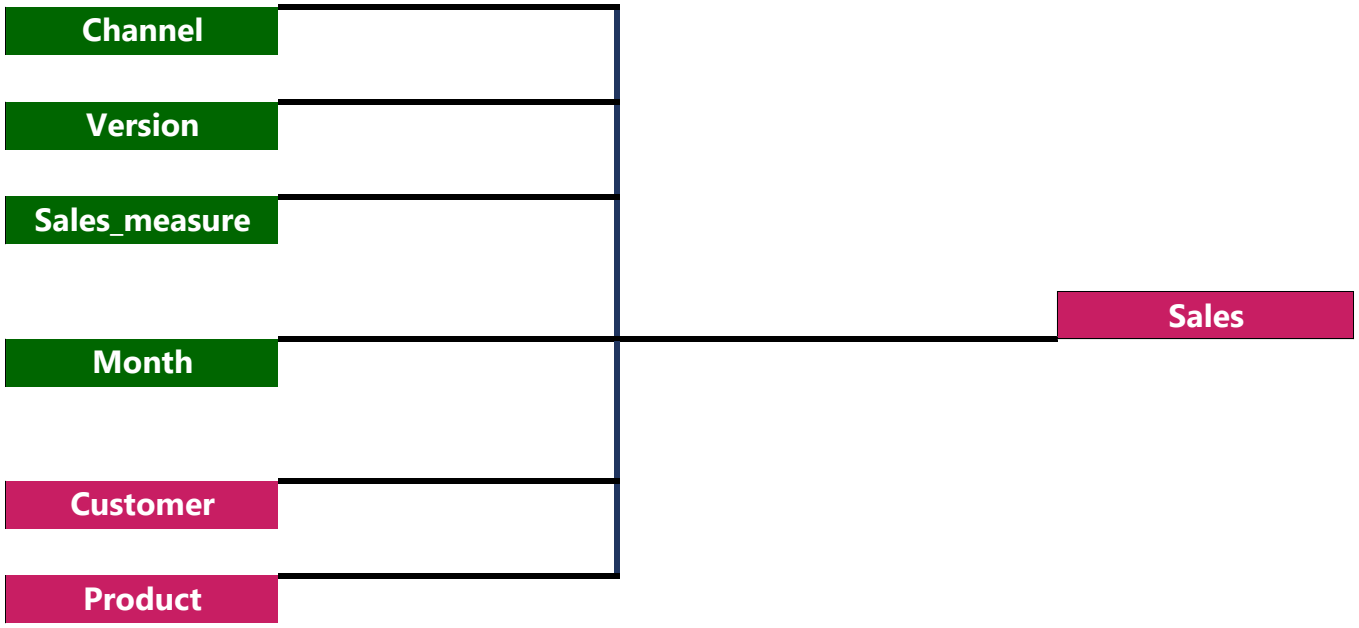
Dimension content

2.2 Dimension.Month

Month	#_Month
2023	*Select a year from the list to see it with attributes.*

cc	Element	Name	Description	PreviousMonth	PreviousYear
4	**All Months**	All Months	2022		
6	**2023**	2.023	2022 (data entry)		
0	2023-~	2023 (entry)	2022 (opening balance)		
3	**2023-Q1**	Qtr 1	Quarter 1		
0	2023-01	Jan	January	2022-12	2023-02
0	2023-02	Feb	February	2023-01	2023-03
0	2023-03	Mar	March	2023-02	2023-04
3	**2023-Q2**	Qtr 2	Quarter 2		
0	2023-04	Apr	April	2023-03	2023-05
0	2023-05	May	May	2023-04	2023-06
0	2023-06	Jun	June	2023-05	2023-07
3	**2023-Q3**	Qtr 3	Quarter 3		
0	2023-07	Jul	July	2023-06	2023-08
0	2023-08	Aug	August	2023-07	2023-09
0	2023-09	Sep	September	2023-08	2023-10
3	**2023-Q4**	Qtr 4	Quarter 4		
0	2023-10	Oct	October	2023-09	2023-11

Model overview



Dimension notes

The attributes for comparison periods in the previous or following year are only filled with the corresponding element names if these elements are also part of the dimension. This has advantages for calculations that recursively work through the time dimension, since in this way a natural stop is set for the OLAP server.

The time editor generates a number of other attributes, including continuous counts of quarters and months since January 1, 1900.

The formatting of the periods in the attribute values cannot be changed, it is set like this by default.

Whether attributes that you add yourself and maintain manually are preserved when you update the dimension depends on the mode you choose. In case of a complete rebuild, these attributes would be deleted afterwards, the extension modes have no effect on them.

Generally, if the Integrator is used anyway, you should also create time dimensions with it because of its greater flexibility.

2.3 Goal: Dimension from available data

Mandatory [Goal.Dim5]

The customer dimension should contain two parallel hierarchies, one by geographical aspects and one by shop types. The data can be found in an Excel file and is already enriched with information for attributes.

Level	Element	Attributes	
		Telephone	SalesPerson
1	**All Customers**		
2	**Americas**		
3	**Argentina**		Octavio Paz
4	Associated Bikes	661-555-0168	Octavio Paz
4	Best o' Bikes	768-555-0125	Octavio Paz
3	**Brazil**		Octavio Paz
3	**Canada**		Alice Munro
3	**Mexico**		Octavio Paz
3	**United States**		Alice Munro
2	**Asia & Pacific**		
2	**Europe, Middle East, Africa**		
1	**All Customers by Business Type**		
2	**Bicycle Shops**		
3	A Great Bicycle Company	371-555-0112	Claude Simon
3	Acceptable Sales & Service	396-555-0139	Patrick White
2	**Sports Outfitters**		
2	**Department Stores**		
2	**Manufacturers**		
2	**Repair Shops**		
2	**Tour Operators**		

2.3 Dimension from available data - Customer

Raw data – #1

- Switch to the Designer.
- Navigate there to

```
//Jedox 251 Database Specialist/Students/
```

and there in your user folder to

```
..└- studentXX/
      └- 02_Project Files/
         └- Customer.xlsx
```

You cannot open this file directly in the Designer, instead a dialog appears to download it. Save the file in a directory of your choice and then open it from there with Excel.

If Excel is not available to you or if problems occur when saving locally, you can use the “Customers_as_text” file in the same directory instead. This file can be opened in the Designer.

Hint

If you are not working with the Jedox Academy training environment, the path to the file may differ from the one specified here! Please use the correct path for your environment hereinafter.

Raw data – #2

The following is an excerpt:

:parent	:child	:weight	Telephone	SalesPerson
	All Customers	1.0		
	All Customers by Business Type	1.0		
All Customers	Americas	1.0		
Americas	Canada	1.0		Alice Munro
Canada	Consumer Equipment	1.0	882-555-0116	Alice Munro
Department Store	Consumer Equipment	1.0	882-555-0116	Alice Munro
Canada	Family Cycle Store	1.0	428-555-0176	Alice Munro
Sports Outfitters	Family Cycle Store	1.0	428-555-0176	Alice Munro
Canada	Fashionable Bikes	1.0	433-555-0168	Alice Munro
Sports Outfitters	Fashionable Bikes	1.0	433-555-0168	Alice Munro

The data is organized in a so-called parent-child structure, i.e. one column (:parent) provides the superordinate element and a second column (:child), an associated subordinate element.

The other columns provide the consolidation factor (the weight) and the attributes which always apply to the element in the column :child.

Because all five columns will be used in the following process the header row with the standard column names of :parent, :child and :weight (plus the attribute names) is required.

▪ In the same manner as before, create another dimension with these settings:

Name	**Customer**
Description	
Template	

Language	Name Translation	Description Translation
(Default Language)	Customer	
English (UK)	Customer	

▪ Switch to the tab: Properties

▪ To create a new attribute click on: Add attribute

Attribute	Type
Telephone	abc
Sales Person	abc

▪ Switch to the Excel file (or the text file, if applicable) with the data and copy the entire data range to the clipboard.

▪ Then switch back to the Modeler and the tab: Elements

▪ Paste the clipboard's content with CTRL+V.

Existing elements are updated if necessary, new elements are created at the end of the list.

The names of the attribute columns are compared to the attribute names in the dimension. Identical names (case-sensitive) are automatically assigned to each other, the values from the source column thus fill the attribute of the same name.

This applies to attribute values in the default language of the database. The otherwise usual syntax of attribute name + @ + language code (e.g. de_DE for German) as column name will NOT cause these values to populate the attribute in the specified language.

2.3 Check the result - Customer

Dimension content

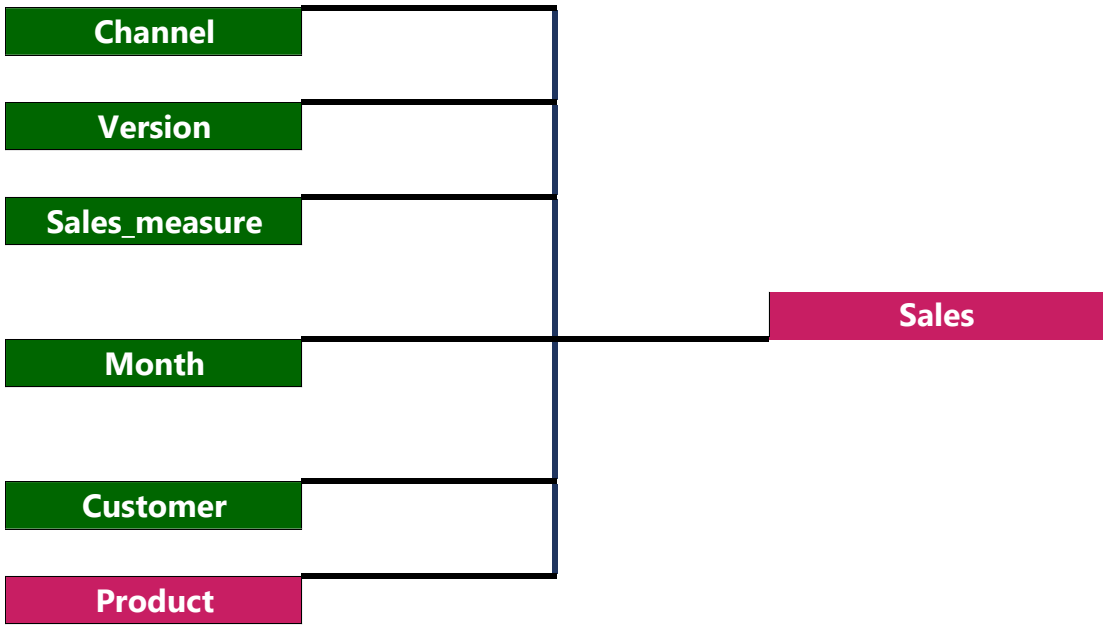
2.3 Dimension.Customer

Customer **#_Customer**

L	Element	Telephone	Sales Person
1	**All Customers**		
2	**Americas**		
3	**Argentina**		Octavio Paz
4	Associated Bikes	661-555-0168	Octavio Paz
4	Best o' Bikes	768-555-0125	Octavio Paz
4	Brown Bicycle Company	582-555-0113	Octavio Paz
4	Futuristic Sport Distributors	239-555-0198	Octavio Paz
4	Highway Bike Shop	383-555-0155	Octavio Paz
4	Rural Sales and Service	380-555-0116	Octavio Paz
4	Successful Sales Company	584-555-0193	Octavio Paz
3	**Brazil**		Octavio Paz
4	Another Sporting Goods Company	119-555-0195	Octavio Paz
4	Basic Sports Equipment	765-555-0141	Octavio Paz
4	Central Discount Store	115-555-0175	Octavio Paz
4	City Cycling	461-555-0118	Octavio Paz
4	Commendable Bikes	763-555-0145	Octavio Paz
4	Elite Bikes	117-555-0173	Octavio Paz
4	Exclusive Bicycle Mart	118-555-0184	Octavio Paz

Model overview

2.3 Check the result - Customer


Channel
Version
Sales_measure
Sales
Month
Customer
Product

2.4 Goal: Dimension from available data

Mandatory [Goal.Dim6]

The product dimension should show products with their product group hierarchy. In addition, an attribute should provide color information for each product. The required information is provided in a text file.

Level	Element	Attribute
		Color
1	**All Products**	
2	**Bikes**	
3	**Mountain Bikes**	
4	Off-Road-100 Blue 38	Blue
4	Off-Road-100 Red 42	Red
3	**Road Bikes**	
3	**Touring Bikes**	
2	**Components**	
3	**Handlebars**	
4	HL Cross Handlebars	
3	**Brakes**	
3	**Chains**	
3	**Frames**	
4	**Mountain Frames**	
5	HL Off-Road Frame - Black 44	Black
5	HL Off-Road Frame - Silver 38	Silver
4	**Road Frames**	
4	**Touring Frames**	
2	**Clothing**	
2	**Accessories**	

2.4 Dimension from available data - Product

Raw data – #1

The raw data for this dimension can be found in this file:

```
//Jedox 251 Database Specialist/Students/
  └- studentXX/
      └- 02_Project Files/
          └- Product.csv
```

The following is an excerpt:

Product Line	Product Group	Product Subgroup	Product	Color
Bikes	Mountain Bikes		Off-Road-100 Blue 38	Blue
Bikes	Mountain Bikes		Off-Road-100 Blue 42	Blue
Bikes	Mountain Bikes		Off-Road-100 Blue 44	Blue
Bikes	Mountain Bikes		Off-Road-100 Red 38	Red
Components	Handlebars		HL Cross Handlebars	
Components	Handlebars		HL Off-Road Handlebars	
Components	Handlebars		HL Trekking Handlebars	
Components	Frames	Mountain Frames	HL Off-Road Frame - Black 44	Black
Components	Frames	Mountain Frames	HL Off-Road Frame - Black 48	Black
Components	Frames	Mountain Frames	HL Off-Road Frame - Silver 38	Silver

Raw data – #2

The data is available in a so-called “full hierarchy” structure including attribute information.

This means that on each line the complete path over all hierarchy levels to a base element can be viewed. Only the top element is typically not included, since it is a constant as a total element.

Here the path runs from “Product Line” via “Product Group” and “Product Subgroup” to the products.

Columns can also remain empty. Here not all products have a “Product Subgroup”, but this is not a problem in the following processing.

The column “Color” contains the color information for the products, which should become an attribute. Entries may also be missing here if there are products without a color assignment.

However, all entries in such an attribute column must refer to elements of the same hierarchy level, in this case to the products. If there were also a color for a product group, this would have to be supplied in a separate column in order to make an assignment in the import definition.

Load the dimension – #1

▪ In the same manner as before, create another dimension with these settings:

Name	**Product**
Description	
Template	

Language	Name Translation	Description Translation
(Default Language)	Product	
English (UK)	Product	

▪ Switch to the tab **Elements**

▪ Choose “Upload file …” from the context menu.

A wizard guides you through the necessary steps for defining the import.

Load the dimension – #2

In the first step, you determine the file with the data to be imported.

- Change the storage location to `Designer`
- Navigate to the specified product file and select it.

- Leave the file type at `Text file`

You do not have to import a file into the Designer before you can use it.

If you select a file from the “Local file system” storage location, it is then automatically uploaded to a default directory of the Designer (which cannot be changed).

Valid file formats are text files, Excel files and Jedox Web files.

Load the dimension – #3

The next step is to specify some parameters for the text file.

The wizard sets default settings that you must be sure to check for correctness and adjust if necessary. The file used requires these parameters:

Header	yes
Data delimiter	;
Enclosure character	#none
Encoding	UTF8
Use escape character	no
Hierarchy format	Full hierarchy

The specification at “Encoding” influences whether letters with diacritical characters (accent, tilde, trema etc.) are displayed correctly. If the preview of the data shows only a substitution character instead of such letters, you must select a different encoding.

If you do not know the settings, you should check the file in advance in a good editor. Excel is less suitable because it already makes interpretations when opening text files and you can no longer see all the details you need, such as the data delimiter.

Load the dimension – #4

You use the preview table to define the structure of the dimension.

- Point to the respective column header and open the menu via the down arrow.
- Set the following settings on the respective columns:

Column	Setting
Product Line	Hierarchy level > Level 1
Product Group	Hierarchy level > Level 2
Product Subgroup	Hierarchy level > Level 3
Product	Hierarchy level > Base Level
Color	Attributes > Create Attribute

- Open the menu on the column header of “Color” and check the level assignment under “Attributes > Color”. “Base Level” should be selected.

Attention: Do not click, only point to open the menu levels, otherwise you may make a different selection and the dimension will not be built up as desired!

- In the next step, select “are assigned to the Total Element dimension” and enter “All Products” in the text field.

- Confirm the following dialog of the wizard without any changes.

Load the dimension – #5

In the preview table you can determine whether a column of the data source can be ignored, whether it contains the elements for a level of the desired hierarchy or whether it provides attribute values.

If you designate a column as an attribute, it will be given the name of the column. Of course, the attribute can be renamed in the Modeler afterwards, should the name not be self-explanatory enough.

Since the dimension also gets a top element “All Products”, the columns of the source file of course actually become the levels 2 to 4 of the dimension. So you can easily assign these level numbers as well.

In fact, when loading the data, it is only crucial that the column "Product Line" is assigned the lowest number and the column "Product Subgroup" the highest number, and that "Product" is defined as the base level. The OLAP server will also build the dimension correctly if you use, for example, 2, 6 and 9 as level numbers.

We can ignore the option "Allow multiple parents with a single hierarchy". It has an impact on the used loading mode of the integrator, which operates in the background. However, for a new dimension and due to the structure of the data, the differences here do not matter to us.

2.4 Check the result - Product

Dimension content

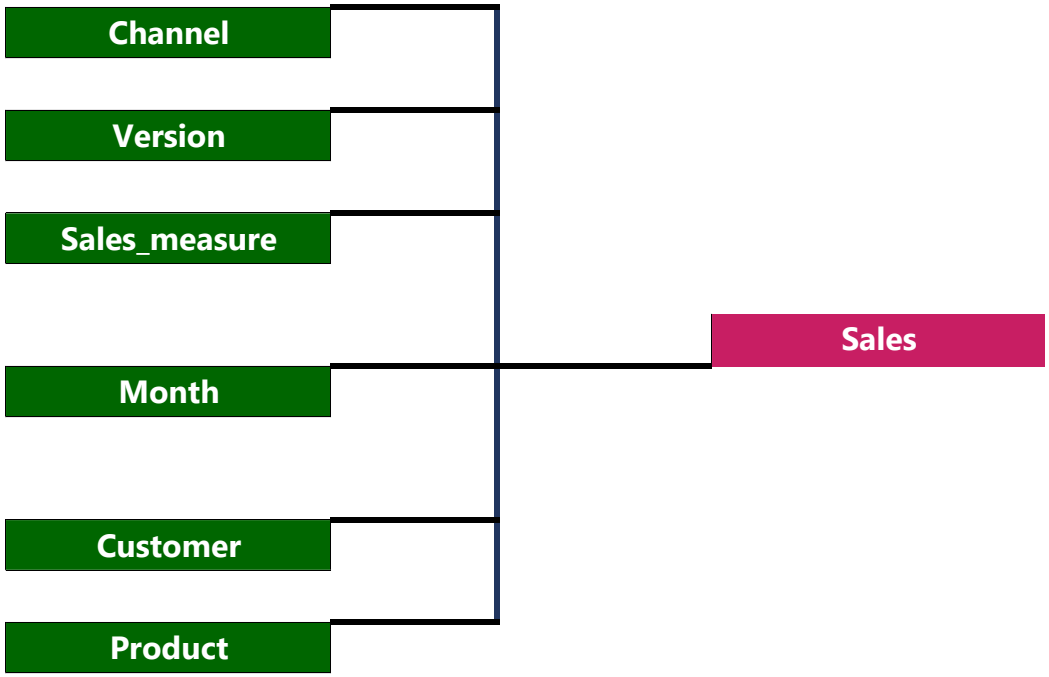
2.4 Dimension.Product

Product **#_Product**

L	Element	Color
1	**All Products**	
2	**Bikes**	
3	**Mountain Bikes**	
4	Off-Road-100 Blue 38	Blue
4	Off-Road-100 Blue 42	Blue
4	Off-Road-100 Blue 44	Blue
4	Off-Road-100 Blue 48	Blue
4	Off-Road-100 Red 38	Red
4	Off-Road-100 Red 42	Red
4	Off-Road-100 Red 44	Red
4	Off-Road-100 Red 48	Red
4	Off-Road-200 Blue 38	Blue
4	Off-Road-200 Blue 42	Blue
4	Off-Road-200 Blue 46	Blue
4	Off-Road-200 Red 38	Red
4	Off-Road-200 Red 42	Red
4	Off-Road-200 Red 46	Red
4	Off-Road-300 Red 38	Red

Model overview

2.4 Check the result - Product


Channel
Version
Sales_measure
Sales
Month
Customer
Product

2.5 Exercise – Project ACME – Part 1

Exercise

2.5 Exercise.Part1

The production manager EMEA creates the report shown below for his sites and asks if it could not be generated with Jedox.

Task:

- Analyze the report and derive a model for a new cube.
- Create the identified dimensions with the required elements and consolidations in a new database “ACME_Costs”.

Information for the exercise

- The values shown in the reports are the annual values.
- However, the actual data from the previous system is transmitted on a monthly basis.
- The budget data is only available as annual values in the form shown in the reports.
- So far, this report is only available for the two countries shown, but other sites may also be interested.

In the web workbook, you will find the two reports shown below clearly arranged next to each other on the “Sheet_a” sheet. You can also copy from there if necessary.

Report France

France

Costs	**102.870**
Costs Planned	**99.000**
Cost Variance	**-3.870**

	Variance	Plan	Actual
		in €	
Production	**10**	**47.000**	**46.990**
Logistics	60	28.000	27.940
CC45100	-2.700	10.000	12.700
CC45110	2.760	18.000	15.240
Manufacturing	-50	19.000	19.050
Maintenance	-50	19.000	19.050
CC45225	1.110	10.000	8.890
CC70202	-1.160	9.000	10.160
Administration	**-3.880**	**52.000**	**55.880**
Marketing	-1.940	26.000	27.940
CC09131	300	13.000	12.700
CC09132	-2.240	13.000	15.240
Controlling	-1.940	26.000	27.940
CC08050	300	13.000	12.700
CC85020	-2.240	13.000	15.240

Report Germany

Germany

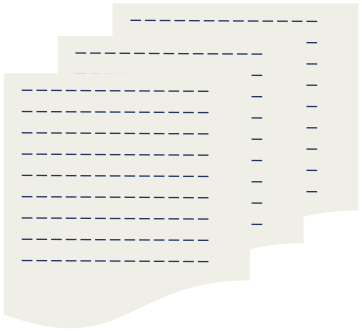
Costs	**95.748**
Costs Planned	**96.000**
Cost Variance	**252**

	Variance	Plan	Actual
		in €	
Production	**-904**	**51.000**	**51.904**
Logistics	-400	28.000	28.400
CC45100	-2.900	10.000	12.900
CC45110	2.500	18.000	15.500
Manufacturing	-504	23.000	23.504
Maintenance	-504	23.000	23.504
CC45225	-848	10.000	10.848
CC70202	344	13.000	12.656
Administration	**1.156**	**45.000**	**43.844**
Marketing	2.400	25.000	22.600
CC09131	2.604	13.000	10.396
CC09132	-204	12.000	12.204
Controlling	-1.244	20.000	21.244
CC08050	-1.300	10.000	11.300
CC85020	56	10.000	9.944

3.0 Goal: Working with cubes

Create a new cube in the OLAP database containing the dimensions created before.

The cube data is available in text files and can be imported directly from these sources.



Load data ►

Target cube
Sales
Version
Month
Product
Customer
Channel
Sales_measure

▼

Actual	2023	All Products	All Channels

	Quantity	Sales	Cost of Sales
All Customers	378.631	58.507.868	33.657.224
Americas	48.266	10.973.647	6.100.153
Asia & Pacific	88.630	15.819.413	8.775.858
Europe, Middle East, Africa	241.735	31.714.808	18.781.213

3.0 Working with cubes — #1

Create cube – #1

▪ Open the context menu on “Cubes” to create a new cube:

Name	**Sales**
Description	
Template	**Custom**

▪ Move the required dimensions from the list of available dimensions to the right.
▪ Arrange them in this order:

Version
Month
Product
Customer
Channel
Sales_measure

▪ Select the new cube and open the section:

Internationalization

Language	Name Translation
(Default Language)	Sales
English (UK)	Sales

Create cube – #2

The dimension order in the cube is important for the PALO.DATA functions.

Although it is possible in principle to change the dimension order subsequently, this can involve considerable adjustment work on reports that are based on this cube.

It is therefore advisable to consider the order of the dimensions when creating a cube.

The following guidelines have proven effective in practice:
- Start with dimensions that appear in every or almost every cube, such as version and time.
- Put dimensions that tend not to be used for drilldowns, such as measures, at the end.
- If several cubes share some dimensions, then ideally choose the same order in all cubes. This has performance advantages when cross-cube calculation rules are defined.

Also note that the “Paste data function” command in Jedox Web does not nest each element in a PALO.EL function as in the Excel Add-In. Following the dimension order is thus mandatory to read data from a cube if you don't want to manually add this sub-function everywhere.

Consistent dimension ordering across cubes in a database makes the job of report designers much easier.

The raw data for the cube can be found in this file:

```
//Jedox 251 Database Specialist/Students/
  └- studentXX/
     └- 02_Project Files/
        └- Sales_data_1.csv
```

The following is an excerpt:

Period	Product	Customer	Channel	Version	Units	Sales	Costs
2023-01	Bike Wash - Dissolver	Rally Master Company Inc	Online Shop	Actual	7.0	0.83	2.36
2023-01	Bike Wash - Dissolver	Rally Master Company Inc	Online Shop	Budget	3.0	78.34	2.44
2023-01	Bottle Cage - Road Frame	Swift Cycles	Online Shop	Actual	14.0	1.93	5.33
2023-01	Bottle Cage - Road Frame	Swift Cycles	Online Shop	Budget	6.0	181.63	5.25
2023-01	Chain	Nearby Cycle Shop	Fax/Phone/	Actual	2.0	6.52	2.37
2023-01	Chain	Nearby Cycle Shop	Fax/Phone/	Budget	1.0	5.54	2.46
2023-01	Cross Bike Tire Tube	Parcel Express Delivery	Online Shop	Actual	2.0	0.27	0.39
2023-01	Cross Bike Tire Tube	Parcel Express Delivery	Online Shop	Budget	1.0	25.4	0.41
2023-01	Cross-150 Silver 44	Black Bicycle Company	Fax/Phone/	Actual	12.0	5297.3	2868.12
2023-01	Cross-150 Silver 44	Black Bicycle Company	Fax/Phone/	Budget	5.0	4499.87	2970.66
2023-01	Cross-150 Silver 44	City Manufacturing	Fax/Phone/	Actual	9.0	4027.73	2294.5
2023-01	Cross-150 Silver 44	City Manufacturing	Fax/Phone/	Budget	4.0	3592.49	2353.0

Load data – Raw data – #2

The data is provided in a so-called denormalized structure, i.e. each row contains a valid element name per cube dimension except for the dimension “Sales_measure” which is represented by the three columns with the values to be loaded. This is a typical format as it can be extracted from operational source systems.

In the following, we will also import source data that is available in other formats:
- denormalized by time, i.e., one column for each dimension of the cube except the "Month" dimension, and one column for each month with the values to be loaded.
- normalized, i.e., one column for each dimension of the cube and one column with the values to be loaded.

Load data – #1

- Choose “Upload file …” from the context menu.

- Change the storage location to `Designer`
- Navigate to the specified file with sales data and select it.
- Leave the file type at `Text file`

Similar to the dimension “Product” dimension, some parameters must be specified for the text file:

Header	`yes`
Data delimiter	`;`
Enclosure character	`#none`
Encoding	`UTF8`
Use escape character	`no`
Mode	`Denormalized`
By dimension	`Sales_measure`

▪ Click on “Refresh” to map columns to dimensions.

Columns are automatically assigned to dimensions of the target cube with the same name. This is also true for the element names of the denormalized dimension.

For all other columns it might be necessary to manually map the appropriate entry from the column header's list box.

▪ Set the settings as follows:

▪ Confirm with “Next” twice.

Ideally, no errors occur when loading the data. If the message “uploaded successfully” is displayed at the end, the log also does not show any differing messages.

▪ Create a view with the settings as shown on page “3.0 Goal: Working with cubes” to check the result of your data loading process.

3.0 Working with cubes — #2

Source data denormalized by time

Depending on the source system the source data might be available in a different way: not denormalized by measure but by time.

The raw data for the cube can be found in this file:

```
//Jedox 251 Database Specialist/Students/
  └- studentXX/
      └- 02_Project Files/
          └- Sales_data_2.csv
```

The following is an excerpt:

Product	Customer	Channel	Version	Measure	2025-01	2025-02	2025-03	(...)
Bike Stand	Workout Emporium	Online Shop	Actual	Cost of Sales	0.0	5.93	0.0	
Bike Stand	Workout Emporium	Online Shop	Actual	Quantity	0.0	7.0	0.0	
Bike Stand	Workout Emporium	Online Shop	Actual	Sales	0.0	14.74	0.0	
Cross-150 Silver 48	Friendly Neighborho	Fax/Phone/	Budget	Cost of Sales	2684.32	0.0	0.0	
Cross-150 Silver 48	Friendly Neighborho	Fax/Phone/	Budget	Quantity	4.0	0.0	0.0	
Cross-150 Silver 48	Friendly Neighborho	Fax/Phone/	Budget	Sales	3834.5	0.0	0.0	
ML Crankset	More Bikes!	Fax/Phone/	Actual	Cost of Sales	0.0	0.0	37.83	
ML Crankset	More Bikes!	Fax/Phone/	Actual	Quantity	0.0	0.0	2.0	
ML Crankset	More Bikes!	Fax/Phone/	Actual	Sales	0.0	0.0	93.51	

Load data – #1

▪ Choose “Upload file …” from the context menu.

▪ Change the storage location to **Designer**

• Navigate to the specified file with sales data and select it.

• Leave the file type at **Text file**

▪ In the next step, check the settings and assignments.
▪ Ensure that the mode “Denormalized” is selected.
▪ Select “Month” as the denormalized dimension.
▪ Click on “Refresh” to map columns to dimensions.
▪ Assign remaining columns manually if necessary.

• | Sales_measure

The column names of the value columns correspond with the elements of the dimension “Month” throughout, so no manual assignment is necessary here.

Load data – #2

The detailed log after execution states that more than 800,000 records were loaded, but the number of filled cube cells only increased by a good 90,000. The difference results from zeros that are not stored, the corresponding cube cells simply remain empty.

▼ Detailed log

Date	Level	Message
(...)	INFO	(...)
2025-10-29 12:41:34	INFO	Records loaded to Cube: 887868
2025-10-29 12:41:35	INFO	Waiting for the Olap Server to finish load processing.
2025-10-29 12:41:36	INFO	Finished load L_Cube_Sales of cube Sales. Filled cells changed from 202960 to 296176
(...)	INFO	(...)

Source data normalized

In a so-called normalized structure each row contains an element name as an entry per cube dimension, and one column contains the associated cube value. This is mostly the result of a cube export.

The raw data for the cube can be found in this file:

```
//Jedox 251 Database Specialist/Students/
  └- studentXX/
      └- 02_Project Files/
          └- Sales_data_3.csv
```

The following is an excerpt:

Period	Product	Customer	Channel	Version	Measure	#Value
2026-01	Cross-250 Silver 58	All Cycle Shop	Online Shop	Budget	Quantity	27.0
2026-01	LL Cross Pedal	Authorized Bike Sales and	Fax/Phone/	Budget	Quantity	5.0
2026-01	Short-Sleeve Jersey	Closest Bicycle Store	Online Shop	Budget	Quantity	5.0
2026-01	Off-Road-500 Red	Coho Sports	Fax/Phone/	Budget	Quantity	3.0
2026-01	Cross-150 Silver 56	Commercial Sporting	Fax/Phone/	Budget	Quantity	73.0

Load data – #3

- Choose “Upload file …” from the context menu.

- Change the storage location to `Designer`
- Navigate to the specified file with sales data and select it.

- Leave the file type at `Text file`

- Ensure that the mode “Normalized” is selected.
- Click on “Refresh” to map columns to dimensions.
- Assign remaining columns manually if necessary.
- The last column “#Value” must be assigned the setting “Value”.

Period ▼	►	• | Month
Measure ▼	►	• | Sales_measure
#Value ▼	►	• | Value

Load data – #4

The loading of this file ends with a warning, the log may show others. To decide whether or which measures are required because of this, the log must be checked in any case.

▼ Detailed log

Date	Level	Message
(...)	INFO	(...)
2025-10-29 12:41:34	WARN	Coordinate 2026-01 not found in dimension Month (load L_Cube_Sales)
2025-10-29 12:41:35	WARN	Coordinate 2026-02 not found in dimension Month (load L_Cube_Sales)
2025-10-29 12:41:36	WARN	Coordinate 2026-03 not found in dimension Month (load L_Cube_Sales)
(...)	INFO	(...)

In this case, all messages refer to missing elements in the “Month” dimension. After updating the dimension to cover at least the missing year, the loading process can be repeated without any further warnings.

3.0 Check the result - Sales

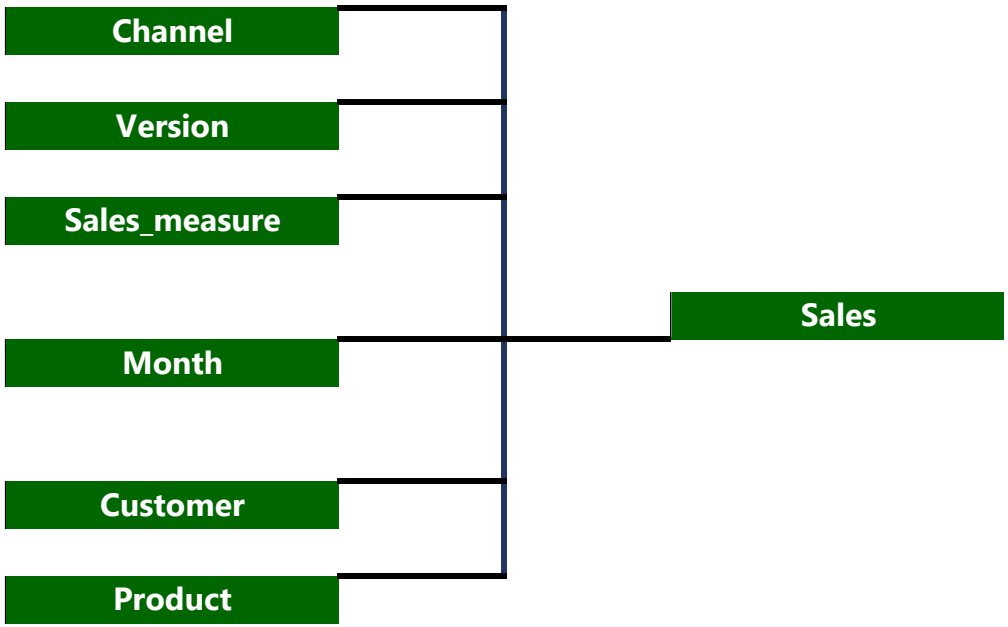
1 /2 Cube content

3.0 Cube.Sales

Actual	2.023	All Products	All Channles

	Quantity	Sales	Cost of Sales
All Customers	378.631	58.507.868	33.657.224
Europe, Middle East, Africa	241.735	31.714.808	18.781.213
Germany	55.430	6.019.899	3.919.253
Camping and Sports Store	1.830	223.121	115.566
Family Entertainment Center	105	26.187	13.755
Handy Bike Services	1.010	130.193	97.421
Outdoor Sporting Goods	101	45.079	24.952
Primary Bike Distributors	879	72.861	49.465
Small Bike Shop	2.523	431.377	298.722
Urban Sports Emporium	1.905	207.229	143.384

2 /2 Model overview


Channel
Version
Sales_measure
Sales
Month
Customer
Product

3.1 Exercise — Project ACME — Part 2

Exercise

In the previous exercise (Project ACME – Part 1), you developed a data model and created the dimensions in a new database "ACME_Costs". Now create the new cube with all necessary dimensions to fill it with the given actual and planned data of the production manager.

Task:

Step #1 Create a cube in which the displayed values can be stored. First check the necessary dimensions and their structure with the help of the provided file with the actual data.

```
//Jedox 251 Database Specialist/Students/
  └- studentXX/
      └- 02_Project Files/
          └- ACMECostsDataActual.csv
```

Step #2 Write the values into the cube using appropriate ways of data entry. Actual data is provided in the linked file as monthly values, budget data is only available as annual values from the reports shown.

Step #3 Create a view with which you can check whether the data in your cube corresponds to the report values shown.

Report France

France

Costs	**102.870**
Costs Planned	**99.000**
Cost Variance	**-3.870**

	Variance	Plan	Actual
		in €	
Production	**10**	**47.000**	**46.990**
Logistics	60	28.000	27.940
CC45100	-2.700	10.000	12.700
CC45110	2.760	18.000	15.240
Manufacturing	-50	19.000	19.050
Maintenance	-50	19.000	19.050
CC45225	1.110	10.000	8.890
CC70202	-1.160	9.000	10.160
Administration	**-3.880**	**52.000**	**55.880**
Marketing	-1.940	26.000	27.940
CC09131	300	13.000	12.700
CC09132	-2.240	13.000	15.240
Controlling	-1.940	26.000	27.940
CC08050	300	13.000	12.700
CC85020	-2.240	13.000	15.240

Actual data France

Here you can find the actual data from the linked file for overview and control.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.000	1.500	800	900	1.200	1.000	1.200	800	1.000	1.500	1.000	800
1.200	1.800	960	1.080	1.440	1.200	1.440	960	1.200	1.800	1.200	960
700	1.050	560	630	840	700	840	560	700	1.050	700	560
800	1.200	640	720	960	800	960	640	800	1.200	800	640
1.000	1.500	800	900	1.200	1.000	1.200	800	1.000	1.500	1.000	800
1.200	1.800	960	1.080	1.440	1.200	1.440	960	1.200	1.800	1.200	960
1.000	1.500	800	900	1.200	1.000	1.200	800	1.000	1.500	1.000	800
1.200	1.800	960	1.080	1.440	1.200	1.440	960	1.200	1.800	1.200	960

Report Germany

Germany

Costs	**95.748**
Costs Planned	**96.000**
Cost Variance	**252**

	Variance	Plan	Actual
		in €	
Production	**-904**	**51.000**	**51.904**
Logistics	-400	28.000	28.400
CC45100	-2.900	10.000	12.900
CC45110	2.500	18.000	15.500
Manufacturing	-504	23.000	23.504
Maintenance	-504	23.000	23.504
CC45225	-848	10.000	10.848
CC70202	344	13.000	12.656
Administration	**1.156**	**45.000**	**43.844**
Marketing	2.400	25.000	22.600
CC09131	2.604	13.000	10.396
CC09132	-204	12.000	12.204
Controlling	-1.244	20.000	21.244
CC08050	-1.300	10.000	11.300
CC85020	56	10.000	9.944

Actual data Germany

Here you can find the actual data from the linked file for overview and control.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
800	1.400	900	1.000	1.100	1.100	1.000	900	1.200	1.300	1.200	1.000
1.300	1.500	1.200	1.200	1.400	1.300	1.200	1.100	900	1.700	1.500	1.200
1.320	960	672	756	1.008	840	1.008	672	840	1.260	840	672
1.540	1.120	784	882	1.176	980	1.176	784	980	1.470	980	784
1.265	920	644	725	966	805	966	644	805	1.208	805	644
1.485	1.080	756	851	1.134	945	1.134	756	945	1.418	945	756
1.375	1.000	700	788	1.050	875	1.050	700	875	1.313	875	700
1.210	880	616	693	924	770	924	616	770	1.155	770	616

3.2 Zero values and empty strings

Preparation

Preparatory steps are required for a scenario with stored zero values.

- Extend the dimension “Month” by the year 2026.
- Open the prepared report file:

3.2 Cube.NULL.Values

In the following sections, the cells in which the entries in the report file are to be made are highlighted in each of the views here.
So you can use these representations at the same time to control your entries in your own view.

By default, the server does not distinguish between empty cube cells and null values. The latter are not stored to keep the cubes smaller and thus more performant.

PALO.DATA formulas always display a "0" for numeric cells regardless of this.

In a planning scenario, however, the distinction can be useful to see which cells have not yet been planned or where a zero has already been explicitly entered.

If the corresponding setting is activated, this has not only consequences for the OLAP server, but also effects on Excel's own formulas.

We will use the prepared view to run through various inputs without and with activated zero values to see the effects.

The columns for the quarter and the months in this view show the cube values with the help of PALO.DATA formulas, the last two columns use plain Excel formulas to show the sum over the months (which is always identical to the value in the quarter column) and the average value of the three months.

Default behavior without zero values – base cells – #1

First, the standard behavior will be run through for comparison.

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	54	15	27	12	54	18
Action Bicycle Specialists	**Forks**	24	15	9	0	24	8
	HL Fork	24	**15**	**9**	0	24	8
	LL Fork	0	0	0	0	0	0
	ML Fork	0	0	0	0	0	0
Bicycle Lines Distributors	**Forks**	30	0	18	12	30	10
	HL Fork	0	0	0	0	0	0
	LL Fork	12	0	0	**12**	12	4
	ML Fork	18	0	**18**	0	18	6

No splashing commands are necessary as these cells are base cells. The quarter level as well as the product group and the country show correct values due to the consolidation.

The sum calculated by Excel matches the values in the quarter column. The average calculated by Excel is the quarter value divided by 3, the number of months.

Default behavior without zero values – base cells – #2

▪ Delete values on the base cell level by either overwriting them with “0” or by executing CTRL+DEL.

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	45	15	18	12	45	15
Action Bicycle Specialists	**Forks**	15	15	0	0	15	5
	HL Fork	15	15	**0**	0	15	5
	LL Fork	0	0	0	0	0	0
	ML Fork	0	0	0	0	0	0
Bicycle Lines Distributors	**Forks**	30	0	18	12	30	10
	HL Fork	0	0	0	0	0	0
	LL Fork	12	0	0	12	12	4
	ML Fork	18	0	18	0	18	6

Default behavior without zero values – consolidated cells – #1

▪ Splash the given values into the marked cells using the "#" command.

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	99	24	45	30	99	33
Action Bicycle Specialists	**Forks**	60	15	**27**	**18**	60	20
	HL Fork	30	15	9	6	30	10
	LL Fork	15	0	9	6	15	5
	ML Fork	15	0	9	6	15	5
Bicycle Lines Distributors	**Forks**	39	**9**	18	12	39	13
	HL Fork	3	3	0	0	3	1
	LL Fork	15	3	0	12	15	5
	ML Fork	21	3	18	0	21	7

Default behavior without zero values – consolidated cells – #2

▪ Splash “#0” into the marked cell to delete the values in the underlying base cells.

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	81	24	45	12	81	27
Action Bicycle Specialists	**Forks**	42	15	27	**0**	42	14
	HL Fork	24	15	9	0	24	8
	LL Fork	9	0	9	0	9	3
	ML Fork	9	0	9	0	9	3
Bicycle Lines Distributors	**Forks**	39	9	18	12	39	13
	HL Fork	3	3	0	0	3	1
	LL Fork	15	3	0	12	15	5
	ML Fork	21	3	18	0	21	7

For the calculation of the sum as well as the average, Excel uses all three monthly values in every case.

Behavior with zero values – immediate effects

Now we will instruct the OLAP server to distinguish between null values and empty cube cells.

- Switch to the Modeler and select the cube
- Open the section
- Activate the option
- Refresh your control view by pressing F9.

Sales
Advanced
Store zero values and empty strings

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	81	24	45	12	81	27
Action Bicycle Specialists	**Forks**	42	15	27		42	21
	HL Fork	24	15	9		24	12
	LL Fork	9		9		9	9
	ML Fork	9		9		9	9
Bicycle Lines Distributors	**Forks**	39	9	18	12	39	13
	HL Fork	3	3			3	3
	LL Fork	15	3		12	15	8
	ML Fork	21	3	18		21	11

Activating this option doesn't generate real zero values but sets all cells without an explicit value to “empty”. But this already changes the result of Excel's average calculation, because empty cells are not taken into account.

Behavior with zero values – base cells

▪ Enter the following values into the marked cells consecutively and check the effects on consolidations as well as the Excel formulas.

2026-02: 12 2026-03: 0 2026-02: 0

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	81	24	45	12	81	27
Action Bicycle Specialists	**Forks**	42	15	27		42	21
	HL Fork	24	15	9		24	12
	LL Fork	9		9		9	9
	ML Fork	9		9		9	9
Bicycle Lines Distributors	**Forks**	39	9	18	12	39	13
	HL Fork	3	3			3	3
	LL Fork	15	3		12	15	8
	ML Fork	21	3	18		21	11

Notes on zero values – #2

3.2 Zero values and empty strings

Also observe the following notes when the zero value option is activated:

▪ Zero values can only be deleted with the key combination CTRL+DEL (or DEL in the user view of a report in Jedox Web).

▪ Explicit zero values require the same amount of storage space as any other stored value.

▪ Cells with a real “0” are counted as a filled cell in the cube properties.

▪ Deactivating the option for storing zero values deletes all explicitly set “0”, and according to the default behavior the cube cells are then empty again. This action cannot be undone.

Behavior with zero values – consolidated cells

▪ Splash “#0” into the marked cell and check the result.

		2026-Q1	2026-01	2026-02	2026-03	Σ	Ø
United States	**Forks**	54	24	18	12	54	18
Action Bicycle Specialists	**Forks**	15	15			15	15
	HL Fork	15	15			15	15
	LL Fork		❶			0	#DIV/0! ❷
	ML Fork					0	#DIV/0!
Bicycle Lines Distributors	**Forks**	39	9	18	12	39	13
	HL Fork	3	3	0	0	3	1
	LL Fork	15	3		12	15	8
	ML Fork	21	3	18		21	11

The splashing command “#0” has the same effect with either the activated option to store zero values or in the default behavior: the underlying base values are deleted and the base cells get the status “empty”. This is in order to prevent users who know the default behavior from accidentally writing a large number of zero values to the cube and thus increasing its storage requirements.

Since the cells are set to “empty”, the #DIV/0! errors (❷) result from the outlined area (❶).

To explicitly write “0” to a consolidated cell, a new splashing command was introduced: “#00”.

► **Try it out in the cell highlighted above!**

Danke – Thank You – Merci – Gracias

We value your opinion

Link ►
https://de.research.net/r/JedoxAcademy

jedox.

Danke – Thank You – Merci – Gracias

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3.3 Flexible cube layout

Introduction

In principle, it is possible to perform the following structural changes to an existing cube at a later stage:

- Changes to the dimension order
- Removing a dimension
- Adding a dimension

These actions can have massive effects on existing reports, up to complete unusability!

Therefore, only perform them if it is absolutely necessary and you are aware of the consequences and resulting follow-up work.

It should not be necessary to change the dimension order if you follow the advice given when creating the cube.

Changes to the number of dimensions in a cube typically require adjustments not only to reports based on it, but also to the associated integrator processes for updating it.

Changing dimension order

- Open the prepared report file:

3.3 Cube.Flexible.Layout	

The file contains two identical reports, differing only in the formula part for the cube values. This allows the effects of the various changes to the cube layout to be reviewed and tracked.

- Switch to the Modeler and select the cube
- Open the section
- Choose the button

Sales
Dimensions
Change layout

- Change the order of the dimensions “Product” and “Customer” in the cube.
- Confirm the move with the button “Save changes”.
- Switch to the control report and refresh the file with F9.

- Swap the dimensions back to the original order.
- Switch to the control report again and refresh it with F9.

Changing dimension order – Additions

The dialog shows the dimensions used by the cube on the right and the remaining dimensions of the database on the left. The dimensions can be moved using the arrow buttons in the center.

Swapping the two dimension shows different effects on the two variants of the control report.

► Variant #1 with a simple PALO.DATA formula results in error values because the order of the arguments does not match the order of the dimensions in the cube anymore.
► Variant #2 still shows the same values. As every element is provided in a PALO.EL formula, the mapping of element name to dimension is unique and can be resolved correctly in the PALO.DATA function.

> This additional effort regarding the formulas has to be carried out by the report designer if dynamic rearrangement of the cube dimensions will be required.

After swapping back the dimensions, the first variant of the report also provides data again, since the order of the dimensions now corresponds again to the order of the arguments in the formula.

Changing dimension order with new cube

If the dimension order of a cube is to be changed, but existing reports without PALO.EL formulas are to remain functional, a so-called compatibility cube can be created.
However, this has the disadvantage of two basically identical cubes in the database, which is actually unnecessary.

- Change the order of the dimensions “Product” and “Customer” in the cube.
- Activate the checkbox “Create new cube” and change the name to Sales_2.
- Confirm the move with the “Save changes” button.
- Switch to the control report and refresh the file with F9 – both the reports display the same data as before.

Comparing the two cubes in the Modeler shows that the new cube was created with the new dimension order and the old cube is unchanged. But note the following:

Section: Name & Description		
Sales		Sales_2
#WERT!	Number of cells	#WERT!
0	Number of filled cells	296.176

The unchanged dimension order in the original cube explains why report variant #1 shows no error values as in the previous dimension swap. However, the cube has no filled cells, yet the report shows data with an origin that needs to be clarified.

Compatibility cube – #1

- Switch to the Modeler and select the cube
- Open the view for “Rules”.

The automatically generated rule looks like this:

```
[] = PALO.DATA("", "Sales_2", !'Version', !'Month', !'Customer', !'Product', !'Channel', !'Sales_measure')
```

Basically, rules are set up in the form of the target cell = calculation rule.

As in this case, the calculation can consist of retrieving a value from another cube with a PALO.DATA function. Here, the dimension names preceded by an exclamation mark act as placeholders or variables for the particular dimension element being queried.
The empty first argument in the function indicates that the queried cube is in the same database.
The target “[]” means that this calculation rule is applied to all cells of the cube “Sales”.

Hints on Rules

Rules are cube-related calculation rules to compute additional values which can be queried in a view like physical or consolidated values. They are used, for example,

- to derive additional measures from values of the same cube
- to calculate measures using values from other cubes (e. g. for currency conversion)
- to calculate measures considering conditions (e. g. only for specific versions or account types)

The definition of rules and their individual components cannot be dealt with in detail here.

> For more in-depth information on the topic of “Rules”, please refer to course 481 Business Logic Expert.

Compatibility cube – #2

Creating a compatibility cube has the following effects:

- the new cube is generated with the desired new dimension order
- the values of the original cube are copied to the new cube
- the values in the original cube are deleted
- a rule is created for the original cube to assign the copied values from the new cube to the cells of the original cube
- the original cube is set to read-only

The write protection serves to ensure data consistency between both cubes. Neither can values be written to base cells or splashed to consolidated cells in a view via PALO.DATA formulas, nor is it possible to load data into the cube via the Modeller.

Task:

- Switch to the control report and test the read-only mode.

Removing a dimension – #1

- Switch to the Modeler and select the cube

Sales_2

- Switch to the tab

Cube Properties

- Open the section

Dimensions

- Choose the button

Change layout

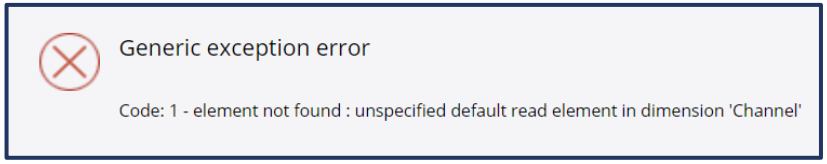
- Select the dimension

Channel

- Move it the left under

Available dimensions

- Save the changes.



An error message appears indicating a missing default element for reading in the dimension.

A dimension cannot be removed from a cube without some preparation. The OLAP server must know which element of the dimension to be removed provides the values that should remain in the cube. This element is to be identified individually according to the dimension - it will often be the top element. Thus only the level of detail in the data is reduced but the totals on the respective elements of the other dimensions remain unchanged.

Removing a dimension – #2

- Switch to the Modeler and select the dimension
- Switch to the tab
- Open the section
- Make the following setting

Channel	
Dimension Properties	
Settings	
Default read element	▼|All Channels

- Switch back to the cube and remove the dimension.
- Create a new cube with this process.

Sales_3

- Check the properties of the original and the new cube.

Section: Name & Description				
previously	Sales_2		Sales_3	Difference
#WERT!	#WERT!	Number of cells	#WERT!	#WERT!
296.176	0	Number of filled cells	291.170	5.006

The difference in the filled cells is very low here, due to the uneven initial distribution. Usually, a higher deviation can be expected!

- Switch to the control report and refresh the file with F9 – both the reports display the same data as before.

- On a new worksheet, create a view on the cube “Sales_3” analogous to that on the sheet “Goal.Cube”. There, the numbers are provided statically for this comparison purpose and should match the data in the new cube.

Adding a dimension – #1

- Switch to the Modeler and select the cube

Sales_3

- Switch to the tab

Cube Properties

- Open the section

Dimensions

- Choose the button

Change layout

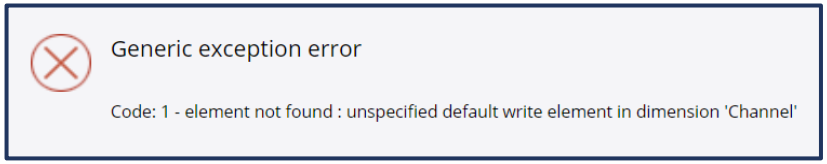
- Select the dimension

Channel

- Move it to the right under

Selected dimensions

- Save the changes.



An error message appears indicating a missing default element for writing to the dimension.

A dimension cannot be added to a cube without some preparation. The OLAP server must know to which element of the dimension to-be-added the values already in the cube should be written. This element is to be identified individually according to the dimension. It will often be a technical data entry element because the cube data cannot be reasonably distributed among the actual dimension elements. Since values are written, the default write element should be a base element.

- Switch to the Modeler and select the dimension
- Switch to the tab
- Open the section
- Make the following setting

Channel	
Dimension Properties	
Settings	
Default write element	▼ ~

- Switch back to the cube and add the dimension at the end of the cube.
- Check the properties of the cube before and after the change (see also next section at ❶).

- Switch to the ad-hoc view in the control report and refresh the file with F9 (❷).
- Switch to the other two reports in the control report. These no longer provide values, but #VALUE! (❸)

To get the two reports functional again, the best choice in this case is to adjust the rule on the Sales cube as follows:

```
[] = PALO.DATA("","Sales_3",!'Version',!'Month',!'Customer',!'Product',!'Sales_measure',!'Channel')
```

- Select the “Sales” cube and open the view for “Rules”.
- Change the cube name and parameter order in the box under “Rule”. You can also copy it from above and paste it there.
- Save the changes.
- Switch to the control report and refresh the file.

Adding a dimension – Additions

(❶) The total number of cells is the same as that of the initial cube, since the number of dimensions and the elements in it

match again. The number of filled cells has not changed because all the values present in the cube have been written to the same and only one base element in the added dimension.

Section: Name & Description		
Sales_3 (before)		Sales_3 (after)
#WERT!	Number of cells	#WERT!
291.170	Number of filled cells	291.170

(❷) The view still works, although the PALO.DATA formulas in it do not pass an argument for the added dimension. This is possible because for dimensions at the end of the cube, in case of a missing function parameter, the default read element is automatically inserted, if it is defined in the dimension.

(❸) These two reports refer to the Sales cube, which now receives its data by rule from the Sales_2 cube. This cube, in turn, obtains the values from the Sales_3 cube by rule. This rule reads:

```
['Channel':'All Channels'] = PALO.DATA("","Sales_3",!'Version',!'Month',!'Customer',!'Product',!'Sales_measure')
```

The PALO.DATA function in the rule does not pass an argument for the “Channel” dimension added to the Sales_3 cube and therefore fails. This also prevents the Sales_2 cube from returning data to the initial Sales cube.