Modeling Basics

OBJECTIVE

In this exercise you will learn how to create elementary information objects such as key figures and characteristics. You will also learn how to maintain(create) master data of an object.

ACTIVITIES

Learn how the SAP BW modeling tools are used.

SOFTWARE PREREQUISITES

- Eclipse with SAP BW Modeling Tools
- SAP GUI

DATA SET

Global Bike (GB) data set

SYSTEM ACCESS

SAP BW/4HANA 2.0 from your UCC

Scenario

Jan Schmidt is Controlling Specialist at Global Bike, Germany. His boss, Hanan Cengiz, asks him to create the data model in the BW/4HANA 2.0 for Global Bike Germany and US with the goal that Hanan can present their sales/cost analytics quicker to their CFO Wilhelm Ollenhauer. In this exercise, Jan models InfoObjects as basic information objects.

There are various models to represent data. Although there are some methodologies that have elements to support multidimensional data models in a special way (e.g. for describing dimensions and hierarchies) we use simple Entity Relationship Model as introduced by Chen[1]. Here are some data model requirements for GB.

- Sales analysis in GB is based on the key figures *sales quantity*, *revenue*, *discount*, and *cost of goods manufactured* in three different dimensions being *product*,

[1] https://dspace.mit.edu/bitstream/handle/1721.1/47432/entityrelationshx00chen.pdf

customer and *time*. Some additional key figures will be derived from these key figures.

- In the customer dimension there is a hierarchy with *sales organization* and *country* as levels.
- In the product dimension there are two divisions, namely *bicycles* and *accessories*.
- In division *bicycles*, we distinguish different *product categories*.
- For some products additional attributes can be used, namely *color* for *touring bikes* and *components* (group set) for *road bikes*.

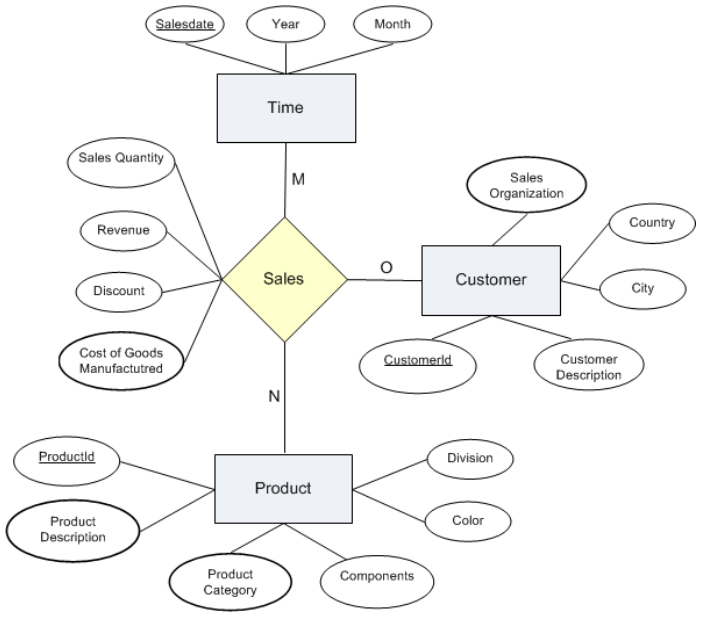

Figure 1

For modeling Figure 1 above, we use information objects (InfoObjects) in SAP BW/4HANA 2.0. There are two kind of information objects: *Key Figures* and *Characteristics*.

- A *Key Figure* (or variable, measure) is often used to document the performance of a business process over time and can be found in document records such as invoice, delivery note, purchase order, or goods receipt. E.g. revenue, quantity.
- A *Characteristic* represents a business object (or concept, business term, business entity) and may have attributes which describes the business object in more detail. E.g. customer, month, product.

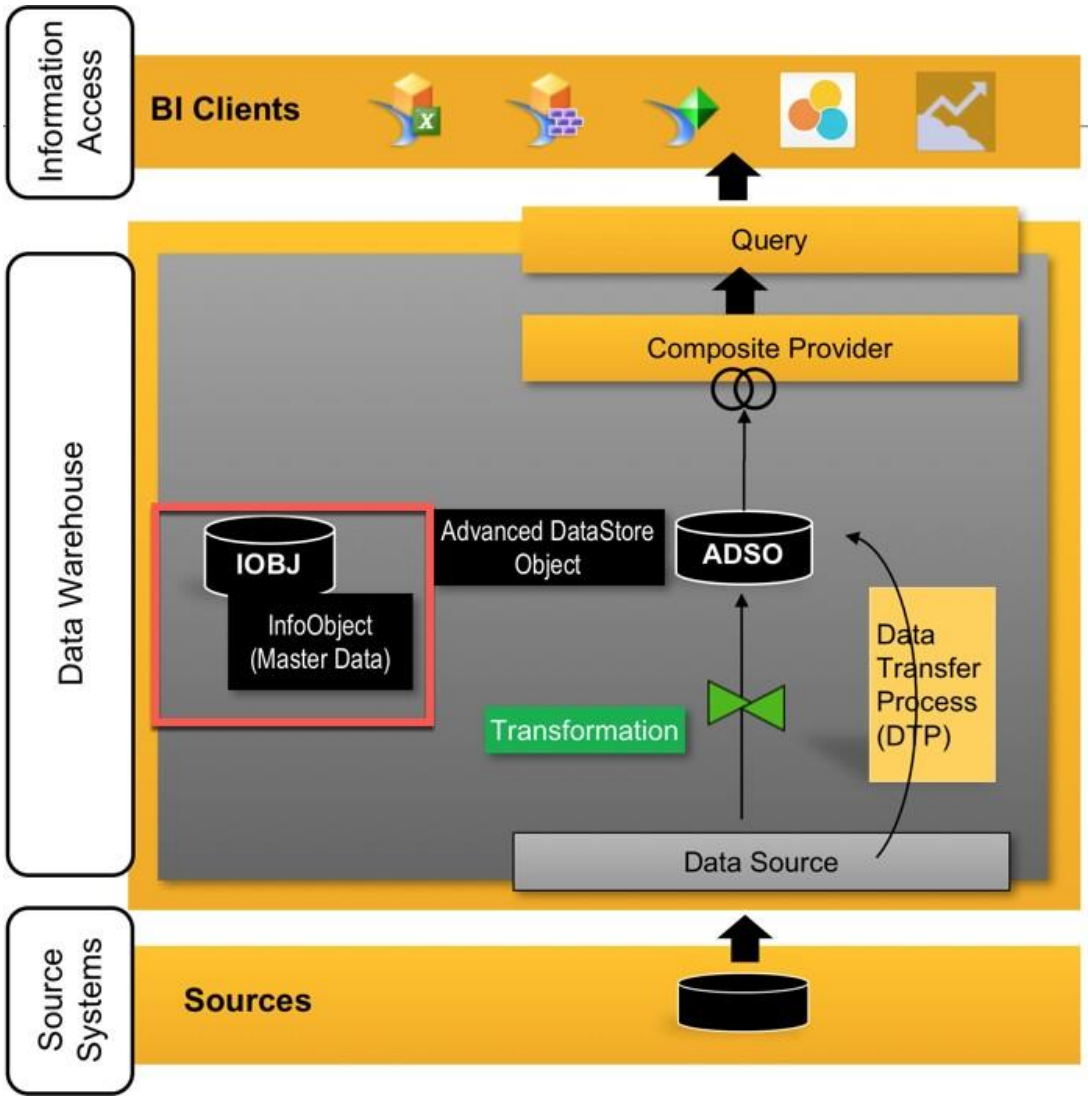

Figure 2

First, you will create the key figures *revenue* and *sales quantity*. Then, the characteristics *product category* and *material*. Then you will populate the characteristic *product category* by entering the data manually (as opposed to using ETL). For *material*, you will use a formal ETL process to migrate data in a later exercise.

The graphic below displays the complete process (5 tasks).

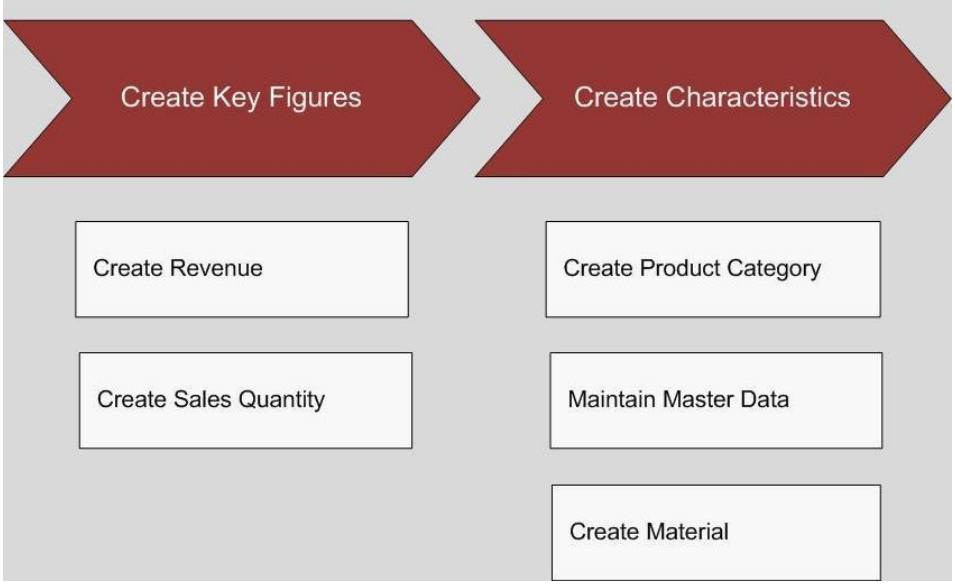

Figure 3

1. Create your first InfoObject

a. Launch Eclipse and open your BW project, go to Project Explorer → your BW-System → BW Repository.

b. Log on and navigate to the InfoArea assigned by your instructor. It has the technical name XXX### and description Student ###.

c. Right click the InfoArea and choose New → InfoObject and create an InfoObject for the key figure revenue. Technical name XXXREV### and description XXX### Revenue. As InfoObject Type select Key Figure with Data Type CURR. *Note: When working with the exercise, please replace in all names XXX with the Id of your course, and ### with your user number (three digits) provided by your instructor.*

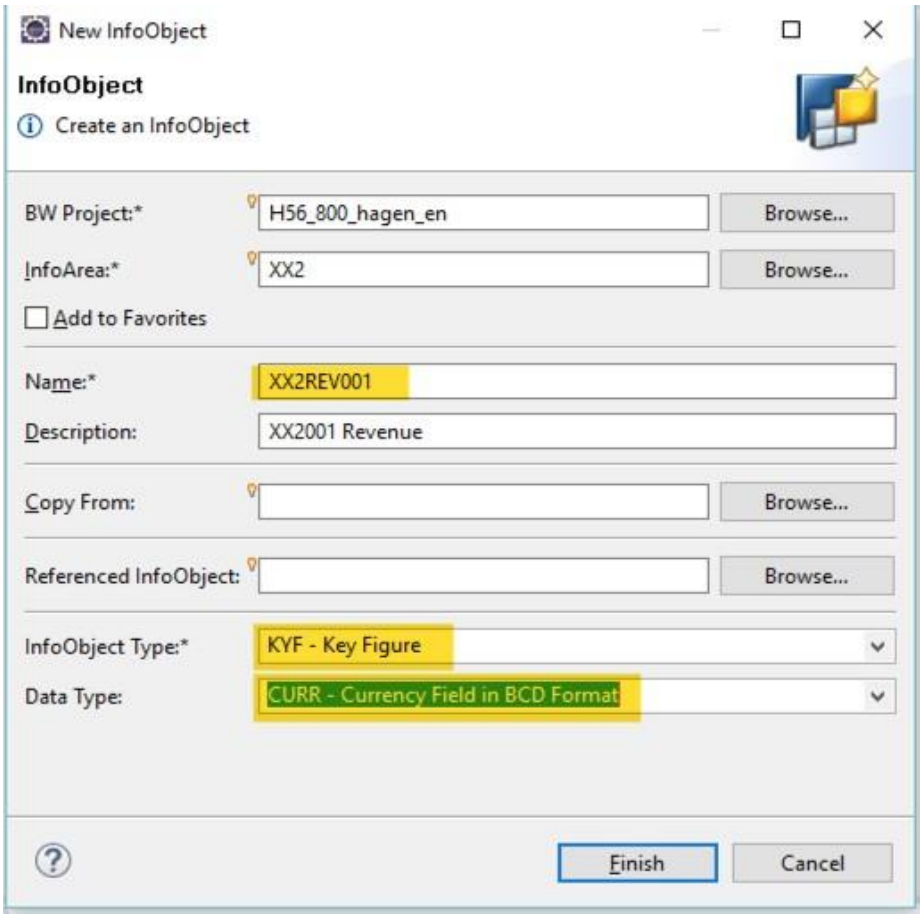

Figure 4

d. Finish.

e. The revenue for GB is generated in various currencies (such as USD and EUR). We would like to capture the currency of revenue in each transaction. For this, set Currency/unit: InfoObject oCURRENCY. The leading o in oCURRENCY indicates that it is an InfoObject delivered by SAP.

f. Aggregation is Summation.

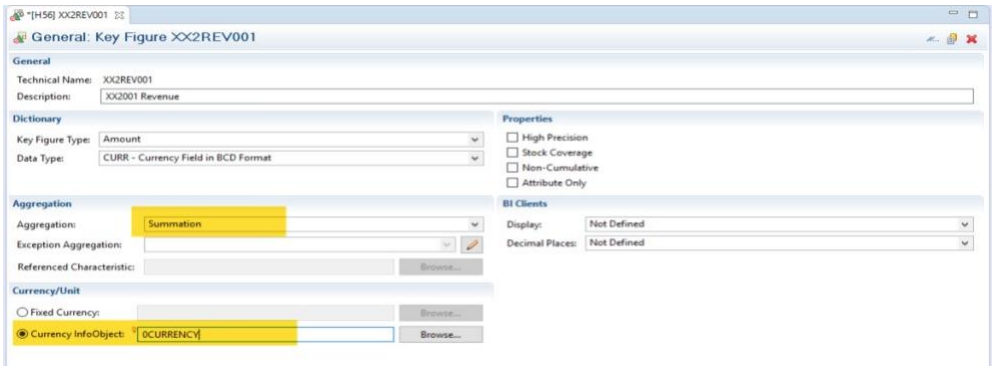

Figure 5

g. Save and Activate (matchstick icon) your InfoObject.

Figure 6

h. Close the Revenue InfoObject tab.

Question 1: What type of InfoObject is Revenue?

Question 2: Why does revenue not have an Exception Aggregation?

Question 3: What are other Aggregation options apart from summation?

2. Create a Sales Quantity InfoObject

a. Launch Eclipse and open your BW project, go to Project Explorer → your BW-System → BW Repository.

b. Navigate to the InfoArea assigned by your instructor. It has the technical name XXX### and description Student ###.

c. Right click your InfoArea and choose New → InfoObject and create an InfoObject for the key figure *sales quantity*. Use for the technical name XXXQTY### and as description XXX### Sales Quantity. As InfoObject Type select Key Figure with Data Type QUAN.

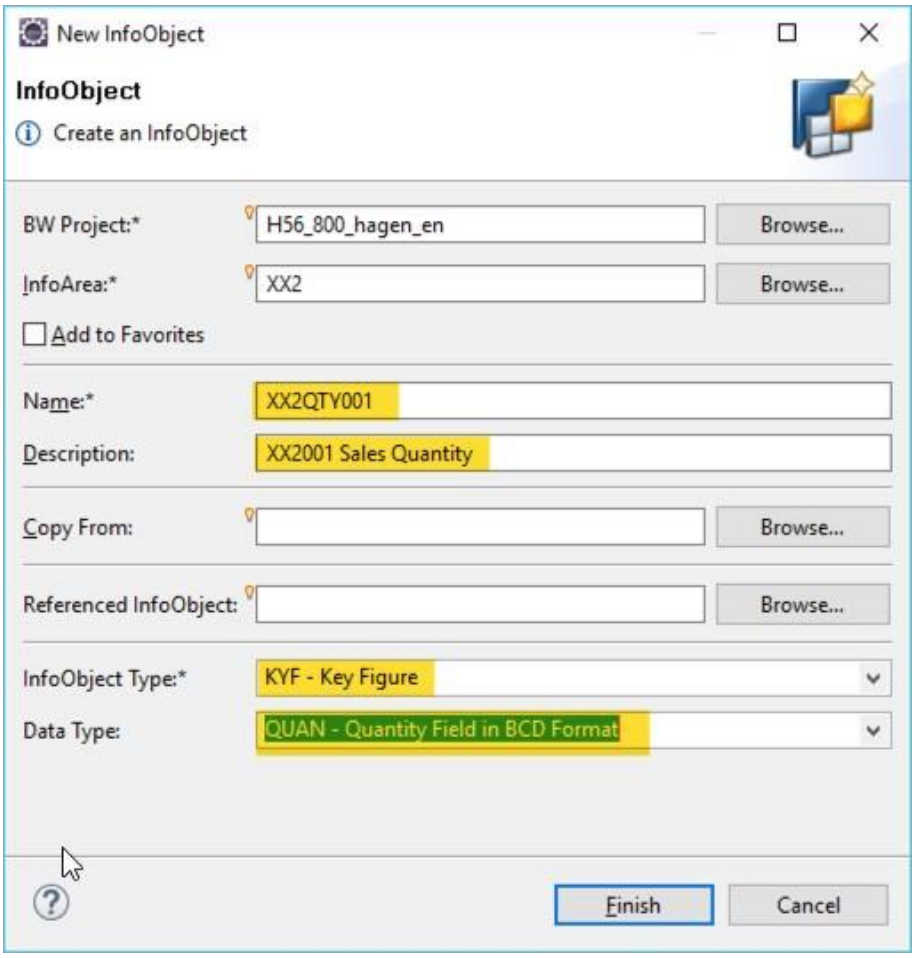

Figure 7

d. Finish.

e. The sales quantity can be stored in different units of measure. Use as unit pre-delivered InfoObject oUNIT.

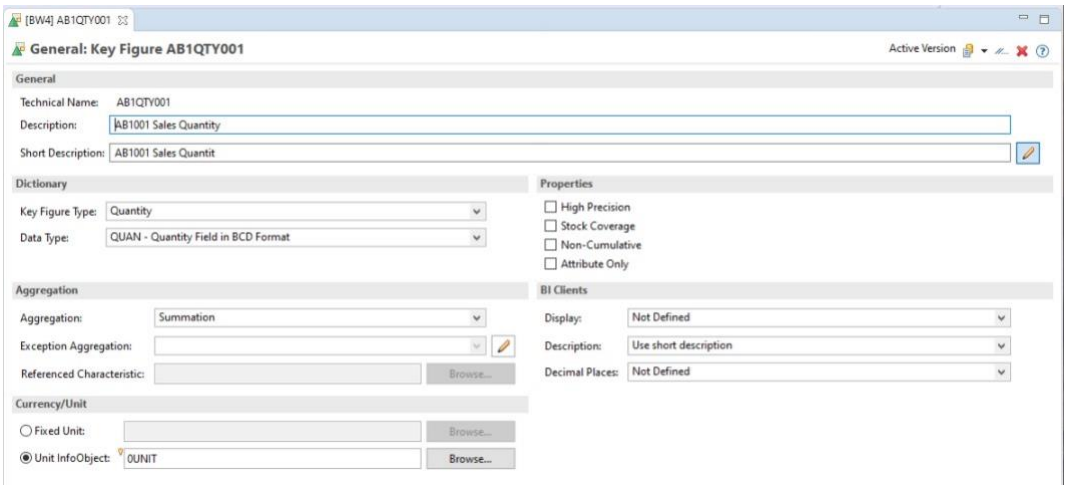

Figure 8

f. Save and activate your InfoObject.

g. Close the Sales Quantity InfoObject tab.

Question 4: What type of InfoObject is Sales Quantity?

Question 5: Why does Sales Quantity not have Exception Aggregation?

Question 6: What are other Aggregation options apart from summation?

3. Create a Product Category InfoObject

a. Launch Eclipse and open your BW project, go to Project Explorer → your BW-System → BW Repository.

b. Navigate to the InfoArea assigned by your instructor. It has the technical name XXX### and description Student ###.

c. Right click and choose New → InfoObject and create an InfoObject for the characteristic product category. Use for the technical name XXXPC### and as description XXX### Product Category. As InfoObject Type select Characteristic with Data Type CHAR.

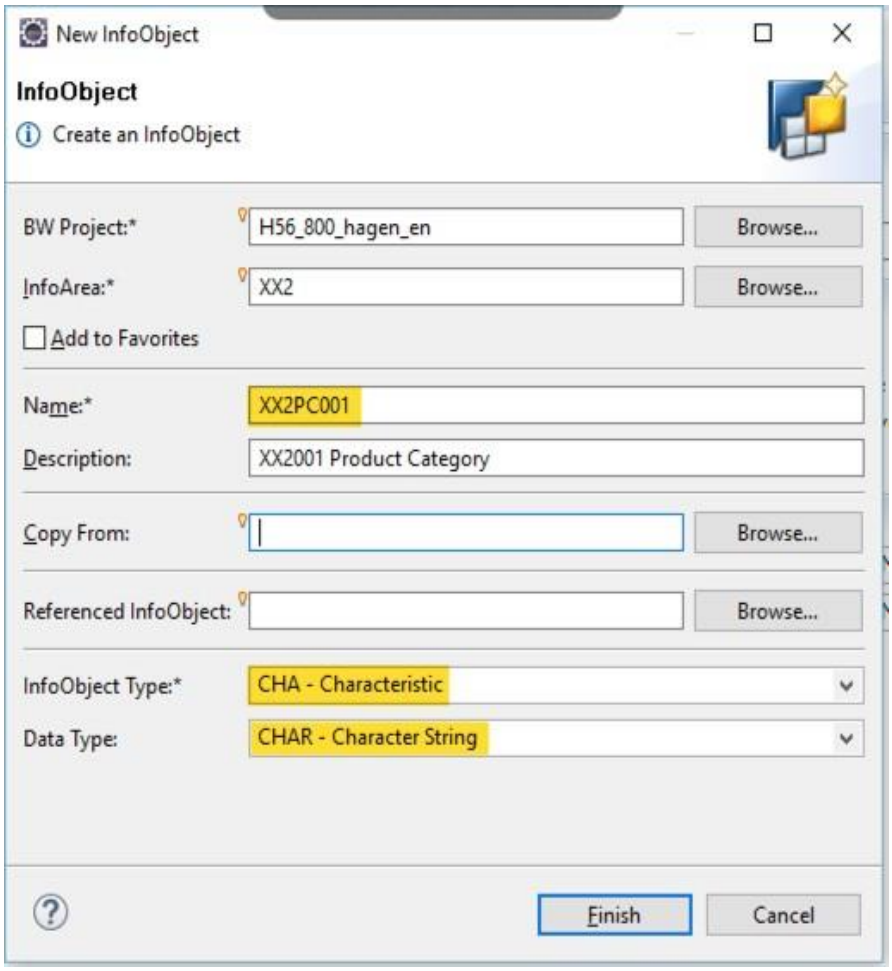

Figure 9

d. Finish.

e. We have to specify certain details of *product category*. The *product category* characteristic should be of type character and of length 3. The characteristic should have *master data* and a *language dependent* short text. Select under Properties Master Data and Texts.

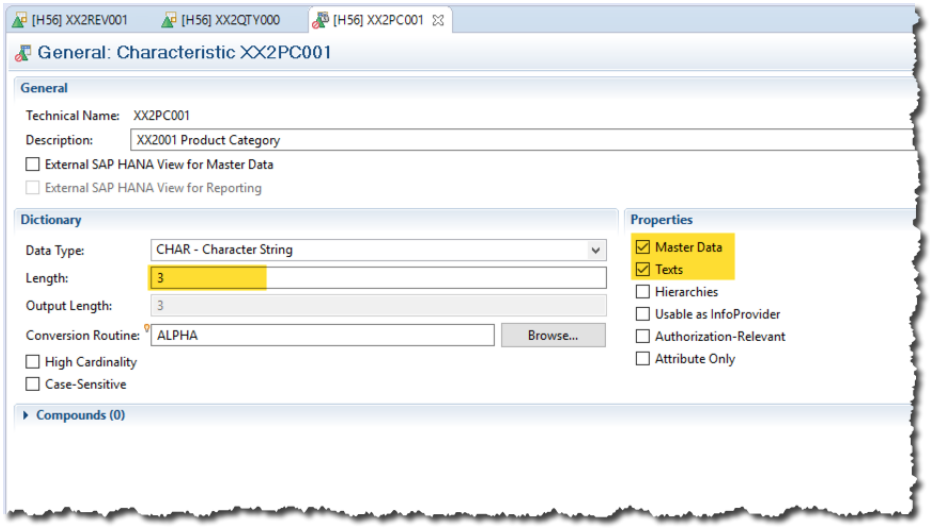

Figure 10

f. New tabs will appear. Go to tab Master Data/Texts and select Short Text and Language-Dependent.

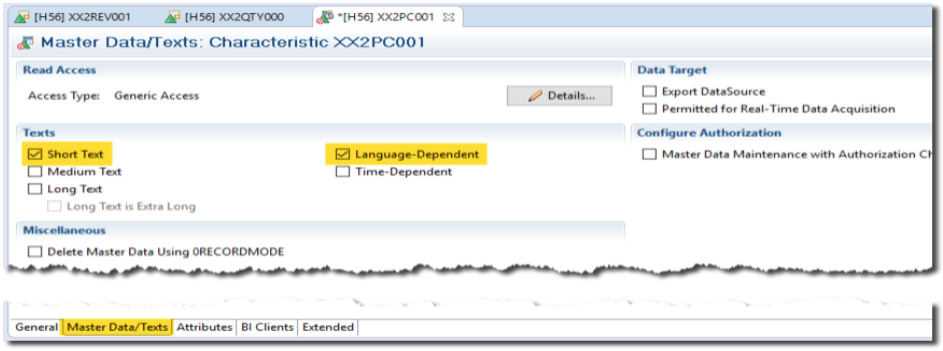

Figure 11

Additional Information

When the indicator "Master Data" is set, the system creates a special table which can hold the keys and potential attributes for product category. Although product category does not have any attributes in our case, this table can be used to ensure referential data integrity.

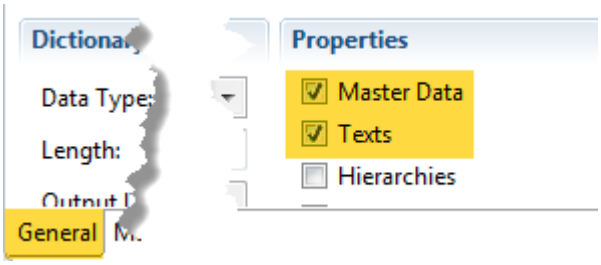

Figure 12

When the indicator “Texts” is set then in addition to a key as unique identifier, every item has a description which can be language dependent. Example: A product category has key ROB, English text Road Bikes and German text Rennräder.

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Then depending on the logon language of the user, the appropriate text is shown by the system. In the following we will maintain English texts only, so students have to use English logon language.

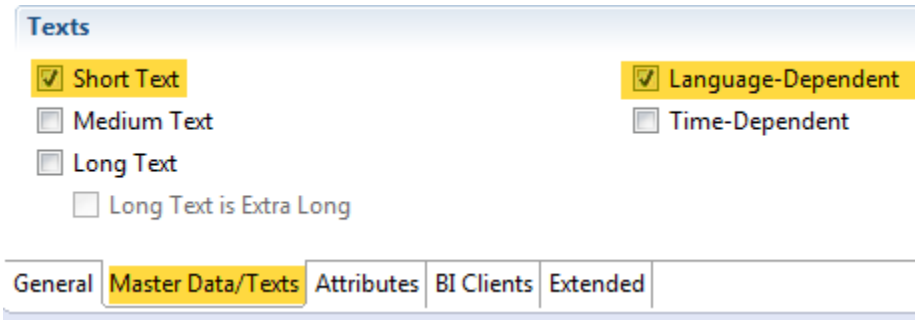


Figure 13

Furthermore, it has to be decided what a user will see in reporting as default. This setting can be overwritten when creating a report later on.

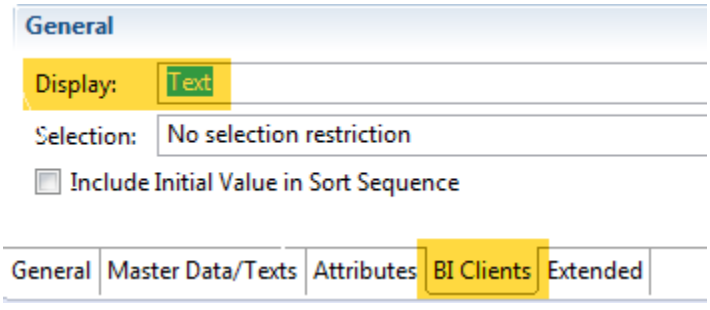


Figure 14

Usually, master data in the data warehouse are the same as in the corresponding operational system and therefore loaded in an automated process. We will do this in the subsequent exercise. Additionally, SAP BW/4HANA offers the possibility to maintain master data manually, which makes sense for small amounts of data with rare changes.

Moreover, in reporting the short text should be showed as default (and not the key).

g. Go to tab BI Client and select as Display Text.

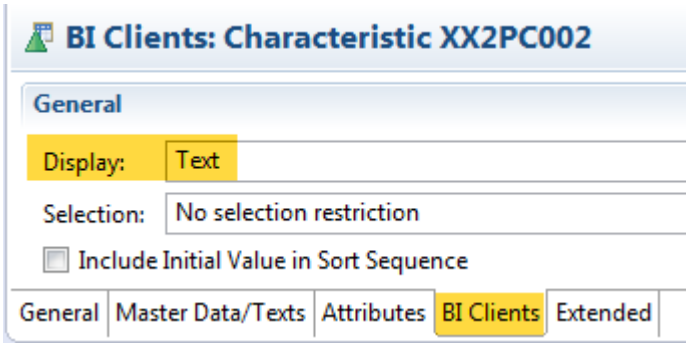


Figure 15

h. Save and Activate your InfoObject.

i. Close the Product Category tab.

Question 7: What type of InfoObject is Product Category?

Question 8: Is the Product category Language Dependent?

Question 9: Is the Product Category Time Dependent?

Question 10: Does Product Category have attributes?

4. Maintain (populate) master data for the Product Category InfoObject.

a. Launch Eclipse and open your BW project, go to Project Explorer → your BW-System → BW Repository.

b. Navigate to the InfoArea assigned by your instructor. It has the technical name XXX### and description Student ###.

c. Under Characteristic, open the InfoObject XXX### Product Category (technical name: XXXPC###).

d. We would like to populate data into the Product Category characteristic InfoObject. Usually we use an ETL process to do this. But when the amount is data is very small

and permanent (not changing often), we can enter the data manually. This is called Maintain.

e. Go to the weblink provided by your UCC for the SAP BW/4HANA 2.0 web cockpit. E.g. http://picard.ucc.uwm.edu/fiori

f. Enter your credentials that you used in Eclipse to login.

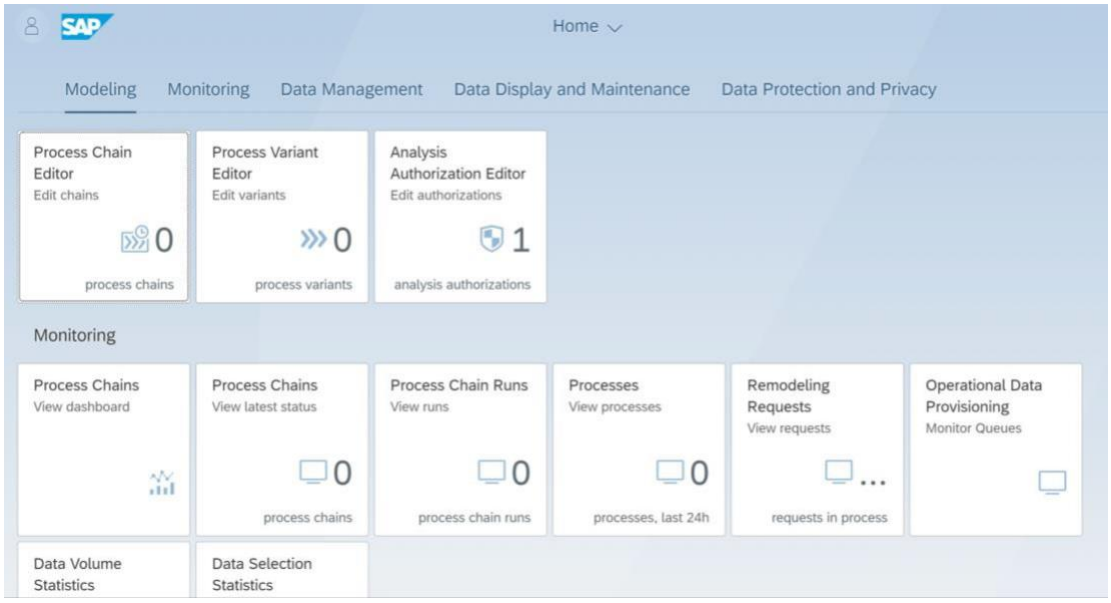


Figure 16

g. Go to **Data Display and Maintenance**

h. Then click on **InfoObject Master Data Maintenance**

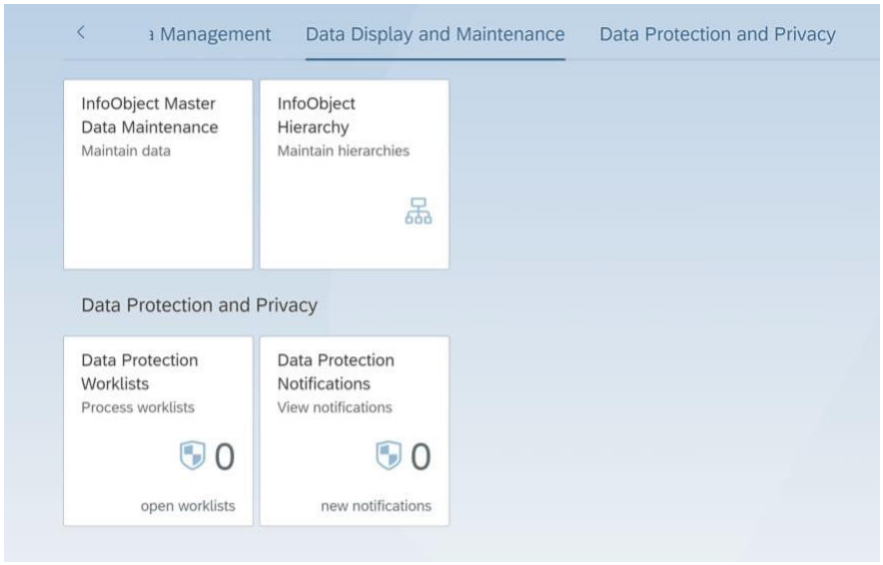


Figure 17

i. Search for your own Product Category InfoObject. XXXPC###

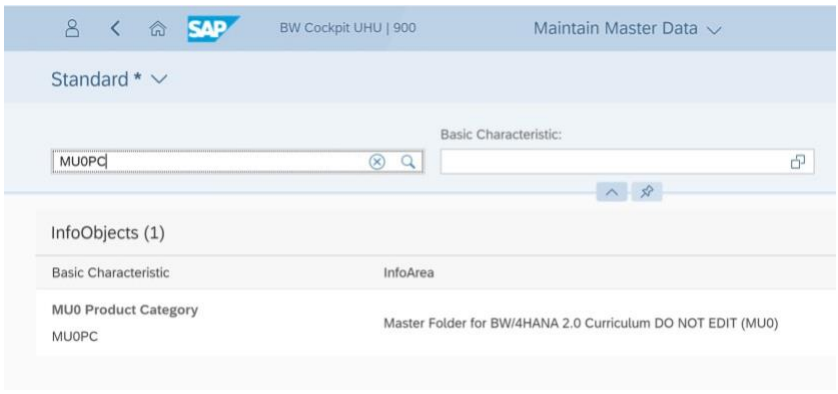
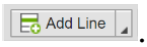


Figure 18

j. Go to **Texts** and Add Line 

. Type for *Product Category* **ACC** and for *Short description* **Accessories**.

k. Go further and enter the following values:

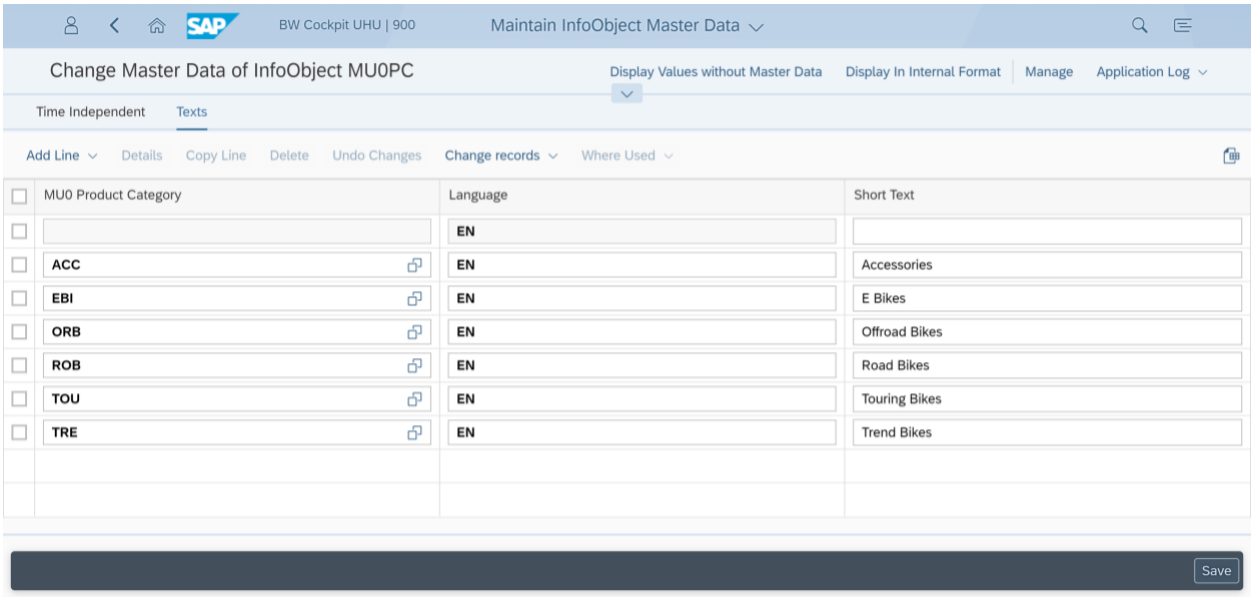


Figure 19

Note: On top of the table the system shows an empty line which was automatically added by the system. The reason for this is beyond the scope of this curriculum.

l. Save your master data. Log out of the BW cockpit.

Question 11: Why did you enter the Product Category as 3 characters long?

5. Create Material InfoObject

a. Launch Eclipse and open your BW project, go to Project Explorer → your BW-System → BW Repository.

b. Navigate to the InfoArea assigned by your instructor, which has the technical name XXX### and description Student ###.

c. Choose New → InfoObject and create an InfoObject for the characteristic material. Technical name XXXMA### and as description XXX### Material. For InfoObject Type select Characteristic with Data Type CHAR.

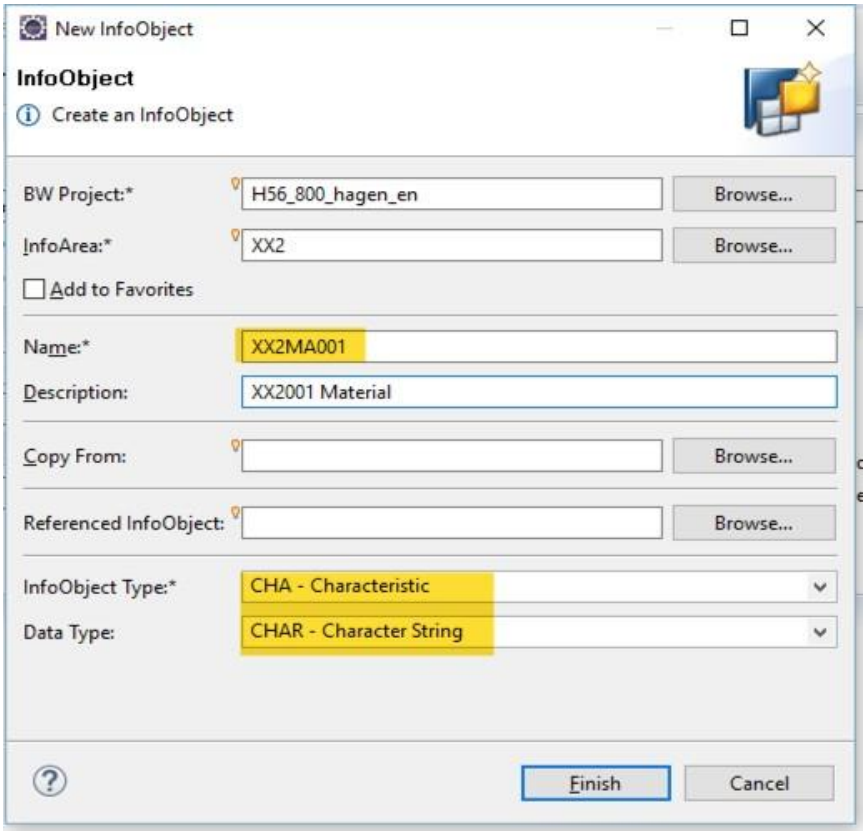


Figure 20

Additional Information

Although the term *product* is widely used when looking at sales figures we will call our InfoObject *material*. It is good practice in SAP to use the same InfoObject in production process which can potentially hold raw materials or semi-finished goods.

Our InfoObject material has several attributes. In addition to *product category* (that we created in the previous step), we will use several attributes created by UCC (technical name starts with MUo).

Some of the attributes will be used for OLAP navigation in reporting later on. These have to be marked as navigational attributes.

d. The material characteristic should be of type character and of length 18. The characteristic should have *master data* and a *language dependent medium length text*.

e. Select under Properties → Master Data, Texts, and Usable as InfoProvider.

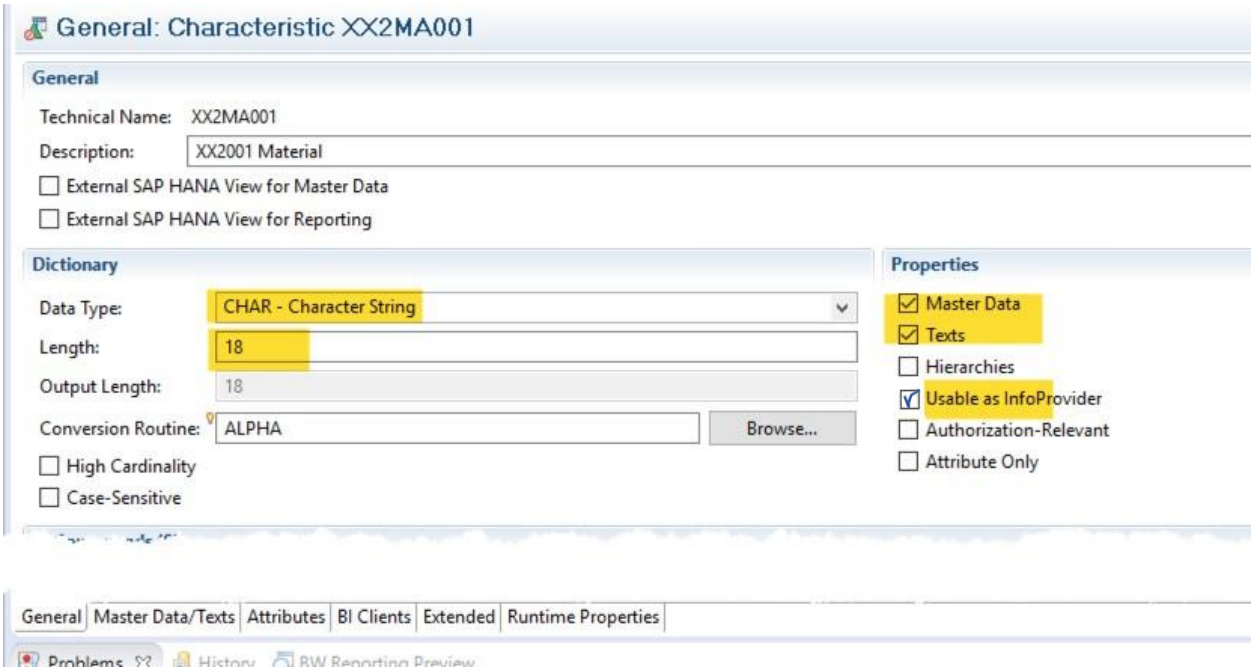


Figure 21

f. New tabs will appear. Go to tab Master Data/Texts and select Medium Text and Language-Dependent.

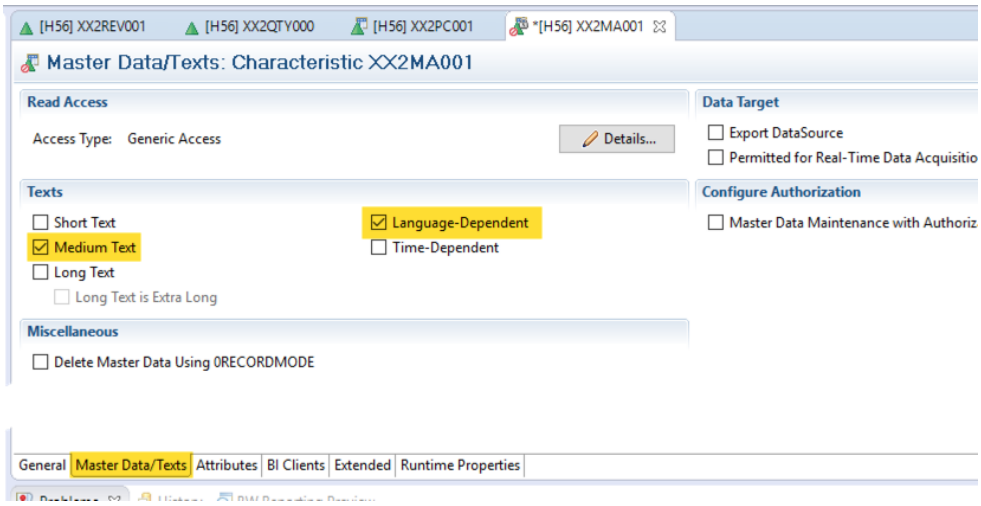


Figure 22

g. While reporting on this data warehouse, we would like the material medium text should be showed as default (and not the key).

h. Go to tab BI Client and select as Display Text**.**

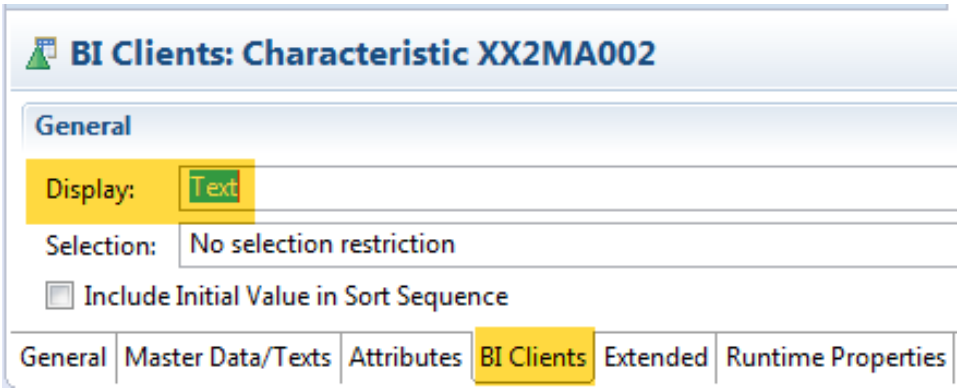


Figure 23

i. Go in the Attributes tab and click on 

.

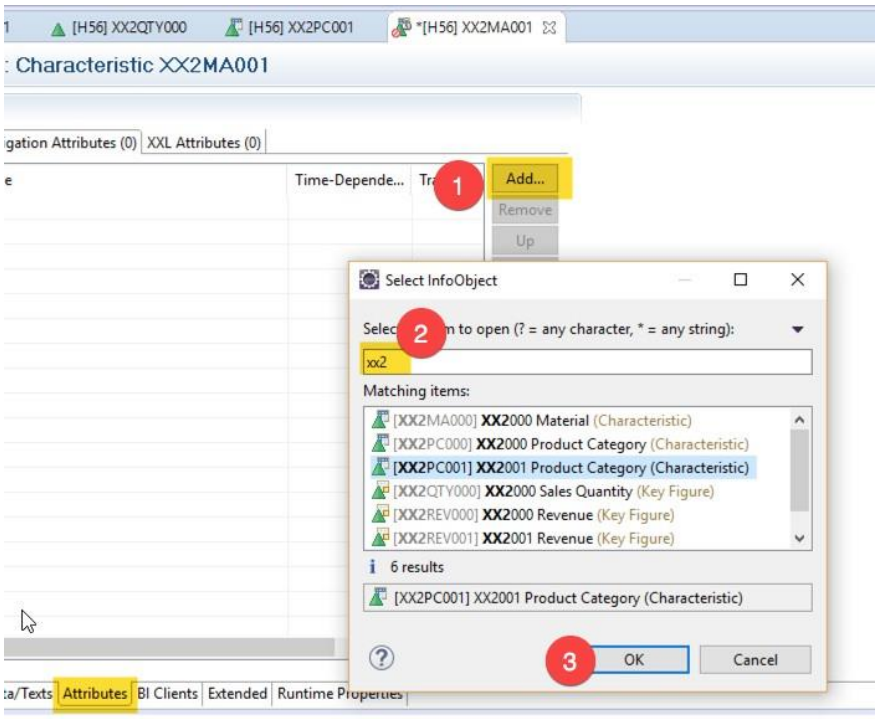


Figure 24

j. Search and add the following attributes.

Hint: Make use of the naming convention to find the technical names of the InfoObjects.

- *All InfoObjects delivered by SAP have a name starting with 0…*
- *All InfoObjects delivered by UCC have a name starting with MU0…*
- *All InfoObjects you created have a name starting with your XXX…*

Name of attribute	Origin	Navigational?
Product Category	characteristic created by you in previous step	yes
Components	characteristic delivered by UCC	no
Color	characteristic delivered by UCC	no
Division	characteristic delivered by UCC	yes

k. For the navigational attributes select the Navigational checkbox.

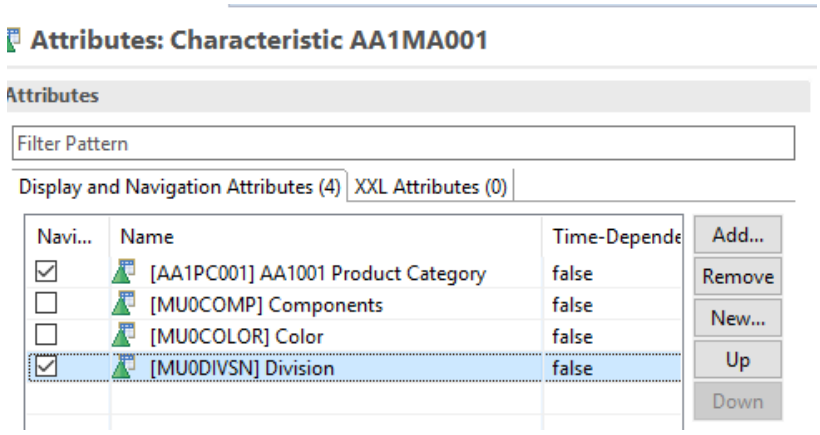


Figure 25

l. You don't have to enter master data for material manually now, since master data will be loaded from flat file in a subsequent exercise using ETL process. To enable the loading process, be sure that in the tab General, set the property Usable as InfoProvider.

m. Save and Activate your InfoObject.

Question 12: What type of InfoObject is Material?

Question 13: Is the Material text Language Dependent?

Question 14: Is the Material text Time Dependent?

Question 15: Does Material have attributes? If yes, what are they?

Question 16: What is meant by Navigation Attributes?

Question 17: Are any attributes time dependent?

Question 18: How many attributes does Division have?

Question 19: What is the length of the *color* attribute?

Question 20: What is the longest material key can we have in our data warehouse?