

4.0β

Data Modeling SAP Analytics Cloud¹

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OBJECTIVE

To acquire and model data for analysis in SAP Analytics Cloud.

DATA REQUIRED

- [*GB_AnalyticsData.xlsx*](#)

Scenario

The entire sales force from Global Bike will be meeting in a couple weeks for their annual retreat where they perform various team building activities, enjoy time away from the office, and more importantly, examine past sales performance to strategize and plan for the future. VP of Sales, Nina Kane has asked you to prepare some historical data so that her business analysts can prepare for the retreat. Therefore, you have downloaded some sales data from the ERP system for this purpose.

The following is an Entity-relationship diagram of the data downloaded to Excel.

¹ This exercise is based on the Global Bike data model developed collaboratively by Klaus Fryburger, Tobias Hagen, and Nancy Jones 2019 and provided as a public model on the UA SAC academic tenant.

ER Model

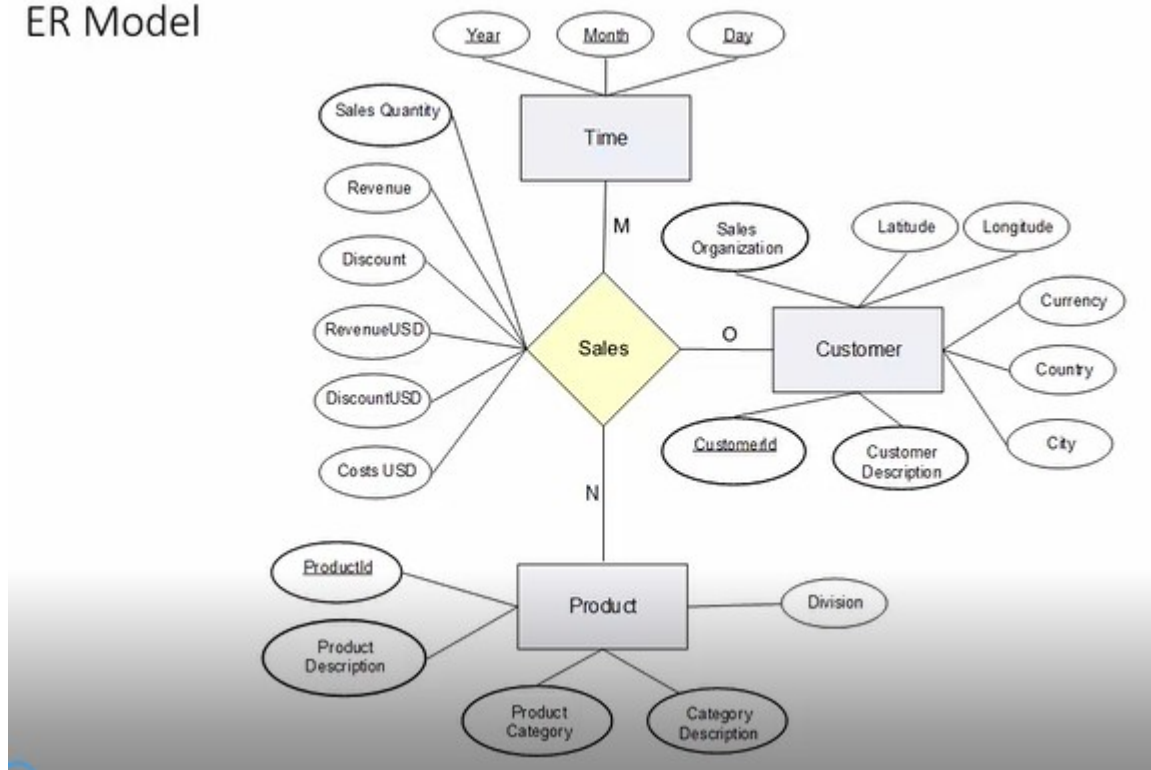


Figure 1: ERD of Global Bike Sales Data created by Dr. Klaus Fryburger, Ludwigshafen University

Background

Data for analysis may be acquired via various means and from various sources. All acquired data should first be examined for anomalies and inconsistencies and any issues addressed before the analysis is performed. This process of data transformation, sometimes called “data wrangling”, is imperative to mitigate the effects of “GIGO”, garbage-in-garbage-out and to provide opportunities for robust analyses.

In SAP Analytics Cloud (SAC), we create data models from imported or linked data sources. The models can consist of one or many data sets and it is in the modeling process that we can identify and fix/transform any data inconsistencies, add hierarchical structures, filter data, merge data sets, create calculated columns, and otherwise prepare the data for analysis.

Creating the Model

1. In SAP Analytics Cloud (SAC), go to Create Model.
2. Choose Import a file from your computer.
3. Select Source File and choose the Excel file *GB_AnalyticsData.xlsx*.
 - a. The first worksheet SalesdataAct will default.
 - b. Use first row as column headers should be selected.
4. Import. This is a large file so it may take some time.
5. Click on the draft data created in the import.
 - a. You will receive a message that only a sample of the data will be shown. Click OK to acknowledge the message.
6. Notice that year, month, and day are contained in separate columns. We will concatenate the values to form one date column.
 - a. Highlight all three columns by using the CTRL key. *Hint: because year is a dimension and month and day are measures, you must use the CTRL key. If all three were of the same data type, you could use the SHIFT key.*
 - b. Select Create Transformation from the dropdown list.
 - (1) Create Transformation → Concatenate.

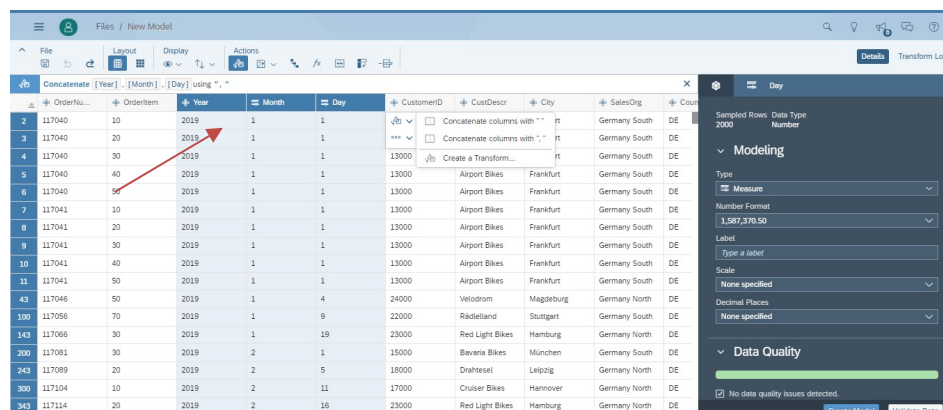


Figure 2: Create Transformation

- (2) Add / to the delimiter between the "" in the transformation window as shown in Figure 3. Be careful to not add any extra spaces between the "".
- (i) Enter to accept the transformation.

Concatenate [Year], [Month], [Day] using "/"					
OrderNu...	OrderItem	Year	Month	Day	Year_Month_...
117040	10	2019	1	1	1

Figure 3: Concatenating Year, Month and Day

(3) The three columns will be merged into one. However, they were merged as measures which is incorrect.

(i) Change the column to type Date Dimension.

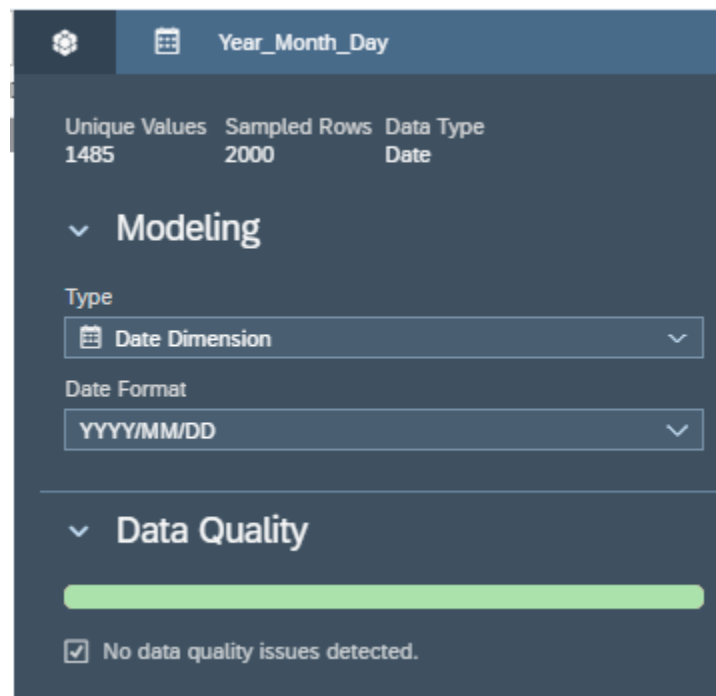


Figure 4: Changing the Data Type

(ii) Change the name of the column to “Date” by double clicking on the column heading and typing in the new name.

7. Examine *Customer* and add attributes.

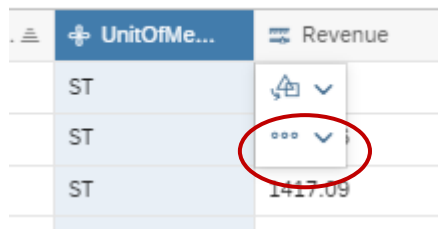
- Because *Customer* is a number, SAC interpreted it as a measure. Change *Customer* to data type Generic Dimension.
- Now let's add some attributes to the *Customer* dimension.

The screenshot shows a data modeling tool interface. On the left, a table titled 'Customer' is displayed with columns: Customer, CustDescr, City, Latitude, Longitude, SalesOrg, and Country. The table contains 17 rows of data. On the right, a sidebar titled 'Customer' is open, showing the 'Modeling' section. Under 'Modeling', there is a 'Type' dropdown set to 'Generic Dimension'. Below this, there is a section for 'Add Dimension Attributes' with a list of properties: Description, Property, Parent-Child Hierarchy (Parent), and Currency. The 'Data Distribution' section is also visible, showing a 'Number of Bars' slider set to 20 and a 'Values' section with a 'Count' of 198.

Customer	CustDescr	City	Latitude	Longitude	SalesOrg	Country
17000	Bikes	Hannover	52.375882	9.73201	DN00	DE
17000	Bikes	Hannover	52.375882	9.73201	DN00	DE
17000	Cruiser Bikes	Hannover	52.375882	9.73201	DN00	DE
17000	Cruiser Bikes	Hannover	52.375882	9.73201	DN00	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
23000	Red Light Bikes	Hamburg	53.551085	9.993682	DN00	DE
21000	Ostseerad	Anklam	53.850291	13.696973	DN00	DE
15000	Bavaria Bikes	München	48.135125	11.58198	D500	DE
17000	Cruiser Bikes	Hannover	52.375882	9.73201	DN00	DE
20000	Neckarad	Heidelberg	49.398752	8.672434	D500	DE
14000	Alster Cycling	Hamburg	53.551085	9.993682	DN00	DE
17000	Cruiser Bikes	Hannover	52.375882	9.73201	DN00	DE

Figure 5: Adding Dimension Attributes

- (1) For Description, add *CustDescr* so that the customer number and the customer's name are linked.
- (2) Add Property *City*.
- (3) Add Property *SalesOrg*.
- (4) Add Property *Country*.
- (5) Add Property *Currency*.
- (6) Add Property *Latitude*.
- (7) Add Property *Longitude*.
8. Examine *Product* and add attributes.
 - a. Add the following Dimension Attributes to *Product*.
 - (1) Add Description *ProdDescr*.
 - (2) Add Property *ProdCat*.
 - (3) Add Property *CatDesc*.
 - (4) Add Property *Division*.
 9. Since *UnitOfMeasure* contains only one value, "ST" (stücke in German and each or piece in English), we can remove the unit of measure column.
 - a. Highlight/select the *UnitOfMeasure* column.
 - b. On the Quick Actions dropdown, choose Delete Column.

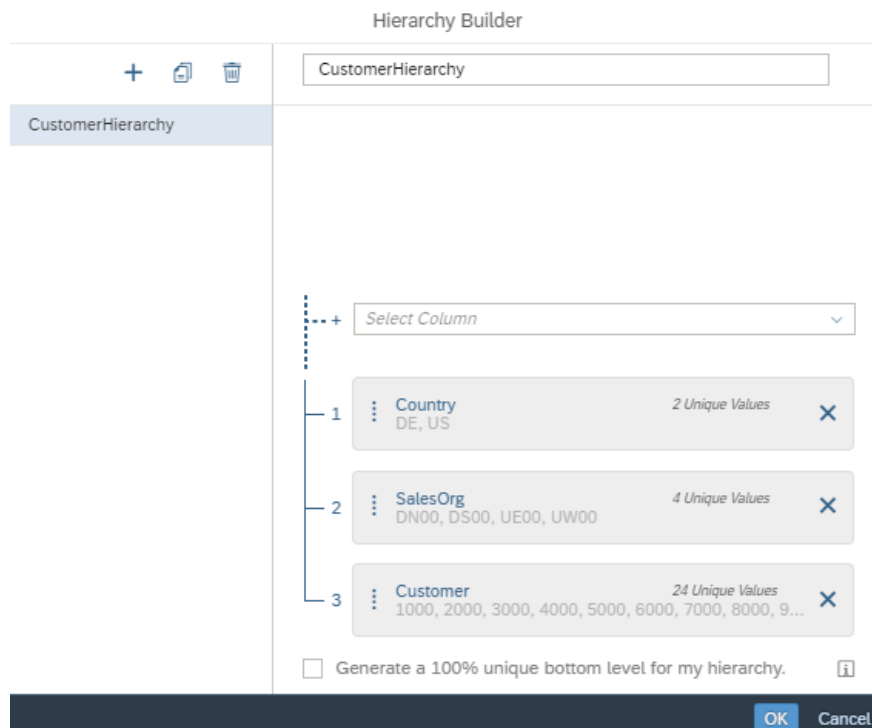


UnitOfMe...	Revenue
ST	
ST	
ST	1417.09

Figure 6: Quick Actions for a Column

10. Create a Customer Hierarchy.

- a. Highlight the *Customer* column.
- b. On the Actions ribbon, choose Level-based Hierarchy.
- c. Add “CustomerHierarchy” to the hierarchy name field.
- d. Add columns to the hierarchy in the following order:
 - (1) *Customer*
 - (2) *SalesOrg*
 - (3) *Country*
- e. The results should look like Figure 7.



Hierarchy Builder

CustomerHierarchy

CustomerHierarchy

Select Column

1 Country
DE, US 2 Unique Values

2 SalesOrg
DN00, DS00, UE00, UW00 4 Unique Values

3 Customer
1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9... 24 Unique Values

☐ Generate a 100% unique bottom level for my hierarchy.

OK Cancel

Figure 7: Customer Hierarchy

f. OK.

11. Add a Product Hierarchy.
 - a. Highlight the *Product* column.
 - b. On the Hierarchy Builder, clicking on the +.
 - c. Name the hierarchy “ProductHierarchy”.
 - d. Add columns to the hierarchy in the following order:
 - (1) *Product*
 - (2) *CatDescr*
 - (3) *Division*
 - e. The results should look like Figure 8.

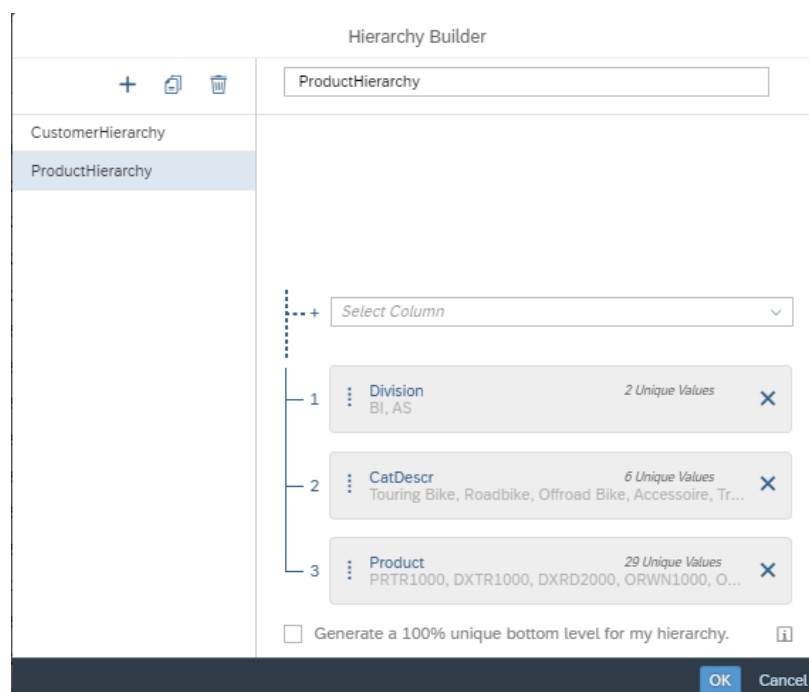


Figure 8: Product Hierarchy

- f. OK.
12. Add a geo enrichment based on latitude and longitude by customer.
 - a. In the Actions ribbon, select Geo Enrichment → Coordinates.
 - (1) Type “CustomerLocation” as the Dimension Name.
 - (2) Select *Customer* as Location ID.
 - (3) Select *CustDescr* as Location Description.
 - (4) The Coordinates should automatically detect the dimensions *Latitude* and *Longitude*.

Geo by Coordinates

*Dimension Name
CustomerLocation

▼ Identifiers

Location ID
Customer

Location Description
CustDescr

▼ Coordinates

*Latitude
Latitude

*Longitude
Longitude

Create Cancel

Figure 9: Add a Geo-enrichment to the Customer Dimension

13. Create Model.

- Select Create Model.
- You will be asked if you are finished mapping and editing. Click Create.
- Give the model a meaningful name, e.g. “Global Bikes” and save the model **to your folder**.
- Once your model is created and saved, you see the following screen.

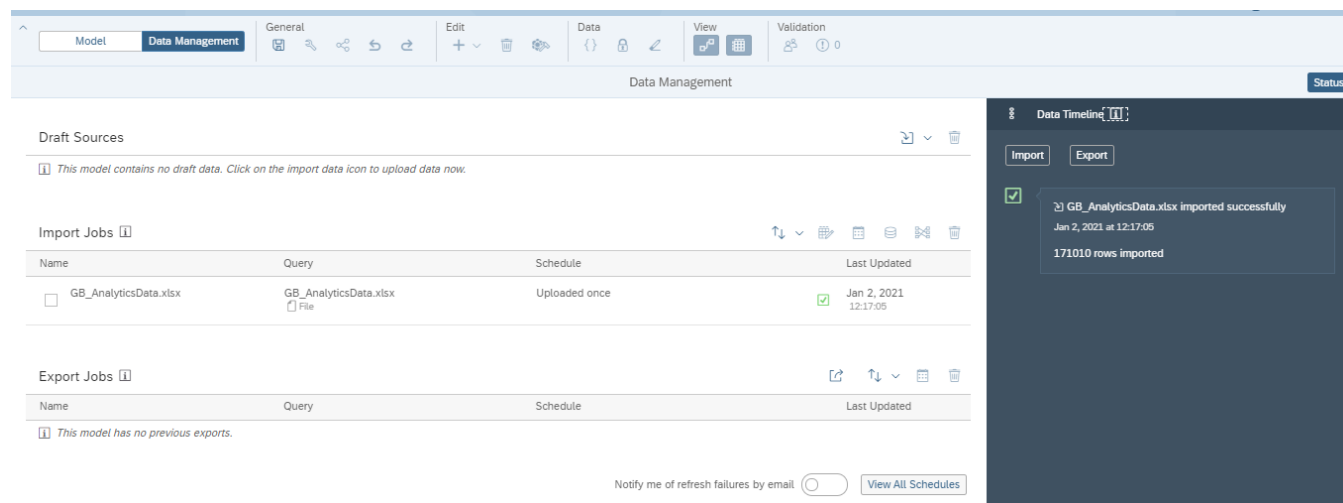


Figure 10: The Saved Model (Data Management screen)

- e. Switch to the Model tab. You will see that the system has generated a diagram called the Data Foundation view, (Figure 11). This is in essence, the star schema for the model. The Accounts are the facts of the star and the remaining “dimensions” are the actual dimensions of the model.

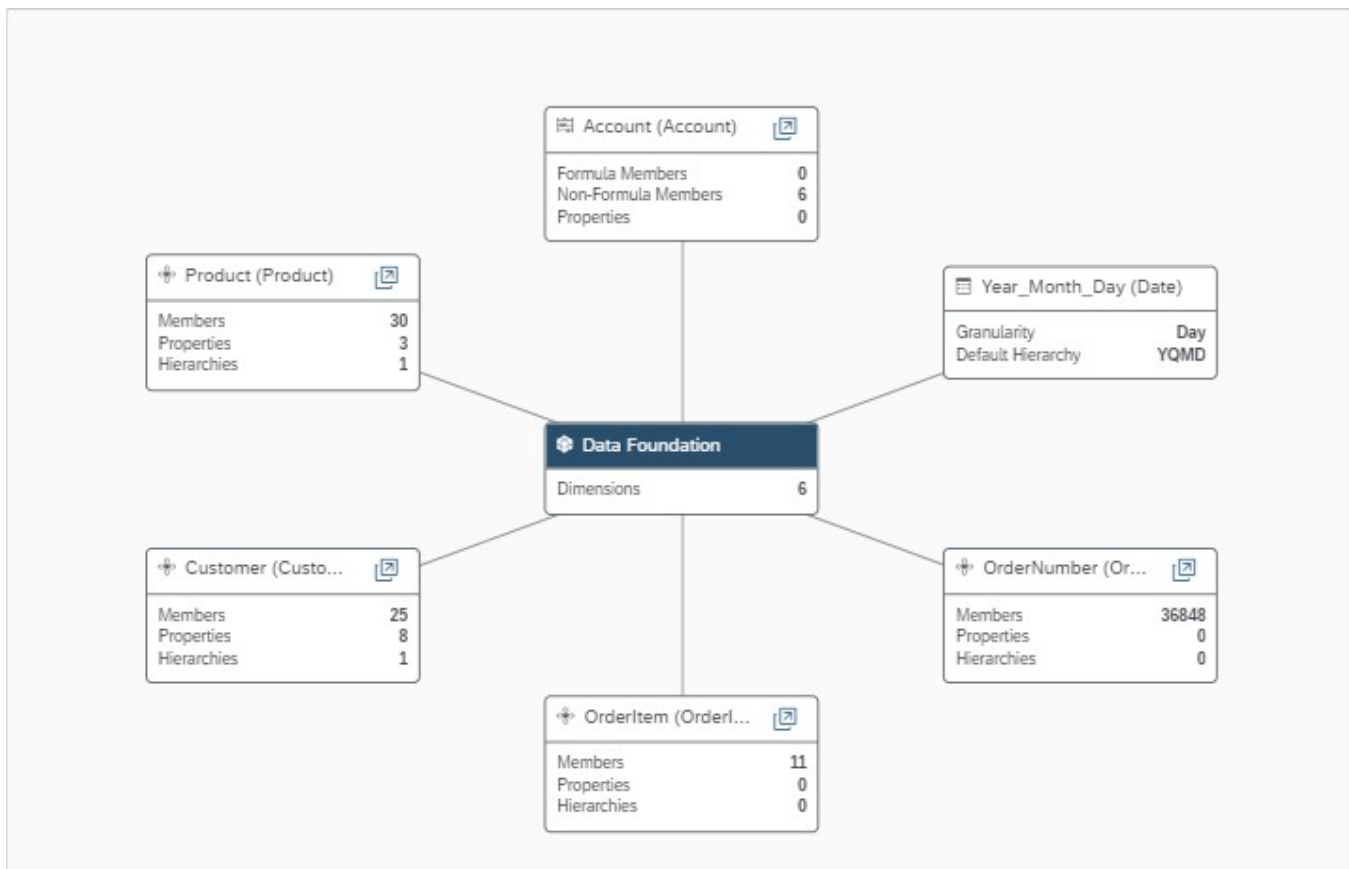


Figure 11: Data Foundation: Model Dimensions

- (1) You have a choice of various ways to view the data. You can toggle between them on the View ribbon.
14. “Finetuning” the key figures (measures).
- Select Account from the upper left of the Model tab page.
 - On this screen, scroll to the right until you see Decimal Places and Units & Currencies.
 - First, we want to associate currency with the measures.
 - CostsUSD* will always be in US dollars, so we need only add a label.
 - Type in USD under Units & Currencies in the row for *CostsUSD*.

	Member ID	Decimal Places	Units & Currencies	Threshold	Hide
1	CostsUSD	2	USD		Visible
2	Discount	2			Visible
3	DiscountUSD	2	USD		Visible
4	Revenue	2			Visible
5	RevenueUSD	2			Visible
6	SalesQuantity	2			Visible
7					
8					
9					
10					
11					

Figure 12: Adding a Currency Reference

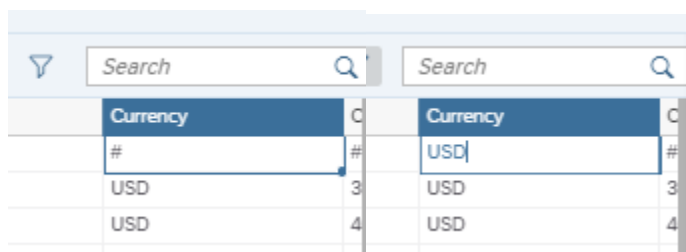
- (ii) Do the same for *DiscountUSD* and *RevenueUSD*.
- (2) *Discounts* may be in either Euros or US dollars, so we need to associate these values with the dimension *Currency*.
 - (i) Add *Currency* from the dropdown list to Units & Currency.
 - (ii) Do the same for *Revenues*.
- d. Describe unit of measure and numeric formatting for *SalesQuantity*.
 - (1) Select the *SalesQuantity* row.
 - (i) Change Decimal Places to 0.
 - (ii) Since we only sell products as each, type “EA” as a label for Units & Currency.
- e. Here are the results of your “finetuning”.

	Member ID	Decimal Places	Units & Currencies	Threshold	Hide
1	CostsUSD	2	USD		Visible
2	Discount	2	Currency		Visible
3	DiscountUSD	2	USD		Visible
4	Revenue	2	Currency		Visible
5	RevenueUSD	2	USD		Visible
6	SalesQuantity	0	EA		Visible
7					
8					
9					

Figure 13: Account Cleanup

15. Define the default currency. *Note: SAC actually has currency conversion capabilities. There are various ways to link up to conversion tables or other sources. Since the data set that was downloaded from the ERP system already contains converted values, we have used this simple means to model currency.*
 - a. Return to the Model overview.
 - b. Select *Customer* in the list of Generic Dimensions to open up a table of the columns and rows associated with *Customers*.

c. Select the Currency column.



Currency	
#	#
USD	3
USD	4

Figure 14: Select Default Currency

d. The top row with the # sign is to designate defaults. Type “USD” in top row.

16. Save.

The Global Bike sales data model is now ready and available for analysis. It is considered a public model and may be shared with other users.