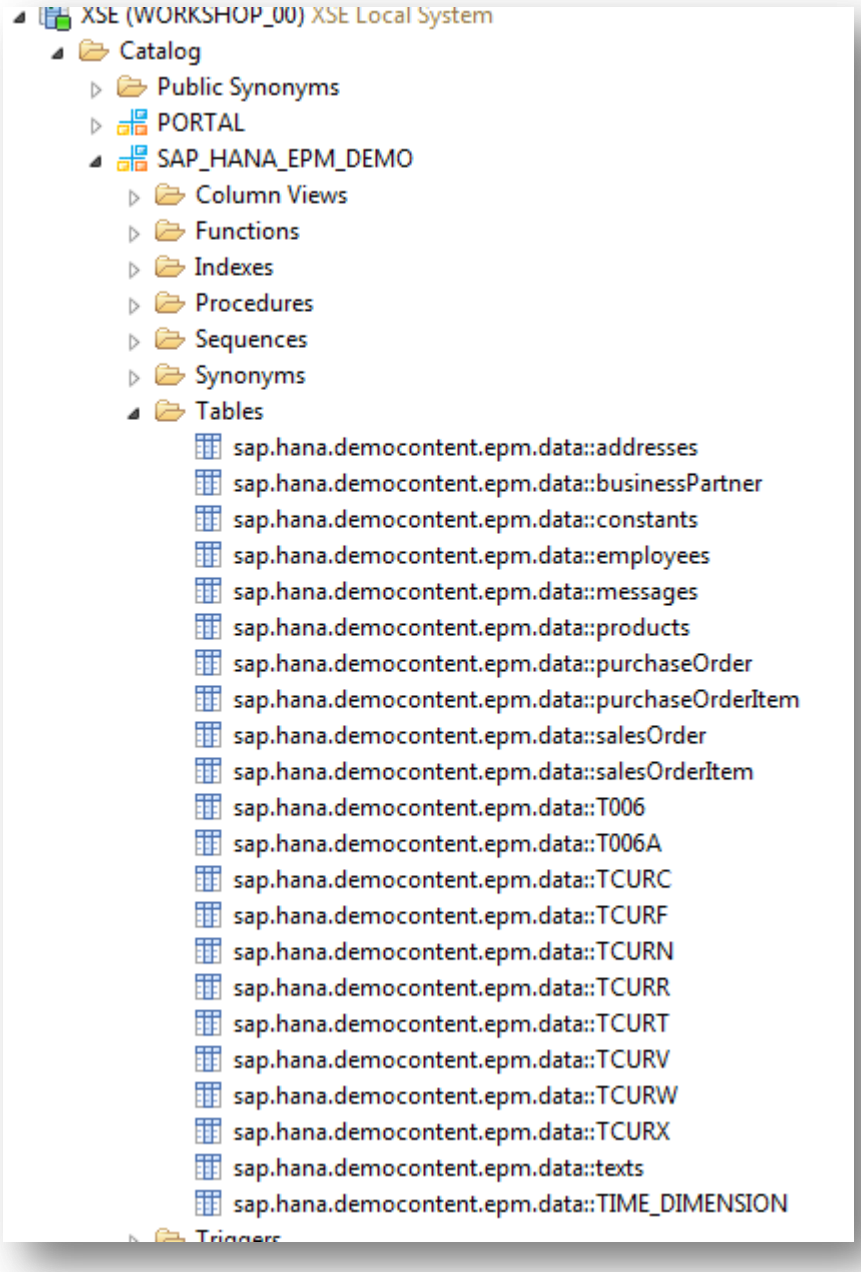
Exercise 2: Modeling Views

There are three types of views – **Attribute Views, Analytic Views, and Calculation Views**. In this exercise, we will utilize these modelling tools to create some more advanced views.

Rather than spending time creating a larger series of tables and sample data, the workshop will leverage the standard EPM (Enterprise Procurement Model) demo model. This model already exists in the workshop under the schema SAP_HANA_EPM_DEMO and contains Sales Orders, Purchase Orders, and supporting master data.

Please note that all the files, views which we will create in this exercise are case sensitive.



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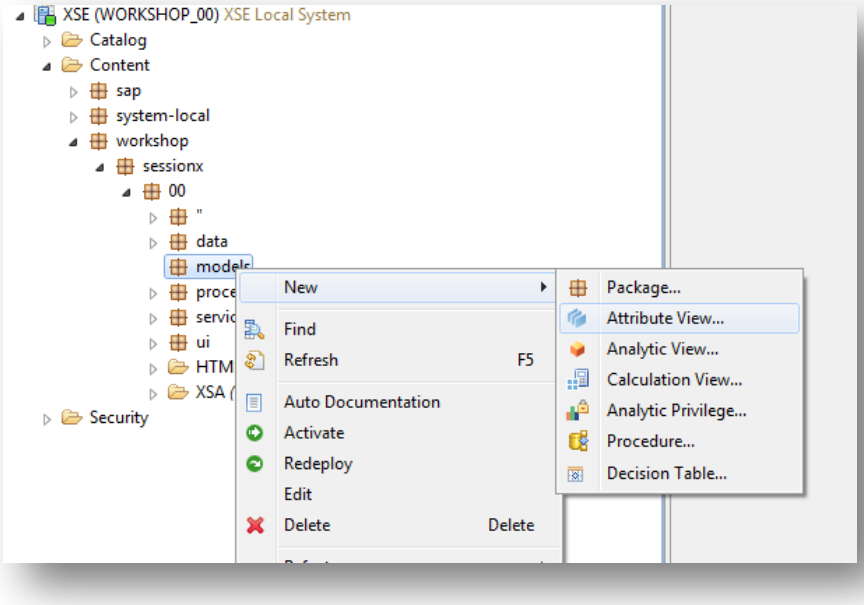
1. Attribute View

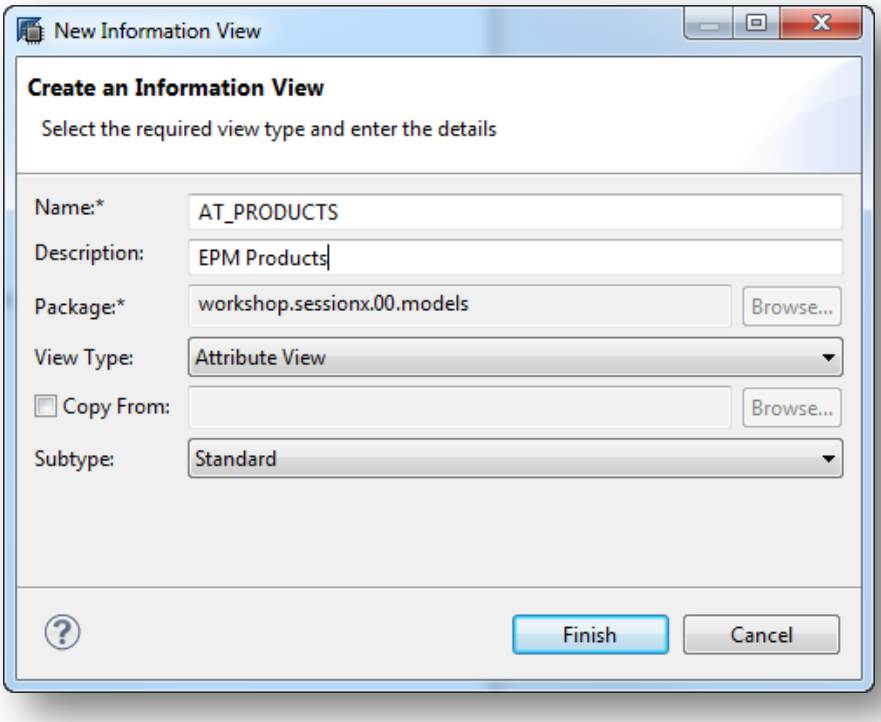
a. For this exercise, you might want to switch to the **Modeler perspective** in SAP HANA Studio as we will be using the SAP HANA Systems view.

b. In the models sub-package of your workshop package, create a new attribute view based upon the expanded information for the products. This will require joining the **products**, **texts**, **businessPartner**, and **addresses** tables.

c. From the right mouse click on the models package, choose New->Attribute View



d. Create an Attribute View named **AT_PRODUCTS**



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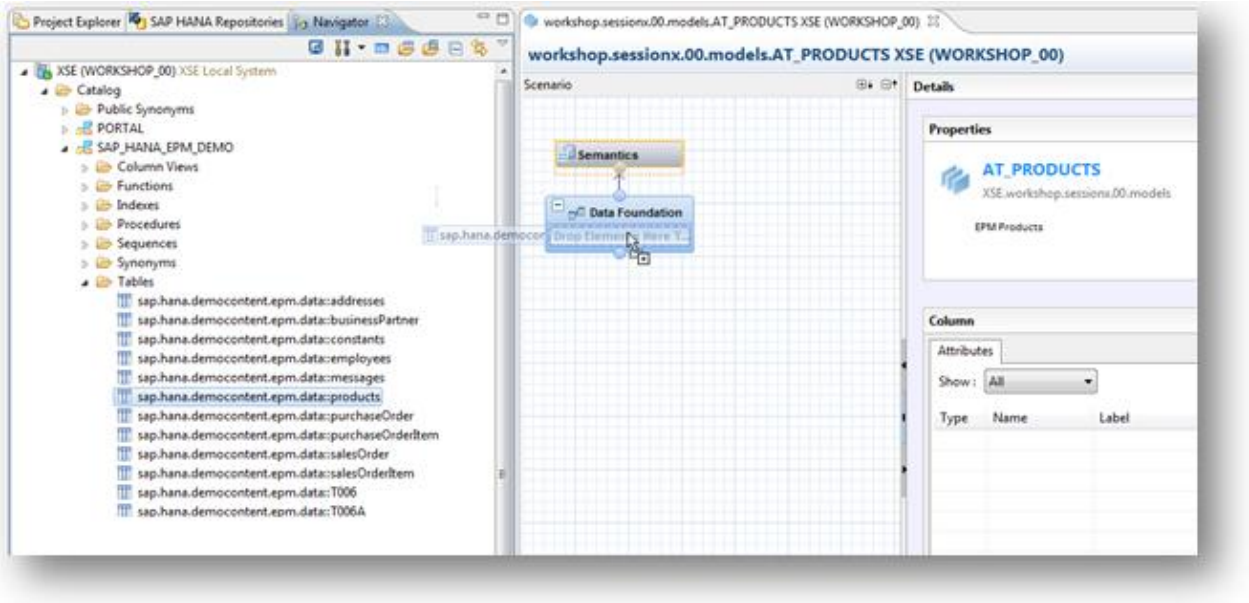
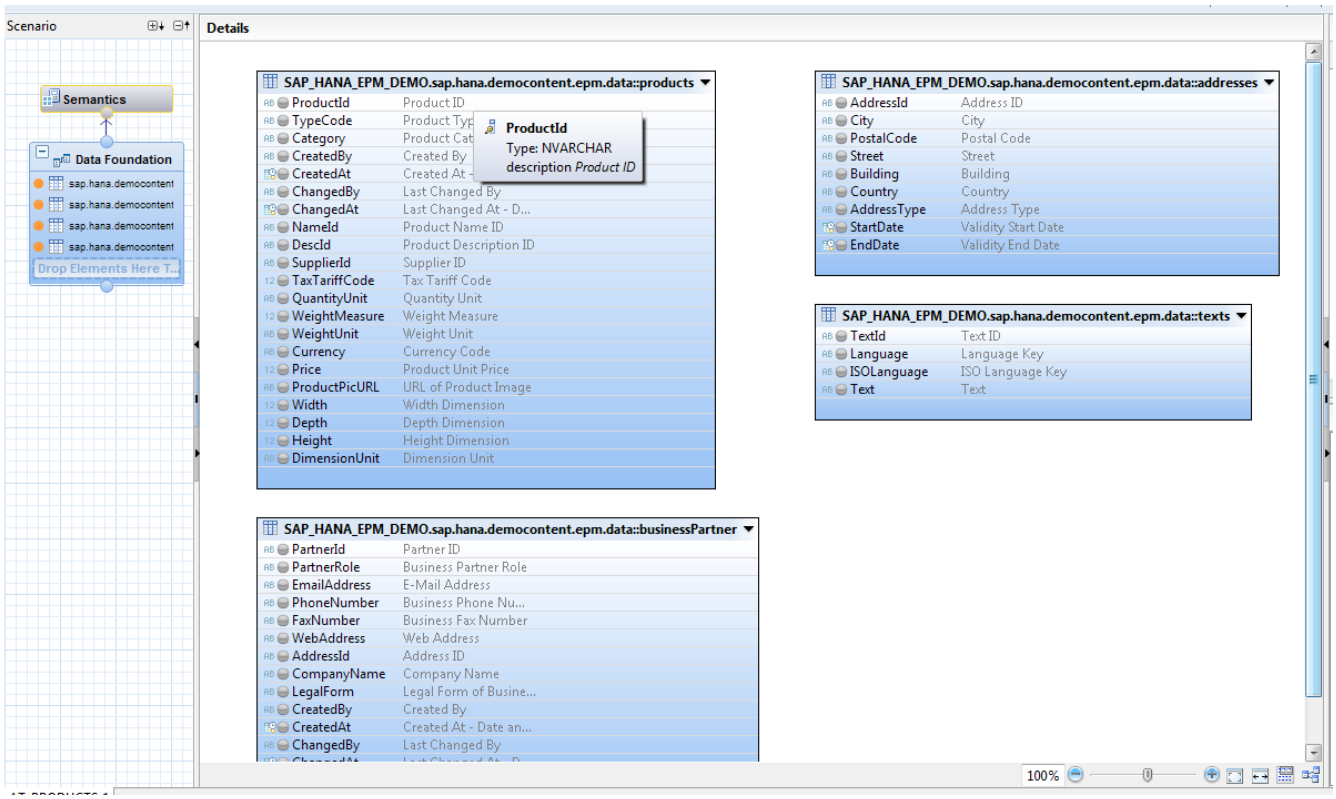
e. To add tables to the data foundation of your view, you can drag and drop them from the SAP_HANA_EPM_DEMO Schema.



f. Add **products**, **businessPartner**, **addresses** and **texts** to your data foundation.



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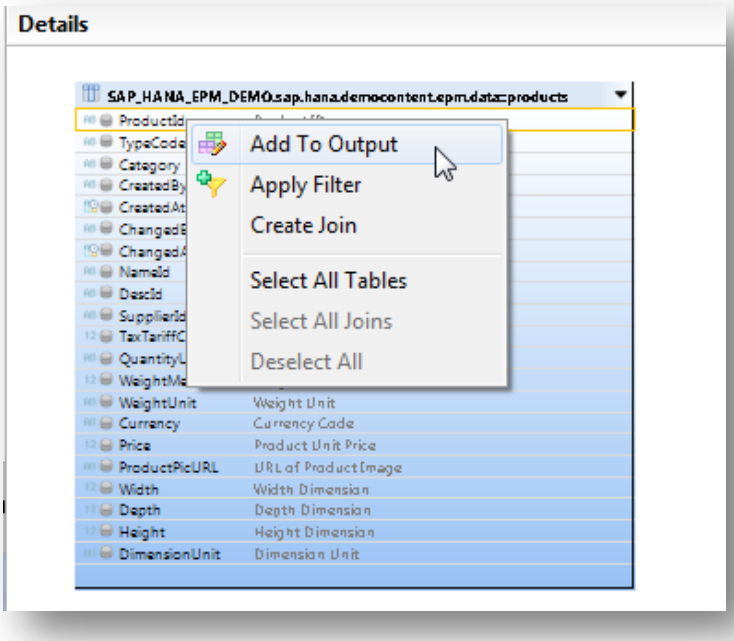
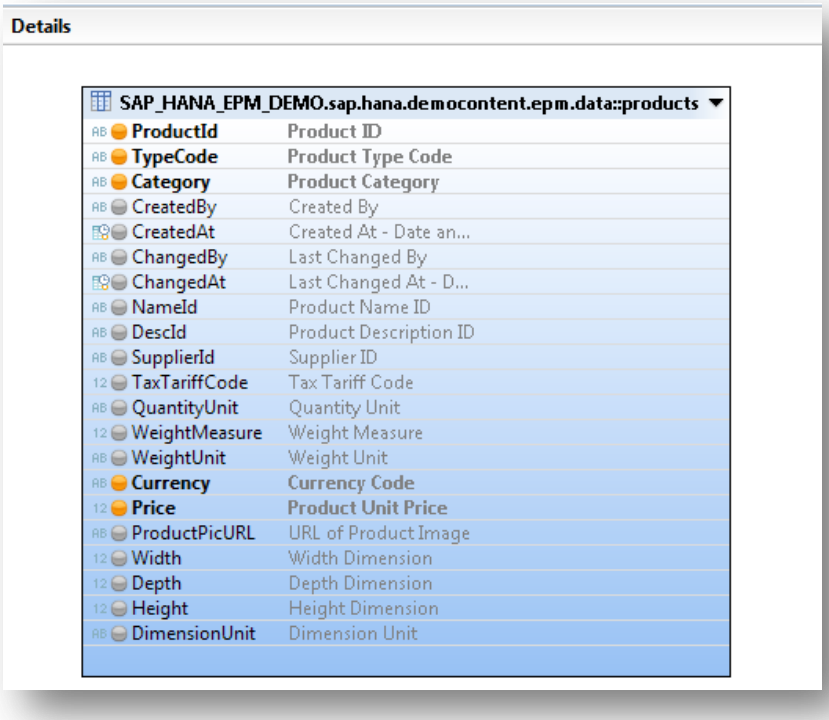
g. Using the Add to Output option from the context menu, add the **ProductId**, **TypeCode**, **Category**, **Currency**, and **Price** fields from the **products** table to the output.





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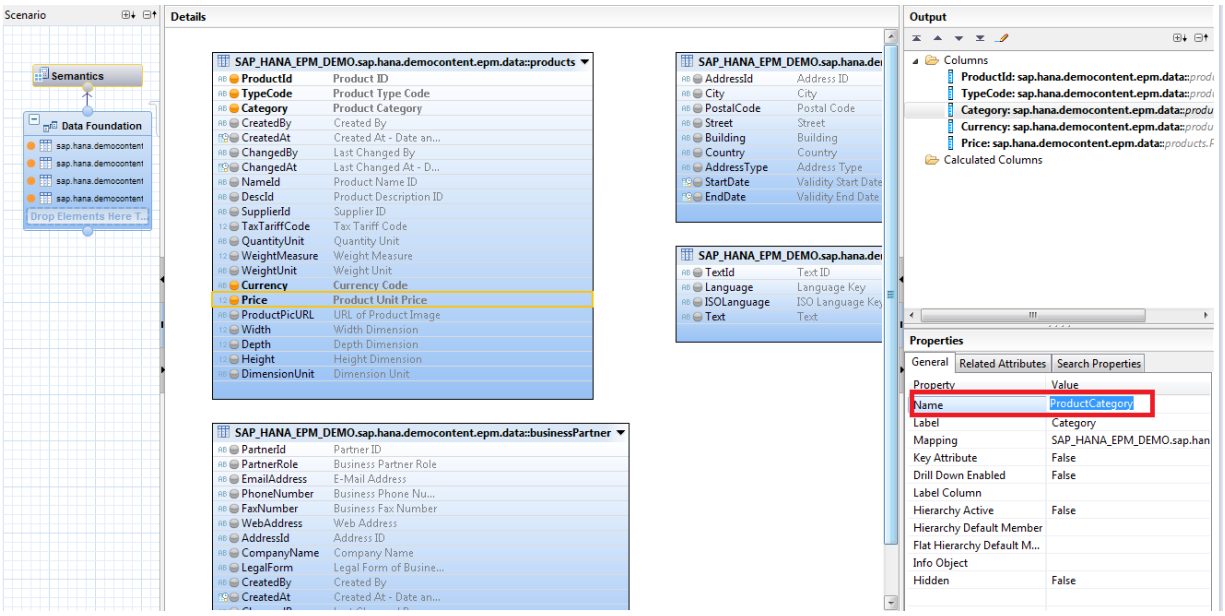
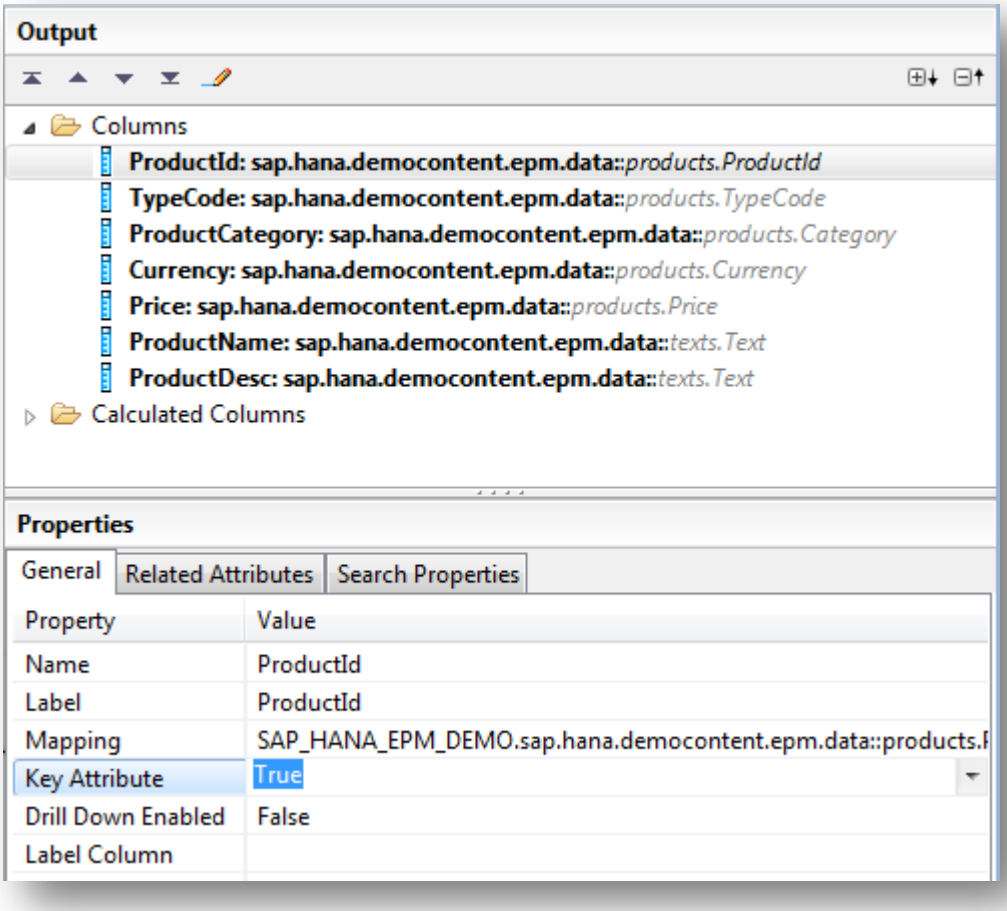
h. Optionally, you can change the name of a column as it becomes part of the view. For example you might change **Category** to **ProductCategory**.



i. We need to define a central type. We can do this by selecting the **ProductId** column in the Output and setting Key Attribute to True.



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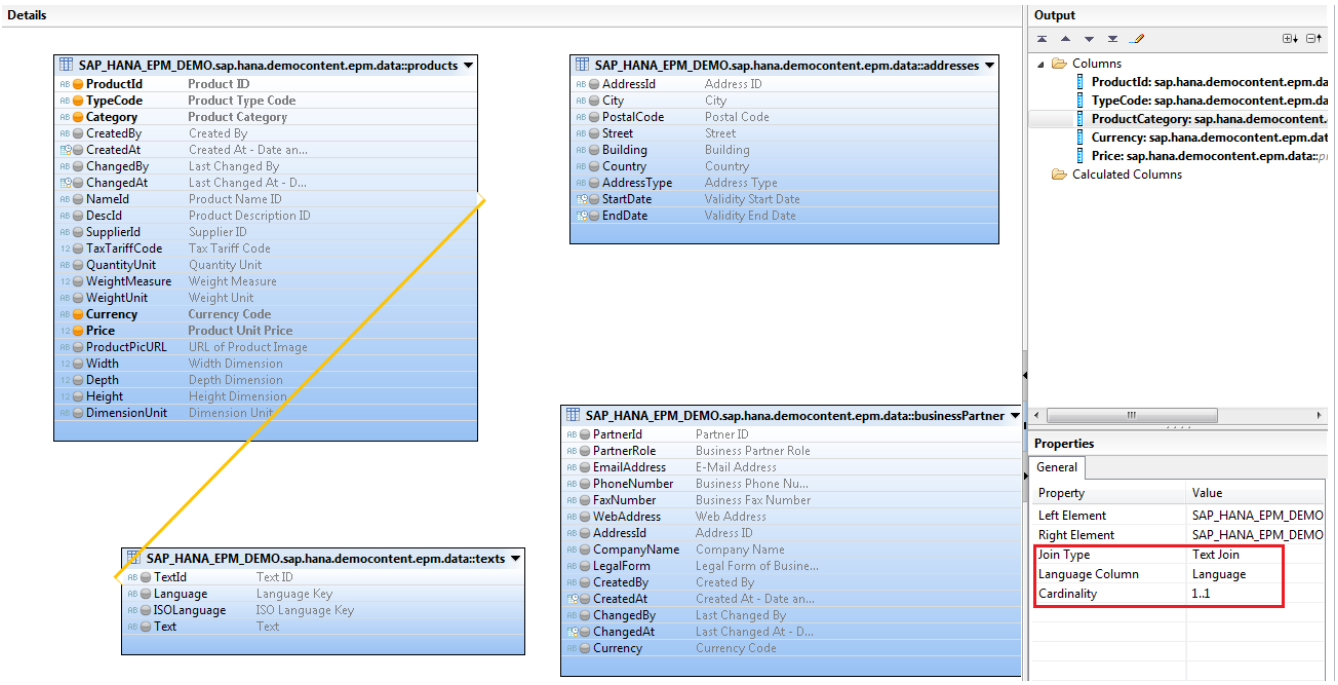
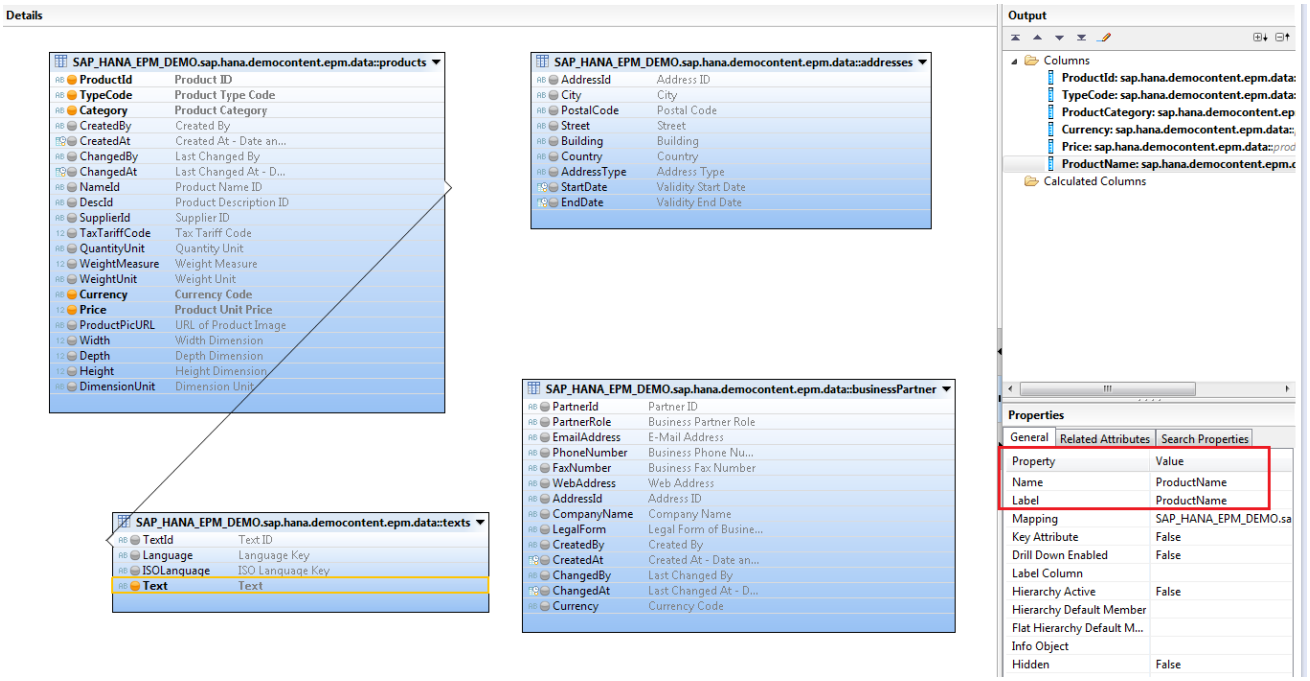
j. Drag and drop the **NameId** column from the **products** table to the **TextId** column of the **texts** table. Change the Join Type to **Text Join** and select **Language** as the Language Column.



k. Add **Text** from texts table to the output and change the column name to **ProductName**.



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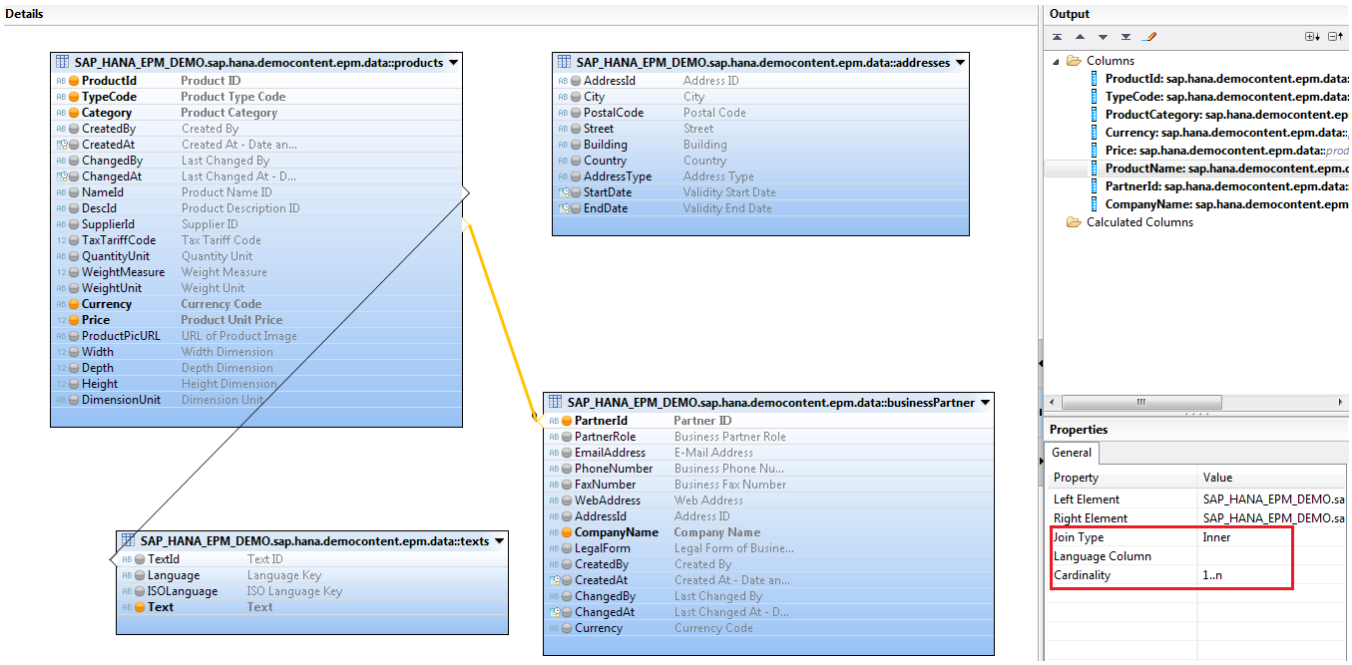
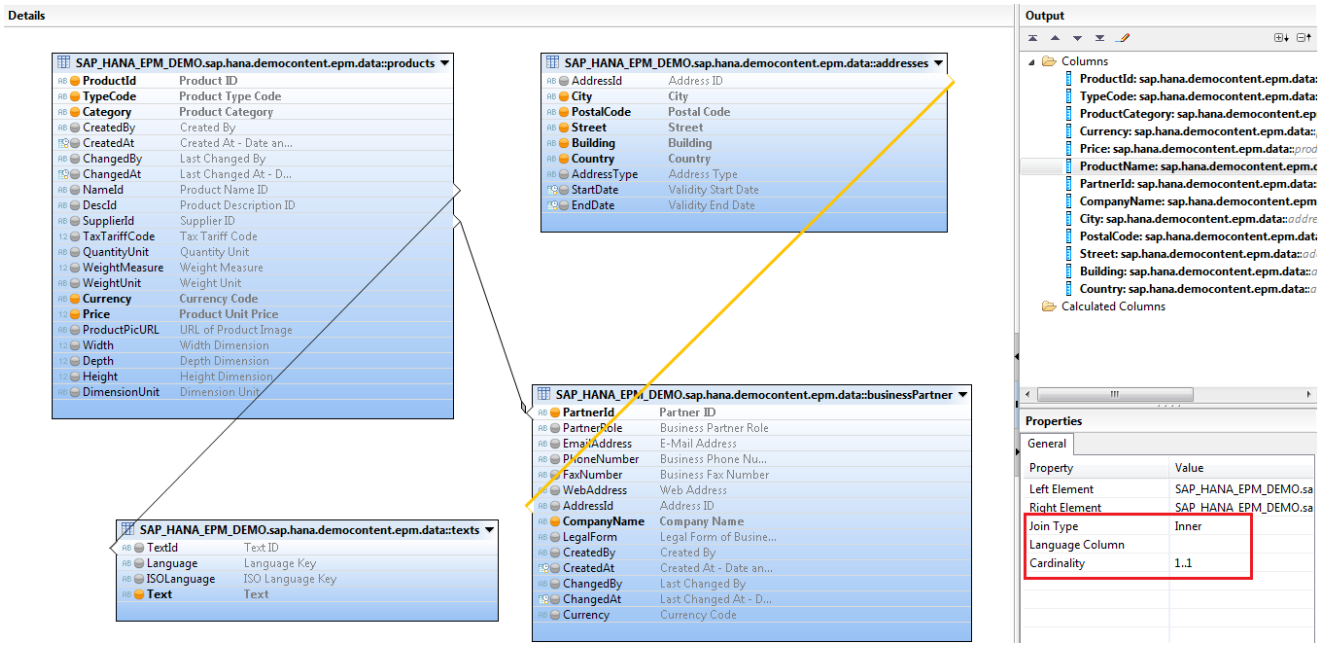
l. Create an Inner, 1:n join between **SupplierId** of the **product table** and the **PartnerId** column of the **businessPartner**. Add **PartnerId** and **CompanyName** to the output from **businessPartner table**.



m. Add an Inner, 1:1 join between the **AddressId** of the **businessPartner table** to the **AddressId** of the **addresses table**. Add the **City**, **PostalCode**, **Street**, **Building**, and **Country** columns of **addresses** to the output.



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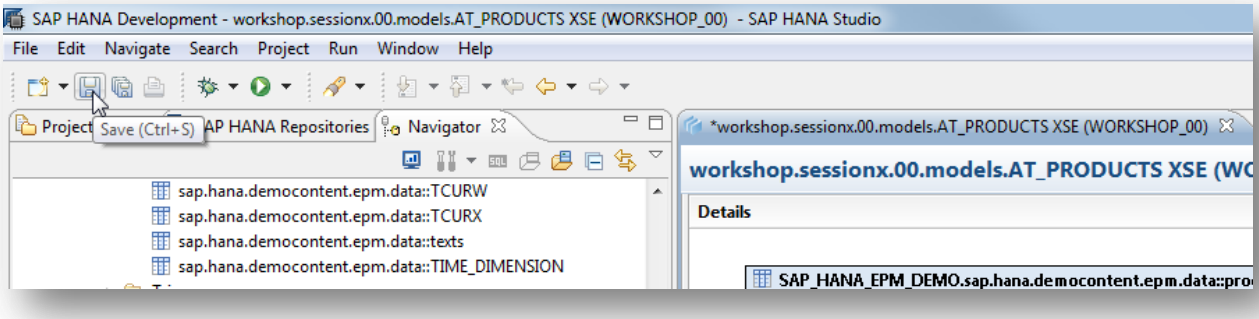
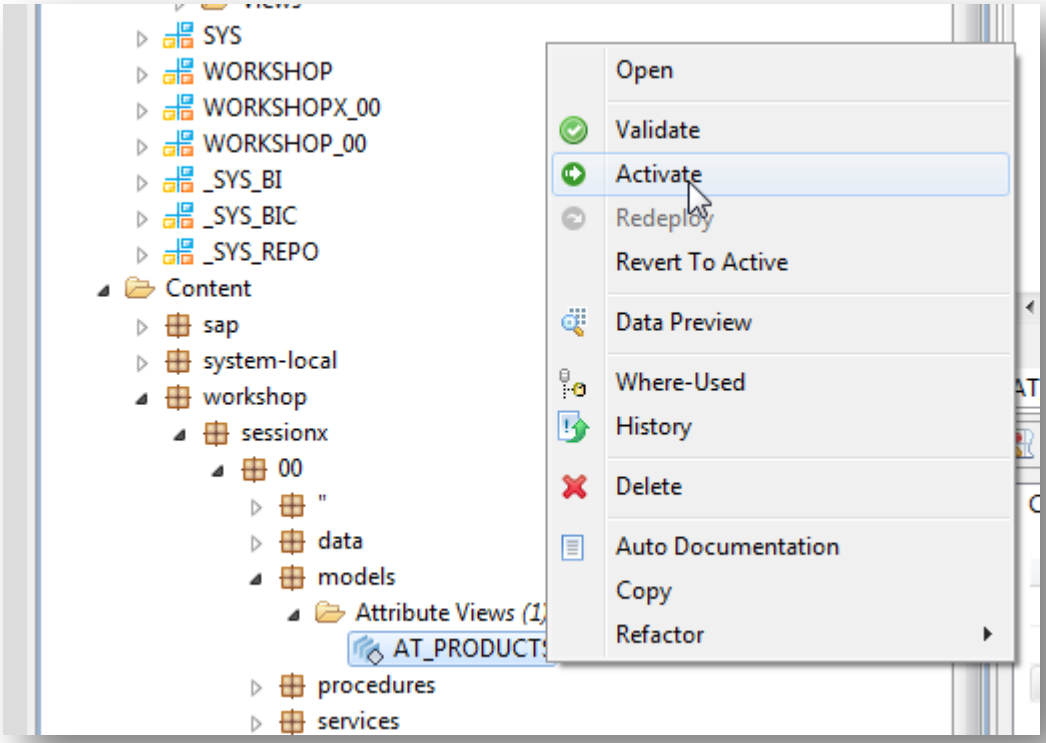
n. Save your model



o. Activate your model



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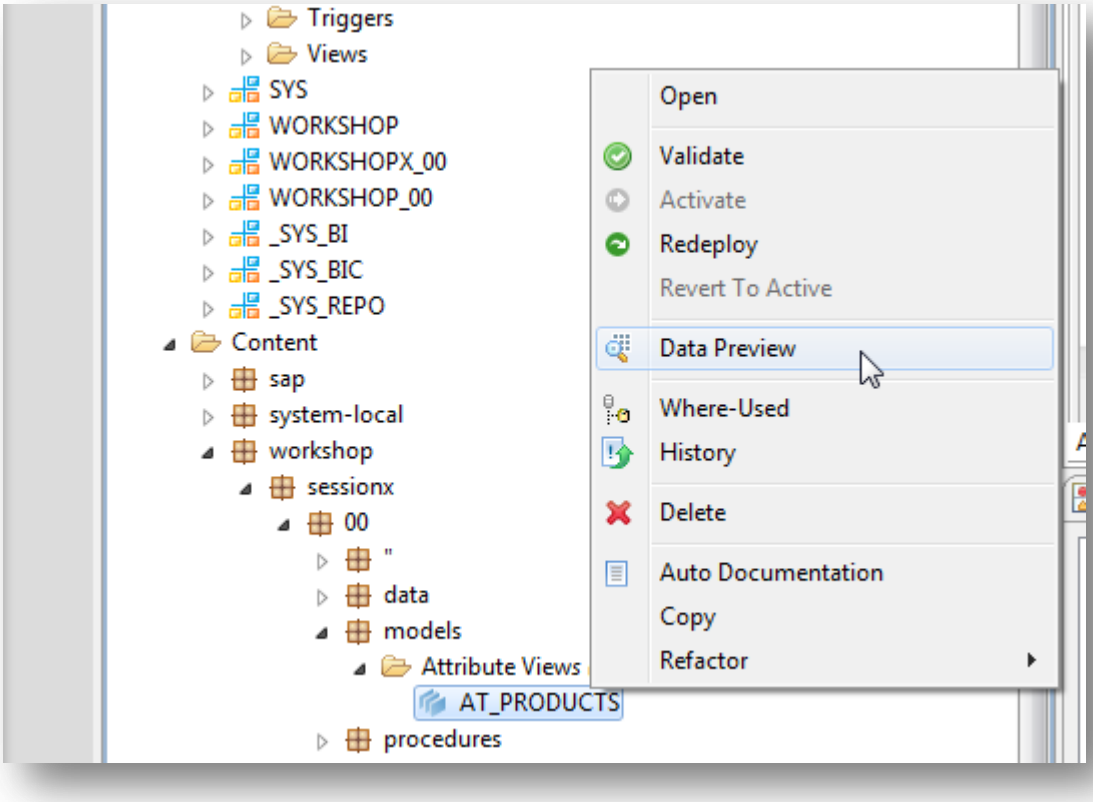
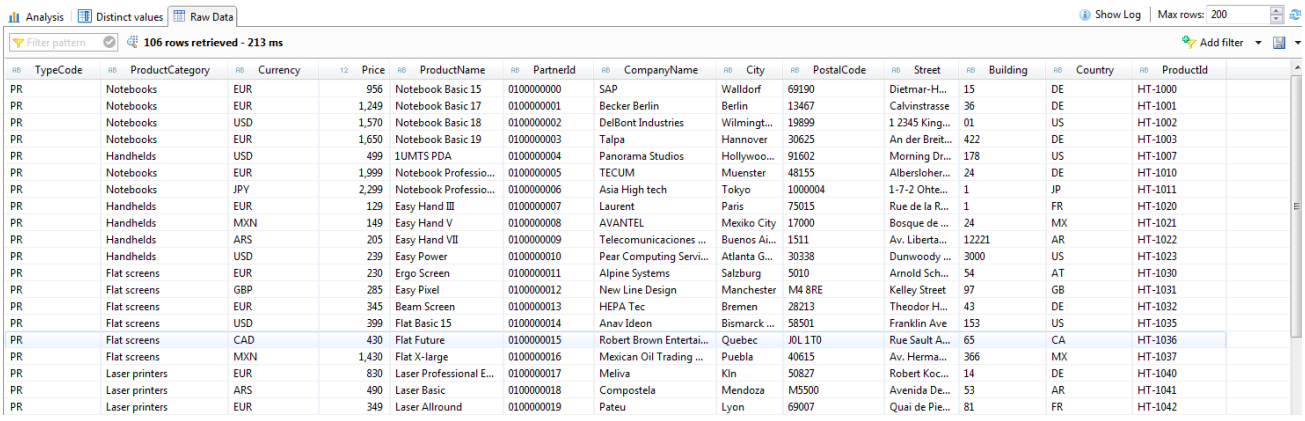
p. To test your Attribute View, choose **Data Preview** from the context menu.



q. In the data preview, there are many tools for performing analysis on the view data. For an initial test choose Raw Data and make sure your outlook looks similar to the following:



Analysis | Distinct values | Raw Data — Show Log | Max rows: 200

106 rows retrieved - 213 ms — Add filter

TypeCode	ProductCategory	Currency	Price	ProductName	PartnerId	CompanyName	City	PostalCode	Street	Building	Country	ProductId
PR	Notebooks	EUR	956	Notebook Basic 15	0100000000	SAP	Walldorf	69190	Dietmar-H...	15	DE	HT-1000
PR	Notebooks	EUR	1,249	Notebook Basic 17	0100000001	Becker Berlin	Berlin	13467	Calvinstrasse	36	DE	HT-1001
PR	Notebooks	USD	1,570	Notebook Basic 18	0100000002	DelBont Industries	Wilmingt...	19899	1 2345 King...	01	US	HT-1002
PR	Notebooks	EUR	1,650	Notebook Basic 19	0100000003	Talpa	Hannover	30625	An der Breit...	422	DE	HT-1003
PR	Handhelds	USD	499	1UMTS PDA	0100000004	Panorama Studios	Hollywoo...	91602	Morning Dr...	178	US	HT-1007
PR	Notebooks	EUR	1,999	Notebook Professio...	0100000005	TECUM	Muenster	48155	Albersloher...	24	DE	HT-1010
PR	Notebooks	JPY	2,299	Notebook Professio...	0100000006	Asia High tech	Tokyo	1000004	1-7-2 Ohte...	1	JP	HT-1011
PR	Handhelds	EUR	129	Easy Hand III	0100000007	Laurent	Paris	75015	Rue de la R...	1	FR	HT-1020
PR	Handhelds	MXN	149	Easy Hand V	0100000008	AVANTEL	Mexiko City	17000	Bosque de ...	24	MX	HT-1021
PR	Handhelds	ARS	205	Easy Hand VII	0100000009	Telecomunicaciones ...	Buenos Ai...	1511	Av. Liberta...	12221	AR	HT-1022
PR	Handhelds	USD	239	Easy Power	0100000010	Pear Computing Servi...	Atlanta G...	30338	Dunwoody ...	3000	US	HT-1023
PR	Flat screens	EUR	230	Ergo Screen	0100000011	Alpine Systems	Salzburg	5010	Arnold Sch...	54	AT	HT-1030
PR	Flat screens	GBP	285	Easy Pixel	0100000012	New Line Design	Manchester	M4 8RE	Kelley Street	97	GB	HT-1031
PR	Flat screens	EUR	345	Beam Screen	0100000013	HEPA Tec	Bremen	28213	Theodor H...	43	DE	HT-1032
PR	Flat screens	USD	399	Flat Basic 15	0100000014	Anav Ideon	Bismarck ...	58501	Franklin Ave	153	US	HT-1035
PR	Flat screens	CAD	430	Flat Future	0100000015	Robert Brown Entertai...	Quebec	J0L 1T0	Rue Sault A...	65	CA	HT-1036
PR	Flat screens	MXN	1,430	Flat X-large	0100000016	Mexican Oil Trading ...	Puebla	40615	Av. Herma...	366	MX	HT-1037
PR	Laser printers	EUR	830	Laser Professional E...	0100000017	Meliva	Kln	50827	Robert Koc...	14	DE	HT-1040
PR	Laser printers	ARS	490	Laser Basic	0100000018	Compostela	Mendoza	M5500	Avenida De...	53	AR	HT-1041
PR	Laser printers	EUR	349	Laser Allround	0100000019	Pateu	Lyon	69007	Quai de Pie...	81	FR	HT-1042

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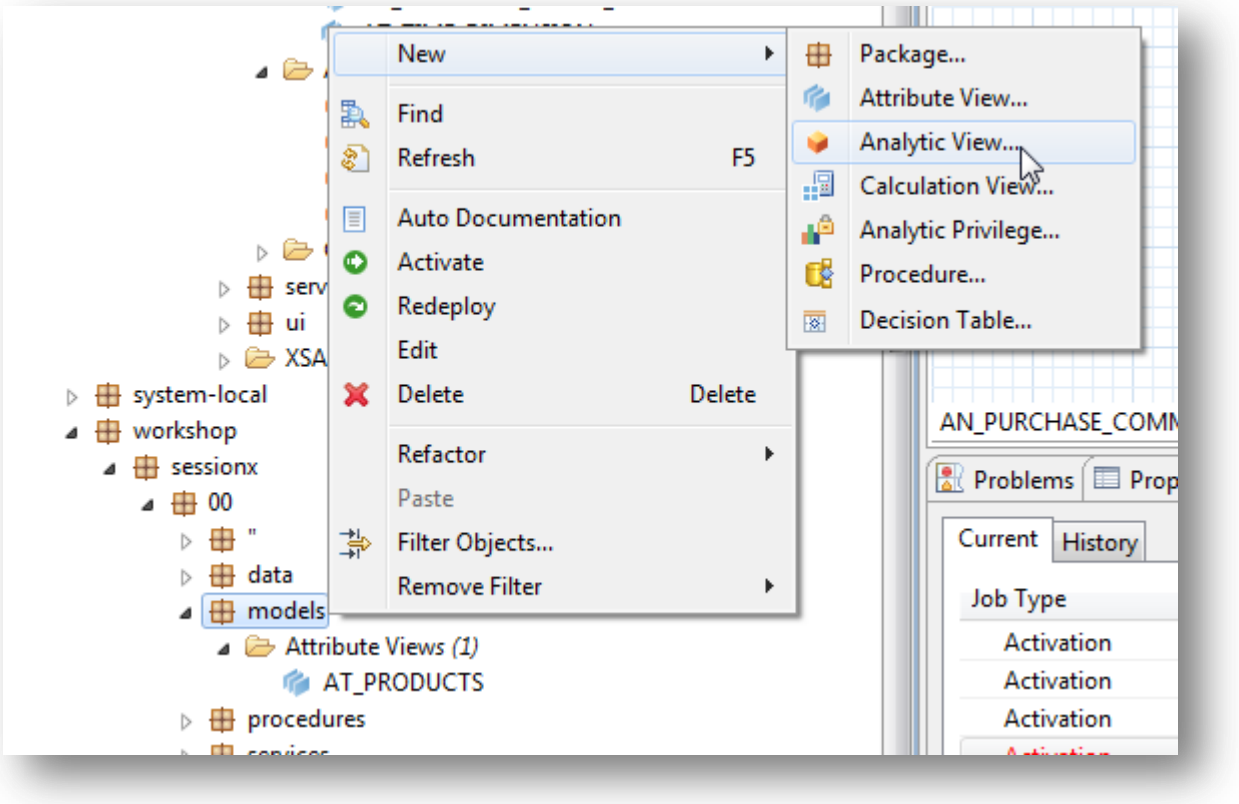
2. Analytic View

a. Now we will create an Analytic View which combines purchase order table data with the product attribute view we created in the previous step.

b. In your models package, create a new Analytic View



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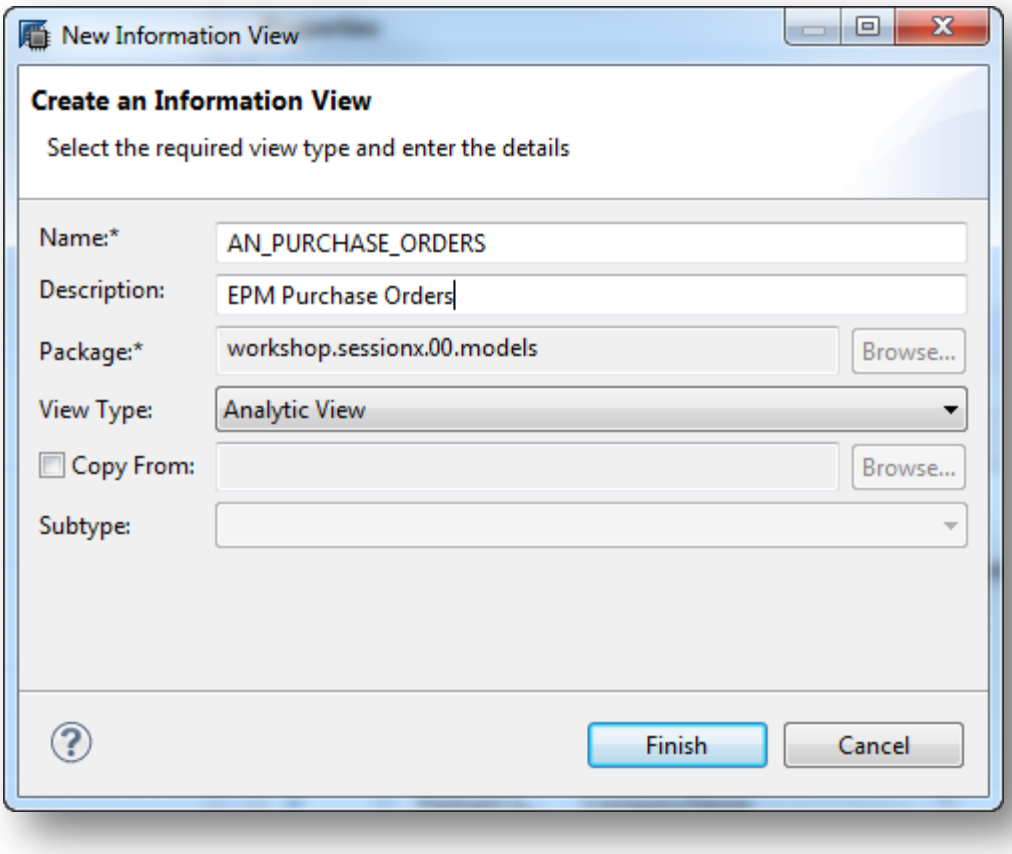
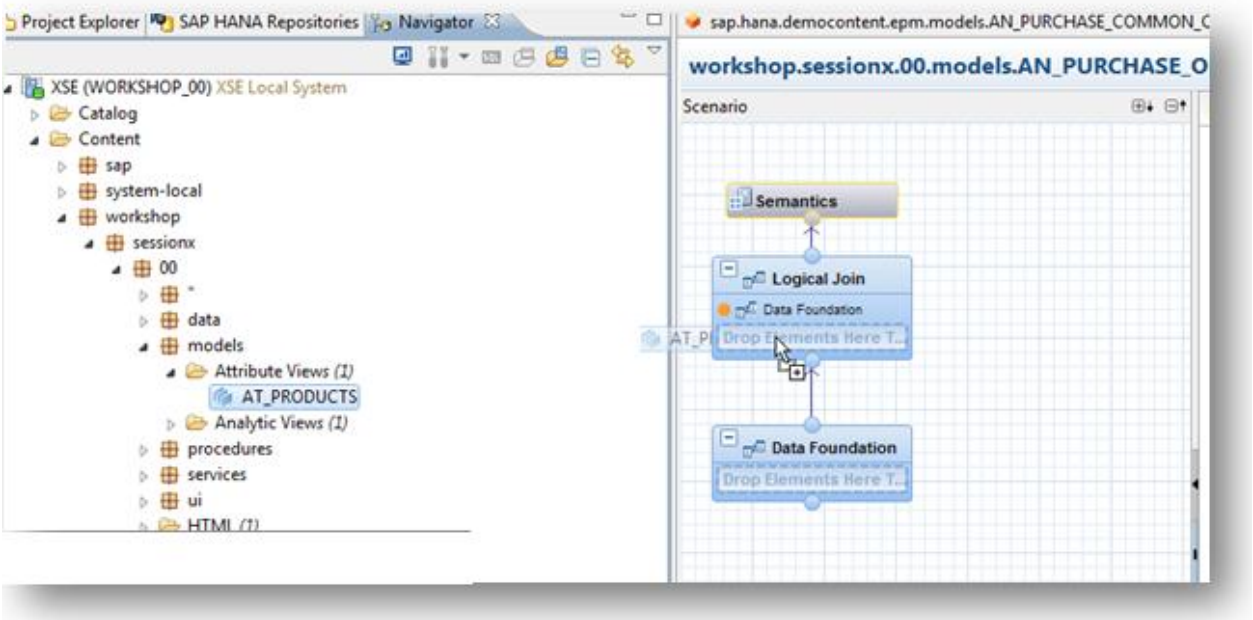
c. Name your new view **AN_PURCHASE_ORDERS**



d. Drag and drop the **AT_PRODUCTS** attribute view from the previous part of the exercise into the **logical Join** of your new view.



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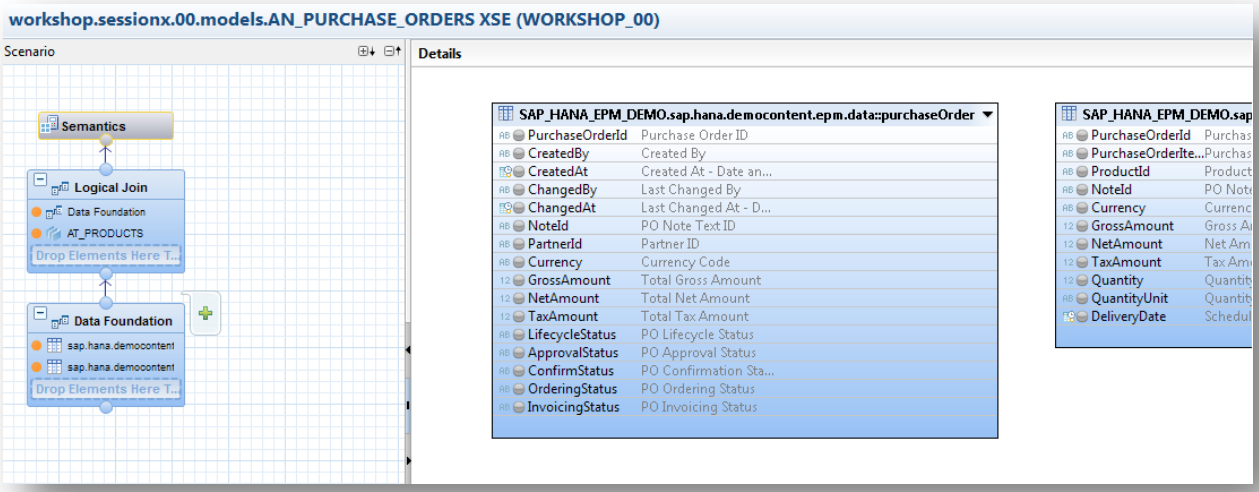
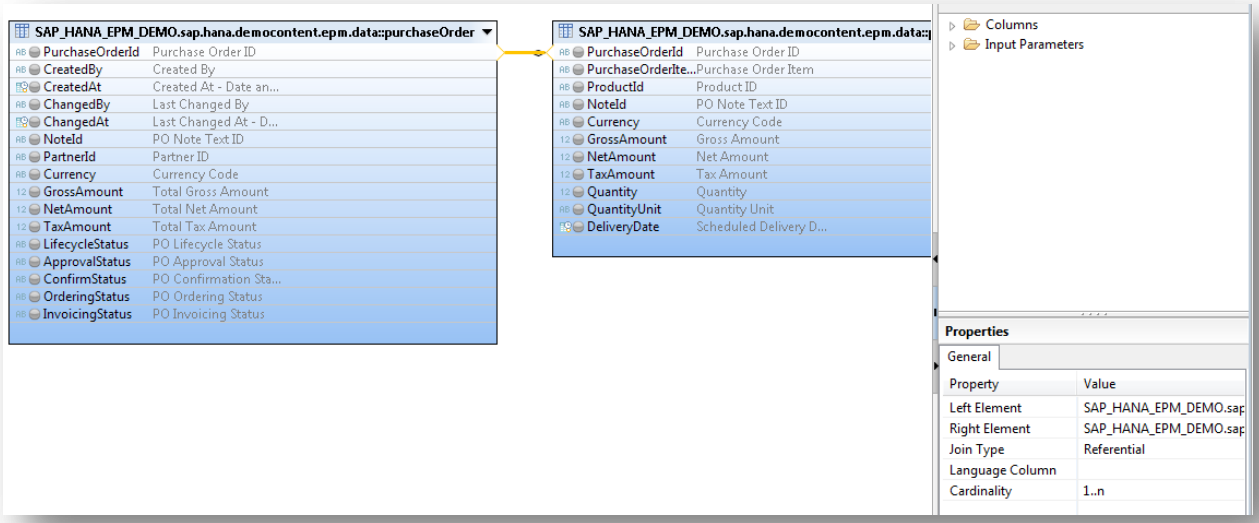
e. Add the **purchaseOrder** and **purchaseOrderItem** tables to the Data Foundation of your view.



f. Create a **1:n referential** join between **purchaseOrder** and purchaseOrderItem on the **PurchaseOrderId** column.



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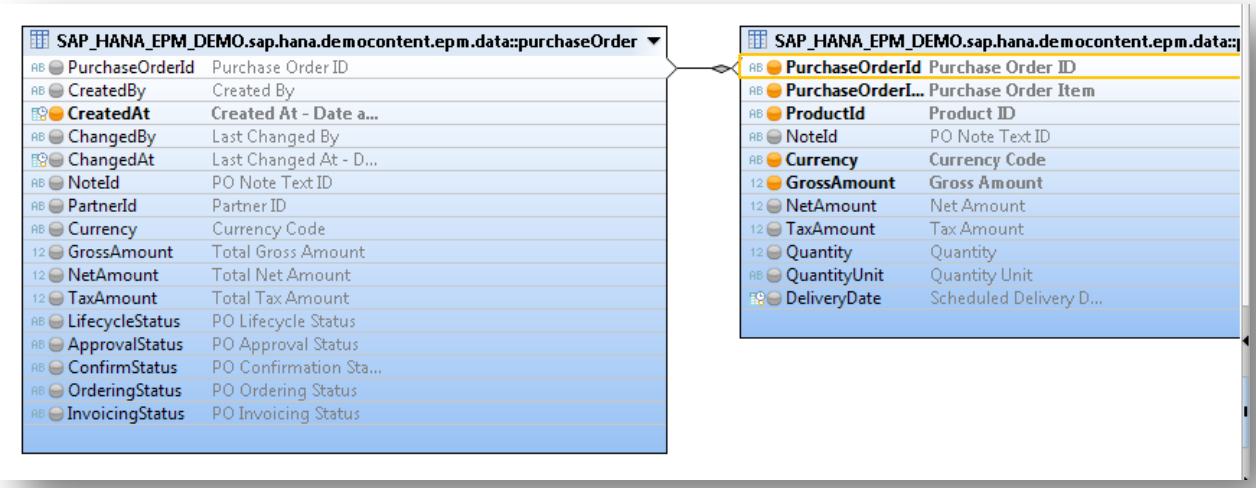
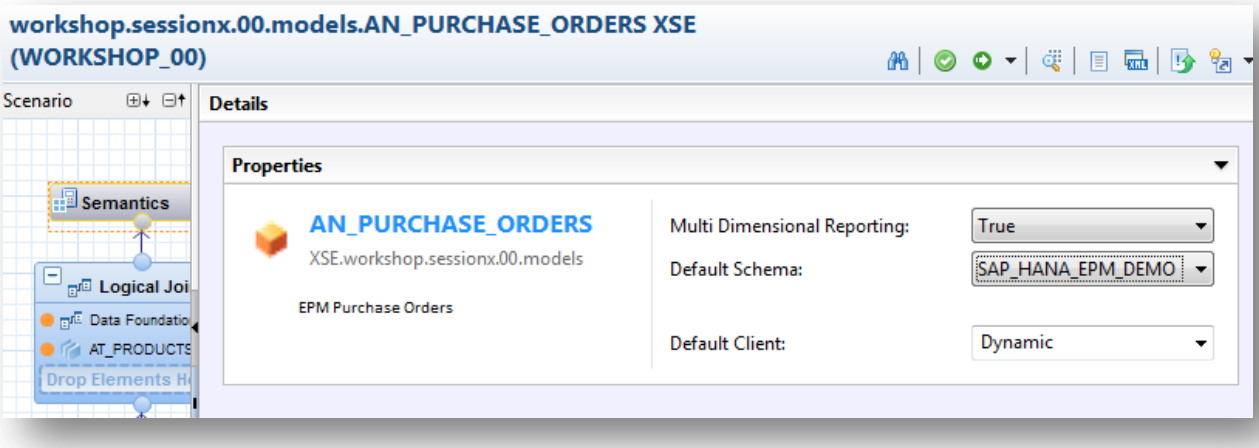
g. Using Add to Output, add the column **CreatedAt** from the purchaseOrder table and the **PurchaseOrderId**, **PurchaseOrderItem**, **ProductId**, **Currency**, and **GrossAmount** columns from the purchaseOrderItemItem.



h. From the **Semantics Scenario**, Set the Default Schema to **SAP_HANA_EPM_DEMO**:



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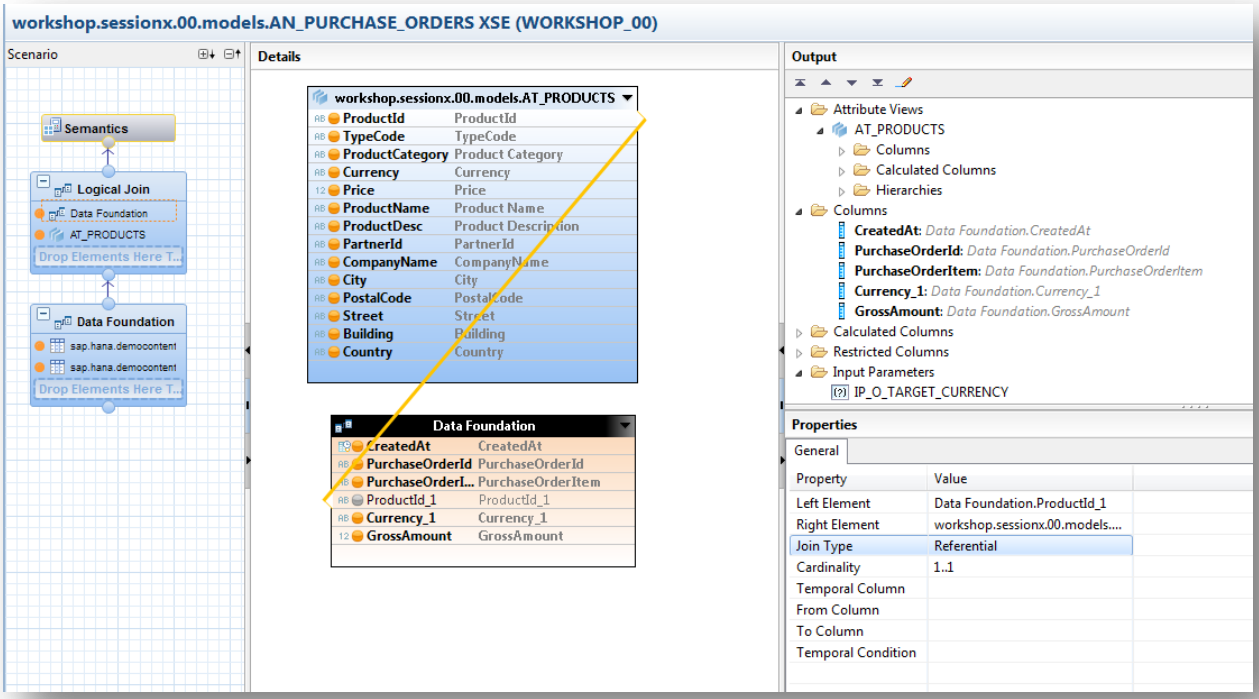
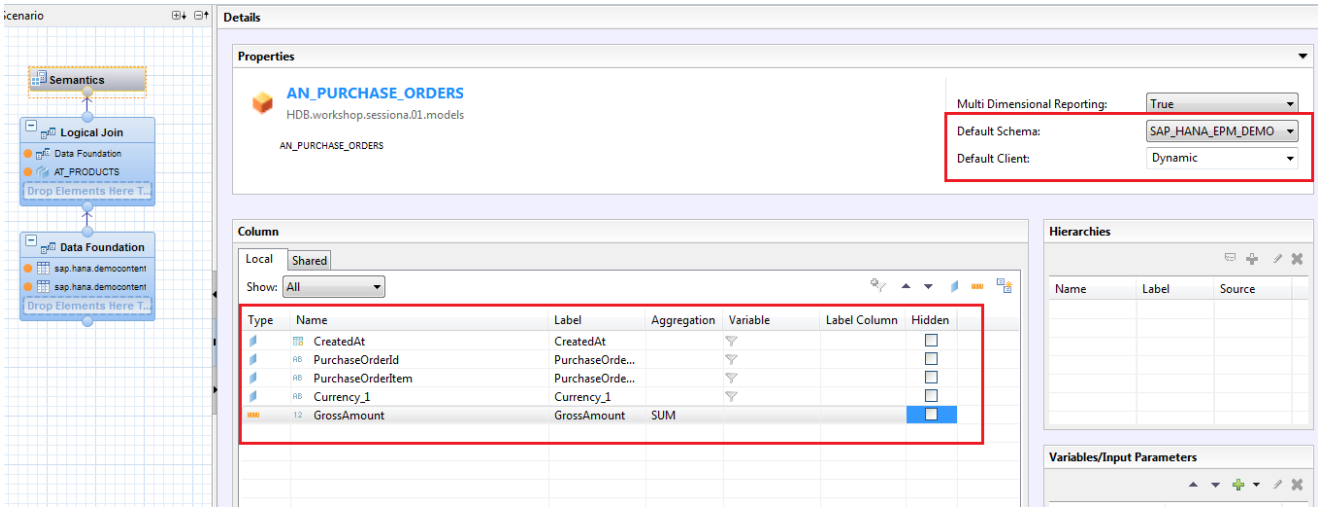
i. Select the Logical Join box in the Scenario. You can then drag and drop the **PurductId_1** from the data foundation to the **ProductId** column of the AT_PRODUCTS view creating a 1:1 referential join.



j. Return to the Semantics Scenario, set the **GrossAmount** as measures and the other fields as attributes.



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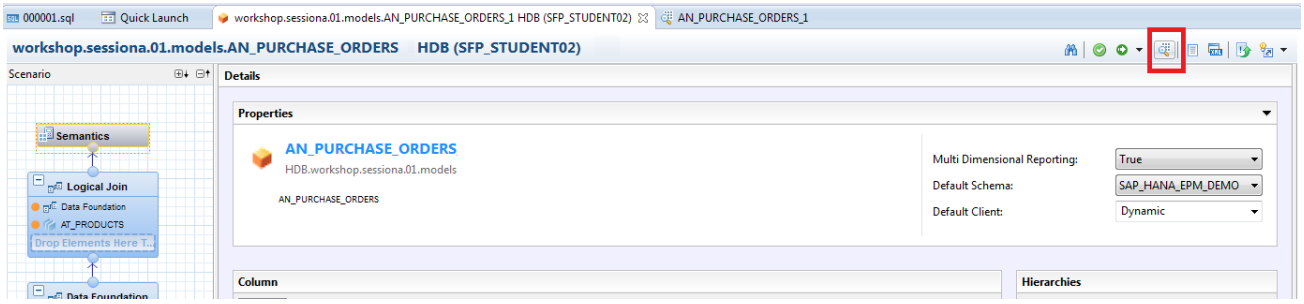
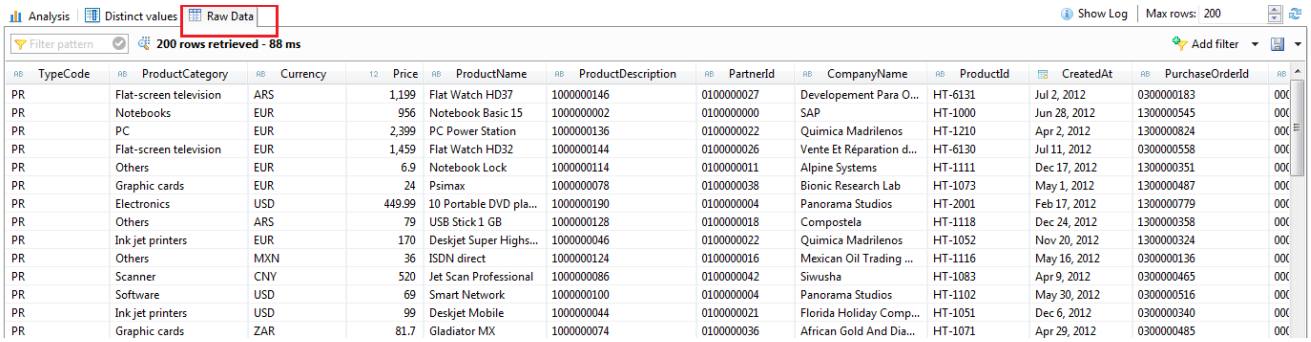
k. Save and activate your Analytic View and then do data preview. (You can either right click on view name and select data preview or simply click on data preview icon)



l. You should see output similar to this.



TypeCode	ProductCategory	Currency	Price	ProductName	ProductDescription	PartnerId	CompanyName	ProductId	CreatedAt	PurchaseOrderId
PR	Flat-screen television	ARS	1,199	Flat Watch HD37	1000000146	0100000027	Developement Para O...	HT-6131	Jul 2, 2012	0300000183
PR	Notebooks	EUR	956	Notebook Basic 15	1000000002	0100000000	SAP	HT-1000	Jun 28, 2012	1300000545
PR	PC	EUR	2,399	PC Power Station	1000000136	0100000022	Quimica Madrilenos	HT-1210	Apr 2, 2012	1300000824
PR	Flat-screen television	EUR	1,459	Flat Watch HD32	1000000144	0100000026	Vente Et Réparation d...	HT-6130	Jul 11, 2012	0300000558
PR	Others	EUR	6.9	Notebook Lock	1000000114	0100000011	Alpine Systems	HT-1111	Dec 17, 2012	1300000351
PR	Graphic cards	EUR	24	Psimax	1000000078	0100000038	Bionic Research Lab	HT-1073	May 1, 2012	1300000487
PR	Electronics	USD	449.99	10 Portable DVD pla...	1000000190	0100000004	Panorama Studios	HT-2001	Feb 17, 2012	1300000779
PR	Others	ARS	79	USB Stick 1 GB	1000000128	0100000018	Compostela	HT-1118	Dec 24, 2012	1300000358
PR	Ink jet printers	EUR	170	Deskjet Super Highs...	1000000046	0100000022	Quimica Madrilenos	HT-1052	Nov 20, 2012	1300000324
PR	Others	MXN	36	ISDN direct	1000000124	0100000016	Mexican Oil Trading ...	HT-1116	May 16, 2012	0300000136
PR	Scanner	CNY	520	Jet Scan Professional	1000000086	0100000042	Siwusha	HT-1083	Apr 9, 2012	0300000465
PR	Software	USD	69	Smart Network	1000000100	0100000004	Panorama Studios	HT-1102	May 30, 2012	0300000516
PR	Ink jet printers	USD	99	Deskjet Mobile	1000000044	0100000021	Florida Holiday Comp...	HT-1051	Dec 6, 2012	0300000340
PR	Graphic cards	ZAR	81.7	Gladiator MX	1000000074	0100000036	African Gold And Dia...	HT-1071	Apr 29, 2012	0300000485

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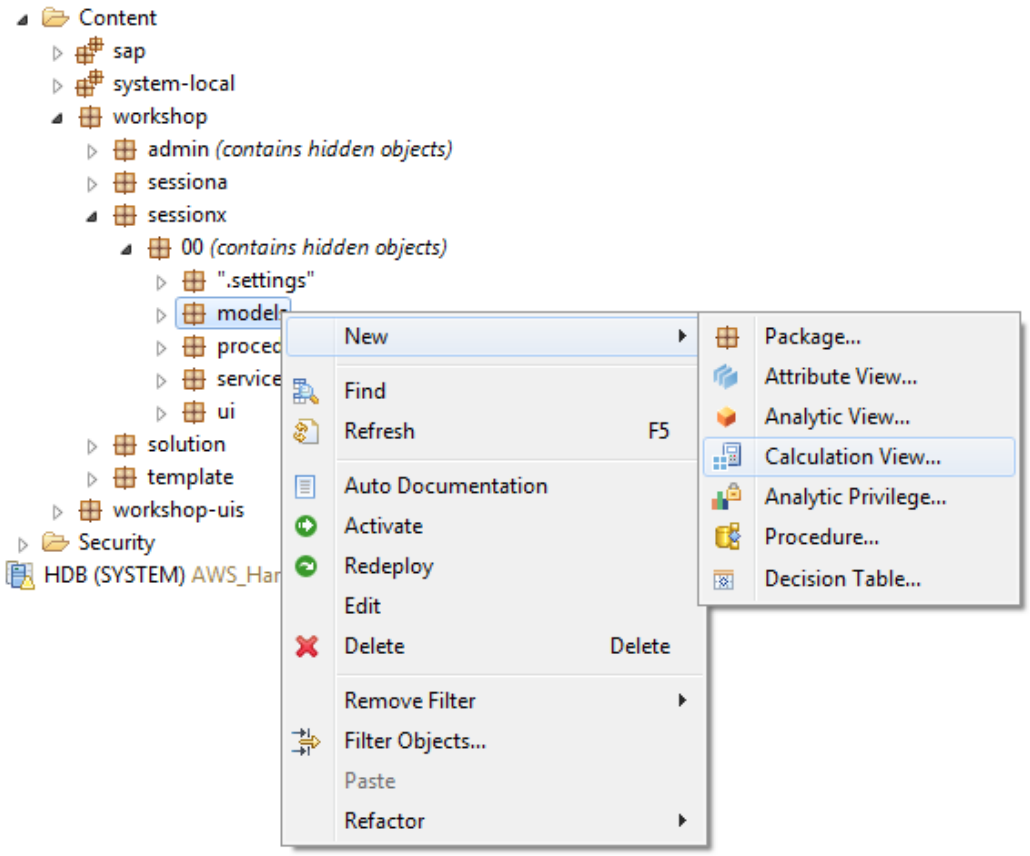
3. Calculation View

a. There are several ways to create views in the SAP HANA database. We just learned about analytic and attribute views and how to combine them into a star schema which forms an analytic view itself. These views are completely processed by the column store. For more complex views we need to leverage the power of the built-in functions. These views are called calculation views. In this example we will create the example GC_TAX_RATE as a graphical calculation view.

b. Right-click on your new package and create a new Calculation View. Note that this will also create a new folder in which to store the view.



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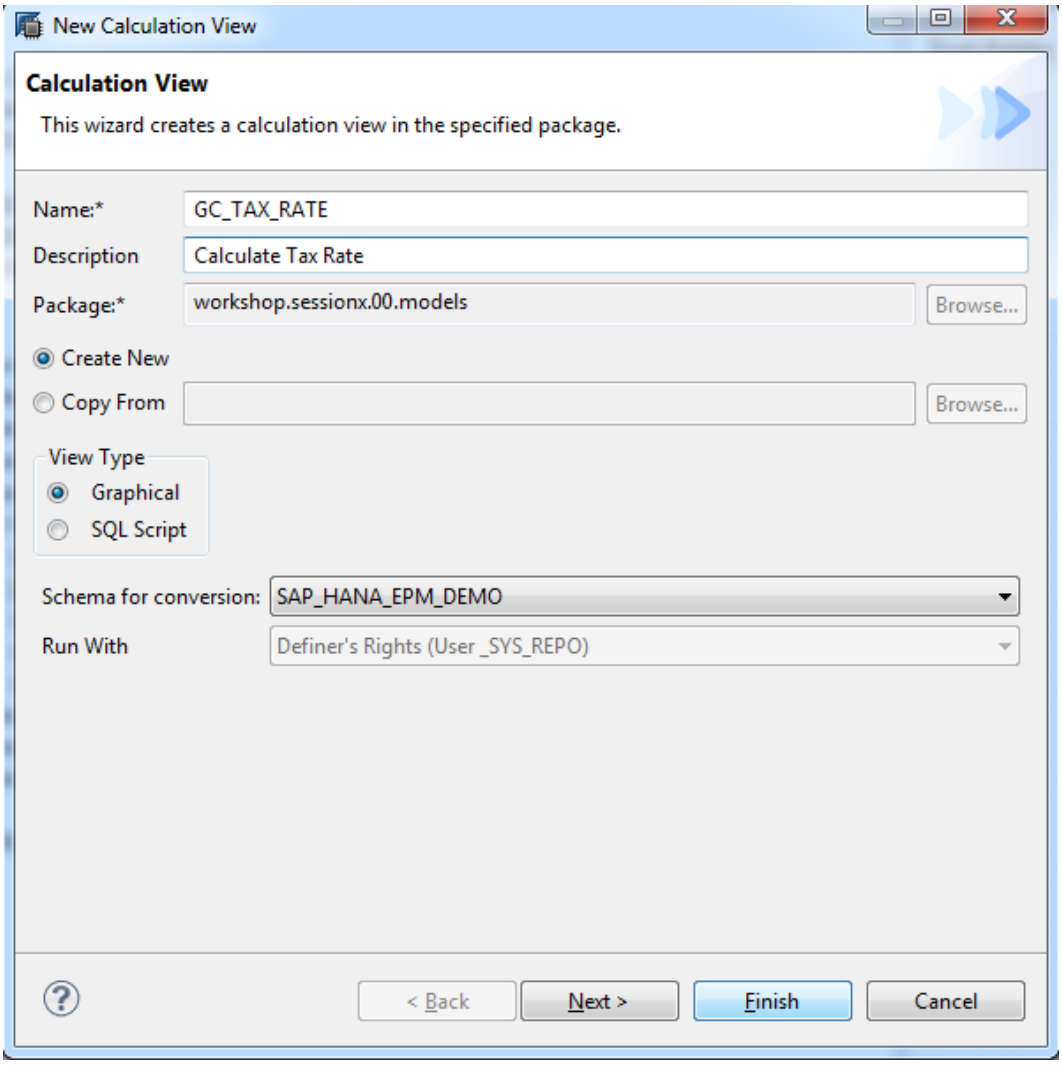
c. Give your new graphical calculation view a name **GC_TAX_RATE** and click finish.



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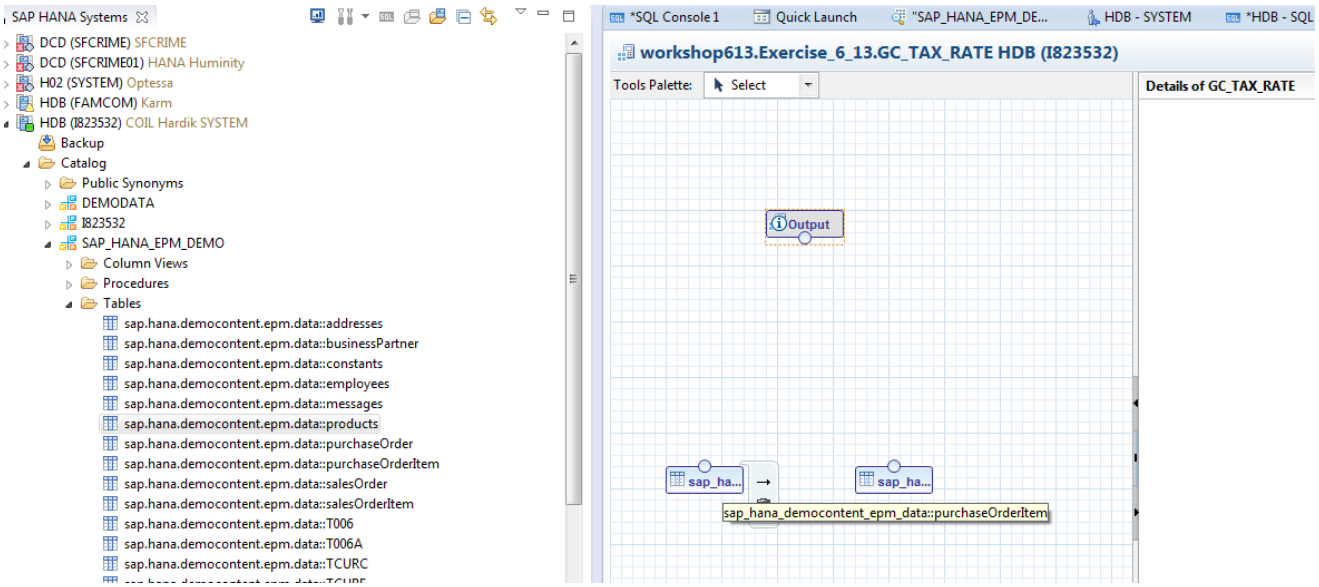
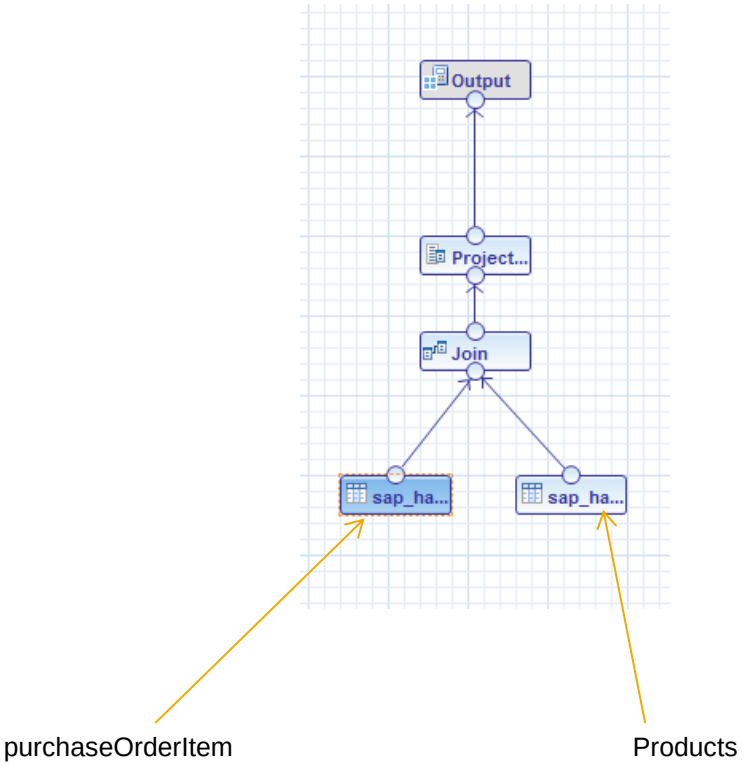
d. Now, drag and drop two tables from SAP_HAHA_EPM_DEMO schema in to the view. 1) **purchaseOrderItem** 2) **Products**. The modeler canvas will appear and it is split into several areas. The left one is used to connect tables with the output node by means of various operations which can be picked from the Tools Palette on top of that area.



e. Add the **Projection** and **Join** operation from the Tools Palette. Connect **purchaseOrderItem** and **products** with **Join**, Join with **Projection** and Projection with **Output**.



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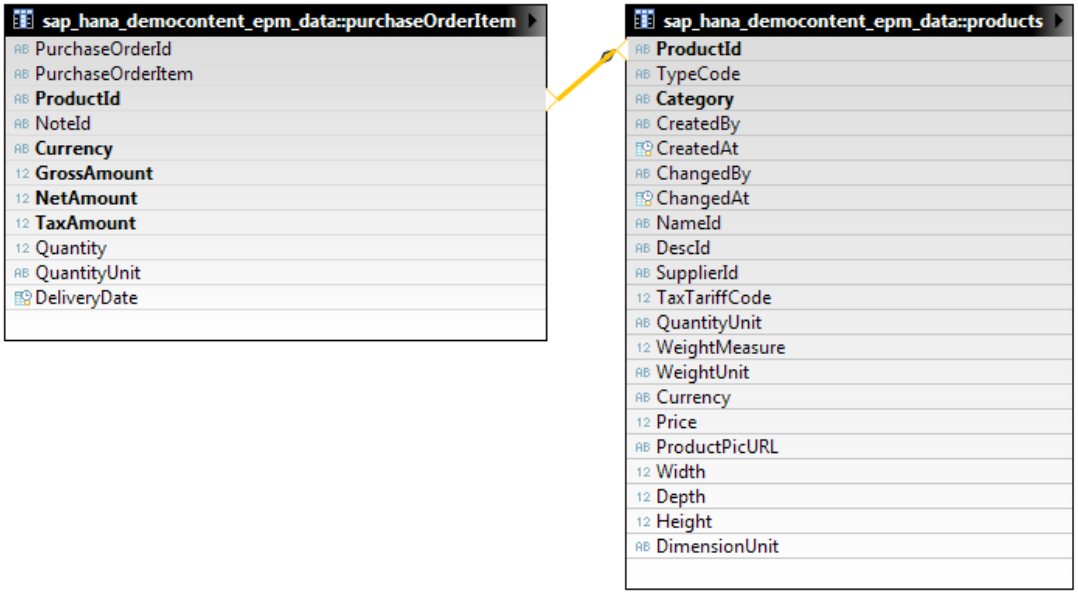
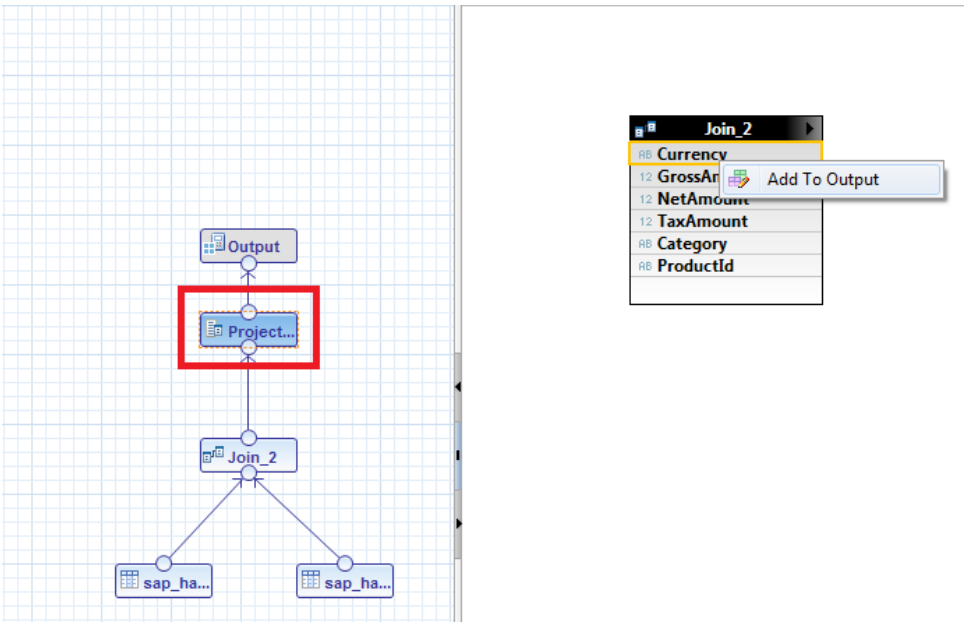
f. Now, select Join and make 1..n inner Join for ProductId from purchaseOrderItem table to products table. Also, add **Currency**, **GrossAmount**, **NetAmount**, **TaxAmount** to ouput from purchaseOrderItem table and **Category** from products table.



g. Now, select Projection and add **Currency**, **GrossAmount**, **NetAmount**, **TaxAmount**, **Category** and **ProductId** as output from the details of Projection.



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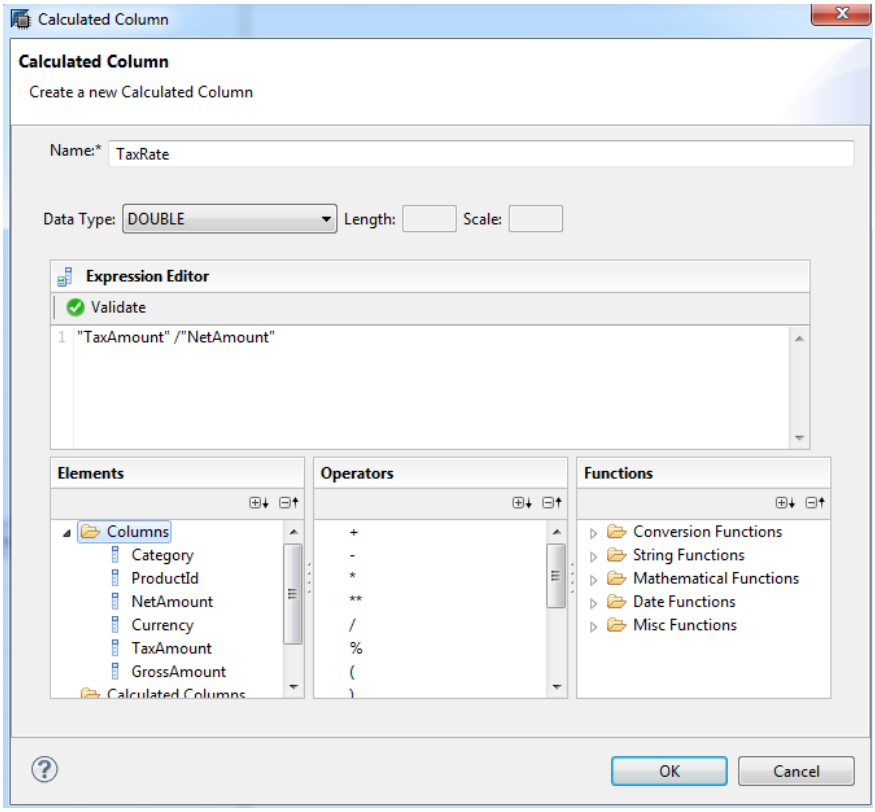
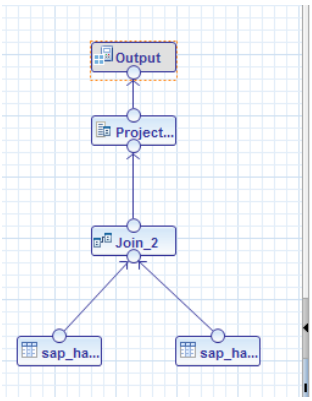
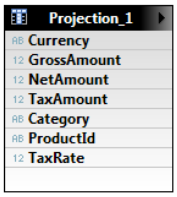
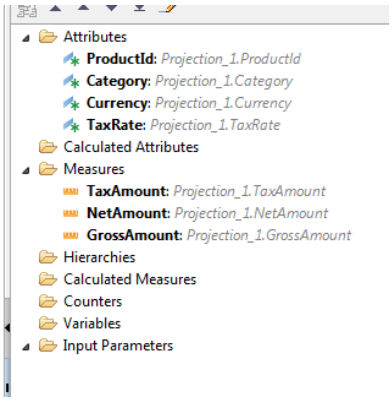
h. Now, right click on Calculated Columns from **output of Projection** and select new. Name it as TaxRate. We will count the tax rate for the product price. Type **"TaxAmount" /"NetAmount"** in Expression Editor. You can also select this columns from Elements. At the end, Validate your expression and select “Add“.



i. Now, Select output and add **Currency**, **Category**. **ProductId** and **TaxRate** as attributes and **TaxAmount**, **NetAmount** and **GrossAmount** as Measures.







j. Now, we will create Input Parameters for this view to to take an input for category. Right click on Input Parameters and select new. Name it IP_CATEGORY. Make sure that you have selected output.

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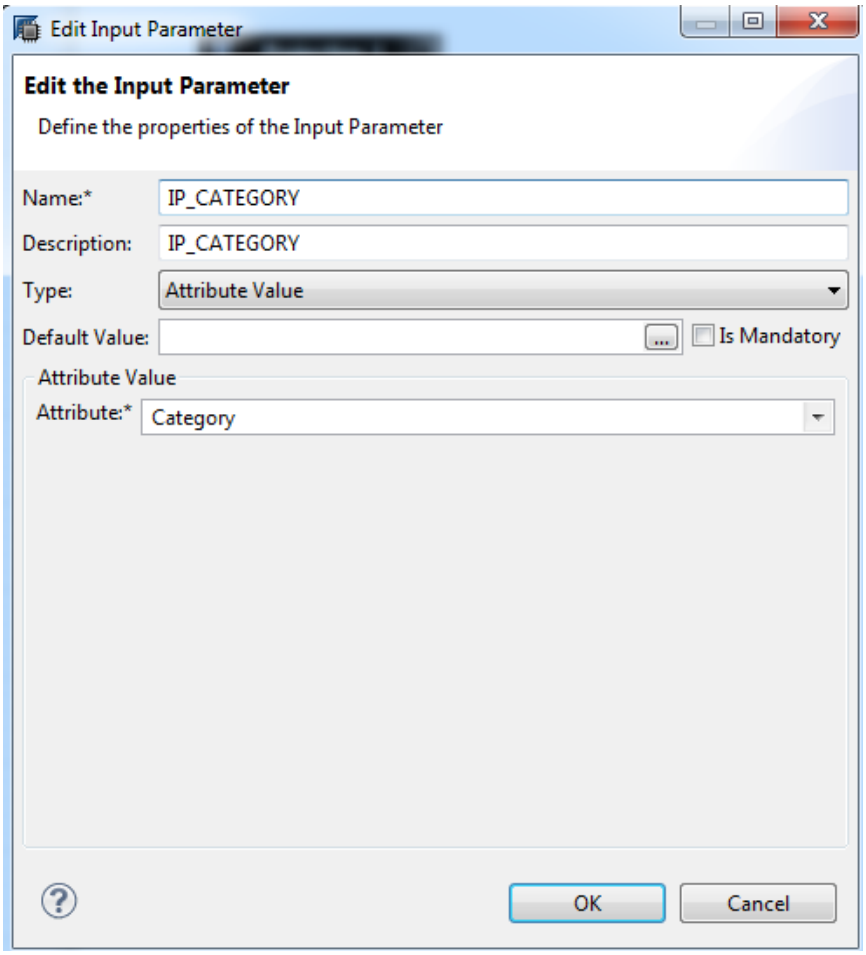

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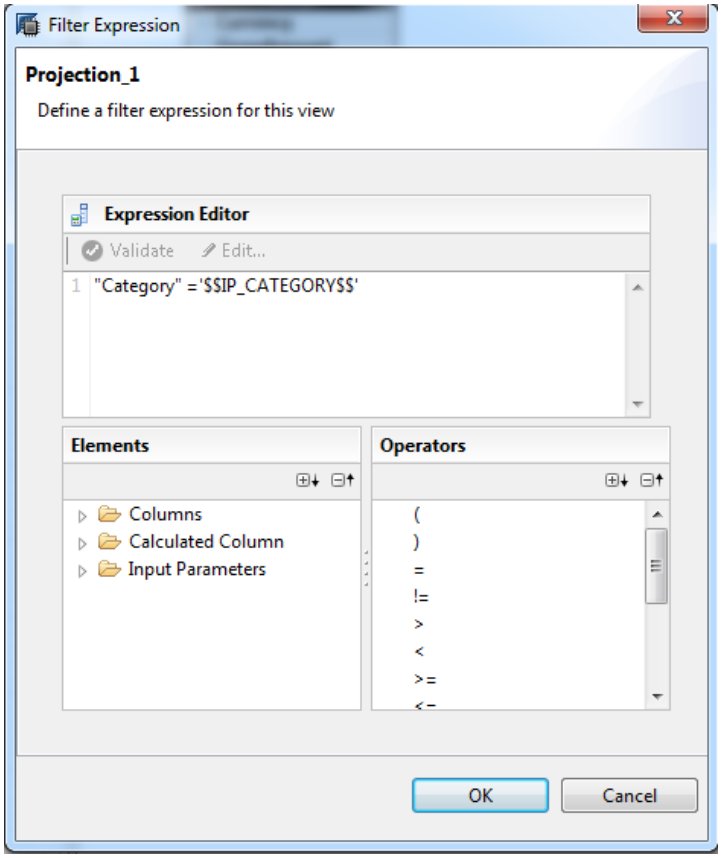
k. Now, go back to Projection and double click on Expression. The fliter expression window will open. In expression editor type "Category" = '$$IP_CATEGORY$$' and select ok. You can select columns from Elements if you want.



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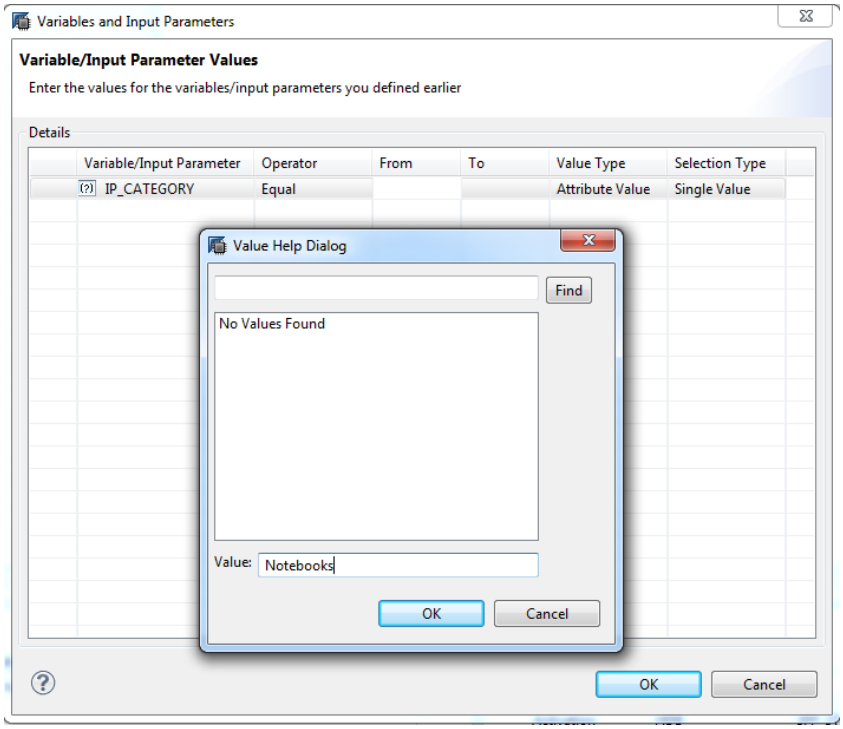
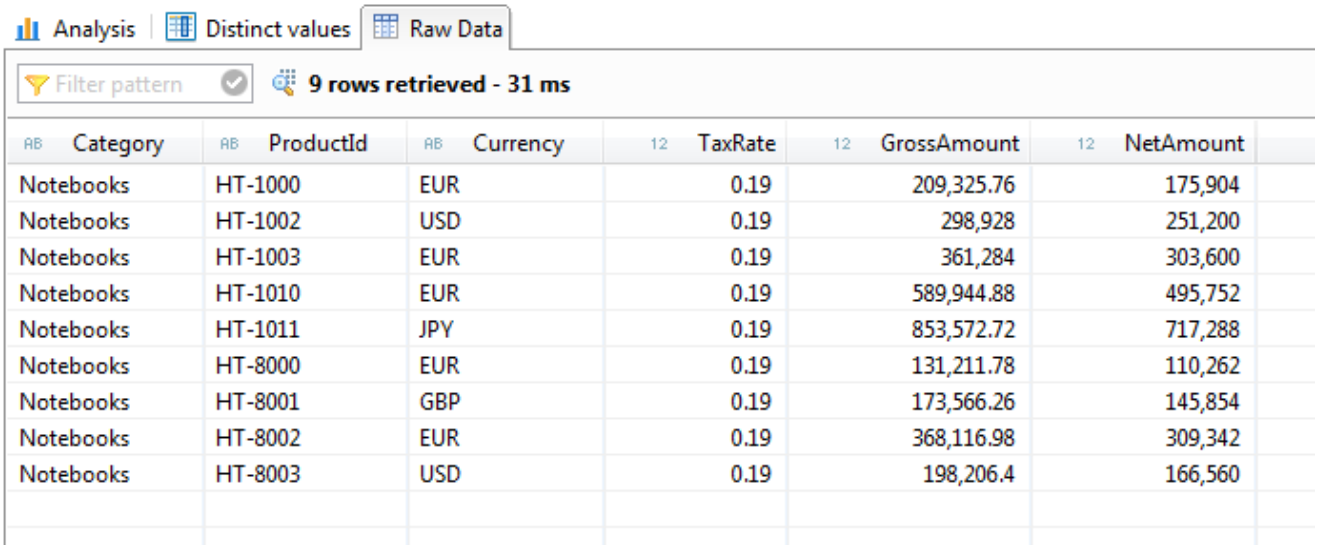
l. Save and activate the view and then do data preview. In the input paremeters window, you can enter either Software, Graphic cards, others, High Tech or notebooks and select ok.



j. You should be able see the data like below.



Category	ProductId	Currency	TaxRate	GrossAmount	NetAmount
Notebooks	HT-1000	EUR	0.19	209,325.76	175,904
Notebooks	HT-1002	USD	0.19	298,928	251,200
Notebooks	HT-1003	EUR	0.19	361,284	303,600
Notebooks	HT-1010	EUR	0.19	589,944.88	495,752
Notebooks	HT-1011	JPY	0.19	853,572.72	717,288
Notebooks	HT-8000	EUR	0.19	131,211.78	110,262
Notebooks	HT-8001	GBP	0.19	173,566.26	145,854
Notebooks	HT-8002	EUR	0.19	368,116.98	309,342
Notebooks	HT-8003	USD	0.19	198,206.4	166,560

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