

DYNAMIC TABLES AND GRAPHS

Summary

1 Objectives	2
1.1 Dimensions in ListBoxes	2
1.2 A very basic data model	3
1.3 Some new tables	4
1.3.1 The Dimensions	4
1.3.2 The Measures	4
1.4 To get the final data model	5
2 The Graphical User Interface	6
2.1 The choice of the dimensions	6
2.1.1 The ListBox itself	6
2.1.2 The Dynamic Table	7
2.2 The measures in ListBox	9
2.2.1 The measures	9
2.2.2 The ListBox itself	9
2.2.3 The dynamic Table	10
2.2.4 Format the measures	11
2.3 The measures displayed as Buttons	12
2.3.1 Step 1: set up the action	12
2.3.2 Step 2: setup the colors to indicate if the measure is selected or not	12
3 Other documents I have published	14

Foreword

This document intends to explain how to make dynamic tables or graphs. By choosing dimensions and measures in a selector (buttons or list box), the end user may interact with the table or graph.

Enjoy ...

The version of this document is 1.0. Personal Edition QlikView 11.20 SR2 has been used.

1 Objectives

1.1 Dimensions in ListBoxes

The user will choose:

- the dimensions to get displayed in the table. He will be also be able to select the values of that dimension
- the measures to get displayed in the table

The screenshot shows a BI tool interface with three selection panels on the left and a data table on the right.

- Measures:** Amount, Price, Total Amount, Total Units, Units. 'Amount' and 'Price' are highlighted in green.
- Customer:** Entreprise Tour Eiffel, Groupe Gillet & Frères, Stade de France.
- Product:** Product 1, Product 2, Product 3, Product 4, Product 5. 'Product 1' through 'Product 5' are highlighted in green.
- Choose one or several dimensions:** Customer, Date Delivery, Product. 'Customer' and 'Product' are highlighted in green.
- With calculated dimension:** A table with columns: CustomerDesc, ProductDesc, Amount, Price. The table contains data for three customers: Groupe Gillet & Frères, Entreprise Tour Eiffel, and Stade de France, each with multiple product entries.

CustomerDesc	ProductDesc	Amount	Price
Groupe Gillet & Frères	Product 1	102 307.35	27.57
	Product 2	40.00	3.33
	Product 3	213.05	10.15
	Product 4	223.10	10.14
	Product 5	83.00	4.61
Entreprise Tour Eiffel	Product 2	25 650.51	13.41
	Product 1	45 600.12	32.57
Stade de France	Product 3	12 372.09	8.25
	Product 4	98 765.00	6 172.81

Or the user will interact with buttons:

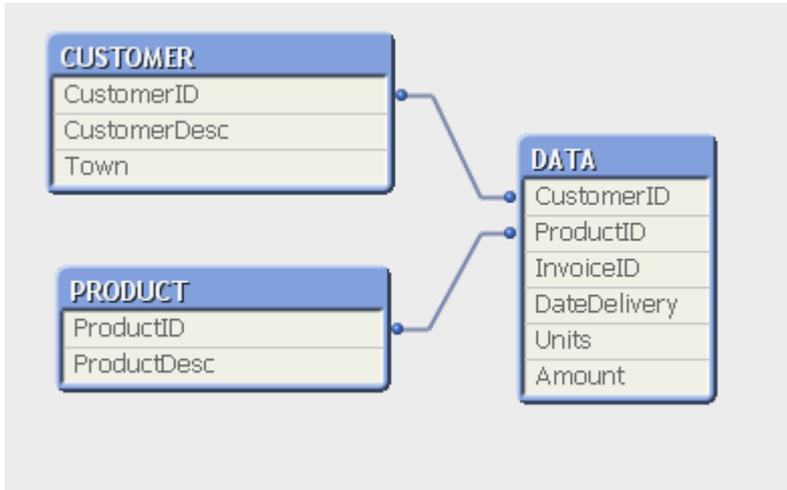
The screenshot shows a BI tool interface with three selection panels on the left and a bar chart on the right.

- Active selections:** CustomerDesc, DateDelivery, ProductDesc. 'ProductDesc' is selected with a green dot.
- Choose one dime...:** Customer, Date Delivery, Product. 'Customer' is highlighted in green.
- Customer:** Entreprise Tour Eiffel, Groupe Gillet & Frères, Stade de France.
- Buttons:** Amount (blue), Units (grey), Price (grey).
- With calculated dimension:** A bar chart titled 'Amount' showing the total amount for three customers: Groupe Gillet & Frères, Entreprise Tour Eiffel, and Stade de France. The y-axis ranges from 0 to 150,000.

CustomerDesc	Amount
Groupe Gillet & Frères	~100,000
Entreprise Tour Eiffel	~25,000
Stade de France	~150,000

1.2 A very basic data model

We have a very simple data model. **2 measures** (Amounts and Units), and **3 used dimensions**: CustomerDesc, ProductDesc and DateDelivery.



And for test reasons, we do not have much data:

	A	B	C	D	E	F	G
1	InvoiceID	CustomerID	ProductID	DateDelivery	Units	Amount	
2	1	1	1	01/07/2013	11	30	
3	1	1	2	01/07/2013	12	40	
4	2	2	2	02/07/2013	13	50.21	
5	3	3	1	03/07/2013	1400	45600.12	
6	3	3	3	03/07/2013	1500	12372.09	
7	3	3	4	03/07/2013	16	98765	
8	4	1	1	10/07/2013	1700	80932.12	
9	4	1	5	10/07/2013	18	83	
10	5	2	2	20/07/2013	1900	25600.30	
11	6	1	1	22/07/2013	2000	21345.23	
12	7	1	3	23/07/2013	21	213.05	
13	8	1	4	31/07/2013	22	223.10	
14							
15							

Only 3 customers

	A	B	C	
1	CustomerID	CustomerDesc	Town	
2	1	Groupe Gillet & Frères	Nantes	
3	2	Entreprise Tour Eiffel	Paris	
4	3	Stade de France	Paris	
5				

And 5 products:

	A	B	
1	ProductID	ProductDesc	
2		1 Product 1	
3		2 Product 2	
4		3 Product 3	
5		4 Product 4	
6		5 Product 5	
7			

1.3 Some new tables

We will add 2 tables that will contain the dimensions and the measures we want to see.

1.3.1 The Dimensions

We can add these dimensions into a table through a file or a simple LOAD INLINE:

Dimensions :

```
Load * INLINE [  
Dimension, "Dimension Desc"  
CustomerDesc, Customer  
ProductDesc, Product  
DateDelivery, Date Delivery  
];
```



As you may notice, the values of the **Dimension** Field are valid dimensions. The "Dimension Desc" field will be used to display the dimensions with an appropriate name to the user. Moreover, this technique lets us modify easily the description if not suited to the users.

1.3.2 The Measures

We could also do a LOAD INLINE with the measures. But we can also read an external source that would contain:

- A code
- A description
- An equation
- A format
- A color

Meas :

```
LOAD OrderID,  
Measures,  
MeasureEquation,  
MeasureFormat,  
MeasureColor  
FROM  
Measures.xlsx  
(ooxml, embedded labels, table is Feuille1);
```



As you may guess, the values of the **Measures** Field are valid measures. But not only as you can see:

	A	B	C	D	E
1	OrderID	Measures	MeasureEquation	MeasureFormat	MeasureColor
2	1	Amount	num(Sum(Amount), '# ###.##', ':', '')	<I>	rgb(255, 0, 0)
3	2	Total Amount	num(Sum({1} Amount), '# ###.##', ':', '')		rgb(255, 0, 0)
4	3	Units	num(Sum(Units), '# ###', ':', '')		rgb(0, 255, 0)
5	4	Total Units	num(Sum({1} Units), '0')	<U>	
6	5	Price	num(Sum(Amount)/Sum(Units), '# ###.##', ':', '')		if (Sum(Amount)/Sum(Units) < 10, rgb(255, 0,0), rgb(0, 0, 255))
7					
8					

(file Measures.xlsx)

As you may see, the file contains:

- The measure name as it will be displayed to the user
- Some measures do not exist in the model like Price, Total Units, Total Amount
- An equation, with some set analysis (Total Amount), a division (Price). The equation contains also the **num()** function in order to get the right decimal for each measure: we want to display Price with 2 decimals when Units will have none. Do not forget that we do not know the content of a column: we cannot format it the standard way.
- A format
- A color

1.4 To get the final data model



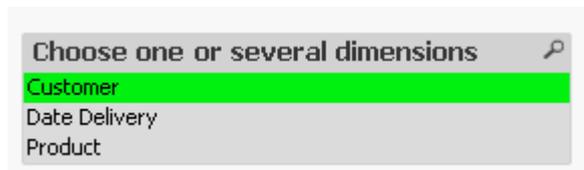
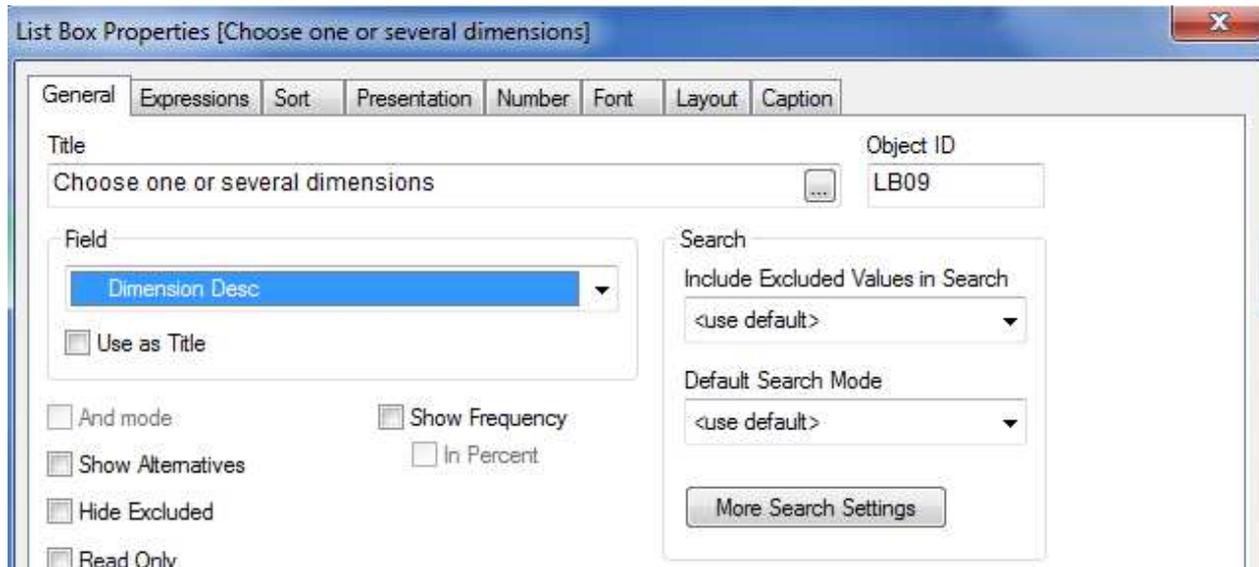
The **Meas** and **Dimensions** tables are so called “data islands”. These tables contain some information that QlikView will interpret (or expand) at a correct time.

2 The Graphical User Interface

2.1 The choice of the dimensions

2.1.1 The ListBox itself

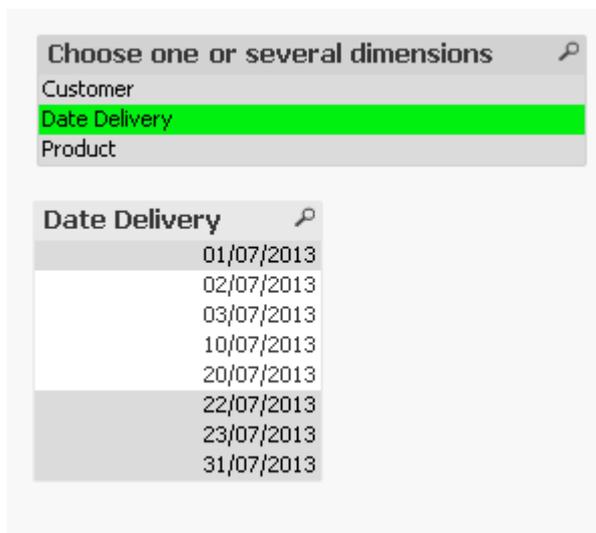
We have populated a table and field with the dimensions. We just need to use it:



We may also try to use the **\$Field** in the List Box: this technique is not so easy when we have many fields. We can reduce the scope of the displayed dimensions by editing an expression, but it is more complicated than a simple LOAD INLINE or parameters in an Excel file.

You may also link another list box to enable the user choose the values of the selected dimension:





See the functions used in the below section to do that.

If you want to display several list boxes on dimension, you may hide the second (and 3d, ..) list box according to the number of chosen dimensions:

Go to the **Presentation** tab, and enter the formula: `=(GetSelectedCount("Dimension Desc") >=2)`



2.1.2 The Dynamic Table

Now, we want to link the table (or graph) with the dimensions chosen by the user.

We will use several functions to do:

Concat() function concatenates different strings (like values) into a single string, the strings being separated by a delimiter.

Syntax: `concat([Distinct] expression, delimiter [, sort order])`

Two remarks:

- Use a delimiter that cannot be part of the values you will concatenate. A pipe (| done with AltGR +6) is a good option
- The sort order is very important so that you get exactly the same order for all expressions you will manipulate. If the list box is sorted by a certain field, you should take the same

Subfield() function is a function that returns an element out from a string composed of several elements separated with a delimiter.

Syntax: `subfield(string expression, delimiter, index of the element)`

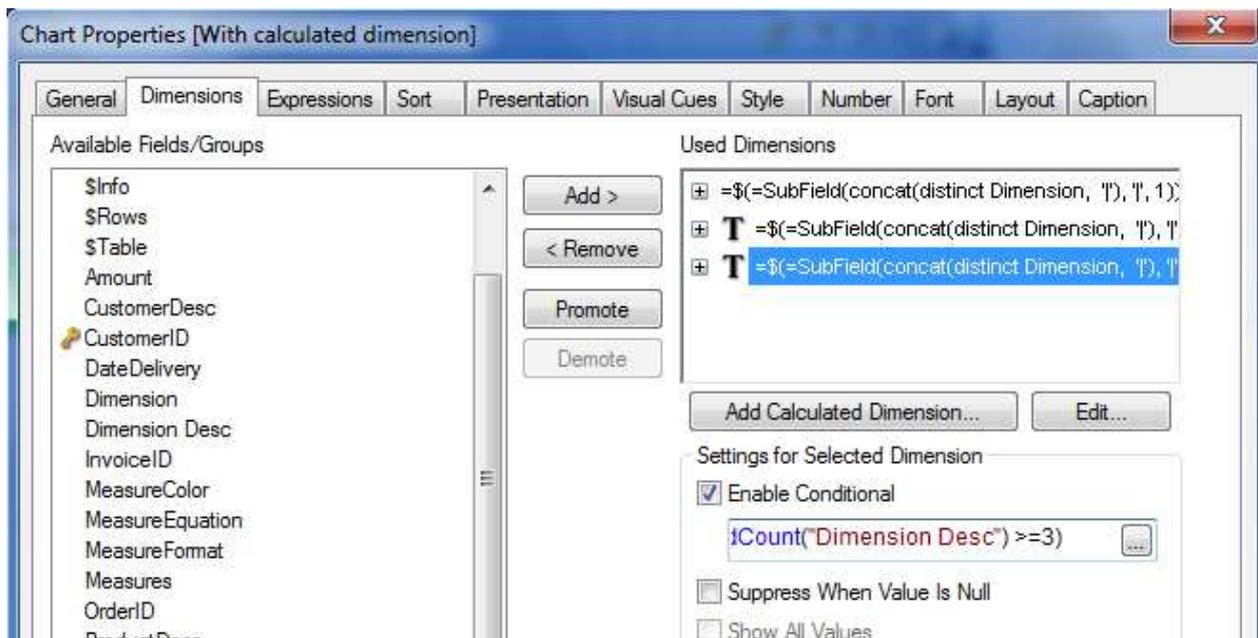
One single remark: use the same delimiter, like pipe (see above)

GetSelectedCount() is a function that returns the number of selected values of the dimension. Take care that the values must be selected directly (through the list box) and not indirectly (through another linked dimension that is selected)

Syntax: `GetSelectedCount(Fieldname [, boolean to include or not excluded])`

One single remark: the FieldName is without any quote, we need to insert it into brackets in case it contains special characters.

The chart properties:



As you can imagine, we need to use the **calculated dimensions** that will be displayed or not according to the choice made by the user.

For the 2d dimension:

```
=SubField(concat(distinct Dimension, '/'), '/', 2)
```

That will be displayed only if the user has chosen more than 2 dimensions:

```
=GetSelectedCount("Dimension Desc") >=2)
```

You may of course decide the maximum number of dimensions your table could have.

And we get this first result:

Choose one or several dimensions 🔍

- Customer
- Date Delivery
- Product

With calculated dimension... 📄 XL 🗄

CustomerDesc	=sum(Amount)
Groupe Gillet & Frères	81015,12
Entreprise Tour Eiffel	25650,51
Stade de France	156737,21

Choose one or several dimensions 🔍

- Customer
- Date Delivery
- Product

With calculated dimension... 📄 XL 🗄

ProductDesc	=sum(Amount)
Product 1	126532,24
Product 2	25650,51
Product 3	12372,09
Product 4	98765

Choose one or several dimensions		With calculated dimension	
Customer		CustomerDesc	ProductDesc
Date Delivery			=sum(Amount)
Product		Groupe Gillet & Frères	Product 1 80932,12
			Product 5 83
		Entreprise Tour Eiffel	Product 2 25650,51
		Stade de France	Product 1 45600,12

Choose one or several dimensions		With calculated dimension		
Customer		CustomerDesc	DateDelivery	ProductDesc
Date Delivery				=sum(Amount)
Product		Groupe Gillet & Frères	10/07/2013	Product 1 80932,12
				Product 5 83
		Entreprise Tour Eiffel	02/07/2013	50,21
			20/07/2013	25600,3



I do not know yet how to catch the order of the click in the List Box. By getting it, we could imagine set the 1st dimension in the table as the first click and so on.

2.2 The measures in ListBox

2.2.1 The measures

Remember that we have a file with the measures. Each measure has:

- An order
- A description to the user
- An equation
- A format
- A color

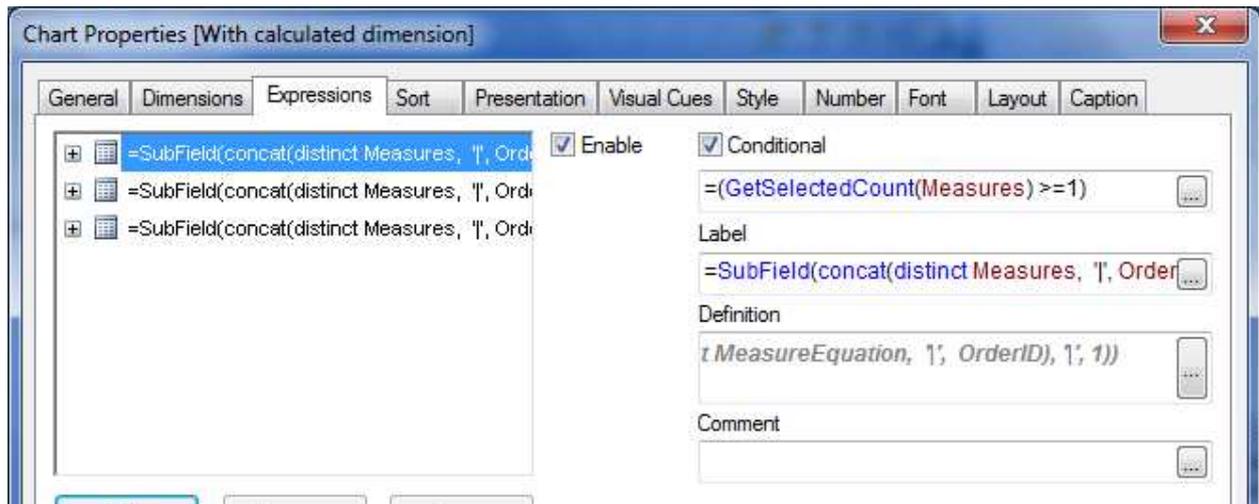
2.2.2 The ListBox itself

As for the dimension part, we have populated a specific table with the measures. Just use it:

But it is also important to set an order so that the **concat()** and **subfield()** function guess exactly the Nth measure:

2.2.3 The dynamic Table

We will use the same functions:



Expression:

`=$(=SubField(concat(distinct MeasureEquation, '|', OrderID), '|', 1))`

Label:

`=SubField(concat(distinct Measures, '|', OrderID), '|', 1)`

Each measure is displayed only if enough measures are selected (the **Conditional** check box must be checked):

`= (GetSelectedCount (Measures) >=1)`

Choose one or several dimensions

- Customer
- Date Delivery
- Product

Measures

- Amount
- Price
- Total Amount
- Total Units
- Units

With calculated dimension

CustomerDesc	Amount	Units	Price
Groupe Gillet & Frères	81 015.12	1 718	47.16
Entreprise Tour Eiffel	25 650.51	1 913	13.41
Stade de France	156 737.21	2 916	53.75

Choose one or several dimensions

- Customer
- Date Delivery
- Product

Measures

- Amount
- Price
- Total Amount
- Total Units
- Units

With calculated dimension

DateDelivery	Units	Price
02/07/2013	13	3.86
03/07/2013	2 916	53.75
10/07/2013	1 718	47.16
20/07/2013	1 900	13.47



As you may notice:

- **Concat()** is used with one argument more, the **OrderID** field, so that the order of the fields are the same for the expressions and the labels.
- Price does not belong to the model
- The formatting is measure dependent, not column dependent: Price has 2 decimals, Units has no decimal whatever the place in the table

2.2.4 Format the measures

We want something like that:

Choose one or several dimensions		With calculated dimension	
Customer		DateDelivery	
Date Delivery		Amount	Price
Product		01/07/2013	70.00 3.04
		02/07/2013	50.21 3.86
		03/07/2013	156 737.21 53.75
		10/07/2013	81 015.12 47.16
		20/07/2013	25 600.30 13.47
		22/07/2013	21 345.23 10.67
		23/07/2013	213.05 10.15
		31/07/2013	223.10 10.14

Under each expression, populate the **Text Color** and **Text Format** properties:

Text Color:

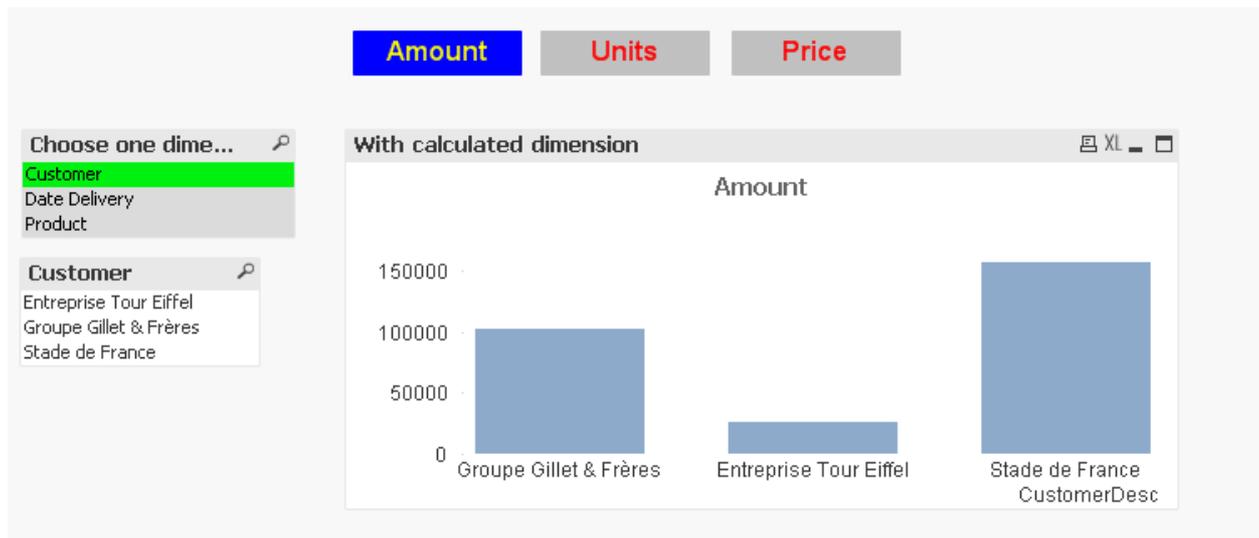
```
=$(=SubField(concat(MeasureColor, '|', OrderID), '|', 1))
```

Text Format:

```
=SubField(concat(distinct MeasureFormat, '|', OrderId), '|', 1)
```

As you can see in the XLS file, the color field can contain complex equation with a **if()** statement for example.

2.3 The measures displayed as Buttons

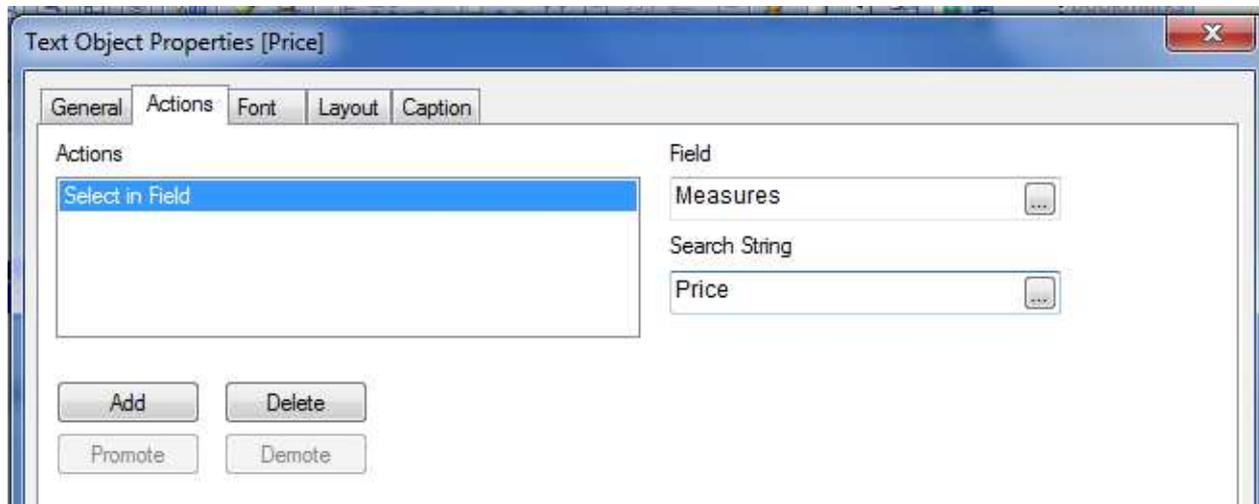


Here, the user may select the measures by pressing a button or a text. A color coding indicates which measure has been selected.

This method is very intuitive and graphical. However, you can display a very limited number of measures.

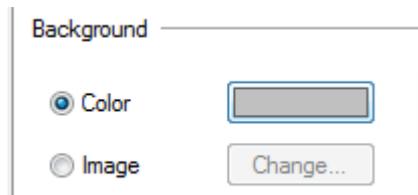
2.3.1 Step 1: set up the action

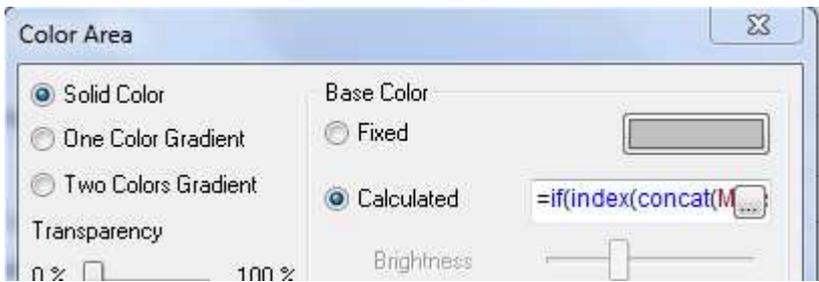
For each button, add an action Selection:



2.3.2 Step 2: setup the colors to indicate if the measure is selected or not

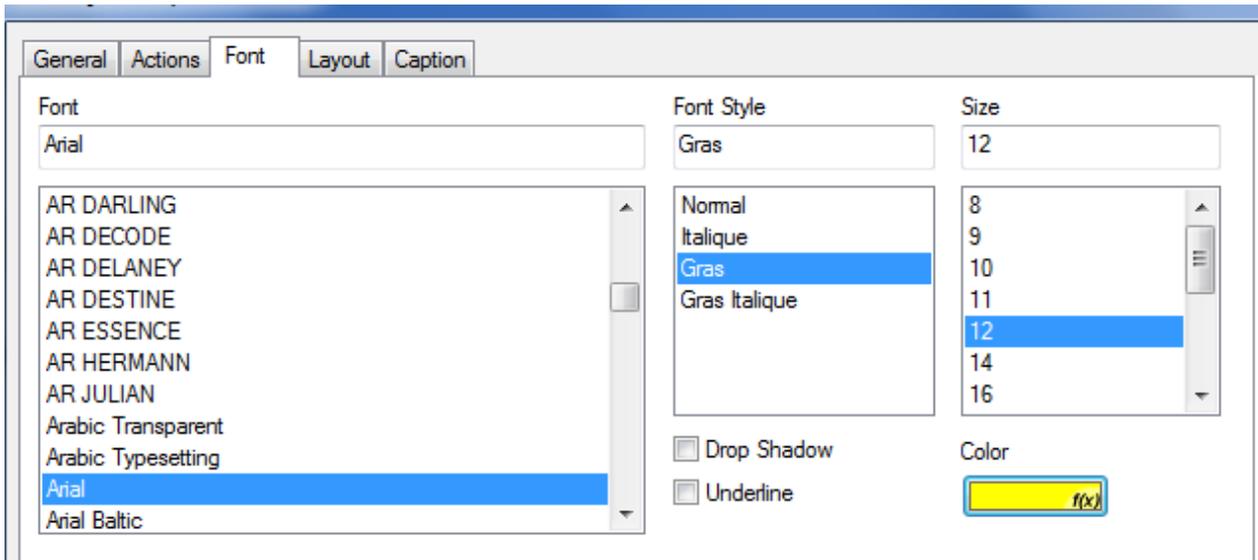
The background:





```
=if(index(concat(Measures, '|'), 'Price') > 0, rgb(0,0,255), rgb(192,192,192))
```

The font:



Press the color button to enter a formula:

```
=if(index(concat(Measures, '|'), 'Price') > 0, rgb(255,255,0), rgb(255,0,0))
```

Because, this work may be cumbersome and most of the time modified (the color is not the right one), we can store the colors into variables and use them in the equation:

vColorBgChosen	=rgb(0,0,255)	
vColorBgNotChosen	=rgb(192,192,192)	

And the equation becomes for Amount:

```
=if(index(concat(Measures, '|'), 'Amount') > 0, vColorBgChosen, vColorBgNotChosen)
```

We could do the same for the font.

3 Other documents I have published

I had the pleasure to write other documents that may be of interest:

LOAD Data into QlikView: <http://community.qlikview.com/docs/DOC-5698>

How to build a Hierarchy ListBox: <http://community.qlikview.com/docs/DOC-4823>

Set Analyses by example:

In English: <http://community.qlikview.com/docs/DOC-4951>

In French: <http://community.qlikview.com/docs/DOC-4889>

Simply create YTD, moving totals and comparison versus Year ago:

<http://community.qlikview.com/docs/DOC-4821>