

## Advanced, Dynamic and Effective Dashboarding with SAS® Visual Analytics

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### ABSTRACT

SAS® Visual Analytics provides a robust platform to perform business intelligence through a high-end and advanced dashboarding style. In today's technology era, dashboards not only help in gaining insight into an organization's operations, but they also are a key performance indicator. In this paper, I discuss five important and frequently used objects in SAS Visual Analytics. These objects are used to get the most out of dashboards in an effective and efficient way. This paper covers the use of dates (as a format) in the date slider and gauges, cascading filters, custom graphs, linking reports within sections of the same report or with other reports, and associating buttons with graphs for dynamic functionality.

### INTRODUCTION

This paper will help beginners to know capabilities of dashboarding in SAS visual analytics. An effective and an efficient dashboarding not only provides all critical data analysis under one roof that is easy to read and interpret but also helps the management in steering the operations important for the success of the organization.

Irrespective of type of data, there are few essential objects in every dashboard, without which the dashboarding is incomplete and not intuitive enough to access the information of the analysis.

In this paper we will see with the help of example dataset, five most important functionalities to get most out of the dashboarding.

### DATE

One of the most important part of data is Date. All the information that is present in a data is always over the period of time. Inference or relation of data with respect to time helps in tracking the progress or process of any organization.

### DATE PART

If a report has multiple data sources it is very important to keep the same format of date in order to provide smooth interaction between different objects.

When data is available at day level, no conversion is required. But if the data is on hour basis, then there is need to convert datetime time stamp into date stamp to be used in date slider. With datetime time stamp, date slider is not very readable and occupies a lot of space.

Conversion of datetime time stamp into date stamp can be effectively done by use of one of the operators "DatePart". Steps are mentioned below:

Step1. Go to the datasource and select '*New calculated Item*'.

Step2. Select DatePart from '*Operators*' section and drag it to the workspace.

Step3. Select DateTime from '*Data Items*' section and drag it to the workspace.

Step4. Results can be previewed by clicking on '*Preview*' button.

Step5. Click '*OK*' to finish the calculation.

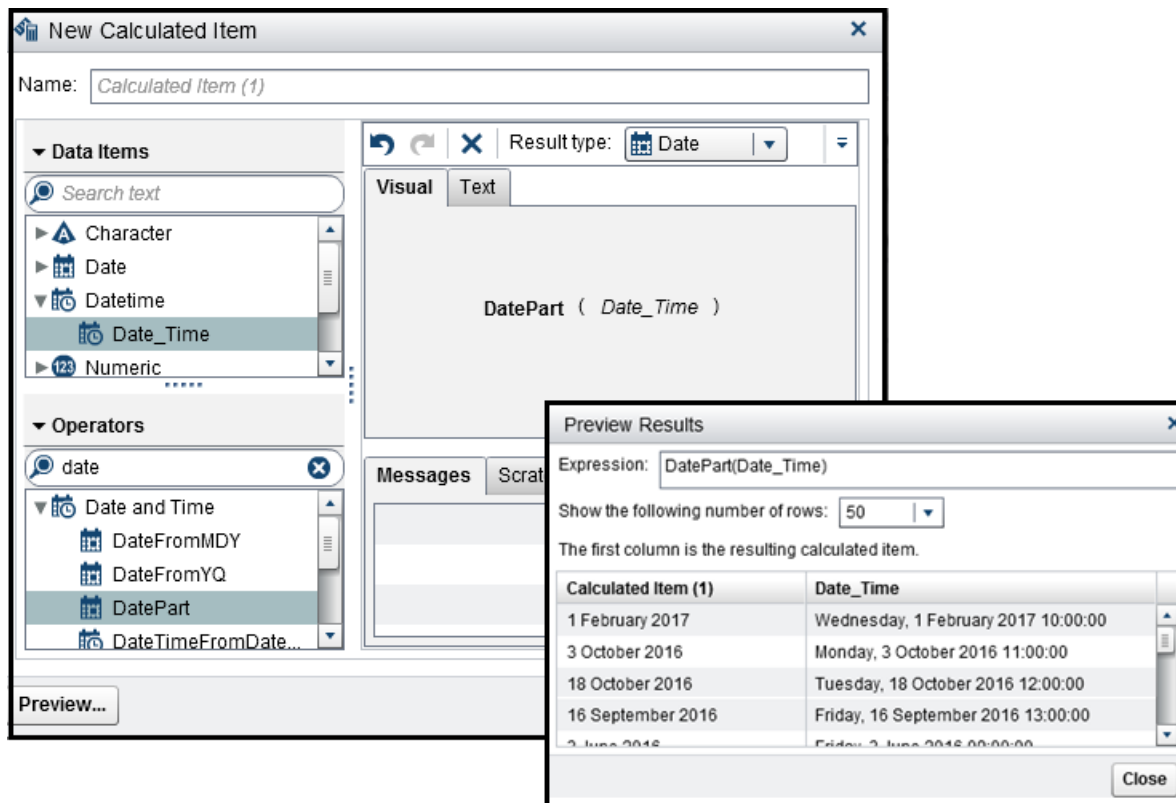
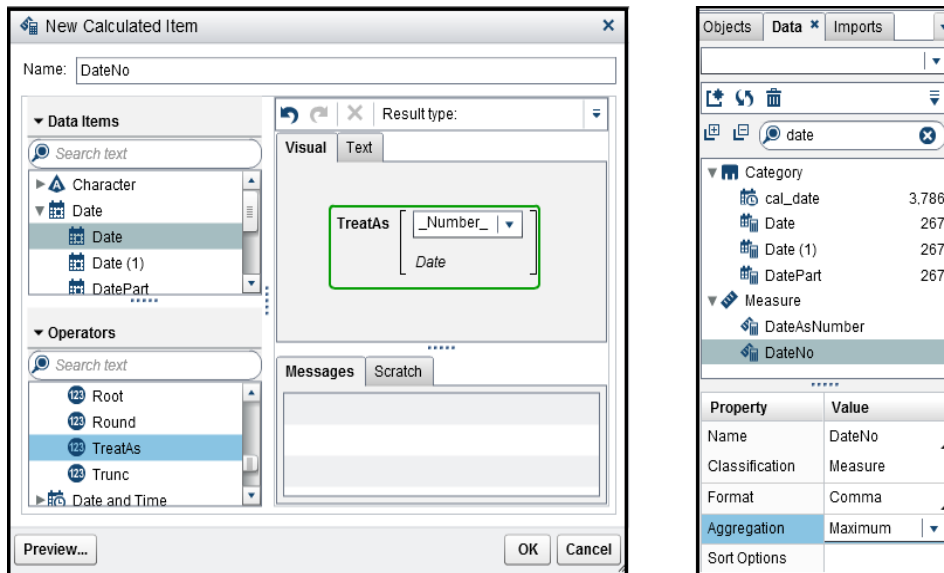


Figure 1. Converting DateTime into Date using DatePart

## ROLLING DATES

Very often in reports it is required that data behind the dateslider, graphs or gauges get dynamically updated and holds the data from past 5 days/months etc. Steps to achieve rolling dates are mentioned below:

- Step1. Convert DateTime time stamp into Date stamp (as described above) and duplicate.
- Step2. Convert original 'Date' into number using 'TreatAs' Operator and save as 'DateNumber'.
- Step3. After calculating 'DateNumber', change the property of Aggregation to 'Maximum'.
- Step4. Use original 'Date' in DateSlider, Gauges or Graphs.



**Figure 2. Converting Date into number using TreatAs Operator**

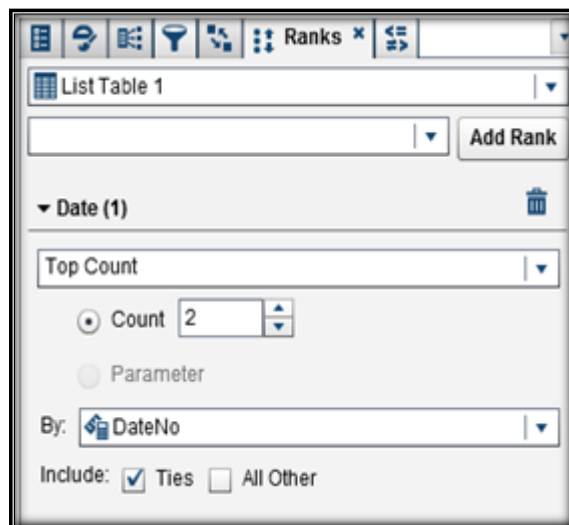
Step5. Go to 'Ranks' tab.

Step6. Select duplicate 'Date (1)' and click on 'Add Rank'.

Step7. Further select 'Top Count' and provide the number of days for which data need to be shown.

In this paper data is selected for two days.

Step8. In 'By' column select 'DateNumber'.



**Figure 3. Providing Ranks to Date**

Upon application of 'Ranks', date slider/ graphs/ gauges will show dynamically two days data. That means, if report is viewed on Wednesday, date slider/ graphs/ gauges will show the data from Monday and Tuesday. If report is viewed on Thursday, date slider/ graphs/ gauges will show the data from Tuesday and Wednesday.



Figure 4. DateSlider showing the application of Ranks

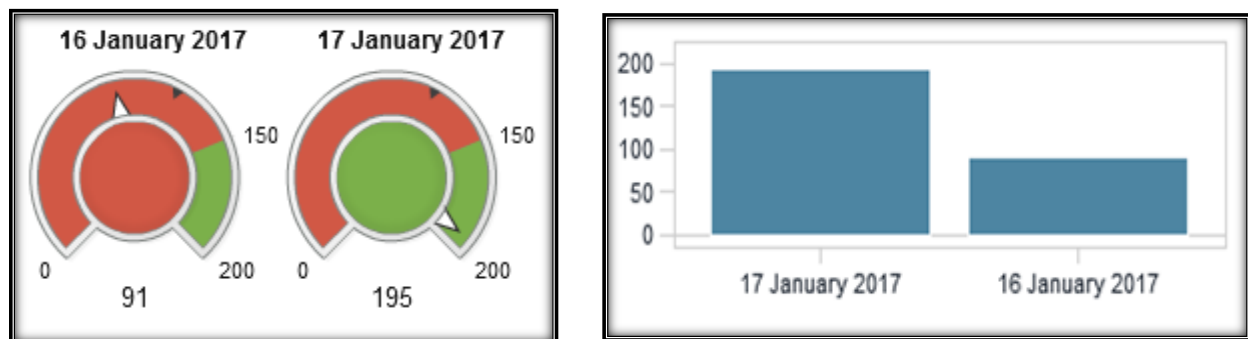


Figure 5. Gauges and Graphs showing the data from past two days upon application of 'Ranks'.

## CASCADING FILTERS

In SAS® Visual Analytics, report section has one global and one local filter section namely *Report Prompt* and *Section Prompt*.

One way to cascade filters / create hierarchy is to place one filter in *Report Prompt* and other in *Section Prompt* area. However, with this option, one cannot restrict the application of filter to only one section of the report.

Alternatively, one can place the filters in report section area and cascade them with help of manual interactions. This can be a tiresome process, if report has multiple filters and graphs. Additionally it will also be difficult to make/update changes and would lead for human error.

So, the best possible option would be to place the filters in *Section Prompt area* and cascade them. As manual interactions are not possible in this section, cascading can be achieved with the help of parameters and applying conditions in '*Advanced Filter*'.

In this paper, mock up dataset is used as below:

Country	City
Netherland	Amsterdam
Belgium	Ghent
France	Paris
Germany	Dusseldorf
Austria	Vienna

Figure 6. Mockup Dataset

Steps to create parameter and apply conditions in 'Advanced Filter' are mentioned below:

Step1. Drag and drop 'Drop-Down' list control to report prompt area. Only 'Drop-Down' list allows the usage of parameters.

Step2. Add 'Country' and 'City' to the filters.

Step3. Select 'Country' filter and right click to make parameter.

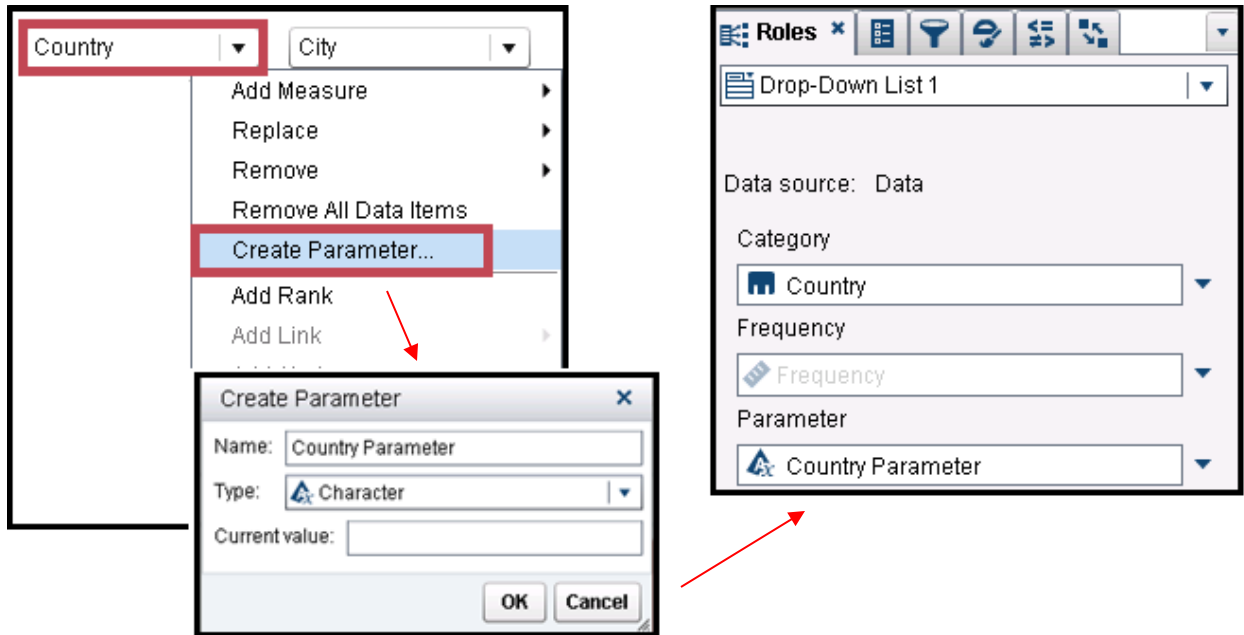


Figure 7. Creating Parameter

Step4. Select 'City' drop-down list and navigate to 'Advanced Filter' to apply a condition: 'Country'n = 'Country Parameter'p

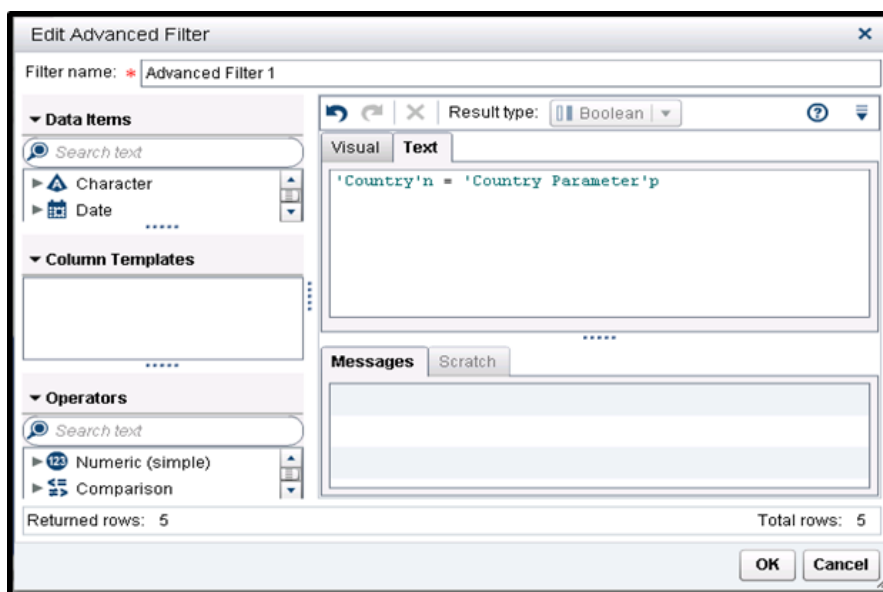
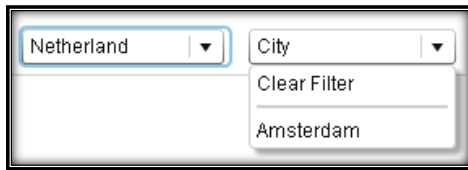


Figure 8. Applying condition for cascading

Use of parameters in 'Country' and condition in 'City' filter allows the cascading to be dynamic.

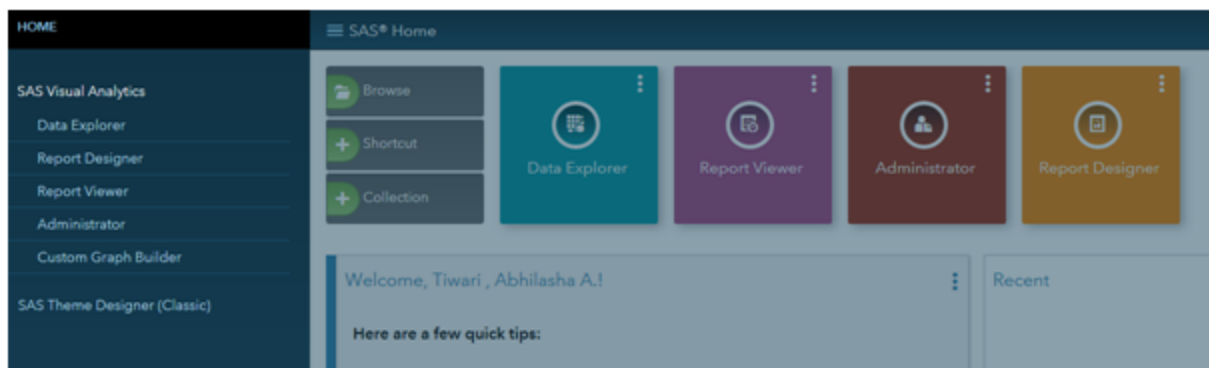


**Figure 9. Cascading Filters**

## CUSTOM GRAPHS

SAS® Visual Analytics provides wide range of charts ranging from Line chart, Bar chart, Dual axis chart to Scatter Plot, Piechart, Waterfall chart etc. Despite providing different types of charts for reporting, there are situations, where one has need to customize the graph according to the requirement. The customization need not be big, but even the possibility to customize the graph is a big advantage for all dashboard developers.

Custom Graph Builder can be accessed from Home page.



**Figure 10. Custom Graph Builder**

Custom graph Builder not only allows to modify the existing graphs but also one can create new graphs by mixing two different types of graphs. It has two main tabs 'Roles' and 'Properties'.

### ROLES

When a graph is dragged on the canvas, roles for that graph are created.

- Can modify/rename the default name given to the roles
- Add / remove extra role to the graph element ie. Category, Measure, Shared role or Group By

Shared role allows to use the same element in both the graphs. This makes the graphs used in report intuitive and user friendly.

### PROPERTIES

- Can modify line or bar color / width / thickness
- Can choose between Grouping style as Stacked or Overlay
- Can modify data labels font size and properties

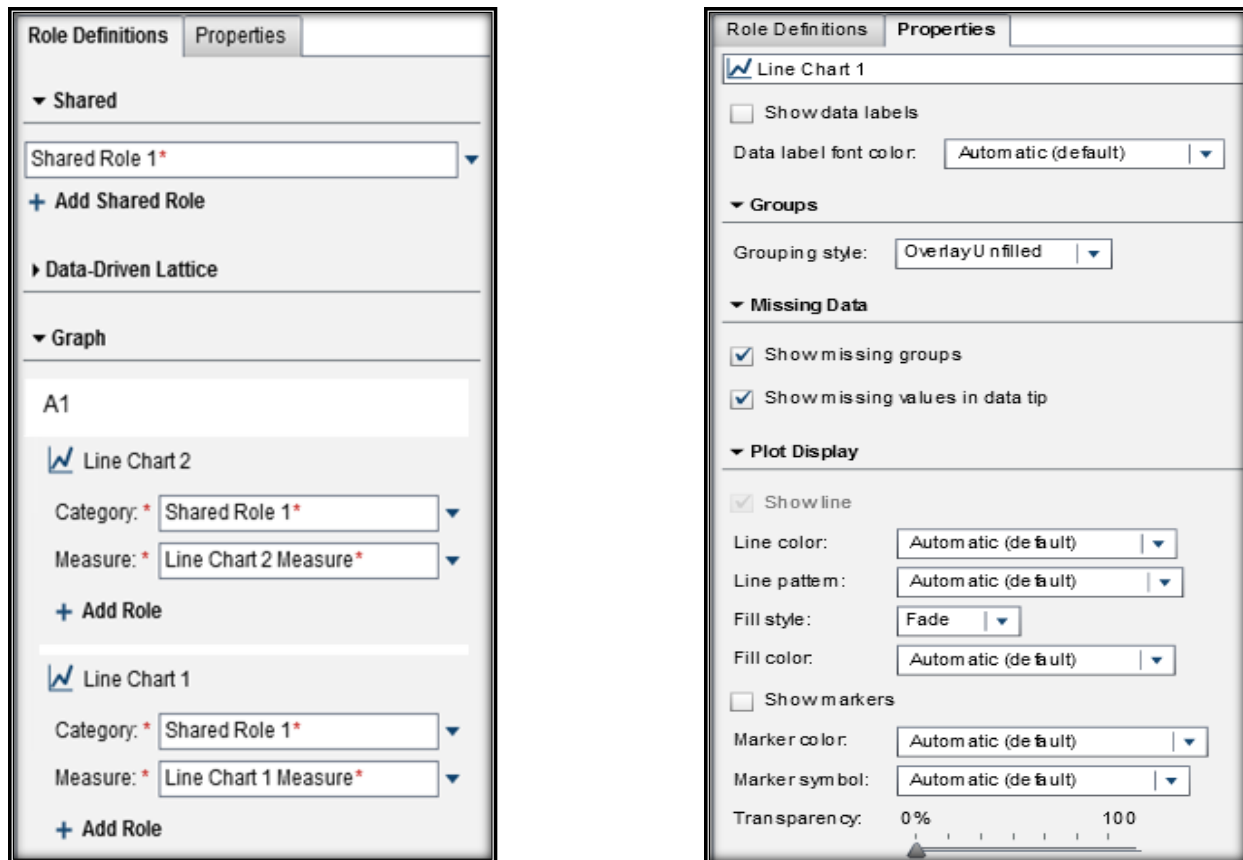


Figure 11. Role and Properties of Custom Graph

## DYNAMIC X-AXIS WITH BUTTONS

Usually for simple dashboarding, a graph with one values on X-axis is sufficient. But in scenarios where one has to show multiple objects/ time frame in the same graph can be challenging.

One way to provide two aspects of same requirement is to put both graphs in one container. This method can take some space and would not be suitable when space is in crunch. In this case, the most preferable would be to optimize the graph instead, and make it more intuitive for the users.

In this paper I have discussed how to optimize X-Axis and show two different time frame (Month and Week) on single click of a button. Steps are mentioned below:

Step1. Make a data set with only 'Date' Column and values as 'Month' and 'Week'.

Step2. Load the table in SAS® Visual Analytics and use them in buttons.



Figure 12. Mock up dataset and buttons

Step3. Select button and right click to '*Create Parameter*'. This parameter will be used to create a new item and used by graph.

Step4. Select dataset that will used by graph for reporting.

Step5. Perform calculations for **Month** using 'Format' function.

Step6. Specify the format as YYYYMM7. (year month) and not only as month. This is to make Month display values in right order. Else it will display in alphabetical order, being a character format.

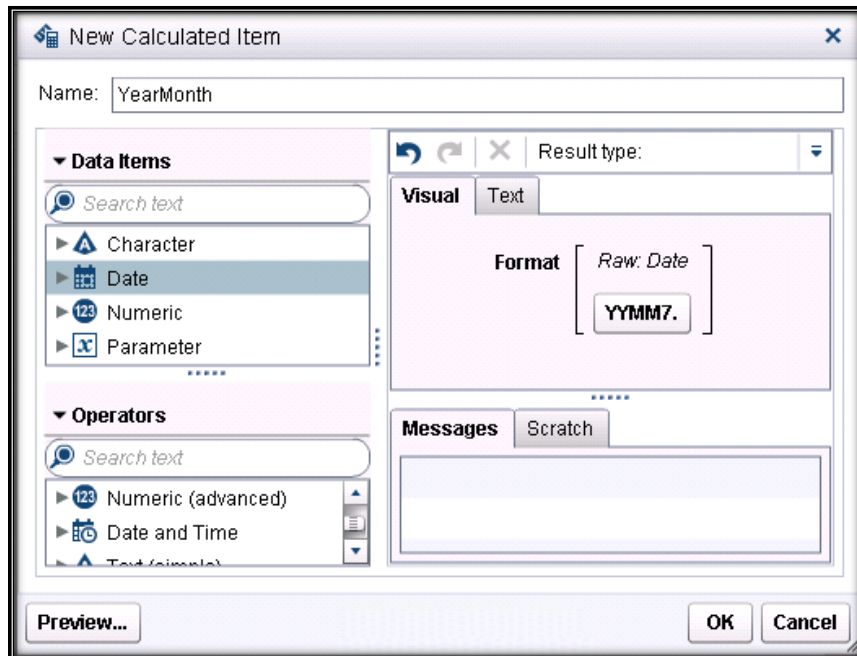


Figure 13. Calculating Month using Format function

Format function is used to obtain the values of month as character and not numeric. This is required for final calculation to be used in graph.

Step7. Perform calculations for **Week** using 'Format' function.

Step8. Calculate Weeknumber using '*WeekNumber*' in Operators section.

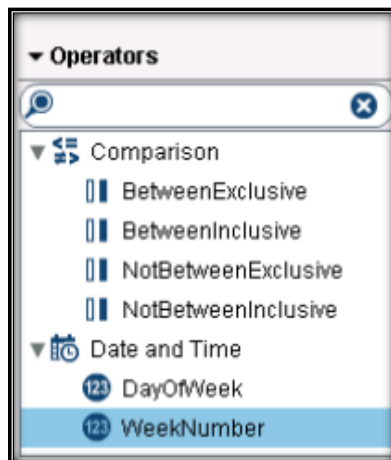
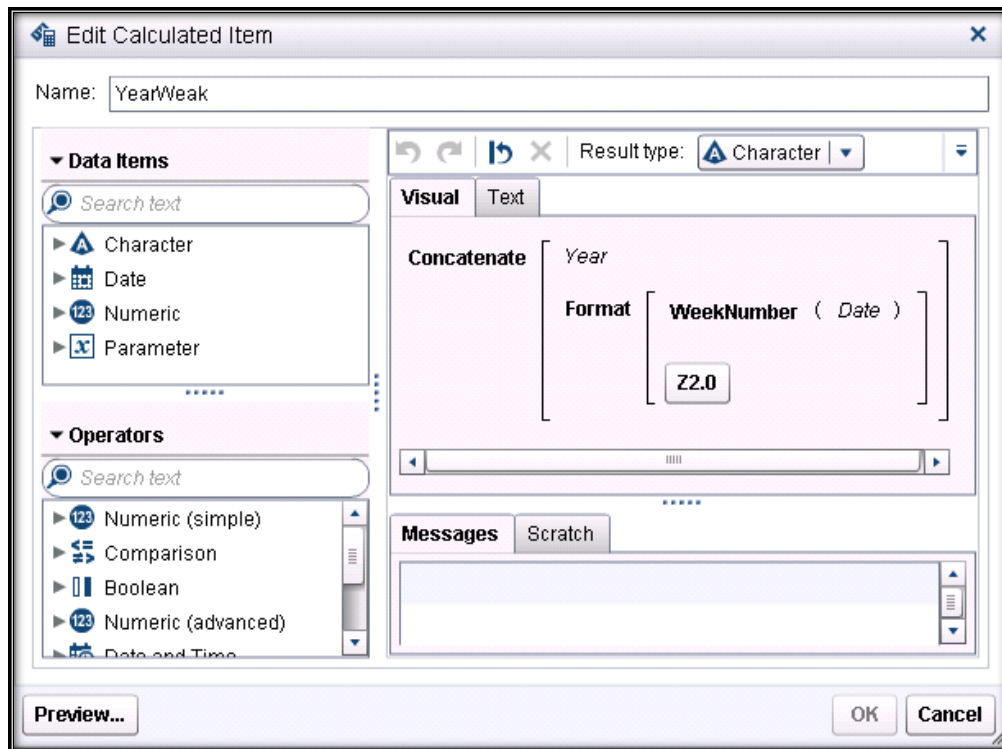


Figure 14. Weeknumber in Operators section

Step9. Convert '*WeekNumber*' into a character using format function 'Z2.0'





**Figure 15. Converting WeekNumber to character using Format function**

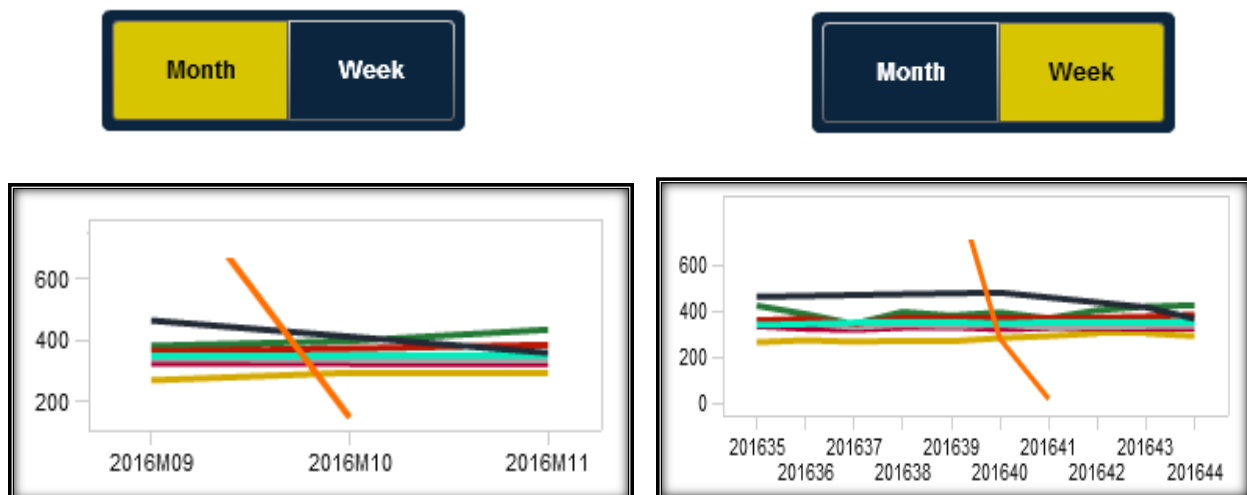
Step10. Now, calculate a new item with following condition:

If 'dateparameter'p = 'Month'

Return 'YearMonth'n

Else 'Year Week'n

Step11. Use the above calculation for X axis.



**Figure 16. Dynamic X-axis ( one with Month and other with Week values)**

Now, when 'Month' is clicked on the button, the graph will display values for month and when 'Week' is clicked, graph will display the values for week.

## LINKING REPORTS

Linking reports are very useful when the reports need to be interconnected or required to go from less detail level to more detail level of dashboard. Steps to link two reports are mentioned below:

Step1. Select a graph and go to 'Interactions' tab.

Step2. Click on 'New' tab and select 'Report Link'. Alternatively, one can also navigate to report link from graph itself. Select graph, right click and go to 'Add Link' to select report.

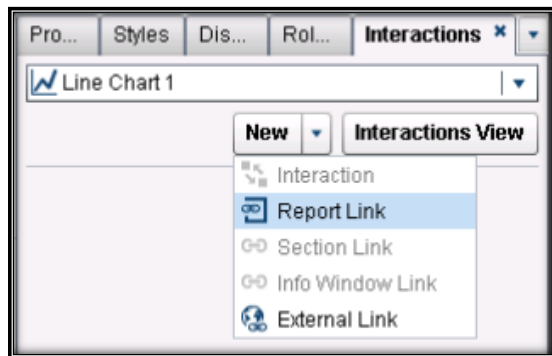
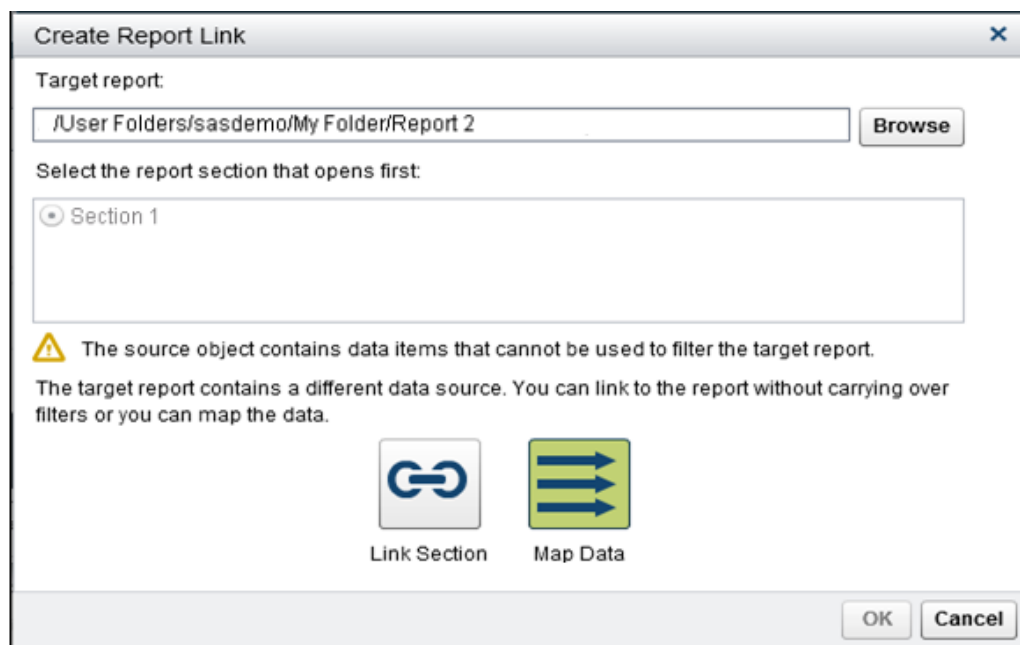


Figure 17. Interactions tab to select 'Report Link'

Step3. Select the report to be linked.

Step4. A new window 'Create Report Link' opens

- **Target Report** has the path location of the linked report. Report linking is sensitive to the location and name of the report. Make sure both of them is not changed, and if there are changes, make sure to connect them again.
- **Section Report** allows to select from the multiple sections of the report (if any) to be opened first when clicked from higher level dashboard. By default first section is selected.
- **Link Section** allows to link both the reports
  - (a) When the data source of both the dashboards are same – no mapping is required and linking would transfer all the filter selection from report 1 to report 2.
  - (b) When the data source of both the dashboards are not same – no mapping is required or there is no requirement to pass filter selection from report 1 to report 2.
- **Map Section** allows to link both the reports when data source of both the dashboards are not same. One can manually select the columns to be mapped from report 1 to report 2. This allows the filter / data selection made in report one to be passed to report 2.



**Figure 18. Linking Reports**

## CONCLUSION

Dashboards are the first step to Business Intelligence as they provide high level information to be monitored and analyzed by organizations. If dashboards are not quick and intuitive enough, it loses its utility. The five capabilities discussed in this paper not only makes the dashboard dynamic, but also easy to access and interpret.

## REFERENCES

SAS Institute Inc. "SAS(R) Visual Analytics 7.3: User's Guide". Accessed March 3, 2017.  
<http://support.sas.com/documentation/cdl/en/vaug/68648/HTML/default/viewer.htm#n0xg3mqyzi0gzn1bd56uw7cwsx2.htm>

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