SESUG Paper 256-2019

Dashboards for SAS® Visual Analytics

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ABSTRACT

Visual Analytics is a great tool to use to visualize and analyze data and create dashboard for others to review data. The designer layout has multiple sections with multiple parts to each section. This paper will provide an introduction to the designer tool available for Visual Analytics.

INTRODUCTION

This paper is a companion to the Hands on Workshop (HOW), Dashboards for SAS® Visual Analytics. This paper will give an overall view of the report designer environment for Visual Analytics. It will show where data and objects are added as well as give an introduction to how objects can be customized to enhance the user experience. It will also touch on how to filter data at the data source and object level.

VISUAL ANALYTICS DESIGNER LAYOUT

The Visual Analytics development environment consists of 3 main sections. The section on the left has tabs for Objects, Data and Imports. The middle section is the canvas where the report is built. The section on the right provides options to customize objects that have been added to the report from the Objects tab. Each object has its own set of properties, styles, etc.

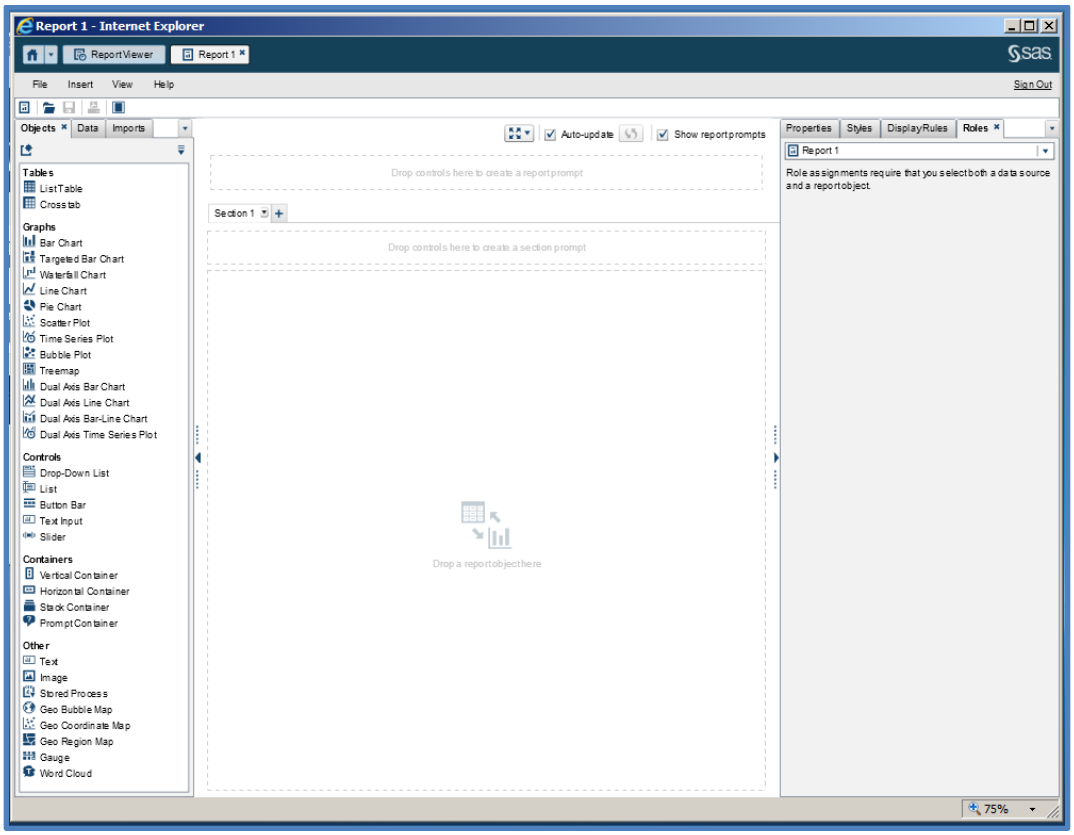

Figure 1 - VA Development Environment

DATA TAB

The first step in creating a report is adding a data source. This is done on the Data tab using the ***Select a data source*** drop down. The ***Add Data Source*** dialog box will open, allowing a data source to be selected. All data sources must have been previously uploaded to the LASR server to be available for use in a report.

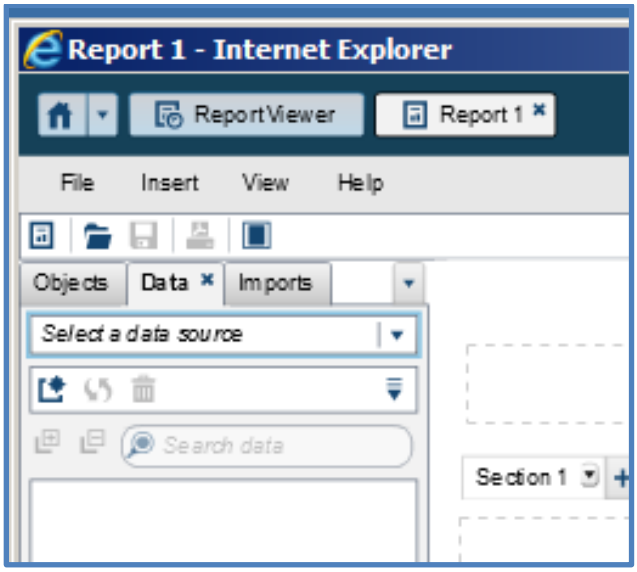

Figure 2 - Select a data source drop down

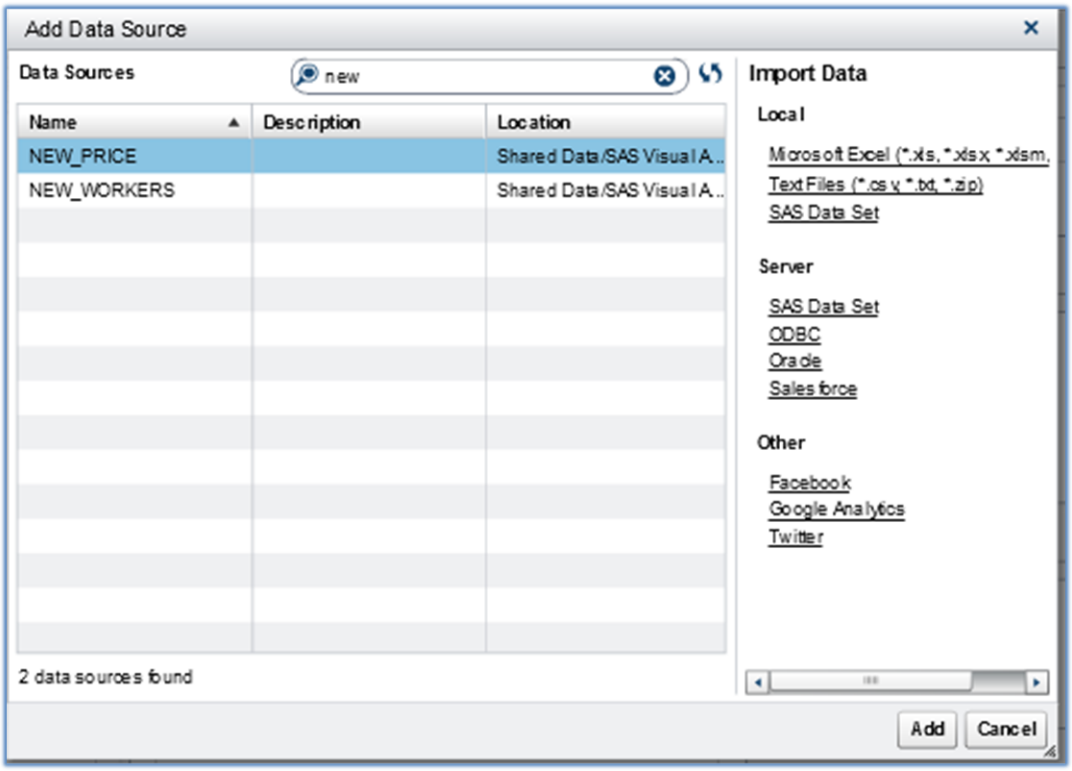

Figure 3 - Add Data Source Dialog Box

Once a data source has been added, the fields for that data source are displayed grouped by field type in the middle section of the Data tab. Within that section, the number of distinct values for each categorical type variable is listed.

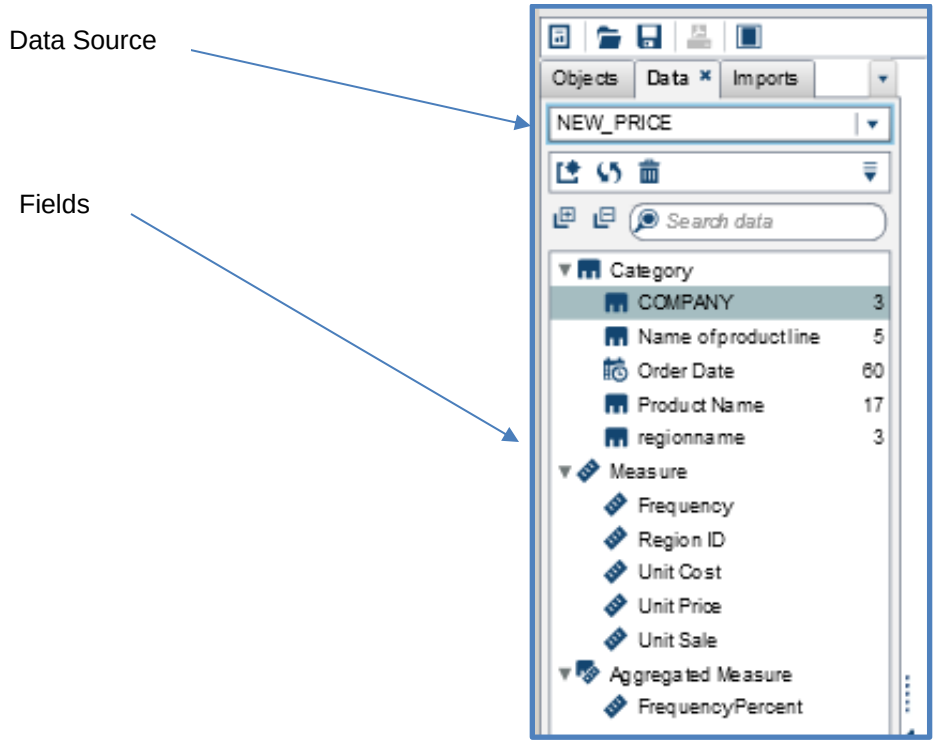

Figure 4 - Data Source Example

When a field is selected, the attributes for that field are displayed in the bottom section of the tab. Some attributes are available for modification. Modifications do not change the underlying data source, it only changes how the data is displayed in the report.

If a Category field is selected that is not a Date field, the Name is the only attribute that can be modified. Changing the Name is available for all field types and can be helpful when field names are displayed in the report as part of a tool tip or a title. Sometimes the actual field name is not very meaningful to an end user.

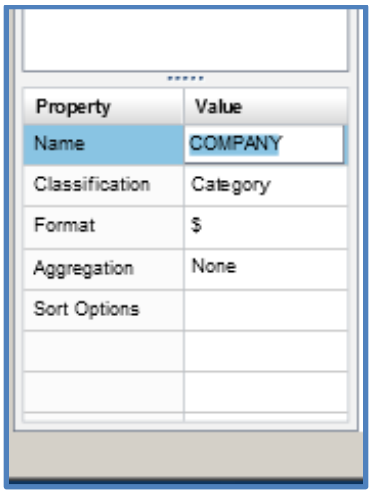

Figure 5 - Categorical Field Attributes

If a Date field is selected, in addition to the ability to change the name, there are a multitude of format options available. This allows for displaying the date field using a standard date format, or a format can be used to display just Day, Month, Year, Quarter or a combination of those values.

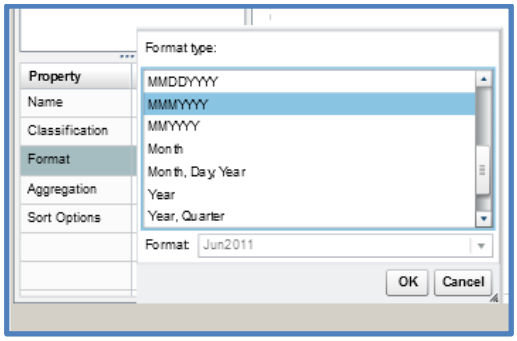

Figure 6 - Date Field Formats

If a Numeric field is selected, there are standard formats such as Comma, Currency, Dollar, and Percent available. There are also formats to display international values. (pound, euro, etc.) Note: Values are not converted, only the display is affected by the chosen format. There are also numerous aggregation options available to be used with numeric data.

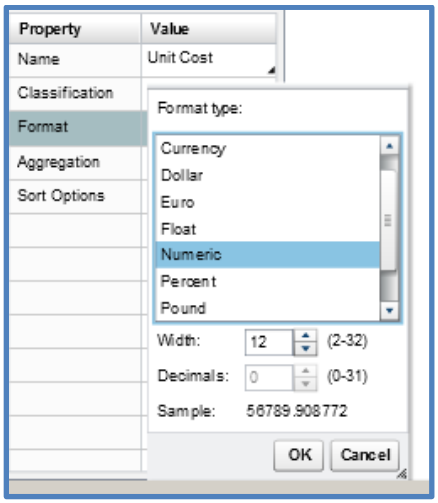

Figure 7 - Numeric Field Formats

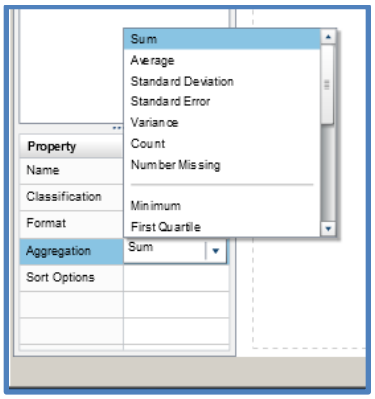

Figure 8 - Numeric Field Aggregation

Right clicking on a field instead of selecting it, shows additional options that allow a data item to be hidden or duplicated. This can be helpful if a field needs to be displayed in multiple ways on the report. For example if a date field needs to be displayed as just the year in one place and the year/month in another, just duplicate the item and then change the formats, names, etc to fit the 2nd need. Also, if there are a lot of data items, and the user only wants the relevant data items to be displayed, hide data items that are not being used.

A custom Category or a Parameter data item is another field type that can be added with the right-click. Any Category field, can also have a custom sort added to it. This allows the designer to decide what sort order should be used when the data is displayed.

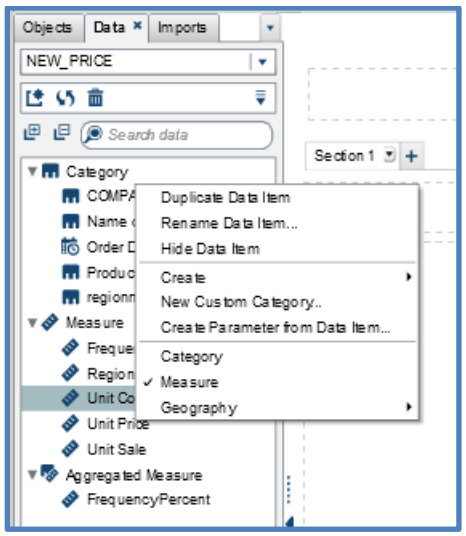

Figure 9 - Right Click Field

Below the ***Select a data source*** drop down, is another drop down that displays additional actions. From this dropdown, the fields in the field list can be grouped or sorted. If needed, this is also where the data source can be changed. This drop down also allows the ability to add some custom fields to the report. For example, a Hierarchy can be added to the report, which is used when a drill down is preferred. Other common additional actions include creating a custom category, adding a calculated item, or adding an aggregated measure.

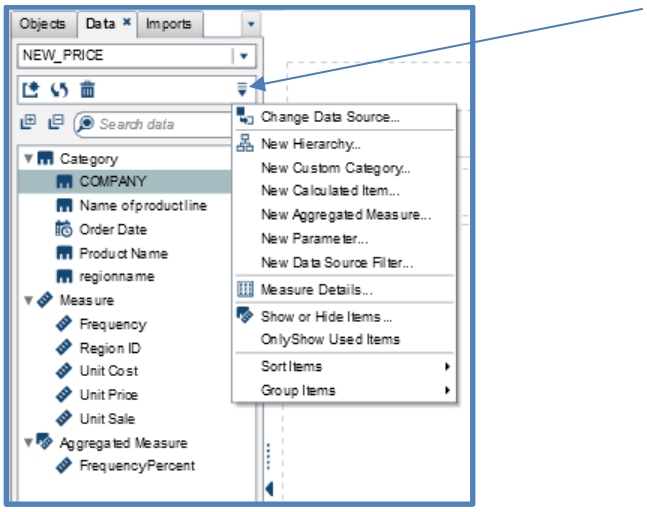

Figure 10 - Additional Options Drop Down

Another feature that is available in this drop down is the data source filter. Sometimes it is helpful to filter the data before it ever gets to the report. For example, maybe the report is a custom report for the North Region. The data set that has the data for all regions can be used as the source, but the data can be filtered by specifying regionname = 'North' at the data source level. This allows only North region data to be pulled into the report.

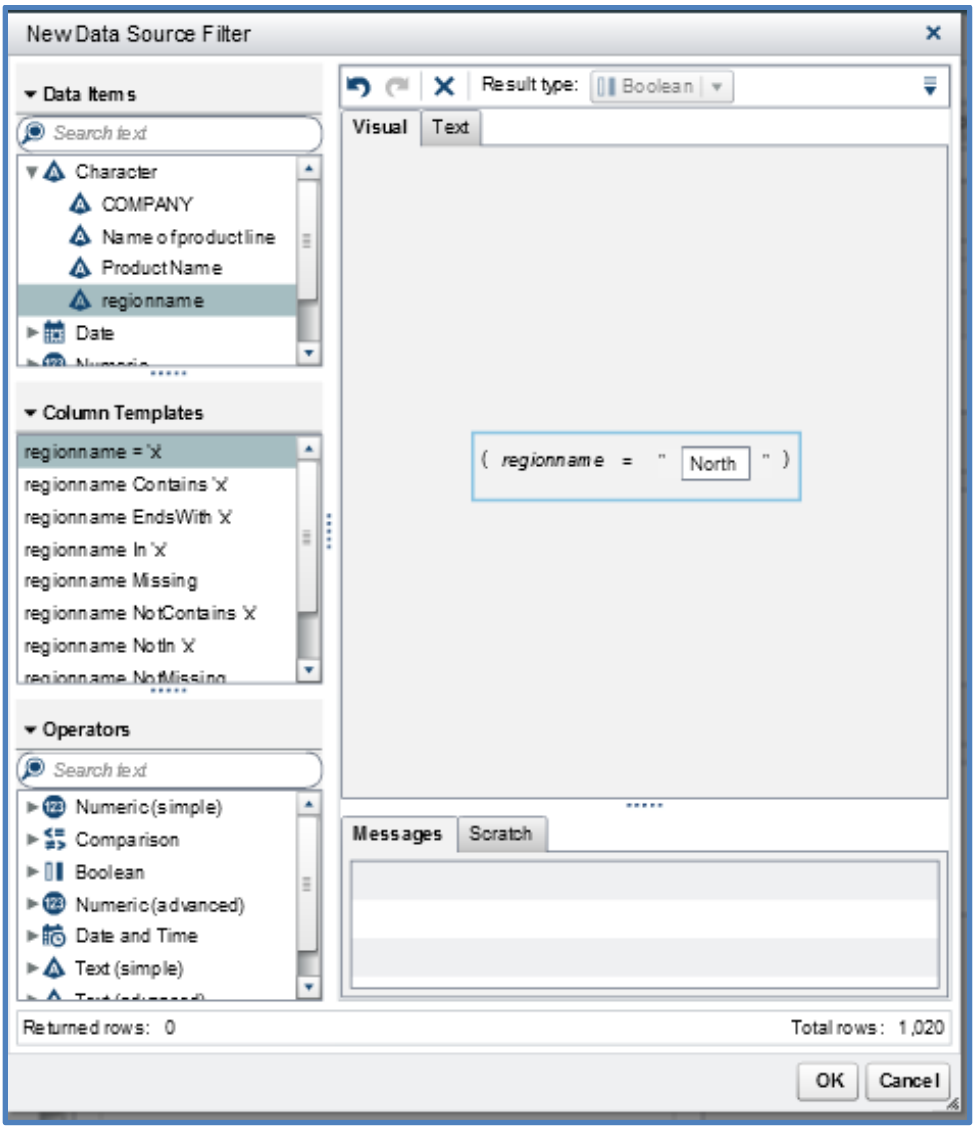

Figure 11 - Data Source Filter

OBJECTS TAB

The Objects tab is accessed by clicking the Objects tab on the left. The Objects are then grouped into 5 sections, Tables, Graphs, Controls, Containers, and Other objects. Objects are customized using the tabs on the right side of the development environment. Thing such as field assignment, borders, fonts and colors are set there.

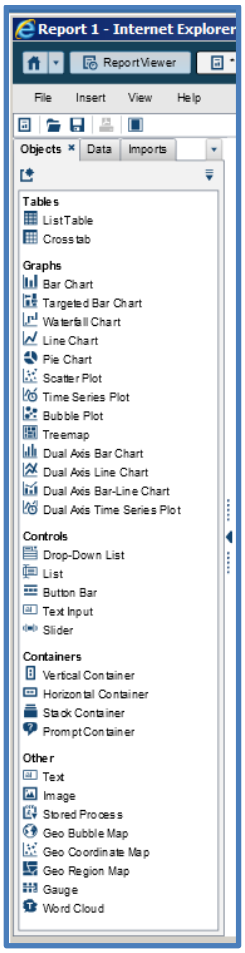

Figure 12 - Objects Tab

TABLES

Visual Analytics offers 2 kinds of tables, a List Table and a Cross Tab table. The List table lists the data, and the Cross Tab Table can be interactive with a drill down feature. In order to have drill down capability, a Hierarchy must have been created in the Data tab.

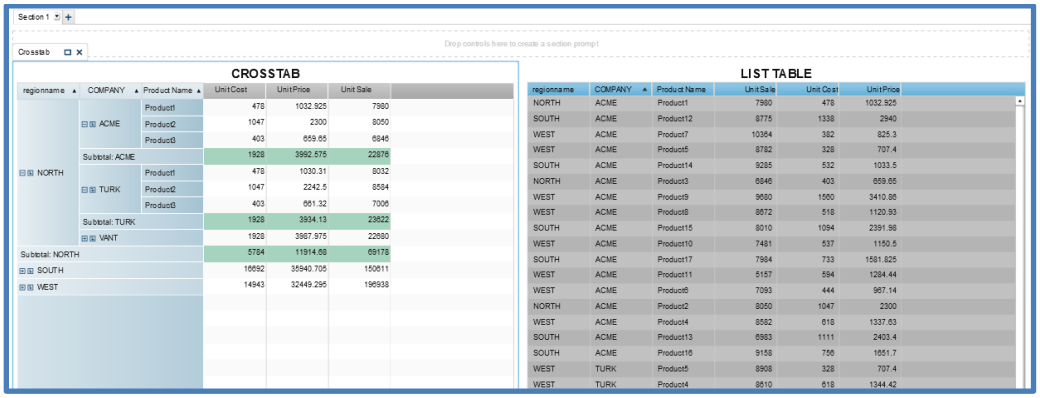

Figure 13 - Table Examples

GRAPHS

Visual Analytics offers 13 types of out-of-the box graphs. It has most of the standard graphs: Bar Chart, Line Chart, Pie Chart, Tree Map, and Bubble Plot. It also allows for a combination of some of these charts, for example, the Dual Axis Bar-Line Chart.

A graph is added by either double clicking on the graph type or click-and-drag the graph type to the report section of the canvas. Just as it is for all objects, the tabs on the right allow for field assignment and graph formatting. The specific options are different based on what object is being used. For example, a Pie Chart would not have the same formatting options as a Line Graph.

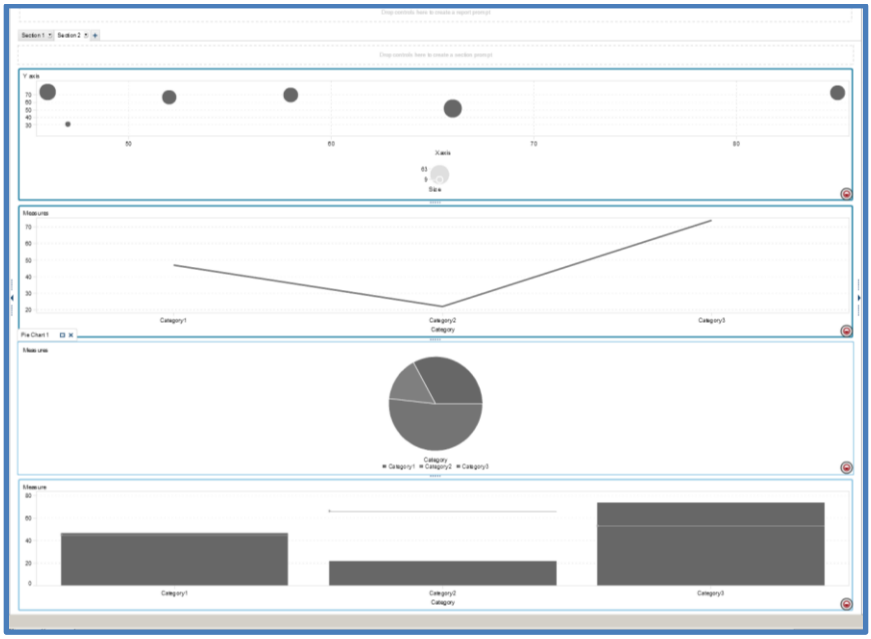

Figure 14 - Graph Examples

CONTROLS

After graphs or tables have been added to a report, it is sometimes useful to allow data filtering to be done dynamically by users. The Control objects allow this to happen. There are 5 types of Control objects:

- Drop Down List - This Control allows a list of values to be displayed when a drop down arrow is clicked. The user then chooses one value to filter the data it is set to affect.
- List – This Control lists all the values with check boxes next to them. By default it allows the user to click multiple values or it can be set to one value only. When the Allow multiple selections box is unchecked on the properties tab, the check boxes change to radial buttons.
- Button Bar – This Control is a bar with buttons on it. The buttons are populated with the values that represent the filter options. This control only allows one button to be selected at a time.
- Text Input - This Control allows for a user to type in a textbox to filter data. This uses a free form field and can be used to allow searching of fields.
- Slider – This Control is generally used for date filtering, although it can be used for other filtering. It can be set to a range or a single value. It can also be displayed horizontally or vertically.

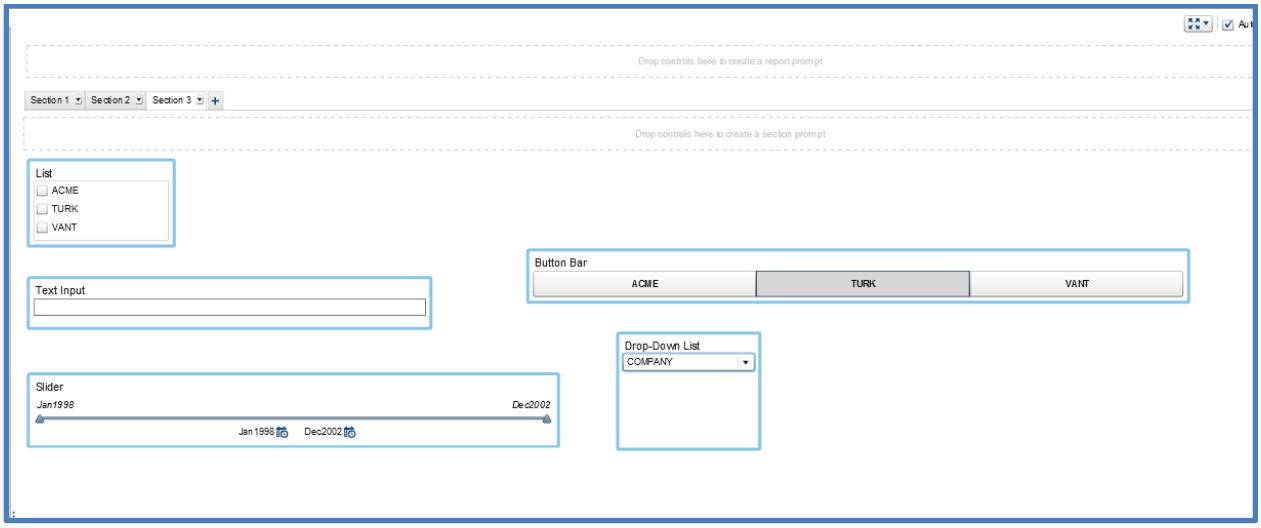

Figure 15 - Controls Examples

As with the other objects available for reports, the field assignment and options for each Control object are set using the tabs on the right side of the report designer screen. This controls borders, colors, fonts, size, etc. for each object.

CONTAINERS

Containers are used to help display the report objects in a uniform manner. This allows for uniform height/width of objects without having to set the values for each object. There are 4 types of containers:

- Vertical – A Vertical Container allows objects to be displayed vertically. The width of objects is controlled by the width of the container. The height of each object can be set individually.
- Horizontal – A Horizontal Container allows objects to be displayed horizontally. The height of objects is controlled by the height of the container. The width of each object can be set individually.
- Stack - A Stacked Container allows objects to be stacked on top of each other. This is used when only one of the objects is to be displayed at a time. The buttons at the top of the container are used to select an object be displayed.
- Prompt – A Prompt Container allows a multi-selection drop-down list to be added to the report and the ability to place a list control in a section or report prompt area.

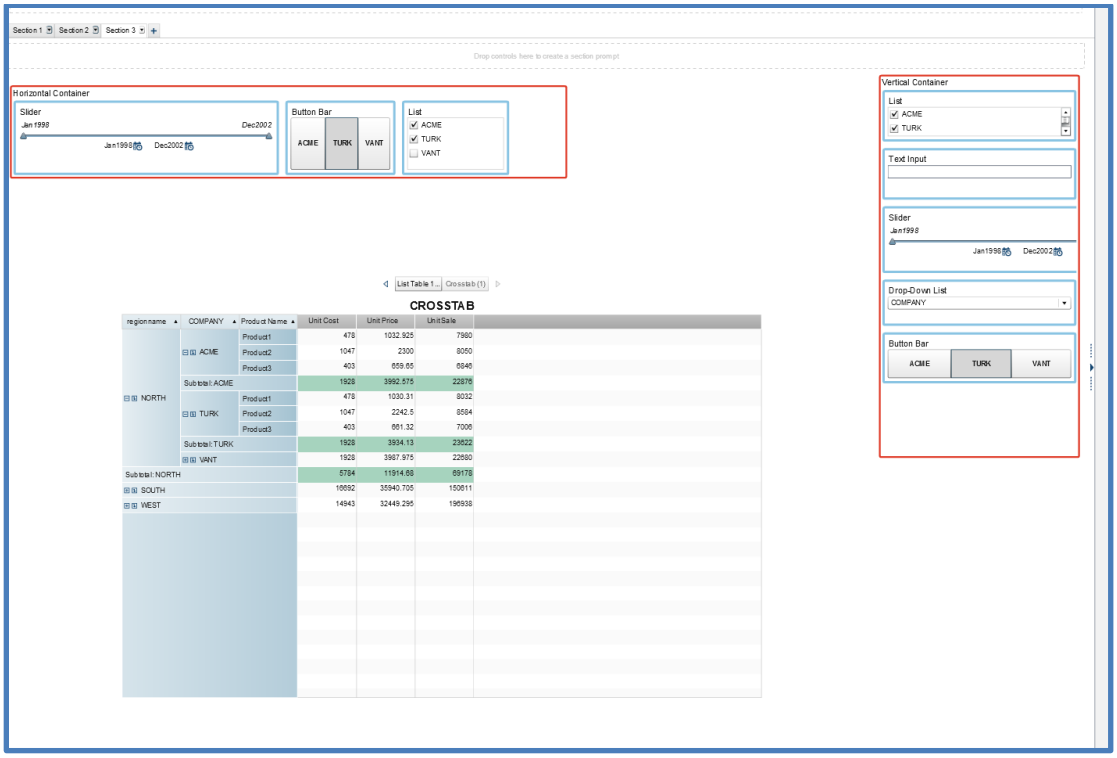

Figure 16 - Container Examples

OTHER

The Other objects section has a variety of objects available. This is where images or static text can be added.to the report. It also allows for Geo Maps, or Word Clouds to be used. Stored processes can be added in this section as well. Each object has properties, styles etc. that can be modified to fit the report needs.

IMPORT TAB

The Import tab is used for importing reports that have been previously created into the report. Using the ***Select a report to import*** drop down box, a report that has been previously created can be selected to import into the current report. Once it has been imported, it is not linked to the original report. Updates to one do not affect the other.

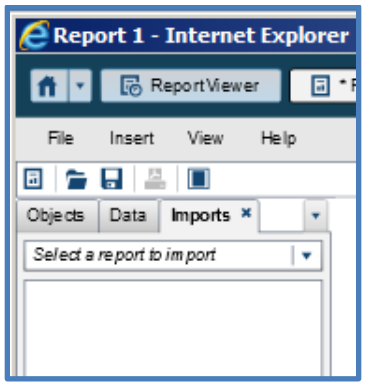

Figure 17 - Import Tab

REPORT CANVAS

The middle section of the Visual Analytics Development Environment is the canvas for the report. This is where the actual report exists. A report can be a single report with just one screen/page or it can be a multi-paged report. There are 3 sections to the report canvas

The top section is used for prompts or filters that relate to the entire report.

Figure 18 - Top Section VA Development Environment

The middle section is used for section prompts. This can be used for multi-page reports. Each page is referred to as a section or page. The section allows filters to affect only that page. When additional pages are added, tabs appear at the top and are used for navigation.

Figure 19 - Middle Section VA Development Environment

The bottom section is where the data is located. This is where the majority of the objects will be placed

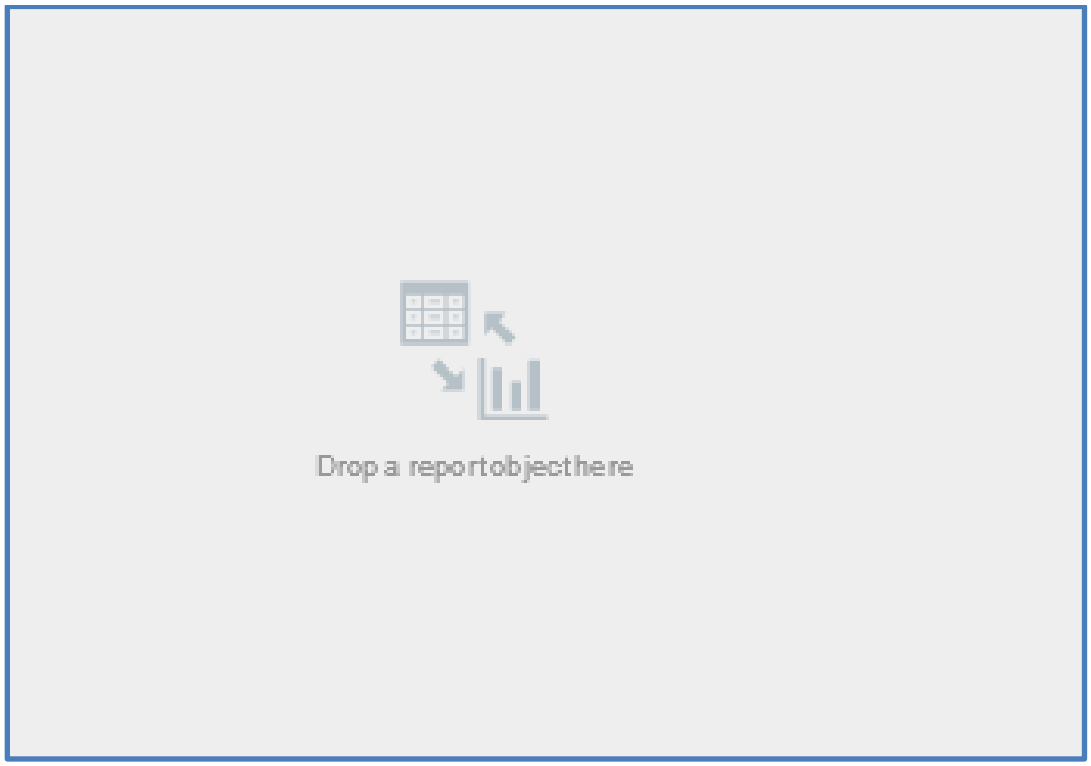

Figure 20 - Bottom Section VA Development Environment

Figure 18 - Report Canvas

REPORT OBJECT FORMATING

Formatting for all objects is done using the tabs at the right of the report designer screen. Before an object can be formatted, it must be selected. This can be done by clicking on the object, or using the drop down at the top of the formatting section to select the object to be formatted.

There are 4 tabs shown by default: Properties, Styles, DisplayRules, and Roles, but there are more tabs available. The additional tabs can be added using the drop down box to the right of the default tabs. Because the available options differ for each object type, the following is an overview of the options available for object customization on these tabs.

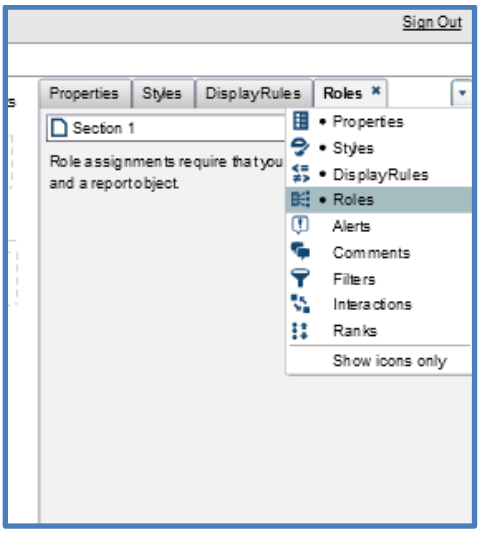

Figure 21 - Additional Formatting Tabs

PROPERTIES

The Properties tab can be used to customize properties for the objects that are in a report. Each set of properties is dependent on the object that has been listed. The properties available to customize can vary quite a bit depending on the object. The Properties tab offers customization for the title, size and position, axis and labels when appropriate.

One property that can be extremely useful is a property that is at the Section level. This controls the layout of the objects on the report canvas. The Layout option has 2 choices: ***Precision* or *Tiled***. ***Precision*** allows the size and placement of objects to be customized. ***Tiled*** forces the objects into a tile presentation. The objects are forced to fit the screen size which may not be appropriate for all reports.

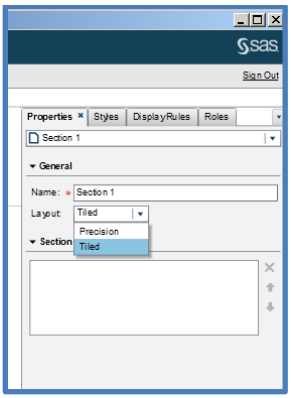

Figure 22 - Section Layout Property

STYLES

The Styles tab is not available for all objects. This tab controls border, outlines and text attributes. Some objects have lots of attributes that can be customized on this tab, and others have just a few.

DISPLAYRULES

The DisplayRules tab is not available for all objects. This is used when data should be displayed with certain colors depending on a field's value. This can be used with either numeric or categorical data.

ROLES

The Roles tab is required for any object that needs data. This tab sets the field associated with an object. Depending on the object, the options available change. This tab lets you specify fields that apply to each part of an object. For example, the x and y axis of a bar chart.

ALERTS

The Alert tab is used to create alerts for subscribers to a report. Subscribers can be notified by email or text when an alert condition is met

COMMENTS

The Comments tab is used to add comments to a report. Comments can be viewed by clicking on the comment icon when the report is being viewed.

FILTER

The Filter tab is used to add a data filter to an object. This is used when an object in the report is only supposed to show a subset of the data. Similar to the data source filter, except at the object level.

INTERACTIONS

The Interaction tab is used for interactions between objects. Interactions can be added using the ***New*** button or by using the ***Interaction View*** and then click and drag between. When necessary a mapping is required to determine how the background tables should be joined.

RANKS

The Ranks tab allows the data displayed in objects to have a rank. For example, it may only be necessary to display the top 5 sales people in the report. The Rank tab allows this to be set with a ranking for an object. If the rank is set to 5 then only the top 5 items will be displayed.

CONCLUSION

This has been just an overview of how to get around in Visual Analytics. It has introduced the basics of creating reports. It described where to add data to the report and then how to add objects that will be used to display that data. And as indicated each object has its own set of customization abilities that can make the report as fancy and involved as needed. Hopefully this gives enough exposure to get started. The best thing to do is get in and play.

REFERENCES

SAS® Visual Analytics 7.4 User's Guide
https://support.sas.com/documentation/cdl/en/vaug/69957/HTML/default/viewer.htm#titlepage.htmThis

RECOMMENDED READING

- *SAS® Visual Analytics 7.4: User's Guide*
- Contact Information

Your comments and questions are valued and encouraged. Contact the author at:

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