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What's New in SAS® Visual Analytics? Smart Business Intelligence, Smart Analytics

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ABSTRACT

The new SAS® Visual Analytics provides a richer reporting experience with the combined editor and viewer. It provides better suggestive user assistance that is embedded in the **user's flow of working with data an**d content. It gives the report author the ability to provide exploring features for report consumers. There are more ways to interact with the visuals. Sharing and reuse are made easier. The automated explanation object allows for enhanced storytelling with analytics.

INTRODUCTION

The new features in SAS Visual Analytics deliver a giant leap in the user experience towards exploring data, uncovering insights, summarizing findings, and sharing them broadly. They make the software easier to use for data scientists, report builders, casual business users, and pure content consumers. SAS Visual Analytics does this by being smarter at getting started, smarter at building reports, and smarter at sharing insights. This paper provides an overview of the major enhancements in user experience for the software released in 2019.

SMARTER WAYS TO START

Start with beautifully designed dashboard templates and take the guesswork out of styling and layout decisions. Pick up where you left off with the all-new home pane. Quickly view and edit your report with a seamlessly integrated interface.

CREATE BEAUTIFUL REPORTS WITH EASE

Page templates create an all-new experience from the start. Rather than focusing on how to lay out objects on the page, or worrying about styling, the templates allow for complete attention to be on the data story. See Figure 1. Available Page Templates. Each new page displays the available templates.
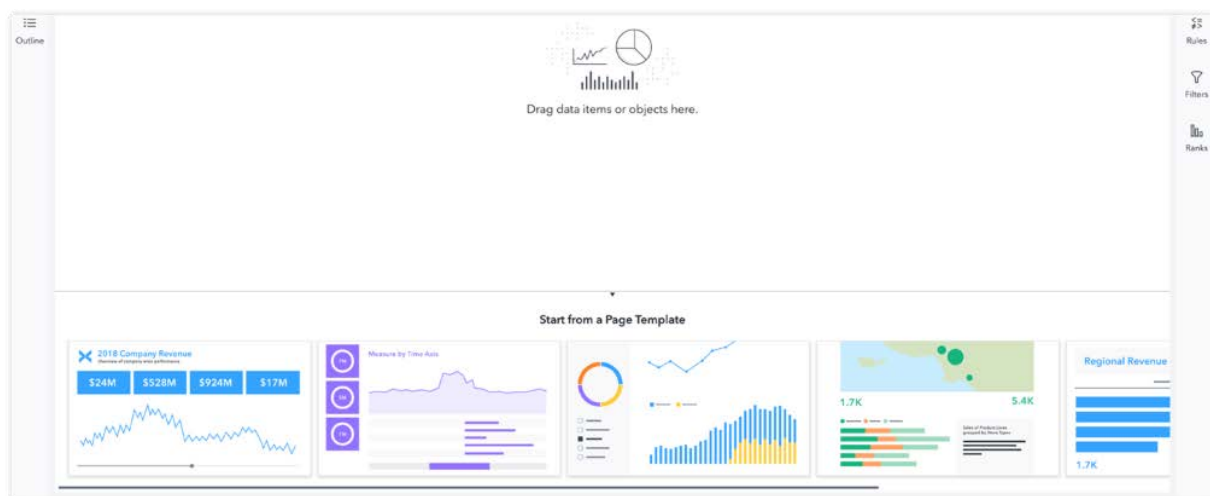

Figure 1. Available Page Templates

With a single click, a beautifully designed dashboard is added to the page. The focus is now on data input and creating a compelling story without worrying about the layout or the colors. See Figure 2, which shows one of the new templates.

Figure 2. A New Page Template on the Canvas

VIEW AND EDIT, INSTANTLY

Gone are the days of launching a separate application to preview a report. Simply click a toggle near the top of the interface and the report experience is switched between editing and viewing the report. Viewing a report this new way alleviates layout discrepancies and ensures that the integrity and layout of a report remains. Figure 3 demonstrates the new report viewing experience.
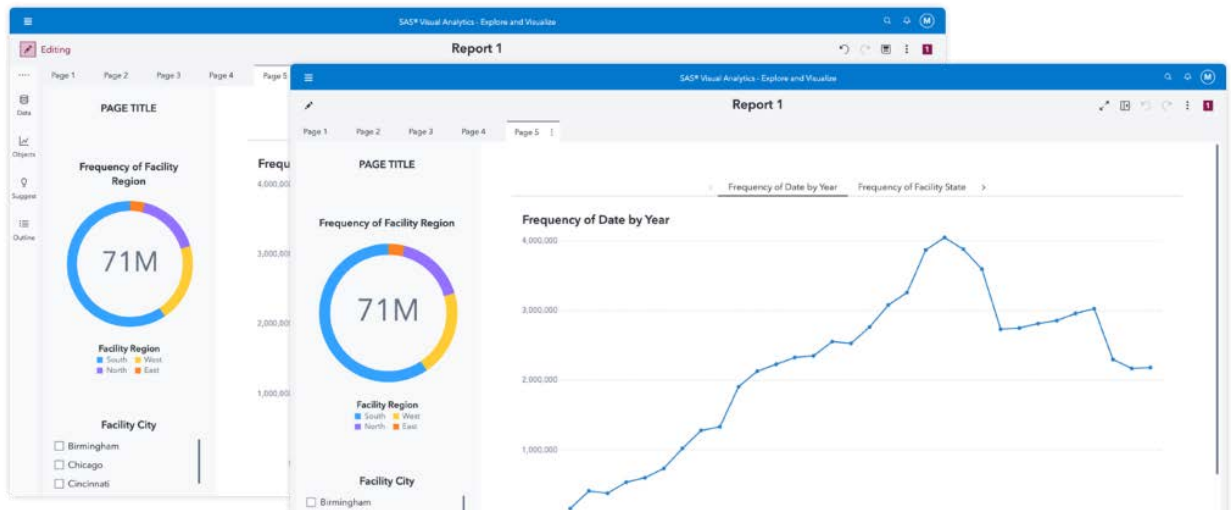

Figure 3. Layouts for Viewing and Editing Reports

A QUICK HOME PANE

A new home pane enables you to quickly access your favorite reports, recent reports, shared reports, and all your SAS Content. The home pane makes beginning a report from a new data set or starting from a previous session more efficient than ever. Powerful sorting, filtering, and searching options that are customized for your browsing preferences ensure the ease of use. Toggle the table view for a more condense browsing experience. Figure 4 shows the new home pane.
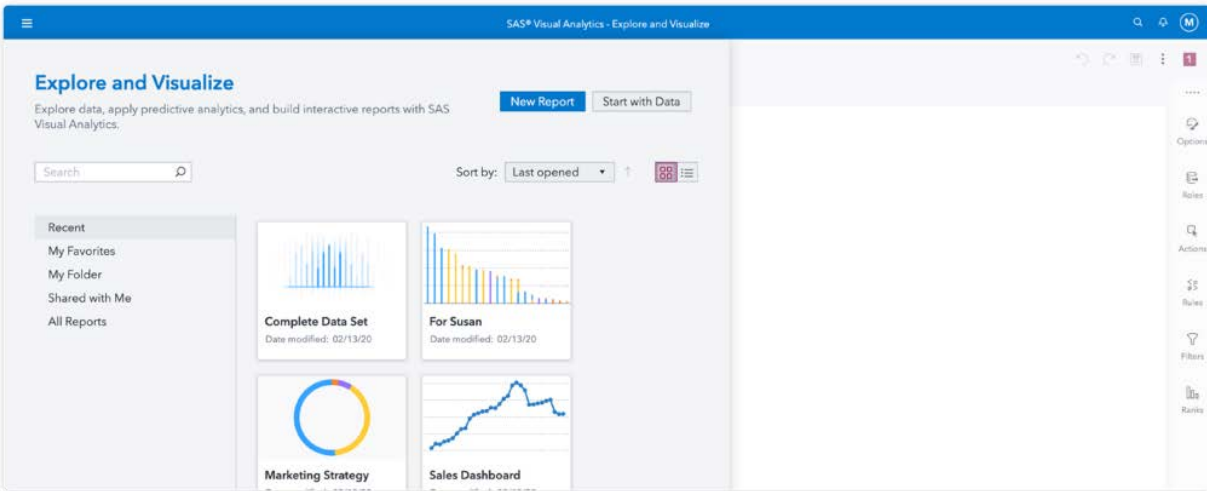
2

Figure 4. The New Home Pane

THE SUGGESTIONS PANE

SAS Visual Analytics continues to provide powerful data-driven decision making to businesses. Visualization suggestions extend these capabilities into an all-new Suggestions pane. This new pane automatically generates visualizations based on your data set. Simply drag and drop these objects onto the report canvas or use these suggestions to gain new insights into your data. Figure 5 shows charts in the Suggestions pane.
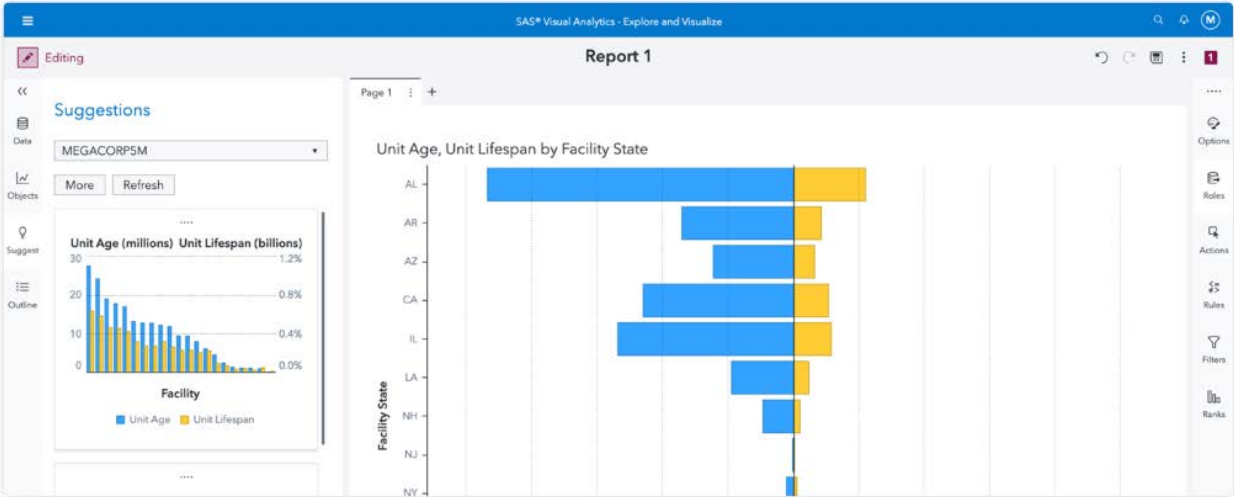

Figure 5. The New Suggestions Pane

LEARN WITH THE NEW PRODUCT TOUR

Learning how to use a new application can be tough. To help ease the learning curve, this release of SAS Visual Analytics includes a product tour. The product tour briefly shows you where the features of the application are found and offers a brief explanation of how these powerful features can assist you in report building. See Figure 6. This seven-step product tour makes getting started even smarter.
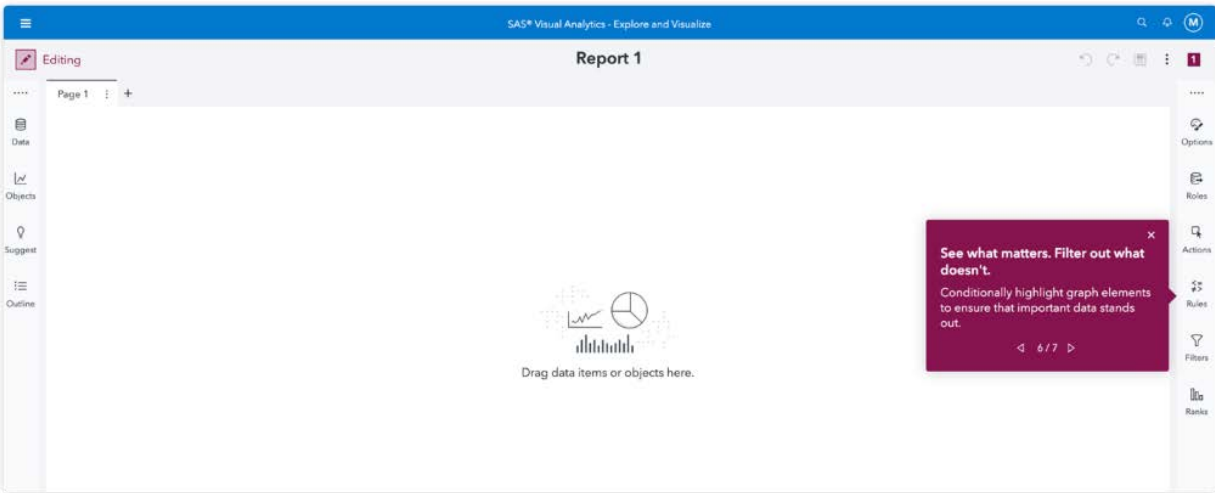
Figure 6. The New Product Tour

SMARTER LAYOUT GUIDES

In SAS Visual Analytics, the layout guides are smarter. The layout guides respond to a click rather than a drag. Additional smart layout guides enable you to ensure that adjacent objects are the same height or the same width. Figure 7 shows some of the new smart layout guides in action.
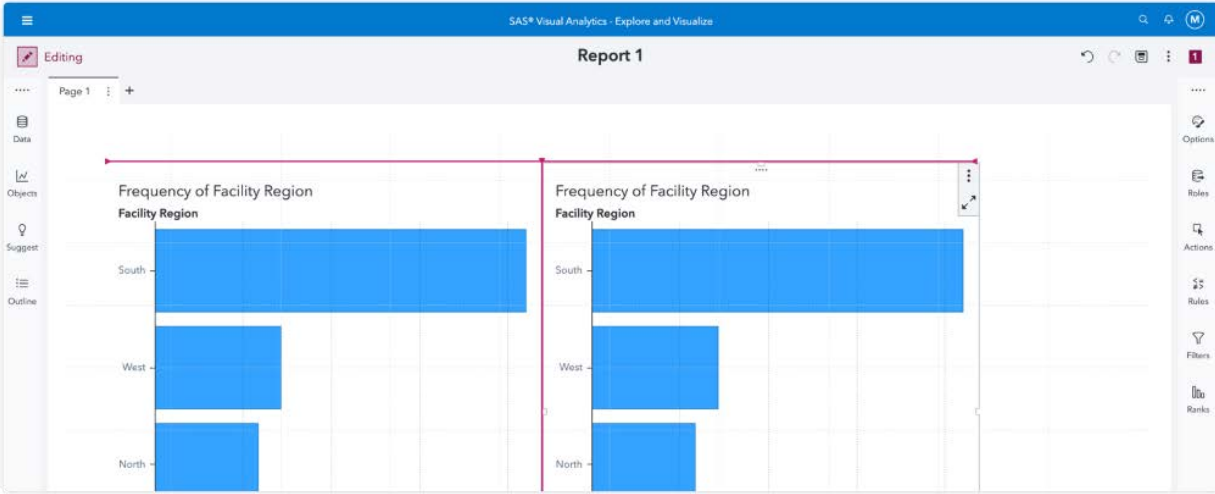

Figure 7. The New Layout Guides

SAVE OBJECTS WITH DATA

Any object in SAS Visual Analytics can now be saved as an object with data, which means that you can save your chart template, with data assignments, to the Objects pane. This functionality allows for the ability to use the same chart across multiple pages, or reports, with ease. See Figure 8 for an example of a graph saved with data.

Figure 8. A Graph Saved with Data

SMARTER WAYS TO BUILD

You can assign data to your visualizations with the click of a button. You can see insights into your data inside the Data pane, which leads to better role assignments. You can build reports faster by using the powerful pop-up menus and tools that speed up your workflow.

ASSIGN DATA IN A SMARTER WAY

Instead of dragging and dropping data items onto your objects or assigning data using the Roles pane, you can now assign data from the object on the canvas**. Click the new "Assign Data" b**utton that automatically appears on all your objects. The enhanced pop-up menu makes data role assignments a breeze. Figure 9 shows the pop-up menus.
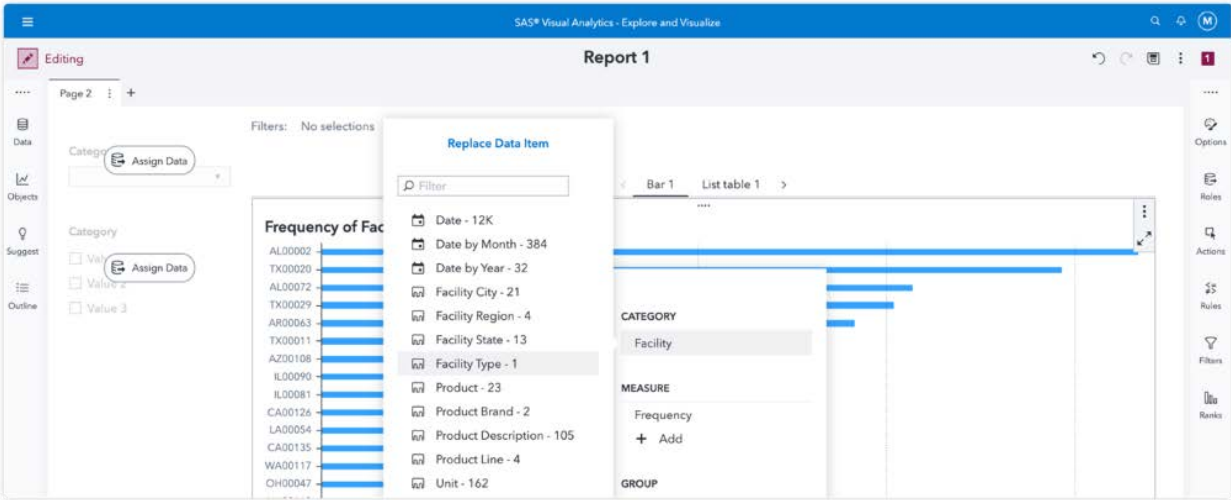

Figure 9. The New Features for Assigning Data

ENHANCED POP-UP MENUS

The pop-up menus for all report objects have evolved to keep up with increased features and to enhance in-context editing. New object-level features have been added and some redundant ones have been removed. In graphs, the context menus complement the new options toolbar. Figure 10 shows an updated pop-up menu.

In list tables, options such as hiding columns, column headings, and totals have been added to the pop-up menu. These new options join the table-management features, such as freezing columns, grouping values, wrapping text, and showing abbreviated cell values.

In graphs, the pop-up menu now includes the options for measure layout (axis graphs), grouping style, grouping scale, showing various labels and the legend, grouping category values, and displaying the new options toolbar.
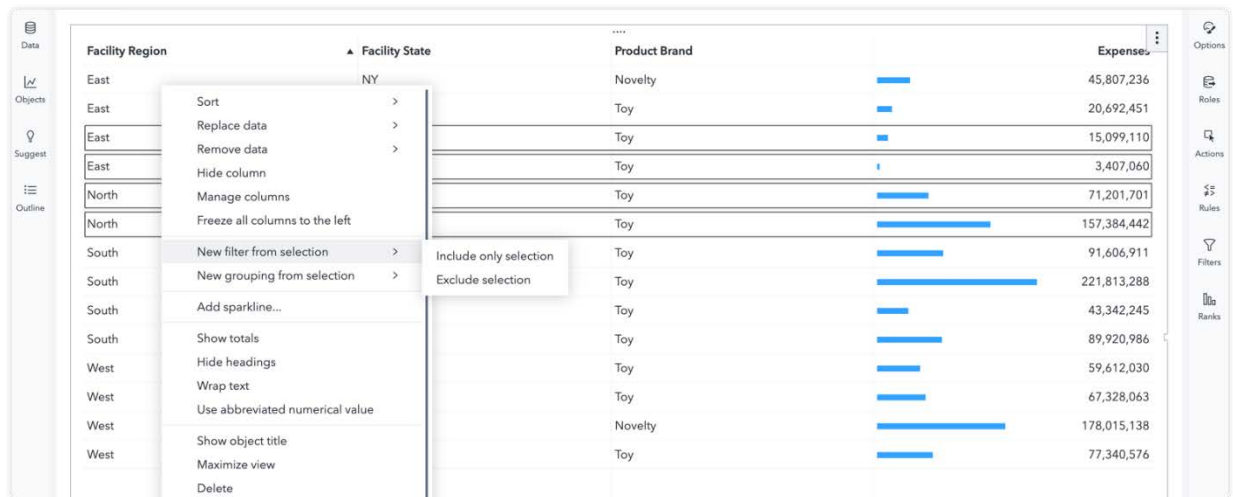

Figure 10. New Pop-Up Menus

OPTIONS TOOLBAR

All new object-sensitive toolbars make it easier to change object-level options without using the Options pane. You can toggle the toolbar to change the direction of your bars in a bar chart, change the marker size in your line chart, or change the style of your pie chart. Figure 11 shows the power behind one of these new object toolbars.
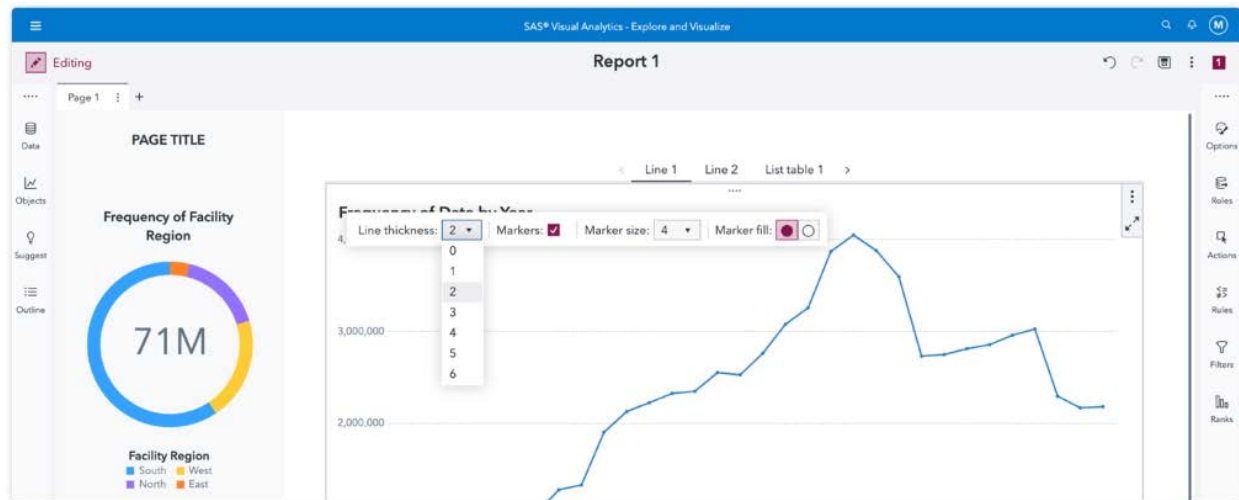

Figure 11. Example of the New Options Toolbar

ALIGN OBJECTS WITH EASE

When you use a precision container, you can ensure that your layout is just the way you want. Now when you have multiple objects inside a precision container, you are able to

command click several objects and new alignment options appear in the toolbar at the top of the application. See Figure 12.
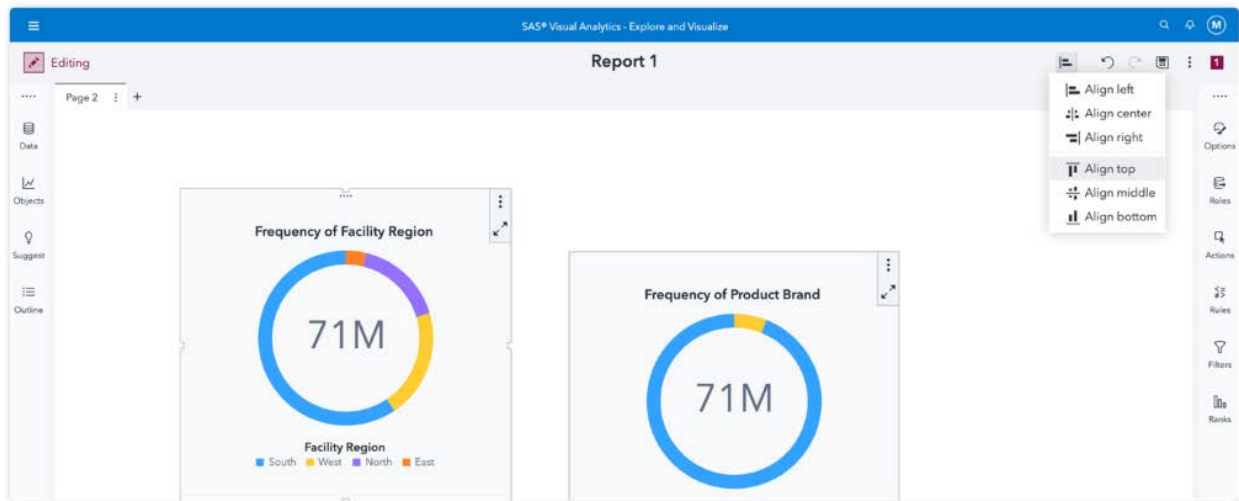

Figure 12. Aligning Objects in a Precision Container

NEW WAY TO GROUP CATEGORY VALUES

Multiple category values in an object, like rows in a table, or bars, or pie segments, can be selected and grouped into one value using the pop-up menu. The newly created group is a custom category that persists though the process of data exploration. A group can similarly be ungrouped to display its respective category values. See Figure 13.
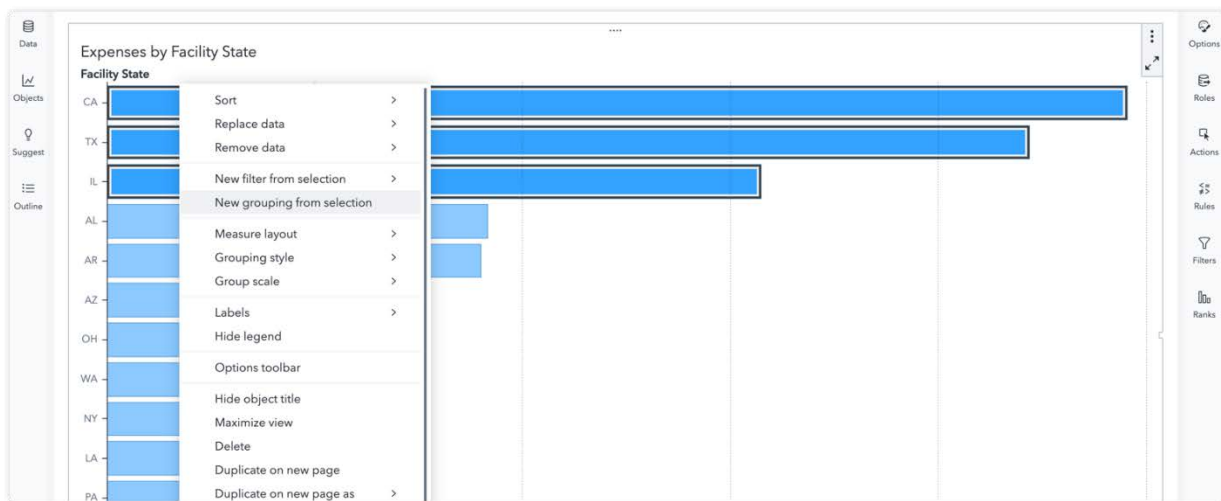
Figure 13. Grouping Multiple Category Values in a Bar Chart

NEW PAGE CONTROL OPTIONS

Page controls enable you to add filters that automatically filter individual pages inside the page prompt area. Now, in the latest release of SAS Visual Analytics, you can orient these controls on the left, right, top, or bottom of your page. Selecting either left or right enables you to add more objects to these page control areas, including a list object. Figure 14 shows some of these new options.

Figure 14. A List as a Page Control

SMARTER INSIGHTS

Empower report viewers to explore content and uncover insights by themselves. Share these insights with your peers. With a single click you can find predicted values that are driven by powerful analytical models. Use new visualizations and enhanced features to manipulate data and record your findings.

NEW VIEWER CUSTOMIZATIONS

Authors of reports can now provide viewers with more ways to modify the report. Three levels of viewer customization provide increasingly powerful ways for report consumers to customize content and explore data. See Figure 15 for some of these features.

The first customization level allows simple actions. This enables viewer users to sort data, toggle totals, change cell graphs, freeze or unfreeze columns, show or hide visualization labels, show or hide legends in charts, and change from stacked bars to grouped bars in a bar chart. A second level provides more comprehensive customizations and allows viewer users to change the object type. This allows them to change from a table to a chart or change chart types and possibly alter the original intent of the report. A third level provides control over the data in a report. Among other things, it enables a viewer user to change the data assignments, filters, and ranks for objects in the report.
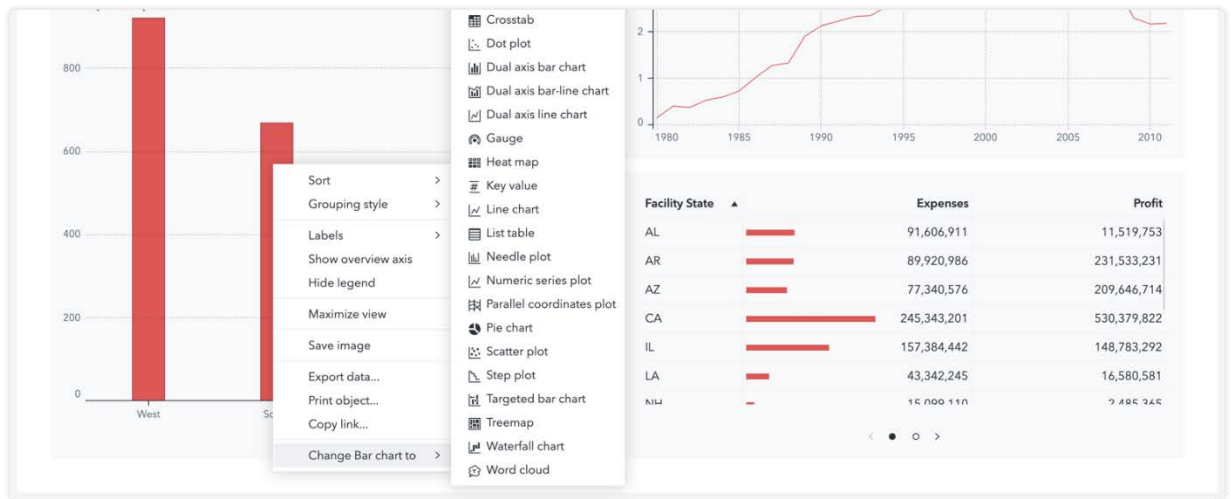
Figure 15. Viewer Customizations

SHARE REPORT

Authors of reports can share the report with another user or a group of users. For increased collaboration, authors can allow others to read and edit the report. They are notified of the shared report, which also appears in their Shared Folder in SAS Drive. These features are in addition to the comprehensive features to generate a sharable link to the report. See Figure 16.
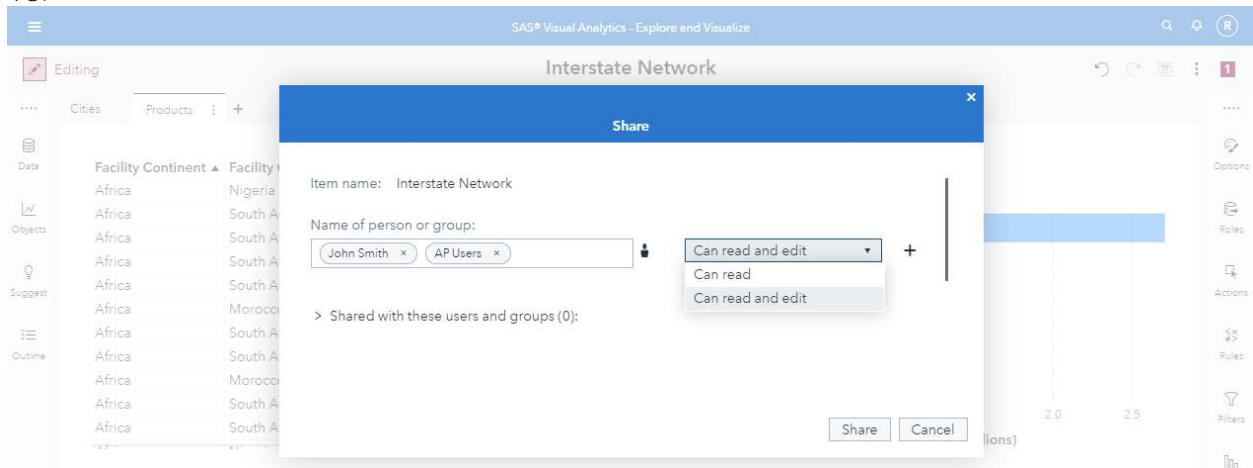

Figure 16. Sharing Reports

INSIGHTS BEFORE YOU START

Gaining insights into your data is now even easier. In this release of SAS Visual Analytics, you can see measures that have a high correlation without leaving the Data pane. Select a measure from your data set and SAS Visual Analytics automatically highlights the additional correlated measures, ensuring that you have the knowledge to create the highest-quality visualizations. See Figure 17.
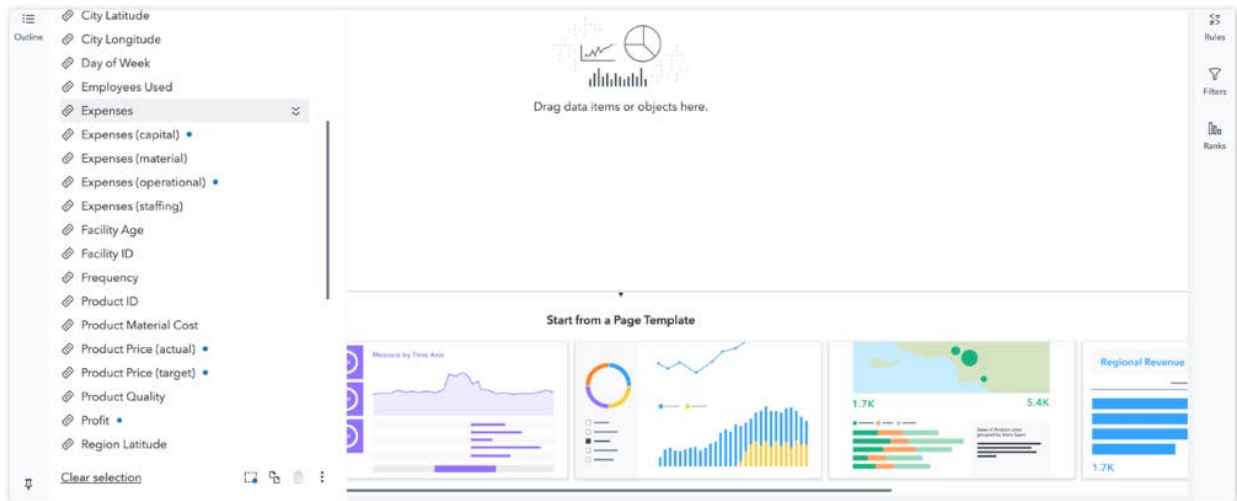
Figure 17. Correlated Measures

AUTOMATED PREDICTION OBJECT

A new object, automated prediction, enables you to predict the value of a selected variable based on the values of underlying factors in the data – in a single click! When a response variable is identified, the object runs several models assuming the remaining data as underlying variables. It then selects a champion model and displays its prediction with the underlying factors. In a What-If type user interaction, you can then adjust the factors to see changes in the predicted response variable. Expanding the object provides more details on the model that was used and the relative importance of the underlying factors. See Figure 18.
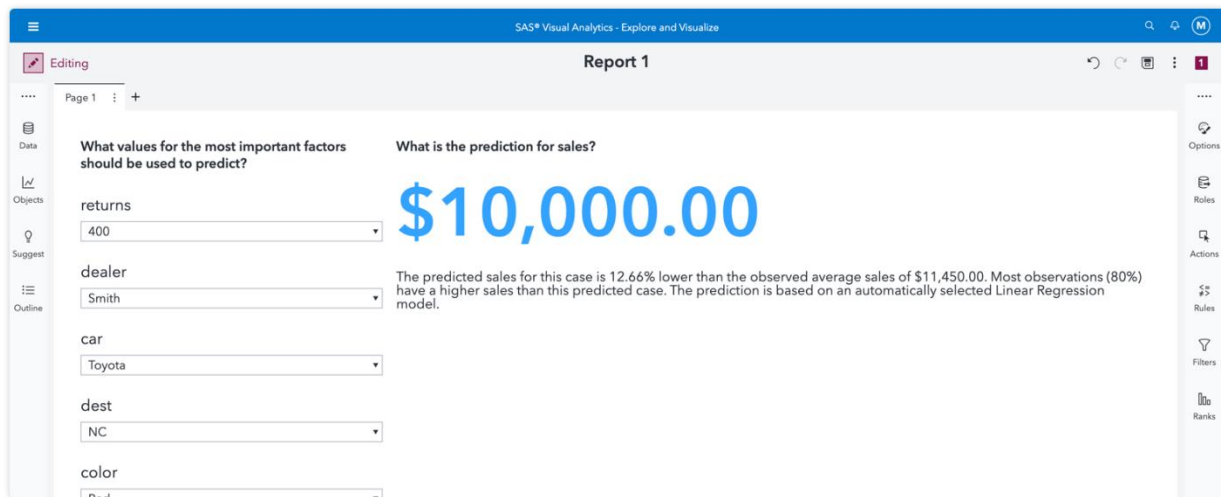
Figure 18. The Automated Prediction Object

CONFUSION MATRIX

The confusion matrix is a new visualization that provides insights into the prediction errors of a categorical response model. It summarizes the number of correct and incorrect predictions by the value of the response variable and is displayed in objects that model for classification variables, and in the Model Comparison object. See Figure 19.
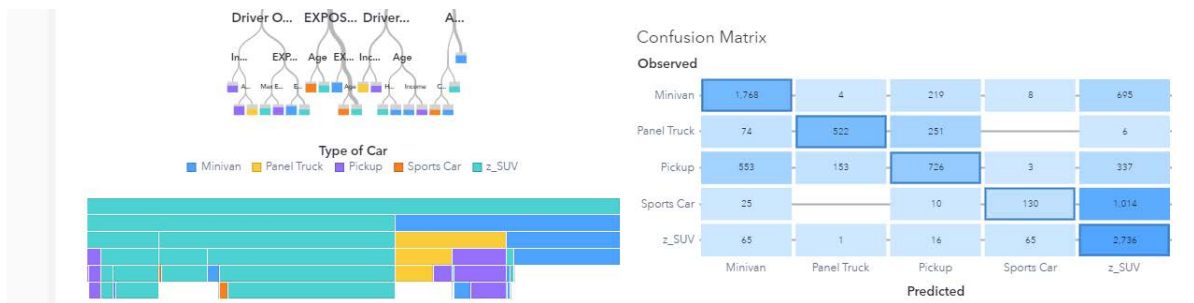
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Figure 19. Confusion Matrix

ENHANCED GEO MAPS

A set of five geo maps (geo contour, geo coordinate, geo network, geo region, and geo region-coordinate) enhance the feature set from the previous single geo map object. As before, you can easily toggle between the map objects. Region maps now support data values and labels. Centroids of custom map regions are automatically calculated. Further, the data providers that contain latitude and longitude coordinates are now supported, in addition to a polygon definition. Figure 20. Geo Maps shows the five geo maps in the objects pane.
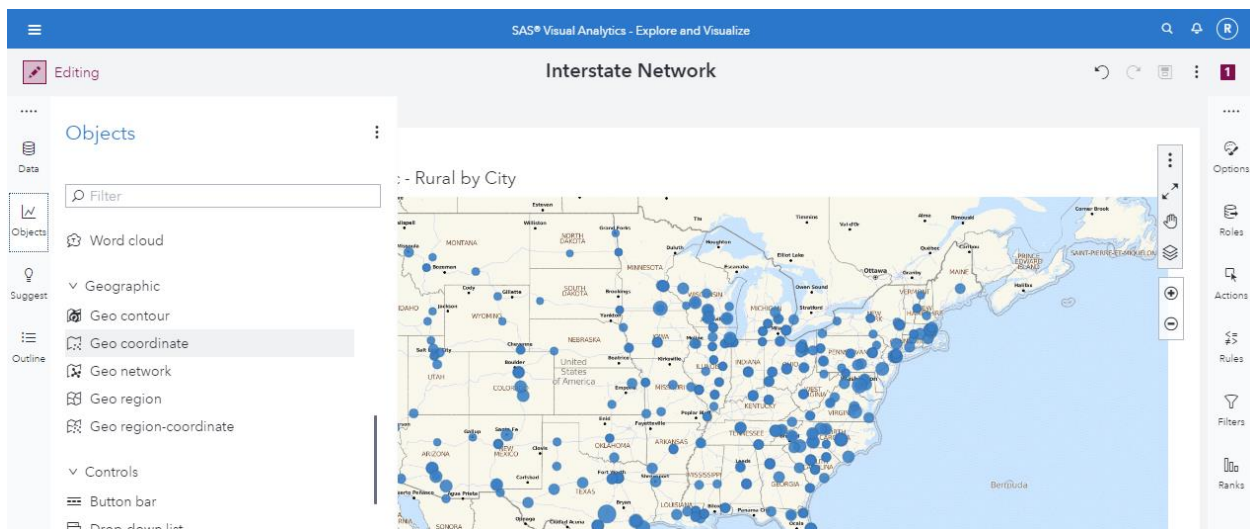
Figure 20. Geo Maps

FREEZE COLUMNS

List tables now support freezing and unfreezing columns to the left of a table. See Figure 21. A thicker line indicates the freeze line. Columns can be dragged into and out of the frozen column group. You can easily unfreeze columns using the pop-up menu for the frozen columns.

Figure 21. A List Table with a Frozen Column

DATES IN DISPLAY RULES

Date variables can now be used in expression-based display rules. A new calendar provides flexibility to select dates alongside the existing drop-down list of values. See Figure 22.

Figure 22. Selecting a Date for a Display Rule

ENHANCED DATA ITEM TOOLTIPS

Tooltips for data items in the Data pane now display the list of objects that use the data item. The tooltip also displays how they are used in each object, for example, whether they are used as a role, or in a rule, filter, or rank. See Figure 23. It also indicates if the data item is used in a hierarchy, a calculated item, or a common filter. The enhanced tooltip makes it easier to manage data in a complex report.

Figure 23. Data Item Tooltips

CONCLUSION

SAS Visual Analytics continues on the design journey of quicker and smarter ways to build and interact with business reports. More power features are made available for report consumers. The new features bring analytics to the forefront and provide new ways to share insights. They build on the groundwork that has been laid by previous releases of strong visuals, reusable building blocks, and rich analytics. The new features are organized around a modern, competitive, and smart user experience in a robust, enterprise-grade software environment. SAS Visual Analytics is well down the path towards becoming an open and versatile business reporting tool.

REFERENCES

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SAS Institute Inc. 2020. "What's new in SAS Visual Analytics 8.5" Accessed on February 17, 2020. https://www.sas.com/en_us/software/visual-analytics/new-features.html

SAS Institute Inc. 2020. Learn and Support page for SAS® Visual Analytics. https://support.sas.com/en/software/visual-analytics-support.html#documentation

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RECOMMENDED READING

SAS Institute Inc. "Overview of SAS Visual Analytics" (video) https://video.sas.com/detail/videos/sas-visual-analytics/video/4420977648001/overview-of-sas-visual-analytics.

Murphy, Travis. 2016. **"Infographics Powered by SAS**® Visual Analytics and SAS® Office **Analytics."** *Proceedings of the SAS Global Forum 2016 Conference.* Cary, NC: SAS Institute Inc. Available https://support.sas.com/resources/papers/proceedings16/SAS3360-2016.pdf.

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