Share Your SAS® Visual Analytics Reports with SAS® Office Analytics

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ABSTRACT

SAS® Visual Analytics allows you to conduct ad hoc data analysis, visually explore data, develop reports, and then share insights through web and mobile tablet apps. You can now also share your insights with colleagues using the SAS® Office Analytics integration with Microsoft Excel, Microsoft Word, Microsoft PowerPoint, Microsoft Outlook, and Microsoft SharePoint. In addition to opening and refreshing reports created using SAS Visual Analytics, a new SAS® Central view allows you to manage and comment on your favorite and recent reports from your Microsoft Office applications. You can also view your SAS Visual Analytics results in SAS® Enterprise Guide®. Learn more about this integration and what is coming in the future in this breakout session.

INTRODUCTION

Most users want to use popular productivity tools to read and write documents, analyze data, share information and collaborate before making decisions and taking action.
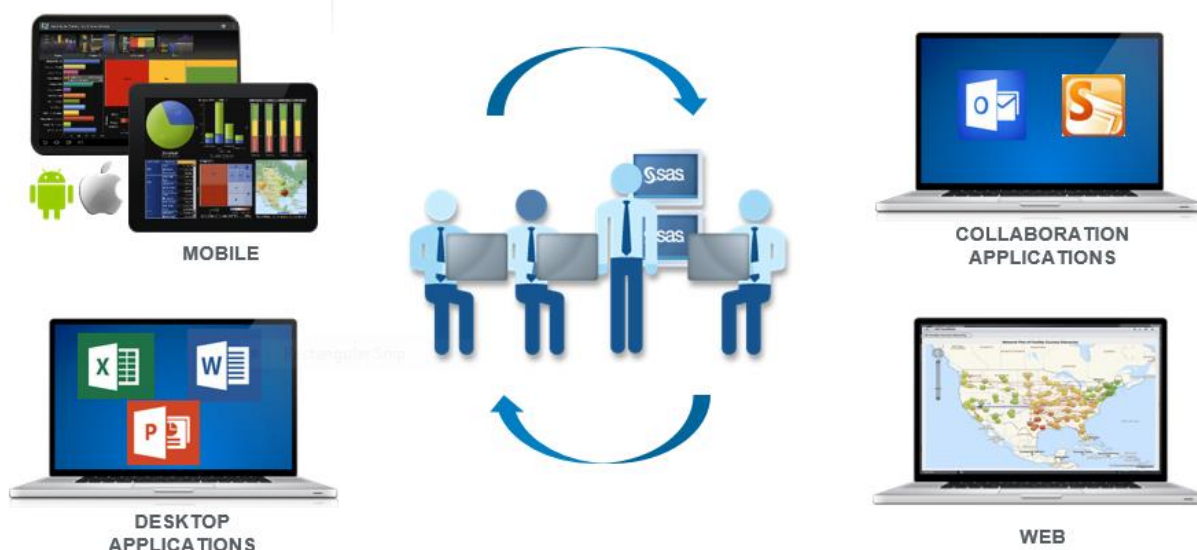
Figure 1: SAS Office Analytics Adds Convenient Access to SAS Visual Analytics from Different Productivity Clients

SAS Visual Analytics is easy to consume in web and native mobile tablet applications. By integrating SAS Office Analytics and SAS Visual Analytics, SAS brings SAS Visual Analytics reports to popular desktop productivity and collaboration applications. Microsoft Office is the leading productivity suite with over one billion users according to Microsoft.[1] This paper covers the integration of SAS Visual Analytics with Microsoft Office, Microsoft SharePoint, and SAS Enterprise Guide. For more general information about SAS Visual Analytics, see www.sas.com/software/visual-analytics.

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[1] Microsoft Corporation (2013). Microsoft by the Numbers. Available at http://www.microsoft.com/en-us/news/bythenumbers/index.html. Accessed on December 19, 2013.

SAS OFFICE ANALYTICS

SAS Office Analytics is a separate, stand-alone offering that enables businesses of all sizes to access the power of SAS through Microsoft Office add-ins, SharePoint integration, and guided analysis and SAS programming. (See www.sas.com/technologies/bi/office-analytics.html for more general information.)

SAS Office Analytics provides add-ins to Excel, Word, and PowerPoint that enable you to combine native Excel, Word, and PowerPoint functionality with SAS Visual Analytics reports. SAS Office Analytics also provides integration with Microsoft Outlook and SharePoint for collaboration. Finally, SAS Office Analytics provides integration with the popular rich desktop SAS programming and analysis application, SAS Enterprise Guide.

First, let's look at how SAS Office Analytics adds a custom ribbon to your Microsoft Office application. To reduce users' learning curves, the add-ins appear as customized ribbons and other elements that match the native application's user interface. Figure 2 shows the SAS Ribbon in Microsoft Word.
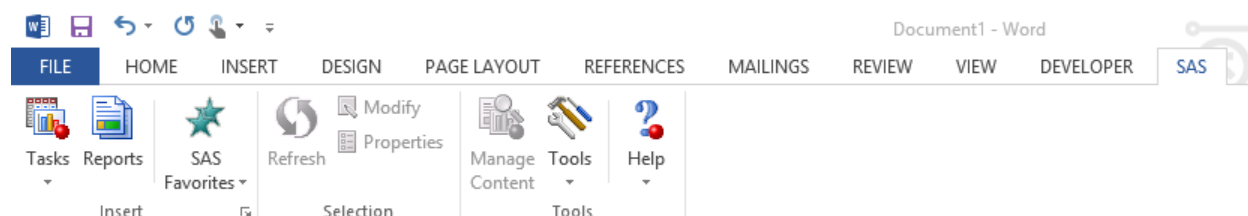
Figure 2: SAS Add-In for Microsoft Office Integrates with the Native Application's Interface

In this paper, we cover these integration points and provide examples using the 6.1 client applications in SAS Office Analytics with SAS Visual Analytics 6.2 and 6.3 server software.

SAS OFFICE ANALYTICS INTEROPERABILITY

The following tables show the interoperability between SAS Office Analytics and SAS Visual Analytics.

Table 1: Interoperability between SAS Add-In for Microsoft Office, SAS Enterprise Guide, Microsoft Office, and SAS Visual Analytics

Version of SAS Enterprise Guide (EG), SAS Add-In for Microsoft Office (AMO)	Date Shipped	Supported Versions of Office	Supported Versions of SAS	Supported Versions of SAS Visual Analytics (VA)	Additional Requirements
EG 4.3 AMO 4.3	Aug 2010	Office 2003, 2007, 2010[1]	SAS 9.2, 9.3[1]	None	[1]hotfix 10 or later required
EG 5.1 AMO 5.1	Feb 2012	Office 2007, 2010, 2013	SAS 9.2, 9.3, 9.4[2]	None	[2]hotfix 15 or later required
EG 6.1 AMO 6.1	July 2013	Office 2007, 2010, 2013	SAS 9.2, 9.3, 9.4	VA 6.1	
EG 6.1M1 AMO 6.1M1	Dec 2013	Office 2007, 2010, 2013	SAS 9.2, 9.3, 9.4	VA 6.2, 6.3, 6.4[3]	[3]hotfix 1 or later required

Table 2: Interoperability between SAS Web Parts, SharePoint Server, and SAS Visual Analytics

Version of SAS Web Parts	Date Shipped	Supported Versions of SharePoint Server	Supported Versions of SAS	Supported Versions of SAS Visual Analytics
SAS Web Parts 6.1	July 2013	SharePoint 2010, 2013	SAS 9.2, 9.3, 9.4	VA 6.1, 6.2
SAS Web Parts 6.11	Dec 2013	SharePoint 2010, 2013	SAS 9.2, 9.3, 9.4	VA 6.2, 6.3, 6.4

IT-MANAGED DATA, USER SELF-SERVICE

Most organizations have a workflow with IT-administered data. Knowledge workers want to analyze some of this data with Excel, write documents with Word, or present findings with PowerPoint. Let's look at how SAS Office Analytics integrates SAS Visual Analytics in each of these applications.

ADD SAS VISUAL ANALYTICS REPORTS TO MICROSOFT EXCEL

You can easily add and refresh SAS Visual Analytics reports to one or more Microsoft Excel worksheets. To open your SAS Visual Analytics content in Microsoft Excel, click the **Reports** button. After you select content in the Reports dialog box, you have the option to open the report in the existing worksheet or a new worksheet. If the SAS Visual Analytics report contains prompts, these prompts appear in a side pane when the Visual Analytics content is selected. Figure 3 shows a simple pie chart and the prompts from a SAS Visual Analytics report.
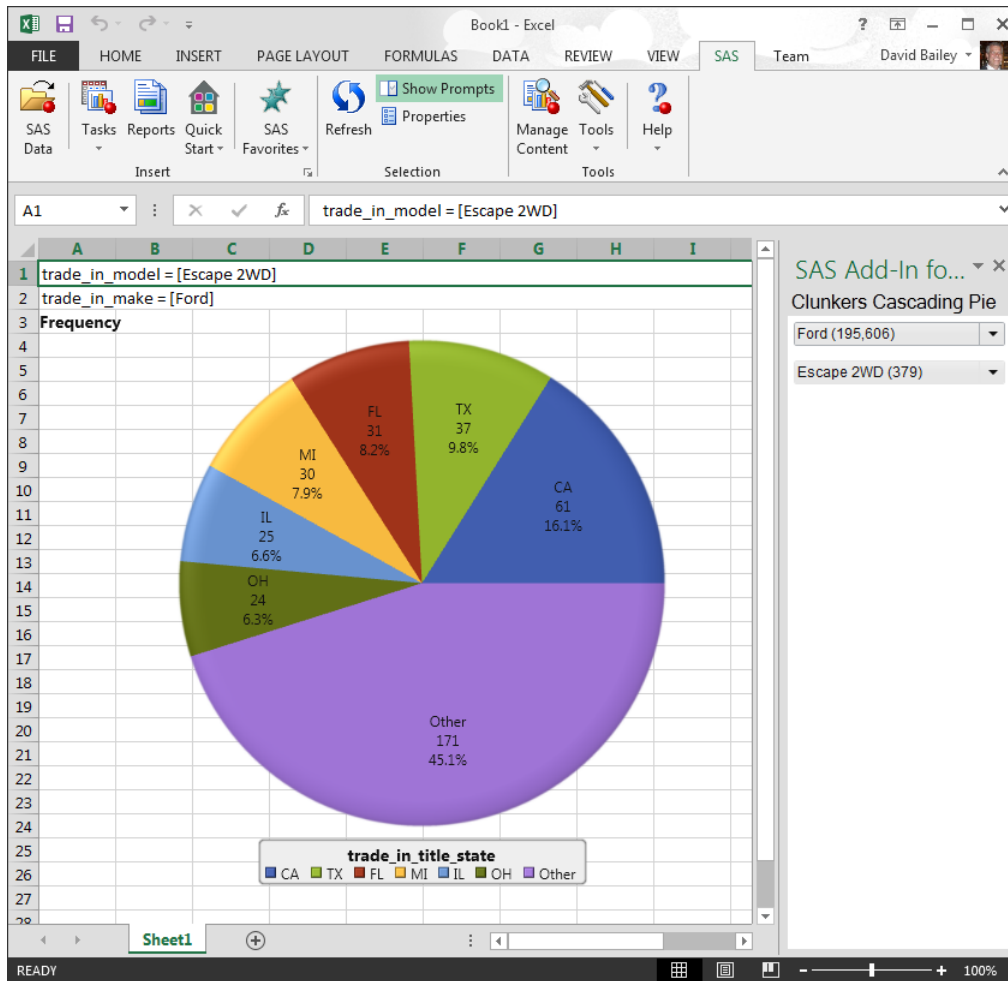

Figure 3: SAS Visual Analytics Report in Excel

You can add multiple SAS Visual Analytics reports (including reports that use different data sources) to your Excel worksheet. Using the functionality in Excel, you can customize your layout so that a single view can contain your

favorite report content and other content. In Figure 4, the Excel worksheet contains a SAS Visual Analytics graph, a SAS Visual Analytics table, and additional text fields.
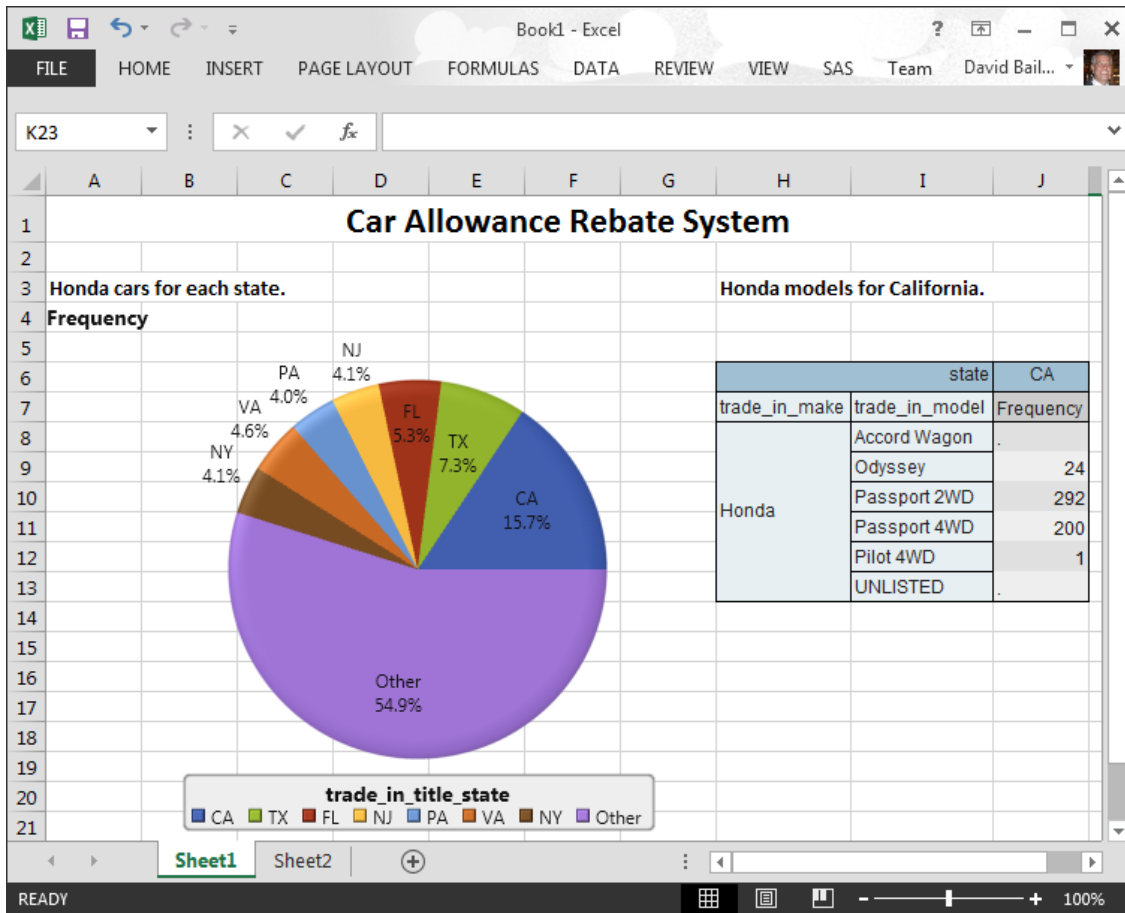

Figure 4: Multiple SAS Visual Analytics Reports in an Excel Worksheet

CREATE MICROSOFT EXCEL CONTENT BASED ON SAS VISUAL ANALYTICS REPORTS

You can use specific Excel features to complement your SAS Visual Analytics report. Let's start with a simple SAS Visual Analytics report in Excel.

Figure 5 shows a simple tabular output generated in SAS Visual Analytics and viewed inside Microsoft Excel.

Figure 5: Visual Analytics Table with No Modifications in an Excel Worksheet

Here are some Excel features that we can apply to this tabular SAS Visual Analytics report:

- **Data bars** - Select the cells in the **Weight** column and select **Quick Analysis**. Then select **Data Bars**.

- **Conditional highlighting** – Select the cells in the **Height** column and select **Quick Analysis**. Then select color scale.

- **Formulas** - Enter "=AVERAGEIF (B2:B20,"F", C2:C20)" in an empty cell to calculate the average female height.

- **Excel charts** – Select **Quick Analysis** and then charts.

Figure 6 shows the same SAS Visual Analytics report with these modifications. When the original SAS Visual Analytics table is refreshed, all of the additional Excel content (table highlighting, Excel formulas, Excel charts) are also refreshed. By using the native Excel capabilities on a SAS Visual Analytics report, you can add value to existing content and represent information in a way that best meets your needs.
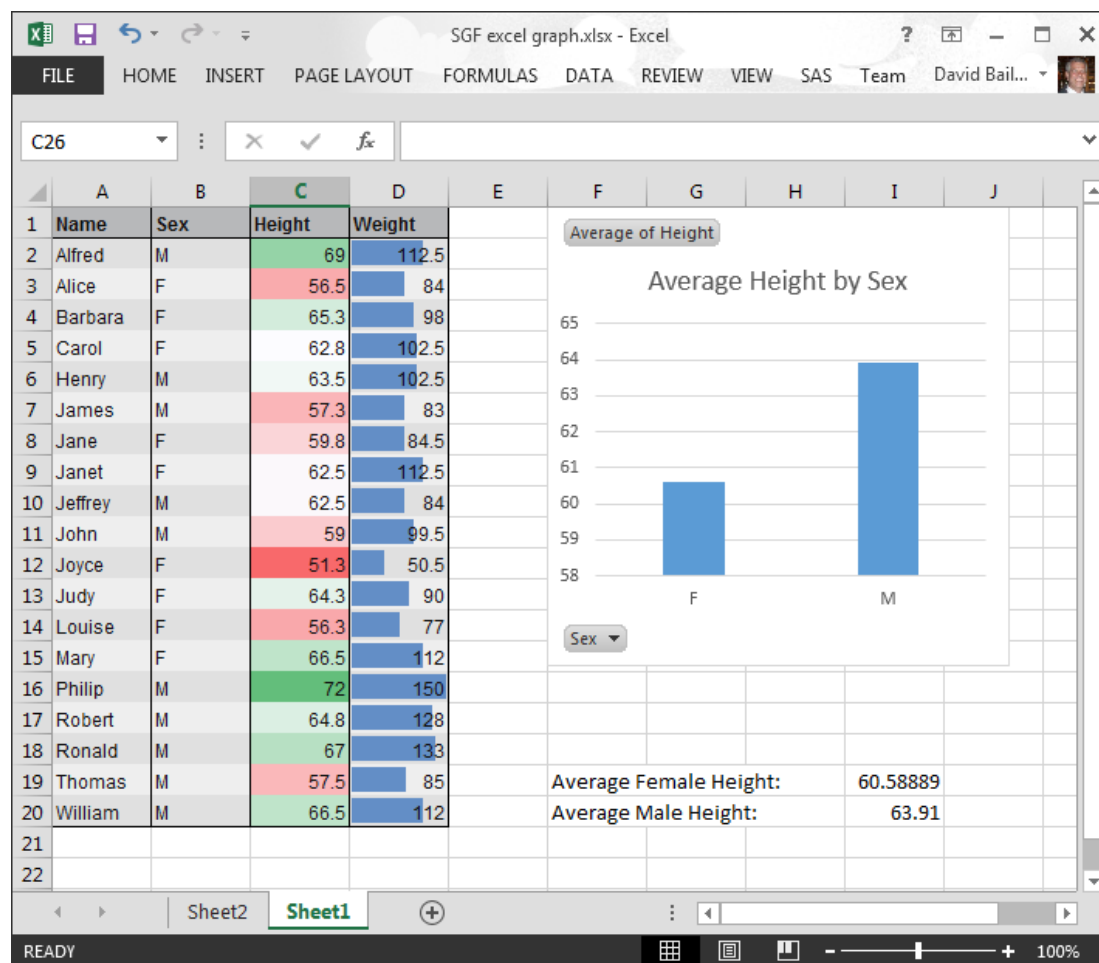

Figure 6: Excel Highlighting, Data Bars, Formulas, and Charts Created from a SAS Visual Analytics Report

RUN SAS TASKS ON YOUR SAS VISUAL ANALYTICS REPORT IN MICROSOFT EXCEL

The SAS Add-In for Microsoft Office includes a large number of tasks that can use your SAS Visual Analytics table as an input data source. When you select a task (such as the Distribution Analytics task), the Choose Data dialog box appears. If you selected content in a Visual Analytics table, the data selected in the Choose Data dialog box is the range of cells in Excel for the SAS Visual Analytics table.

For example, as shown in Figure 7, the SAS Visual Analytics table on the left is the input data source for the Distribution Analytics results on the right.
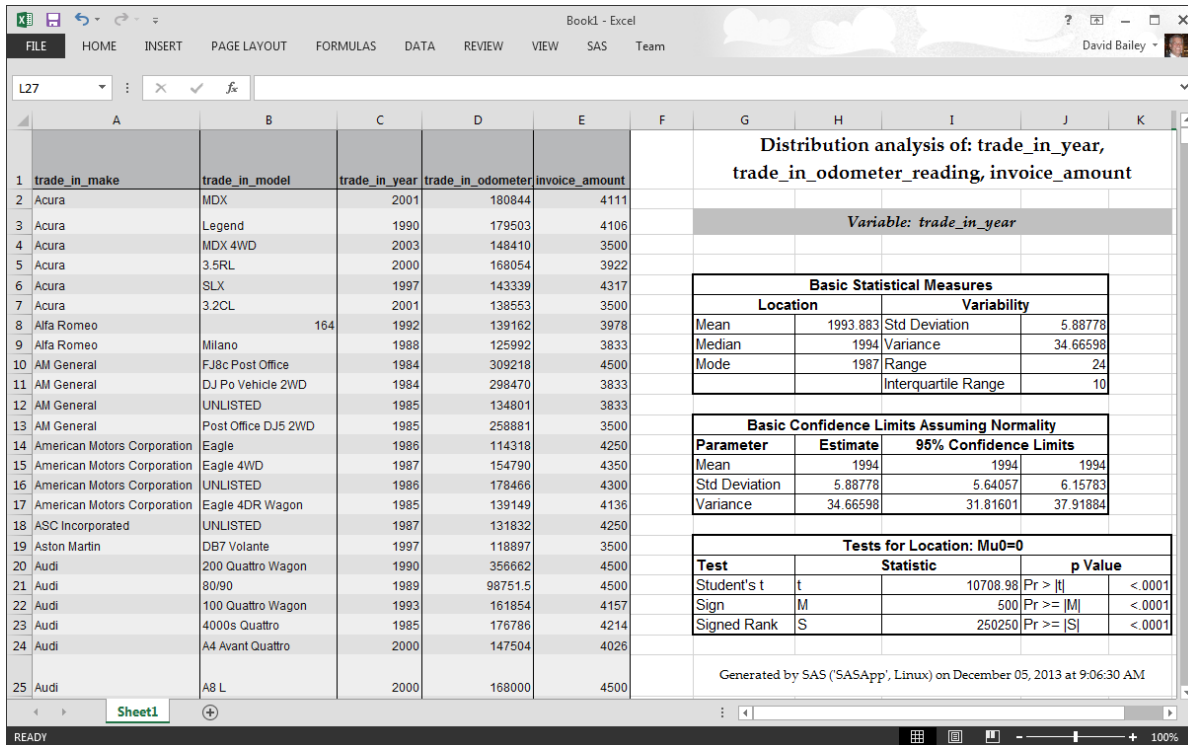
Figure 7: SAS Distribution Analysis Output Created from a SAS Visual Analytics Tabular Report

PRESENTING YOUR RESULTS IN MICROSOFT POWERPOINT

Many decisions require collaboration, which results from presentations either in internal meetings or in external client or customer presentations. SAS Office Analytics makes it easy to insert your SAS Visual Analytics reports you're your PowerPoint presentations. Using the native PowerPoint tools, you can add text or formatting or other context to help your colleagues understand the reports or analytics. Although you can run tasks in PowerPoint, usually you want to insert these SAS Visual Analytic reports into pre-defined internal or external templates according to your organization's designs. The SAS Visual Analytic report is inserted in you're the slide's placeholders. After the SAS Visual Analytics report is added, you can adjust the size and layout. The SAS Add-In for Microsoft Office remembers these changes when refreshing the report results. Figure 8 shows a sample report (including the user prompts) inserted across several slides in the presentation.
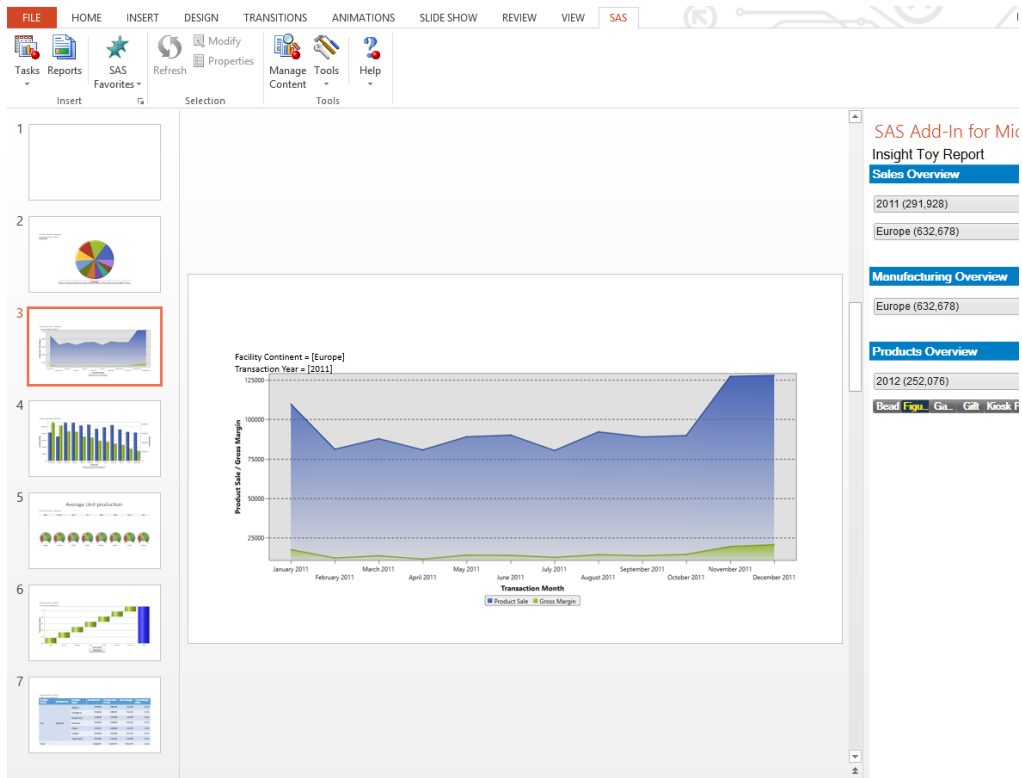
Figure 8: Inserting a SAS Visual Analytics Report into Microsoft PowerPoint

After you insert a SAS Visual Analytics report, you can refresh and obtain new data or results while keeping the same presentation look and layout. If you modify the prompt values in the report and run refresh, you can quickly and easily create different slide presentations for different business units or clients. The overall layout and organization of the presentation remains the same but the contents are updated to show the latest data or information. In order to share these presentaitons with others who do not have the SAS add-in or to create a static presentation (for example if you want to keep a historical view), you can specify which contents to remain static, so the SAS add-in does not refresh these data values. Figures 9 and 10 show an example of refreshing and changing prompt values.
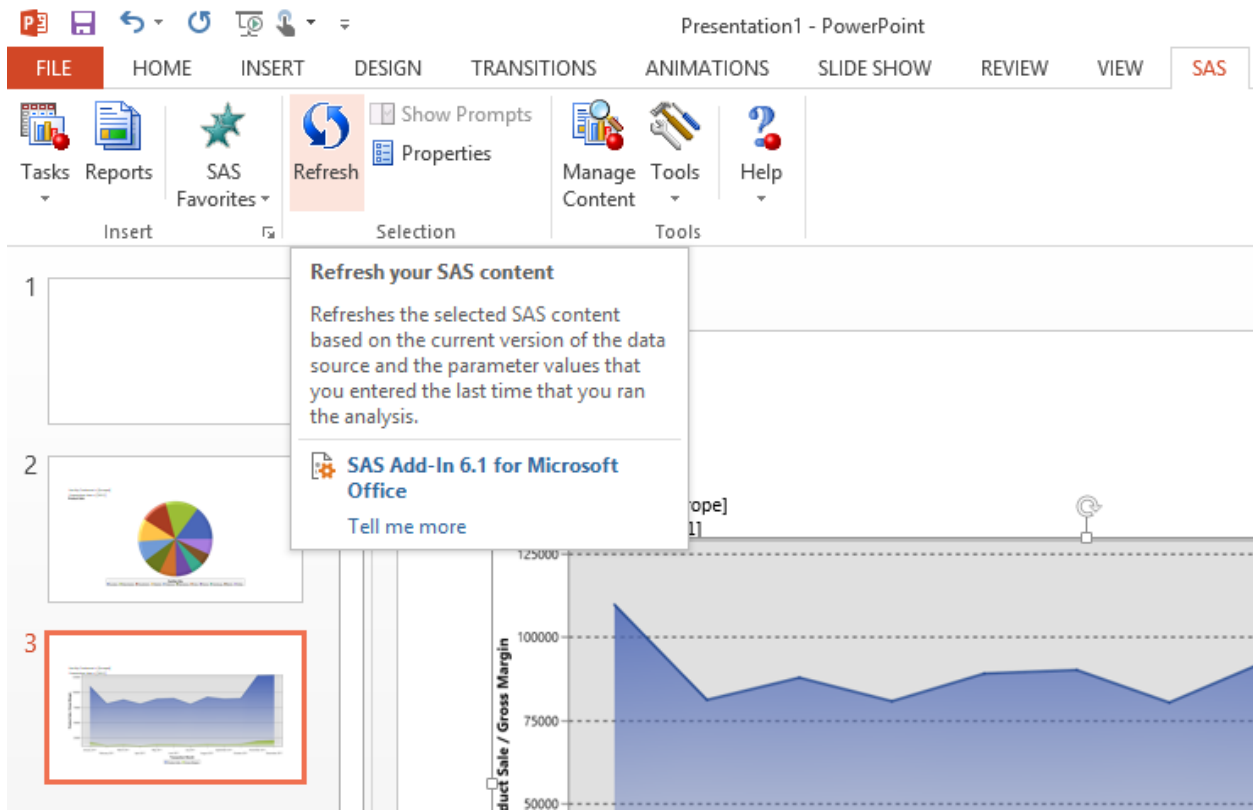
Figure 9: Refresh Your Reports to See the Latest Updates
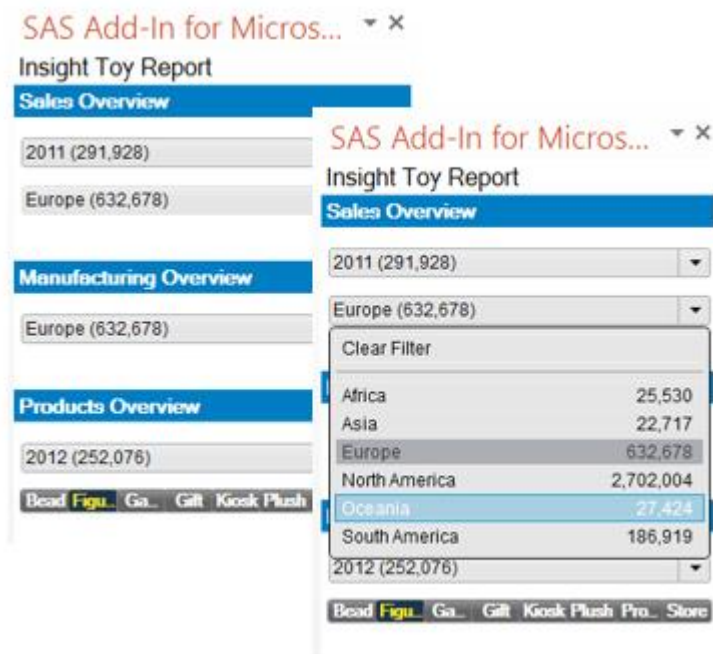

Figure 10: Modify the Prompt Values to Quickly Create Content for a New Audience

DOCUMENTING YOUR RESULTS IN MICROSOFT WORD

Using the SAS add-in in Microsoft Word is an easy way to incorporate your SAS Visual Analytics content into your documents. After adding the SAS Visual Analytics content, you can use the tools in Word to create your layout and add additional text. Some organizations prefer to use Word for sophisticated looking reports, adding their own additional commentary and analysis, or using Word to create more background material to complement a shorter presentation or slide deck. In the same way as in the PowerPoint integration, some sophisticated Word users can use different prompt values to automate the creation of a similar, long, formatted document with customized results or analysis from SAS. Users with Visual Basic for Applications (VBA) skills can go even further with this automation. For more information, see "Tips and Techniques for Automating the SAS® Add-In for Microsoft Office with Visual Basic for Applications" in *Proceedings of the SAS Global Forum 2011 Conference* at http://support.sas.com/resources/papers/proceedings11/012-2011.pdf.

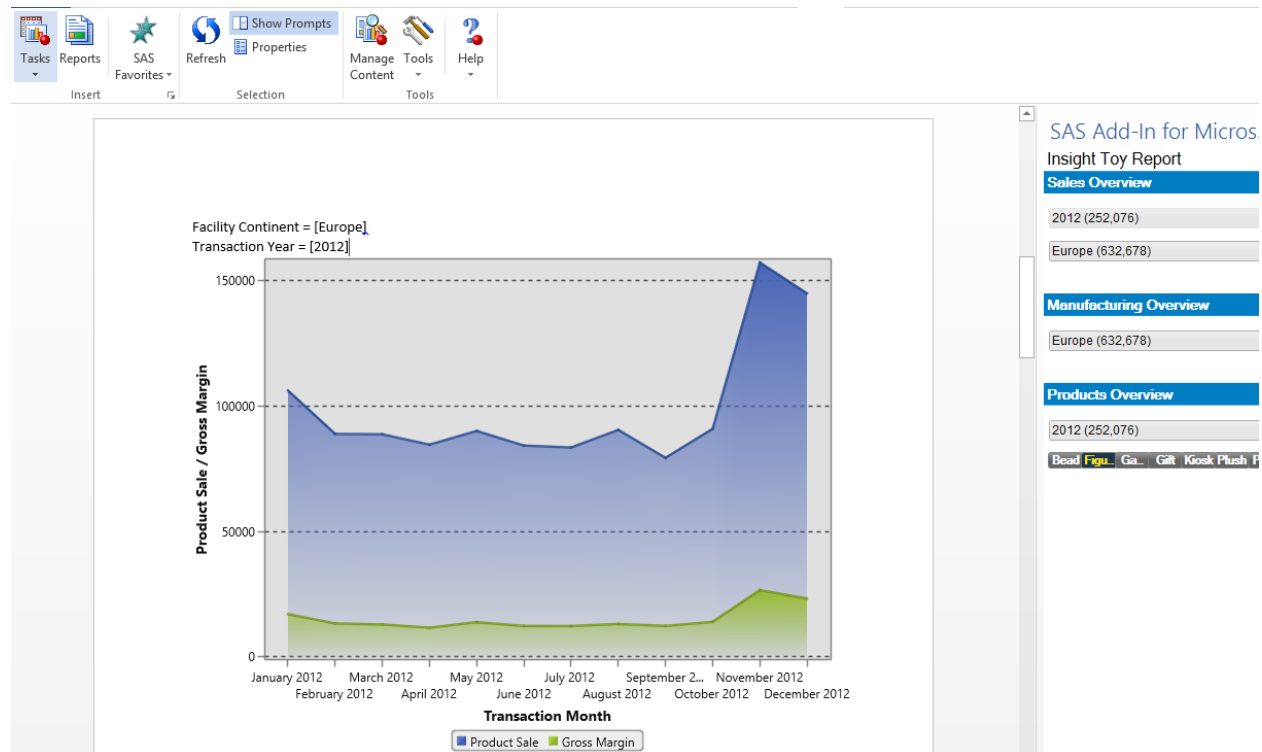Figure 11 is a basic example of interacting with results in Word.

Figure 11: Inserting a SAS Visual Analytics Report into Microsoft Word

SHARE AND COLLABORATE WITH OTHERS ON YOUR SAS VISUAL ANALYTICS RESULTS

In addition to sharing your work with colleagues or clients using presentations and documents, many business users use Microsoft Outlook and SharePoint for content sharing and collaboration. SAS Office Analytics integrates with these popular applications to make it easy for you to share your SAS Visual Analytics content and collaborate with others who might be adding other content.

INTEGRATION WITH OUTLOOK

According to a 2012 McKinsey Global Institute study, knowledge workers spend 28% of work time managing e-mail.[2] With so much time spent on e-mail, bringing business intelligence closer to this activity makes sense and can provide

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[2] McKinsey Global Institute. (2012). "The social economy: Unlocking value and productivity through social technologies". Available at http://www.mckinsey.com/insights/high_tech_telecoms_internet/the_social_economy. Accessed on December 6, 2013.

some efficiency and productivity gains. SAS Office Analytics includes an add-in for Outlook that enables individuals to consume business intelligence and analytics easily without distracting from the main e-mail task and without filling up Microsoft Exchange Server quotas. Users of Microsoft Outlook also frequently use the calendar and task capabilities for organizing meetings and tasks as project management tools.

In Microsoft Outlook, SAS Office Analytics enables you to open reports in e-mails, meeting invites, and task assignments. Reports can be easily forwarded to others. SAS Central (similar to the SAS Visual Analytics Hub) is your starting point and provides a quick thumbnail view of your recent and favorite reports. The Gadget Pane makes it very convenient to keep track of selected reports without distracting from important e-mails, tasks, or appointments. By adding your key performance indictators and reports to the Gadget Pane, you turn your Outlook application into a BI application. Figure 12 shows both SAS Central and the Gadget Pane in Microsoft Outlook.
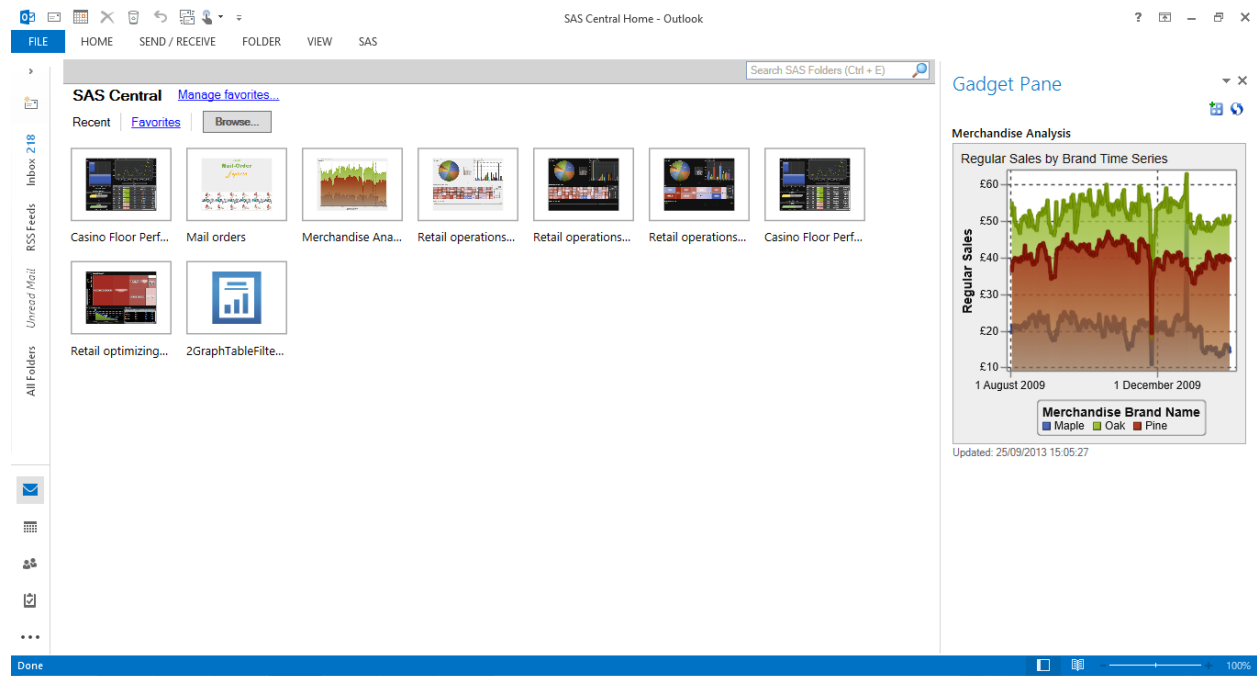
Figure 12: Use SAS Central for Easy Navigation or the Gadget Pane to Track Key Performance Indicators

To see a larger view of a report, you can open the report in a new window. Figure 13 shows an example of a SAS Visual Analytics report opened in a new window. Note that by using the options in integrated SAS Ribbon, you can refresh content, create a favorite, send a report to another Microsoft Office applications.
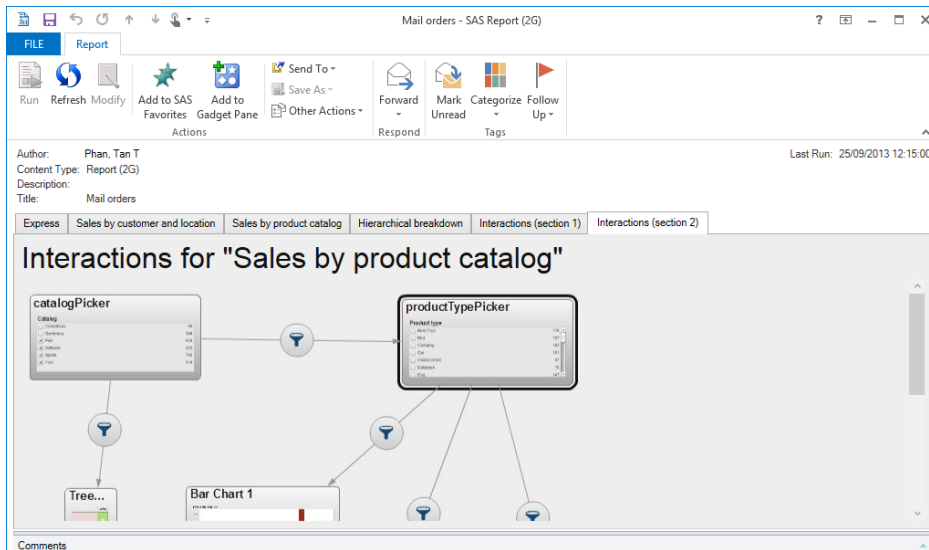
Figure 13: Report Content Opens in a New Window

COMMENTS FOR COLLABORATION

In addition to viewing reports, SAS Office Analytics provides additional collaboration functionality in Outlook and SharePoint by enabling you to view, add, and edit comments that are saved with the report. Comments are available from various clients including mobile tablet apps in iOS and Android. It's a very "social" world, and some managers find that these comments are the key way to understanding the analytics or report information. Permission to view or add comments can be managed by a user with administrative rights. For each report, comments are centralized, so all of the comments are accessible to different types of users. Figure 14 shows a report that contains comments.
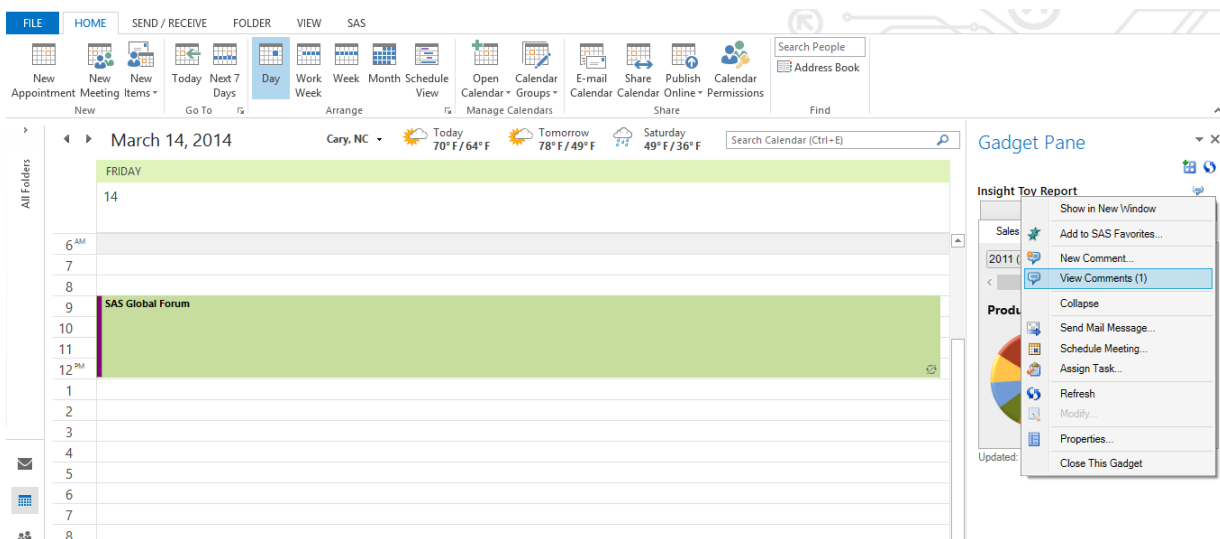

Figure 14: View or Add Comments to a Report to Extend the Conversation

Comments are saved with the report (not buried in separate e-mails) and ready to access anytime. To facilitate collaboration, send a link to the report in an e-mail, meeting invitation, or task assignment.

INTEGRATION WITH SHAREPOINT

Providing the same user experience as Outlook, SAS Office Analytics adds a SAS Central view of your recent and favorite reports in SharePoint. SAS Office Analytics also provides a web part that you can use to view your SAS Visual Analytics reports. Many users have departmental SharePoint sites with a lot of other information. Like the Gadget Pane in the Outlook, this SAS web part provides unobtrusive access to SAS Visual Analytics results in a location where most of your users are already looking for business information or sharing documents. If colleagues need to access documents that contain SAS Visual Analytics results, they can retrieve the documents from the SharePoint site and refresh or manage the SAS contents using the SAA add-in in Excel, Word, or PowerPoint (as previously described). Figure 15 shows a SAS Central Web Part in SharePoint, and Figure 16 shows a SAS Content Viewer Web Part, which displays an interactive SAS Visual Analytics report.
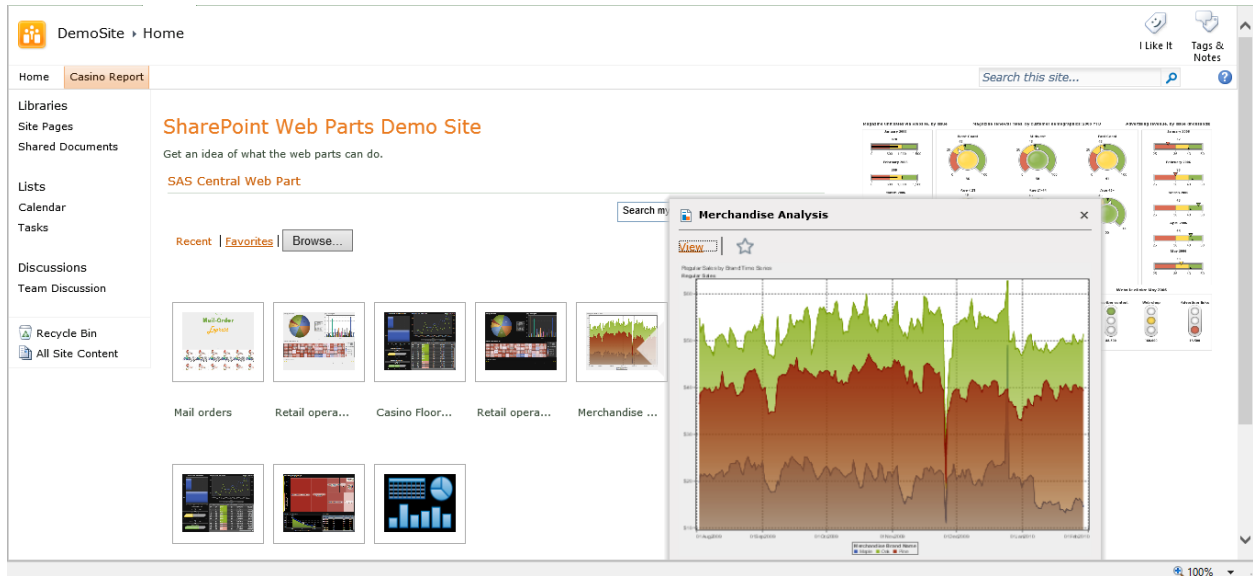

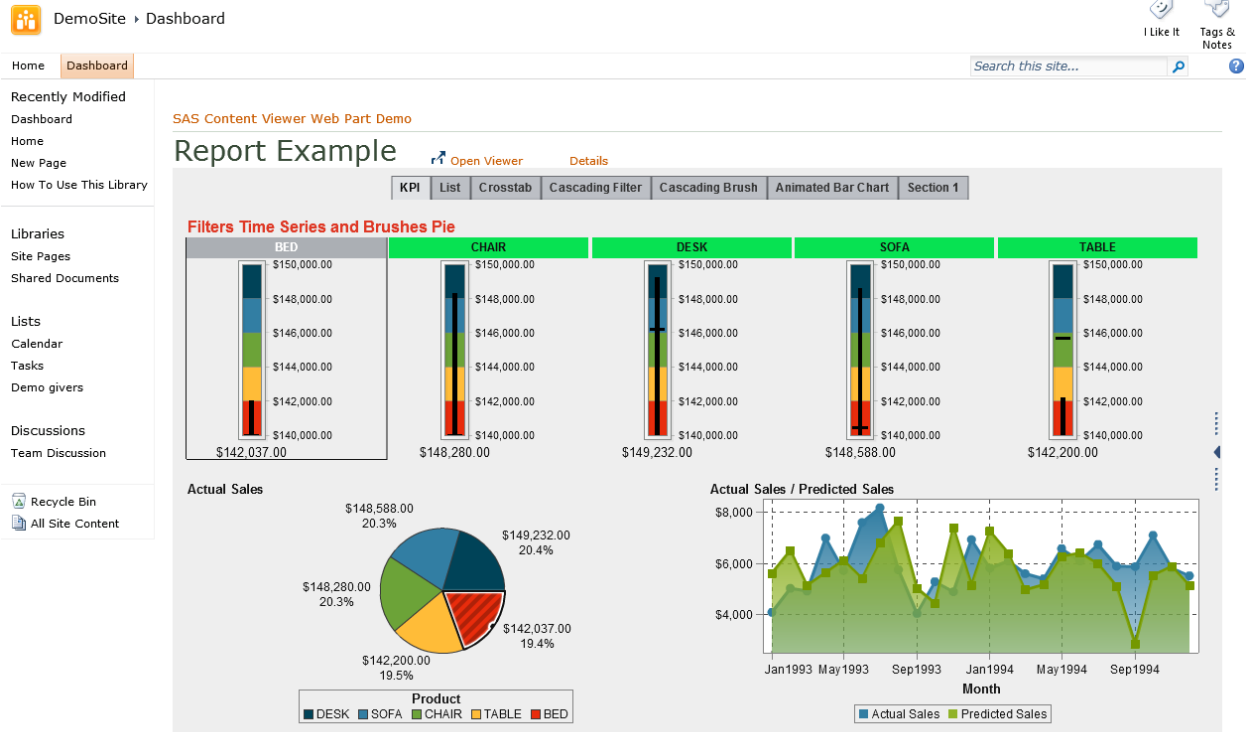**Figure 15: SAS Central in Microsoft SharePoint**

Figure 16: SharePoint with a SAS Visual Analytics Report Displayed in the SAS Content Viewer Web Part

Comments are also available to provide the same collaboration and contextual information found in Outlook. Figure 17 shows a comments pane on the right of a report. The availablility of these comments give more information and perspective to other users who are working with the same analysis.
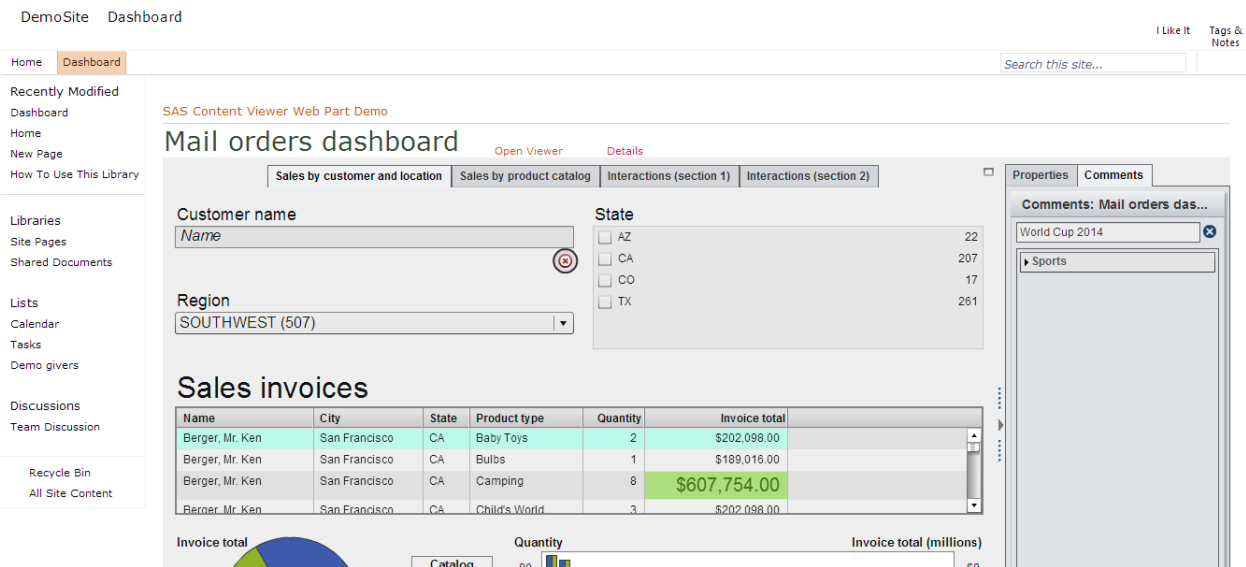

Figure 17: View, Add, and Search Comments on Visual Analytics Report from within SharePoint

SAS VISUAL ANALYTICS INTEGRATION WITH SAS ENTERPRISE GUIDE

SAS Enterprise Guide is a popular desktop application for SAS analysis. Now, SAS Enterprise Guide also provides a convenient location for consuming SAS Visual Analytics results. The first maintenance release of SAS Enterprise Guide 6.1 (available starting in December 2013) provides integration with SAS Visual Analytics 6.2 and 6.3. This integration allows SAS Enterprise Guide to open and refresh reports that were created using SAS Visual Analytics Designer and SAS Visual Analytics Explorer. Figure 18 shows an example of an interactive prompt-based report from SAS Visual Analytics in SAS Enterprise Guide.
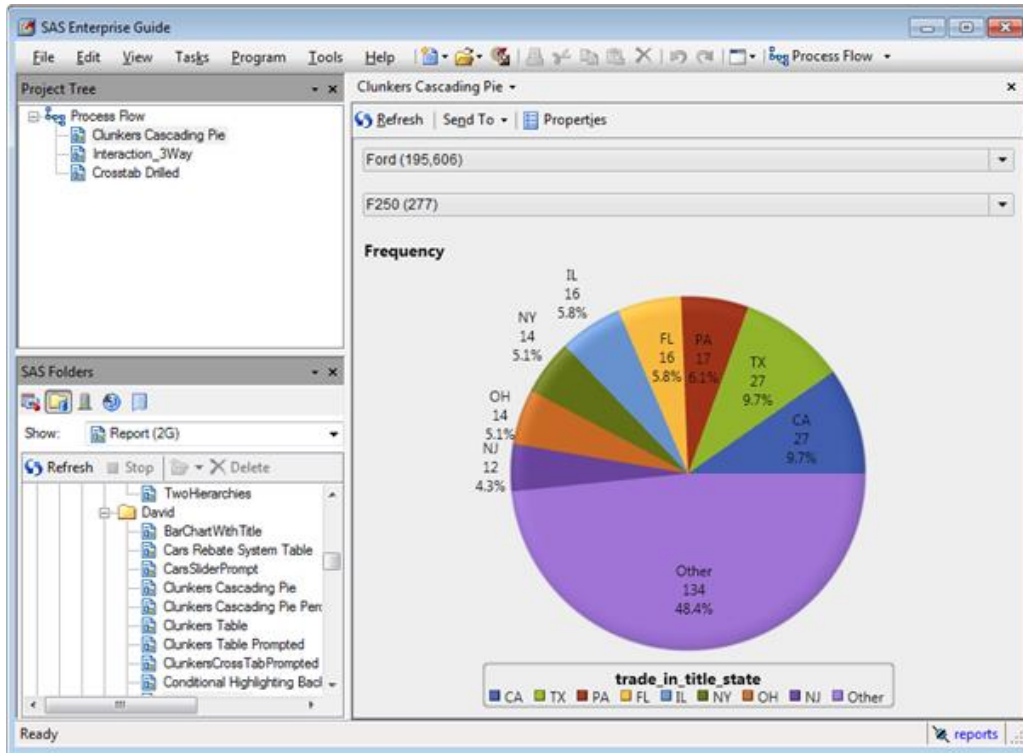

Figure 18: Viewing a SAS Visual Analytics Report in SAS Enterprise Guide

The report viewer in SAS Enterprise Guide is fully interactive. The report shows a pie chart of automobile trade-in data. Use the two controls at the top of the display to filter the data displayed. In the example (Figure 18), the data for Ford F-250 trucks is shown.

Another example of an interactive report is shown in Figure 19 with a hierarchy-driven crosstabulation output. The breadcrumb trail controls at the top of the report are used to select higher levels, while the drill-down controls in the table headings are used to drill into a hierarchy.

Figure 19: Interacting with a SAS Visual Analytics Report in SAS Enterprise Guide

A SAS Visual Analytics report can have interactivity within report objects. Figure 20 demonstrates a three-way interactive report. Select the "**Europe – Front**" row in the table to only show data for front wheel drive cars manufactured in Europe. Then click the "**Sedan**" bar further to show horsepower and engine size data for front wheel drive sedans manufactured in Europe.
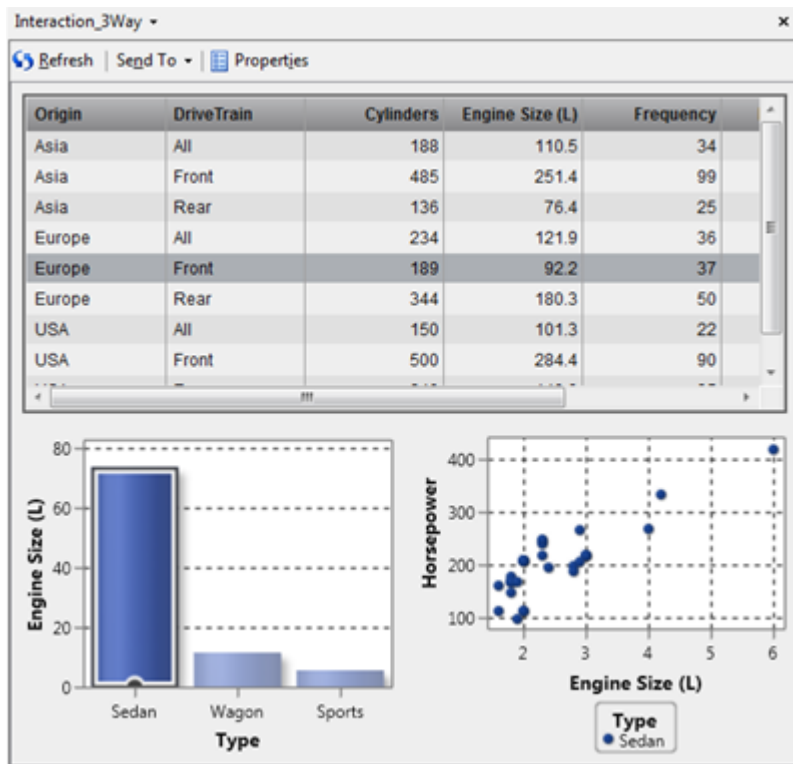

Figure 20: Interacting with a SAS Visual Analytics Report in SAS Enterprise Guide

SAS Visual Analytics reports are cached in the client, so they can be viewed later even if the server is inaccessible. However, settings made in SAS Enterprise Guide are not persisted to the server. For example, if you drill into a specific hierarchy level, that will not be reflected in the report when viewed in other applications.

CONCLUSION

SAS is releasing an exciting new capability in SAS Office Analytics that integrates SAS Visual Analytics with your Microsoft Office applications. You can share and enhance your SAS Visual Analytics results using Microsoft Office and SAS Enterprise Guide. You can open and refresh your results, and a new SAS Central view in Outlook and SharePoint enable you to manage and comment on reports. These capabilities enable you to customize and get more insights from your data and share those insights with colleagues more easily than ever.

RECOMMENDED READING

Allemang, Mark. 2014. "I Didn't Know SAS® Enterprise Guide® Could Do That!" *Proceedings of the SAS Global Forum 2014 Conference*. Cary, NC: SAS Institute, Inc. Available at http://support.sas.com/resources/papers/proceedings14/.

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Chitale, Anand and Mike Barnhart. 2012. "A New Outlook into Your Business." *Proceedings of the SAS Global Forum 2012 Conference.* Cary, NC: SAS Institute, Inc. Available at http://support.sas.com/resources/papers/proceedings12/024-2012.pdf.

Mullis, Randy. 2014. "Better Together: Best Practices for Deploying the SAS® Web Parts for Microsoft SharePoint." *Proceedings of the SAS Global Forum 2014 Conference.* Cary, NC: SAS Institute, Inc. Available at http://support.sas.com/resources/papers/proceedings14/.

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