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Automating Gorgeous Executive-Level Presentations Using SAS® Office Analytics
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ABSTRACT

A lot of time and effort goes into creating presentations or dashboards for the purposes of management business reviews. Data for the presentation is produced from a variety of tools, and the output is cut and pasted into Microsoft PowerPoint or Microsoft Excel. Time is spent not only on the data preparation and reporting, but also on the finishing and touching up of these presentations.

In previous years, SAS Global Forum authors have described the fundamental automation capabilities of SAS® and Microsoft Office. The default look and feel of SAS output in Microsoft PowerPoint and Excel is not always adequate for the more polished requirement of an executive presentation. This paper focuses on how to combine the capabilities in SAS® Enterprise Guide®, SAS® Visual Analytics, and Microsoft PowerPoint into a finished, professional presentation. We will build and automate a beautiful finished end product that can be refreshed by anyone with the click of a mouse.

INTRODUCTION

This paper is suitable for a business analyst or “hands on” decision maker who might spend time or manpower assembling information into management presentations. The goal of this paper is to show you how to save time, while making your presentations data driven, easy to update, and attractive. While this paper focuses on Microsoft PowerPoint, the paper is suitable for anyone who participates in the preparation of a dashboard using Microsoft Excel or who would like to embed SAS analytics into a Microsoft Word document. The capabilities shown here hold true with minor variations.

Here are the fundamental requirements for easy-to-use, data-driven reports:

1. The ability to create a report that reflects timely data and enables the user to change values at run time.
2. The ability to compose and arrange informational objects on a slide and to optimize the look and feel of those objects.
3. The ability to refresh reports on demand, without involving programming support or data support.

These three features enable an executive to have a hands-off relationship to the complexities of the data extracts and presentation preparation. What is left is the ability to produce the desired report or presentation when needed, with less reliance on others. These items are discussed in order in the next sections.

For this paper, we are using Medicare Claims data from the CMS Synthetic Public Use files that are available for public download on [hhs.gov](https://www.hhs.gov).

BUILDING BLOCKS FOR AUTOMATION

The detailed mechanics of how to create a SAS® Stored Process have been covered in earlier papers. (For more information, see *References*.) This paper gives a brief overview and assumes that you have a basic understanding of a stored process. The paper focuses instead on specific features that would be helpful in designing an automated report.

REVIEW: CREATING A STORED PROCESS

The power of SAS Enterprise Guide is that it allows the user to access many different data sources, to integrate data, and to present the data in report format. No programming skill is required. Furthermore, any of these tasks can be combined into a single “process flow.” The output of any of these can be leveraged into an executive presentation and run on demand.

SAS Enterprise Guide provides a wizard to take any or all of these processes, connect them together, and encapsulate them into a reusable ‘object’ that SAS refers to as a stored process. Stored process is the technical term for what end users will know simply as a ‘report’. Behind the scenes, SAS Enterprise Guide generates the code for the process flow and registers it in the SAS metadata. From that point forward, any SAS user with proper credentials can run that stored process in Microsoft PowerPoint.

So suppose the task is to filter CMS health claims by the year 2011 and then to print a report with a simple bar chart showing the average number of diagnosed disease conditions by age range.

Figure 1 shows a SAS Enterprise Guide process flow that accomplishes this task. The health claim source data is represented by the **CMS_SAMPLE** icon. The data is filtered by year 2011, resulting in a subset of data named **Query_2011_Claims**. The filtered data is the input into a bar chart task, which produces the **SAS Report – Bar Chart** report.

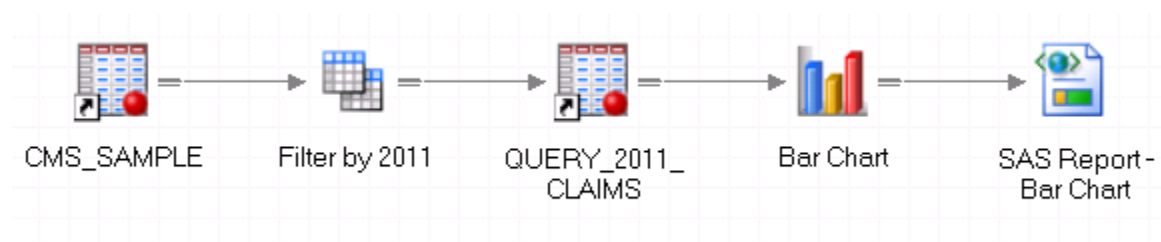


Figure 1 – SAS Enterprise Guide Process Flow

Suppose we want to automate this process so it can be run on demand. To save this process flow as a SAS® Stored Process, right-click the last task step, which in this example is Bar Chart.

Figure 2 shows the pop-up menu that appears. Select **Create Stored Process** to open the Create Stored Process Wizard. Then follow the steps in the wizard.

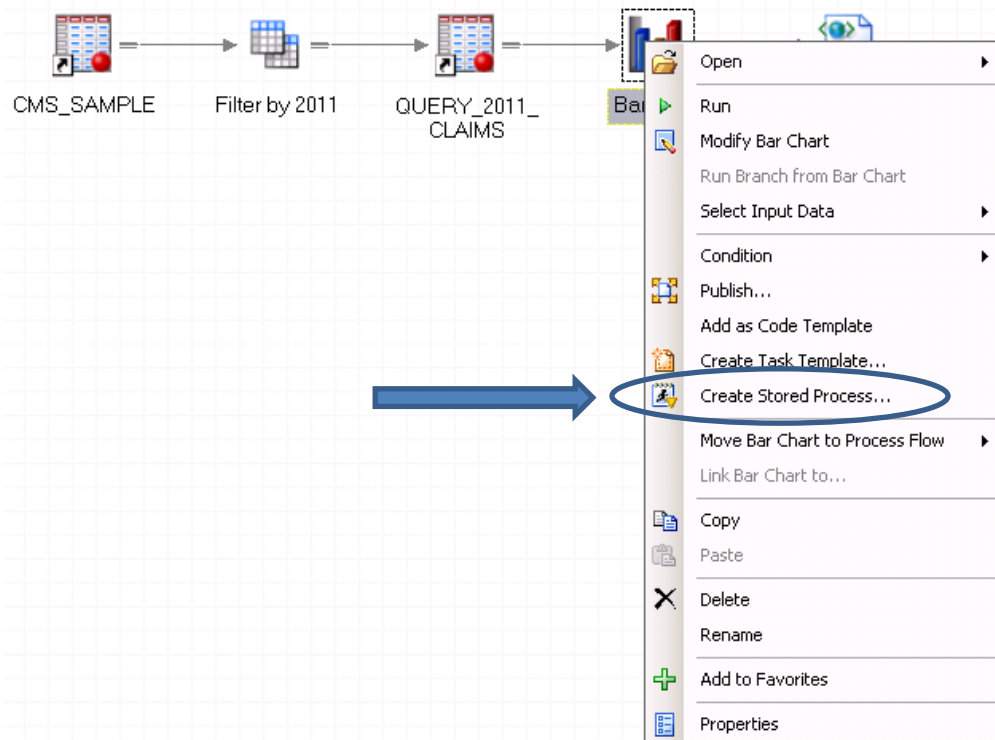


Figure 2 –Pop-up Menu for the Bar Chart Task in Process Flow

After you complete all the steps in the wizard, SAS Enterprise Guide adds two icons to the process flow, as seen in Figure 3. These icons indicate that a reusable version of this process flow has been created, registered in metadata, and is available for use.

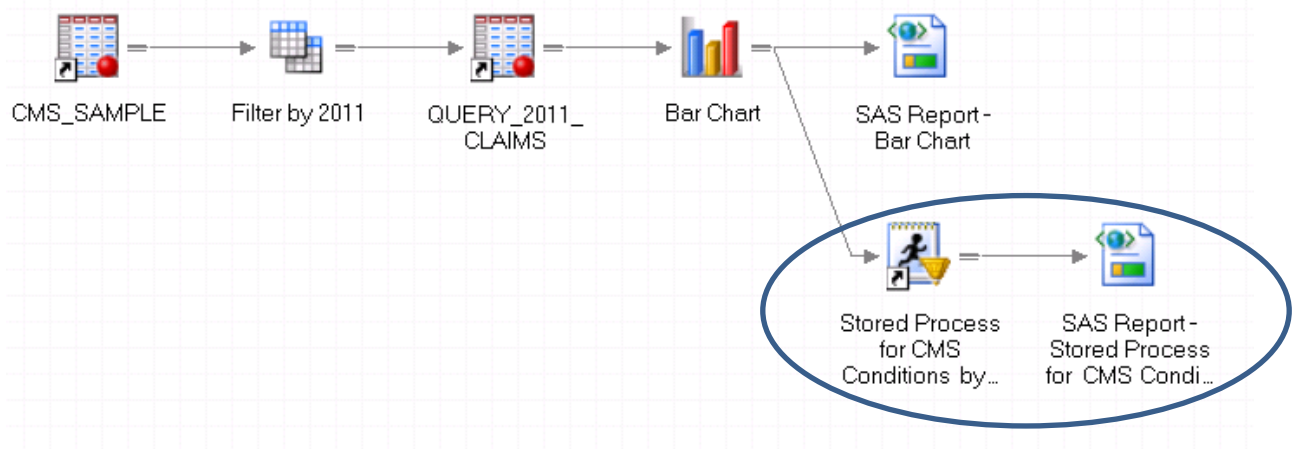


Figure 3 - Stored Process Successfully Created

Figure 4 shows the output from the report as it would look in SAS Enterprise Guide and Microsoft Office.

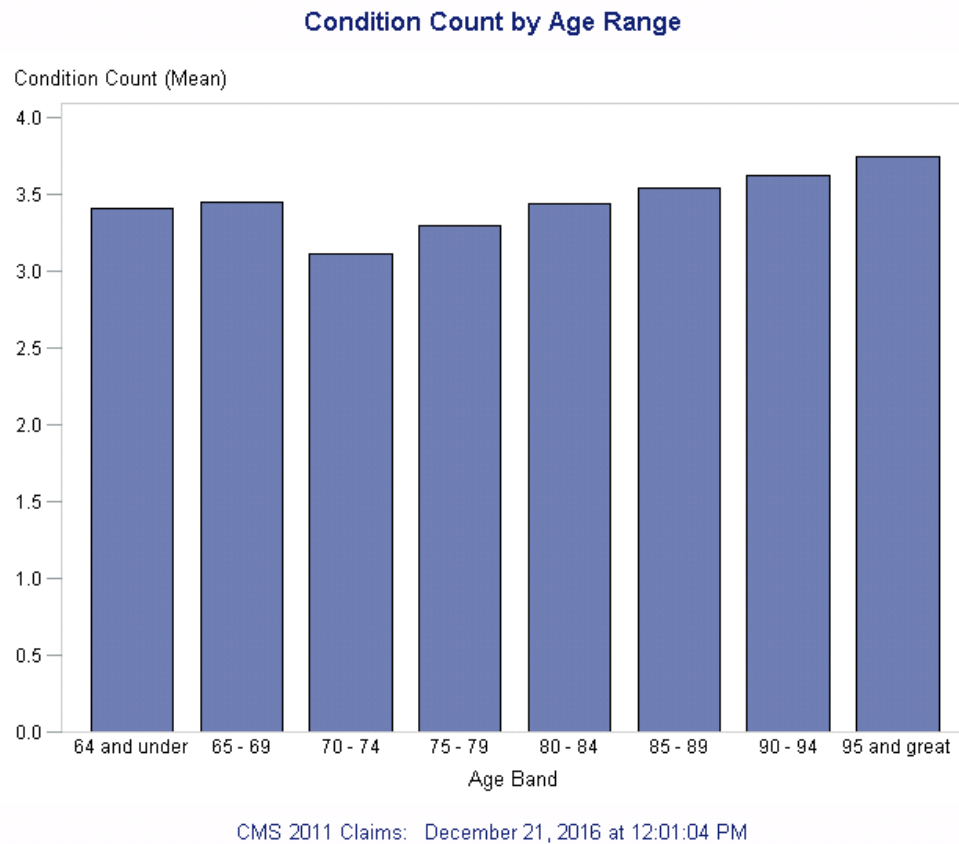


Figure 4 - Stored Process Output – CMS Claims Report

FLEXIBILITY: PROMPTING USERS FOR DATA

The second feature that is very helpful for report automation is the ad hoc prompt. Many times a user request to IT or a SAS developer is simply to rerun an existing report with a new value for a filter. Ideally, we want users to select data values at report run time. This capability can be accommodated in two ways. First, in SAS Enterprise Guide, the designer of the SAS Stored Process incorporates a variable, data-driven component into the reports based on requirements. Second, in SAS Visual Analytics, report content is changed through interactivity with controls or interactions. Using these techniques, the user can run the report as needed, with less reliance on developers.

Prompt Controls in Enterprise Guide

In SAS Enterprise Guide, a prompt is created by using the Query Builder wizard. A data filter is assigned to a visual prompt, and the result is a pause when the process is run, waiting for user input. In our current example, we would like a user to have the flexibility to select the claim year.

Figure 5 shows a process flow with an icon for the Query Builder and a small '?' superimposed. This question mark indicates that the user will be prompted for a value.

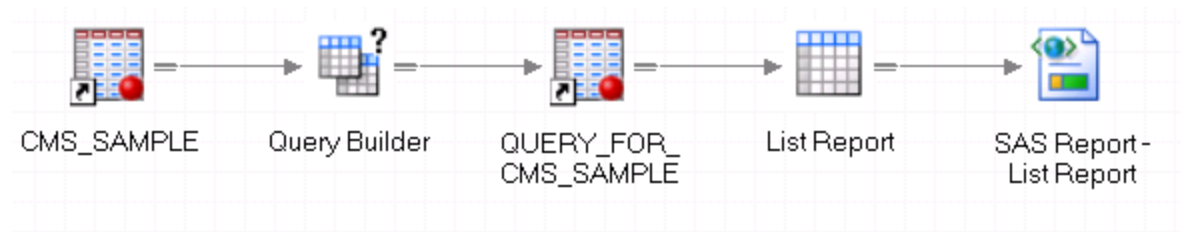


Figure 5 - Query Builder with Prompt Feature Enabled

SAS and SAS Enterprise Guide will translate this user prompt into a dialog box that pops up for the user to make their selections. What we require the user to provide for the prompt is up to us when we design our report. A user can select from a list or enter a value.

Figure 6 is a user-defined prompt for our CMS data report. We are allowing the user to specify age ranges, states, and disease category areas. Each of these selections will be evaluated and passed to a query on the database. Only the data satisfying all these requirements will move forward into the report creation.

Specify Values for STP - CMS Claims - PX3

☐ Show only required items (denoted by★)

General [Reset group defaults](#)

Select Age Group
Available: 🏠

Available	Selected
64 and under	70 - 74
65 - 69	75 - 79
70 - 74	
75 - 79	
80 - 84	
85 - 89	
90 - 94	
95 and great	

Select State(s)
Available: 🏠

Available	Selected
AL	AL
AR	AR
AZ	AZ
CA	CO
CO	CT
CT	DC
DC	
DE	
FL	
GA	

★ Select Disease Category
Available: 🏠

Available	Selected
Diseases of Respiratory System	Congenital Anomalies
Diseases of the Blood	Diseases of Respiratory System
Diseases of the Musculoskeletal System	Mental Disorders
Diseases of the Skin	
Endocrine, Metabolic, Immunity Disorders	
Infectious and Parasitic Disease	
Injury, Poisoning	
Mental Disorders	
Neoplasms	

Run Cancel

Figure 6 - Stored Process Prompts for User Interaction

Prompt Controls in SAS Visual Analytics

SAS Visual Analytics reports can also be included in a PowerPoint presentation.

Reports in SAS Visual Analytics are typically built to allow flexibility. The user should be able to interact with the report by changing values in real time. This interaction takes the form of a drop-down list or selection list.

While prompts in SAS Enterprise Guide are shown at run time and are selected PRIOR TO the refreshing of the SAS Enterprise Guide report, the control objects in SAS Visual Analytics are interactive, or 'live.' In

SAS Enterprise Guide, you can change the content of the report by rerunning the stored process. In SAS Visual Analytics, you can interact with the report in real time by changing interactions or by selecting different values from the drop-down lists.

Therefore, the means of designing an interaction with a SAS Visual Analytics report in Microsoft PowerPoint is simply to include interactions in the SAS Visual Analytics report itself.

Figure 7 shows a simple SAS Visual Analytics report with two drop-down lists (year and age range). When this report is embedded into PowerPoint, the report will automatically refresh when the user interacts with these controls.

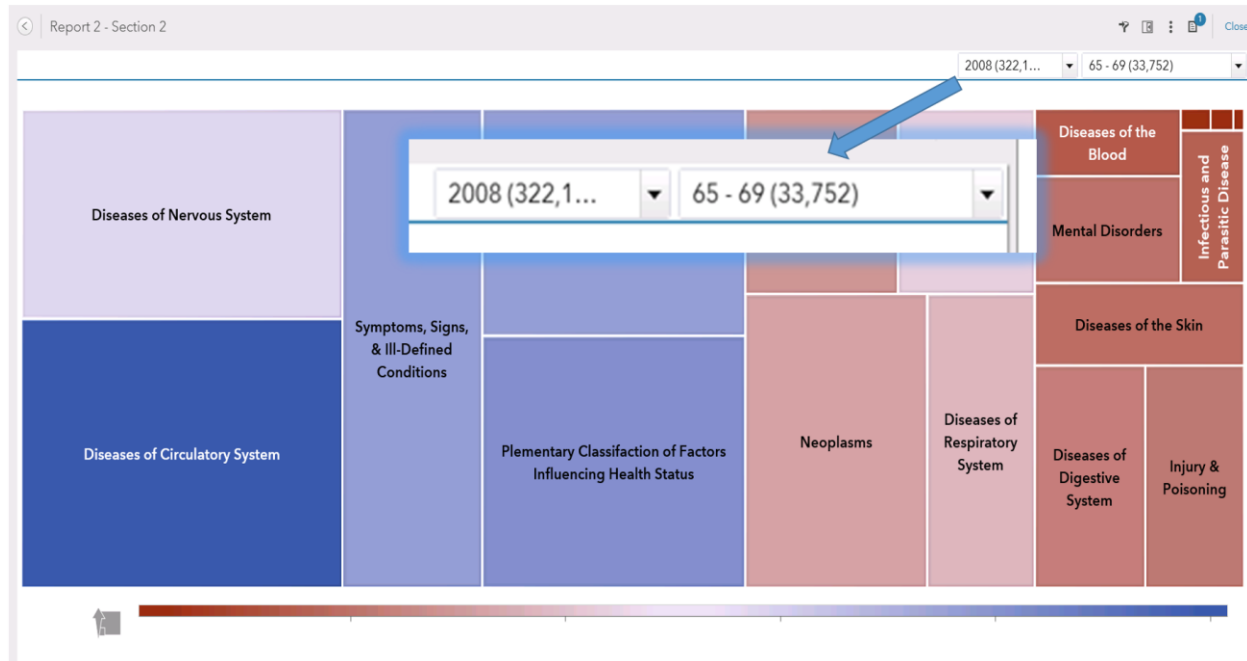


Figure 7 – SAS Visual Analytics Report with Drop-down List Controls

While not required, the use of prompting and interactions in SAS reports is a powerful feature that helps to automate otherwise time consuming iterations of minor changes between user and SAS developers.

BRINGING THE CONTENT INTO MICROSOFT POWERPOINT

After your tables and graphs are complete in SAS Enterprise Guide and your report is complete in SAS Visual Analytics, the next step is to bring them into Microsoft PowerPoint. This section addresses how to 1) bring in the presentation components and 2) how to rearrange and embellish them to make your presentation look professional.

INSERTING STORED PROCESSES INTO YOUR POWERPOINT PRESENTATION

To prepare your presentation for SAS reports, create a new slide with a 'Blank' layout. (Always start with a Blank layout for this work. This is important to ensure that your content appears as expected. It is advised to add headings later). Figure 8 shows the 'Blank' layout option in PowerPoint.

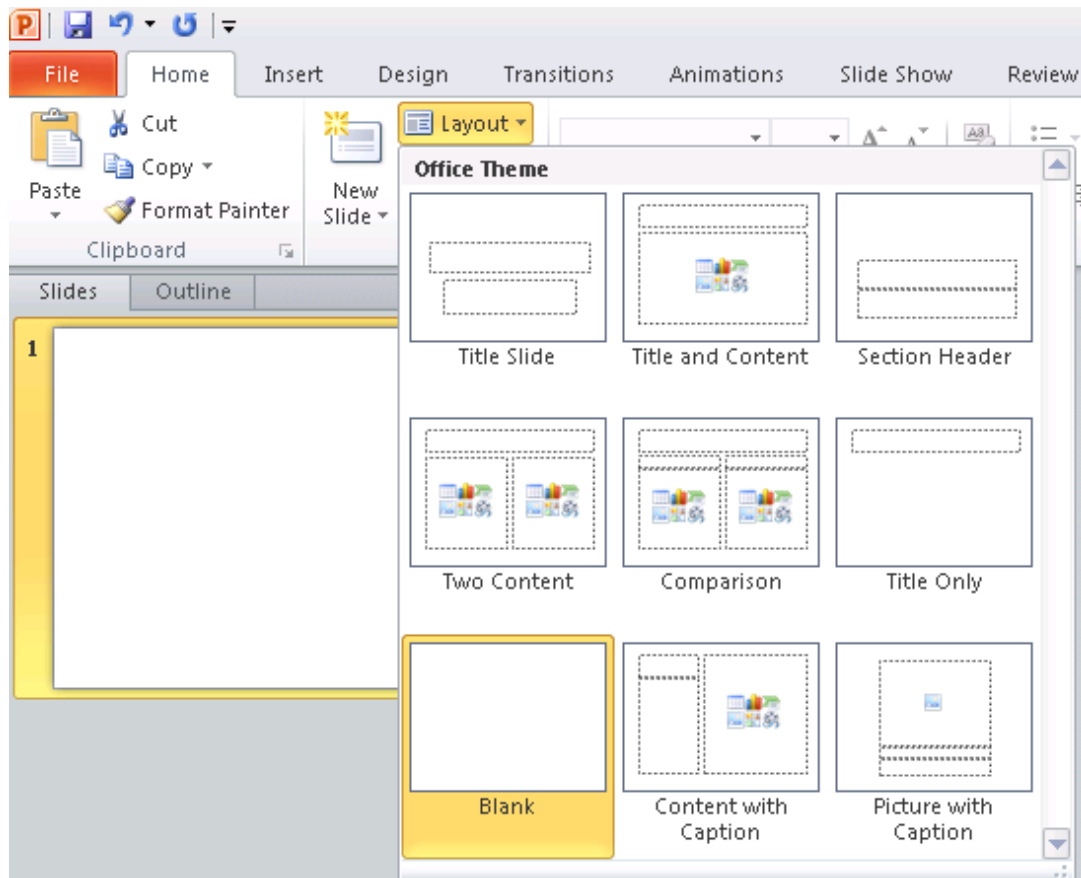


Figure 8 - Microsoft PowerPoint Layouts: Blank Option

Next we will embed SAS content into our slide. The toolbar for the SAS Add-in for Microsoft Office is used to add SAS content to the PowerPoint slides. Figure 9 shows the toolbar for the SAS add-in in Microsoft PowerPoint.

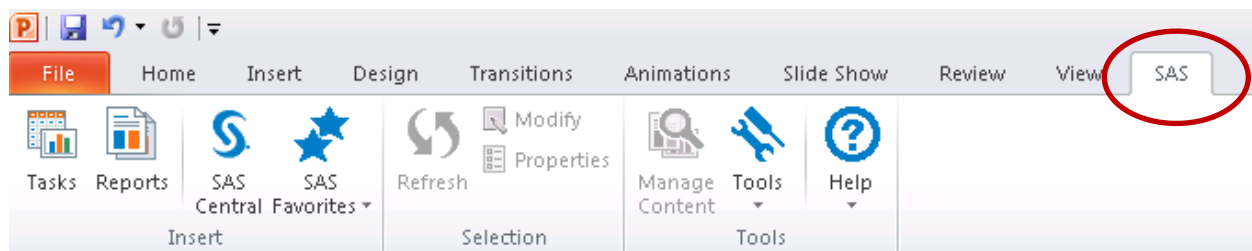


Figure 9 – Toolbar for SAS Add-in for Microsoft Office

On the toolbar, click **Reports**. In the Reports dialog box, select **Stored Processes** from the **Files of Type** drop-down list. Next, select the desired Stored Process, and click **Open**. The output from that stored process appears in the PowerPoint slide. We then can add more slides, each time ensuring that the layout is blank, select another report, and populate our PowerPoint with automated content. Note that when we select a report that includes prompts as part of the design, we are prompted to select our values before the slide is built.

These actions are illustrated in Figure 10 and Figure 11.

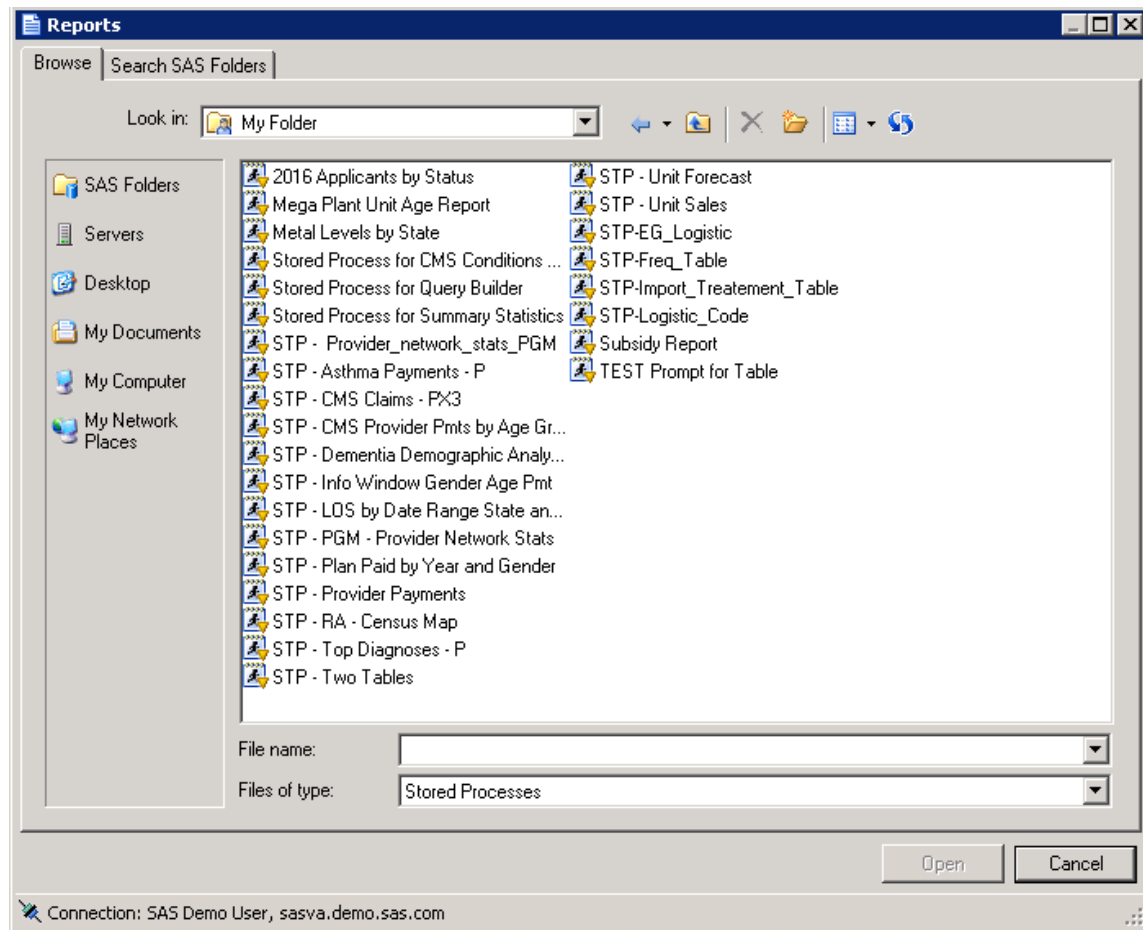


Figure 10 - Selecting a Stored Process

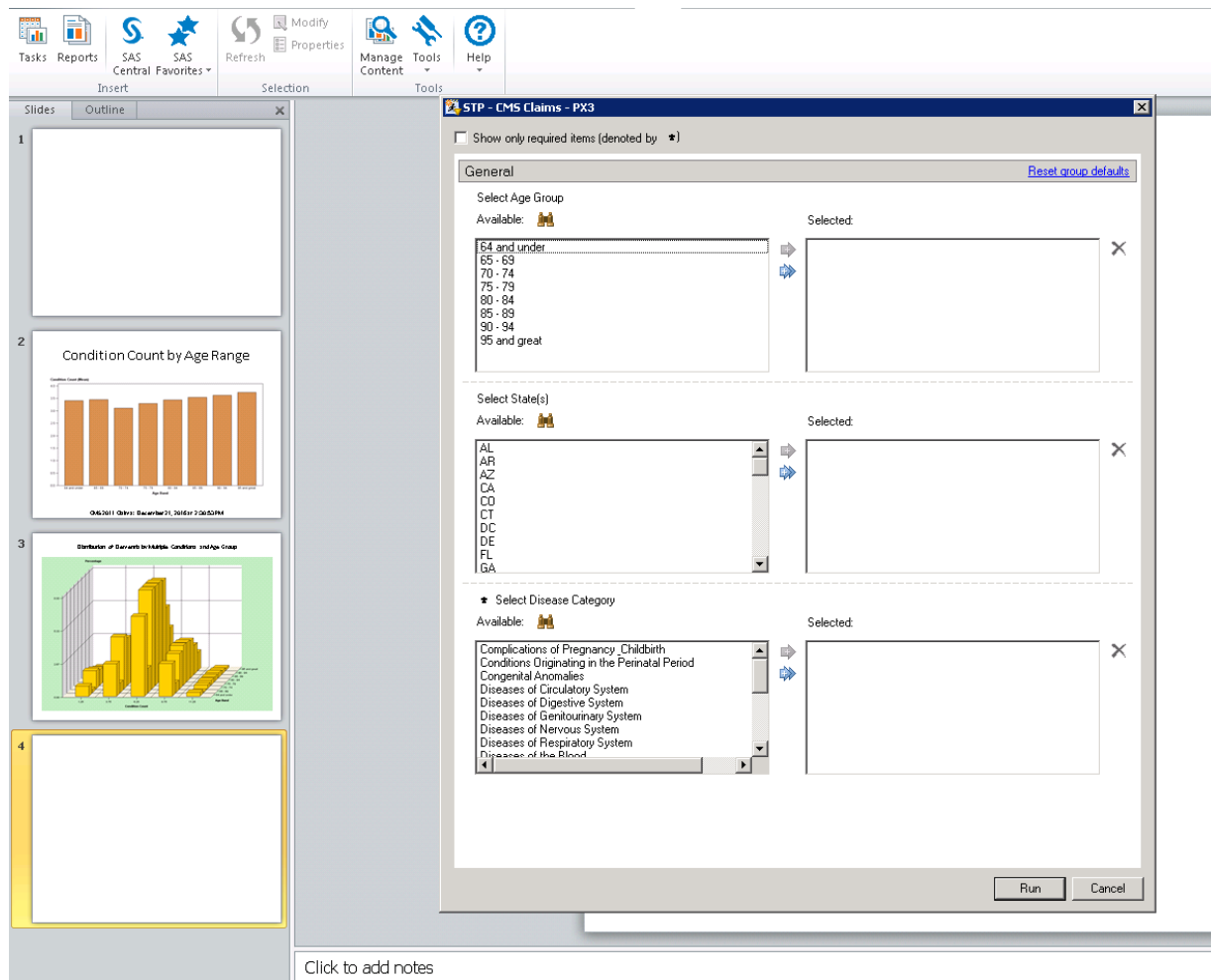


Figure 11 - Prompting at Run Time

INSERTING A SAS VISUAL ANALYTICS REPORT INTO YOUR POWERPOINT PRESENTATION

To insert a SAS Visual Analytics report into PowerPoint, click **Reports** in the toolbar for the SAS add-in. This time, subset the list of file types by **Reports (2G)**, and then select a report. The SAS Visual Analytics report appears on your slide. When you open a SAS Visual Analytics report, you will see a new **Report Controls** icon on the toolbar for the SAS add-in. This functionality enables you to access the control objects that you built into your report. Figure 12 shows the Report Controls icon. Clicking **Report Controls** will surface the drop-down lists that we previously saw in the SAS Visual Analytics version of the report. Here you can change the contents of the slide dynamically. To close the Report Controls, click the icon a second time. (Note: Report Controls do not appear in Slide Show Mode).

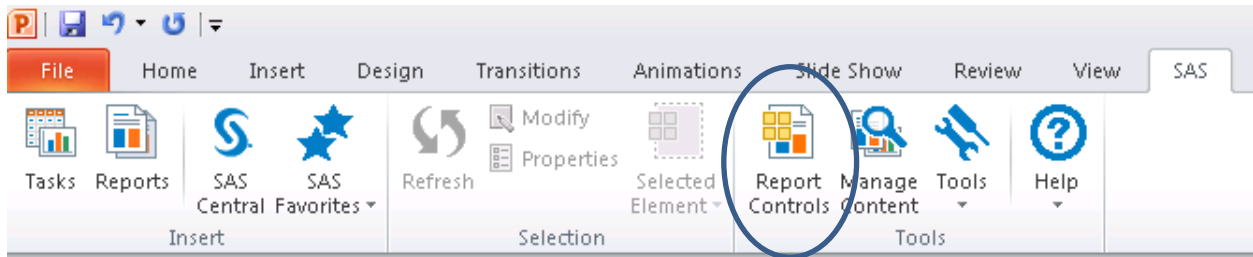


Figure 12 - Report Control Button for SAS Visual Analytics Reports

Figure 13 shows a sample of the Report Controls window. Note that you can control the values of the drop-down lists, and for a multipage SAS Visual Analytics report, you can insert individual sections into the PowerPoint presentation.

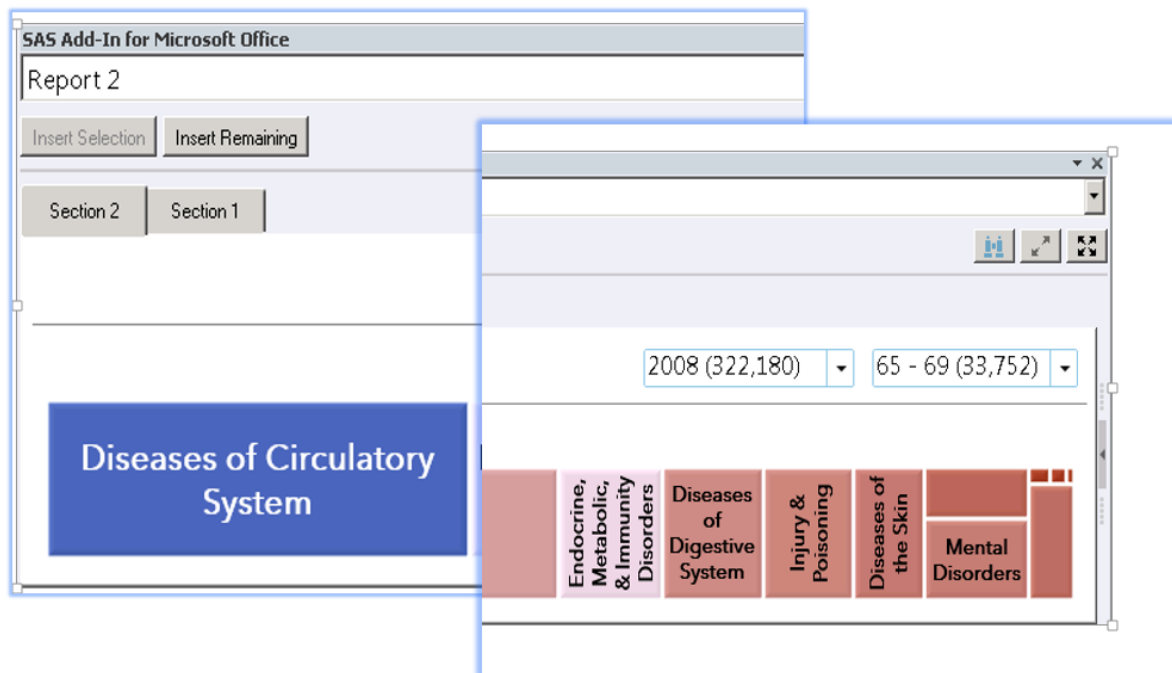


Figure 13 - Sample Report Control for SAS Visual Analytics Report

MODIFY THE LOOK AND FEEL USING MICROSOFT BUILT-IN CAPABILITIES

Earlier in this paper, we mentioned that the default appearance of SAS reports are not always optimal for viewing when initially placed into PowerPoint. A report builder might want to modify fonts, orientation, outlines, or other items. They make these changes by using the built-in formatting controls of PowerPoint. This section addresses how to make SAS reports more pleasing to the eye.

Important: When you modify the look and feel of SAS reports within PowerPoint, *the format of the report does not change when the report is refreshed, only the values will change*. The PowerPoint presentation can be saved with those formatting modifications and distributed to others. (Note: If your report changes significantly in layout, you might have to touch up the formatting. An example of a change in layout is adding columns).

For example, Figure 14 shows how a table looks 'out of the box' from a SAS stored process. The font sizes in the table are small, and the footer is not appropriate for an executive presentation.

Figure 15 shows that same table after modifying the readability. In this case, we removed the footer, moved the table, resized the table, added gridlines, and made the font larger. This makes for a better slide. If the user was to refresh the content, this table would stay just the way it looks here, and only the number would change.

Selected CMS Claim Costs by State, Disease Category and Age Band

			\$ Member Paid	\$ Allowed Amt	\$ Plan Paid
Age Band	Disease Category	State	MEAN	MEAN	MEAN
disease_category= Diseases of Digestive System					
80 - 84	Diseases of Digestive System	AZ	\$37	\$175	\$138
80 - 84	Diseases of Digestive System	CA	\$32	\$163	\$131
80 - 84	Diseases of Digestive System	CO	\$30	\$137	\$107
80 - 84	Diseases of Digestive System		\$33	\$162	\$129
80 - 84---- Subtotal			\$33	\$162	\$129
			\$33	\$162	\$129

Generated by the SAS System (SASApp, X64_ES08R2) on December 21, 2016 at 2:54:26 PM

Figure 14 - Stored Process Table before Modifications

Selected CMS Claim Costs by State, Disease Category and Age Band

			\$ Member Paid	\$ Allowed Amt	\$ Plan Paid
Age Band	Disease Category	State	MEAN	MEAN	MEAN
<i>disease_category = Diseases of Digestive System</i>					
80 - 84	Diseases of Digestive System	AZ	\$37	\$175	\$138
80 - 84	Diseases of Digestive System	CA	\$32	\$163	\$131
80 - 84	Diseases of Digestive System	CO	\$30	\$137	\$107
80 - 84	Diseases of Digestive System		\$33	\$162	\$129
80 - 84— Subtotal			\$33	\$162	\$129
			\$33	\$162	\$129

Figure 15 - Stored Process Table after Modifications

REARRANGE YOUR CONTENT FOR DESIRED IMPACT

In this example, we want to take two or more SAS outputs that were originally placed on separate slides and bring them together. This work requires a simple cut and paste and then resizing. In Figure 16, you see the separate slides that contain the output for two SAS Stored Processes: Condition Count by Age Range and Dementia Distribution by Multiple Conditions and Age Group.

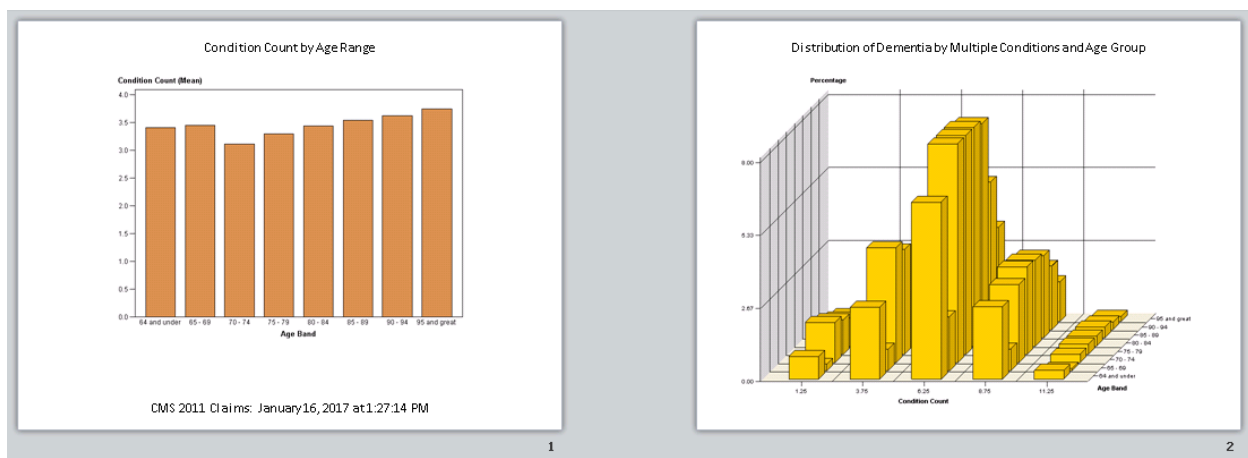


Figure 16 – Output from Two Stored Processes on Different Slides

The process is simple. Right-click the object, and select **Cut**. Then paste the object into your new slide. If desired, grab the handle on the object outline, and change the shape into the form you desire. Delete headings or footers, and change the fonts at this time. In this way, you can build a dashboard-style PowerPoint slide or infographic type of slide from multiple sources. (Note: It is important that you CUT and PASTE. If you COPY, you will not be able to refresh the second version of the object).

Figure 17 shows combining two different reports onto one slide. Although they now share the same slide, each report is separate and can be refreshed separately. Also note that fonts were resized to match one another.

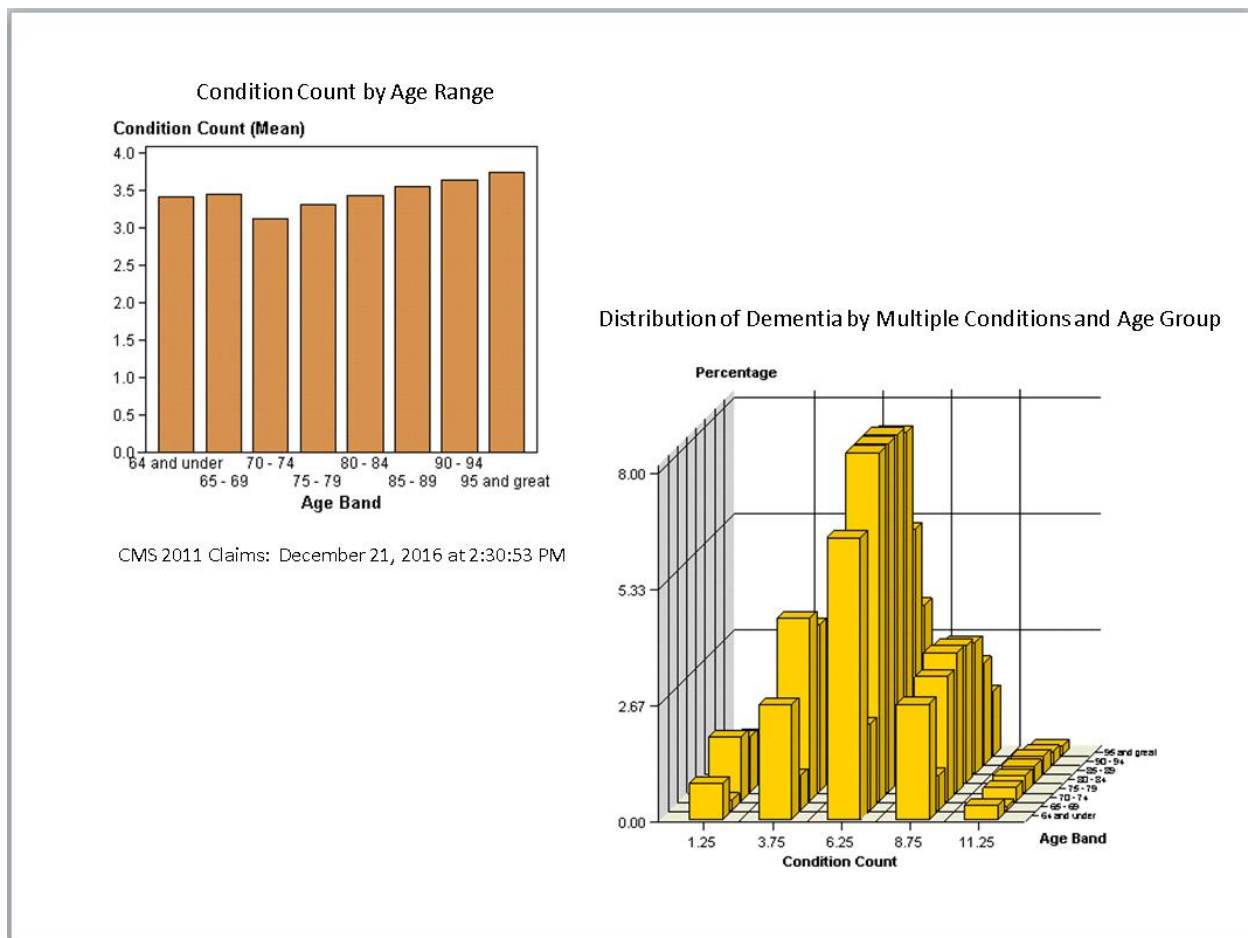


Figure 17 - Two Stored Process Outputs on One Slide

SHARING AND REFRESHING YOUR AUTOMATED PRESENTATION

The final step of creating your ad hoc executive report is to control the updates and refreshes of the slide show. SAS® Office Analytics makes this easy by listing all the connections to SAS in the Manage Content window, shown in Figure 18. Features in this window are helpful in understanding how your PowerPoint session is connected to SAS. Each entry indicates whether the item is a stored process or a report. Each entry also indicates the slide number, when the item was last modified, and approximately how long that one item would take to refresh. The check box at the beginning of each line enables the user to perform an action on one or more items.

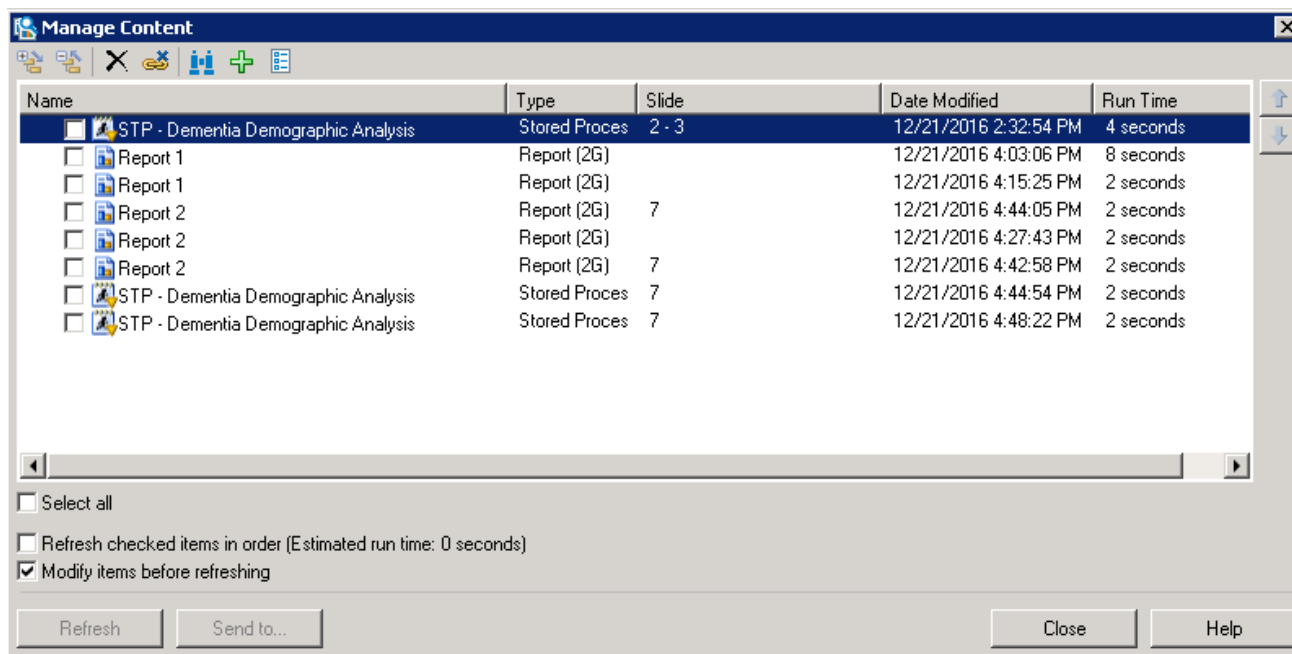


Figure 18 - Managing Embedded SAS Content

Figure 19 shows the final product -- a professional PowerPoint slide that combines output from SAS Enterprise Guide and SAS Visual Analytics. The data that drives these graphics could be large data from any database, processed on the SAS Server. Furthermore, each graphic could be derived from entirely distinct data sources. This slide is entirely data driven and can be refreshed with the click of a mouse, helping to automate otherwise time-intensive preparations for executive presentations.

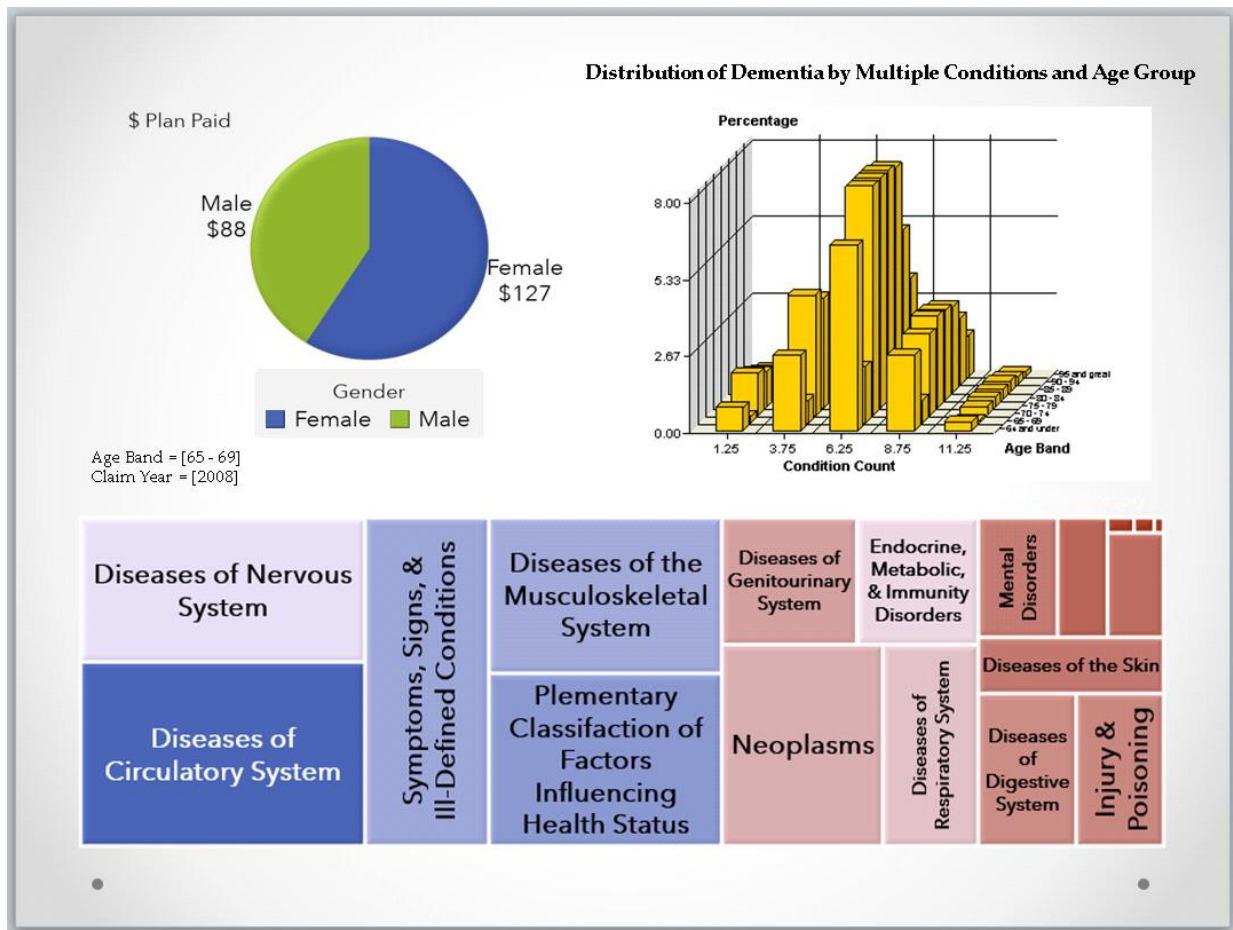


Figure 19 - Complete Automated Slide

CONCLUSION

Much time and effort is spent by managers and their staff to prepare Microsoft PowerPoint slide presentations and Excel spreadsheets for management reviews or team reviews. The task is frequently one of cutting and pasting point-in-time measurements or metrics. There is an opportunity to save time and money through the automation of some of these tasks.

SAS Office Analytics offers powerful integration with the Microsoft Office suite of products. This presentation focused on Microsoft PowerPoint, but the same techniques apply to Microsoft Word and Microsoft Excel. Integration with Microsoft Outlook and Microsoft SharePoint is also provided, but the mechanisms are different as they interact with the specifics of the interface.

TIPS FOR SUCCESSFUL AUTOMATED PRESENTATIONS

- Always start with blank layouts for your PowerPoint slides.
- It's simpler to assemble individual SAS reports into dashboards, rather than try to create the dashboard in SAS Enterprise Guide or SAS Visual Analytics. Then you can run the dashboard as one unit in Microsoft PowerPoint.

- When moving objects from one slide to another, be sure to CUT and PASTE. Do not COPY if you intend to refresh the data.
- If you have a stored process report that uses a BY variable, SAS will produce one slide per BY value. You can then cut and paste the output from each slide into a single dashboard. For example, if you wanted the same graph repeated for each region, SAS will output one graph per slide per region.
- You can save and share the PowerPoint .pptx file with others. There are two requirements for a recipient to be able to update the reports: 1) the person must have the SAS Add-in for Microsoft Office installed (SAS Office Analytics); 2) the person must have a login to SAS that gives them authority to run the SAS Enterprise Guide or SAS Visual Analytics queries.
- Trial and error with slide backgrounds should be done as you compose your slides. Some backgrounds interfere with placement of graphics and tables.
- Because tables and graphics can change appearance based on data dimensions, always build in time to review your slide deck before presenting. You might have to modify the appearance of headings, the size of the image object, or things like that.

REFERENCES

“**CMS 2008-2010 DATA ENTREPRENEURS’ SYNTHETIC PUBLIC USE FILE (DE-SYNPUF)**.” Centers for Medicare and Medicaid Services. Available https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/SynPUFs/DE_Syn_PUF.html. Accessed on December 21, 2016.

RECOMMENDED READING

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