

VBA FINAL PROJECT



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Automated Printing, "Smart Print"

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EXECUTIVE SUMMARY

The Problem

A manager's time is extremely valuable to an organization and the work that they along with the problems which they solve should reflect that fact. Often times, managers receive data (or create it themselves) and output it in the form of an Excel worksheet. They create meaningful information from which important decisions can be made. This is commonly reflected in charts and graphs.

Managers frequently need to take these resulting charts to meetings or deliver them to superiors in printed form. When these charts and graphs were built they were created for computer viewing, and printing one or many charts can be a tedious chore in Excel. There should be a way to simply indicate the chart(s) for printing and give the command to print.

The Solution

Smart Print is a VBA macro designed to make a manager's life easier by simplifying and automating report (charts and graph) printing. The idea is that the user should be able to simply indicate which charts he/she wants to print and then give the command! There's no reason computers shouldn't be able to work out the simple yet menial details of how that actually happens.

Smart Print Features

Below is a list of the basic features of Smart Print

- Select one or many charts for easy printing
- View charts to be printed before executing
- Define only high-level page printing setup such as page orientation
- Enjoy automation of quick chart formatting without sacrificing customizability

In a Nutshell

Smart Print allows the user to select charts from any worksheet and compile them to a new worksheet to be printed. The macro handles general formatting and spacing tasks and provides a convenient final viewing for the user, at which point he/she can make final alterations or print immediately.

IMPLEMENTATION DOCUMENTATION

Custom Ribbon Button

Smart Print is available to the user through a custom ribbon menu icon. The ribbon group is called *Printing* and is available on the Home tab, as seen in Figure 1. Clicking the Smart Print button will bring up a user form which guides the user through the simple process of selecting and preparing charts and graphs for printing.

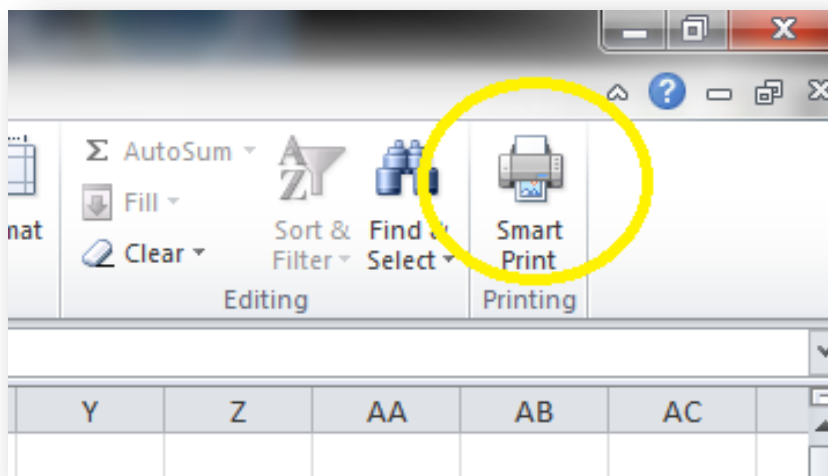


Figure 1 – Smart Print button as seen on the Home ribbon

User Form

All of the necessary tasks for printing setup and available features of Smart Print are contained within one small user form. The form remains open and viewable until the user closes it. This includes when the user is making their selection of charts to print.

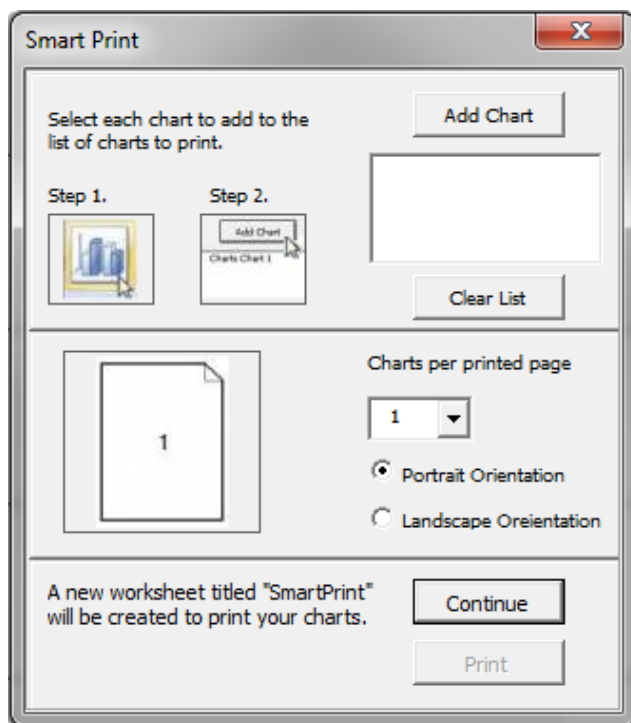


Figure 2 – The user form when it is first pulled up

The user form contains minimal information in order to highlight the simplicity of the function, which is really the true value of the project. Everything that Smart Print can do is seen from this one view.

The form contains brief descriptions and even two small instructional images to help the user see exactly what they should do.

A step-by-step walkthrough of the basic functionality of Smart Print, as well as accompanying screenshots, can be found in the following pages of the report.

User Form (Add Chart)

Once the user has selected a chart from their workbook they will then click the *Add Chart* button in the top right of the window, as shown in Figure 3. Their selected chart will then be added to the list box located just beneath the *Add Chart* button. A live list is kept of each chart added. Notice that the name of the selected chart's parent worksheet is displayed first, followed by the chart name. In this case, "Chart Tab" is the name of the worksheet where the chart is found, and "Chart 1" is the chart name. If no chart is selected, the *Add Chart* button will do nothing. Each consecutive chart will be added directly below the previous in the list.

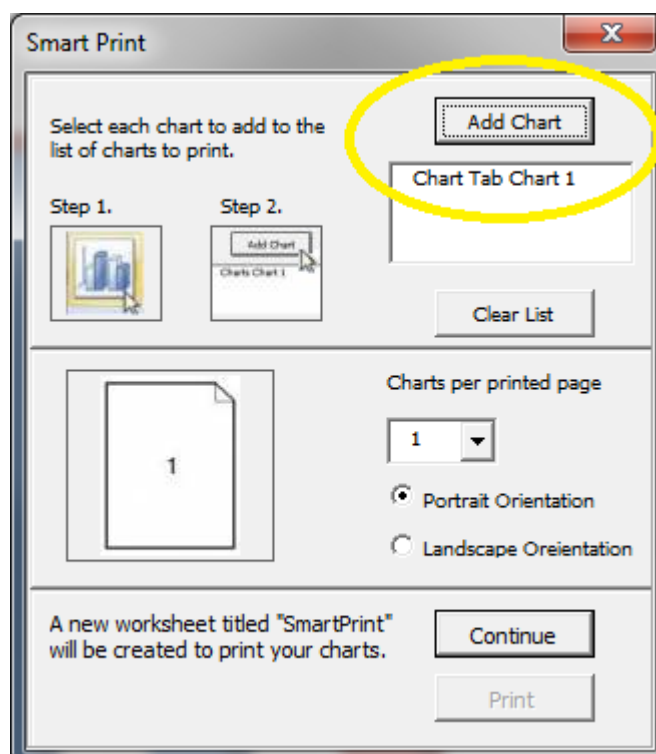


Figure 3 – The *Add Chart* buttons can be found at the top frame of the form

User Form (Clear List)

Notice below the chart list seen in Figure 2 that there is a button called *Clear List*. The user can click this button to remove all entries from the list and begin selecting charts afresh. To discover how this chart stores the selected charts proceed to the next section, otherwise continue on to the Page Setup section.

User Form (How charts are stored)

In the early versions of this macro the *Clear List* button was actually a *Remove Chart* button. Although removing one item is a more convenient and intuitive function, because of the way I had to solve temporary chart saving it became too complex of a problem to solve.

What is actually happening when the user clicks *Add Chart* is a hidden worksheet is being created in the workbook and the selected chart is copied over to that hidden worksheet as a picture. Each time the user adds a new chart, a new picture is added to that hidden worksheet on top (but not replacing) existing pictures. If the user clicks *Clear List* then not only is the list box in the user form cleared, but also the hidden worksheet is deleted. When the user proceeds to add charts then the hidden worksheet is once again automatically created. I discuss more of this solution in the Learning Outcomes section of the report.

Page Setup

Notice the middle section of the user form. Here, the page orientation (Landscape or Portrait) can be selected as well as the desired number of charts per page to print.

The preview image found to the left of the options will dynamically change depending on which options the user selects. The user can switch back and forth between options to see the layout constructed for printing. If the user later decides that they want a different setup, they can simply return to these options, reselect, and resubmit.

Currently, the options supported are either 1 or 2 charts per page, per page orientation. During development, I experimented with printing 3 or 4 charts per page but reposition and sizing became overly complex.

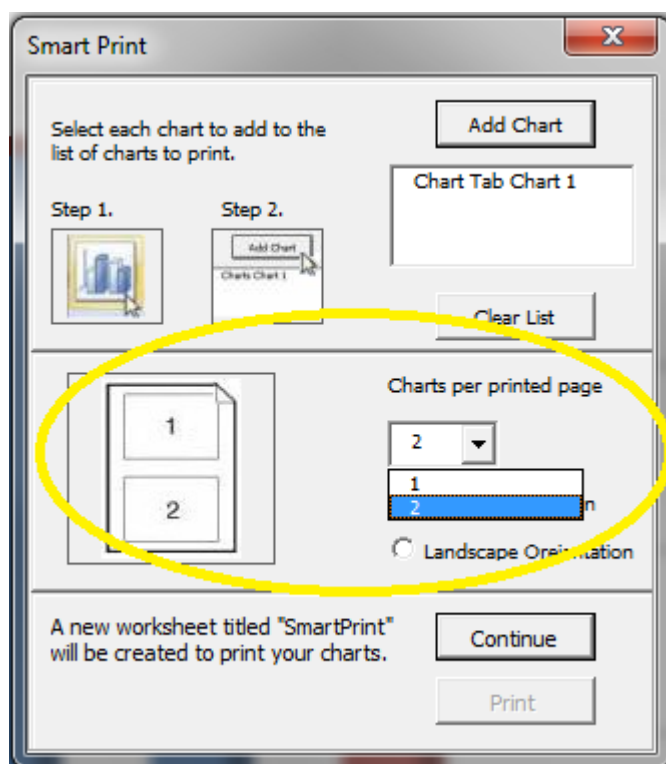


Figure 4 – The page orientation and charts per page can be set at any time

Building the “SmartPrint” Tab

Once the user has made their chart selections and page setup decisions they are ready to proceed. At this point the user will click the *Continue* button. Should no charts be selected when the user clicks that button, nothing will happen – for their own safety, only when the user adds at least one chart for printing will they be allowed to continue.

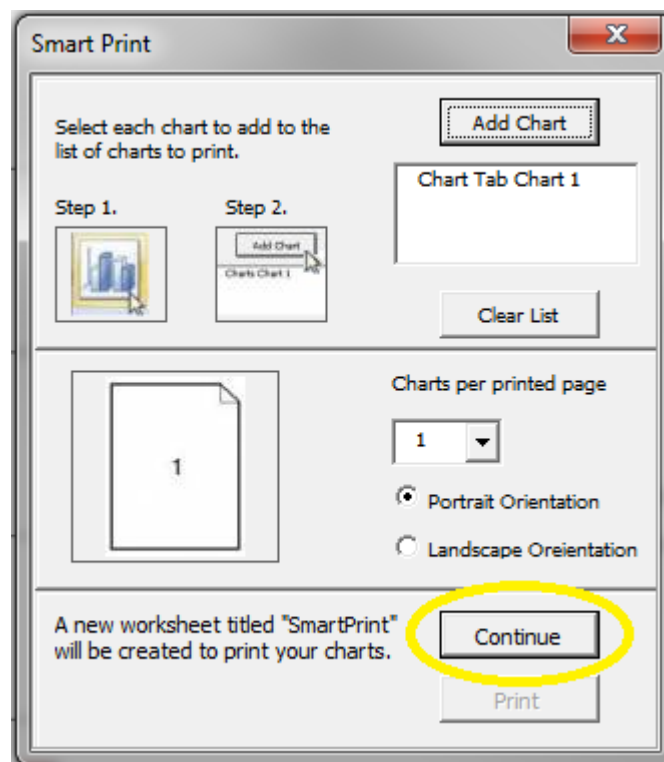


Figure 5 – Users will only be allowed to move forward if at least one chart has been added

After the user clicks the *Continue* button, the “SmartPrint” tab will be built and added to their workbook. If this is not the first time the user has used this macro, likely a tab named “SmartPrint” will already exist. In this case the old tab will be deleted and a new one rebuilt in its place. This will happen each time the continue button is pressed, allowing users to see any changes that they make before final print previewing.

Beware! In the unlikely event that a tab named “SmartPrint” already exists, it will be deleted by the macro! See Figure 6 on the next page.

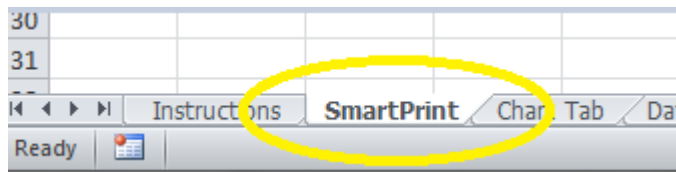
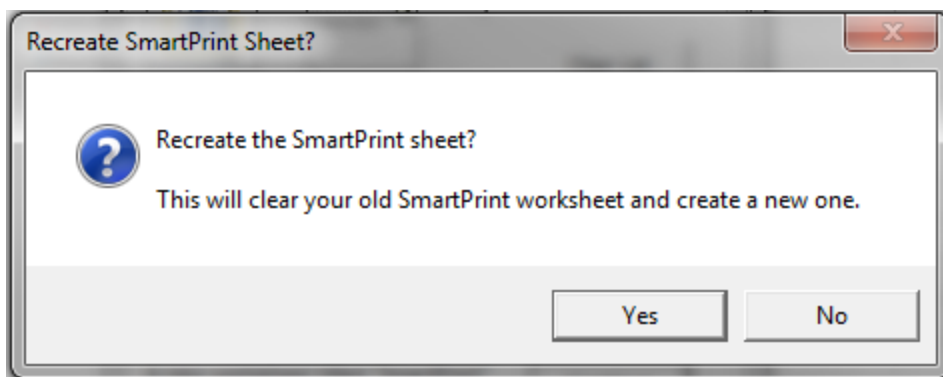


Figure 6 – The “SmartPrint” tab will be recreated each time the *Continue* button is clicked.

Print Preview

After the “SmartPrint” tab has been built, the user can choose to make any manual alterations they wish such as fine-tuning the chart sizes and positions. Note, the charts shown on this page will actually be pictures and not charts. If changes to the data or chart titles need to be made, the user must edit the original chart and then add the chart again to Smart Print.

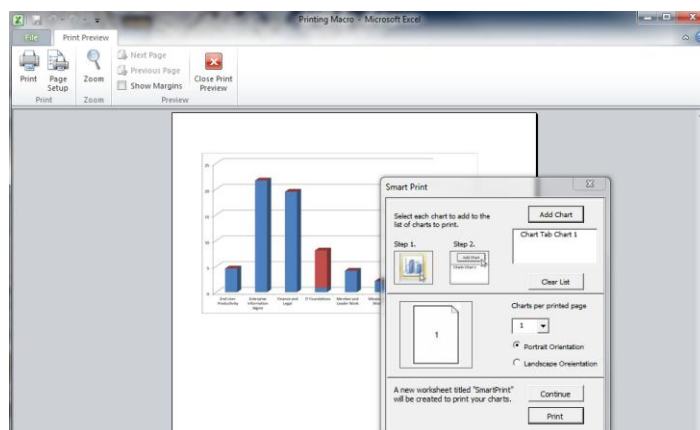
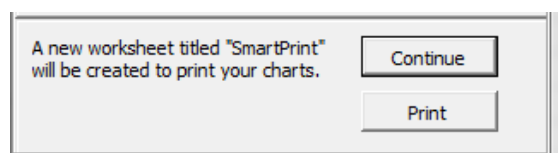


Figure 7 – Print Preview after clicking *Print*

After clicking *Print* the user will be directed to the standard Print Preview screen offered by Excel. Here, the user can confirm that the charts will be printed as desired and can confirm the print job on ribbon menu or cancel out and continue editing.

LEARNING AND DIFFICULTIES ENCOUNTERED

- Since this is a tool for managers to make it as easy as possible, I went through several user interface designs trying to get it right. As a test case, I actually asked my wife (who is virtually inexperienced in Excel) to print off some charts according to her desire using this tool. As I proceeded through design iterations, I asked other volunteers to test the interface and provide feedback. I learned of the conundrum that you need to include all the information, but still only include as little as possible or users get confused in the details.
- I had to create a custom error message for users who decided to recreate the “SmartPrint” worksheet since it involves deleting the “SmartPrint” tab. The default error message warns them about deleting a worksheet with data. Since this most likely okay, I wanted to reword the warning to let them know just what was happening instead of scare them.
- I encountered incredible difficulty trying to figure out how to copy the charts that the user selects to a new worksheet. Originally, I was just grabbing the name of the chart to display in the list for their convenience, but this was not enough because eventually I needed the chart object. The problem with grabbing the chart name for user is that the chart name is specific to each worksheet and not unique through the workbook. Additionally, there was no way to tell when the tab name ended and the chart name began because users could name these whatever they want.
 - I ended up using a hidden worksheet tactic and also approached chart printing as picture objects instead of chart objects. The help I found on the web suggested this as a much easier route. The hidden page then had to be dynamically deleted and recreated without the user knowing in case they decided to alter their list before finishing the process.
 - What I ended up trying was removing the “remove chart” feature and replaced it with a “clear list.” This way, the add functionality could include code to copy charts to a hidden worksheet. Once finalized, that sheet would copy over to SmartPrint for the actual formatting. Figuring out how to do this took **hours** but I learned a lot along the way.
- Trying to auto-format and position the charts dynamically proved to be the hardest part of this project. I was unable, for some reason still unknown, to take advantage of PageSetup’s properties FitToPages, and Zoom for printing purposes. Instead, I had to devise a sneaky way to divide/space the charts and restrict width depending on situations.

ASSISTANCE

Aside from hundreds of Google searches and scouring past ExcelForums.org posts, I had no live help completing this project.