

7 Steps to a SAS® Enterprise BI Proof of Concept Project

Sheryl Weise, Wells Fargo Bank

ABSTRACT

The Purchasing Department is considering contracting with your team for a new SAS Enterprise Business Intelligence application. He's already met with SAS and seen the sales pitch, and he is very interested. But the manager is a tightwad and not sure about spending the money. Also, he wants his team to be the primary developers for this new application. Before investing his money on training, programming, and support, he would like a proof-of-concept. This paper will walk you through the 7 steps to create a SAS Enterprise BI POC project:

1. Develop a kick-off meeting including a full demo of the SAS Enterprise BI tools.
2. Set up your Linux filesystems and security.
3. Set up your SAS metadata ACTs, users, groups, folders, and libraries.
4. Make sure the necessary SAS client tools are installed on the developers' machines.
5. Hold a SAS Enterprise BI workshop to introduce them to the basics, including SAS® Enterprise Guide®, SAS® Stored Processes®, SAS® Information Maps®, SAS® Web Report Studio®, the SAS® Information Delivery Portal®, and the SAS® Add-In for Microsoft Office®, along with supporting documentation.
6. Work with them to develop a simple project, one that highlights the benefits of SAS Enterprise BI and shows several methods for achieving the desired results.
7. Last but not least, follow-up!

Remember, your goal is not to launch a full-blown application. Instead, strive towards helping them see the potential in your organization for applying this methodology.

INTRODUCTION

This paper will walk you through the steps we use to assist our users in creating a SAS Enterprise Business Intelligence proof-of-concept project. The client and web-based tools we use are 9.3 versions of SAS Enterprise Guide, SAS Information Map Studio, SAS Add-in for Microsoft Office, SAS Management Console®, SAS Web Report Studio, and the SAS Information Delivery Portal. In order to keep the POC from getting too complex, this paper does not include cubes. The client server platform we use is Linux with grid technology.

STEP 1: THE KICK-OFF MEETING

First, build a **great** demo of your SAS Enterprise Business Intelligence products. The first impression is the most important. If you create a master demo with all the SAS products you offer, then you can whittle it down based on the users' needs. The first part of our demo contains slides with basic information, and the second half is a live demo of the SAS products. We usually plan three hours for this first meeting.

DEMO PART 1

I usually begin by spending about one hour explaining the following content:

- Basic department information including the services my team provides.
- Description of the SAS vendor, especially as an industry leader in the Gartner Group BI Magic Quadrant.
- Overview of SAS as an analytical tool and a decision making platform. Figure 1 provides an excellent start.

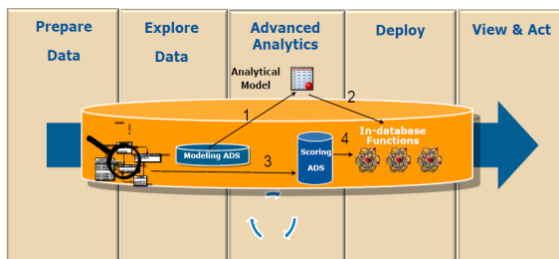


Figure 1. SAS Flow

- Describe the SAS architecture. Make sure to describe the SAS metadata and how it is the center of the SAS Enterprise BI platform. Figure 2, from the SAS website, represents all four tiers. When I present each tier I explain the general use and the personnel using/supporting it (e.g. SAS Administrators, developers, consumers, etc.). Many of our users are proficient in PC SAS® so I make sure to explain a little bit about SAS Enterprise Guide and the differences between them.

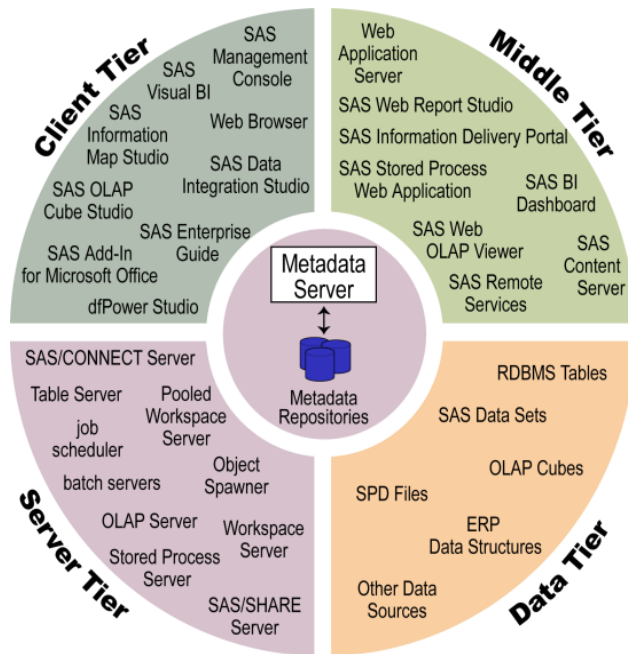


Figure 2. SAS Enterprise Business Intelligence Platform Tiers

- Provide a description of the various tools you'll be showing them in the demo. Keep this high level since it won't make much sense until they actually see the processes. Include some metadata examples of various groups and security to assure them their data and reports will be secure. I like to point out the folder usage from the various tools, and the groups on the SAS Portal pages.
- Finally, since our platform is now part of a SAS Grid environment, I include a picture of the environment and describe what it means to run SAS on the grid.

DEMO PART 2 (LIVE)

Present an outline, screenshots, and descriptions of the various SAS products and some of the capabilities. Here's the outline I follow:

- Development and Analytics using SAS Enterprise Guide (coded before the demo)
 - SAS Enterprise Guide's wizards and programming capabilities
 - SAS Access Engines
 - SAS Statistics
 - SAS Graph
 - SAS ODS
 - Teradata In-Database Analytics
- Staging Tools
 - SAS Information Map Studio
 - SAS Web Report Studio
 - SAS Enterprise Guide
 - SAS Stored Process Server
- Delivery Tools
 - SAS Information Delivery Portal (various portal types)
 - SAS Web Report Studio
 - SAS Add-in for Microsoft Office (AMO)

Before beginning the live portion of the demo, go over the two paths you'll be following to create BI reports:

Path 1:

1. Build a SAS data set via SAS Enterprise Guide and register it
2. Build a SAS Information Map on the data from #1
3. Using SAS Web Report Studio, build a report using the Info Map from #2
4. Surface the report on the SAS Portal

Path 2:

1. Build a SAS data set via SAS Enterprise Guide and register it
2. Create a report using SAS Enterprise Guide
3. Turn the report from #2 into a SAS Stored Process and test on the SAS Stored Process Server
4. Surface the stored process on the SAS Portal

Don't worry about making sure they understand each of the tools. Your goal is not to overwhelm them but to help them understand the power in each tool and how they build upon each other. This is the longest part of the demonstration – I usually take about an hour.

CONCLUDING THE KICK-OFF MEETING

If they are interested in proceeding, finish by filling out a SAS Active Project form. We create a project for each POC and document it using MS Sharepoint (see template in Display 1). We gather the following information:

- A 3-5 digit acronym representing the project/team. For this paper we'll use ZIP.
- A description of the project.
- A count of the approximate number of developers and consumers.
- The SAS Client software – determine versions and what is needed. Currently, we suggest SAS Enterprise Guide 5.1, SAS Information Map Studio 4.31, and, optionally, SAS Add-in For Microsoft Office 5.1. We do not offer SAS Management Console to our users but maintain that on the SAS Support team.
- Determine which products SAS web tier platforms they'll use: SAS Information Delivery Portal, SAS Web Report Studio, SAS Stored Process Server, and/or SAS Enterprise Miner, and create a document with the various links.
- An individual to be the lead contact with their email address.
- Names, email addresses, roles, and IDs for each person to be set up in the metadata. Developers must have a Linux ID, whereas the consumers can use their LDAP IDs.
- Include notes from each meeting, takeaway tasks, milestones met, etc.

<p><ACRONYM and PROJECT/GROUP NAME></p> <p>Project Description</p> <ul style="list-style-type: none"> • Business Function: • Description of Project: • Migration or new to SAS?: • Number of Users: • Server, Desktop, or both?: <p>Key Project Dates</p> <ul style="list-style-type: none"> • Kickoff: • Server allocations: • Desktop Installs: • Update TNSNAMES: • Metadata Build-Out: • Automation: • NDM: • Production ready: <p>Desktop Details</p> <ul style="list-style-type: none"> • PC SAS, Enterprise Guide, or both: • SAS Version: • SAS Currently Installed?: • EBI (Y/N): • AMO (Y/N): • Emimer (Y/N): • Users have admin rights?: 	<p>Server Details</p> <ul style="list-style-type: none"> • Server: • Emimer (Y/N): • EBI (Y/N): • Filesystem Names: • Storage Requirements: • Initial data load volume: • Yearly data volume growth rate (% or TB): • NDM Internal (Y/N): • NDM External (Y/N): • External Data Sources (Teradata, DB2, Oracle): • Existing KEON configuration? (Y/N): • Automation/Autosys: • Long running batch jobs? (greater than 24 hours, over weekends, etc): <p>Additional Meeting Notes</p> <ul style="list-style-type: none"> • Date/note <p>Project Contacts</p> <ul style="list-style-type: none"> • Primary Contact - primarycontact@wellsfargo.com - Manager and primary LOB contact • Support Contact - supportcontact@wellsfargo.com - Primary contact for issues <p>1SAS Info</p> <ul style="list-style-type: none"> • Important updates and communications are posted to the 1SAS Teamsite • To engage 1SAS support, request software, etc., open an issue/request in SAS Issues and Requests • Weekly Maintenance window each Sunday from 8 AM ET to 6 PM ET <p>Important Links</p> <ul style="list-style-type: none"> • Desktop Install Requests • SAS License Renewal • NDM Setup Requests • Autosys/LSF Setup Requests • SAS Grid Document Library
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Display 1. MS Sharepoint SAS Active Project Template

STEP 2: LINUX FILESYSTEMS AND SECURITY

Start with a test environment – you don't want newbies working with SAS metadata in a production environment. Set up numerous 50G POC filesystems ahead of time, so space is available as needed. This can then be broken up into multiple projects, each using their chosen acronym. Within each filesystem, set up a standard set of directories. See Output 1 for an example.

```
[srvr] sas1 /workspace/uat/poc/zip> ls -l
drwxrwxrwx 2 sas1 sas 2 Feb 23 11:01 data
drwxrwxrwx 2 sas1 sas 2 Feb 23 11:01 output
drwxrwxrwx 2 sas1 sas 2 Feb 23 11:01 programs
drwxrwxrwx 2 sas1 sas 2 Feb 23 11:01 reports
drwxrwxrwx 2 sas1 sas 2 Feb 23 11:01 scripts
drwxrwxrwx 2 sas1 sas 2 Feb 23 11:01 stp
```

Output 1. Standard Linux Filesystems

Set up security at the acronym level, using Linux ACLs, to prevent others from accessing the filesystem. Also, since we use the Stored Process Server for our stored processes, we add the ID needed to the ACLs.

See a sample in Output 2.

```
[srvr] sas1 /workspace/uat/poc/zip> gacl .
A::OWNER@:rwaDxtTnNcCy
A:g:GROUP@:
A::EVERYONE@:
A::sassrv1@wellsfargo.com:rxtncy
A::a987654@wellsfargo.com:rwaDxtTnNcCy
A::a123456@wellsfargo.com:rxtncy
```

Output 2. Linux ACL

We use a SAS program to read the SAS metadata and get the users' IDs to build Linux ACLs. SAS provides a macro, %mduextr, which builds a set of datasets containing the information needed for the ACLs. We create a text file for each ACL, and then use a Kornshell script to read the file and apply the ACL.

STEP 3: SAS METADATA

The SAS metadata for each project consists of four parts: users/groups, ACTs (Access Control Templates), folders, and libraries. Enter them in the order indicated below. Via the SAS Management Console, log on as an unrestricted user (eg: sasadmin@saspw).

1. Groups

Figure 3 shows the three groups we'll use for our example. The first, ZIP is an 'umbrella' group whose sole responsibility is to combine all the other groups for information to be shared on the SAS Portal with everyone on the project. It doesn't have any roles. The other two are user groups.




 ZIP	Overview folder for IDP only (no users)
 ZIP Consumers	Group for consumers of the POC
 ZIP Developers	Group for SAS developers with full read/write access

Figure 3. POC SAS Metadata Groups

Using the User Manager, set up the 'umbrella' group with the acronym name, without any roles. Then set up a group for each level of user. For this paper we're setting up the ZIP Developers and ZIP Consumers, both a part of the ZIP group. Add the appropriate roles depending on the capabilities you want them to have, as shown in Figure 4.

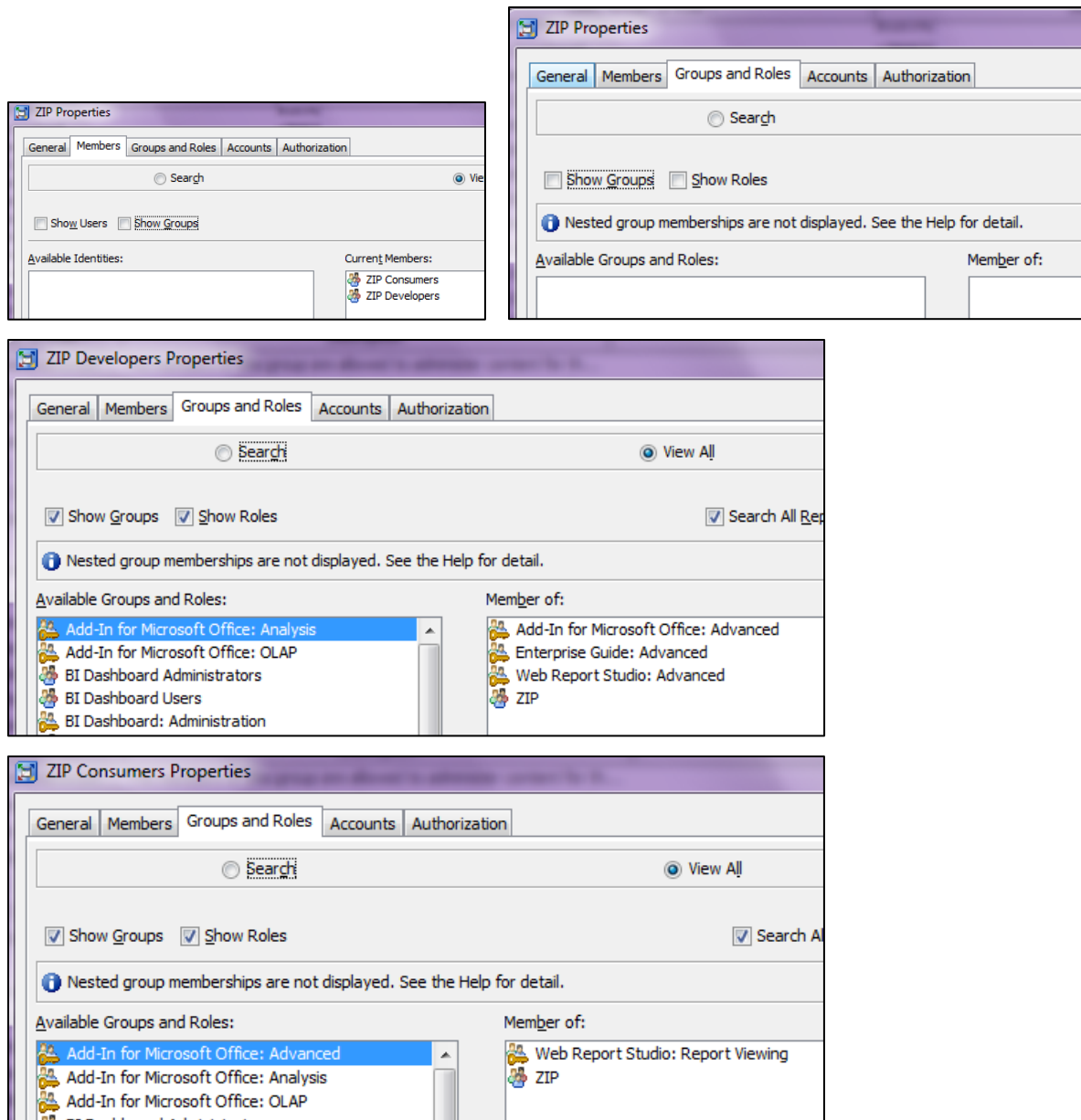


Figure 4. ZIP Groups in SAS Metadata

2. Users

Each developer should have a Linux ID and be set up with default authorization (DefaultAuth), then added to the ZIP Developer group. We set each user up with just the most basic information and their email address. This enables us to send emails from SAS. The users are part of the ZIP Consumer group using local authentication. Figure 5 shows one of each type of user.

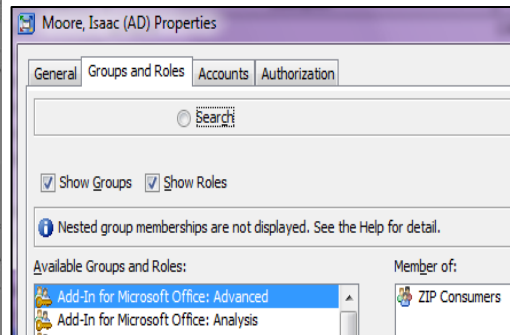
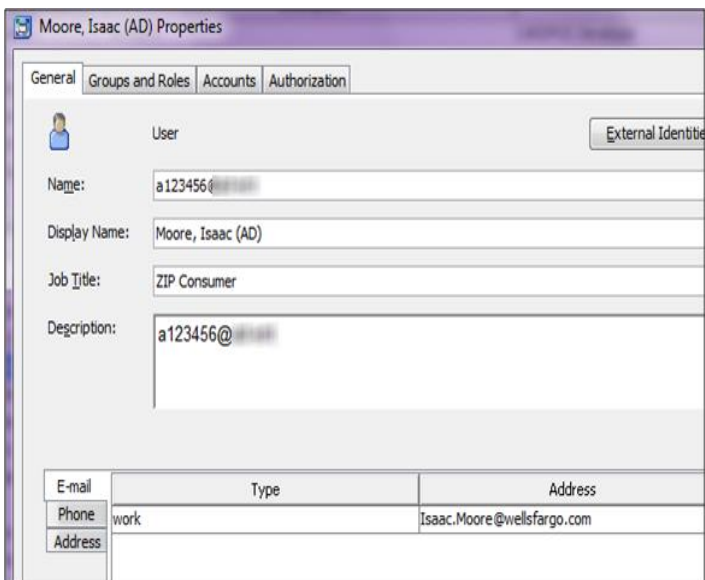
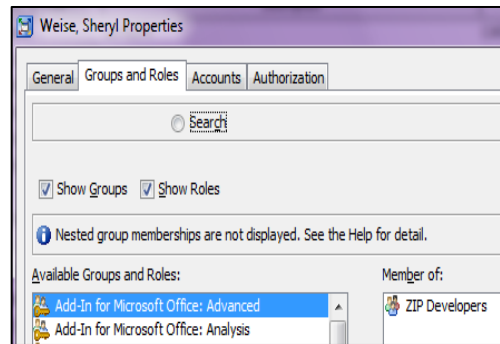
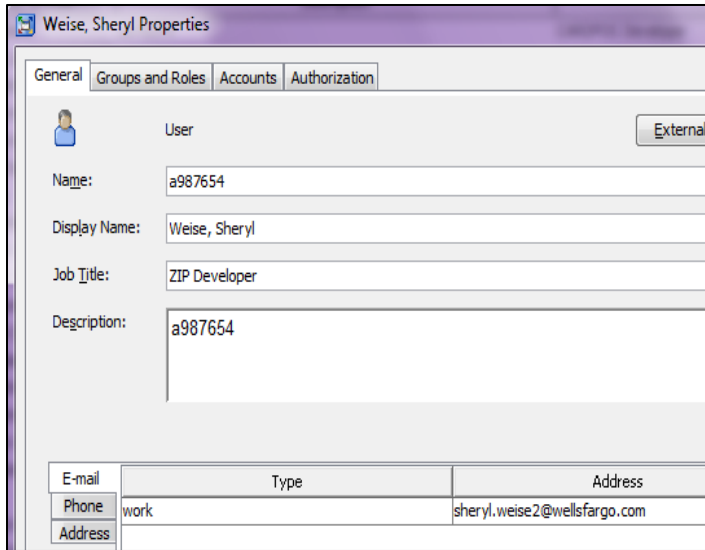


Figure 5. ZIP Developer and ZIP Consumer Users in SAS Metadata

We also add an internal account for the ZIP Developers to use to test their results the same as if they were a consumer (see Figure 6). This account exists only in the SAS metadata and uses the SAS System Services ID for Linux access.

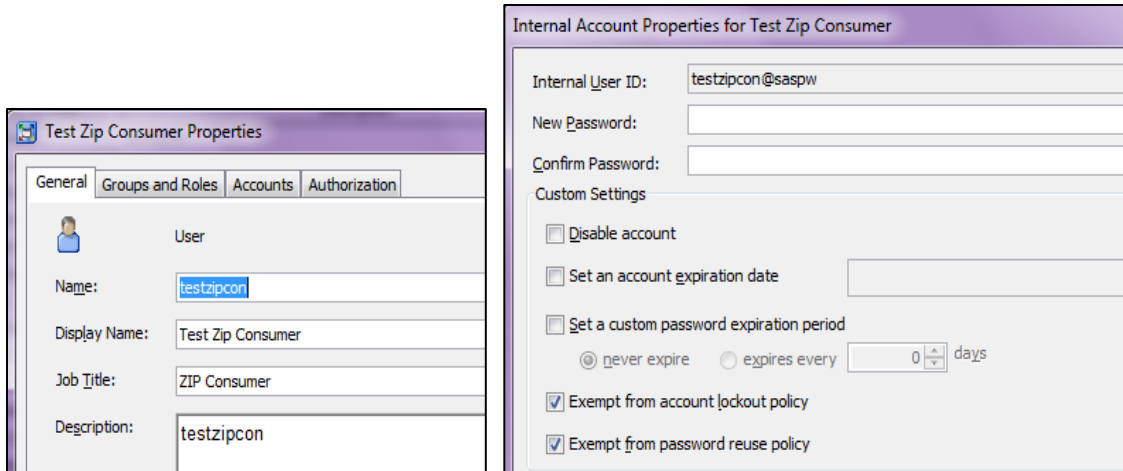


Figure 6. Internal Account to Test ZIP Consumer Capabilities

3. ACTs

Using the Authorization Manager, set up an ACT for each of the two user groups, adding the appropriate group and setting up permissions, as show in Figure 7.

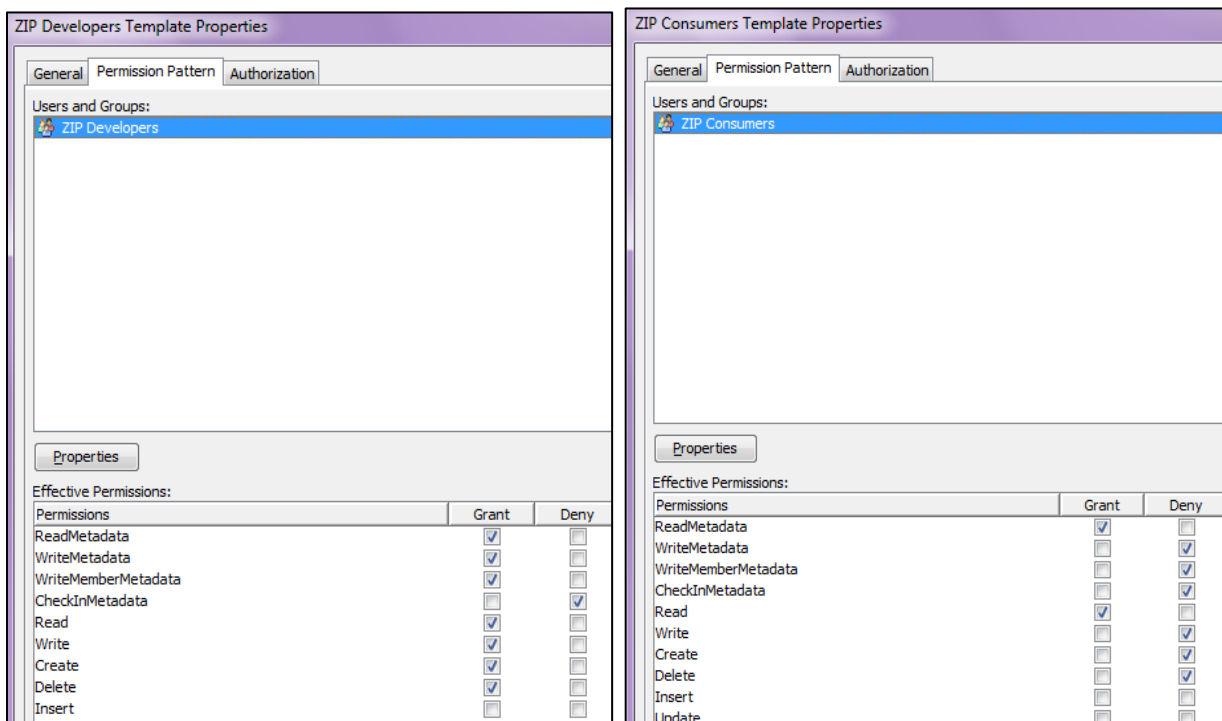


Figure 7. SAS Metadata ACTs

We use a separate ACT for each user group, so we can control access at the folder level as wanted. For example, the developers will have write access to the script directory in Linux, whereas the consumers won't access at all. Remember, we create the Linux ACLs using the SAS metadata groups.

4. Folders

From the Folders tab, create a folder structure similar to Figure 8. SAS recommends you keep the structure as flat as possible and name each folder clearly,

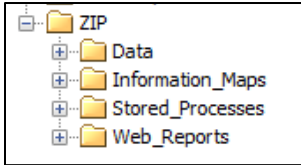


Figure 8. SAS Metadata Folders

Next, right-click on the ZIP folder, and go to the Authorization tab to add the Access Control Templates. Make sure to add the Private User Folder ACT to prevent other users from having access, and then add the 2 ZIP ACTs, as show in Figure 9.

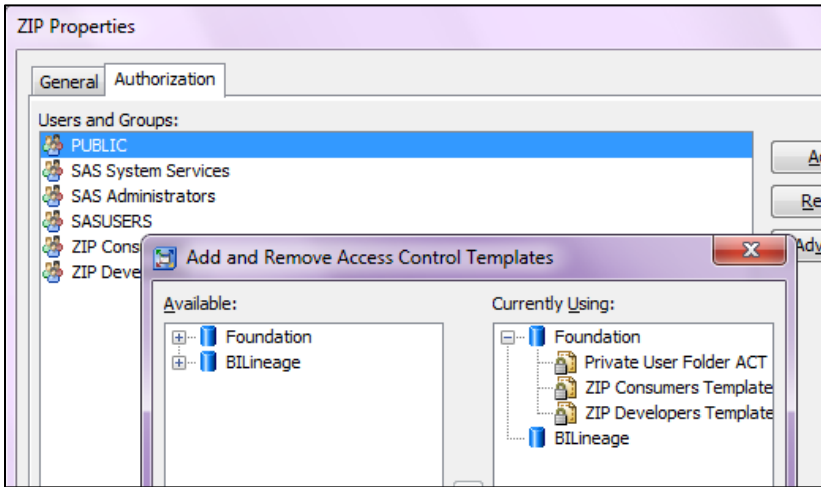


Figure 9. Adding SAS Access Control Templates

As you click on each group you'll see the permissions in green, showing they are set via the ACTs.

5. Data libraries

Using the Data Library Manager, set up a SAS metadata definition for the library on Linux. When you set the Location (see Figure 10) to the folder created in #4 it inherits the permissions and thus prevents anyone outside of the ZIP group from accessing.

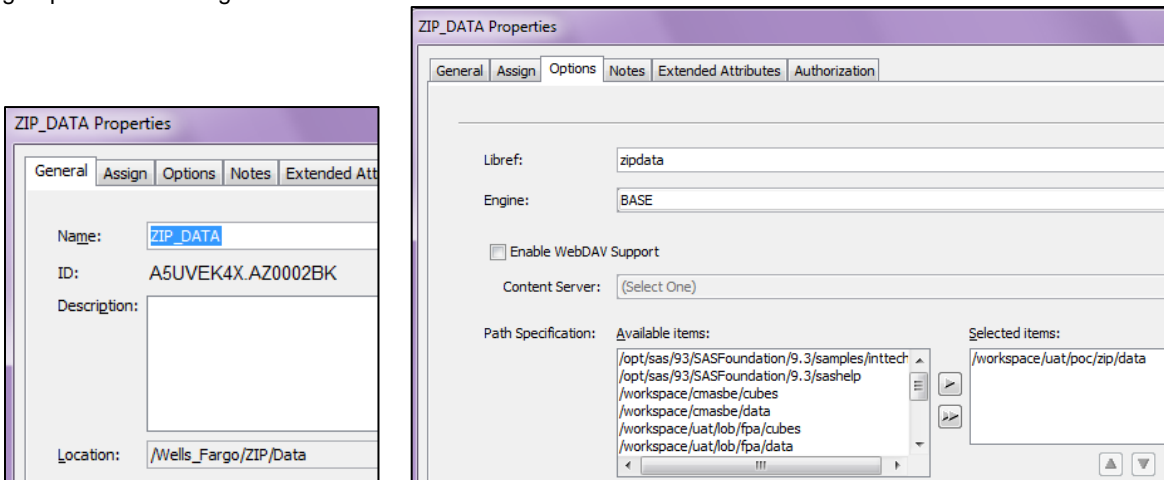


Figure 10. ZIP Data Library Definition

STEP 4: SAS CLIENT TOOLS

This paper assumes the SAS web tier applications with assisting components (eg: Java, servlet container, Web Dav component, etc.) are already installed. Some companies use packages to push out the software, while others use a

SAS depot for the users to pull their own software. We recommend packages so that every install is consistent and contains all the necessary software. The client software for this paper includes:

- SAS Enterprise Guide 5.1
- SAS Information Map Studio 4.31
- SAS Add-in for Microsoft Office 5.1
- SAS Management Console 9.3 (for the SAS Support team)

Once the developers have the software installed, you provide instructions to configure the Linux connection. The users must be set up in the SAS metadata first (see Step 3). I created a basic SAS Enterprise Tutorial for experienced SAS Developers. For people new to development I recommend they take the beginning SAS programming class which is now taught using both PC SAS and SAS Enterprise Guide. I also provide a SAS Developer Reference Guide with recommended training, links to helpful internet sites, etc.

STEP 5: SAS ENTERPRISE BI WORKSHOP

Set up a 3 hour session with your developers to teach them how to create 2 basic BI reports, following the same 2 paths as you showed in the Live Demo. For this paper we'll use the ZIP environment. This is the agenda I follow (this assumes you have SAS Enterprise BI content development knowledge):

1. From SAS Enterprise Guide, review folder/server views, log arrows, hover and automatic statement, etc.
2. Again from SAS Enterprise Guide, write a new, simple program to create the data set. A sample is in Display 2.

```
libname sh '/opt/sas/93/SASFoundation/9.3/sashelp' ;
libname zip '/workspace/uat/poc/zip/data' ;

proc sql ;
  create table zip.slwzipcd as
  select distinct
    zip
    ,city
    ,countynm
    ,1 as Total
  from sh.zipcode
  where statecode eq 'VT'
  order by countynm, zip ;
quit ;
```

Display 2. Sample SAS Code

I have each user add their initials to every step along the way so that their information is separate from any others in the workshop.

3. Register the data sets to the SAS Metadata using the Tools/Update Library Metadata. Have your users watch as only one person needs to do the tasks shown in Figure 11.

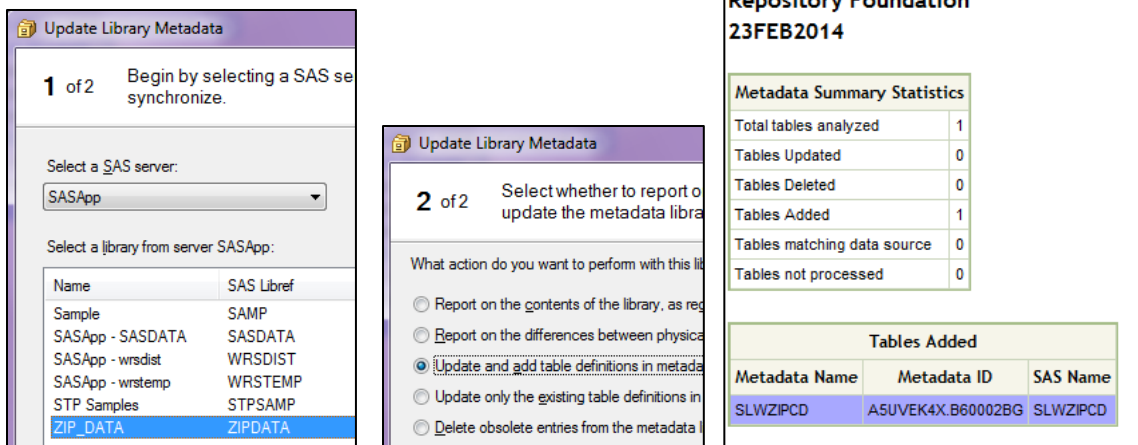


Figure 11. Registering SAS Data

4. Create an information map from that data set. Point out how the icons change as the variables become categories and measures. Change the zip variable to a category, change some names to better labels, add a format to the Total variable, etc. Figure 12 shows some of these changes.

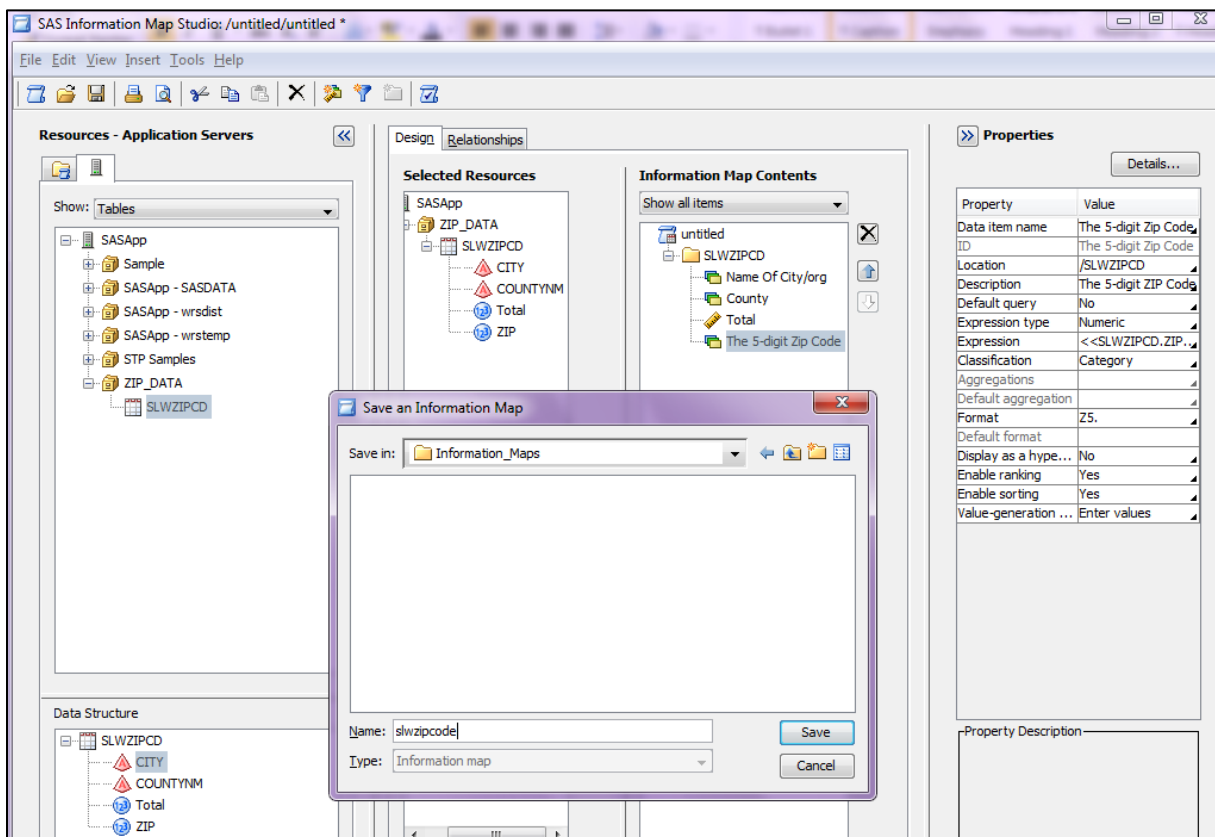


Figure 12. Creating a SAS Information Map

5. Create a web report using SAS Web Report Studio and the SAS Information Map from #4. It should consist of a horizontal bar chart, as shown in Figure 13, and then save it in the appropriate folder.

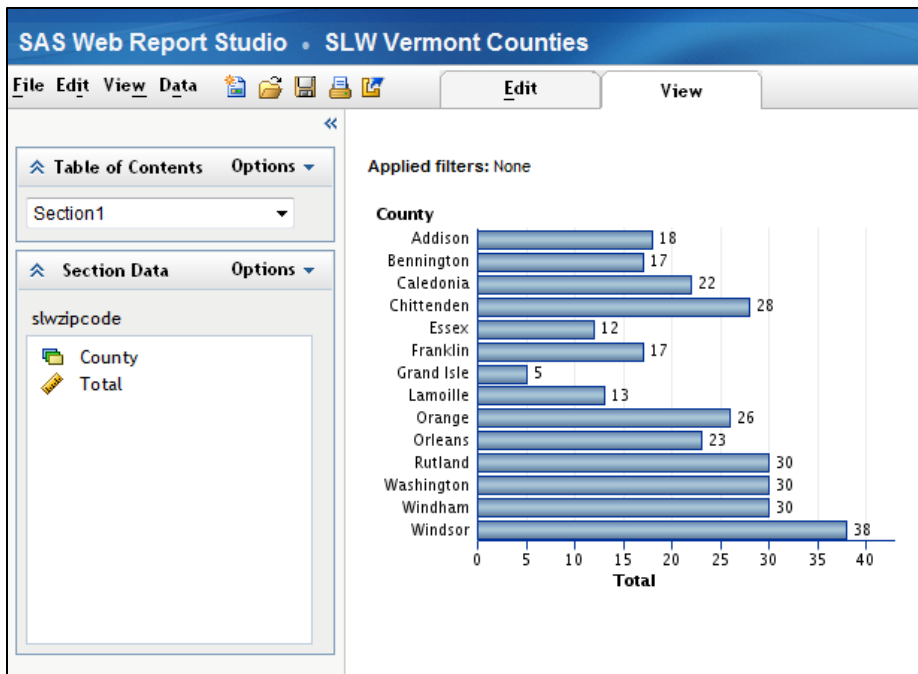


Figure 13. Graph Using SAS Web Report Studio

- Using SAS Enterprise Guide, recreate the same report as created in step #5, using the graphics wizard. Then add a few more bells and whistles using similar code as show in Display 3. Turn this report into a stored process, adding the same style sheet used in #5, and test using the SAS Stored Process web application, as shown in Figure 14.

```

options nocenter ;
libname zipdata '/workspace/uat/poc/zip/data' ;

PROC SQL;
    CREATE VIEW WORK.SORTTempTableSorted AS
        SELECT T.COUNTYNM, T.Total
        FROM ZIPDATA.SLWZIPCD as T
;
QUIT;

Axis1 STYLE=1 WIDTH=1 label=('County') ;
Axis2 STYLE=1 WIDTH=1 MINOR=NONE label=none ;
TITLE;
FOOTNOTE;
PROC GCHART DATA=WORK.SORTTempTableSorted ;
    HBAR3D
    COUNTYNM /
    SUMVAR=Total
    SHAPE=CYLINDER
    FRAME
    TYPE=SUM
    SUM
    COUTLINE=BLACK
    MAXIS=AXIS1
    RAXIS=AXIS2 ;
RUN; QUIT;

```

Display 3. SAS Graph Code

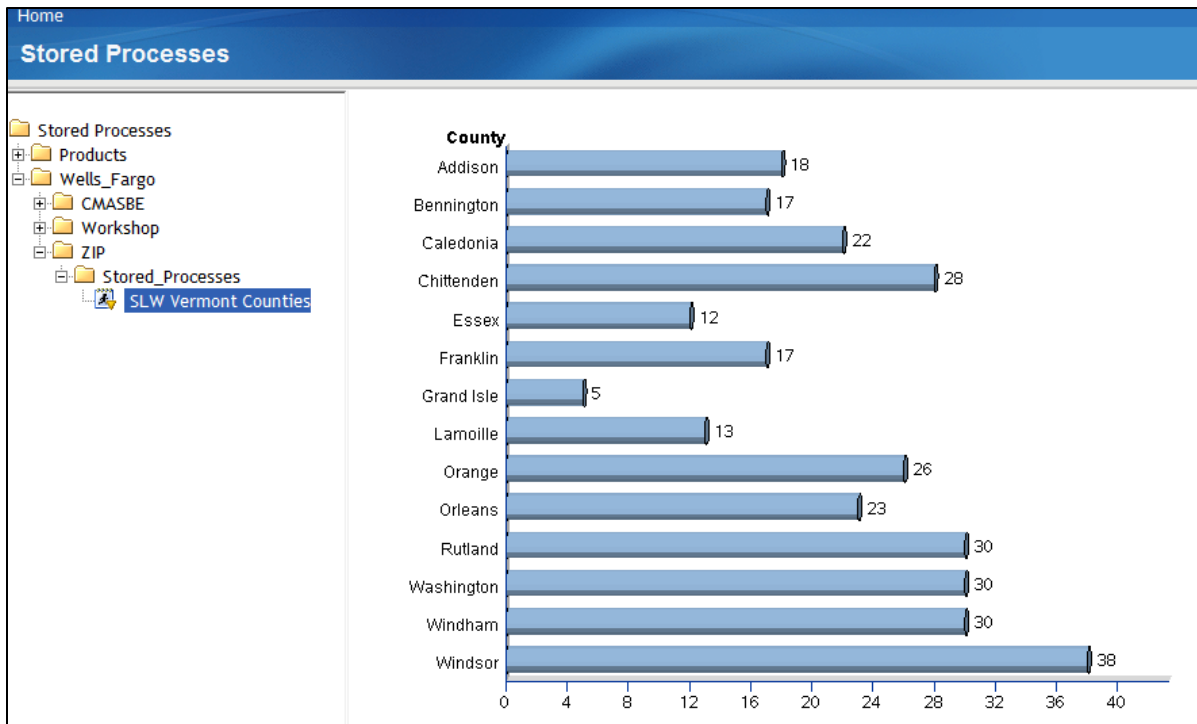


Figure 14. Testing Stored process

7. Create a SAS Information Delivery Portal page with 2 columns. Add a SAS Report Portlet and add the report from #5 to it. Add a SAS Stored Process Portlet to the page, and add the report from #6. One version looks like Figure 15.

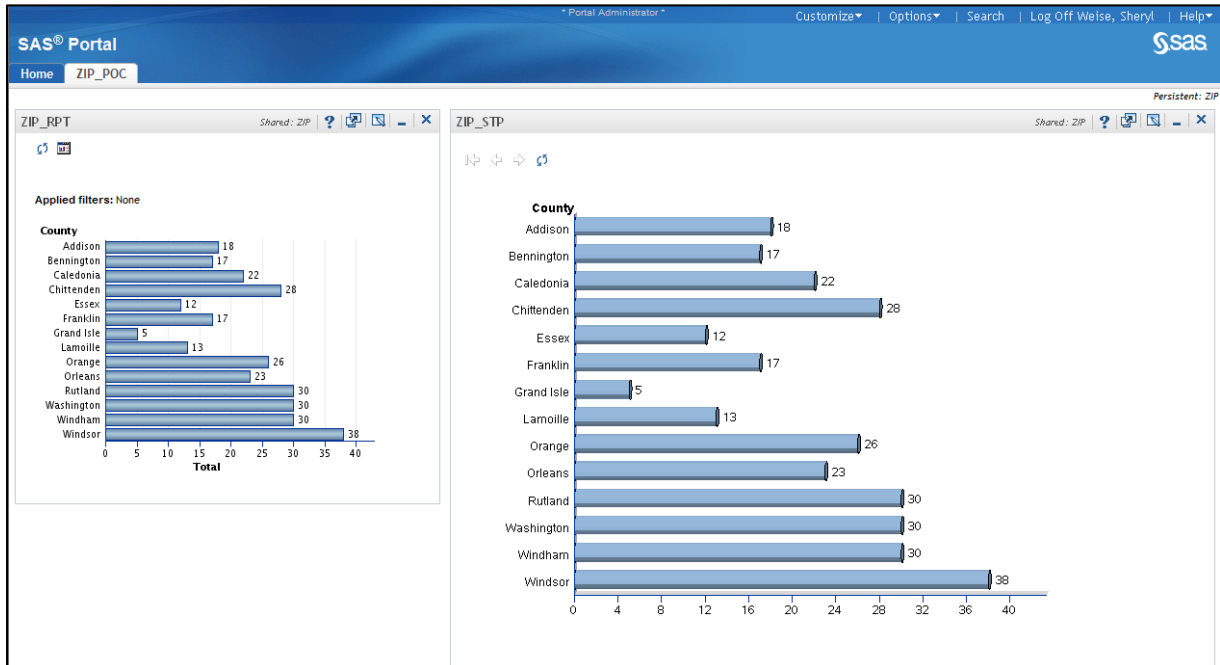


Figure 15 SAS Information Delivery Portal

Make sure your page and portlets are all created as Persistent and shared with only the ZIP group. They will have to create their versions in their personal folders, since they are not Content Administrators.

8. If they are interested in SAS Add-in for Microsoft Office, have them open up MS Excel and pull in the results of this workshop (data and SAS Stored Process). Then repeat the process using MS PowerPoint and pull in the SAS Web Report for variety.
9. If your audience contains PC SAS developers, go over additional features of SAS Enterprise Guide, especially if their prior experience is with only PC SAS. I recommend:
<http://analytics.ncsu.edu/sesug/2013/CC-22.pdf>
10. After getting permission, show them other SAS Enterprise BI projects that have been created at your company.

STEP 6: DEVELOP A PROJECT

I've found the best way is for them to identify a repetitive SAS process they already perform. For example, a weekly process they run to create some specific output which they then email to a group of users. Help them map out their design: input, output, processing, prompts, delivery tool, etc. Go over their SAS folders and Linux filesystems. Make sure to show them the SAS Stored Process examples. Some business examples I have helped with:

- A chained stored process for querying servers. The first screen provided drop-down menus, date selection (calendars), entry boxes, and radio buttons for output type, to query against 60K plus servers. The result provided the output in the format requested, or a report stating no results were found matching the selection criteria.
- A Web Report built pulling data from 3 different databases nightly, and summarizing to create 4 different graphs.
- A marketing map of products by state and county, along with the detailed data, accessible from Microsoft products only.

I recommend setting up weekly meetings to continue providing assistance until they complete their proof of concept. Be available when they are ready to present to management, in case additional questions arise.

STEP 7: FOLLOW UP

After the presentation conduct a follow-up meeting with the team, both consumers and developers and gather feedback. Would they like an additional POC project? Are they ready to do a full-blown project? Even if they decide not to proceed at this time, follow-up with them in 3 months and see if there is any additional assistance you can provide. And if they do decide to begin developing in the SAS Enterprise BI platform, recommend they start with the fast track class taught by SAS, and continue to provide support as they grow comfortable with the tools.

CONCLUSION

Remember to be flexible. No two projects and no two user groups are alike.

RECOMMENDED READING

- SAS® EBI: What is it, what will it do for me and does it really work?
- presented at SESUG 2009 by Frederick Pratter, PH.D.

CONTACT INFORMATION

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

Sheryl Weise
Wells Fargo Bank
Charlotte, NC
Sheryl.Weise2@wellsfargo.com

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