Let SAS® Handles Your Job While You are Not at Work!

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ABSTRACT

Report automation and scheduling are very hot topics in many industries. Automating reports have many advantages including reduced work load, elimination of repetitive tasks, generate accurate results, and better performance. This paper illustrates how to design an appropriate program to automate and schedule reports in Base SAS® and SAS Enterprise Guide® using SAS server as well as the Windows Scheduler. The automation part includes good aspects of formatting Microsoft Excel using XML or VBA coding and conditional auto e-mailing with file attachments. This paper illustrates important aspect of scheduling reports as well using Microsoft Office Add-Ins to automat reports without using much manual intervention.

INTRODUCTION

Most of our corporate industries analyses data using Microsoft Excel. Formatting and automating excel reports will be the most challenging task. In recent years, SAS launched web based applications such as Visual Analytics and other Business Intelligence solution applications for people across all levels in an organization. We can certainty take advantage of these applications in order to analyze and run reports in more effective manner. This paper highlights some of the important key features of automating reports using windows scheduler and provides useful information on SAS Add-In for Microsoft Office without even using schedulers and end user can have an option filter data and generate excel reports.

USING WINDOWS TASK SCHEDULER

You can schedule your report using windows scheduler under **Control Panel ▸ Administrative Tools ▸ Task Scheduler ▸ Create Task**. You can give path to invoke your project or program under general tab and then you can schedule time by adding new trigger selecting bellow mentioned options. Window 7 or Windows 8 scheduler has very good options to keep track of all your scheduled reports.
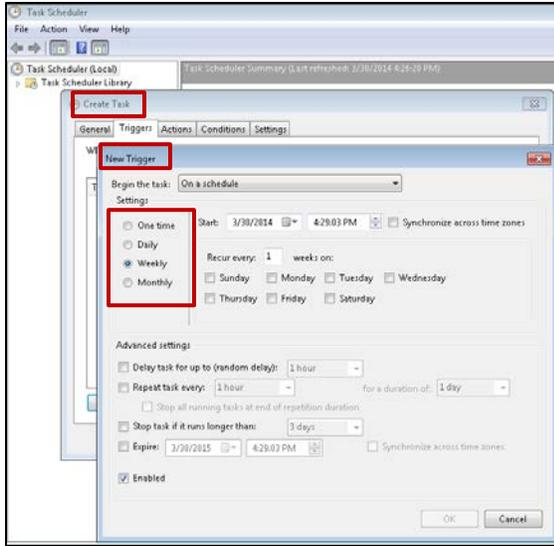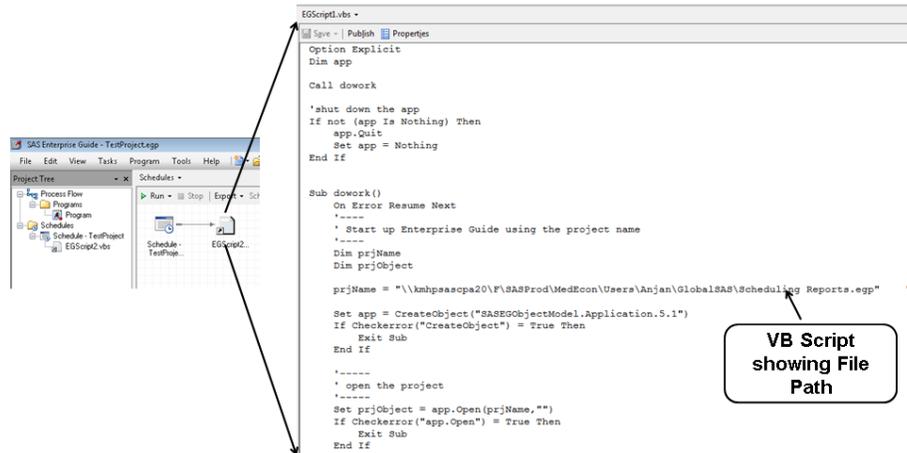
SCHEDULING IN SAS ENTERPRISE GUIDE

SAS Enterprise Guide has way to schedule your project or program generated by Point and Click method. You can schedule project or program followed by **File ▸ Schedule project**. When you schedule a task SAS Enterprise Guide outputs task window as shown below.
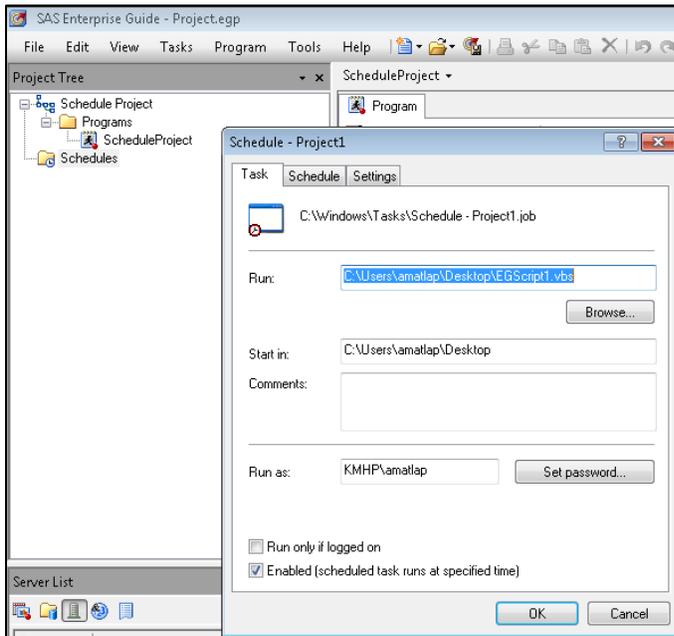
SAS Enterprise Guide scheduling based on VB scripting method as shown in the bellow figure. VB Scripting code involves Create Object method to invoke project through Application Programing Interface (API). If you are familiar with Visual Basic coding, you can take advantage using VB code adding in Microsoft Excel modules for forming and auto emailing reports.

```
EGScript1.vbs ▾
 Save ▾ | Publish  Properties
Option Explicit
Dim app

Call dowork

'shut down the app
If not (app Is Nothing) Then
    app.Quit
    Set app = Nothing
End If

Sub dowork()
    On Error Resume Next
    '----
    ' Start up Enterprise Guide using the project name
    '----
    Dim prjName
    Dim prjObject

    prjName = "\\kmhpsascpa20\F\SASProd\MedEcon\Users\Anjan\GlobalSAS\Scheduling Reports.egp"    '

    Set app = CreateObject("SASEGObjectModel.Application.5.1")
    If Checkerror("CreateObject") = True Then
        Exit Sub
    End If

    '-----
    ' open the project
    '-----
    Set prjObject = app.Open(prjName,"")
    If Checkerror("app.Open") = True Then
        Exit Sub
    End If
```

VB Script showing File Path

When you schedule your report using Point and Click method in SAS Enterprise Guide under file menu, scheduler outputs scheduler window with three tabs as shown in below figure. You can specify project or program path in task tab. You also have an option to set user name and password, however this task is optional.   You can specify time in schedule tab which invoke the project or program at specified time.
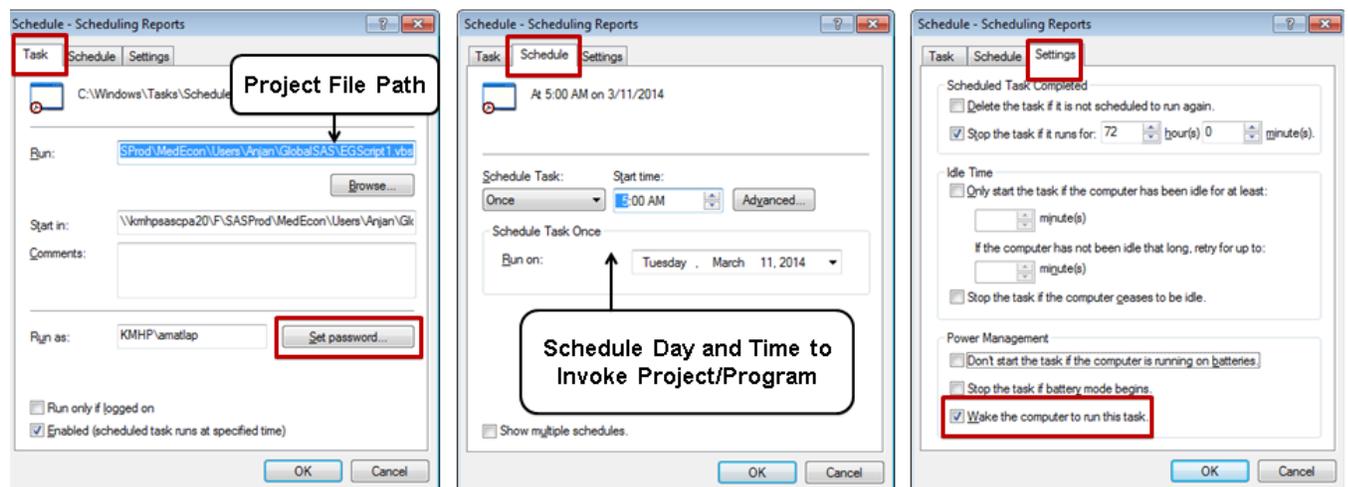

USING XML TAG SETS

You can use XML tag sets in Point and Click Method for formatting Microsoft Excel reports using ODS option in PROC REPORT similar to Base SAS. You have an option to write PROC REPORT code using XML tag sets in programming window and link this code window at the end of your project in Pont and Click method as shown below figure (see Appendix for code details) [1].

---

[1] In appendix section PROC REPORT using xml tag sets and conditional email program is included, you can take advantage of this code for formatting and auto email reports. Please make a note that XMLtag sets do not support image files to display on Excel reports.
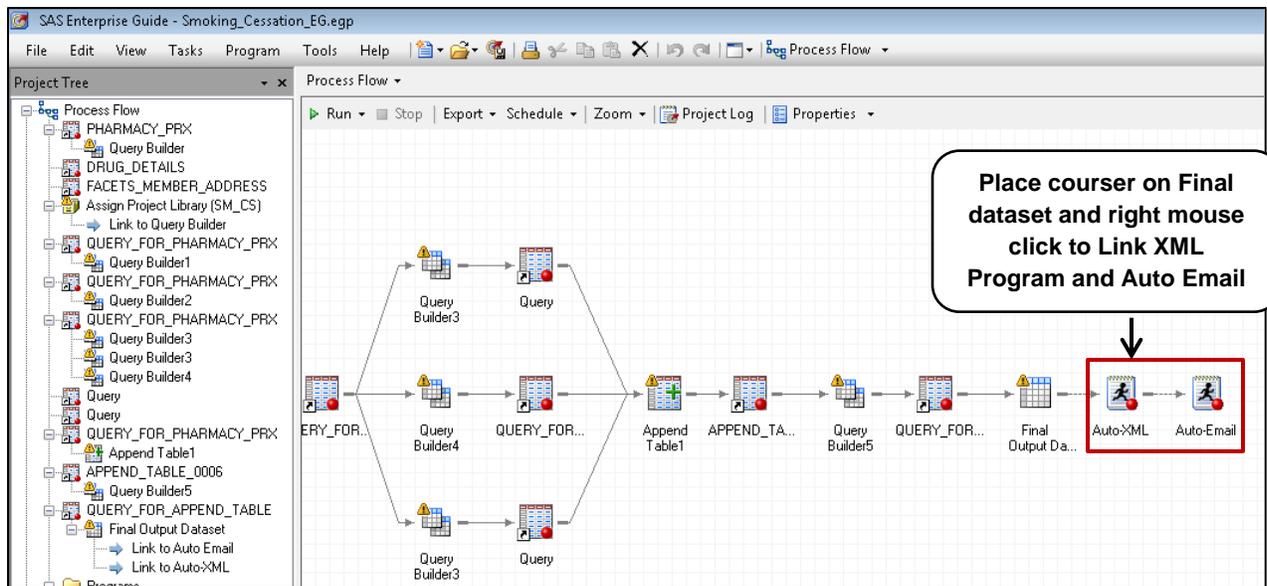
CREATING PROMPTS

SAS Enterprise Guide has an excellent feature that you can easily add or access existing prompts in SAS program or from Query Builder. Bellow mentioned example is showing to create prompt in Query Builder. Step 4 shows using this prompt as a macro variable in PROC REPORT.
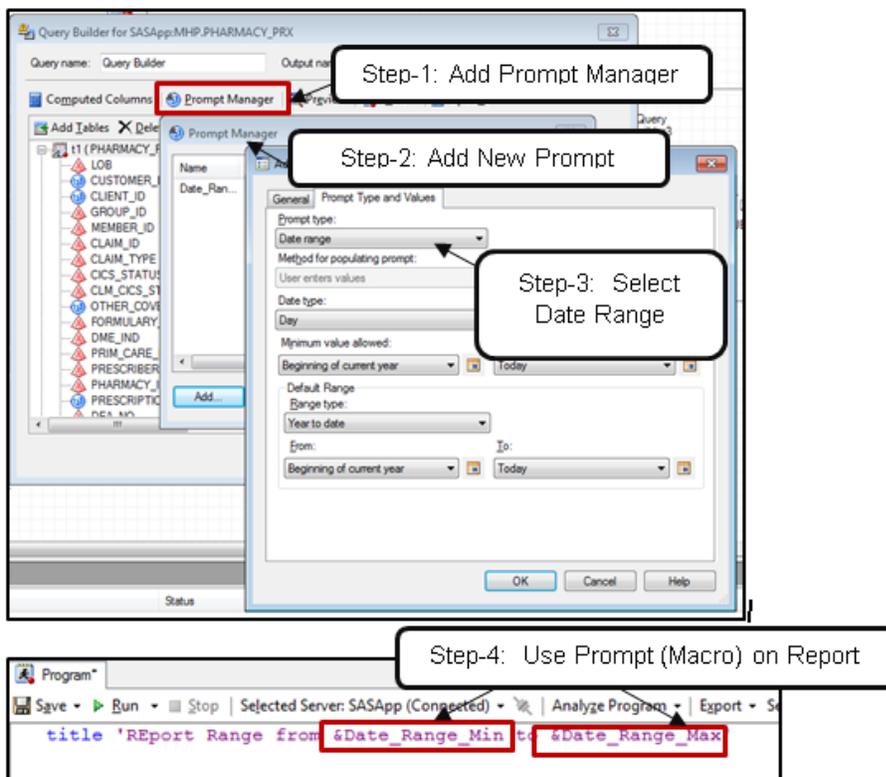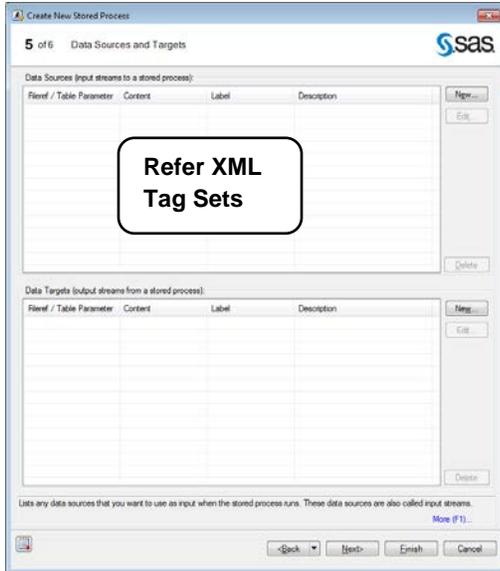
Prompts can be used variety of ways to meet user requirements in a given project. Prompts can allow user to enter information, search through data or drill down your data. Once you raise prompt in Point and Click method then you can either use this prompt dynamically or use as a macro variable as shown in the below code [2]. You can use prompts in Add-In for Microsoft Office, this task is mentioned later section in this paper.

```
 *---Using Date Range (MONYRPROMPT_MIN and MONYRPROMPT_MAX)and Member_Benfit_Group as
                              text input prompt---*;
PROC SQL;
   CREATE TABLE WORK.ER_CLAIMS AS
   SELECT DISTINCT t1.CLAIM_ID,
          t1.MEMBER_ID,
          (DATEPART(t1.SERVICE_FROM_DATE)) FORMAT=MMDDYY10. AS SERVICE_FROM_DATE,
          t1.CLAIM_TYPE,
          t1.CLAIM_FORM_TYPE,
          t1.PLACE_OF_SERVICE,
          t1.SERVICE_CATEGORY,
          t1.PROCEDURE_CODE,
          t1.REVENUE_CODE,
                t1.TOTAL_PAID_AMT  FORMAT=dollar12.2
      FROM ADC5400.FACETS_CLAIMS t1
      WHERE datepart(t1.SERVICE_FROM_DATE) BETWEEN "&MONYRPROMPT_MIN"d AND
            "&MONYRPROMPT_MAX"d
      AND t1.MEMBER_BENEFIT_GROUP = "&Member_Benfit_Group";
QUIT;
```

STORED PROCESSES

SAS Stored Processes are SAS programs stored in central location that can be run on demand.   Once you created and registered stored processes, all stored processes are available in SAS Application or Metadata or Stored Processes server. You can able to run stored processes in SAS Intelligence platform applications, such as Add-In for Microsoft Office and SAS Web Report Studio. After completion of your project you can register stored processes by following steps as shown below.

---

[2] The following example is showing date range prompt as &MONYRPROMPT_MIN and &MONYRPROMPT_MAX and also &Member_Benfit_Group as text input field.

Name and Save Stored Processes at Specified Path

Modify or Insert Code if necessary

Step 1 is showing the project path and in step 2, you have an option to add or modify and clear SAS code.

Register Store Processes

At step-3 you have choice of register stored process in stored processes server or Metadata server or SAS application server.

After complete compilation of your program, stored processes are available and you can access from Add-In for Microsoft or SAS Web Report Studio through web services.

SAS ADD-IN FOR MICROSOFT OFFICE

SAS Add-In for Microsoft Office provides bridge between SAS analytics and Microsoft Office tools especially Excel reports. Once you add SAS Add-In for Microsoft Office in Excel options, this feature appear on Excel Ribbon as shown below figure. You can access SAS datasets from SAS data folder and you can run stored process from Reports on Excel Ribbon.
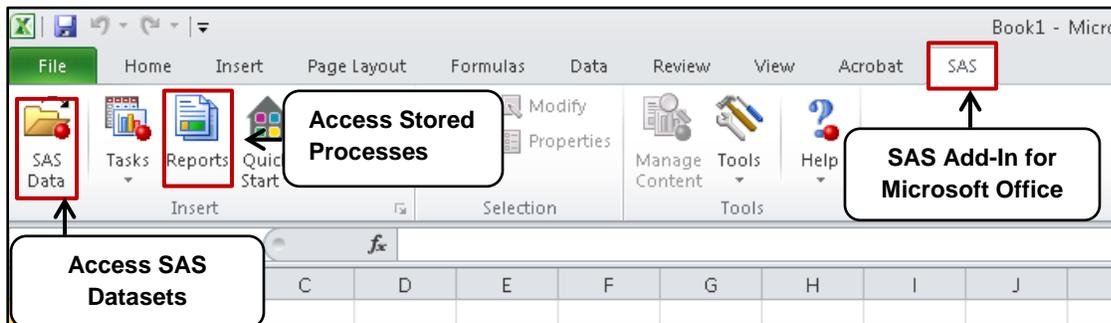

ACCESSING SAS DATASETS IN EXCEL

You can access SAS datasets in Excel Spread sheet by selecting SAS Data icon as shown in the figure. You have an option to display your results either using worksheet or pivot table for further data analysis. Whenever you run SAS program to update your SAS dataset and end user can refresh your data by choosing refresh button.
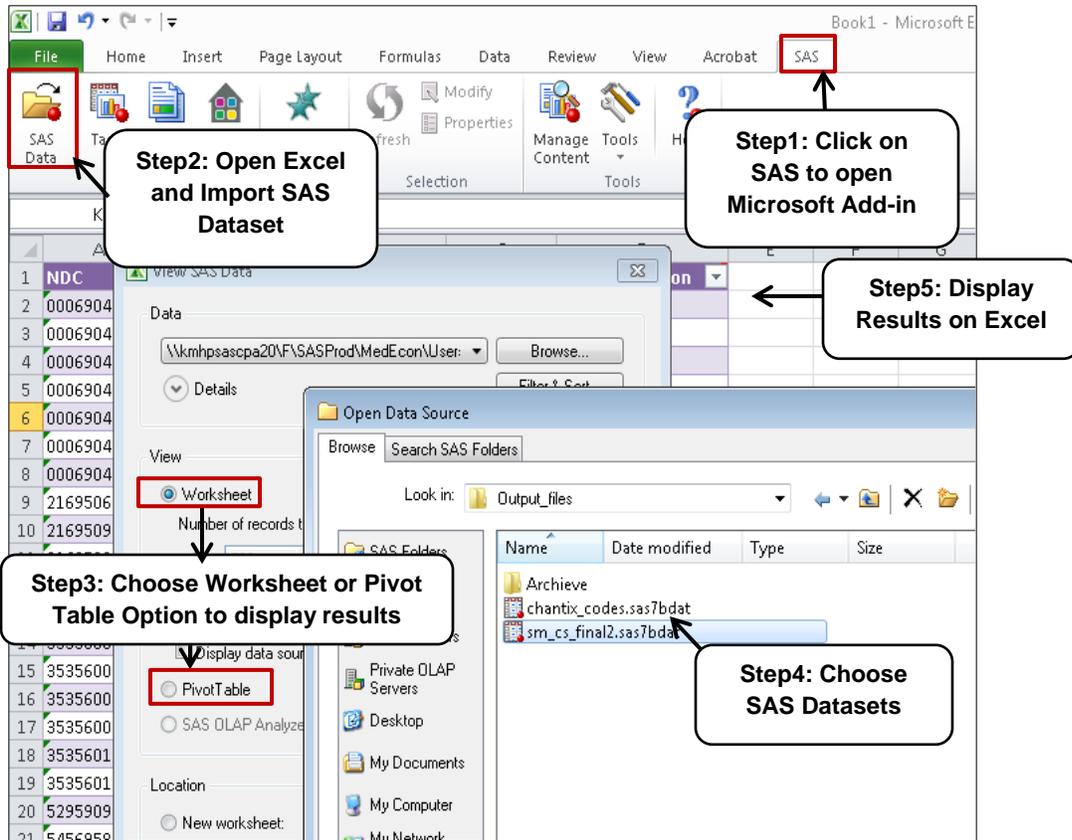
RUN STORED PROCESSES IN EXCEL

All registered stored processes are available by selecting correct file paths in server locations. At this point you can able to access all predefined prompts in Excel to filter your data.
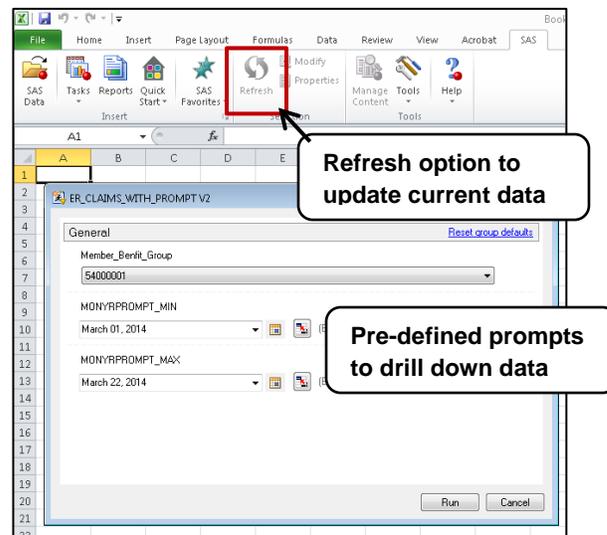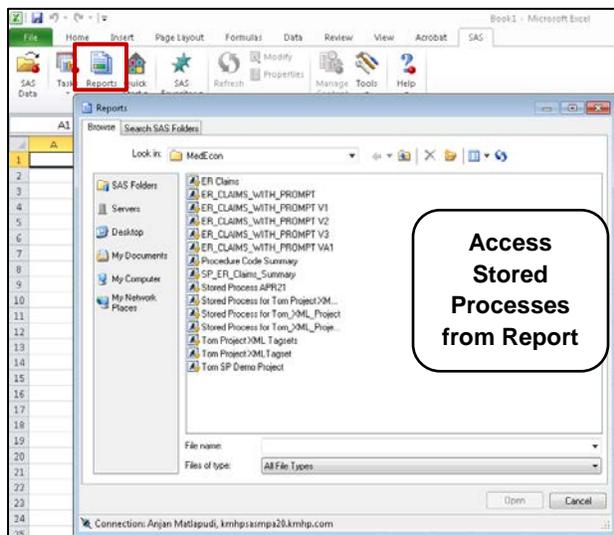
CONCLUSION

SAS lunched excellent products such as Visual Analytics and SAS Business Intelligence application which includes SAS Add-In for Microsoft Office, SAS OLAP Cube Studio, SAS Reporting Web Studio and SAS BI Dashboard.   All these applications have rich GUI interface that user can easily analyze data and can able to generate reports. SAS Management council has excellent feature to give user authentication at server level access or folder level access. Management council administrator can able to create folders to categorize reports and able to authenticate read and write access to end users.

In this paper I have provided available options to automat reports, you can schedule your reports using windows schedulers in SAS Enterprise Guide or using Base SAS. I further highlighted some important aspects of Stored Processes facility and end user can drill down data by raising prompts to display reports in Microsoft Excel, Word, Access and Outlook without even using schedulers.

REFERENCES

Tricia Aanderud and Angela Hall '*Building Business Intelligence Using SAS® Content Development Examples'*. SAS Press 2012 Edition.

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CONTACT INFORMATION

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APPENDEX - PROGRAMS

```
****************************************************************************/
* PROC REPORT Using XML Tag sets
****************************************************************************/;
*---Using Date Range (MONYRPROMPT_MIN and MONYRPROMPT_MAX)and Member_Benfit_Group as
text input prompt---*;
PROC SQL;
   CREATE TABLE WORK.ER_CLAIMS AS
   SELECT DISTINCT t1.CLAIM_ID,
          t1.MEMBER_ID,
          (DATEPART(t1.SERVICE_FROM_DATE)) FORMAT=MMDDYY10. AS SERVICE_FROM_DATE,
          t1.CLAIM_TYPE,
          t1.CLAIM_FORM_TYPE,
          t1.PLACE_OF_SERVICE,
          t1.SERVICE_CATEGORY,
          t1.PROCEDURE_CODE,
          t1.REVENUE_CODE,
          t1.TOTAL_PAID_AMT  FORMAT=dollar12.2
      FROM ADC5400.FACETS_CLAIMS t1
       WHERE datepart(t1.SERVICE_FROM_DATE) BETWEEN "&MONYRPROMPT_MIN"d AND
       "&MONYRPROMPT_MAX"d
       AND t1.CLAIM_PAYMENT_STATUS = '02'
       AND t1.MEMBER_BENEFIT_GROUP = "&Member_Benfit_Group";
QUIT;

data _null_;
    call symput("filedate", trim(left(put (today(),yymmdd10.))));
 run;


%stpbegin;

%let SAMPDIR = C:\Anjan\PromptManagerDemo;

%put &SAMPDIR.;

ods tagsets.ExcelXP path="&SAMPDIR."
file="StoredProcess_XML_Demo_Report_&filedate..xml" style=Printer;

********************************************************************************
* XML Tag sets Report Demo
********************************************************************************;
*--- Set Tag set options---*;
ods tagsets.ExcelXP options(embedded_titles='yes'
embedded_footnotes='yes'
print_header = '&C&A&RPage &P of &N'
print_footer = '&Printed &D at &T'
autofilter = '1-2'
suppress_bylines='yes'
sheet_interval='bygroup' sheet_Name="Wow ! We Made It !!"
width_points='1' width_fudge='1'
absolute_column_width='143,110,36,58.5,58.5,57.75'
frozen_headers='yes'
autofit_height='yes');

title1 justify=left bold color=Navy  FONT= "Times New Roman" height=18pt "ER Report" ;
title1 justify=left bold color=Blue  FONT= "Times New Roman" height=14pt "Report from
&MONYRPROMPT_MIN. to &MONYRPROMPT_MAX. " ;
```

```sas
proc report data=WORK.ER_CLAIMS (obs=100) nowd   split='#'
                 style(report)=[
                                  borderwidth=0.2
                                  asis=off
                                  frame       = HSIDES
                                  rules       = groups
                                  cellpadding = 1.0
                                  cellspacing = 0.8]

                 style(header)=[background=Silver bordercolor=#FF8080
                 font = Fonts('headingFont')] ;

column MEMBER_ID CLAIM_ID SERVICE_CATEGORY PROCEDURE_CODE REVENUE_CODE CLAIM_TYPE
SERVICE_FROM_DATE TOTAL_PAID_AMT;

define MEMBER_ID/'Member Id' group style()={just=left cellwidth=1.5 in };
define CLAIM_ID/'Claim Id' group style()={just=left cellwidth=1.5 in tagattr='@' };
define SERVICE_CATEGORY  /'Service # Category' style()={just=right cellwidth=1.0 in };
define PROCEDURE_CODE  /'Procedure # Code' style()={just=right cellwidth=1.0 in };
define REVENUE_CODE  /'Revenue # Code' style()={just=right cellwidth=1.0 in };
define SERVICE_FROM_DATE  /'Service Date' style()={just=center cellwidth=1.0 in };
define CLAIM_TYPE  /'Claim Type' style()={just=right cellwidth=1.0 in };
define TOTAL_PAID_AMT  /'Ammount Paid' style()={just=right cellwidth=1.0 in };

format TOTAL_PAID_AMT dollar12.2;

compute MEMBER_ID;
* Placeholder for row highlighting;
RowNum+1;
if (mod(RowNum, 2) ne 0)
then call define(_row_, 'style', 'style=[background=#FFFFCC]');
endcomp;

run;

ods tagsets.ExcelXP close;
quit;

%stpend;

*********************************************************************
* Conditional Email
*********************************************************************/;
proc sql;
select count(distinct MEMBER_ID) into: mem_ct
from member_tbl;
%let member_ct = %eval(&mem_ct.);
quit;

FILENAME myemail EMAIL from=("sender@email.com")
to=("addtional@email.com");

%macro sendemail;

*---if member count is not null then email to end user, otherwise you get an email--*;
%if &member_ct. = &mem_ct. %then %do;
data _null_;
file myemail
TYPE = "TEXT/HTML"
SUBJECT = "Auto Email:Stored Processes XML Demo Report";
put '<html><head>';
put '<style type="text/css" MEDIA=screen><!--';
put 'body { color: #346170; font-family: Verdana; font-size: 10pt; }';
```

```
put '.errorMessage { color: Red; font-size: 8pt; }';
put '--></style></head><body>';
put 'Hi Everyone,<br/>';
put '</br>';
put ' Stored Processes XML Demo Report is completed.<br>';
put 'You can access this report by clicking the following hyperlink:</br>';
put '<a href="C:\ Stored Processes XML Demo Report.xml">Global 2014 SAS Report</a>';
put '<br>';
put '</br>';
put 'Thank you and have a Nice day!';
put '<br>';
put '</br>';
put 'Anjan Matlapudi<br/>';
put 'Corporate Medical Informatics<br/>';
put 'AmeriHealth Caritas Family of Companies<br/>';
put 'e-mail:sender@email.com<br/>';
put '</body></html>';
run;
%end;
%else %do;
data _null_;
FILE myemail
TO='sender@email.com'
SUBJECT= 'Error With Data';
PUT 'ATTENTION PLEASE !!,';
PUT 'There was an error when this program ran. Please check the
program and resubmit.';
PUT ' ';
PUT 'Anjan';
run;
%end;
%mend sendemail;

%sendemail;
```