

PhUSE 2010

Section: Coding Solutions: Paper CS01

SAS® Drug Development Program Portability

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THE
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SAS Drug Development

Programming Environment: Process Editor



Pros

- Internet-based application
 - Can access SAS (Base/Stat/Graph) functionally from virtually anywhere that has an internet connection
- Only requires a JRE to be installed locally
 - Easily supported by the company's IT resources
- Running as part of a validated system



Cons

- Internet based application
- Touch points with the data have to be defined through a GUI or WebDAV LIBNAME (Username and Password required)
- SAS code development - performance (architecture due to compliance)
- Using shared resources (temporary disk space, CPU and Memory)





Pros

- Interface has not changed since the beginning of time
- Interactive running of code is very fast using all local resources
 - temporary disk space, CPU, and Memory



Cons

- Installation
 - Requires IT support
- Maintenance required (Setinit)
- Compliance
 - Very difficult to have a PC maintain



SAS Programming Environment

Best of Both Worlds

The IDEA

- Use PC SAS for code development
- Promote to SAS Drug Development

The APPROACH

- Design a template to facilitate
 - Use PC SAS for code development
 - Fast, easy, known UI
- Simple upload to SAS Drug Development
 - No changes to code required
 - Run code in compliant environment

Local Development Assumptions

Similar hierarchy to SAS Drug Development

- At least from some directory down if relative path is used

Similar library reference name(s)

- LIBNAME INDATA - Refers to the same type of data

Actual copy of data -

- Can be a subset

Same revision of SAS macros

- For consistency

No non-compliant PE code

- X command, pipe, etc.

Using an include file to set file references

- Setup

The Trick Is...

```
%macro setup;  
/* the macro variable _SDDUSR_ is a SAS Drug Development  
automatic macro variable */  
%if %symexist(_SDDUSR_) %then %do;  
    %put "inSDD";  
    %include &setup;  
%end;  
%else %do;  
    %put "non inSDD";  
    %include "s:\project_a\protocol_b\setup.sas";  
%end;  
%mend;  
  
%setup;
```

Plus the Process Editor XML

```
%include &setup;

/* rest of SAS processing code */
/*****PACMAN***** DO NOT EDIT BELOW THIS LINE *****/
/*<?xml version="1.0" encoding="UTF-8"?>*/
/*<process sessionid="92218c:12116ee7143:5a73" sddversion="3.4" cdvoption="N" parseroption="B">*/
/*<parameters>*/
/*<parameter userdefined="S" obfuscate="N" id="&star;LOG&star;" canlinktobasepath="Y" protect="N" label="SAS log" systemtype="&star;LOG&star;"
/*<type="LOGFILE" autolaunch="N" filetype="LOG" tabname="System Files">*/
/*<target rootname="" extension="log">*/
/*<folder system="RELATIVE" source="RELATIVE" displayname="outlogs" id="outlogs" itemtype="Container" fileinfoversion="3.0">*/
/*</folder>*/
/*</target>*/
/*<description>*/
/*</description>*/
/*</parameter>*/
/*<parameter userdefined="S" obfuscate="N" id="&star;LST&star;" canlinktobasepath="Y" protect="N" label="SAS output" systemtype="&star;LST&star;"
/*<type="LSTFILE" autolaunch="N" filetype="LST" tabname="System Files">*/
/*<target rootname="" extension="lst">*/
/*<folder system="RELATIVE" source="RELATIVE" displayname="outlistings" id="outlistings" itemtype="Container" fileinfoversion="3.0">*/
/*</folder>*/
/*</target>*/
/*<description>*/
/*</description>*/
/*</parameter>*/
/*<parameter dependsaction="ENABLE" obfuscate="N" systemtype="SDDPARMS" label="Process parameter values" tabname="System Files" baseoption="A"
/*<processid="P5" required="N" enable="N" resolution="INPUT" type="PARMFILE">*/
/*</parameter>*/
/*<parameter dependsaction="ENABLE" obfuscate="N" systemtype="&star;PGM&star;" label="SAS program" tabname="System Files" baseoption="A"
/*<processid="P5" required="N" enable="N" resolution="INPUT" type="PGMFILE">*/
/*</parameter>*/
/*<parameter dependsaction="DISABLE" obfuscate="N" label="Input process" tabname="Parameters" baseoption="A" advanced="N" order="5" id="SE
/*<resolution="INPUT" type="INPROCESS">*/
/*<default>*/
/*<file system="RELATIVE" source="RELATIVE" displayname="setup.sas" id="setup.sas" itemtype="Item" type="sas" fileinfoversion="3.0">*/
/*</file>*/
/*</default>*/
/*</parameter>*/
/*<parameter id="REST_AUTO" resolution="INTERNAL" type="TEXT" order="7">*/
/*</parameter>*/
/*</parameters>*/
/*</process>*/
/**/
/*****PACMAN*****PACMAN*****/
```

Template

```
%macro setup;
/* the macro variable _SDDUSR_ is a SAS Drug Development automatic macro variable */
%if %symexist(_SDDUSR_) %then %do;
    %put "inSDD";
    %include &setup;
%end;
%else %do;
    %put "non inSDD";
    %include "s:\project_a\protocol_b\setup.sas";
%end;
%mend;

%setup;
```

Specific code
written here

```
%include &setup;

/* rest of SAS processing code */
/*****PACMAN***** DO NOT EDIT BELOW THIS LINE *****/
/*<?xml version="1.0" encoding="UTF-8"?>*/
/*<process sessionid="92218c12116ee7143:5a73" sddversion="3.4" cdvoption="N" parseroption="B">*/
/*<parameters>*/
/*<parameter userdefined="S" obfuscate="N" id="&star;LOG&star;" canlinktobasepath="Y" protect="N" label="SAS log" systimetype="&star;LOG&star;" type="LOGFILE" autolaunch="N" filetype="LOG" tabname="System Files">*/
/*<target rootname="" extension="log">*/
/*<folder system="RELATIVE" source="RELATIVE" displayname="outlogs" id="outlogs" itimetype="Container" fileinfoversion="3.0">*/
/*</folder>*/
/*</target>*/
/*<description>*/
/*</description>*/
/*</parameter>*/
/*<parameter userdefined="S" obfuscate="N" id="&star;LST&star;" canlinktobasepath="Y" protect="N" label="SAS output" systimetype="&star;LST&star;" type="LSTFILE" autolaunch="N" filetype="LST" tabname="System Files">*/
/*<target rootname="" extension="lst">*/
/*<folder system="RELATIVE" source="RELATIVE" displayname="outlistings" id="outlistings" itimetype="Container" fileinfoversion="3.0">*/
/*</folder>*/
/*</target>*/
/*<description>*/
/*</description>*/
/*</parameter>*/
/*<parameter dependsaction="ENABLE" obfuscate="N" systimetype="SDDPARMS" label="Process parameter values" tabname="System Files" baseoption="A" processid="P5" required="N" enable="N" resolution="INPUT" type="PARMFILE">*/
/*</parameter>*/
/*<parameter dependsaction="ENABLE" obfuscate="N" systimetype="&star;PGM&star;" label="SAS program" tabname="System Files" baseoption="A" processid="P5" required="N" enable="N" resolution="INPUT" type="PGMFILE">*/
/*</parameter>*/
/*<parameter dependsaction="DISABLE" obfuscate="N" label="Input process" tabname="Parameters" baseoption="A" advanced="N" order="5" id="SE" resolution="INPUT" type="INPROCESS">*/
/*<default>*/
/*<file system="RELATIVE" source="RELATIVE" displayname="setup.sas" id="setup.sas" itimetype="Item" type="sas" fileinfoversion="3.0">*/
/*</file>*/
/*</default>*/
/*</parameter>*/
/*<parameter id="REST_AUTO" resolution="INTERNAL" type="TEXT" order="7">*/
/*</parameter>*/
/*</parameters>*/
/*</process>*/
/*</>*/
/*****PACMAN*****PACMAN*****/
```

Translation into the Process Editor

Process Editor - sample.sas- <version not available> (/Customer/Customer9/Coumpound/PROT016/DEV) from SAS Drug Develop...

```

1
2
3 %include &setup;
4
5 /* rest of SAS processing code */

```

Parameters

#	Var Name	Type	Label	Enabled	Required	Default	
1	*LOG*	SAS log	SAS log	☐	☐	SAS Log File	Syst
2	*LST*	SAS output	SAS output	☐	☐	SAS Output File	Syst
3	SDDPARMS	Process parameter va...	Process par ...	☐	☐	SAS v9 Data Set (PC, Unix)	Syst
4	*PGM*	SAS program	SAS program	☐	☐	SAS Program File	Syst
5	SETUP	Input process	Input process	☒	☒	setup.sas- <version not available> (.) from RELATIVE	Para
6	BASE_1 [SE...	Base path for relative ...	Base path fo...	☐	☐	/Customer/Customer9/Coumpound/PROT016/DEV from SDD	Para
7	REST_AUTO...	Text field	Text field	☒	☒		Para
8	COMA_PROJ...	Folder	Folder	☐	☒	../macro (relative)	Para
9	COMA_PROJ...	Folder	Folder	☐	☒	../..../macro (relative)	Para
10	COMA [SET...	Folder	Folder	☐	☒	../..../macro (relative)	Para
11	FMTFOLDER ...	Folder	Folder	☐	☒	../formats (relative)	Para
12	METADATA ...	Folder	Folder	☐	☒	../metadata (relative)	Para
13	DATAANAL...	Folder	Folder	☐	☒	../dataanalysis (relative)	Para
14	SDTM [SETUP]	Folder	Folder	☐	☒	../sdtmpplus (relative)	Para
15	EFF [SETUP]	Folder	Folder	☐	☒	../outtables/eff (relative)	Para
16	EFFG [SETUP]	Folder	Folder	☐	☒	../outgraphics/eff (relative)	Para

Up
Down

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Demo



Running Process Editor Code

Outside of SAS Drug Development

If the PE code was not generated outside of SAS Drug Development first...

- Programmatically manipulate the PE code to remove the %include (input process) and replace it with a fully qualified path to a local setup file
- Using the API SAS macros allows this manipulation to occur over an entire directory of SAS PE programs
- SAS data sets, SAS macros, SAS format catalogs, and any other included files need to be exported and placed into the proper local folder hierarchy.

Note: This process is the reverse of the prior slides

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Questions?

