WRITING AN IN-HOUSE SAS® USER’S GUIDE

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Introduction

At the Federal Reserve Board (FRB), in-house SAS User’s Guides have been developed for the MVS/TSO® and UNIX® operating systems. The in-house user’s guides document SAS-related information specific to the Federal Reserve Board, and are designed to supplement rather than replace SAS Institute’s manuals.

The author of this paper believes that many SAS sites can benefit from an in-house SAS user’s guide, and hopes that this paper proves helpful to future developers. This paper describes some possible information to include in an in-house SAS user’s guide, using specific examples from the user’s guides developed at the Federal Reserve Board.

The following topics are discussed in this paper.

- Objectives and scope of an in-house SAS user’s guide.
- Which SAS sites can benefit from an in-house SAS user’s guide?
- Information to include in an in-house SAS user’s guide.

Objectives and scope of an in-house SAS user’s guide

The objectives of an in-house SAS user’s guide can include the following.

- Present site-specific information about the SAS system that is not described in SAS Institute’s manuals. Examples include descriptions of in-house utilities, the location and contents of macro libraries, and information on how to obtain consulting assistance.
- Assist SAS users as they convert to a new platform or operating system by explaining differences between the old and new environments. For example, SAS users converting from the MVS/TSO operating system to personal computers (PCs) could benefit from a user’s guide that explains the differences between the SAS system for MVS/TSO and the SAS system for PCs.

The scope of an in-house SAS user’s guide can be either of the following.

- One operating system.
- Multiple operating systems.

At the FRB, separate in-house SAS user’s guides were written for the MVS/TSO and UNIX operating systems. This was done for the following reasons.

- Much of the site-specific information to be documented in our in-house user’s guides is also operating system-specific. Almost no information was published in both user’s guides.
- Many experienced SAS users at the Federal Reserve Board have converted or are converting from MVS/TSO to UNIX. To ease the transition, the FRB SAS user’s guide for UNIX outlines commands and features that work differently in SAS for UNIX than in SAS for MVS/TSO. Examples include how to execute the SAS system under Xwindows, how to pipe the output of UNIX commands to SAS commands and the output of SAS commands to UNIX commands, and details about how SAS for UNIX handles autoexec and configuration files.
Which SAS sites can benefit from an in-house SAS user’s guide?

• Sites that have customized the configuration of the SAS system or developed site-specific software, documentation, or utilities.

• Sites that are converting experienced SAS users to a new operating system.

• Sites that use outside SAS consultants. At the FRS, outside consultants have benefited from the consolidation in one manual of site-specific information such as the location of the macro library, the JCL needed to execute the SAS system, and how to get manuals.

• Sites that hire employees on a cyclical basis. At the FRS, research assistants are hired after college and stay for two or three years. Consolidating site-specific information in one manual reduces the impact of this turnover.

Information to include in an in-house SAS user’s guide

1. System computing environment.

A. System resource limits.

Examples. For SAS under MVS/TSO at the FRS, there are limitations on the maximum region size for a batch job at all times and stricter limitations on region size and the number of print lines for batch jobs executed during daytime hours. For SAS under UNIX at the FRS, there are limits on the amount of disk space available on the /tmp directory, where our temporary WORK libraries are created.

B. Available graphics devices, and how to direct output to them.

C. The types of tape drives that are available, and how to use them.

D. Differences between workstations used to run SAS software.

Example. SAS for UNIX is executed on several different workstations at the FRS. HDS workstations do not support a graphical user interface to the SAS system. NCD, SUN4 (101), SUN4 (UNIX), and SUN5 (UNIX) workstations have different keyboards.

E. Cutting and pasting text.

Example. The FRB SAS user’s guide for UNIX provides site-specific information about cutting and pasting text. It describes how to cut and paste text using only a mouse and the customized function key configuration used at the FRB. It also describes how to cut and paste text to and from non-SAS windows.

F. System commands.

Example. The FRB SAS user’s guide for UNIX provides examples of common UNIX commands.

2. SAS computing environment.

A. SAS invocation methods. This could include clists and procedures for SAS under MVS/TSO, scripts or in-house pull-down menus for SAS under UNIX, batfiles or pull-down menus for SAS under Windows, or other operating system-specific methods.

Example. At the FRS, two interactive clists and three batch JCL procedures can be used to invoke the production version of SAS under MVS/TSO. Additional clists and procedures can be used to execute test and backup versions of SAS under MVS/TSO.

B. In-house options added to the programs (clists, procedures, scripts, etc.) used to invoke SAS.

C. SAS options settings that differ from the default settings described in SAS Institute’s manuals.

Example. For SAS under UNIX, the default value of the filelocks option for Release 6.09 is “fail”. This prevents writing to a SAS library from more than one session, which can damage the library, but also prevents use in more than one SAS session of customized function key and window information stored in the SASUSER catalog. The default value of the file locks option at the FRB was changed to “none”.

D. The current production release of SAS software, and a list of currently licensed SAS products.
E. List of SAS-related directories, files, and programs. This could include the location of load libraries, executable programs, macro libraries, and format libraries.

3. Documentation of in-house enhancements and utilities.

A. In-house macro library.
Example. At the FRB, an in-house macro library was developed in SAS for UNIX. The FRB SAS user’s guide for UNIX documents the macros in the library. It also tells users that this library has been defined to SAS as an autocall library, enabling users to call these macros without including or defining them in their programs. Users developing their own macro libraries who wish to define them as autocall libraries also need to know that the in-house macro library has been defined as an autocall library.

B. User written SAS procedures.

C. In-house print form library.
Example. A library of in-house print forms was developed in SAS for UNIX. A list of available forms, their attributes, and how to reference them is provided in the FRB SAS user’s guide for UNIX.

D. In-house format library.
Example. An in-house format library was developed in SAS for MVS/TSO. A list of available formats and how to use them is provided in the FRB SAS user’s guide for MVS/TSO.

E. Host editor customization.
Example. In SAS for UNIX, the host edit facility integrates UNIX editors such as Emacs, vi, or xedit with an interactive SAS session under Xwindows. In SAS for UNIX at the FRB, a command was added to the system autoexec file that specifies Emacs as the default host editor. A macro was written that changes the host editor to vi or xedit or restores the default host editor.

F. Function key customization.
Example. In SAS for UNIX at the FRB, a customized function key configuration was developed for UNIX workstations. For more information, see “SAS Program Function Key Remapping in the UNIX Environment,” by Bruce Gilsen, in the Proceedings of the Eighteenth Annual SAS Users Group International Conference, pages 497-506.

G. In-house SAS utilities.
Example. In SAS for MVS/TSO, the SASZ SAS Utilities menu system was developed. It allows users to easily accomplish tasks such as allocating new and existing SAS libraries, customizing function keys, and changing the destination of printed output. For more information, see “Improving SAS System Support (Version 6) at a Large Site,” by Bruce Gilsen and Bert Shankman, in the Proceedings of the Seventeenth Annual SAS Users Group International Conference, pages 1459-1468.

4. Interacting with other languages, packages, and operating systems.

A. SAS/CONNECT ® software customization.
Examples. A macro that allows users to invoke SAS/CONNECT without being prompted for their MVS/TSO password is documented in the FRB SAS user’s guide for UNIX. Detailed instructions about communicating with the remote host during error recovery are also provided. These instructions are more detailed and site-specific than the instructions in the manual, “SAS/CONNECT Software, Usage and Reference, Version 6, First Edition.”

B. Copying SAS files to and from other operating systems.
Examples. The FRB SAS user’s guide for UNIX provides detailed examples of copying SAS files between the UNIX and MVS/TSO operating systems. The examples of PROC CPORT and PROC CIMPORT in the “SAS Procedures Guide, Version 6, Third Edition,” and in “SAS Technical Report P-195, Transporting SAS Files Between Host Systems,” are generalized. The examples in the FRB SAS user’s guide for UNIX are specific to the FRB’s computing environment. Other site-specific or operating system-specific information that is documented in the FRB SAS user’s guide for UNIX includes how to allocate a transport data set on the MVS/TSO operating system and how to copy the transport data set between the two operating systems.

C. Copying SAS files to and from other packages and languages.
Example. The FRB SAS user’s guide for UNIX documents macros that copy SAS data sets to and from FAME databases. FAME is a time-series database management system used at the FRB for macroeconomic data storage.

5. Programming standards and guidelines.

Standards can be provided for coding technique, code alignment, and documentation. Naming conventions can be provided for files, programs, and variables.

6. Information for users converting to a new operating system.

Experienced SAS software users converting to a new operating system can benefit from documentation that explains the differences between the old and new environments. Since this documentation describes SAS commands and tasks that the user probably executed on the old operating system, it can emphasize “how to” examples and differences between the operating systems rather than definitions and syntax.

Example. The FRB SAS user’s guide for UNIX contains several sections of particular interest to users converting from the MVS/TSO operating system. Many of these users executed SAS for MVS/TSO in batch mode using job control language (JCL), and have never used the SAS system interactively. These sections provide examples that demonstrate how to execute SAS for UNIX under the X Window System and utilize the graphical user interface that it provides. Examples include the following: how to use pull-down menus to copy the contents of a SAS window to and from a UNIX file, how to read and write permanent SAS data sets to and from a UNIX file, how to read and write data to and from a UNIX flat file, and how to execute system commands during a SAS session. A basic understanding of these SAS commands or tasks is assumed.

7. How to get help.

A. In-house SAS consulting assistance. The telephone number and electronic mail address of an in-house SAS Help desk or consulting group can be provided.

B. How to obtain manuals.

C. Brief descriptions of SAS manuals that are operating system-specific or may be of particular interest to users of a particular operating system.

Examples. The FRB SAS user’s guide for UNIX describes the two UNIX companion manuals from SAS Institute. It also describes manuals such as the “SAS/INSIGHT User’s Guide, Version 6, Second Edition,” which might be of particular interest to SAS software users on the UNIX operating system.

D. Brief descriptions of non-SAS manuals that may be of particular interest to SAS software users of a particular operating system.

E. Use of the SAS system’s on-line Help facility.

F. Use of the sample library provided with SAS software.

G. How to subscribe to the SAS Institute publications SAS Communications ® and Observations ®.

H. How to subscribe to and read the Usenet SAS news group, comp.soft.sys.sas.

I. In-house SAS mailing lists.

J. In-house, regional, and national SAS user’s groups.

K. In-house training. This can include in-house courses, computer-based training (CBTs), and videos.

8. Enhancements to SAS software documentation.

Example. SAS PMENU (pull-down menu) diagrams and cross-reference.

The PMENUs provided with the SAS system are probably self-documenting to experienced users. New users, however, may benefit from a graphical representation of the PMENUs and a cross-reference that lists PMENUs and the commands that the PMENUs execute.

SAS Institute does not publish diagrams of their PMENUs or a cross reference, so PMENU documentation was developed in-house at the FRB. The FRB SAS User’s Guide for UNIX displays the PMENUs that are available in the program editor window and two cross-reference listings, as follows.
• The first list is sorted by the order in which the PMENUs are displayed. This list can be used to determine the effect of selecting a particular sequence of PMENUs. For example, it may not be obvious that selecting the PMENUs Globals $\rightarrow$ Data management $\rightarrow$ Edit $\rightarrow$ Record Edit invokes PROC FSEDIT.

• The second list is sorted alphabetically by the command-line commands that correspond to the PMENUs. This list can be used to determine the PMENUs that must be selected to execute a particular command. For example, some trial-and-error clicking of PMENUs may be required to determine that the libname window is displayed by selecting the PMENUs Globals $\rightarrow$ Data management $\rightarrow$ Libname list. This list can also be used as an index, analogously to the Index button on the main menu of SAS/ASSIST® software.

Figures 1 and 2 are samples of the documentation provided in the FRB SAS User's Guide for UNIX. They display the PMENUs and cross-reference listings for the File option of the PMENUs that are available in the program editor window.
Figure 1
### PMENUs and their corresponding Command-line commands sorted by PMENUs

<table>
<thead>
<tr>
<th>Task</th>
<th>PMENUs</th>
<th>Command-line commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include flat file into pgm window</td>
<td>File--- &gt; Open--- &gt; Read file...</td>
<td>include</td>
</tr>
<tr>
<td>Include catalog entry into pgm window</td>
<td>File--- &gt; Open--- &gt; Read object...</td>
<td>copy</td>
</tr>
<tr>
<td>Save window contents to default file</td>
<td>File--- &gt; Save</td>
<td>file</td>
</tr>
<tr>
<td>Save window contents to a file</td>
<td>File--- &gt; Save as--- &gt; Write to file...</td>
<td>file</td>
</tr>
<tr>
<td>Save window contents to catalog entry</td>
<td>File--- &gt; Save as--- &gt; Write to object...</td>
<td>save</td>
</tr>
<tr>
<td>Free a print file</td>
<td>File--- &gt; Print--- &gt; Free print file...</td>
<td>free</td>
</tr>
<tr>
<td>Print a window</td>
<td>File--- &gt; Print--- &gt; Print file...</td>
<td>print</td>
</tr>
<tr>
<td>Set formname</td>
<td>File--- &gt; Print--- &gt; Set form name...</td>
<td>formname</td>
</tr>
<tr>
<td>Set default print file</td>
<td>File--- &gt; Print--- &gt; Set print file...</td>
<td>prfile</td>
</tr>
<tr>
<td>Edit a form entry</td>
<td>File--- &gt; Print--- &gt; Open a form...</td>
<td>fsform</td>
</tr>
<tr>
<td>End the SAS session</td>
<td>File--- &gt; Exit...</td>
<td>bye</td>
</tr>
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<td>Save window contents to default file</td>
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<td>file</td>
</tr>
<tr>
<td>Save window contents to a file</td>
<td>File--- &gt; Save as--- &gt; Write to file...</td>
<td>file</td>
</tr>
<tr>
<td>Set formname</td>
<td>File--- &gt; Print--- &gt; Set form name...</td>
<td>formname</td>
</tr>
<tr>
<td>Free a print file</td>
<td>File--- &gt; Print--- &gt; Free print file...</td>
<td>free</td>
</tr>
<tr>
<td>Edit a form entry</td>
<td>File--- &gt; Print--- &gt; Open a form...</td>
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<td>Print a window</td>
<td>File--- &gt; Print--- &gt; Print file...</td>
<td>print</td>
</tr>
<tr>
<td>Set default print file</td>
<td>File--- &gt; Print--- &gt; Set print file...</td>
<td>prfile</td>
</tr>
<tr>
<td>Save window contents to catalog entry</td>
<td>File--- &gt; Save as--- &gt; Write to object...</td>
<td>save</td>
</tr>
</tbody>
</table>

**Figure 2**
Conclusion

This paper provided information about writing an in-house SAS User's Guide. First, the objectives and scope of an in-house user's guide and some ideas about which sites could benefit from an in-house user's guide were outlined. Then, a list of topics to include in an in-house user's guide were provided, using specific examples from the two in-house SAS user's guides developed at the Federal Reserve Board.

The author of this paper believes that many SAS sites can benefit from an in-house SAS user's guide, and looks forward to exchanging information with prospective writers at other sites.

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References


Acknowledgments

The following people contributed to the development of this paper: Donna Hill, Julia Meredith, and Peter Sorock at the Federal Reserve Board. Their support is greatly appreciated.

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