THE USER-WRITTEN SAS PROC: AN EVOLUTIONARY TOOL IN THE INFORMATION CENTER

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Abstract

With the progression of end-user computing and the availability of "simple to use" languages such as SAS, there is a new direction for SAS users and programmers alike. The 1980's are proving to be the era of the Information Center, the necessary link between end-user computing and the data processing environment. User-written PROCes could evolve into a complete Information Center tool.

The scenario is typical, an end-user would like to use data in his/her custom system and SAS. The application programmer does not know how to create a SAS data set from the customized system or read a SAS data set by the system. Creating external files would become a nightmare for both the end-user and the application programmer.

The Information Center links the user community to the data processing department. Similarly, the user-written SAS PROC links the SAS user's application and the programmer's customized system.

What is an Information Center?

Although the Information Center has been defined in many ways, in the context of this paper it will be defined as follows. An Information Center is a means rather than a place to access data. An end-user using a terminal on a desk is using the Information Center. A microcomputer user using a software tool is using the Information Center.

The support staff, hardware, software and training are all part of the Information Center.

What are User-Written PROCedures?

Some common languages today are FORTRAN and PL/I. Interfacing these languages with SAS became necessary because of the enormous requests for sharing data between written programs and SAS. The solution may be to convert the programs into SAS PROCS.

All that is required is a program, the appropriate subroutine libraries, a SAS parser and creativity. The result is a user-written PROCedure. The PROCedure can be totally transparent to the user as another SAS PROC. This is what an Information Center tool should be, transparent and easy to use.

What are the advantages of the user written PROCedure?

There are many advantages of SAS PROCs written by the user, but the most important reason always gets back to the user. Is it easy? When the user is familiar with SAS, switching to a new PROC is like adding another type of bread to a bread basket. The friendliness of SAS has always been one of its best features, therefore, adding another PROC to the library will keep the user happy by continued ease of use. Time will also be saved by reducing the learning curve required to input and manipulate data in a customized system.

Transparency to the user is also a key to a successful tool. If the user PROC is treated like any other SAS PROC and is documented properly, the user will not know the difference. However, it is not recommended to make it completely transparent in order to prevent the SAS Institute from receiving unwarranted service calls.

Making the user satisfied is the ultimate function of the programmer. But once in a while it is important to keep the programmer happy as well. There are at least a couple of ways to do this. One way is to tell the programmer that the system does not need to be rewritten in another language, does not need to be overhauled and programming the changes will be challenging as well as simple. Another way to do it is to tell the programmer that external files can be avoided and the data input facility is provided in SAS, reducing some work. When the PROC is considered in the design stage, it can save the programmer a considerable amount of time.
How can PROCedures be implemented into the Information Center?

Probably the most important step in developing the user PROC as an Information Center tool is often overlooked availability of resources. If the programming skills, subroutine libraries and SAS skills are not available, user-written PROCs will be impossible. So these three areas should be investigated first and skills developed where appropriate.

One of the most important functions of the Information Center staff is to encourage the user community to participate. If the users know about the possibility of incorporating their systems into SAS, enthusiasm will surely be inevitable. Notifying the user community of the availability of PROCs is important and will encourage other users to get involved. This can be accomplished by newsletters, demonstrations, seminars, direct contact and many other ways.

Creating a user PROC library is very important to the Information Center as a means of making the tool available to all users. Once again, this can be transparent to the user. This will prevent confusion on the part of Information Center staff, systems support, programmers and the user community.

Documentation can be a difficult endeavor. It is important that the user PROC documentation parallels the normal documentation (e.g., see SUGI '84 Proceedings, page 800-803). This will prevent user fear of documentation because they are already familiar with the documentation of SAS PROCs in the SAS Basics and Statistics manual.

What is the responsibility of the user(s)?

The first thing to find out is what language the system or program is written in. If it is not FORTRAN or PL/I, then there is no need to proceed further. These are the only two languages that SAS currently supports PROC writing.

The next step is to contact the Information Center staff or proper data processing coordinator to make the request. They will decide the feasibility of the PROC as a tool for the Information Center.

If it is determined feasible, write down all the things the PROC is required to do. If it is a system conversion, this step may be omitted.

Provide several test data samples and if possible, verify the results. If data has been used to test the original system, use it again to compare results.

If the system is in the planning stages, notify the programmers of the intent before the system is built.

What is the responsibility of the application programmer(s)?

The programmer must know how to use SAS enough to understand interfacing requirements with the FORTRAN or PL/I language. Although assembler knowledge isn't required, it is always helpful when developing the SAS parser.

Collaborate with the Information Center on questions and applications. They are trained to understand the users needs and requirements. Yet they are still data processing oriented. This will usually save hours of unnecessary work. This does not mean the programmer and user should not communicate.
If possible, consider PROC writing in the design stage. Once the skills have been developed, PROC writing for SAS users is very attractive to the user. Often the request for SAS PROCs are not initiated by the user because they do not know if it is possible or feasible.

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What is the responsibility of the Information Center Department?

Before user PROCs can become a tool of the Information Center, there has to be potential users. It is the job of the Information Center staff to locate these users and encourage them to participate. A user core of PROC users may be the best way to start. Once there is user interest, it will expand.

The user PROC must be incorporated as and recognized as an Information Center tool. Although it is directly related to SAS, it still must be distinguished as separate. The reason for this is because the user PROCs must be documented, installed and developed as a specific tool to the user(s). The PROC has all qualities of an individual tool.

The Information Center staff will also act as a liaison between user(s) and programmer(s). Although this at times seems like an unnecessary step, communication is one of the greatest keys to a successful tool. The user can more easily communicate with a trained staff person than a programmer with technical expertise. In addition, the staff can also convey the user's needs to the programmer(s).

APPLICATION PROGRAMMERS

Answer Problems

APPLICATION PROGRAMMERS

USER COMMUNITY

How can problems be avoided?

If there is no expertise and resources available, there is no reason to consider user PROCs. This is a prerequisite to considering the user PROC as an Information Center tool.

Most errors in developing user PROCs were made because of lack of proper planning. Consideration of creating a user PROC versus a custom program should be addressed in the design stage.

Sometimes user PROCs are hurried into without proper evaluation of alternatives. It might be more appropriate to create external files. Sometimes the cost is extremely critical in evaluating the PROC. Depending on the size of the system, a feasibility study might be very appropriate. However, because it is not a difficult task to make a basic conversion, usually such a study is unnecessary.

Planning is the key to successful PROCEDURE writing. Consider PROC writing in the design stage. PROCs in the Information Center should also be addressed in the design stages.
Conclusion and Summary

The user-written PROC is a tool that has all the qualities of an Information Center tool. With careful steps taken, the user PROC may evolve into a common Information Center tool. Just like any other tool in the Information Center, it needs to be demonstrated to the user, accepted by the programmer and marketed by the Information Center staff. But that doesn't make it anything less than an Information Center tool, just another challenge.

References


SAS SUGI Proceedings, 1984, pp. 800

The Bible, Epistle to the Philippians, Chapter 4, Verse 13