Automating Projects

When we do project work, especially when doing conversions, we are often doing the same operation over and over again. Quite often these tasks are done manually and take a lot of time and resources. But these repetitive tasks can typically be automated.

For example, it is not unusual for us to convert hundreds of SAS programs from a mainframe so that they will run on a Windows server. If one were to do this conversion manually, the steps might look something like this:

1. Go to the mainframe, select the program and control statements and download them to the new server.
2. Separate control statements (JCL) from the program source as needed.
3. Create a box of comments at the beginning of the program with comments that provide the program name, the date of the conversion, our phone number etc.
4. Using the control statements, generate a new FILENAME, or LIBNAME statement to access the data from its' new location, or to point to the old location with a FTP option.
5. Scan the program for other statements that either won't work on the new server.
6. Replace program statements that need to be changed in a standard way.
7. Insert additional statements as required.
8. Submit the old job for a test if possible.
9. Submit the new job for a test if possible.
10. Check the logs and make sure record counts agree between the old and new runs.
11. Compare the results of output reports and output files from the two runs.
12. After testing is correct, make an entry in a file or spreadsheet to indicate the job is tested.
13. Move the job into production and start on another.

Of course, each conversion is slightly different and will require additional steps or alterations to the above list. If these steps are done manually it will not only take time, but it may be done inconsistently or inaccurately between jobs or programmers.

This is a classic case where we have many tedious tasks and steps taking place and the changes for the most part are repetitive and predictable: exactly the kind of thing that computers are good at doing.

Another approach might be to automate as much as possible in the process using scripting and SAS as a text handling language. This time the steps might be:

1. Write a program that will accept the name of a single job to convert (or maybe do them all at once), and in that single job, pull the job from the mainframe, separated the JCL, write out the changed program with the comment box, the new control statements, and the inserted and altered code. At this point, a manual step might be worthwhile to look over the new job, or perhaps it can be automatically run on the new system.
2. After running, we have a log reading program to extract the row and column counts for each of the steps in the new process. If an old log is available, it also can be read to read original metrics. This phase can automatically compare the old metrics to the new and report differences as an audit along with run time improvements or losses. If the run metrics appear to be matching, compares can be scheduled for all files coming out of the process if they are available. A compare could even be written to compare reports generated between the two runs.

3. After tie out occurs and appropriate manual checks, the status files can be updated and the movement to production might be automated.
   This process can be run again manually for the next job, or in some kind of loop to process many at a time until the conversion is finished.

SAS with its text is an excellent tool to do as much as possible in the conversion in the three main areas:

1. Extracting the original jobs, doing as much changing and code insertions as possible. This is not just a find and replace but can actually use logic to do much more. Of course manual steps might be done rather than coding for complex scenarios.
2. By automating the checkout and auditing of the test runs testing will be easier and more consistent that if done manually. Again manual check out can easily be inserted as needed.
3. By automating the status of the conversion, much of the project reporting and progress is generated with very little work.

We have done this kind of automating in many, many projects. It works best for conversions, but the conversion certainly doesn't need to be related to SAS; this technique can be used for any large system with many repetitive tasks. At SSC we have developed some standard "engines" to plug into such a job and find that we can easily alter each of them for the task at hand. Keep this in mind next time you have a large implementation in place and let the computers do as much work as possible. Please contact us if we can assist in any way.