

CustomReports 2.0 - A Reporting System

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ABSTRACT

CustomReports 2.0 is a SAS/AF® PC application providing a "point-and-click," user-friendly, graphical interface for medical claims data analysis and reporting and is considered the "second generation" of a reporting system developed in-house by Healthsource Provident personnel. CustomReports 2.0 provides standard reports with pre-defined formats, and also allows within the application itself the use of SAS/ASSIST® software for ad-hoc reporting and statistical analysis. The system enables a remote user to "sign-on" to Healthsource Provident's mainframe and extract data from the claims historical database, allowing them access to data, reporting and analysis using the application locally.

INTRODUCTION

The Health Data Analysis (HDA) area of Healthsource Provident Administrators, Inc. has for a number of years made use of a mainframe-based application, CustomReports, developed in-house for ad-hoc reporting against its historical transactional claims database. In addition to sharing this application across many corporate departments, the product was made available to the insurer's policyholders to provide access to information about the medical claim experience for their employees.

While the original product continues to be widely used, it suffers from comparison to more modern PC-based products, and HDA wanted a new tool for data reporting analysis that would provide greater flexibility and ease of use. In cooperation with the Health Information Systems area, review of various software vendors was undertaken and it was decided to make use of SAS® software as a foundation for future data reporting, analysis, and application development needs.

FEATURES OF THE APPLICATION

Development was undertaken using SAS version 6.08 for OS/2®. The following features were determined to be critical to the development agenda:

- Capabilities comparable to those existing for data retrieval by account, time frame, and other selection criteria must be included.
- Data access must be dynamic.

- Retained data used for analysis should be stored in a PC-based environment.
- Pre-defined standard reports should be modular, to enable easy addition, modification, and deletion.

Application development began using prototype screens created using SAS/AF FRAME objects, while corresponding conversations regarding data content, access and other issues took place. These frames could be built quickly, and provided a tangible focus for discussions, however, at the same time, the ability to see something that had a very complete and finished look to it raised expectations about when the application would actually be available.

DATA ACCESS

While one of the goals for this application was to remove the dependency upon connection to the mainframe system in order to do reporting and analysis work, this connection must be established for the initial extraction and later transfer of the data, which is handled using SAS/CONNECT®. Distinct from the application itself, although critical for operation from a remote site, IBM LAN Distance™ Remote software provides the initial connection to the Healthsource-Provident environment for these components of the application.

At the time CustomReports 2.0 was being developed, SAS software could not directly access the claims database, so it was decided that the current installation method would be utilized for data access. This was accomplished by submitting a batch job to the MVS mainframe from the AF application. The job executes a COBOL program which provides access to the data and selects the required data items, followed by a SAS DATA step which provides additional formatting before saving the requested data to a personal library.

The SCL code fragment that follows illustrates how the job is submitted. Note that within a submit block, SCL program variables are referenced as are macro language variables, by preceding them with the "&" symbol. In this example, &parmfile is a file containing the data selection parameters. This workfile is uploaded to the MVS file named by &reqfile. The JCL to be submitted, identified by &jcl, is contained in

a partitioned dataset containing a member for each user of the product. This JCL is written directly to the MVS internal reader by the null DATA step, as illustrated in the SAS® Companion for the MVS Environment.

JCL Submission

```
submit continue remote;
  proc upload infile=&parmfile
              outfile=&reqfile;

  run;
  filename injcl &jcl;
  filename outrdr sysout=a pgm=intrdr
  recfm=fb lrecl=80;

  data _null_;
    infile injcl(&userid);
    file outrdr noprint notitles;
    input;
    put _infile_;
  run;
  endsubmit;
```

DATA STORAGE

An important distinction between the original CustomReports and the new version, is that instead of simply running a report against the claims database, a subset of the data is created which is retained as long as needed for further reporting and analysis. As stated previously, one objective for this product was to make the data available in a PC-based environment. For Healthsource-Provident employees, reducing dependency on the mainframe was sought to meet expense reduction goals by elimination of redundant processing, and to make the data readily available, regardless of schedule limitations. Local access to their data was also an important feature for policyholders at remote locations, who incur expensive charges for long-distance access and data transfer costs.

When the requested data extract is complete, a choice is made to transfer the data to any of the following three locations:

- PC workstation hard drive
- Local Area Network shared drive
- IBM LAN File Services™ shared "drive" is mainframe storage defined and referenced using a LAN type drive/directory file structure

Connection to the mainframe is required only for data access and data transfer, and is utilized only if one of these options is chosen. All other options for the application reference data that is

stored in one of the locations just mentioned. The only true independence comes by storing data on the workstation itself, because a LAN network connection must be present for both of the other options.

STANDARD REPORTS

A set of standard pre-defined reports was developed which are comparable to a number of existing reports available from other reporting systems. The application was designed in such a way that it is possible to add, delete or modify reports without making any changes to SCL code. If the report requires any special options, changes can be made to a single SCL catalog entry.

The reports are grouped by category and two SAS datasets are used: one to present list boxes from which a report may be selected and to retrieve the program code to be submitted for the selected report, and the other to control the various options that are available for a particular report.

Each report program is stored as a catalog member, and may execute various SAS procedure steps before final output is formatted using PROC REPORT. Additional reports can be developed and tested independently of the application, and then included in the application by adding the code to the catalog, and making the appropriate entries in the control datasets mentioned above.

IMPLEMENTATION

The roll-out strategy for this reporting system consists of a "turn-key" approach. All required software and hardware is purchased, loaded and tested, and is then shipped to the customer ready for use. The customer receives training from Healthsource-Provident application trainers and have access to SAS support since the policyholders have the license in their name, and are considered SAS customers.

The application workstation shipped to the customer provides all components necessary to communicate with the Healthsource-Provident home-office mainframe computer for data extraction, and provide the capability for downloading data to the policyholder's workstation. Another feature incorporated in the system is the ability to access a server dedicated to this application for software updates and data storage. LAN Distance software is used to connect the policyholder to the home-office server and is pre-loaded onto the

workstation. The system has a tape backup unit provided for restoration of the product in the event of a failure and will accommodate product enhancement upgrades and data backup. PolyPM™, a teacher-pupil software package, is installed on each workstation to enable home-office technical support.

FUTURE CAPABILITIES

Future enhancements which are being considered in the development strategy for this product are:

- Incorporation of comparative data
- Drill-down reporting capabilities in pre-defined reports
- Automatic graphics in pre-defined reports
- Data modeling
- Alternative data sources

CONCLUSION

This product, which started as an external customer demand, has now paved the way for a corporate strategy for client-server reporting technology. The pioneering work done to incorporate the innovative new features of SAS with known functions of mainframe processing has laid the groundwork for other systems, and created an insatiable demand for reporting tools to enable analysts and consultants to get the information they need, when they need it.

REFERENCES

SAS Institute, Inc.(1990), *SAS® Companion for the MVS Environment, Version 6 First Edition*, Cary, NC: SAS Institute Inc.

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