ABSTRACT

Most major companies have an enormous amount of useful information stored on their mainframe computers. Due to a lack of computer expertise on the part of most managers, however, this information can usually only be accessed via standard reports or predefined queries. The use of SAS/AF software can change this situation in that it can provide the power of the SAS® system to users who are unfamiliar with the SAS language.

This paper describes the Sales Inquiry System that was written using SAS/AF software. This system permits Marketing managers at Miles, Inc. to retrieve, summarize, and display detailed sales data by responding to the menu prompts. The user can retrieve and summarize on the basis of customer, date, product, product family, state, county, type of sale, etc., or any combination of the above. The information is then presented in either a table or a graph.

INTRODUCTION

Each day within the Diagnostics Division of Miles Inc. thousands of invoice records are generated and stored within the company mainframe computer. This raw data contains a wealth of information regarding our customers, the products they buy, the prices that are paid, and the regions which receive shipment. The proper use of this information can provide great assistance to Marketing in the design of promotion and pricing strategies. Until recently, however, this information was only available to Marketing in the form of standard production reports and inflexible on-line queries. If a specialized report was requested from MIS the turnaround could take several days to several weeks. Compounding this problem is the fact that, in general, Marketing managers cannot perform their own custom queries since they are not skilled in computer languages.

In response to this need a Sales Inquiry System (SIS) was designed and implemented using the menu structure of SAS/AF software. This approach allowed us to harness the power of the SAS system without requiring the users to learn the SAS language.

SYSTEM REQUIREMENTS

The system was designed to provide the following features:

1. Sub-minute response time on queries against a SAS data set containing 1.1 million observations and 86 variables.
2. Limited work file size so that the Miles TSO system can support the system.
3. A user interface that is flexible enough to allow a wide variety of data queries and display formats.
4. A user interface that requires little back-up documentation and that can be used by people with low levels of computer literacy.
5. A choice of either tabular or graphical display.

THE DESIGN OF SIS

Using these system requirements as a guide, SIS was designed using the following tools:

SAS/AF. SAS/AF software was selected as the user interface since it permits the use of menus and customized screens that guide the user as he enters his query. Liberal use was also made of the help screen capability of this package.

Macros. Most of the SAS/AF program screens were used only to set global macro variables. These macro variables, then, trigger the creation of the needed SAS code via the SAS macro language.

Binary search. Due to the large number of observations in the SAS data set, a binary search algorithm was used to limit the number of observations that need to be accessed for each query. (Binary searches in the SAS language are programmed by using the POINT= option in the SET statement.) Since the data set was already sorted by date, the binary search code was written to key off the date variable.

Customized KEEP statements. Due to the large number of variables in the SAS data sets, only those variables which are required in the current query are kept. Macros were used to generate KEEP statements that include only the variables which are requested by the user.

PROC TABULATE and SAS/GRAPH®. These facilities allow the data to be displayed in either tabular or graphical form.
SIS OVERVIEW

Figure 1 is a flowchart that overviews the main steps SIS goes through when the user chooses "Shipment Information (Summarized)" from the main menu. As can be seen, SIS is set up to perform two main tasks: to determine what criteria should be used to subset the data and to determine how this data should be displayed.

Figure 2 displays the screens that a user sees as he performs a typical query. On the "Shipments Selection Screen" the user must make exactly one selection from each of the six sections. For example, if the user wants to make a query based on only certain customers, he should select the "Customer" field. Alternatively, if the subsetting criteria is not based on customer or customer type, "ALL" should be selected in the "WHO" section.

The "Shipments Display Screen" allows the user to specify how he wishes the selected data to be displayed. Selecting "Single result" produces only a single number that summarizes the data selected. "One-way analysis" and "Two-way analysis" allows the user to specify one or two variables by which to break down the results.

Finally, the user chooses whether to see the data in the form of a table or a graph. If "Graph" is chosen, SIS decides whether to use a bar graph or a geographical map, based on the data.

Figure 3 is a flowchart that governs the process when the user selects "Shipment Information (Detailed)" from the main menu. Figure 4 displays the screens that would be generated from a typical query. The result of such a query is a report that lists all the line-item invoice data that satisfies the selection criteria.

CONCLUSION

SAS/AF software is a valuable tool for unlocking the power of the SAS system for general users. By filling in simple screens a novice user can construct complex queries against SAS data sets without having to write a single line of SAS code.

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SAS, SAS/AF, and SAS/GRAPH are registered trademarks of SAS Institute Inc., Cary, NC, USA.

Author may be contacted at:
Miles Inc.
P.O. Box 70
Elkhart, IN 46515
(219) 258-6483

SUMMARIZED SHIPMENT INFORMATION FLOW CHART

Figure 1
Figure 2
Figure 2 (continued)

DETAILED SHIPMENT INFORMATION FLOW CHART

MAIN MENU

OPTION 2

SELECT SUBSETTING VARIABLES

SELECT SUBSETTING VALUES

HELP SCREENS

SELECT DISPLAY VARIABLES

REPORT

Figure 3

1010
Figure 4