A SYSTEMATIC RESPONSE TO CUSTOMER COMPLAINTS
USING PROC FSEDIT, PROC FSLETTER, AND PROC GCHART

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ABSTRACT

This paper describes the development of a system to circulate customer complaint information, establish a database with the data, and statistically analyze the results using SAS facilities available on a Corporate IBM Mainframe. Repeated requests for statistical analyses of customer data in filing cabinets precipitated development of the system. The paper describes data entry into the database using PROC FSEDIT, forms development under PROC FSLETTER, and presentation graphics from PROC GCHART.

INTRODUCTION

The Textile business has traditionally catered to the needs and wants of the customer. Customer service representatives and Textile Engineers grew out of that need and have successfully assisted the customer over the years. These representatives are grouped within the company by product lines. Their emphasis on quality and a desire to respond to market changes prompted frequent requests for statistical evaluations of customer feedback. As a statistician I responded to requests from all of the groups for presentation graphics of our yarn performance at the customer's plant. We have also statistically designed experiments with automotive customers and analyzed the data to scientifically determine which yarn or yarn variable was responsible for a certain type of performance. We have visited the customer to present the results and find them receptive to statistical evaluations because of their increasing respect for quality products. It became obvious to our representatives that an efficient and analyzable data resource was needed for their information.

At their request we began the development of a database and data analysis system. The objective was to do statistics on the information and present the results in a professional and "not too statistical" format. We actually sat together during the programming of almost every phase of their system.

DATA ENTRY FOR EACH PRODUCT LINE (PROC FSEDIT)

One person was appointed from each product line group to describe the areas of assistance and complaints involved in that group. Our product lines include carpet yarn, hosier yarn, non-hosier nylon, flat polyester, warp knit yarns, rayon, and yarns for weaving. After a SAS dataset was created to hold the data, a screen was designed for data entry using PROC FSEDIT to conform to the type of complaint and claims data gathered for each product. The variables to be entered were determined by the needs of analysis needed, the type of information usually on the hand-written reports, and the data needed by the plans to research the complaints. A different prompt screen was used for each product group as screen 2 to remind the user of all four-letter problem codes and all two-letter description codes for entering the data for that product. Examples of the data entry screens for carpet yarn and warp knit yarns are illustrated.
DEFECTIVE YARN CATEGORIES (CARPET YARN)

POOR FIBER QUALITY
- SUILED OR DAMAGED
- MIXED OR MISELABELED
- OFF-DYING

MD-MULTIHAW YARN
- DP-MADE PACKAGES
- WD-WORKED END

MF-BROKEN FILAMENTS
- G-GREASE
- MC-MADE CASE

P-PLUGS
- DC-DECASED CASE
- MT-MISLABELED "TREA"

LB-LOOPY FILAMENTS
- GG-GLAID TUBE"COLOUR"

MF-WIRE FILAMENTS
- ENT-ENTANGLEMENT
- IZ-STATIC

RE-MEAT-HEATSET
- POOR PKG PREP

*...* N-LOW HIGH N-SKIN N-HIGH N-AXIAL

ST-STAT TW
- B-BAD WINDS
- SR-SALES REQ SETTLE

G-GREASE
- O-OVERWINDS
- H-POW-RUL VARIATION

LY-LEY YARN
- U-UNDERWINDS

LTY-LAME YARN
- H-LOW-LOW 1-1-HIGH 1-INTERMIX-CASE WEIGHT

TT-TOU FILS
- TF-TRAP FILS L-LOW H-HIGH I-INTERMIX-CASE WEIGHT

QUALITY CLAIM - PRODUCT RETURN - TRANSSHIPMENT - ENGINEER

COMPLAINT NO. ___
CUSTOMER ___
LOCATION OF MATERIAL ___

RESULTS AND RECOMMENDATIONS:

APPROVED SETTLEMENT ___

ROLL IDENTIFICATION

FILL IN LEFT SIDE FIRST

WARP KNIT CLAIM DATA ENTRY SCREENS
The complaint descriptions were coded using one or two letters and PROC FORMAT so that every customer representative used the same terminology for the same type of complaint. Using PROC FORMAT in the command list that invoked the data entry screen, we had the computer screen return the same type of complaint. Using PROG customer representative used the same terminology in the command list that invoked the data entry screen. This brought about standardization of terminology in complaint descriptions. Program code in the warp knit claim data entry command list looked like this:

```
OOIY OFF-DENER - OFF-DYING | POPX | PTF | MISC
```

Even though statistics would not be possible on any remark data, the representatives were accustomed to adding these details, so we provided space on the entry screens and complaint form letters for that information.

COMPLAINT AND CLAIM LETTERS FOR EACH PRODUCT LINE (PROC FSLETTER)

Letters to be issued internally for complaints and claims were designed for each product group using PROC FSLETTER. All of the variables on the letter were also on the data input screens for our database. We approximated as closely as possible, the previously hand-written papers issued with customer complaint information. This minimized the shock of changing from a hand-written form to a computer-issued form. These letters were limited to one page in most cases, but when lists of lot numbers or items involved were necessary, a second page was added. An example of the carpet yarn complaint illustrates that. Claims needed to provide blanks for signatures of approval since money was involved. The text flow and alignment options in PROC FSLETTER were not useful for this type of application. Examples of those form letters can be seen on the following page:
DISTRIBUTIONS FOR EACH PRODUCT LINE (PROC FS-LETTER)

Each product line group distributed information to different individuals at different locations, so different PROC FSLETTER forms were developed using the different locations. The claim or complaint letter file was copied with different forms for the locations and different lists of people included in each letter file. The letters within a product group were all the same except for different distributions which correspond to different plant sources for complaints. When the complaint was entered, the representative knew which location was involved. With the appropriate "send" command on the data entry screen, he sent a letter with data he had just entered into the database inserted in the right places. The appropriate plant printer and corporate printers issued the letter. This allowed rapid circulation of the information to our North Carolina, South Carolina, or Tennessee plants from the technical people in Georgia. Location was determined by the form used and the letter determined the distribution. Last minute comments were added when needed by the technical representative to the paper being sent without affecting the data in the database. This made conversational material possible without any more "remarks" being necessary in the database.

DATA ANALYSIS (PROC GCHART)

Routine data analysis needed to be done for each product group by complaint type (the four-letter code), by customer, and by claims cost. We built other possibilities into the data entry, such as relating the complaint frequency to machine types which the customer used or which we used. The graph used to present the data analysis was a PROC GCHART horizontal bar chart such as the ones below. One "bug" in PROC GCHART limited more sophisticated graphics. The simultaneous use of the group and subgroup options frequently caused the vertical axis labels to offset to an incorrect bar. The frequency on the horizontal axis also defaulted to a fractional portion of a count, so that was avoided using macros.

TRAINING AND MAINTENANCE

The technical representatives who assisted with development are now the "local experts." Others have also been trained in how to update the distributions, verify the data entry, and run the plots. Their part of the software maintenance requires a minimal knowledge of SAS programming, and could be menu-driven. The local experts are vital and emphasize local ownership and pride in the system.

SUGGESTED IMPROVEMENTS

Data input for customer names should also be coded using PROC FORMAT to prevent the misspelling of customer names and resulting difficulties with the statistics. However, maintenance of the customer coding could be difficult with the constant adding of new customer names.

Customer complaint numbers should be automatically generated to avoid duplication. We had to work within an already existing system.

One and two-letter coding for complaints and claims using PROC FORMAT should be the same for levels such as high, low, or intermittent in all categories. This minimizes the need to refer to a prompt screen during data entry.

All analyses should be menu-driven. We are currently using command lists and haven't gotten that far.

SUMMARY

A combination of SAS facilities can be used to accommodate customer needs and the need to maintain a quality product. As a result of our company efforts in this direction, our customers have called on us for suggestions on how to statistically analyze their data. That is good business.

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EXAMPLES OF DATA ANALYSIS

FLAT POLYESTER CLAIM COSTS YTD

BY CUSTOMER
(REPORT DATE 27JUN86)

FREQ DOLLAR

CUSTOMER

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<thead>
<tr>
<th>CUSTOMER</th>
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<tr>
<td>BROWNING</td>
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<td>412.</td>
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<td>AARON MFG.</td>
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<td>THOMAS BROS.</td>
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<td>30.</td>
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<td>HENDERSON</td>
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FLAT POLYESTER COMPLAINTS YTD

(REPORT DATE 27JUN86)

CUSTOMER DENIER

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MERGE NUMBER

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