An Executive Information System Prototype at Long Island Jewish Medical Center

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Abstract

The goal of any executive information system is to increase efficiency of operations in an organization by providing a tool that makes information available to enhance the decision-making process of key employees and bring a unique perspective to critical issues. This paper presents an overview of such a system built with version 6.06 of the SAS® system.

Introduction

Long Island Jewish Medical Center is located in New Hyde Park, New York. The hospital is divided into three divisions, the L.I.J division which cares for most medical center patients, the Children's division, specializes in care of patients age 0-17, and the Hillside psychiatric division. The need for administrators to have an overview of the hospital at their fingertips prompted the Director of MIS to express interest in an executive information system. Currently, SAS runs on an IBM® 3090 200e under MVS® and TSO®. Base SAS is used as an informational tool for ad-hoc reporting and data analysis for various departments that have the personnel and inclination to use it.

System overview

The EIS, (presently in development), Base SAS, SAS/AF®, SAS/FSP®, SAS/ASSIST®, SAS/GRAPH® are used together to provide EIS capability. SAS/CALC® and SAS/SHARE® beta releases are installed and will be incorporated into the system soon. The EIS output device is IBM 3472G terminal with an IBM mouse. Menus and submenus were built with the EIS builder Under SAS/ASSIST. These menus call SAS/AF applications that prompt the user for input into programs that do reporting or graphing of data. Report output is displayed in the SAS/FSP output window. I have chosen three out of the many applications to illustrate how EIS works.

Example #1: Select the "Medical Center" option from the Opening menu.

![Fig. 1 Opening menu]

When the Medical Center option is chosen a SAS/AF application is invoked that displays the screen (below).

![Fig. 2 Medical center SAS/AF application]

After making all required selections the query is submitted and either a report or graph is output.

![Fig. 3 Sample output report]

NOTE: Procedures PREP and PREP1 have created a report of output for:

LONG ISLAND JEWISH MEDICAL CENTER

L.I.J - Division 1991 - Medical Center

12/12/91


JANUARY 1,445 1,754 1,754 1,804 1,804 1,804 1,804
FEBRUARY 1,551 1,693 1,693 1,793 1,793 1,793 1,793
MARCH 1,028 1,175 1,175 1,215 1,215 1,215 1,215
APRIL 1,777 1,777 1,777 1,797 1,797 1,797 1,797
MAY 1,703 1,703 1,703 1,703 1,703 1,703 1,703
JUNE 1,791 1,791 1,791 1,791 1,791 1,791 1,791
JULY 1,694 1,764 1,764 1,804 1,804 1,804 1,804
AUGUST 1,715 1,715 1,715 1,795 1,795 1,795 1,795
SEPTEMBER 1,651 1,720 1,720 1,750 1,750 1,750 1,750
OCTOBER 1,750 1,750 1,750 1,750 1,750 1,750 1,750

Source: Base output, 1/00 - 10/91, complete through April, 1992

Additional output was generated for: 1993
After viewing the report as shown in figure 3 the user can issue an "end" command by using the left mouse key, the F3 key or typing "end" at the command line to return to the original EIS main menu. The SAS/AF application under the medical center option on the main EIS menu is designed to view the medical center as a whole. The reports and graphs supply information on present discharge status as well as the past four years.

Example # 2 : Select the "Discharges" option from the opening menu.

The "Discharges" selection on the main EIS menu, offers a more specific view of the hospital. Figure 4 illustrates the submenu that appears when one selects it from the EIS main menu.

The selections on this submenu lead the user to SAS/AF applications that specialize in specific queries on hospital discharges. Note the SAS/AF screen in figure 5 that appears after choosing the DRG selection from the submenu in figure 4.

This SAS/AF application allows the user to make queries on single DRG or range of DRG and produce reports or graphs by month or year for a particular DRG. Reports and graphs report statistics for the DRG over a five year period.

Example # 3 : Select the "Physician" option from the EIS opening menu.

The physician selection, leads to statistics by physician via selection boxes to select by physician.

All the SAS/AF applications are similar, you can see by the previous examples all have a general theme. The user can make selections for the hospital division, statistic, type of output and time period for the query. When the user makes these selections the selections are highlighted in reverse video and the value of a macro variable is set. When the user sets all required criteria and attempts to submit the query, macro variable values are passed from the SCL program to SAS code that is submitted to the SAS system. Throughout the SCL program behind the SAS/AF screen, user selections are controlled by error routines that display the appropriate message across the top of the SAS/AF screen. Below is the code behind the attending physician by name selection.
%MACRO PARMS;
  %if stat = 'TOIS' %then do;
    %global TITL;
    CALL SYMPUT(TITL,'Total Discharges');
    CALL SYMPUT(SUM,'SUM');
    %mend mdls;
  %end;

  %if stat = 'TLOS' %then do;
    %global TITL;
    CALL SYMPUT(TITL,'Total Days');
    CALL SYMPUT(SUM,'SUM');
    %mend tlos; %tlos;
  %end;

  %if stat = 'ALOS' %then do;
    %global TITL;
    CALL SYMPUT(TITL,'Avg. Days');
    CALL SYMPUT(SUM,'8.2');
    %mend alas; %alas;
  %end;

  %if Division = 'LIJ' %then do;
    %GLOBAL /NST TITL CLR;
    CALL SYMPUT('/NST',DIV/S/ON);
    CALL SYMPUT('TITL', 'L/J Division');
    CALL SYMPUT('clr', 'red');
    _MEND L/J; %L/J; %LFLE;
  %end;

  %if Division = 'HILL' %then do;
    %GLOBAL /NST TITL CLR;
    CALL SYMPUT('/NST',DIV/S/ON);
    CALL SYMPUT('TITL', 'Hillside Division');
    CALL SYMPUT('clr', 'Green');
    _MEND HIL; %HIL; %HFLE;
  %end;

  %if Division = 'CHILD' %then do;
    %GLOBAL /NST TITL CLR;
    CALL SYMPUT('/NST',DIV/S/ON);
    CALL SYMPUT('TITL', 'Childrens Division');
    CALL SYMPUT('clr', 'Blue');
    _MEND CHI; %CHI; %CFLE;
  %end;

  %if Division = 'INST' %then do;
    %GLOBAL /NST TITL CLR;
    CALL SYMPUT('/NST',DIV/S/ON);
    CALL SYMPUT('TITL', 'All Divisions');
    CALL SYMPUT('clr', 'Blue');
    _MEND ALL; %ALL; %JFLE;
  %end;

  %MEND PARMS;
%

%MACRO LFLf;
  CALL NEW('WORK. TEST1(REPLACE=YES)', 'LIJ.ADM5CAN',O, 'N');
  SCAN = OPEN('LIJ.ADMSCAN', 'I');
  CALL SET(SCAN);
  SUB = OPEN('WORK.TEST', 'U');
  CALL SET(SUB);
  DO WHILE (FETCH(SCAN) NE -1);
    NAME = GETVARC(SCAN, VARNUM(SCAN, 'NAME'));
    L = LENGTH(STR);
    ST = SUBSTR(NAME,1,L);
    IF ST NE 'N' THEN CONTINUE;
    AP = APPEND(SUB);
  END;
  CALL CLOSE(SCAN);
  CALL CLOSE(SUB);
%MENDLFLE;
%

%MACRO HFLE;
  CALL NEW('WORK. TEST1(REPLACE=YES)', 'HILL.ADMSCAN',O, 'N');
  SCAN = OPEN('HILL.ADMSCAN', 'I');
  CALL SET(SCAN);
  SUB = OPEN('WORK.TEST', 'U');
  CALL SET(SUB);
  DO WHILE (FETCH(SCAN) NE -1);
    NAME = GETVARC(SCAN, VARNUM(SCAN, 'NAME'));
    L = LENGTH(STR);
    ST = SUBSTR(NAME,1,L);
    IF ST NE 'N' THEN CONTINUE;
    AP = APPEND(SUB);
  END;
  CALL CLOSE(SCAN);
  CALL CLOSE(SUB);
%MENDHFLE;
%

%MACRO ILFLE;
  CALL NEW('WORK. TEST1(REPLACE=YES)', 'INST.ADMSCAN',O, 'N');
  SCAN = OPEN('INST.ADMSCAN', 'I');
  CALL SET(SCAN);
  SUB = OPEN('WORK.TEST', 'U');
  CALL SET(SUB);
  DO WHILE (FETCH(SCAN) NE -1);
    NAME = GETVARC(SCAN, VARNUM(SCAN, 'NAME'));
    L = LENGTH(STR);
    ST = SUBSTR(NAME,1,L);
    IF ST NE 'N' THEN CONTINUE;
    AP = APPEND(SUB);
  END;
  CALL CLOSE(SCAN);
  CALL CLOSE(SUB);
%MENDILFLE;
%

%MACRO CFLE;
  CALL NEW('WORK. TEST1(REPLACE=YES)', 'CHILD.ADMSCAN',O, 'N');
  SCAN = OPEN('CHILD.ADMSCAN', 'I');
  CALL SET(SCAN);
  SUB = OPEN('WORK.TEST', 'U');
  CALL SET(SUB);
  DO WHILE (FETCH(SCAN) NE -1);
    NAME = GETVARC(SCAN, VARNUM(SCAN, 'NAME'));
    L = LENGTH(STR);
    ST = SUBSTR(NAME,1,L);
    IF ST NE 'N' THEN CONTINUE;
    AP = APPEND(SUB);
  END;
  CALL CLOSE(SCAN);
  CALL CLOSE(SUB);
%MENDCFLE;
%

%MACRO PARM;

%MACRO LFLf;

%MACRO HFLE;

%MACRO ILFLE;

%MACRO CFLE;

%RETURN;

MAIN:
  ERROROFF ALL;
  CALL SYMPUT(DATASET,'ADMTMD');
  CALL SYMPUT('Banner','Admitting Doctor');
  CALL SYMPUT('VARY', 'ADMT MD');
  CALL SYMPUT(VMAT', '$DOCFMT25.
  IF DIVISION NE _BLANK_ THEN
    IF STAT NE _BLANK_ THEN
      IF PERIOD NE _BLANK_ THEN
        IF OUTPUT NE _BLANK_ THEN
          IF (N EQ _BLANK_) THEN DO;
            MSG = 'Please enter any portion of the doctors last name Or cancel
            IF ERRORONN THEN
              _STATUS_ = 'R';
              _msg_ = 'Please enter a partial or whole
            ERRORONN ;
          END;
        IF STAT NE _BLANK_ THEN
          IF PERIOD NE _BLANK_ THEN
            IF OUTPUT NE _BLANK_ THEN
              IF STATUS NE 'C' THEN
                IF (N EQ _BLANK_) THEN DO;
                  MSG = 'Please make your selections then enter a partial or whole
                  ERRORONN ;
                END;
              IF DIVISION NE _BLANK_ THEN
                IF STAT NE _BLANK_ THEN
                  IF PERIOD NE _BLANK_ THEN
                    IF OUTPUT NE _BLANK_ THEN
                      IF STATUS NE 'C' THEN
                        IF (N EQ _BLANK_) THEN DO;
                          MSG = 'Please make your selections then enter a partial or whole
                          ERRORONN ;
                        END;
                      IF DIVISION NE _BLANK_ THEN
                        IF STAT NE _BLANK_ THEN
  END;

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IF PERIOD NE BLANK THEN IF OUTPUT NE BLANK THEN IF N NE BLANK THEN IF STATUS NE "C" THEN DO; %FARM; IF (EXIST("TEST1")) THEN DO; TST = OPEN("TEST1"); NAME = DATA(TST, "NAME"); CALL CLOSE(TST); DE = DELETE("WORK.TEST1"); END; ELSE RETURN; END; RETURN; TERM: IF STATUS NE "C" THEN DO; IF Division EQ BLANK THEN IF Output EQ BLANK THEN IF STAT EQ BLANK THEN IF N EQ BLANK THEN _MSG_ = "Please make a selection before trying to submit!"; STATUS = "R"; ERROROFF N; END; IF N EQ BLANK THEN do; ERRORON N ; _MSG_ = "Please enter a some portion of the doctors name ili"; _STATUS_ = "R"; END; IF PERIOD EQ BLANK THEN do; ERRORON OUTPUT ; _MSG_ = "You have not choen a PERIOD, please select one"; _STATUS_ = "R"; ERROROFF N; END; IF OUTPUT EQ BLANK THEN do; ERRORON DIVISION; _MSG_ = "You have not chosen an OUTPUT, please select one"; _STATUS_ = "R"; ERROROFF N; END; IF STAT EQ BLANK THEN do; ERRORON DIVISION; _MSG_ = "You have not chosen a STATISTIC, please select one"; _STATUS_ = "R"; ERROROFF N; END; IF DIVISION EQ BLANK THEN do; ERRORON period ; _MSG_ = "You have not chosen a DIVISION, please select one"; _STATUS_ = "R"; ERROROFF N ; END; IF PERIOD = "MONTH" THEN IF OUTPUT = "REPORT" THEN IF STAT NE BLANK THEN IF STATUS EQ "E" THEN SUBMIT IMMEDIATE ; %MACRO SELECT ; %GLOBAL VAR3 NAME; %LET VAR3 = &INST..&DTASET(WHERE = ( NAME eq &NAME)); %LET NAME = &NAME; %IF &PERIOD = "YEAR" %THEN %LET SUM = ""; %END SELECT; %SELECT; proc means data = &VAR3 noprint missing; class &VARY ; VAR TOSAYS TOSAY1 TOSAY2 TOSAY3 TOSAY4 TOSAY5; TITLE 1 'LONG ISLAND JEWISH MEDICAL CENTER'; TITLE2 'TITLE the Last Five Years'; TITLE 1 '------BANNER-----'; %MPTGO; ENDSUBMIT; IF PERIOD = "YEAR" THEN IF OUTPUT = "REPORT" THEN IF STAT NE BLANK THEN IF STATUS EQ "E" THEN SUBMIT IMMEDIATE ; %MACRO SELECT ; %GLOBAL VAR3 NAME; %LET VAR3 = &INST..&DTASET(WHERE = ( NAME eq &NAME)); %LET NAME = &NAME; %IF &PERIOD = "YEAR" %THEN %LET SUM = ""; %END SELECT; %SELECT; proc means data = &VAR3 noprint missing; class &VARY ; VAR TOSAYS TOSAY1 TOSAY2 TOSAY3 TOSAY4 TOSAY5; TITLE 1 'LONG ISLAND JEWISH MEDICAL CENTER'; TITLE2 'TITLE the Last Five Years'; TITLE 1 '------BANNER-----'; %MPTGO; ENDSUBMIT; IF PERIOD = "YEAR" THEN IF OUTPUT = "REPORT" THEN IF STAT NE BLANK THEN IF STATUS EQ "E" THEN SUBMIT IMMEDIATE ; %MACRO SELECT ; %GLOBAL VAR3 NAME; %LET VAR3 = &INST..&DTASET(WHERE = ( NAME eq &NAME)); %LET NAME = &NAME; %IF &PERIOD = "YEAR" %THEN %LET SUM = ""; %END SELECT; %SELECT; proc means data = &VAR3 noprint missing; class &VARY ; VAR TOSAYS TOSAY1 TOSAY2 TOSAY3 TOSAY4 TOSAY5; TITLE 1 'LONG ISLAND JEWISH MEDICAL CENTER'; TITLE2 'TITLE the Last Five Years'; TITLE 1 '------BANNER-----'; %MPTGO; ENDSUBMIT; IF PERIOD = "YEAR" THEN IF OUTPUT = "REPORT" THEN IF STAT NE BLANK THEN IF STATUS EQ "E" THEN SUBMIT IMMEDIATE ; %MACRO SELECT ; %GLOBAL VAR3 NAME; %LET VAR3 = &INST..&DTASET(WHERE = ( NAME eq &NAME)); %LET NAME = &NAME; %IF &PERIOD = "YEAR" %THEN %LET SUM = ""; %END SELECT; %SELECT; proc means data = &VAR3 noprint missing; class &VARY ; VAR TOSAYS TOSAY1 TOSAY2 TOSAY3 TOSAY4 TOSAY5; TITLE 1 'LONG ISLAND JEWISH MEDICAL CENTER'; TITLE2 'TITLE the Last Five Years'; TITLE 1 '------BANNER-----'; %MPTGO; ENDSUBMIT; IF PERIOD = "YEAR" THEN IF OUTPUT = "REPORT" THEN IF STAT NE BLANK THEN IF STATUS EQ "E" THEN SUBMIT IMMEDIATE ; %MACRO SELECT ; %GLOBAL VAR3 NAME; %LET VAR3 = &INST..&DTASET(WHERE = ( NAME eq &NAME)); %LET NAME = &NAME; %IF &PERIOD = "YEAR" %THEN %LET SUM = ""; %END SELECT; %SELECT; proc means data = &VAR3 noprint missing; class &VARY ; VAR TOSAYS TOSAY1 TOSAY2 TOSAY3 TOSAY4 TOSAY5; TITLE 1 'LONG ISLAND JEWISH MEDICAL CENTER'; TITLE2 'TITLE the Last Five Years'; TITLE 1 '------BANNER-----'; %MPTGO; ENDSUBMIT; IF PERIOD = "YEAR" THEN IF OUTPUT = "REPORT" THEN IF STAT NE BLANK THEN IF STATUS EQ "E" THEN SUBMIT IMMEDIATE ;
DIS = &STATAX; YEAR = 'AXX';
KEEP DIS &VARY YEAR;
RUN;
%MEND;
%END;
%MEND MAKE;
%MAKE;
%MEND REP;
%LOCAL DG;
CALL SYMPUT('DG',PUT(&VARY,&VMATJ);
%ENDREP;
%nmacro notas:
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y Y &Y4 END = EOF;
IF EOF THEN %REP;
%END;
%macro notes:
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isa/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro deId:
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro deId:
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro deId:
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro nota/os;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro isaJos;
DATA SIX;
SET ONE&Y1 ONE&Y2 ONE&Y3 ONE&Y4 ONE&Y5 ONE&Y6 END = EOF;
IF EOF THEN %REP;
%END;
%macro decIde;
**The Discharge Database group**

SAS/AF applications within the discharge database group see summarized patient discharges, patient length of stay, and patient average lengths of stay. All applications in this group report on data for the present year and four recent past years. Summarization is done for SAS data sets within four SAS data libraries, one for the institution as a whole and one for each of the three hospital divisions. Selections MEDICAL CENTER, DISCHARGES and PHYSICIANS on the main EIS menu correspond to SAS/AF applications that query the SAS datasets within these libraries. The summarized SAS datasets are created by four batch jobs that are run every month. Each month, as patients are discharged from the hospital, patient records are accumulated on a tape that provides raw input for monthly batch SAS jobs. At the end of the year a tape is produced and a monthly SAS job is submitted for the last time. Then the cycle starts again for a new year.

Each tape contains individual records for each patient discharged, about 30,000 records at years end. Five years of Summarized data in indexed SAS data sets puts the potential 150,000 records in the hands of the users, and at the same time provides reasonable response time in TSO foreground.

A batch job is submitted monthly that summarizes patient discharge data for the institution and provides the institution database for discharges that previous SAS/AF applications reported from. This monthly batch job (example of code omitted to save space) is presently one of four jobs that create four SAS data sets that contain similar data on each division.

**The Census Database Group**

SAS/AF applications that report from this data group are selected by the user choosing the Census selection from the main EIS menu. SAS/AF applications provide reports and graphs on current patient status in the hospital. To provide current information, SAS batch jobs are submitted by the installation job scheduler to update two SAS data sets. Each day the hospital produces a set of patient statistical data. The daily SAS job reads this data, date stamps it and appends the data to one of the two SAS data sets within the Census data base group. This provides EIS with a historical database of patient activity. SAS/AF applications query this data by month and day. The other census database SAS dataset is also updated by a batch job that gets submitted by the installation scheduler every four hours. This SAS data set provides data for a graph that reports on the status of occupied or unoccupied beds in each nursing station. Normally nursing station data is stored in an IMS data base that is part of a CICS online application. The scheduled job takes a snap shot of nursing station data by unloading it to an IBM sequential flat file and then submits the batch SAS job that reads the unloaded data and updates the SAS data set. When an EIS user selects the nursing station graph option from the census submenu the graph reflects the condition of the nursing stations at the time of the snap shot.

**The Budget data base group**

The budget data base group and its corresponding applications is the smallest contribution to the EIS. Presently there are only two applications for the budget selection, both of which are graphs that provide administrators with a graphical view of budgeted discharges or patient days vs actual patient discharges or patient days. Data for actual discharges and days comes from the statistical file that's built for the census data base group. Data for budgeted discharges and days comes from a lotus spreadsheet that I get from the finance department. When I receive the P.C. lotus spreadsheet I export the data into an ASCII file, I then upload the data to the mainframe into an IBM sequential file. I then use a batch job that reads uploaded lotus data, summarize the statistical data from the census database group and combine both variable in a SAS dataset for graphing by the budget SAS/AF applications.

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