# Enhanced Data Support Methodology (EDSM): Using Technology for Competitive Advantage for Managed Health Care

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EDSM is an integrated physician, hospital and health plan based point and click healthcare analysis and reporting system that is being implemented at Allina Health System of Minneapolis, MN. Allina is an integrated healthcare system comprised of 19 hospitals, 57 clinics and a healthplan that provides a full range of insurance products to more than a million members.  More than 12,000 practitioners, over 2,000 clinics and several hundred hospitals from Minnesota, Wisconsin, North and South Dakota are part of the care delivery network.  Users select hospital, clinic, pharmacy and enrollment data from a menu by specific hospital, clinic or employer groups or overall.  Standardized reports are available through reporting windows with 5 levels of drilldown.  The system integrates EIS drilldown with graphic illustrations, quality control, forecasting and query capabilities.  Data is refreshed by a monthly download from mainframe DB2 tables.  Data is also imported from other external databases and spreadsheets.. EDSM utilizes  SAS®  Base, SQL, Access, Graph, AF, SCF, EIS, Quality Control, ETS, GIS, Insight, OR, Query, Neural Networks and Warehouse Administrator.

The system is used to help develop practitioner profiles, pricing; network coverage evaluation; disease analysis and management; process control evaluation; utilization analysis; and forecasting.  EDSM is utilized at all staff levels from senior management to rank in file employees.  Thirty-six months of claims data currently composes the active database.  EDSM was developed to provide internal and external customers with direct access to data for decision support purposes.  The initial prototype of EDSM was developed in 10 months (1996-97) with a focus on claims based, healthplan data.  The application is currently in beta test with 50 users.

SAS Connect and SAS Access are software applications used to downloaded data from mainframe IBM DB2 files to a Compaq fileserver and stored as SAS datasets.  Allina is building an Oracle based data warehouse for networkwide applications.  In the near future, all hospital, clinic, healthplan data will be located in the data warehouse and provide for data extractions on a monthly basis.  The results of current applications to the claims data base will be expanded to include non-healthplan physician and hospital information in 1998.  The application is currently being converted to run under UNIX on an IBM RISC6000 box.

EDSM consists of fifteen modules: hospital, clinic, pharmacy, enrollment, reporting, data bases, product analysis, process control, executive information system, decision analysis, modeling, geographic information system, query window, graphics, and project management.  EDSM is parameter driven requiring the user to select the product(s), employer groups and date range for analysis.

**Definitions**

Hospital Module

There are 3 submodules: hospital summary, hospital specific, trend analysis(graphic format) .  The following is available:

        Inpatient        Data:
             patient count, cost, total admissions, number of inpatient days, per member per month costs, cost per day, cost/patient, admissions/1000, days/1000, average length of stay

        Outpatient Data:
             patient count, cost, per member per month costs, visits, visits/1000, cost/visit, cost/patient

There are 4 drilldowns: major products, subproducts, in or outpatient categories, major diagnostic categories.

Clinic Module
There are 3 submodules: clinic summary, clinic specific, trend analysis(graphic format).
       Analysis variables:
             patient count, cost, visits, per member per month costs, visits/1000, cost/visit,
cost/patient

There are 5 drilldowns: Major products, subproducts, clinic, physician, major diagnostic category.

Pharmacy Module
There are 2 submodules: tabular format, graphic format.
       Analysis variables:
             patient count, prescription count, cost, cost/patient, cost/prescription, average cost per
             script

There are 6 drilldowns: major products, subproducts, clinic, specialty, physician, therapeutic class.

Enrollment Module
There are 2 submodules: age\sex distribution, monthly enrollment.
       Analysis variables:
             age, sex, count by month

The analysis consists of an age/sex distribution plot and a monthly enrollment plot over a time period
determined by the user.

Reporting
The module consists of reports that are run on a scheduled (monthly, quarterly, semiannually, annually)
and are parameter driven.  The user must specify the date range, employer group numbers, print
specifications, and other selection parameters.

Data Bases
This module consists of disease specific data bases that are subsets of the "master" data base .  The data
bases were constructed for user access, i.e. to develop their own queries.  For example, six specific data
bases were constructed to address strategic clinical priorities(colon cancer, breast cancer, pediatric
asthma, pregnancy care, cardiovascular and diabetes).  Reporting and analysis of related information for
each condition is run against its' established data base.

Product Analysis
This module combines selected data from the hospital, clinic, pharmacy and enrollment files and presents
the information by product.  The drilldown consists of product level detail only .

Process Control
The purpose of  this module is for control chart applications.  The analysis identifies random fluctuation
or patterns which may indicate that a process is out of control.

Executive Information System
The module is utilized by Allina senior management to monitor selected key indicators which reflect the
business and operational status of the health system as a whole.

Decision Analysis
A module is under development that will be used to show decision makers the impact of their decisions
which are based upon experience, data and intuition.  For example, what are the resource implications
(human, financial, capital) associated with the most important decisions that need to be made to achieve
each health system strategic target?

Modeling
This module is utilized to forecast trends on an overall and individual hospital, clinic and health plan product basis.  Forecasts are produced at a summary level and down to the major diagnostic categories.  For example, pharmacy information is shown at the summary level and specific therapeutic class.  Pharmacy has been the most advanced EDSM application and is in the "pilot" testing phase with Allina physicians at various clinic locations within the health system.

Geographic Information System (GIS)
GIS geographically presents the Allina  priority databases at the zip code level of analysis across its patient-member catchment area.

Query Window
Users access query windows for ad hoc needs of selected databases represented on the menu.

Graphics
Graphics interfaces SAS's capabilities for users to develop their own graphic data displays.

Project Management
The module tracks time and financial expenditures by project.  Following the collection of defined data elements, future project time and financial costs are estimated for program planning and budgeting purposes.

EXAMPLE Users enter the system via the following main menu.  Clicking on a button takes them to the next level of detail within a module.  The Security system controls what modules and what level of detail within a module a user can access.



01/06/98
Page #:3
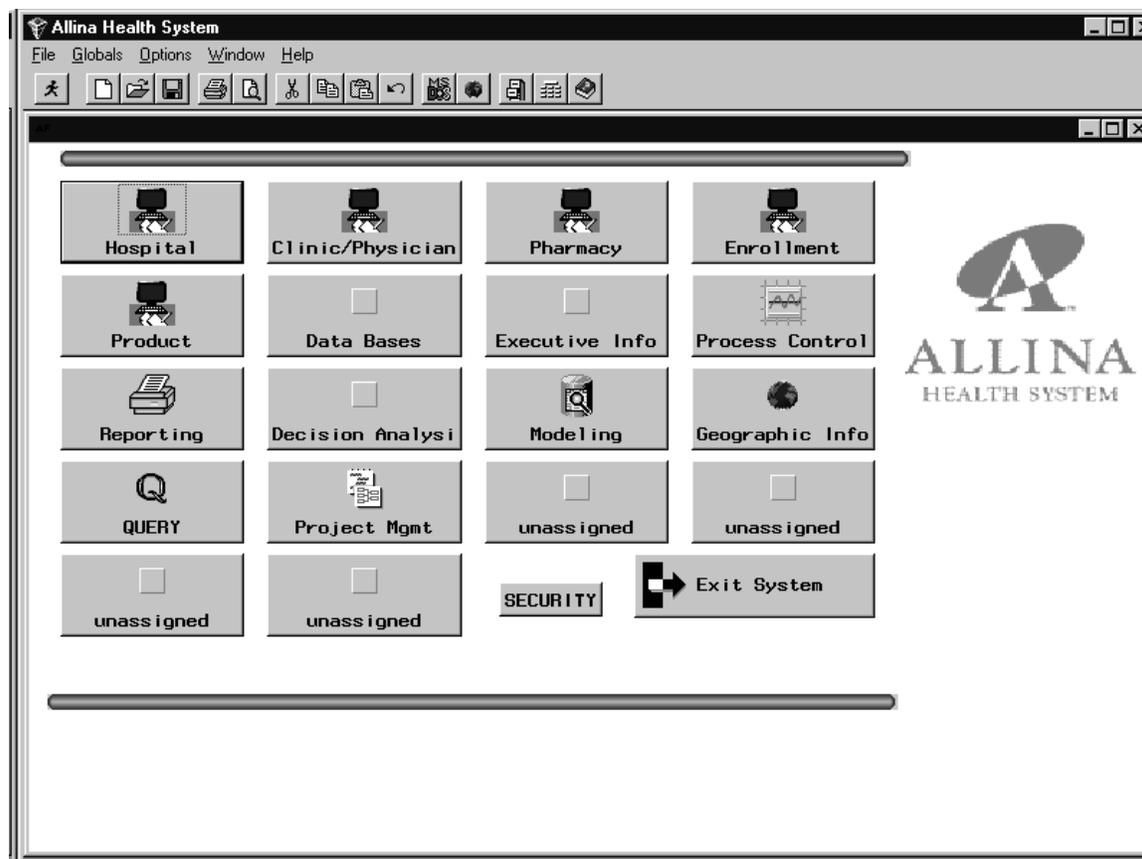
By selecting HOSPITAL on the main menu, the following menu is activated. From this menu the user has 3 options: Hospital Data summarized over all hospitals, data on a specific hospital or trend data.
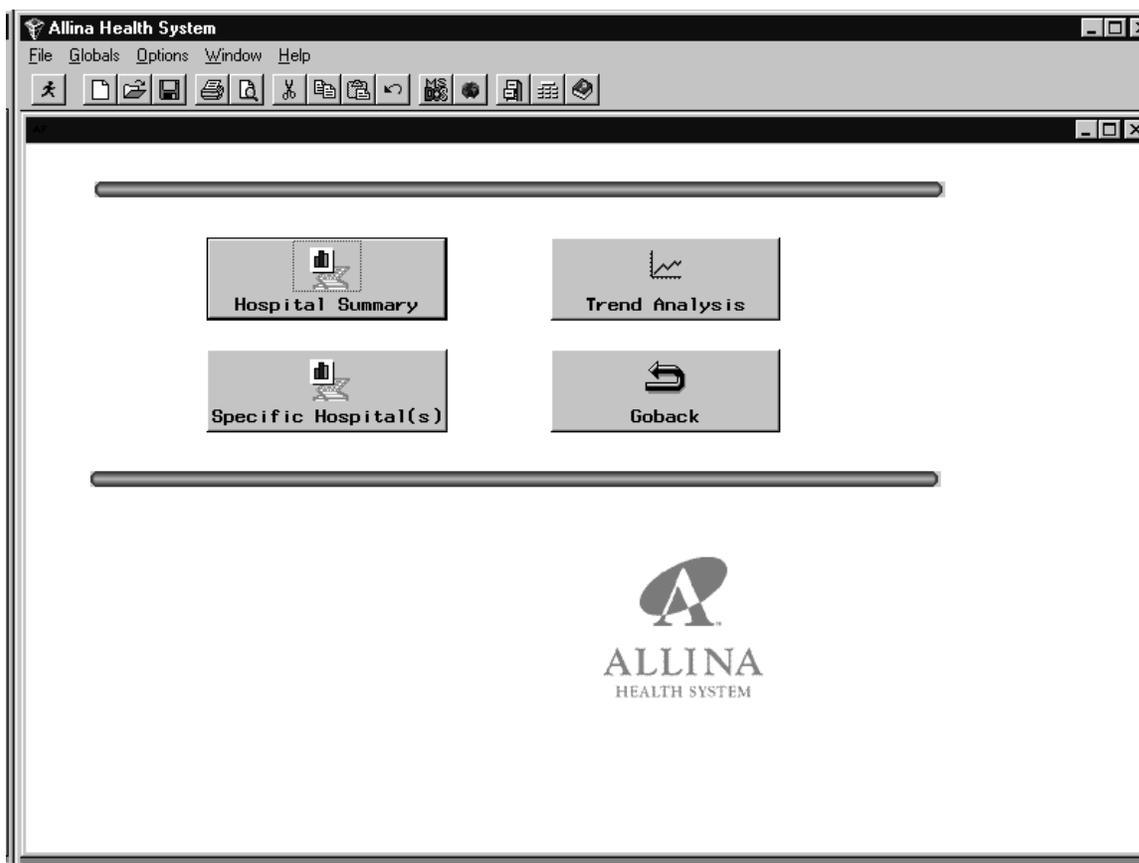


By selecting HOSPITAL SUMMARY on the above menu, the following menu appears. From this menu, the user must select a REPORT CATEGORY, REPORT and DATE RANGE.

The base data is maintained in SAS datasets by module by month. After the user selects the report parameters from the above screen, the data is summarized and presented in the following tabular format. The lower table illustrates the five levels of drilldown.



Hospital Inpatient Drilldown

☐ Chart

| | PATIENTS | ADMISSIONS | DAYS | TOTAL PAID |
|---|---|---|---|---|
| Choice Commercial.......... | 2,269 | 2,286 | 9,375 | $12,143,676.26 |
| Medica Risk................ | 1,154 | 1,177 | 8,961 | $8,822,879.59 |
| Medica Self-Insured........ | 760 | 767 | 3,053 | $4,374,064.50 |
| Medicaid................... | 648 | 657 | 3,374 | $3,916,990.60 |
| Medica Primary............. | 241 | 244 | 937 | $1,563,334.48 |
| Medicare................... | 937 | 939 | 8,038 | $1,157,284.16 |
| Medica Choice UBS.......... | 206 | 212 | 1,522 | $579,318.78 |
| Medica Primary UBS......... | 26 | 27 | 180 | $93,846.28 |

Statistic: SUM

| Actions | Print | Notes | Bookmark | Goback | Help |

Allina Health System

File  Globals  Options  Window  Help

Hospital Inpatient Drilldown

☐ Chart

| | PATIENTS | ADMISSIONS | DAYS | TOTAL PAID |
|---|---|---|---|---|
| Choice Commercial.......... | 2,269 | 2,286 | 9,375 | $12,143,676.26 |
| Select................... | 1,607 | 1,618 | 6,525 | $8,620,521.95 |
| In-Network............. | 1,587 | 1,598 | 6,341 | $8,499,655.22 |
| Surgical............. | 491 | 493 | 2,242 | $4,024,312.14 |
| Cardiovascular | 59 | 60 | 366 | $811,744.79 |
| Musculoskeletal | 97 | 97 | 364 | $667,047.42 |
| Neoplasms | 69 | 69 | 390 | $630,609.43 |
| Injury/Poison | 65 | 66 | 300 | $542,306.40 |
| Digestive | 70 | 70 | 272 | $470,353.06 |
| Genitourinary | 80 | 80 | 228 | $416,846.46 |
| Congenital Anomalie | 16 | 16 | 66 | $191,516.84 |
| Metabolic | 7 | 7 | 126 | $104,166.33 |
| Respiratory | 9 | 9 | 49 | $73,499.10 |
| Nervous System | 8 | 8 | 21 | $40,391.58 |
| Other | 5 | 5 | 23 | $23,102.26 |
| Diseases of Skin | 3 | 3 | 16 | $17,983.59 |
| Infectious | 1 | 1 | 8 | $17,562.50 |
| Diseases of Blood | 2 | 2 | 13 | $17,182.38 |
| Medical............. | 463 | 470 | 1,871 | $2,194,045.62 |
| Maternity........... | 433 | 434 | 973 | $1,059,706.94 |
| Complex Newborn...... | 27 | 27 | 474 | $946,162.85 |
| Well Newborn......... | 151 | 151 | 252 | $165,666.99 |
| ECF/SNF............. | 18 | 19 | 517 | $93,744.74 |

Statistic:  SUM

Actions    Print    Notes    Bookmark    Goback    Help

Trend analysis is also available.  By selecting TREND ANALYSIS from the Hospital Menu (upper screen, page 4), a menu appears that requires the user to make several parameter selections.  Based on these selections, a graphics similar to the one below will be displayed.
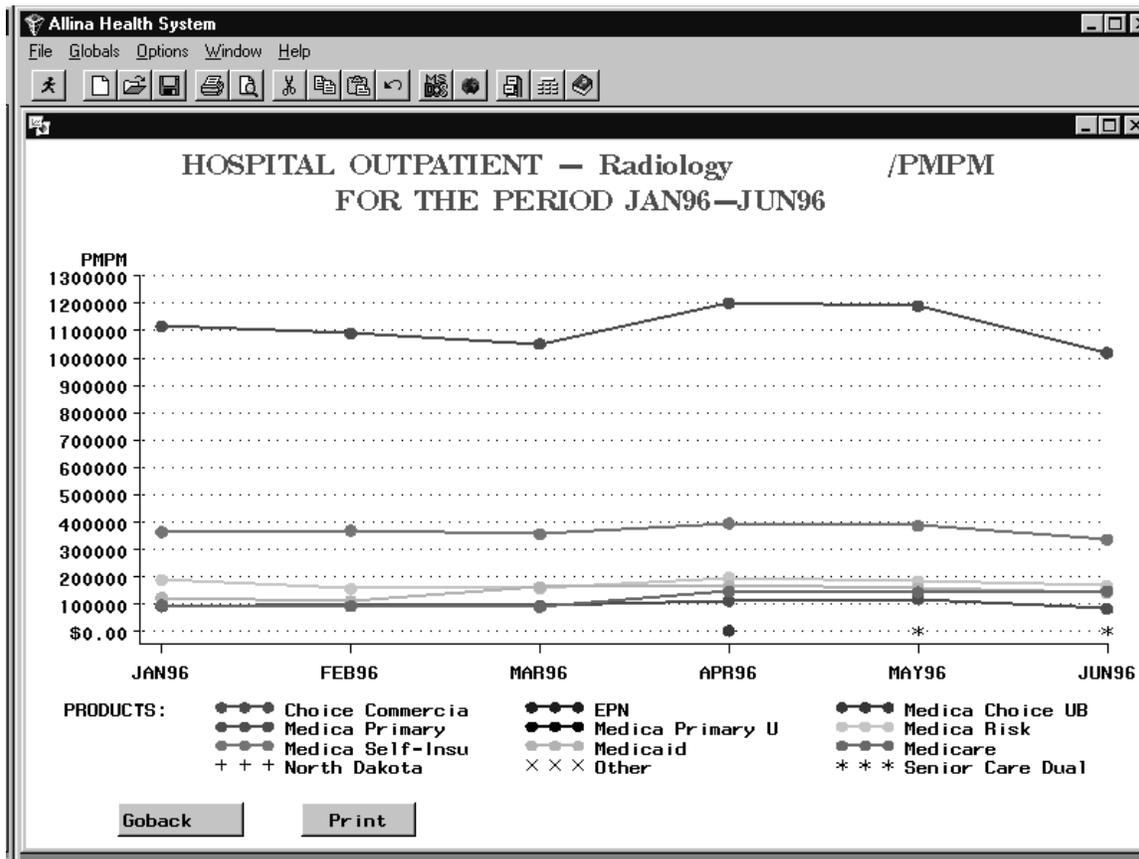


All other modules follow a similar format.  The user clicks his/her way through the menu screens until he/she has selected the parameter required to run a report.  As with this hospital example, multiple reports/outputs are available based on the selection.  To utilize this system, the user is expected to understand the data he/she is accessing.  No level of SAS knowledge is required.

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