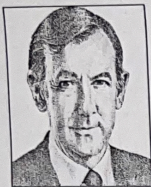


APPLIED INTELLIGENCE

DSS Applications Should Shed New Light on a Problem



**JAMES
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This is part two of a three-part series on executive information systems and decision support systems—technologies that enable executives to gain direct access to information.

Decision support systems (DSS) can be considered

among the industry's many terms or concepts that are either hard to grasp or are constantly being redefined. Simply stated, a DSS is any system that can be used to increase the efficiency and effectiveness of the decision-making process.

Yet, the concept of a DSS remains confusing to many people. To some, it means end-user computing, personal computing or executive information systems (EIS). However, these terms are not synonyms for DSS.

The general characteristics of a DSS distinguish it from other systems. Data in a DSS is more aggregate and less record-oriented than information systems (IS) applications. DSS data is stored in the form of multidimensional arrays. The interaction between the DSS and the user is very flexible, immediate and accessible to a non-IS professional. The DSS is generally used to identify and understand problems and opportunities.

Decision support systems evolved gradually from more structured computer applications. As corporations succeeded in automating well-structured operational systems, they began to tackle the additional reporting requirements of those applications. Users (analysts and executives alike) began to demand tools that provided flexibility and functionality, not just reporting, to support their problem-identification and decision-making needs. These evolving needs were met by DSS products.

One important characteristic of DSS products is their ability to support a powerful data model and retrieve data from a variety of production database-management systems (DBMSs) as well as from external sources. The decision support structure must aid in the processes of ad hoc queries and analysis, and must be flexible enough for the user to add or delete data as the problem is better understood.

The interface must be responsive, allowing a user, after reviewing the answer to a question, to immediately formulate and execute the next question, whether the request is for more data, a report, a graph or additional analysis.

A DSS application should help a user gain new insights into a problem and aid in the problem definition, redefinition and solution—to bring about a new understanding of the problem. As the problem definition is clarified, the DSS application must change dynamically to reflect greater user insight into the problem.

The diversity of functions within DSS products makes it difficult to group all the products into one category. By understanding the needs of the users and translating those needs into software functions, there emerge five distinct types of decision support products: spreadsheet products, EIS, business-modeling products, general DSS products and statistical-analysis products.

Of the five, spreadsheets are the most widely used. A spreadsheet enables users to perform the first level of analysis and to develop simple models.

Typically, spreadsheet data is not accessed through a data dictionary; the user has the freedom to perform any

general DSS or business-modeling tool.

As described last week, executive information systems are specifically designed to help executives gain insights and track critical success factors. The focus of an EIS is to aid a decision maker in assimilating information quickly and identifying problems or opportunities, not as an aid in problem analysis or resolution. In many corporations, well-developed EIS have replaced the traditional periodic executive summary reports. Representative products in this category include Command Center, from Pilot Executive Software, and Commander EIS, from Comshare Inc.

Business-modeling products are used

programming skills are often required in order to make effective use of the language.

The focus of business modeling products is on a robust modeling facility with analysis capabilities and on tools to transfer data into the modeling environment from a variety of sources. Representative business modeling products are IFPS/Plus, from Execucom Systems Corp., and System W, from Comshare.

The fourth category is the general DSS product. These products are similar to but more powerful than business-modeling tools. Among the distinguishing characteristics of general DSS products are the facilities provided to manage multidimensional data and the ease in which data can be added to the system. These products are intended to manage larger databases and serve a broader set of user needs.

These types of DSS products also provide facilities for creating highly formatted reports and a variety of graphic displays. A very robust procedural language is provided that requires proficient skill for effective use. The language can be used to write user-oriented procedures such as screen data entry, processing and reporting. Representative products in this category are Express, from Information Resources Inc., and Stratagem, from Computer Associates International Inc.

The last category, statistical-analysis products, consists of products that are used for the statistical analysis and modeling of data. Their libraries of statistical routines are more extensive than those found in the general DSS products.

Where a general DSS product may have one or two types of regression, a statistical-analysis product has several, including linear, multiple, polynomial and stepwise.

Generally, users are expected to understand the appropriateness of the technique and how to interpret the results. Usually these are used by trained analysts. SAS, from SAS Institute Inc., and SPSS-X, from SPSS Inc., represent products in this category.

Micro products are now beginning to provide capabilities previously found only on the mainframe. Mainframe DSS products are being ported to the micro. As the power of the micro continues to be expanded and enhanced, the applications that can run stand-alone on the micro will be larger and more complex. There is no doubt that the definition of DSS will be further modified as the micro technology (hardware and software) revolution continues.

Next week, we'll look at the features that managers should look for in a DSS product for their organizations. ■

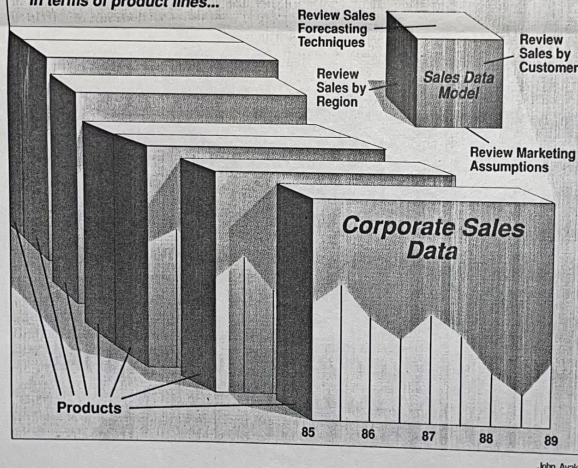
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Decision Support Systems

Let Managers Examine Data in Multiple Dimensions

Using decision support tools, managers could analyze sales in terms of product lines...

...or review sales data in multiple other dimensions.



John Avakian

One important characteristic of DSS products is their ability to support a powerful data model and retrieve data from production DBMSs as well as from external sources.

operation, logically valid or invalid, on any data in the spreadsheet. The lack of control mechanisms has caused many managers to become wary of information reported from spreadsheets.

Spreadsheet facilities include functions for performing some level of mathematical, financial, reporting and graphical operations. For efficient processing, the entire spreadsheet is usually maintained in high-speed memory. As a result, spreadsheet products are practical only for applications limited to hundreds or thousands of numbers. Applications that require more data or that must manage different types of information are usually implemented with a

by financial analysts to represent relationships between data elements in the problem set. Models may be as straightforward as a profit-and-loss income statement or a balance sheet. More complex business models include econometric forecasts or a product-mix algorithm. Analysts can use these products to perform what-if and goal-seeking analyses, and provide some level of statistical and graphical capabilities.

The query and reporting facilities of these products are usually quite extensive. Most of these products provide interfaces to more specialized software to augment their own facilities. A programming language is usually available, and