Executive information systems: Definitions and guidelines

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ABSTRACT

This paper attempts to define a class of computer application, called Executive Information Systems (EIS), which has become a popular target of MIS departments in large organizations. By the end of 1987, fully 50% of the 100 largest organizations in the United States, and 33% of the largest 1,000, will have implemented information systems for use by their executives. A few of these systems will have substantially improved the productivity and profitability of their organizations, but the majority will have had little impact.

Part of the explanation for the differences between success and failure can be found in the definitions different organizations use for EIS and part can be found in the approaches they take to implementing EIS. The objective of this paper is to increase the chances of success by offering a firm definition and suggestions for effective implementation of EIS.
INTRODUCTION

An Executive Information System is a computer-based system that provides up-to-date answers to key questions raised by managers without burying the manager in unneeded data. EIS systems are action-oriented systems, because the answers lead to action by the managers.

A modern airplane cockpit is an effective model for an EIS. Key indicators are monitored constantly. When an indicator, such as elevation, moves outside an acceptable range, a warning sounds. The pilot can take immediate action to correct the problem. Hundreds of indicators are monitored, yet most of them become visible to the pilot only when a problem is apparent. A smaller number, such as speed, attitude, elevation, and course are constantly visible, because they show just how well the flight is going. These essential indicators are the ones that the pilot must watch constantly in order to “stay on course.”

An EIS system has a similar hierarchy. Each executive must watch a small number of key indicators to be certain that his or her segment of the enterprise is “on course.” In addition, there are hundreds, or even thousands, of additional indicators that are important, but that need to become visible only when their values go outside an acceptable range.

FINDING THE RIGHT BALANCE

An EIS system becomes more a burden than an asset when it provides too much information or, rather, when it buries the key indicators under the weight of hundreds of other pieces of potentially interesting information. On the other hand, systems that are thin on content are no more than toys. Answers to one question often lead to additional questions. An EIS must provide answers to that second level question, as well.

The problem facing designers is how to find the right balance. Too much data makes an EIS hard to use; too little makes it a toy. Yet executives do not maintain constant focus. The information they want to monitor changes as business problems ebb and flow.

A strategy that has proven effective in finding that correct balance is to include the detail, but hide it. In this strategy, you maintain data on every indicator of interest to the manager, but show only the critical success factors and other indicators that have exceeded acceptable ranges.

ON-LINE OR ON PAPER?

On-line data display does not appear to be an essential ingredient of successful executive information systems. On-line display may be useful when it hides unnecessary data. It also may offer a provocative “state of the art” management tool that may draw executives into testing the system. However, the excitement of on-line display should not blind EIS developers to the real needs of executives. Many executives travel a great deal and need data when they are out of the office. Others want to show information to people who are not served by the EIS. Still others want more comparative detail than can be shown on a CRT screen.

Paper-based executive information systems offer the dual advantages of portability and precision. Paper can be taken out of the office more easily than can a display. A page of charts can show ten to one-hundred times as much comparative information as a screen on a computer display. Further, a well designed page of charts can emphasize the critical indicators while also showing comparisons of dozens of lower-level indicators.

WHAT TO SHOW IS THE MOST IMPORTANT QUESTION

Whether paper or PCs are used to display the information is a far less important question than the choice of what information to display.

An EIS reaches into the heart of an organization. What indicators the executives monitor is closely watched by managers and workers throughout an organization. The most powerful impact of successful EIS systems has been the motivation it has created within an organization. Thus, picking the right indicators is the most important step toward making the system useful.

How can you find the right indicators? Two popular methods do not work well:

1. Asking the senior executives what questions they would ask when they got back from a three week vacation. Although this leads to a few good indicators, it generally misses important ones, because the senior executive’s attention is focused on a limited subset of business problems.

2. Interviewing all senior managers to ask what data they think is most important. This has the benefit of getting managers involved in the process, but leads to too many indicators, with no way to limit them.

Some organizations have found a better way. Many large organizations have developed strategic and tactical plans for one, two, or five years. In these plans, the organization has laid out its objectives and how it plans to reach them. Whether it is “on course” can be measured by comparing its performance against the objectives laid out in those plans. The right
indicators can be derived from a careful analysis of the plans by a team consisting of a business analyst who understands the organization and an EIS consultant who has analyzed enough EIS implementations to be able to recommend good display formats and effective hierarchies of indicators.

DATA INDEPENDENCE KEEPS YOUR OPTIONS OPEN

Information for an EIS will come from several different sources:

1. corporate data bases maintained in DB-2 or other DBMS systems
2. departmental data bases maintained in FOCUS, RAMIS, IFPS, or other planning and reporting systems
3. application programs such as MRP or financial management
4. personal data stored on minis or micros, and
5. external data bases such as Dow-Jones News Service.

In the rush to get a system operating, many EIS planners develop direct links from each of the data sources to the displays. They generate graphs or reports using programs appropriate to each data source and then combine the displays in a library for instant viewing. The benefits of this approach are quickly forgotten when the user begins to ask for changes.

Requests arise to compare data from multiple sources or to use one chart design with data from another source. Every request will create a substantial development task unless a strategy of data and graphics independence is followed.

Data independence means that data to be used in the EIS are transferred from their original source into a single holding place. FOCUS, LOTUS, or any other reporting system will all serve well. The value of data independence is created by storing all appropriate data in a common format. When a user requests comparisons or new formats, applying the display to the data becomes a simple task.

Similarly, graphics independence means using a graphics system that can chart data from any data source so that a chart design can be used regardless of the source of data to be charted.

VISIBILITY IN THE EXECUTIVE SUITE

Executive information systems offer a short-cut to information systems executives who want to participate in general management. The person who puts together the right data displays becomes an aide to the manager who uses those displays and thereby becomes eligible for management opportunities that arise. However, this visibility works two ways. If a system for executives is seen as a toy or as “too hard to use,” then the visibility of its builder becomes a liability. Sticking close to the definitions and suggestions in this paper can help make certain that building an EIS system gives you the right kind of visibility.
The Microcomputers track covers several business applications and core areas of microcomputer technology. The sessions are intended to meet the needs of novice and experienced users. Presenters provide the latest information on such major microcomputer topics as chip architecture, operating systems, and integrated software. Given the significant penetration of the business market by microcomputers, few managers and decision makers can afford to ignore these recent developments.