Executive Information Systems

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Chapter 1. Introduction

What Is an Executive Information System?

An executive information system (EIS) provides key information, gathered from both internal and external sources, to senior executives and managers. It accomplishes the multiple purposes of supporting decision making, communicating information, and providing awareness.

EISs typically present summarized information, but allow the user to drill down to more detailed information. EISs should also present information in a user-friendly format to facilitate easy analysis, and employ graphical user interfaces (GUIs), which can be tailored to individual preferences. Often, EISs are integrated with spreadsheet, word processing, and other decision-support software.

A key ability of an EIS is easily communicating the comments and conclusions of executives to others. As a result, EISs are typically supported by an electronic mail (e-mail) system.

Installing an EIS often forces a business to restructure the information it uses to make decisions and the process by which it collects information. For example, if an EIS is designed for the company's chief executive officer (CEO), then all those reporting to the CEO will want the same information; likewise, if it is designed for vice presidents, then those reporting to them will want that same information. The EIS facilitates a shared view of the company that is focused on the issues of interest and importance to its executives, in contrast to traditional accounting systems that are focused on day-to-day financial transactions.

EISs have been known by many names over the years. Initially, decision-support systems (DSSs) were developed with the same aim of current EISs. In addition, EISs are known in some circles as executive-support systems (ESSs). No matter what they are called, the number of EIS installations continues to grow. According to industry estimates, revenues from the sales of commercial EIS software have grown at an average rate of 30 percent per year for the past five years. Projections indicate future growth at or above that rate.[1]

The Purpose of This Bulletin

The purpose of this technology bulletin is to report on the capabilities and features of today's EISs. Specifically, this bulletin identifies ways EISs can benefit businesses and how such systems affect both internal and external accountants. It also reviews key business processes that are affected by implementing an EIS.

The Scope of This Bulletin

This bulletin primarily discusses mainframe-based EISs, since these represent the majority of the EISs in use today. However, where pertinent, it also discusses the features of EISs that are on networks or based on personal computers (PCs), which are gaining in popularity. This bulletin is based on a survey of current EIS research done in academic and corporate environments. And, where appropriate, it provides examples of implemented EISs based on articles published in trade publications.

This bulletin does *not* include detailed information about EIS implementation; such information would be found in a publication such as a practice aid. It also does not evaluate specific EIS software products or computer hardware platforms.

The Structure of This Bulletin

Following the introduction in chapter 1, this bulletin proceeds as follows:

- Chapter 2 discusses the elements of an EIS, including its data extraction, decision-support, and communications capabilities.
- Chapter 3 presents some of the benefits of an EIS, including an example of a successful large-scale EIS.
- Chapter 4 investigates some of the limitations of an EIS.
- Chapter 5 analyzes the business processes that are affected by the development and implementation of an EIS.
- Chapter 6 summarizes the main points of this bulletin.

Chapter 2. Elements of an Executive Information System

An EIS is not a specific technology. Rather, it is a system of software that uses other technologies such as GUIs, personal computers, relational databases, and network communications to display key information to management. Thus, an EIS implementation would normally include database interface and presentation features. It would also include access to other decision-support tools, such as spreadsheets, and contain application development features such as fourth-generation programming languages.

Database Interface Features

Available Databases

EISs normally access information from virtually all of a company's internal databases, including production, financial, customer, and vendor information. In addition, EISs can access external databases that provide executives with industry information and business news services.[2]

EISs with access to external news databases must effectively filter huge amounts of data to be effective. News services such as Dow Jones News Retrieval allow subscribers to filter the material they receive based on individual, predefined selections. Texaco Corp.'s Exploration Producing Technology department hires outside consultants to sift through raw petroleum industry data before loading it into company information systems.[3] Other filtering alternatives include having either the public relations department or a separate in-house department review, filter, and scan interesting items into the EIS.[4]

Multidimensional Database

For an EIS to be effective, it must be able to access databases that can be organized in many ways and displayed in multidimensional views. For example, the same database should be able to supply sales information grouped by product, or customer type, or shipping locations. Conversely, the nature and type of inquiries that an EIS can make would be limited by the nature and structure of the underlying databases.

EISs designed today should have the capacity to run on many different operating platforms and retrieve data from different database systems.[5] Information systems are evolving from closed, single-vendor systems to open multiple-vendor ones.

Timeliness of the Data

EISs can display real-time, up-to-the-minute information. However, this requirement can vary with the time sensitivity of the information. In most cases, it is adequate to extract the data from a host database and download it to a special EIS database in an overnight batch process. This provides current, but not up-to-the-minute, data for the EIS. At Metropolitan Life Insurance Co., the regional sales data in its EIS is refreshed once or twice a day, while the financial budget figures are refreshed only once a month.[6]

However, where operational managers need real-time information, the EIS must be designed to produce interactive, on-line information updates. This way, managers can utilize the information to immediately intervene in a process. For example, a quality control manager could make immediate changes to a process based on information provided by the EIS. In addition, if the EIS identified a deteriorating quality trend, the manager could schedule preventive maintenance for later that day.

Soft Information

The amount of nonfinancial or *soft* information is increasing in EISs. EIS managers actually report a positive correlation between the amount of soft information and the perceived value of the EIS.[7]

Most EISs include soft information such as speculations, forecasts, estimates, and predictions. For example, soft information about competitor pricing and operations can be very useful. MetLife has added a sales prospecting file to its EIS where salespeople can share information about potential clients.[8] Soft information can either be annotated directly to a screen display or set up in a separate database.

Presentation Features

Graphics

One of the most compelling reasons for the success of early EISs was their user-friendly graphics, a big improvement over the text-based screens then in use. However, graphic environments are common today and this distinction is not as dramatic as it once was. But EISs continue to use highly graphic screens and menus as a major feature.

In addition, most EISs use a color scheme to indicate the specific status of the information. For example, information displayed in red may represent an exception or warning, while information in yellow may alert the user that the information needs to be recalculated. By using a uniform color scheme, the EIS can direct the user to areas of concern very quickly.[9]

Natural Language

An important feature in some EISs is the integration of natural language into the user interface. A natural language interface eliminates the need for complex computer commands, using instead a set of commands similar to everyday language. This results in an EIS that is easier to use and easier to learn.

Mouse Control

Most EISs are designed for ease of use by allowing the user to bypass the keyboard and virtually control the EIS by using a mouse. In some cases, this is accomplished by placing the EIS in a *Windows*™ environment. The reasoning behind this arrangement is that executives who do not use keyboards usually feel more comfortable using a mouse.

Communications

EISs provide a natural system for executives to communicate by integrating easy-to-use e-mail facilities into the EIS. Executives can easily exchange written messages or graphics with other executives from the EIS screens. A major element of newer EIS packaged software is an orientation towards work groups. In some companies, EIS developers are experimenting with sending voice messages where spoken comments annotate the screen displays.[10]

Other Decision-Support Activities

Drill Down

Drill-down analysis is the ability to start from an aggregated number and then examine (drill down to) the more detailed underlying data. As the user moves to finer and finer levels of detail, it is possible to find more detailed analysis of specific exceptions.

Integration With Spreadsheets

Often, EISs are integrated with spreadsheets. This integration facilitates the analysis of data using the full capabilities of the spreadsheet. For example, the EIS designed by CIGNA Health Care Information Services allows extracted data to be exported directly to spreadsheet programs.[11]

Decision Support

In some situations, EISs also offer more sophisticated analysis tools than those provided by standard spreadsheets. For example, an EIS might provide for time-series analysis, sophisticated statistical analysis, or optimization analysis using a tool such as linear programming.

Knowledge Discovery

Knowledge discovery uses computers to manipulate data to try to find knowledge in that data. Although knowledge discovery is in its infancy, there are some important tools already available that can be used to tease trends or behaviors out of data. Knowledge discovery tools are not yet a substantial part of today's EISs, but research in the integration of such tools is continuing.

Application Development Features

Fourth-Generation Programming Language

The EIS should use a high-level, developer-oriented language for developing its applications. The language commands should include query commands for extracting data, as well as commands for statistical and mathematical functions.

Executive Information System Shells

There are a number of EIS development shells available to facilitate application development. These shells provide developers with user-friendly development features, such as windows and prompts, which look up codes and commands, and may provide development aids, such as preformatted query statements, that prompt developers for data selection and sort parameters. In addition, EIS development shells include development tools to facilitate screen and menu design,

which is usually done on-screen. Developers normally do not have to develop these shells from scratch or address the problems of integrating separately available tools into a system.

For example, in the PC environment, *Forest & Trees*™ from Trinzic Corporation (formerly Channel Computing, Inc.) provides many of the application development features discussed here. In the mainframe environment, *Commander EIS* from Comshare Incorporated includes development tools that enhance existing reports with color and define personalized exception reporting and drill-down capabilities.

Rules-Based Logic

EISs generally allow developers to build intelligence into the systems using rule-based heuristics. These heuristics can help search through data by limiting the search to data that only exceeds certain parameters of change. For example, "If [(1992 data) minus (1991 data)] / (1991 data) > .1, then examine." The use of such rules can range from one or two rules to an entire knowledge base of rules.[12]

Typical Installation Configurations

Following are three common EIS hardware and software installation configurations:

- *Mainframe to midrange with packaged or modified EIS software.* Most EIS systems implemented during the 1980s were installed on mainframe computers. EIS information is downloaded from the mainframe to a smaller or midrange computer in a process called *staging*. Normally, the management information system (MIS) department staff handles the staging in an overnight batch process. For example, for its EIS, Fidelity Investments, Inc. maintains an EIS database on a separate computer that contains only certified data downloaded from each business unit's computer.[13]
- *Midrange or local area network (LAN) with packaged EIS software (for smaller companies or departments within larger companies).* This is the fastest growing segment of the EIS market. Packaged EIS software in this category is designed for mass markets and usually employs client-server technology. For example, Management Information Support, Inc. uses an IBM midrange computer as the server for its EIS.[14]
- *Mainframe, midrange, or LAN to PC with off-the-shelf spreadsheet and graphics packages.* This is the lowest-cost and simplest configuration. In its EIS, Land Rover North America, Inc. downloads data from a midrange computer onto a LAN. Using the macro language of Lotus® 1-2-3®, the EIS formats the data into a spreadsheet. It then uses Harvard Graphics® to create charts and graphs to visually display the spreadsheet information. From these screens, slides for company presentations can also be created.[15] Dictaphone uses the same software packages for its EIS after downloading data from its mainframe computer.[16]

Chapter 3. Benefits of an Executive Information System

A typical executive works in a very unstructured and ad hoc way. To be effective, executive information systems must be able to support a variety of work styles and be able to assimilate information from many sources.[17] Consequently, EISs should be designed to provide summaries about key business indicators and support decision making. They present a summarized view of information for exception monitoring, as well as a detailed view for resolving the exception and understanding its root causes.

An Example: Phillips 66 Company[18]

The EIS implemented by the Phillips 66 Company is an example of successfully using key business-indicator information to support executive decision making. This EIS uses external information from market sources—not internal information from the accounting system—to produce effective decisions made in a decentralized organization.

In 1987, Phillips faced a problem with pricing its petroleum products as a result of a company-wide reorganization. Because they lacked the timely information needed for flexible price setting, senior executives had to set standardized, corporate-wide petroleum prices that priced Phillips out of some local markets every day. As part of the reorganization, Phillips had eliminated many middle management positions and was trying to design a pricing information system that would support management at all levels in its decentralized organization. This information system needed to integrate information on competitors' prices, the petroleum market spot prices, and Phillips' internal cost and supply levels, all on a daily basis.

To alleviate this pricing problem, Phillips designed an EIS that gathered daily information on Phillips' pricing in each local market and compared it to local competitors' prices and to the market spot prices. This price information was then correlated with the daily sales volume of that specific market. The result was displayed as on-screen price-volume graphs and charts, showing trends over the prior sixty days.

This information was made available to both local market managers and senior executives in the corporate office. Because the local market managers had been given the responsibility of making pricing decisions, the senior executives were free to simply monitor pricing activity.

The impact and importance of this system of decentralized pricing, and the EIS that supported it, was enormous. Phillips estimated that for each day its pricing was off by one penny, the company lost $40 million in annual profits.

Phillips designed its information system around providing the information needed to support a key business decision, its daily selling price. They then put both the pricing information and decision-making responsibility in the hands of the local market managers who were in the best position to make the decision. Phillips met its business objectives by effectively implementing the key elements of an EIS to support executive decision making.

Reasons for Implementation

The primary reason for implementing an EIS is to support executive decision making. This is accomplished by utilizing the following EIS features and approaches.

Integrating Information

Often, a key feature of an EIS is its ability to gather information from different, unconnected information systems within a company. For example, an EIS could combine operational information from the shop-floor production system with financial information from the accounting system and statistical information from the research and development (R&D) system. The EIS designed by Dictaphone handled worldwide product and financial information, as well as a five-year history of all financial reports.[19]

Just as significant is the ability of an EIS to gather external information. For example, an EIS could combine internal company information with external information from government statistics, industry databases, and on-line news services.

Specialized Displays

Traditional printed reports sometimes do not represent information clearly or concisely. An EIS uses visual means such as charts, graphs, and icons to represent its information. And because the EIS uses a highly graphic environment, it often helps senior executives with little computer experience to overcome their resistance to computers. As Dictaphone executives became comfortable using their EIS for monitoring financial information, they began to use their personal computers for other functions.[20]

The use of specialized drill-down displays to link summarized information with lower levels of detail is also important. This ability to display underlying unsummarized data helps management to determine the cause of many problems flagged at the summary level by studying detailed source data.

Rapid Development

Most commercial EIS software packages include application development tools for rapid system development. And since these tools can be used by both programmers and nonprogrammers (such as systems or business analysts), EIS projects have a broader base of available development resources than traditional programmed-software projects.

A working model of key EIS screens can normally be developed very quickly. This provides EIS projects with an additional advantage over traditional programmed-software projects since management will usually support a project once they have seen a working model. In fact, studies show that initial EIS screens must be demonstrated to the executive group during the first six weeks of development or the project may not receive support for continued development.[21]

Exception Reporting

A primary benefit of an EIS is its ability to filter out routine data. Executives using such a system are alerted only to key indicators that are outside normal tolerances. Mainframe-based *Commander EIS* software allows executives to define their own personalized range for exception reporting; the numbers outside the range are displayed in color.

Some EISs even have alarm systems that monitor these key indicators and send visual or audible alarms when a deviation outside normal tolerances occurs. PC-based software *Forest & Trees,* for example, uses predefined alarm settings for each key indicator, with visual or sound options for communicating the alarm.

The capacity of an EIS to monitor huge quantities of data makes it very attractive to use for business processes with critical, time-sensitive reporting requirements. For example, a comprehensive quality control program could utilize the display and alarm features of an EIS.

Improved Organizational Communication

An EIS is normally designed with intercompany communication in mind. In an EIS designed by Consolidated Edison, executives, project engineers, and staff used the system to jointly report on and evaluate project management tasks.[22] The EIS highlighted those projects that were behind schedule; executives could then simply click an on-screen mail icon and send a message to the managers involved with the current percentage-completion information about their project.

Strategic Sales Advantage

An EIS can be used as a tool for compiling and communicating strategic information about customers from diverse and often informal sources. For example, sales executives can have access to information about customers (or competitors), as reported by people in the field, news reports, and other company executives. According to one study, a very promising EIS application is automating the sales and marketing process.[23] The EIS becomes the information database for sales support information. An EIS developed by Pratt & Whitney Corporation included a database strictly for detailed customer information and profiles.[24]

Competitive Advantage

Sometimes the information available from a company's EIS is also valuable to its customers. By making this information available to customers, a company can gain an advantage over its competitors. In industries such as banking and insurance, where there is often little product differentiation, information can be a key factor in customer loyalty. When CIGNA Health Care Information Services developed an EIS for monitoring health-care utilization trends for its medical insurance business, they found their customers could use that same information about their company to better manage and trim their employee benefits costs. The EIS, known as *CIGNA Express,* provides CIGNA's customers with access to its internal health-care utilization/management information reports.[25]

The initial EIS was developed in response to demands from CIGNA's customers for detailed information to support the steep rise in CIGNA's health insurance premiums during the 1980s. The current system updates information quarterly and shows customers their actual health-care utilization results as compared to industry norms or to other organizational units. As a valuable marketing tool, CIGNA enables its customers to make their own executive decisions based on information extracted from CIGNA's EIS.

Chapter 4. Limitations of an Executive Information System

EISs do not come without limitations. The development of an EIS can result in some security problems. In addition, the nature of accounting data can limit data analysis and management's view of the organization. Although an EIS may initially aim at meeting the needs of the executives, it is typically not long before that focus changes to include those who work for them. EISs can also misdirect an executive's attention to drilling ever downward through quantitative information, even though the real issues could be qualitative.

Further, there are some important development and maintenance issues. The EIS must integrate all of a company's databases to be effective. Executives must be actively involved in the EIS development process or the system is likely to fail, which can be costly in both executive time and money. When the EIS operates on a network, it can also markedly increase the need for network support.

Security

In mainframe environments, EISs pose a security concern because they bypass normal password and other security devices. In a network or PC environment, EISs can allow unauthorized access to data because they are operated in a nonsecure environment. (The AICPA Information Technology Division's practice aid, *Information Security,* to be published in 1994, will contain more detailed information about data security.)

Passwords

In some systems, the EIS has the normal password capabilities for restricting access. However, the levels of password control that are implemented in the EIS must be the same as those that exist in the database. If the level of password control interferes with the operation of the EIS, the password restrictions are often scrapped in favor of system performance. In other EISs, there is no such parallel password structure, so even if the developers wanted to ensure security, they cannot.

Data Access

Often during the development phase of an EIS project, users are allowed to have expanded database access, whether at *read-only* or *write* levels. Generally, this access is needed to fully accommodate the EISs drill-down capabilities. Once the EIS is implemented, users' database access may remain unrestricted.

If EIS data can be accessed by unauthorized users, sensitive information can be gathered and used against the company or its officers. This sensitive data may include accounting information such as salaries or R&D expenditures, or softer information such as reports on competitors. If data access is not secure, unauthorized users may even change the data used by the EIS. In this unsecured environment, the EIS may lead users to inappropriate conclusions.

Financial Data Interrelationships

The preestablished accounting data can ultimately limit the nature of EIS investigations. Typically, the chart of accounts constrains the way financial data can be analyzed. Unfortunately, if specialized data, such as details by region or department, are not captured in the chart of accounts and the corresponding database, then it will not be possible for EIS users to manipulate the data on a regional or departmental basis.

In addition, these data interrelationships are likely to force the same outdated hierarchical view of the company promulgated by the chart of accounts. For example, a traditional chart of accounts is tied to the tree-like models of organizations. Thus, the chart of accounts and the models implied by it would hinder the ability of the executives to employ more current network models of a company.

Executive Information

EISs are designed primarily for executives, often for the senior executives in the company. However, there are few employees who would not benefit from the information provided by the EIS. If the president is interested in the EIS information, then everyone who works for the president, and is evaluated by the president, would be interested in the same data. An EIS establishes information needs for senior executives, and often, as a result, for the rest of the company.

However, it is rarely limited to senior executives for long.[26] As middle and lower management levels begin to use the EIS, the system may be modified to meet their needs. As a result, the overall focus of the EIS may be shifted away from the needs of senior executives.

Drill Down and Other Analysis

The drill-down feature is a useful vehicle for analyzing data. However, the focus on quantitative data can divert attention from issues that are more qualitative in nature. The EIS must be viewed, therefore, as only one in a portfolio of tools available to the executive.[27]

Limited Integrated View

EISs are often touted as a means to provide executives with integrated views of the company. However, the executive's ability to have this integrated view is limited to the extent to which the entire range of databases are accessed by the EIS. If the EIS does not access virtually all of the company's internal databases, and possibly other external databases, then the value of its use for integrated views is diminished. The cost of developing these integrated views can be substantial.

Executive Involvement

Executives must be an integral part of the EIS development process or their interests will not be represented appropriately. For example, if executives are not involved in the design of the system, then the appropriate databases will not be available and the appropriate rule bases will not be defined. However, the cost of involving executives in the development process can be substantial.

Network Support

When the EIS is operated over local or enterprise-wide networks, the business may be faced with unstable applications. Supporting a combination of software and network systems may require additional technical support and management. And since enterprise-wide networks rely on complex LANs, bridges, routers, and gateways, it is unrealistic to expect end-users to support such functions.

Additionally, software edit checks must be in place so that EIS software updates do not crash the entire system. And if the EIS is operated on a departmental network, additional support will be needed to ensure it can access data on the enterprise-wide network.

Costs

Finally, the total cost to develop an EIS can be substantial, beyond the mere cost of executive involvement. These costs include hardware, software, and opportunity costs. Throughout the EIS implementation process, it is important that an appropriate cost-benefit evaluation is developed and used to monitor the functions and size of the EIS.

Chapter 5. Business Processes Affected by an Executive Information System

Implementing an EIS involves change in company information flows as well as business processes. To be successful, the EIS must be seen as a part of a larger change in business processes. Listed below are some key business processes that are affected by the implementation of an EIS.

Data Organization and Access

Much of the information summarized by the EIS is captured by the corporate transaction-based information systems. If this information is not keyed and indexed to show the proper views and levels of details required by the EIS, then EIS developers must create that database. Conflicts may arise where the transaction-based information is owned by managers in one department but incorporated in the EIS and displayed to executives and managers in other departments.

Where organizations have reduced middle management, more lower level managers will, by necessity, have access to more data. Land Rover North America Inc.'s EIS, for example, allows its remote zone managers access to its sales, dealer, and financial information.[28] Studies have shown that distributing EIS information to lower level managers can substantially increase their overall productivity. However, to make maximum use of the EIS information, lower level managers usually require easy access to decision-support software tools.[29]

Also, when business organizations decentralize and form independent business units, data problems are created for EISs. Each independent business unit must have all the elements of the information system to compute its separate profit or loss, as well as other performance information.[30] To support these newly organized, independent business units, some companies will have to redesign their EIS software to match their new organizational structure.

EISs may also provide a short-term solution when the requirements of a company's data formats are beyond the scope of its current database. For example, the transaction-based database may not generate the data needed for activity-based costing, which uses a cost driver for allocating overhead based on specific activities. The EIS could transform the data so that managers could analyze the data based on cost drivers. In these cases, the long-term solution may be to reengineer the company's chart of accounts to capture the appropriate information in sufficient levels of detail.

Management Reporting System

EISs can improve a company's organizational effectiveness by providing uniquely summarized information to its executives. By reviewing and analyzing the EIS data, executives are in a position to formulate clear strategic plans. These plans result in an organization that is strategically managed, and encourage a decision-making style throughout the organization that values analysis and knowledge.[31]

The EIS can be designed to support either a shared vision of the company by all its executives or each executive's individual vision of the company. Executives could jointly evaluate their business and agree on a set of key business indicators. The EIS reports and screens would be designed around these key indicators, and represent a shared vision of the company. As part of a major reorganization, the management of Xerox Corporation was directed to "share a common focus on a short list of key items."[32] Alternately, the EIS could be customized to accommodate the variation among executives as to what they believe constitutes the key business indicators of the company.

Additionally, when business organizations decentralize decision-making responsibilities, EISs must support this structure. Executives will seldom delegate responsibilities without the assurance they will have adequate financial information to monitor and control the activity.[33] The EIS should be designed to provide executives with the information they need for these monitoring activities.

Corporate Software Development

The availability of the EIS shells and their application development tools can revolutionize the way in-house software is developed.[34] The development tools allow user departments to develop large portions of the EIS without support from the MIS department. Users outside the MIS department often design the EIS screens and menus, and create program logic.

However, application development for many mainframe-based EISs still requires substantial MIS department support. In addition, developing a mainframe-based EIS generally requires additional consulting support from the EIS software vendor.

Software and Hardware Support

The process of maintaining an EIS is quite different from traditional software, since the EIS application development has taken place in user departments such as finance or marketing.[35] Yet the MIS department normally has company-wide responsibility for maintaining networks, system security, and data integrity. The company should have clear policies and procedures identifying the department responsible for maintaining and supporting the different aspects of the EIS.[36]

Computer System Downsizing and Rightsizing

As more and more companies reconfigure their mainframe systems to run on smaller systems, existing mainframe EISs must also be capable of running in downsized versions.[37]

Also, the company must consider where it will store the EIS data. Most EISs are served well by a client-server and distributed processing arrangement. But when a mainframe database system has been in use, the data is usually kept on the mainframe that is well suited for database storage and maintenance. Commonly, the EIS data is downloaded to a network file server where it is selected and summarized by the EIS software.

Alternately, the entire database can be reproduced by MIS and stored on a separate computer that acts as a server. The data can then be distributed to client PCs where most of the display and computational processing work occurs.

Chapter 6. Conclusion

An executive information system is designed to facilitate the use or review of information from both internal and external sources. Typically, EISs provide the ability to use this information to support executive decision making. One popular information format uses a drill-down approach where executives start at an aggregate level of accounting data and investigate successively more detailed information with each additional inquiry. Another format uses summaries of critical information gathered from external sources.

EISs have been known by many names, including DSSs and ESSs. EISs can have an important influence on the underlying information system and the type of information on that system. If the president is interested in certain data, then everyone who works for the president is likely to want that same data. As a result, the development of an EIS generally focuses on a top-down approach to information. The use of EISs is expanding to include management levels below the senior executive level.

The EIS should be regarded as one tool in an executive's portfolio of tools. EISs generally consist of database interfaces, presentation features, decision support capabilities, and application development features. The EIS database can include both internal and external information. The presentation features may include the heavy use of both graphics and natural languages. EISs generally provide decision-support tools to analyze the databases they access.

There are a number of benefits and limitations to using EISs. However, their value comes not only from their use, but also from their development. The process of building and implementing an EIS forces executives and managers to think about the key factors of their business. In addition, an EIS can support both a shared vision of the company and its objectives, or the differing visions of its individual executives.

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