

# Executive Information System

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## Summary

A management information system (MIS) provides information that is needed to manage organizations efficiently and effectively. Management information systems involve three primary resources: people, technology, and information or decision making. Management information systems are distinct from other information systems in that they are used to analyze operational activities in the organization. Academically, the term is commonly used to refer to the group of information management methods tied to the automation or support of human decision making, e.g. decision support systems, expert systems, and executive information systems

### Key words:

Executive System, EIS, Executive Information System.

## 1. Introduction

An executive information system (EIS) is a type of management information system intended to facilitate and support the information and decision-making needs of senior executives by providing easy access to both internal and external information relevant to meeting the strategic goals of the organization. It is commonly considered as a specialized form of decision support system (DSS).

The emphasis of EIS is on graphical displays and easy-to-use user interfaces. They offer strong reporting and drill-down capabilities. In general, EIS are enterprise-wide DSS that help top-level executives analyze, compare, and highlight trends in important variables so that they can monitor performance and identify opportunities and problems. EIS and data warehousing technologies are converging in the marketplace.

In recent years, the term EIS has lost popularity in favor of business intelligence (with the sub areas of reporting, analytics, and digital dashboards).

## 2. Literal Review and Methodology

Basically executive information systems were developed as mainframe computer-based programs. The purpose was to package a company's data and to provide sales performance or market research statistics for decision makers, such as financial officers, marketing directors, and chief executive officers, who were not necessarily well acquainted with computers. The objective was to develop computer applications that would highlight information to satisfy senior executives' needs. Typically, an EIS

provides data that would only need to support executive level decisions instead of the data for all the company.

The application of EIS is not only in typical corporate hierarchies, but also at personal computers on a local area network. EIS now cross computer hardware platforms and integrate information stored on mainframes, personal computer systems, and minicomputers. As some client service companies adopt the latest enterprise information systems, employees can use their personal computers to get access to the company's data and decide which data are relevant for their decision makings. This arrangement makes all users able to customize their access to the proper company's data and provide relevant information to both upper and lower levels in companies.



The components of an EIS can typically be classified as:

### 2.1.1 Hardware

The computer hardware for an EIS environment, focus on the hardware that meet the executive's needs. The executive must be put first and the executive's needs must be defined before the hardware can be selected. The basic hardware needed for a typical EIS includes four components:

1. Input data-entry devices. These devices allow the executive to enter, verify, and update data immediately
2. The central processing unit (CPU), which is the kernel because it controls the other computer system components
3. Data storage files. The executive can use this part to save useful business information, and this part also help the executive to search historical business information easily
4. Output devices, which provide a visual or permanent record for the executive to save or read. This device refers to the visual output device such as monitor or printer

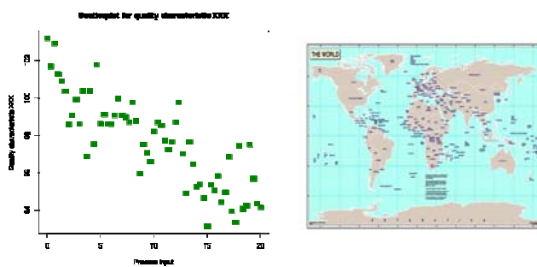
In addition, with the advent of local area networks (LAN), several EIS products for networked workstations became

available. These systems require less support and less expensive computer hardware. They also increase access of the EIS information to many more users within a company.

### 2.1.2 Software

The software is vital to design an effective EIS. Therefore, the software components and how they integrate the data into one system are very important. The basic software needed for a typical EIS includes four components:

1. Text base software. The most common form of text are probably documents
2. Database. Heterogeneous databases residing on a range of vendor-specific and open computer platforms help executives access both internal and external data
3. Graphic base. Graphics can turn volumes of text and statistics into visual information for executives. Typical graphic types are: time series charts, scatter diagrams, maps, motion graphics, sequence charts, and comparison-oriented graphs (i.e., bar charts)



4. Model base. The EIS models contain routine and special statistical, financial, and other quantitative analysis

### 2.1.3 User interface

An EIS needs to be efficient to retrieve relevant data for decision makers, so the user interface is very important. The user interface, in the industrial design field of human-machine interaction, is the space where interaction between humans and machines occurs. The goal of interaction between a human and a machine at the user interface is effective operation and control of the machine, and feedback from the machine which aids the operator in making operational decisions. Examples of this broad concept of user interfaces include the interactive aspects of computer operating systems, hand tools, heavy machinery operator controls, and process controls. The design considerations applicable when creating user interfaces are related to or involve such disciplines as ergonomics and psychology. A user interface is the system by which people (users) interact with a machine. The user interface includes hardware (physical) and software (logical)

components. User interfaces exist for various systems, and provide a means of:

- Input, allowing the users to manipulate a system
- Output, allowing the system to indicate the effects of the users' manipulation

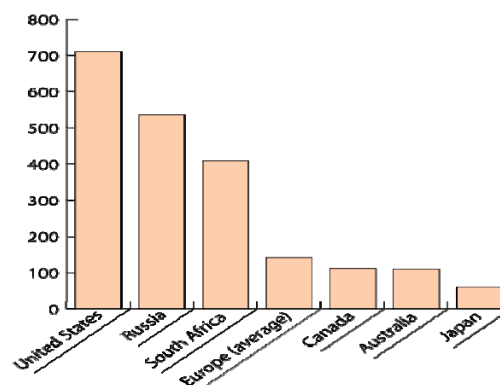
Generally, the goal of human-machine interaction engineering is to produce a user interface which makes it easy, efficient, and enjoyable to operate a machine in the way which produces the desired result. This generally means that the operator needs to provide minimal input to achieve the desired output, and also that the machine minimizes undesired outputs to the human.

Ever since the increased use of personal computers and the relative decline in societal awareness of heavy machinery, the term user interface has taken on overtones of the graphical user interface, while industrial control panel and machinery control design discussions more commonly refer to human-machine interfaces.

Other terms for user interface include human-computer interface (HCI) and man-machine interface (MMI).

Several types of interfaces can be available to the EIS structure, such as scheduled reports, questions/answers, menu driven, command language, natural language, and input/output.

### 2.1.4 Telecommunication



As decentralizing is becoming the current trend in companies, telecommunications will play a pivotal role in networked information systems. Transmitting data from one place to another has become crucial for establishing a reliable network. In addition, telecommunications within an EIS can accelerate the need for access to distributed data.

### 2.1.5 Applications

EIS enables executives to find those data according to user-defined criteria and promote information-based insight and understanding. Unlike a traditional management information system presentation, EIS can distinguish between vital and seldom-used data, and track different key critical activities for executives, both which

are helpful in evaluating if the company is meeting its corporate objectives. After realizing its advantages, people have applied EIS in many areas, especially, in manufacturing, marketing, and finance areas.

#### 2.1.6 Manufacturing

Basically, manufacturing is the transformation of raw materials into finished goods for sale, or intermediate processes involving the production or finishing of semi-manufactures. It is a large branch of industry and of secondary production. Manufacturing operational control focuses on day-to-day operations, and the central idea of this process is effectiveness and efficiency.

#### 2.1.7 Marketing

In an organization, marketing executives' role is to create the future. Their main duty is managing available marketing resources to create a more effective future. For this, they need make judgments about risk and uncertainty of a project and its impact on the company in short term and long term. To assist marketing executives in making effective marketing decisions, an EIS can be applied. EIS provides an approach to sales forecasting, which can allow the market executive to compare sales forecast with past sales. EIS also offers an approach to product price, which is found in venture analysis. The market executive can evaluate pricing as related to competition along with the relationship of product quality with price charged. In summary, EIS software package enables marketing executives to manipulate the data by looking for trends, performing audits of the sales data, and calculating totals, averages, changes, variances, or ratios.

#### 2.1.8 Financial

A financial analysis is one of the most important steps to companies today. The executive needs to use financial ratios and cash flow analysis to estimate the trends and make capital investment decisions. An EIS is a responsibility-oriented approach that integrates planning or budgeting with control of performance reporting, and it can be extremely helpful to finance executives. Basically, EIS focuses on accountability of financial performance and it recognizes the importance of cost standards and flexible budgeting in developing the quality of information provided for all executive levels.

### 3. Advantages and disadvantages

#### Advantages of EIS

- Easy for upper-level executives to use, extensive computer experience is not required in operations

- Provides timely delivery of company summary information
- Information that is provided is better understood
- Filters data for management
- Improves tracking information
- Offers efficiency to decision makers

#### Disadvantages of EIS

- System dependent
- Limited functionality, by design
- Information overload for some managers
- Benefits hard to quantify
- High implementation costs
- System may become slow, large, and hard to manage
- Need good internal processes for data management
- May lead to less reliable and less secure data

### 4. Future trends

The future of executive info systems will not be bound by mainframe computer systems. This trend allows executives escaping from learning different computer operating systems and substantially decreases the implementation costs for companies. Because utilizing existing software applications lies in this trend, executives will also eliminate the need to learn a new or special language for the EIS package.

### 5. Conclusion

An increasing number of organizations invest in the development of Executive Information Systems (EIS) to support senior management. Several studies however indicate that a high percentage of these attempts fail. The level of success of EIS is affected by several factors. These factors may primarily be associated with two phases of EIS implementation: the initial EIS development process and EIS operation.

The study consisted of three phases:

- An analysis of the literature to identify factors which affect EIS success. Most of the literature on factors associated with EIS success and failure comprises

case studies or articles for the professional EIS community. A framework to taxonomise these factors has been developed to facilitate their examination in a structured manner. The factors are classified in six categories, each affecting EIS development and operation.

- A small-scale survey study to validate and determine the relative importance of factors appearing in the literature.  
The study was organized on the framework developed earlier. The relative importance of factors was based on the perceptions of EIS professionals (people involved in development and operation of EIS). The results from this phase were used to generate a set of hypotheses concerning the relationships between these factors and EIS success.
- A survey study to test the hypotheses. This phase investigates potential relationships between EIS success and organizational variables in the form of People, Activities, System Characteristics, and Social/Cultural, Political and Technological factors.

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