Management Information Systems (MIS): Manager Decision-Making Tools

8.1 What Is a MIS?

Management Information Systems help managers make effective decisions to support ongoing operations within an organization. Learn about the types of reports produced by a MIS.

A **management information system**, or **MIS**, is a computer-based system that provides managers with the tools to run their department effectively. Relative to other types of specialized information systems, an MIS is used by mid-level management to support ongoing operations. The emphasis is on making routine decisions. MIS relies mostly on internal sources of information.

Management information systems are software programs that are used to generate reports on your business performance. Firms of all sizes can benefit – even small businesses. With an MIS program, you can produce performance summaries with any frequency, using them to supervise activities, make progress checks and spot any deviations from normal business procedures.

While you can customize the reports from an MIS, they generally fall into three categories. Summary reports provide concise accounts of your business's activities. They can display data year-to-year – or another time frame if you wish – or projected vs. actual. Summary reports can be tailored to include tables and graphs. Detail reports are specific to narrowly-defined activities. You might wish to review the sales of one representative, orders from one supplier or business from one store location. Exceptions reports show any statistics that fall outside of a normal range. An exceptions report might reveal cost overruns or production down time.
MIS software benefits its users in both daily operations and strategic planning. As a decision-making tool, MIS reports can provide the metrics to help management make better-informed decisions. Exceptions reports are excellent tools for supervising activities. Whether a problem is caused by human error, mechanical failure or random incident, the report highlights it. Tracking progress is another activity that MIS supports. Because you can identify trends, as well as track year-to-year developments, reports can validate your progress – or document your shortfalls.

MIS reports tend to be relatively inflexible. While you can customize your reports, the system itself is rigid. Because it uses past and current data, it is limited by a backward orientation. Because MIS reports summarize historical data, the insight it

offers when there is a change of corporate direction results may be hard to predict. The decision-making process that MIS reports support are those that are structured and numbers-oriented.

Small businesses can benefit by installing MIS software. Most businesses track key data – sales, payments and inventories, for example – but not all integrate this information into a common database. That is the role of a management information system. A pharmaceutical sales rep can leave samples with a doctor, key in that information on her laptop, upload it to a server and have inventories adjusted, while management has a record of the activity. A doctor's office with an MIS application can connect patient records to billing and insurance companies. Installation is not difficult, but will need the assistance of a systems integrator.

8.2 INFORMATION SYSTEMS

An information system is a computer system that provides management and other personnel within an organization with up-to-date information regarding the organization's performance; for example, current inventory and sales. It usually is linked to a computer network, which is created by joining different computers together in order to share data and resources. It is designed to capture, transmit, store, retrieve, manipulate, and or display information used in one or more business processes. These systems output information in a form that is useable at all levels of the organization: strategic, tactical, and operational.

Systems that are specifically geared toward serving general, predictable management functions are sometimes called management information systems (MIS). A good example of an MIS report is the information that goes into an annual report created for the stockholders of a corporation (a scheduled report). The administration of an information system is typically the province of the MIS or information technology (IT) department within an organization.

Some applications have infringed on the familiar MIS landscape. Enterprise resource planning (ERP) software and executive information systems (EIS) both provide packaged modules and programs that perform the same functions as traditional MIS, but with greater functionality, flexibility, and integration capabilities.

MAINFRAMES.

The original computerized information systems were based on mainframes. "Mainframe" is a term originally referring to the cabinet containing the central processor unit or "main frame" of a room-filling computer. After the emergence of smaller mini-computer designs in the early 1970s, the traditional large machines were described as "mainframe computers," or simply mainframes. The term carries

the connotation of a machine designed for batch rather than interactive use, though possibly with an interactive time-sharing operating system retrofitted onto it. It has been conventional wisdom in most of the business community since the late 1980s that the mainframe architectural tradition is essentially dead, having been swamped by huge advances in integrated circuit design technology and low-cost personal computing. Despite this, mainframe sales in the United States enjoyed somewhat of a resurgence in the 1990s, as prices came down and as large organizations found they needed high-power computing resources more than ever. Supporters claim that mainframes still house 90 percent of the data major businesses rely on for mission-critical applications, attributing this to their superior performance, reliability, scalability, and security compared to microprocessors.

8.3 THE INTERNET.

The Internet has opened up further developments in information systems and the exchange of information via web-based e-mail, intranets, and extranets. These technologies allow for much faster data and information exchange and greater access for more users. Web-casting and videoconferencing allow for real-time information exchanges. Mobile computing technologies accessed by handheld devices, such as multi-functional mobile phones, personal digital assistants, and podcasting (via iPods), are offering further modes of communication.

8.4 INFORMATION SYSTEM DESIGN AND ADMINISTRATION

The design of an information system is based on various factors. Cost is a major consideration, but there certainly are others to be taken into account, such as the number of users; the modularity of the system, or the ease with which new components can be integrated into the system, and the ease with which outdated or failed components can be replaced; the amount of information to be processed; the type of information to be processed; the computing power required to meet the varied needs of the organization; the anticipated functional life of the system and/or components; the ease of use for the people who will be using the system; and the requirements and compatibility of the applications that are to be run on the system.

There are different ways to construct an information system, based upon organizational requirements, both in the function aspect and the financial sense. Of course, the company needs to take into consideration that hardware that is purchased and assembled into a network will become outdated rather quickly. It is almost axiomatic that the technologies used in information systems steadily increase in power and versatility on a rapid time scale. Perhaps the trickiest part of designing an information system from a hardware standpoint is straddling the fine

line between too much and not enough, while keeping an eye on the requirements that the future may impose.

Applying foresight when designing a system can bring substantial rewards in the future, when system components are easy to repair, replace, remove, or update without having to bring the whole information system to its knees. When an information system is rendered inaccessible or inoperative, the system is considered to be "down."

A primary function of the maintaining an information system is to minimize downtime, or hopefully, to eradicate downtime altogether. The costs created by a department, facility, organization, or workforce being idled by an inoperative system can become staggering in a short amount of time. The inconvenience to customers can cost the firm even more if sales are lost as a result, in addition to any added costs the customers might incur.

Another vital consideration regarding the design and creation of an information system is to determine which users have access to which information. The system should be configured to grant access to the different partitions of data and information by granting user-level permissions for access. A common method of administering system access rights is to create unique profiles for each user, with the appropriate user-level permissions that provide proper clearances. Individual passwords can be used to delineate each user and their level of access rights, as well as identify the tasks performed by each user. Data regarding the performance of any user unit, whether individual, departmental, or organizational can also be collected, measured, and assessed through the user identification process.

The OSI seven-layer model attempts to provide a way of partitioning any computer network into independent modules from the lowest (physical/hardware) layer to the highest (application/program) layer. Many different specifications can exist at each of these layers.

A crucial aspect of administering information systems is maintaining communication between the IS staff, who have a technical perspective on situations, and the system users, who usually communicate their concerns or needs in more prosaic terminology. Getting the two sides to negotiate the language barriers can be difficult, but the burden of translation should fall upon the IS staff.

A little patience and understanding can go a long way toward avoiding frustration on the part of both parties. There is more to maintaining an information system than applying technical knowledge to hardware or software. IS professionals have to bridge the gap between technical issues and practicality for the users. The information system should also have a centralized body that functions to provide information, assistance, and services to the users of the system. These services will typically include telephone and electronic mail "help desk" type services for users, as well as direct contact between the users and IS personnel.

INFORMATION SYSTEM FUNCTIONS DOCUMENT AND RECORD MANAGEMENT.

Document and record management may well be the most crucial aspect of any information system. Some examples of types of information maintained in these systems would be accounting, financial, manufacturing, marketing, and human resources. An information system can serve as a library. When properly collected, organized, and indexed in accordance with the requirements of the organization, its stored data becomes accessible to those who need the information.

The location and retrieval of archived information can be a direct and logical process, if careful planning is employed during the design of the system. Creating an outline of how the information should be organized and indexed can be a very valuable tool during the design phase of a system. A critical feature of any information system should be the ability to not only access and retrieve data, but also to keep the archived information as current as possible.

One of the important roles of an MIS is to provide the right information to the right person in the right format at the right time. Information is collected within the organization on an ongoing basis and an MIS processes this information, so managers get the summarized reports. Information is typically in the form of reports on a daily or weekly basis.

MIS reports can be in the form of tables with numerical values, visual displays or other key indicators. Reports can be in paper format, electronic format or both. More sophisticated systems use electronic reports that can be updated on demand in close to real-time. This gives managers an updated snapshot of the current state of operations. For example, an MIS could provide a manager with real-time information on customer records, customer complaints, sales and production cycles.

Types of Reports

A MIS can produce a number of different types of reports. A **scheduled report** is produced on a regular interval, such as every day, week or month. For example, a manager of a production floor may want to see weekly payroll reports to keep track of labor costs. Reports typically focus on a number of key indicators, such as inventory levels, production activity or sales volume.

Often, these indicators are compared to numbers from prior reporting periods or to targets set by the organization. This gives mangers the opportunity to implement any corrective actions where necessary.

An **on-demand** report is only produced by request instead of on a fixed schedule. Such reports are typically produced when a question arises regarding the status of a particular item or production element. For example, consider a shipping company that picks up, ships and delivers thousands of packages every day. If you ship a package, you get a tracking number that you can use to get the status of that package. When you log in to the website and enter the tracking number, you are requesting an on-demand report.

An **exception report** is automatically generated when a situation is unusual and requires some sort of attention. For example, consider a manufacturing plant with several production lines. All lines are expected to generate a certain volume. An MIS could generate an exception report if these are not met. Exception reports rely on **trigger points**. These are parameters set up by managers that would result in an exception. In the case of the production lines, the trigger point could be something like 10% below expected production.