

What is “Information Systems”?

1.1.introduction

IS is not simply about computers - it's about how businesses can make the best use of computer technology to provide the information needed to achieve their goals. In the same way as your own needs and priorities are unique to you, each organization has different goals and requirements, and the successful implementation of IS requires a thorough understanding of the business issues involved, as well as the different technologies that are available. Most of the time there is no single “correct answer”, and you will need to draw on your own knowledge and judgment when planning or using an information system. The purpose of this introductory course is to provide you with a basic knowledge of the different elements of information systems: the building blocks that can be combined in a variety of different ways to suit particular business needs.

Perhaps the best way to illustrate the importance of IS, is to consider the impact that it has on your own life. Try to imagine what your daily life would be like without information systems: you might be able to survive without your student fee account, but can you also imagine no television, no cellphone, no fax. Most of our lives would be affected dramatically. Now stop to consider the times that you have been irritated or frustrated by the inefficiency of a large organization (Home Affairs? University registration?), and you will see that technology alone is not the solution to business problems – computers are simply one element of a complete system intended to support the flow of information within a business environment.

1.2 The Role of IS in Business

Businesses make use of information systems so that accurate and up-to-date information will be available when it is required. Since it is not always possible to predict what information will be needed at some future date, most organizations use computers to record and store the details of all their business transactions. When a query arises, or a standard business report must be produced, this raw data can be retrieved and manipulated to produce the required information.

An employee may want to know how much leave he has due, a customer may enquire whether an item is in stock, financial statements must be produced for shareholders. Because the methods and calculations used in processing the employee payroll are very different from those used for managing stock control or for preparing a balance sheet, you will usually find that a number of different application programs are used within a single business. These application programs, plus the computer equipment that they run on, and the data that they use, must together meet the information requirements of the organization, and their integration must be carefully planned to ensure that all aspects of the business are supported as efficiently as possible.

1.3 Classification of Information Systems

Within any single organization, executives at different levels in the management hierarchy have very different information requirements, and different types of information systems have evolved to meet their needs. A common approach to examining the types of information systems used within organizations, is to categories IS applications by the roles they play at various levels in the organizational structure – this is known as the **vertical** approach. In this case the organization is viewed as a management pyramid with four levels (see Figure 1-1).

1.3.1 Transaction Processing Systems

At the lowest level of the organizational hierarchy we find the **transaction processing systems** (TPS) that support the day-to-day activities of the business. These applications are normally the first to be computerized and are characterized by large numbers of transactions updating the corporate database. These systems are mainly used by clerical staff performing such regular business activities as invoicing and issuing of stock, following well defined business procedures. The users of transaction processing systems tend to work at the lowest level of detail as they process or query one transaction at a time, using computer systems to capture the raw data which reflects the business processes of the organization. For example, the itemized till slip from a supermarket is produced by the TPS, and details of each individual item sold will be recorded in the store's database.

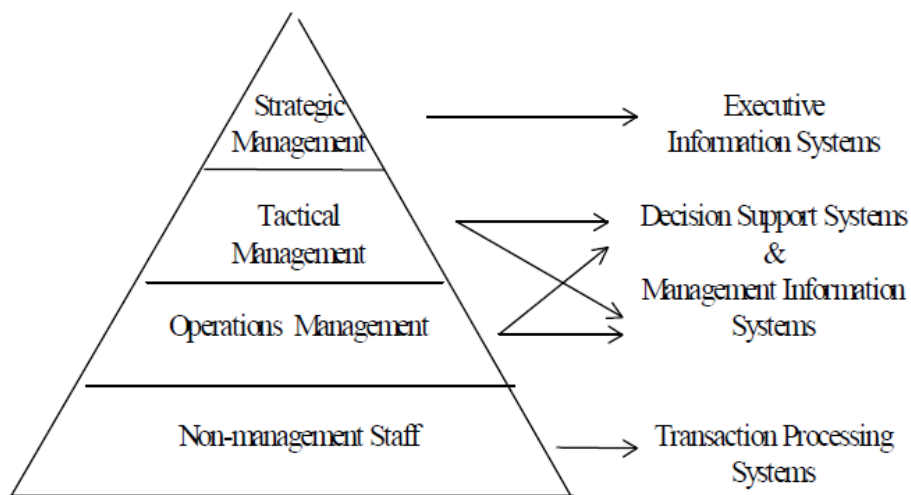


Figure 1-1: Levels of management and types of support systems

1.3.2 Management Information Systems

The next level in the organizational hierarchy is occupied by low level managers and supervisors. This level contains computer systems that are intended to assist operational management in monitoring and controlling the transaction processing activities that occur at clerical level. **Management information systems** (MIS) use the data collected by the

TPS to provide supervisors with the necessary control reports. For example, in a debtors system, the individual responsible for collection of unpaid accounts could extract a listing from the computer of customers whose accounts have been outstanding for more than three months. At this level, output reports generally contain summarized totals of the TPS data, produced either on a cyclical basis (weekly or monthly) or on request. Additional reports include control listings, where totals are balanced between processing runs to ensure that data has not been lost or fraudulently manipulated, or exception reports, where the computer selects and reports only on unusual transactions that need to be reviewed by management. The main focus of MIS is to avoid wading through huge volumes of detailed data, instead using control totals and exceptions to identify problems.

1.3.3 Decision Support Systems

Tactical management occupies the next level in the organizational hierarchy. These managers are responsible for ensuring that plans and targets set by senior management are achieved. They tend to focus not on the progress of individual transactions but on the bigger picture – for example the relative sales performance of different sales areas in the organization. To achieve this they need to receive regular reports from the MIS with summary totals and comparison between prior months and years, or planned activity levels. Where summary figures are of concern, these managers may request more detailed reports from the operations personal.

1.3.4 Executive Information Systems

The highest level in the organizational structure is that of strategic management, and once again its information requirements are unique. These managers are charged with the task of setting the strategy for the organization. They require an information system that will enable them to identify problems, opportunities and trends that may enhance or threaten their organization's competitive position.

1.4 Office Automation Systems (OAS)

Other types of information systems are not specific to any one level in the organization but provide important support for a broad range of users. Many standard computer applications, such as word processing, spread sheeting, data management, and presentation graphics are used across all management levels of the organization. Apart from their individual capabilities, many of these programs are able to exchange information, so that for example a word processing document may include a graph developed using a spreadsheet program, which is dynamically updated when the data in the spreadsheet is changed.

Word processing software is used to create and maintain electronic documents. Because word processors create virtual (electronic) documents as opposed to physical ones, any errors or alterations can be made to the document before it is printed. This simple concept has empowered all the one and two fingered typists of the world and made the professional typist an endangered species.

Spreadsheets are to numbers what the word processor is to text. They allow for easy preparation of financial statements, cash flows, budgets and other problems requiring quantitative analysis. The beauty of the electronic spreadsheet is that it mirrors the way we performed the task manually, except that users enter data via a keyboard and view it on a computer screen rather than writing on to paper. This similarity ensures users understand and become proficient in the use of spreadsheet packages in a very short period of time. Because of their ability to use formulas and functions to recalculate answers when values are changed, spreadsheets are excellent tools for performing “*what if*” analysis. Today’s spreadsheet packages also offer a variety of statistical and business analysis tools, together with the ability to generate business charts directly from the spreadsheet data.

Data management software is used to create and maintain records about items such as customers, stock or employees, which are vital to the operation of any business. The main advantage of automation when applied to organizational record-keeping, is the power of the computer to select, sequence, summaries and report on data once it has been captured. In addition, data management software incorporates error-checking features, which could ensure for example that only valid account numbers may be entered in a transaction, and sophisticated backup and retrieval methods.

Presentation graphics software provides an easy means of generating high quality presentation materials based on color overheads, slides or large screen displays. The latest versions include advanced slide show facilities together with animation and sound clips. This has become a popular tool for marketing, executive reporting, training and seminars.

1.3 Groupware

Most office automation applications are designed for standalone users although the data and information can be shared through the use of networks and e-mail. However, much of the work performed in business today is cooperative with individuals working together in groups to achieve common goals. **Groupware** is the term given to software developed to support the collaborative activities of work groups, with typical requirements being information sharing, electronic meetings, scheduling and e-mail.

Project management software provides graphical tools to help manage projects by sequencing tasks, allocating and scheduling resources and reporting on project progress. Files can be checked in and out by members of the project team, changes are tracked using version control, and project managers can use “*what if*” queries to assess the impact of changes in the use of resources or time.

Electronic meeting software is designed to support interaction between members of a distributed group, without the cost and time wasted through travelling to a physical destination. Here groups can log into an electronic meeting from their offices or in special purpose electronic meeting rooms. While the meeting can be conducted by typed communications between the recipients, voice and even video communication can also be included.

Electronic mail, commonly referred to as e-mail, can be defined as the electronic exchange of messages between users. Where a user has the required software and links to the internet (for mail dispatched to remote locations), he or she can enter a message into the computer and transmit it to the recipient's Internet address. The message is then transferred across the network and stored on the network server in the recipient's mailbox from where it can be retrieved. E-mail facilities allow users the ability to print out messages, forward them to third parties and store mail in appropriate folders for future reference. In addition e-mail has a number of advantages over the traditional "snail mail" system. Mail can travel to anyone connected to the Internet in a very short time. It is simple to set up mail groups so that a number of individuals can communicate about common issues. Files can be attached to e-mail transmissions, so any material in electronic form can be communicated across the internet.