

KEY CONCEPTS

■ Information System ■ Hardware ■ Software ■ Data ■ Telecommunications ■ Information Systems ■ Decision Support System ■ Management Information System ■ Office Automation Systems

Learning Objectives

To understand:

- The meaning Information System
- Uses of Information System
- Types of Information System
- Information System and Cyber Security
- Information System and Its Application in Different Spheres of Business

Lesson Outline

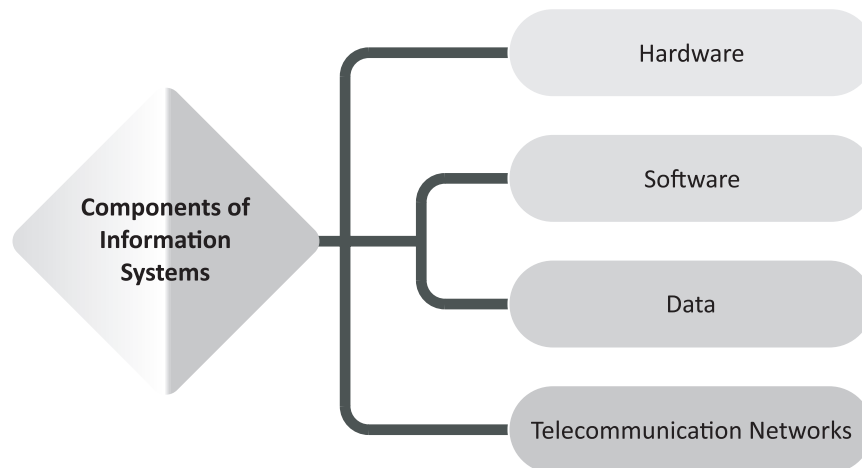
- What is Information System?
- How Information System is Useful for Business?
- Types of Information System
- Application of Information System
- Information System and Security
- Lesson Round-Up
- Glossary
- Test Yourself

WHAT IS INFORMATION SYSTEM

Information systems encapsulates the tools that organizations use to collect, manage, and analyze data. Decision making process in the organization is getting improved by enhancing decision making capacity and efficiency of operations as whole, which in turns result in improved profitability.

In today's scenario, be it human resource management, financial management, or customer support activities, or supply chain of operations, data is core of every business activity and information system become inevitable part of all such data-driven activities.

Information system does not merely mean the usage of software for the purpose of processing data and sharing information based on such processing, in real sense it is more than that and encapsulates various components such as hardware, software and telecommunication networks to collect useful data, especially in an organization.



Components of Information System

- a. **Hardware** – This is the physical component of the technology. It includes computers, hard disks, keyboards, iPads, etc. The hardware cost has decreased rapidly while its speed and storage capacity has increased significantly. However, the impact of the use of hardware on the environment is a huge concern today. Nowadays, storage services are offered from the cloud, which can be accessed from telecommunications networks.
- b. **Software** – Software can be of two types, system software and application software. The system software is an operating system that manages the hardware, program files, and other resources while offering the user to control the PC using GUI. Application software is designed to manage tasks by the users. In short, system software makes the hardware usable while application software handles specific tasks.

An example of system software is Microsoft windows, and an example of application software is Microsoft Excel.

Large companies may use licensed applications which are developed and managed by software development companies to handle their specific needs. The software can be proprietary and open source, available on the web for free use.

- c. **Data** – Data is a collection of facts and is useless by themselves, but when collected and organised together, it can be very powerful for business operations. Businesses collect all the data and use it to make decisions that can be analysed for the effectiveness of the business operations.

- d. **Telecommunications** – Telecommunication is used to connect with the computer system or other devices to disseminate information. The network can be established using wired or wireless modes. Wired technologies include fiber optic and coaxial cable, while wireless technologies include radio waves and microwaves.

Elements of complete Information System implementation

- Development of computer applications for business transactions, such as production, marketing, selling, etc.
- Development of management information systems for effective business control.
- Planned introduction and use of computers and telecommunications.
- Creation of an overall systems and standards architecture for technology, applications and data.
- Development of information systems for business planning.
- Improved productivity in information systems and computing.
- Development of appropriate staff resources.
- Development of internal support systems (payroll, personnel, pensions, etc.).

Implementation Plans of Information System

Three general tactical implementation plans of implementing Information System are there. The process of putting the new information system online and retiring the old system is known as system changeover. There are four changeover methods which are:

| <i>Changeover Method</i> | <i>Particular</i> |
|---------------------------|--|
| Direct Cutover | The direct cutover approach causes the changeover from the old system to the new system to occur immediately when the new system becomes operational. It is the least expensive but involves more risks than other changeover methods. |
| Parallel Operation | The parallel operation changeover method requires that both the old and the new information systems operate fully for a specified period. Data is input to both systems and output generated by the new system is compared with the equivalent output from the old system. When users, management, and IT group are satisfied that the new system operates correctly then the old system is terminated. It is the costliest changeover method and involves lower risks. |
| Pilot Operation | The pilot changeover method involves implementing the completely new system at a selected location of a company. Direct cutover method and operating both systems for only the pilot site. The group that uses the new system first is called the pilot site. By restricting the implementation to a pilot site reduces the risk of system failure as compared with is less expensive than a parallel system. |
| Phased operation | The phased operation changeover method involves implementing the new system in stages, or modules. We can implement each subsystem by using any of the other three changeover methods. In this approach risk of errors or failures is limited to the implemented module only as well as it is less expensive than the full parallel operation. |

HOW INFORMATION SYSTEM IS USEFUL FOR BUSINESS

Business Information Systems may be boundary-spanning field of ponder relating to how Information and Communication Technologies (ICT) can be deployed to enhance business processes and upgrade the organization's value chain systems, which firms utilize to obtain, create, and deliver goods and services across the globe.

Information Systems play a vital role within the modern economy and enterprise setting characterized by strategic procurement, worldwide outsourcing, physically distributed operational environments, and extensive business alliances.

Amalgamation of various components such as Hardware, Software, Data and Telecommunication Networks is information system. These resources are useful for the processing and dissemination of information for the business. In the process of the information systems, the data is collected, stored, and processed for end users in various projects.

Customization is an important aspect in the growth of the company. Based on the proficiencies of the software, employees can tailor information to their requirements. Like, for instance, a manager can create reports that will be helpful for him to identify the levels of productivity of his employees. He gets real-time data to be able to identify problems that a business has regarding production line and know whether it needs to be shut down.

Information systems help decision-makers at a business to make informed decisions for the company. Information technology helps get prepared data on all areas of the business as it offers current data, background, and trend analysis. To utilize this nitty-gritty information on the company environment and finances to progress business execution within the long- and short-term.

Generally, the application of computer information systems in a business helps to manage operations, interact with customers and suppliers to compete with other business firms and organizations. This motivates more companies to learn about Information Systems (IS) and to utilize it for an added business advantage.

Following are the main reasons, why information system is useful for business:

a. Efficient functioning:

In order to achieve higher profitability for your business, it is essential to improve the efficiency of business operations continually. This is possible to do by continuously storing the correct amount of stock so that you can always give your consumers what they want.

b. New products, services, and business models:

For businesses to make new products and services, information systems play a crucial role. Information System also help create new business models, and these can describe how a company produce, design, and sell their products.

c. Behavioural changes:

The information system can also help to communicate better between the employers and the employee. It works better as it stores information systematically, including the documents and files in folders that can be easily accessed and shared by the employees. This way, it oversees the flow of information between the management and the lower-level employees.

d. Better decision making:

Information systems assist managers in creating informed decisions with the help of real-time data. Continuously making informed decision improves decision power and avoid wastage of time looking for information.

e. Store and Analyse Information:

Most information systems function as delivery vehicles for data stored in databases. Databases support the operations and management aspects of a business. With a database, the collected data is stored and organised. Examples of databases include employee records and product catalogues.

When it comes to analysing collections of stored data, data warehouses are built by information systems from several data sources to analyse the data. These archival data are mined for relevant information to develop and launch new products, reach out to potential customers as well as to serve the existing customers with accuracy and efficiency.

f. Simplify Business Processes:

The integration of information systems in a business enables easier management of certain business processes to save on time and labour. For instance, buyers can have a seamless shopping experience at an online retailer as they can select a particular product display based on best-selling items, price range and customer ratings.

With the help of information systems, these products are neatly organised which enhances the shopping experience. Besides that, business managers can utilise information systems for inventory management. That way, they can determine the inventory needed, reorder with their suppliers in addition to track and receive shipments in a timely and systematic manner.

g. New Products and Services:

Any company looking to improve and secure the future must establish a broader perspective with the use of a well-designed and coordinated information system. The Information System makes it easier to analyze independent processes such as information to produce valuable products or services and organized work activities.

Therefore, an Information System can give a company the competitive advantage by analyzing how a company creates, produce, and sell their products or services. This means that the focus will be put on the main goal ahead.

Transformation of Business through Information System

Information Systems (IS) importance has increased dramatically, and most businesses have been prompted to introduce it to keep their competitive edge. Today, nobody can envisage a business without an effective digital information system.

Introduction of an information system to a business can bring numerous benefits and assist in the external and internal processes that a business encounters daily, and decision-making for the future.

Changes in technology and new innovative business models have transformed social life and business practices. Smartphones, social networking, texting, emailing, and Webinars have all become essential tools of business because that is where the customers, suppliers, and colleagues can be found and explored for advancement in business performance.

Businesses are using information technology to sense and respond to rapidly changing customer demand, reduce inventories to the lowest possible levels, and achieve higher levels of operational efficiency.

Supply chains have become more fast-paced, with companies of all sizes depending on just-in-time inventory to reduce their overhead costs and get to market faster.

As newspaper print readership continues to decline, more than 168 million people read a newspaper online, and millions more read other news sites. About 83 million people watch a video online every day, 66 million read a blog, and 25 million posts to blogs, creating an explosion of new writers and new forms of customer feedback that did not exist five years ago. Social networking site Facebook attracted over 1 billion monthly visitors in 2014 worldwide. Businesses are starting to use social networking tools to connect their employees, customers, and managers worldwide. Many Fortune 500 companies now have Facebook pages, Twitter accounts, and Tumblr sites.

E-commerce and Internet advertising continues to expand. Google’s online ad revenues surpassed \$17 billion in 2013, and Internet advertising continues to grow at more than 15 percent a year, reaching more than \$43 billion in revenues in 2013.

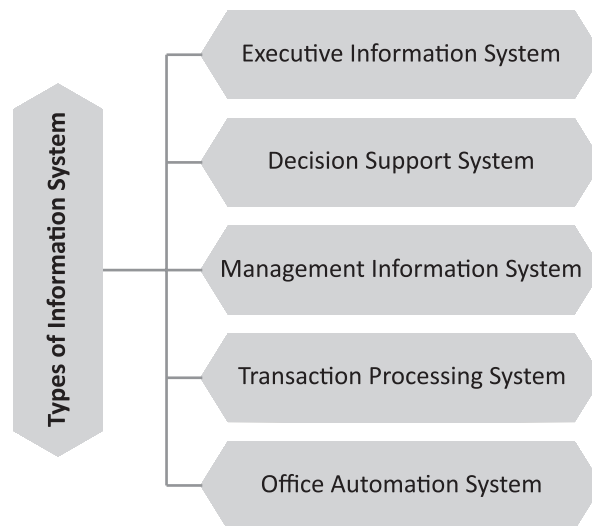
Information system managers oversee a wide assortment of assignments related to the information system, from coordinating or planning to inquire to supervising arrange security or web operations. Also, they can plan the computer-related activities of the company. Since information systems managers manage an assortment of other computer-related employment, they are expected to have knowledge and experience working in IT.

TYPES OF INFORMATION SYSTEM

The introduction of information systems into the business has evoked a chain reaction among different interrelated processes that have only benefited the companies by increasing profits and reducing costs and lead time, among other things. Therefore, it is imperative to understand the growing importance of information systems in companies.

Although many information systems offer various benefits, but common benefits should be offered by all information system.

| | |
|---|--|
| Common Benefits of Information System that should be offered | It will induce innovation in business activities through its research and development. |
| | It will enable automation, reducing steps undertaken to complete a task. |
| | It helps keep the hardware, software, data storage, and networking system safe and up to date. |



1. Executive Information System

An Executive Information System (EIS) is a management support system that facilitates and supports the decision-making requirements of an organization's senior executives. Hence, it is also called an "Executive Support System (ESS)."

An Executive Information System (EIS) is a kind of Decision Support System (DSS) used in organizations to help executives in decision making. It does so by providing easy access to important data needed in an organization to achieve strategic goals. An EIS usually has graphical displays on a user-friendly interface.

Early executive information systems were developed on mainframe computers as computer-based programs to provide the description, sales performance and/or market research data for senior executives of a company.

Executives, however, were not all literate or confident about the computers. Also, EIS data endorsed only executive-level decisions that did not necessarily support the entire company or enterprise. Current EIS data is available on Local Area Networks (LANs) throughout the company or enterprise, facilitated by personal computers and workstations.

Employees can access company data to help make decisions in their workplaces, departments, divisions, etc. This enables employees to provide relevant information and ideas above and below the level of their company.

Executive support systems are intended to be used directly by senior managers to support unscheduled strategic management decisions. Often such information is external, unstructured, and even uncertain. Often, the exact scope and context of such information are not known in advance.

Key Characteristics of Executive Information System

Trend Analysis: EIS helps executives of the organizations to data prediction based on trend data.

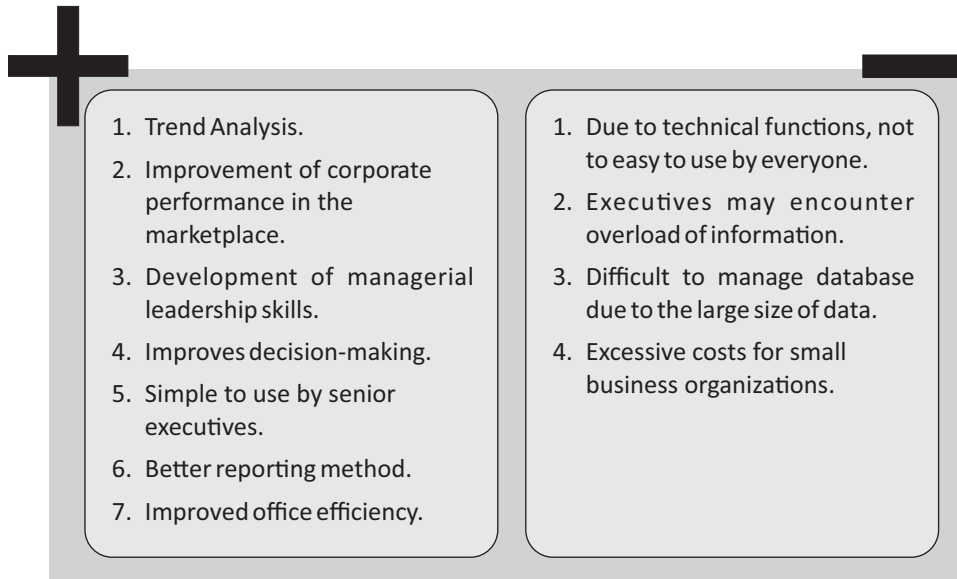
Integration of Data: EIS integrates integrate external and internal data. The external data collected from various sources.

Easy to use: It is a very simplest system to use.

Detailed Data: EIS provides absolute data from its existing database.

Presentation of Information: EIS represents available data in graphical form which helps to analyze it easily.

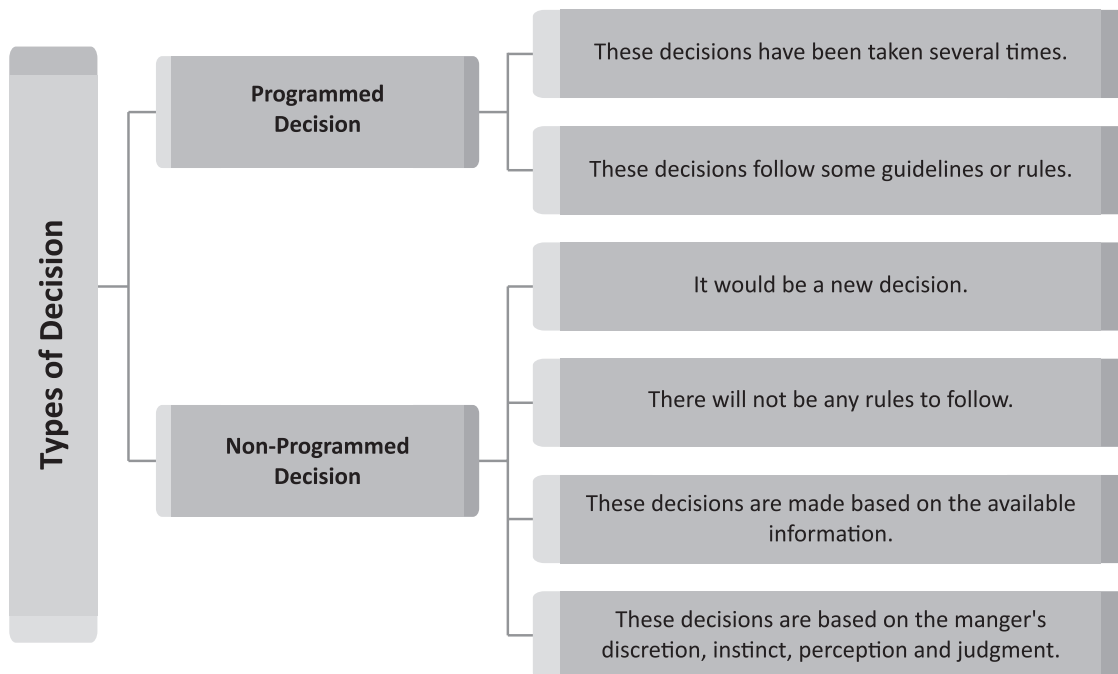
Advantages and Disadvantages of Executive Information System



2. Decision Support System

Decision Support Systems (DSS) are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various related information systems involved in organizational business processes, such as office automation system, transaction processing system, etc.

DSS uses the summary information, exceptions, patterns, and trends using the analytical models. A decision support system helps in decision-making but does not necessarily give a decision itself. The decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.



Attributes of a DSS

- Decision Support System is adaptable and flexible as per the requirement of business and managers.
- Interactivity is one of the main attributes of decision support system wherein it interacts with all the spheres of business and all level managers to improve the efficiency of business.
- Decision support system is curated the way that it very easy to use and understand.
- Decision support system are efficient and effective based of the information being fed into it.
- DSS are completely controlled by the decision-makers.
- Development of DSS is easy and non-complex.
- DSS can be extended to whole organization for more efficient performance with ease.
- DSS support for modeling and analysis.
- Data access is one of the main attributes of decision support system.
- DDS is Standalone, integrated, and Web-based.

Characteristics of a DSS

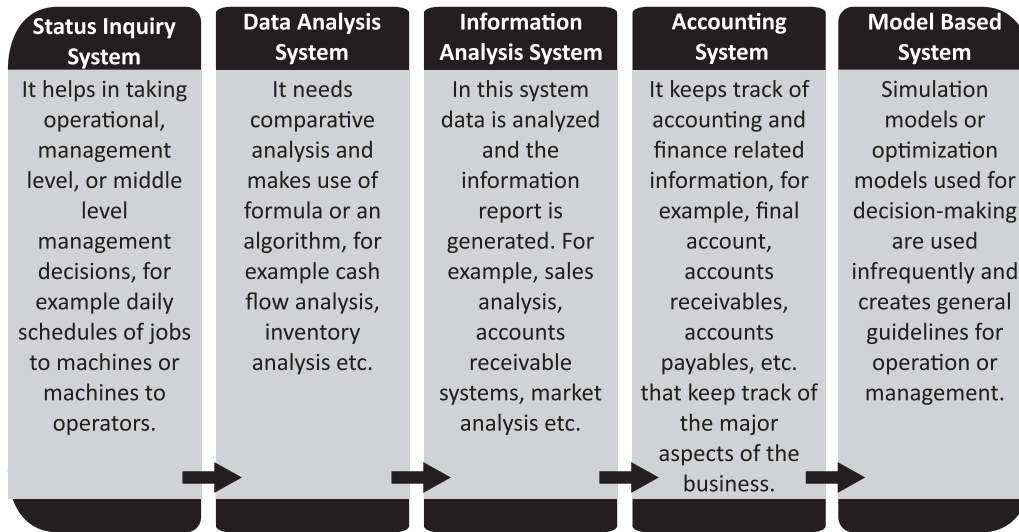
- Support for decision-makers in semi-structured and unstructured problems.
- Support for managers at various managerial levels, ranging from top executive to line managers.
- Support for individuals and groups. Less structured problems often requires the involvement of several individuals from different departments and organization level.
- Support for interdependent or sequential decisions.
- Support for intelligence, design, choice, and implementation.
- Support for variety of decision processes and styles.
- DSSs are adaptive over time.

Components of a DSS

Following are the components of the Decision Support System:

| | |
|--|---|
| Database Management System (DBMS) | To solve a problem the necessary data may come from internal or external database. In an organization, internal data are generated by a system such as TPS and MIS. External data come from a variety of sources such as newspapers, online data services, databases (financial, marketing, human resources). |
| Model Management System | It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc. |
| Support Tools | Support tools like online help; pulls down menus, user interfaces, graphical analysis, error correction mechanism, facilitates the user interactions with the system. |

Types of Decision Support System



3. Management Information System

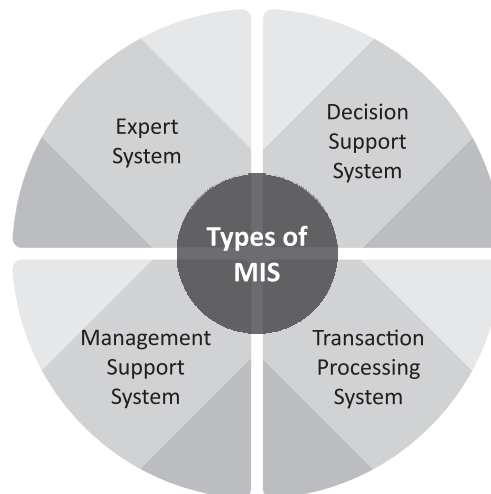
A management information system (MIS) is a computerized database of financial information organized and programmed in such a way that it produces regular reports on operations for every level of management in a company. It is usually also possible to obtain special reports from the system easily.

The main purpose of the MIS is to give managers feedback about company’s own performance so that top management can monitor the company. Information displayed by the MIS typically shows “actual” data over against “planned” results and results from a year before, thus it measures progress against goals.

The MIS receives data from company units and functions. Some of the data are collected automatically from computer-linked check-out counters and others are keyed in at periodic intervals.

Routine reports are preprogrammed and run at intervals or on demand while others are obtained using built-in query languages; display functions built into the system are used by managers to check on status at desk-side computers connected to the MIS by networks.

MIS software is used to track sales, inventory, equipment, and related business information. In the past, these applications ran on mainframe computers. However, as computing systems evolved, organizations began to run MIS software on client-server systems. Today, MIS applications are commonly run in the cloud, including hybrid cloud environments.



1. **Expert System:** An expert system provides managers with insights and advice based on Artificial Intelligence (AI). In an expert system, the AI is trained to simulate the knowledge of a human expert in a particular field.
2. **Decision Support System:** A DSS analyzes business data to assist managers with decision making. For example, a DSS could project revenue figures based on new product sales assumptions.
3. **Transaction Process System:** A TPS processes the routine transactions associated with a business. Examples include payroll processing, order processing for an e-commerce business and invoicing.
4. **Management Support System:** An MSS stores and organizes data, enabling end users to generate reports and analyze data to address business needs and inform planning. A data warehouse is an example of a MSS.

The data managed by MIS software tools can help managers make better decisions related to sales, manufacturing, resource allocation and more. Similarly, the MIS department plays an important role in providing support services within an organization, such as the following:

1. **Governance:** Governance involves systems and controls over employees' use of computing systems. The MIS department defines, manages, and enforces the rules covering how and whether employees can access the company's technologies and network infrastructure. The MIS department is responsible for IT security and enforcing codes of conduct related to computer systems use.
2. **Infrastructure:** An organization's IT infrastructure is comprised of the technology systems that support the business' day-to-day functioning -- for example, phones, desktop and laptop computers, servers, application software and cloud computing. The MIS department provides internal help desk and support services, assisting employees and troubleshooting issues related to the infrastructure.
3. **Data management:** Data management involves provisioning and managing systems that enable employees to access and update critical business data. The MIS department is responsible for ensuring the availability and security of the organization's data management systems.

Pros and Cons of Management Information System

The following are some of the benefits that can be attained using MIS:

- Improve an organization's operational efficiency, add value to existing products, engender innovation and new product development, and help managers make better decisions.
- Companies can identify their strengths and weaknesses due to the presence of revenue reports, employee performance records etc. Identifying these aspects can help a company improve its business processes and operations.
- The availability of customer data and feedback can help the company to align its business processes according to the needs of its customers. The effective management of customer data can help the company to perform direct marketing and promotion activities.
- MIS can help a company gain a competitive advantage.
- MIS reports can help with decision-making as well as reduce downtime for actionable items.

Some of the disadvantages of MIS systems:

- Retrieval and dissemination are dependent on technology hardware and software.
- Potential for inaccurate information.

Management Information System and Its Application

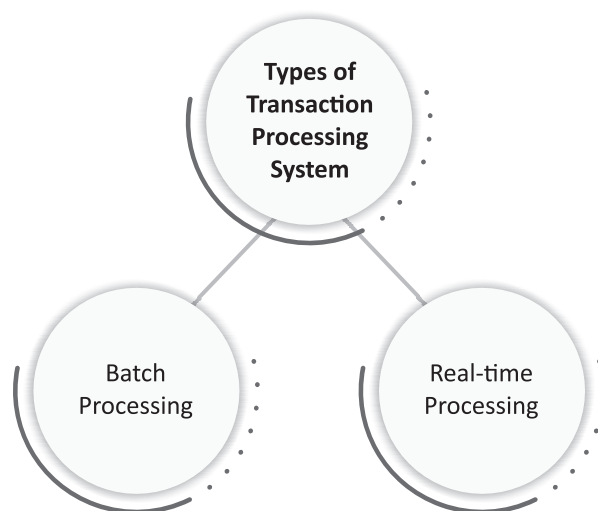
- **Enterprise Systems**—also known as enterprise resource planning (ERP) systems—provide integrated software modules and a unified database that personnel use to plan, manage, and control core business processes across multiple locations. Modules of ERP systems may include finance, accounting, marketing, human resources, production, inventory management, and distribution.
- **Supply Chain Management (SCM)** systems enable more efficient management of the supply chain by integrating the links in a supply chain. This may include suppliers, manufacturers, wholesalers, retailers, and final customers.
- **Customer Relationship Management (CRM)** systems help businesses manage relationships with potential and current customers and business partners across marketing, sales, and service.
- **Knowledge Management System (KMS)** helps organizations facilitate the collection, recording, organization, retrieval, and dissemination of knowledge. This may include documents, accounting records, unrecorded procedures, practices, and skills. Knowledge management (KM) as a system covers the process of knowledge creation and acquisition from internal processes and the external world. The collected knowledge is incorporated in organizational policies and procedures, and then disseminated to the stakeholders.

4. Transaction Processing System

Transaction processing is a style of computing, typically performed by large server computers, that supports interactive applications. In transaction processing, work is divided into individual, indivisible operations, called transactions.

A transaction processing system allows application programmers to concentrate on writing code that supports the business, by shielding application programs from the details of transaction management, transaction processing system offers following features to the business:

- It manages the concurrent processing of transactions.
- It enables the sharing of data.
- It ensures the integrity of data.
- It manages the prioritization of transaction execution.



- a. **Batch Processing:** Batch processing is when clusters of transactions are refined simultaneously using a computer system. This method, although designed to be efficient for breaking down bulky series of programs, has a drawback as there is a delay in the transaction result.
- b. **Real-time Processing:** Real-time processing carries out its transactions exclusively; this method ensures a swift reply on the condition of the transaction result. It is an ideal technique for dealing with singular transactions.

Transaction Processing System Features

There are several features involved in a good transaction processing system. A few of these critical features are described below.

- **Performance:** The concept behind the use of TPS is to efficiently generate timely results for transactions. Effectiveness is based on the number of transactions they can process at a particular time.
- **Continuous availability:** The transaction processing system should be a very stable and reliable system that must not crash easily. Disruption of TPS in an organization can lead to work disturbance and financial loss.
- **Data integrity:** The TPS must maintain the same method for all transactions processed, the system must be designed to effectively protect data and overcome any hardware/ software issues.
- **Ease of use:** The TPS should be user-friendly in order to encourage the use and decrease errors from inputting data. It should be structured in such a way that it makes it easy to understand as well as guarding users against making errors during data-entry.
- **Modular growth :** The TPS hardware and software components should be able to be upgraded individually without requiring a complete overhaul.
- **Controlled processing:** Only authorized personnel, staff members, or employees should be able to access the system at a time.

Components of Transaction Processing System

Below are some of the components involved in a Transaction Processing System:

- a. **Inputs:** These are source documents gotten from transactions which serve as inputs into the computer's accounting system examples are invoices, and customer orders.
- b. **Processing:** This requires the breaking down of information provided by the inputs.
- c. **Storage:** This is saved information in TPS memory, it may be in the form of ledgers.
- d. **Output:** Any generated record may serve as the output.

Limitations of Transaction Processing Systems

- Managing operations with the Transaction Processing System can be complicated if the company is not big enough to efficiently use the transaction processing system.
- Transaction Processing System needs both hardware and software components to efficiently manage high data volume. This capacity makes TPSs susceptible to software security breaches in the form of the virus and faulty hardware issues such as power outage can disrupt the whole system.

- Effective integration of a Transaction Processing System in a company operation requires skilled personnel, it also requires a link with associate company branches to maintain a secure flow of information. This high requirement can create instability and flux in the company's daily operations.

Functions of Transaction Processing System

Transaction Processing Systems can execute input, output, storage, and processing functions.

- *Input functions:* This includes the securing of data on the source document, entering of input data in the system and validate data.
- *Output functions:* This includes the production of the report of the transaction via monitor or paper, examples are exception reports, detail reports, and summary reports.
- *Storage functions:* This is the process by which data is stored. It entails the storage of information, accessing, sorting, and updating stored data.
- *Processing functions:* This entails the transformation of data, it includes calculation, computation, and apt result.

Examples of Transaction Processing System

- TPS accumulates data about transactions and initiates processing that transforms stored data. Examples include order processing, employee records, and hotel reservation systems.
- Batch transaction process examples include bill generation and check clearances.
- Examples of real-time transaction processes are the Point-of-Sale terminals (P.O.S) and microfinance loan systems.

5. Office Automation System

Office Automation Systems (OAS) are configurations of networked computer hardware and software. A variety of office automation systems are now applied to business and communication functions that used to be performed manually or in multiple locations of a company, such as preparing written communications and strategic planning.

In addition, functions that once required coordinating the expertise of outside specialists in typesetting, printing, or electronic recording can now be integrated into the everyday work of an organization, saving both time and money.

Types of functions integrated by office automation systems include

- (1) electronic publishing;
- (2) electronic communication;
- (3) electronic collaboration;
- (4) image processing; and
- (5) office management.

At the heart of these systems is often a Local Area Network (LAN). The LAN allows users to transmit data, voice, mail, and images across the network to any destination, whether that destination is in the local office on the LAN, or in another country or continent, through a connecting network.

An Office Automation System makes office work more efficient and increases productivity. Office management systems include electronic office accessories, electronic scheduling, and task management. These systems

provide an electronic means of organizing people, projects, and data. Business dates, appointments, notes, and client contact information can be created, edited, stored, and retrieved. Additionally, automatic reminders about crucial dates and appointments can be programmed.

Projects and tasks can be allocated, subdivided, and planned. All these actions can either be done individually or for an entire group. Computerized systems that automate these office functions can dramatically increase productivity and improve communication within an organization.

Benefits of an Office Automation System

Implementing an office automation system offers organizations a broad range of benefits. These benefits include:

- a. *Improved accuracy:*** Humans make errors, properly implemented automated systems do not. Human errors are not only inefficient in that they must be corrected and lead to productivity delays, but they can be costly. For instance, adding too many digits when paying an employee or vendor. Serious mistakes can lead to security and compliance issues, potentially fines and penalties. An office automation system limits human intervention in the transfer of data, which minimizes the occurrence of errors.
- b. *Reduced costs:*** By automating complex business processes, organizations do not need to invest as much into hiring for those tasks. As a result, operational costs are lower, while productivity and profit margins are significantly higher.
- c. *Reduced time and resources:*** Through automation, organizations can accomplish more with less. By eliminating tedious and time-consuming processes, employees can spend their time on more high value tasks. For example, returning to the popular paperless benefit, with office automation software employees do not need to spend as much time collecting important documentation, entering that information, or filing away voluminous paper copies. The system does it for them.
- d. *Data storage and management:*** Office automation systems simplify data storage while giving organizations the ability to monitor and control data through an electronic document management system. Common features include things like task management and reminder systems, as well as easy access to information by key stakeholders.
- e. *Data insights and more informed decisions:*** Office automation systems give organizations access to large data sets, reports, and analytics. Access to data enables more informed decisions. Moreover, by analyzing data and key performance indicators, organizations can implement improvements to their processes to remove bottlenecks and other inefficiencies.
- f. *Business Process Improvement:*** Through business process improvement, organizations optimize performance, improve the quality of their products or services, and ensure a higher level of compliance. The ability to improve business processes is what separates office automation systems from piecemeal automation technology.

Key features of an Office Automation System

There are countless applications and software programs that promise improved efficiency through automation. An office automation system should offer following features:

- a. *Process modeling and workflow design:*** An important benefit of an office automation system is the ability to design and improve workflows. The solution that you choose should give you the ability to create detailed workflows in a matter of minutes.
- b. *Mobile compatibility :*** In the age of the stay-at-home economy and the COVID-19 pandemic, mobility is more important than ever. Employees must be able to perform their functions from anywhere. A cloud-based solution is always secure and always accessible.

- c. **Integration :** One of the biggest challenges that organizations face when attempting to automate their processes is integrating various third-party software or apps. The office automation system should work seamlessly with your other tools like email marketing and CRM system.
- d. **Managing tasks and deadlines:** Task management is an important feature of office automation solutions. For processes to run smoothly, employees must know what to do and when to do it. The office automation system should allow to create and view pending tasks and deadlines, as well as redistribute tasks as needed.
- e. **Access control and security:** To protect the security of office systems, it is required to set access privileges throughout the organization. Cloud-based solutions also offer advanced security features to protect data from being compromised.
- f. **Communication:** An important feature of any automation system is the ability to communicate seamlessly. Stakeholders should have all the information they need to perform each task, as well as the ability to reach out to others for further assistance.

The office automation system should offer features like a form builder. Form builders can be used to capture data, display data from other systems, and even design approval screens for managers to make decisions.

- g. **Reporting and analytics:** To evaluate and improve the office automation system, access to data and key performance indicators is required.

APPLICATION OF INFORMATION SYSTEMS IN BUSINESS

Advances in computer-based information technology in recent years have led to a wide variety of systems that managers are now using to make and implement decisions. By and large, these systems have been developed from scratch for specific purposes and differ significantly from standard electronic data processing systems. Too often, unfortunately, managers have little say in the development of these decision support systems, at the same time, non-managers who do develop them have a limited view of how they can be used.

Information Systems in Daily Life

| <i>Daily Life Situation</i> | <i>Application of information Systems</i> |
|---|---|
| E-Learning | E-learning or electronic learning is an information system that is applied in schools. The application of data that is processed and disseminated through technology. There are many benefits from the presence of information system applications in the field of education, including convenience. The convenience offered not only saves time but also saves paper. |
| Fleet Management System | The fleet management system is an information system application that will assist the process of monitoring the logistics fleet and delivery of goods so that the tracking process becomes more systematic and continues to be centralized. Usually, this system responds to the detected location by using the help of GPS. |
| Integrated Service System for Students | This student service system was created to facilitate student activities on campus activities. One of the activities is to obtain results from academic activities in the form of tests or other activities. In addition, the application of this information system can also facilitate the registration of the desired courses each semester. Students do not need to come directly to campus to carry out these activities. These students are only enough to open the available applications. |

| <i>Daily Life Situation</i> | <i>Application of information Systems</i> |
|-------------------------------------|---|
| Online Booking | <p>Next is the application of information systems in placing orders online. Reservations that can be made online can be in the form of transportation tickets, concert tickets, and hotels. Apart from these things, many other things can be ordered online, either on a website or an application.</p> <p>The way it works is also very easy, one only needs to choose what things they want to order online. Later that person will get evidence in the form of a successful booking. After the evidence is obtained, the person can immediately exchange the existing ticket.</p> |
| Enterprise Resource Planning | <p>Also called ERP or management systems, they are systems that focus on the administration of the production and distribution of goods generated by a company, and allow to keep track of sales, invoicing, shipments, and many other concepts related to production. As a result of the information processing, the information issued allows top management to make decisions that can positively affect a company.</p> <p>This is an example of a company management information system that not many ordinary people know about. This information system is widely used by several companies because it facilitates their activities. Many large companies have used this system.</p> <p>This system functions in terms of monitoring or supervision of company management.</p> <p>Furthermore, this system is also connected to the fields of work units in finance, marketing, operations, and others. Things that used to take a long time can now be done in a short time.</p> |
| Artificial Intelligence | <p>One of these information systems was previously used by companies. Artificial Intelligence or artificial intelligence greatly facilitates the transaction process in the company. Seeing the sophistication of A.I, it is not surprising that many have applied this to other places.</p> <p>Perhaps the most widely heard and most often heard is that AI is applied to mobile phones. The way this system works is to solve existing problems with the knowledge of the experts who have been included in it. So, the system that is processed to produce this information still comes from humans as well.</p> |
| Video Call | <p>This is an information system where the application is on the cellphone. The way it works is extraordinary, it is easy to just download an application that provides video call facilities. Then just register via telephone number.</p> <p>Currently, many applications provide video call facilities, even though these facilities are already built-in on mobile phones. Usually, this video call facility is integrated with a chat application that uses internet quota as a means. So, to make this video call make sure you have an internet connection.</p> |

Some of the target areas of implementation of Information Systems are as follows:

- a. **Commercial systems.** Better known as point of sales, this type of system is used by economic establishments to keep track of sales and business expenses, facilitates accounting, and allows managers to find weak points that need to be addressed.

- b. **Geographic information systems.** These systems model large amounts of information that enable decision-making in fields such as environmental impact, urban planning, or cartography.
- c. **Banking systems.** These systems allow the use of monetary transactions quickly between multiple customers regardless of the physical location where they are located or even regardless of the bank of which they are customers.
- d. **Communication systems.** Here we can group all the systems that allow us to send and receive information from our friends, colleagues, neighbors, and even people we do not even know physically. A clear example of this type of system is social networks, instant messaging, or e-mail.
- e. **Content Management Systems.** The so-called CMS allows us to create and manage content quickly and to some extent easily, that is, it is not necessary to be a web programmer to create a complete structure for a site. As an example, a CMS called Sharepoint hosts the institutional portal and its entire structure of web pages.
- f. **Learning Management Systems.** LMS is very similar to CMS, the difference is that they allow creating of educational content and keeping track of a student, using activities ranging from publishing news or events to discussion forums and evaluations that allow automatic grading of the student.
- g. **Streaming systems.** YouTube, Spotify, or Netflix are mainly a source of entertainment, they provide a continuous information flow (stream) to the customer and allow them to watch or listen to content from the network.

INFORMATION SYSTEMS AND SECURITY

Technology is a huge part of how business is done, so managing corporate and customer data is a top priority for companies. As this intervention of technology in business is continuously increasing at high pace, it becomes most essential to keep the data secured and make policies related to data security.

Following should be adhered to while focusing on maintaining security of information system:

- a. **Confidentiality:** When protecting information, we want to be able to restrict access to those who are allowed to see it; everyone else should be disallowed from learning anything about its contents. This is the essence of confidentiality.

Confidentiality is the ability not to disclose information to unauthorized persons, programs, or processes. It relates to information security because it requires control over access to protected information. Confidentiality requires measures to ensure that only authorized persons have access to information, and while unauthorized persons are denied access to them. Simply put, confidentiality means that something is secret and should not be passed on to unintentional persons or organizations.

If confidentiality is compromised, this can lead to loss of privacy and disclosure of confidential information to the public or other persons. There is a wide range of information that could be considered confidential, such as financial information, medical information, and other sensitive information. Some information is more sensitive than others and requires a higher level of confidentiality.
- b. **Integrity:** Integrity means that protection against improper modification and destruction of information, ensuring that information cannot be changed undetected, and ensuring the integrity of the information. This means that a cyber threat or vulnerability to cyber-attack can be measured by compromising one or more of its principles. Integrity is based on encryption and hashing to ensure the best possible protection against cyber-attacks and cyber threats such as cyber espionage.
- c. **Availability:** Availability ensures that information is available to those in need that includes timely and reliable access, regardless of the time of day, place of residence, location, or other factors.

The accuracy and completeness of the information are crucial to the functioning of an organization. Focus on integrity to ensure that data is considered authentic and reliable and cannot be manipulated. It should be noted that integrity is important in order to protect data in its use, not only in the management of the organization but also in its use by other organizations and individuals.

LESSON ROUND-UP

- Information systems encapsulates the tools that organizations use to collect, manage, and analyze data and encapsulates Hardware, Software, Data and Telecommunication Networks as its components.
- Implementation of Information System in the organisation can be in four ways i.e., Direct Cutover, Parallel Operation, Phased Operation and Pilot Operation.
- Information System will induce innovation in business activities through its research and development. It will also enable automation, reducing steps undertaken to complete a task.
- An executive information system is a management support system that facilitates and supports the decision-making requirements of an organization's senior executives. Hence, it is also called an "executive support system."
- Decision support systems are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various related information systems involved in organizational business processes, such as office automation system, transaction processing system, etc.
- A management information system is a computerized database of financial information organized and programmed in such a way that it produces regular reports on operations for every level of management in a company.
- Transaction processing is a style of computing, typically performed by large server computers, that supports interactive applications. In transaction processing, work is divided into individual, indivisible operations, called transactions.
- Office automation systems are configurations of networked computer hardware and software.
- ERP or management systems, are systems that focus on the administration of the production and distribution of goods generated by a company, and allow to keep track of sales, invoicing, shipments, and many other concepts related to production.

Three aspects for system security should be focuses on are Confidentiality, Integrity, and Availability.

GLOSSARY

Telecommunications: Telecommunication is used to connect with the computer system or other devices to disseminate information.

Executive Information System (EIS): It is a management support system that facilitates and supports the decision-making requirements of an organization's senior executives.

Model Management System: It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc.

Expert System: An expert system provides managers with insights and advice based on Artificial Intelligence (AI).

Knowledge Management System (KMS): helps organizations facilitate the collection, recording, organization, retrieval, and dissemination of knowledge.

Fleet Management System: The fleet management system is an information system application that will assist the process of monitoring the logistics fleet and delivery of goods so that the tracking process becomes more systematic and continues to be centralized.

Artificial Intelligence: Artificial Intelligence or artificial intelligence greatly facilitates the transaction process in the company. Seeing the sophistication of A.I, it is not surprising that many have applied this to other places.

TEST YOURSELF

(These are meant for recapitulation only. Answer to these questions are not to be submitted for evaluation.)

1. What do you mean by Information System and How it can be implemented in small business?
2. Utilization of Information Systems in small-size and mid-size firms is minimal.” Justify the statement.
3. Information System does not only mean application of software. Elaborate the statement.
4. How information systems are benefiting businesses to perform more effectively and efficiently.
5. What are various types of Information Systems?
6. How Management Information System and Decision Support System are interrelated?
7. Transactions are easy to process through information systems. Justify the statement.
8. Office automation system comes with numerous of features. Briefly enumerate such features.
9. All 5 types of Information Systems are inter-related and inter-connected. Explain such inter-relatedness amongst all Information Systems in your own words.
10. Write a note on application of Management Information System in Small Business.