

Unit - 1

Information Systems

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Information Systems

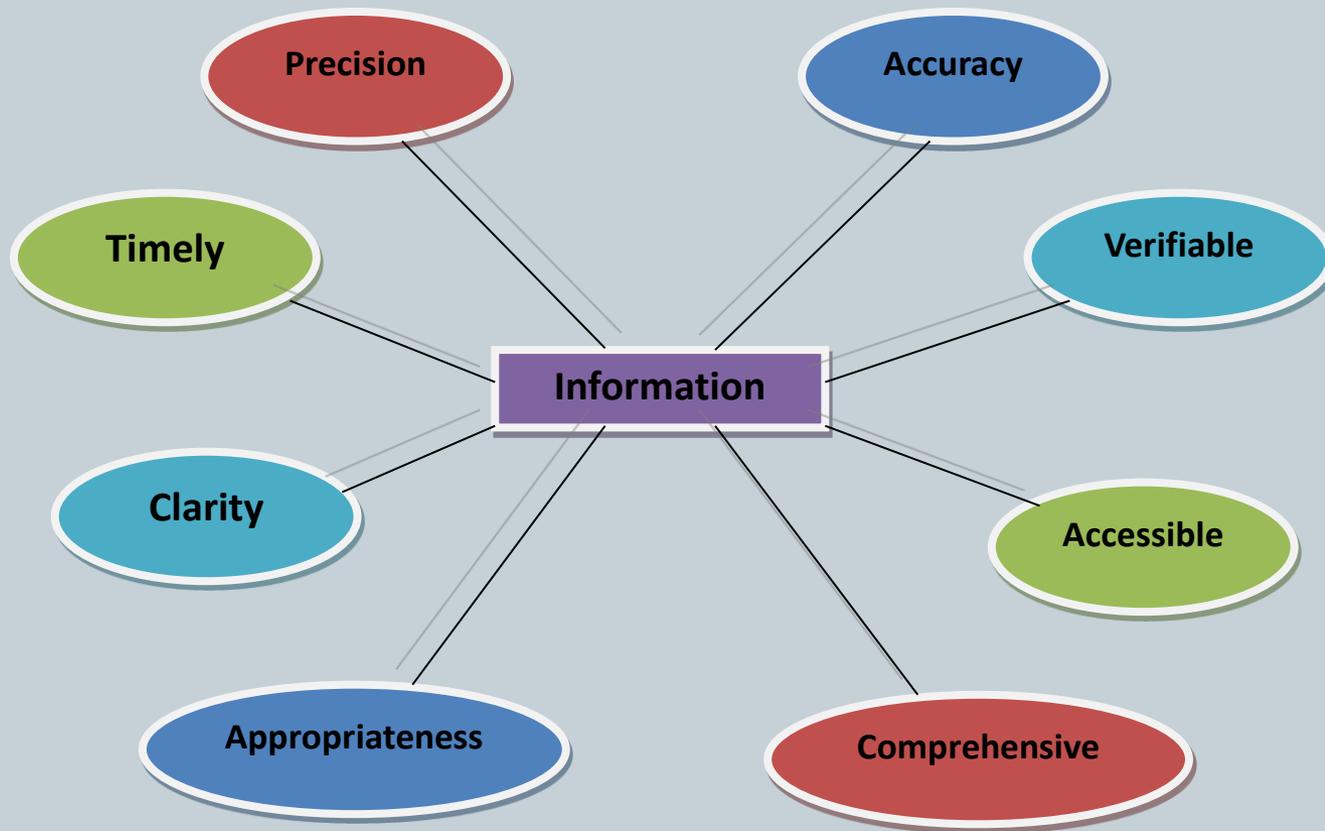
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- The purpose of information system is to provide the fundamental knowledge to enable one to participate in the development and use of information systems in modern organizations.
- What do you mean by Data, Information, Knowledge and Wisdom?

- Data, Information and Knowledge are three often-encountered words that belong closely together, seem to have slightly different meanings.
- Sometimes, they are interchangeably used also.
- Yet, clarity in their meanings is quite essential to understand the gamut of Knowledge.
- **Information:** relates to description, definition, or perspective (what, who, when, where).
- **Knowledge:** comprises strategy, practice, method, or approach (how).
- **Wisdom:** embodies principle, insight, and moral (why).

Fig. 1: Information Attributes (Characteristics)

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Timely – The receipt of information within the time frame it is needed by the recipient.

Accessible – The ease and speed with which information can be obtained.

Precision – The measurement detail used in providing information.

Appropriateness – How well the information relates to a user's requirement.

Accuracy – The degree of the absence of error in information.

Comprehensiveness – The completeness of the information.

Verifiable – The degree of consensus arrived at among various users examining the same information

Clarity – The degree to which information is free from ambiguity.

Process of converting data into information

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- Basically, data must be processed to be considered information by recipients.
- The mechanisms of how data are processed, we can identify some unique logical processing steps or operations taken to convert data into information.
- Any one operation or any combination of these operations can produce information from data. These data operations are:

- **Capturing:** This operation refers to the recording of data from an event or occurrence, in some form such as personnel files, purchase orders, Registers etc.
- **Verifying:** This operation refers to the checking or validating of data to ensure that it was captured and recorded correctly. Examples of verification might be one person reviewing another's work.
- **Classifying:** This operation places data elements into specific categories which provide meaning for the user. For example, classification of documents.

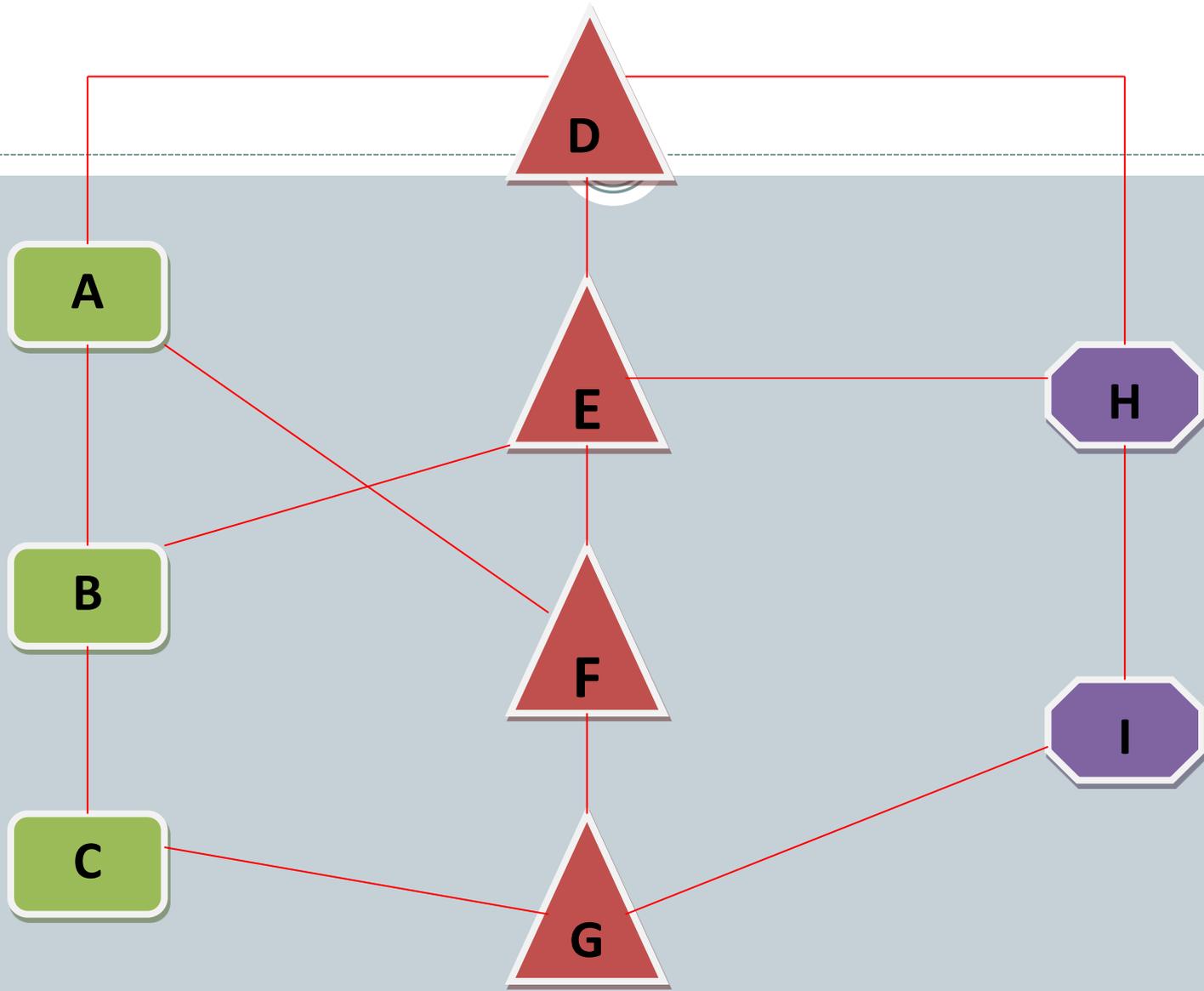
- **Arranging (Sorting):** This operation places data elements into specified or predetermined sequence. Whether arrangement by colour, size, type of binding, subject, alphabetic, etc.
- **Calculating:** This operation entails the arithmetic and / or logical manipulation of data. For example, computations must be performed to derive employees' pay, customers' bills, students' grade point averages, and so forth.

- **Storing:** This operation places data onto some storage media such as paper, microfilm, or magnetic tape, where the data can be retrieved when needed.
- **Retrieving:** This operation entails searching out and gaining access to specific data elements from the medium where it is stored.
- **Reproducing:** This operation duplicates data from one medium to another, or into another position in the same medium. For example, a file of data stored on a magnetic disk may be reproduced onto another magnetic disk or onto a magnetic tape for further processing.
- **Disseminating / Communicating:** This operation transfers data from one place to another. It can take place at a number of junctures in the data processing cycle.

System (s)

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- A **System** can be defined as any set of objects and ideas, and their interrelationships which are ordered to a common goal or purpose.
- A **System** can be defined as any integrated assemblage of components or sub-system designed to achieve an objective.
- **Longman's Dictionary** defines system as “An organized set of ideas, methods, or ways or working.



- Fig. 2 illustrates a conceptual model of a system. In this illustration the various symbols **A** through **I** represent the components of the system.
- The lines connecting the symbols represent the relationships among components.
- Identical symbols represent a unique relationship among one or more components, which can be termed a **subsystem**.

- The use of the term subsystem facilitates analysis or communication.
- For example, we can describe the system by its components *A, B, C,...I* or by its subsystems *ABC, DEFG, HI*, whichever serves our purposes better.
- With complex systems, we can divide the analysis and design of the system into subsystems for control and implementation purposes.

Organizations Perceived as System

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- Any organizations can be viewed as a system composed of three subsystems, namely, the ***management subsystem*** the ***operations subsystem***, and the ***information subsystem***.
- The ***management subsystem*** includes all the people and activities directly related to determining the planning, controlling, and decision-making aspects of the operations subsystem. In simple terms setting rules and regulations.

- The ***operations subsystem*** includes all of the activities, material flow, and people directly related to performing the primary functions of the organization. Means, how books move from different sections to finally users.
- The ***information subsystem*** is an assemblage or collection of people, machines, ideas, and activities that gather and process data in a manner that will meet the formal information requirements of an organization.

What is Information System?

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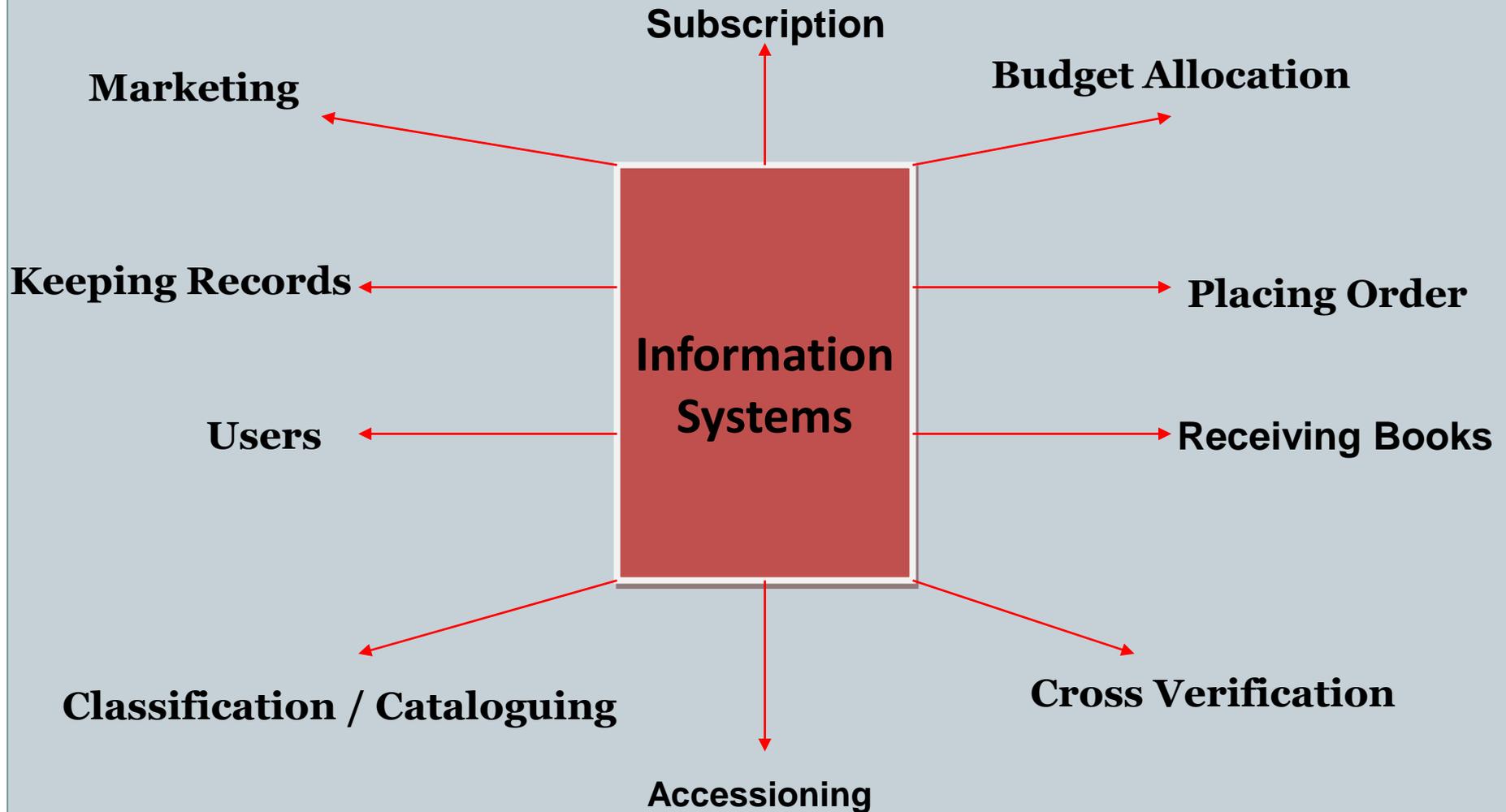
- Information System is an organization of people, materials and machines that serves to facilitate the transfer of information from one person to another.
- **Dictionary of Information Technology and Computer Science** defines “information system is a system within an organization that processes and distributes the information needs to plan, monitor and control its activities.”
- It includes people as well as technology.
- It uses a number of well-established technologies and operated by professionally trained manpower.

- **William S. Davis** defines “information system as a set of hardware, software, data, human and procedural components intended to provide the right data and information to the right person at the right time. It is a set of interrelated components that function together in a meaningful way”.

- It is a set of interrelated components that function together in a meaningful way”.
- **Sage** defines “an information system as an input-output structure, which acquires, stores and processes data and produces and / or disseminates information in an organized manner”.
- In brief, a system, which performs the data to information process, is called an information system.

The Information Systems Concept

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Types of Information Systems

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- Since different types of information systems produce information in different ways, information scientists must adjust their goals and methodologies to the type of information system that they are investigating.
- The four principal types of information systems commonly studied are **computers, computer based information systems, libraries and information centers, and social and biological systems.**

1. Computers

- Computers are an important area of study because of their enormous capacity for storing and processing information.
- Supercomputers, for example are capable of many billions of operations per second; CD-ROMs technology permits more than half a billion characters of data (tens of thousands of pages of text) to be stored on a 4.75 inch compact disc and enables users to access millions of facts virtually instantaneously; advances in programming techniques permit the artificial reproduction of the intelligent decision-making processes of human thought.

2. Computer-based Information Systems

- The great advances in computer technology that have occurred since the invention of the integrated circuit in 1959 have made the computer increasingly popular in a wide variety of applications that fall under the purview of information science.
- Examples include Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), computer-assisted learning programmes, and hundreds of types of online databases, from airline schedules to encyclopedias

3. Libraries and Information Centres

- It is in the very nature of libraries and information centers to process information.
- Because the techniques they use to accomplish this, such as cataloguing and indexing, are well established, they provide information scientists with a fertile area in which to develop and implement new ideas and technologies designed to increase efficiency.

4. Social and Biological System

- Information scientists can study the governmental system embodied by elected city officials, for example, by treating the officials as symbols of various constituencies.
- The mechanisms for the selection of such symbols are clearly information-generating process.

Characteristics of Information Systems

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- Information systems are human made i.e. they have to be designed, developed, operated and maintained.
- In the development and operation of information systems, both the software and databases are important.
- There is a need for economy in developing the systems and which can be met by sharing software, hardware, maintenance and operation, etc.
- It involves human-machine communication at various levels, which require proper documentation.
- Users of the systems and the technology on which the systems were developed are continuously changing, therefore, there is a need to update the systems to make them dynamic, responding to changes.

- **Issues to be taken care**
- Information systems are quite expensive to develop and operate;
- They need to be analyzed to determine whether they are serving the desired needs of users;
- The measurement of their performance, continue to receive considerable attention.