Unit-1
Foundation of Information System

- Introduction to information system in business
- Fundamentals of information systems
- Solving business problems with information systems
- Types of information systems
- Effectiveness and efficiency criteria in information system

Information system in business/ (Why information system is important in business)

- Any business can be successful only when there is a consistent management of organizational and financial data with efficient information systems.
- Most of the companies have seen a drift in the process of workflow due to the accuracy and reliability of information.
- There is no alternative for the right information at the required time in the world of business where every industry revolves round the "Internet of Things".
- This raised the need to innovate and develop the systems that can be implemented to make information accurate, that can be quickly accessed on demand.
- An effective information system can entitle an organization with better planning, decision-making and hence desired results.
- With the constant change and evolution of customer preferences and requirements – businesses that can bring about new methods and innovative techniques can survive the market and continue to function as per the customer demands.
- The implementation of information system can benefit a lot in businesses and helps in controlling the internal and external processes.

Fundamentals of Information System

Data, information, and knowledge

   – **Data**: Raw facts.
   – **Information**: Collection of facts organized in such a way that they have additional value beyond the value of the facts themselves.
   – **Process**: Set of logically related tasks performed to achieve a defined outcome.
   – **Knowledge**: Awareness and understanding of a set of information.

Information System:

- "Information systems (IS) is the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data."
- "Information systems are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational

settings."

- "Information systems are interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization."
- Most of the Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace.
- Information systems are used to run interorganizational supply chains and electronic markets.
- For instance, corporations use information systems to process financial accounts, to manage their human resources, and to reach their potential customers with online promotions.
- Many major companies are built entirely around information systems.
- Hardware, software, computer system connections and information, information system users, and the system's housing are all part of an Information System.
- Personal computers, smartphones, databases, and networks are just some examples of information systems.

Components of information system

Information systems consist of the following general components:

- Hardware
- Software
- Databases
- Telecommunication
- Human resources
- Procedures

Computer hardware

- This is the physical technology that works with information.
- Hardware can be as small as a smartphone that fits in a pocket or as large as a supercomputer that fills a building.
- Hardware also includes the peripheral devices that work with computers, such as keyboards, external disk drives, and routers.
- With the rise of the Internet of things, in which anything from home appliances to cars to clothes will be able to receive and transmit data.

Computer software

- The hardware needs to know what to do, and that is the role of software.
- Software can be divided into two types: system software and application software.
- The primary piece of system software is the operating system, such as Windows or iOS, which manages the hardware's operation.
- Application software is designed for specific tasks, such as handling a spreadsheet, creating a document, or designing a Web page.

Telecommunications

- This component connects the hardware together to form a network.
- Connections can be through wires, such as Ethernet cables or fiber optics, or wireless, such as through Wi-Fi.
- A network can be designed to tie together computers in a specific area, such as an office or a school, through a local area network (LAN).

- If computers are more dispersed, the network is called a wide area network (WAN). The Internet itself can be considered a network of networks.

Databases and data warehouses

- A database is a place where data is collected and from which it can be retrieved by querying it using one or more specific criteria.
- A data warehouse contains all of the data in whatever form that an organization needs.
- Databases and data warehouses have assumed even greater importance in information systems with the emergence of "big data," a term for the truly massive amounts of data that can be collected and analyzed.

Human resources and procedures

- The final, and possibly most important, component of information systems is the human element: the people that are needed to run the system and the procedures they follow so that the knowledge in the huge databases and data warehouses can be turned into learning that can interpret what has happened in the past and guide future action.

Solving business problems with information systems

There are two common approaches to solve the business problems with information system:

The Scientific Method

- The systems approach is based on the established problem-solving methodology known as the scientific method. The scientific method consists of five steps:
  - Recognize phenomena in the real world.
  - Formulate a hypothesis about the causes or effects of the phenomena.
  - Test the hypothesis through experimentation.
  - Evaluate the results of the experiments.
  - Draw conclusions about the hypothesis.

The Systems Approach

- The systems approach is a modification of the scientific method.
- It stresses a systematic process of problem solving.
- Problems and opportunities are viewed in a systems context.
- Studying a problem and formulating a solution becomes an organized system of interrelated activities.

  - Define a problem or opportunity in a systems context.
  - Gather data describing the problem or opportunity.
  - Identify alternative solutions.
  - Evaluate each alternative solution.
  - Select the best solution.
  - Implement the selected solution.
  - Evaluate the success of the implemented solution.

Types of information system:

Executive Support Systems (ESS)
- This type of IS was designed to help senior management support the business and make strategic decisions.
- It gathers, analyses and summarizes the key internal and external information used in the everyday business.
- It supports an inventory of all present information assets; projected revenue figures based on new product sales expectations and reasonable sales figures between one week and the next.
- For example, a CEO may require overall sales for the company, along with sales for every department separately, and general economic data for the year.

Management Information Systems (MIS)
- MIS is mostly concerned with internal sources of information.
- These systems usually take data from the transaction processing systems and summarize it into a series of management reports.
- MIS is an information system that generates exact, timely and structured information so managers and other users can make decisions, resolve problems, supervise activities, and track progress.
- For example, complied data of call volume in a call center with abandon % and call service levels for every hour, every day and monthly summary.

Decision Support Systems (DSS)
- DSS is an information system intended to help users reach a decision when a decision-making situation arises.
- This system comprises tools and techniques to help collect relevant information and analyze the choices and alternatives.
- DSS usually involves use of complex spreadsheet and databases to create models which will help determine difficult situations and its possible outcomes.

Knowledge Management Systems (KMS)
- KMS exist to help businesses create and share various information.
- These are typically used in industries where employees create new knowledge and expertise – which can then be shared by other people in the organization to create additional commercial opportunities.
- Good examples include firms of lawyers, training related businesses, accountants and management consultants.

Transaction Processing Systems (TPS)
- TPS are designed to process repetitive transactions efficiently and accurately.
- A business will have many (sometimes several) TPS; e.g.: billing systems to send invoices and statements to clients; systems which calculate weekly or monthly payroll and tax payments; stock control systems to route all transactions into, within and out of the business; production and purchasing systems to analyze and calculate all raw material requirements.

Office Automation Systems (OAS)
- OAS are systems that try to improve the efficiency of employees who need to process data and information.
- The best example is the wide range of software systems that exist to improve the productivity of employees functioning in an office (e.g., Microsoft Office) or systems that allow personnel to work from home or while on the move.
- Another good example would be salesforce system which is a ticketing system used to process IT information in the office and on the go.

Effectiveness and efficiency criteria in information system

- **Efficiency**: It is a measure of the number of resources required to achieve the output which is use of resources to get results. Being efficient implies that the system is operating in the right way.

- **Effectiveness**: Research to quality of output from the system. Effectiveness means doing the right thing in the right manner so that desired result may be achieved.

The relationship between efficiency and effectiveness is that effectiveness is the measure of goodness of the output.
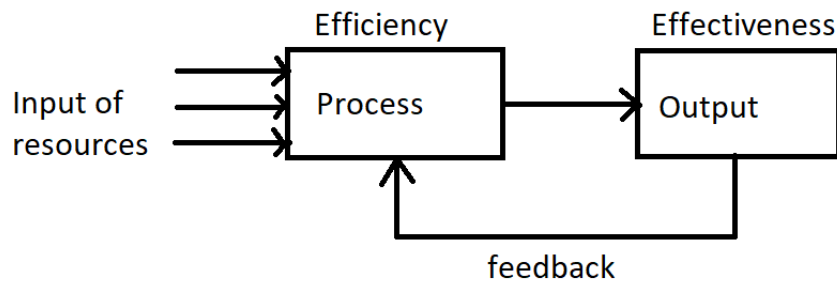
Following attributes measure the effectiveness of the information system.
- Timeliness
- Accuracy
- Completeness
- Adequacy
- Secured
- Exception based