Introduction to Systems Analysis and Design Concepts and Environment

[Chapter 1]

System Analysis and Design

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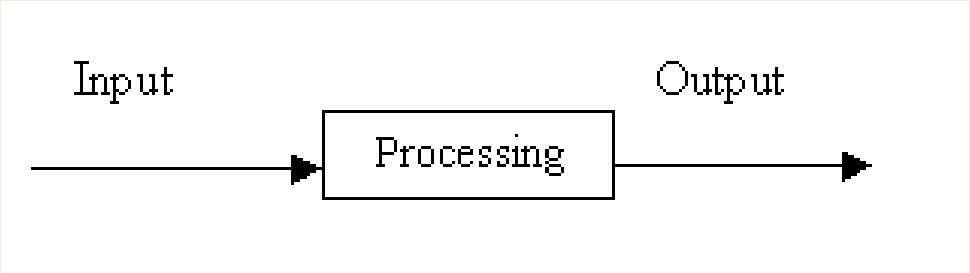
What is Systems Analysis and Design?

- Systems are created to solve problems.
- Think of the systems approach as an organized way of dealing with a problem.
- System Analysis and Design, mainly deals with the software development activities.

Defining A System

- This term is derived from a Greek word *systema* which means an organized relationship among functioning units and components.
- A collection of components that work together to realize some objective forms a system.
- Basically there are three major components in every system, namely input, processing and output.



Defining A System

- **Systems Analysis**: understanding and specifying in detail ***what*** an information system should do

- **System Design**: specifying in detail ***how*** the parts of an information system should be implemented

Characteristics of a system:

- organization (order),
- interaction,
- interdependence,
- integration
- central objective

Characteristics of a system:

1. Organization
   - structure and order
   - Example: Hierarchical organization in a company.
   - Computer system: organization of various components like input devices, output devices, CPU and storage devices

2. Interaction
   - Between sub systems or the components
   - Example: the main memory holds the data that has to be operated by the ALU.

Characteristics of a system:

3. Interdependence
   - Component linkage
   - Component dependence

4. Integration
   - How subsystems are tied together to achieve the system objective

5. Central Objective
   - Should be known in early phases of analysis

Elements of a System

A system is a set of components working together to achieve some goal.

The basic elements of the system may be listed as:

- Resources- Hardware, Software and liveware (human)
  - Example: Banking system- computers, trained staff
- Procedures- set of rules to accomplish the goal of the system.
  - Example: Banking systems have their predefined rules for providing interest at different rates for different types of accounts.
- Data/Information -inputs/outputs

Elements of a System

- Intermediate Data- intermediate transformation of data before final output
  - Output depends on it

- Processes-operational elements to convert i/p into o/p
  - Example: the processing of a cheque as a process.
  - A cheque passes through several stages before it actually gets processed and converted

- Environment
  - System should adapt to the environment

Elements of a System

- Feed Back

  Compares the output against a performance standard.

  Useful to improve the system to meet the user needs.

  – Example: Y2K problem for computer systems. Those systems, which are not Y2K compliant, will not be able to work properly after year 2000. For computer systems to survive it is important these systems are made Y2K compliant or Y2K ready.

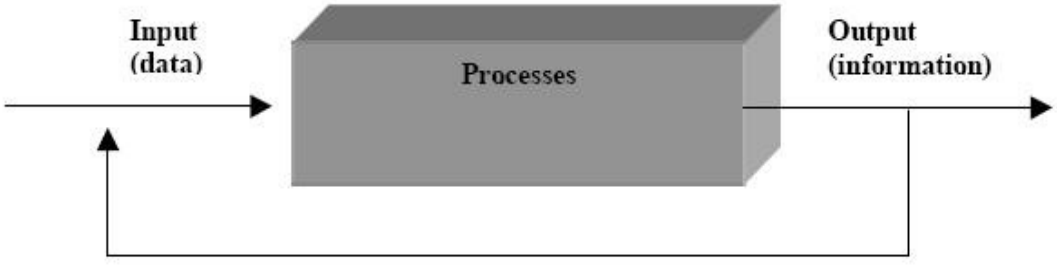


Fig 1.1
A system converts input data into output information

Elements of a System

- Boundaries and Interfaces
  - Every system has defined boundaries within which it operates. Beyond these limits the system has to interact with the other systems.
  - Interfaces are another important element through which the system interacts with the outside world
    - Should be customized to the user needs. These should be as user friendly as possible.