SYSTEMS AND NETWORK ADMINISTRATION
INSY3072

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Chapter One

SYSTEMS CONCEPTS

System theory

System

- A set of elements or components that interact to accomplish goals

- A combination of components working together

- A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective.

System theory

- a system is a set of interrelated elements, with inputs and outputs, and with a set of processes which convert inputs into outputs.

- A system is defined as a set of objects together with relationship between the objects and between their attributes related to each other and to their environment so as to form a whole.

Components of a system
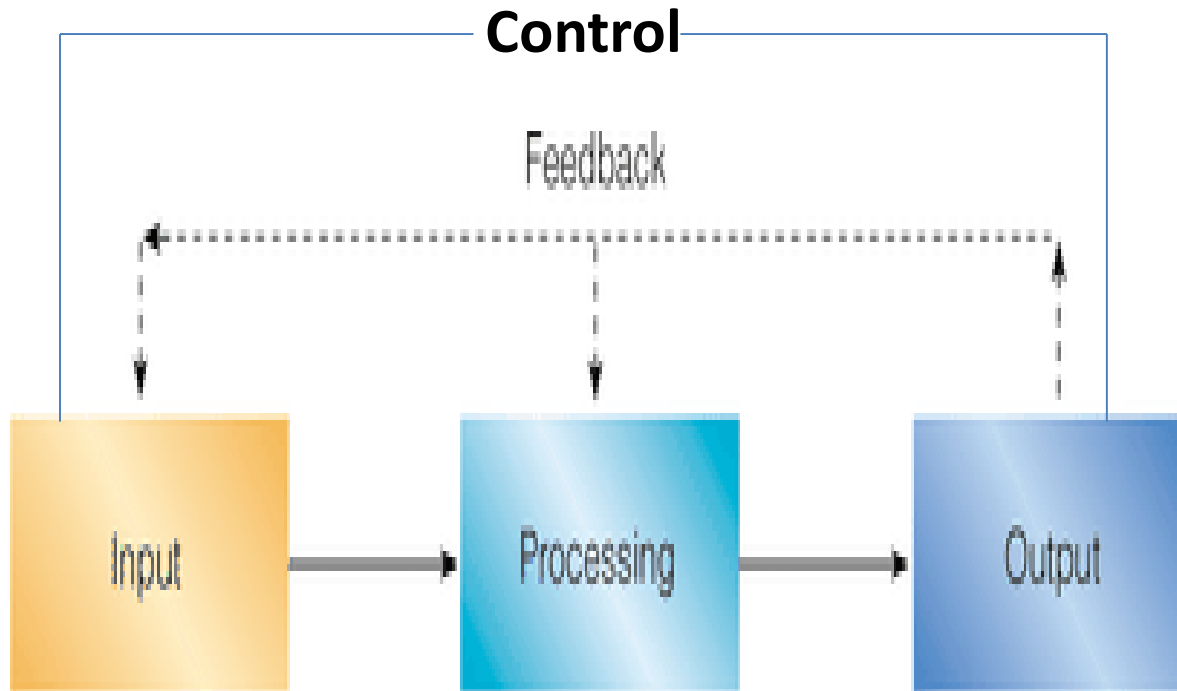
System theory

- A system is an entity which maintains its existence through the mutual interaction of its parts. The key emphasis here is one of "mutual interaction," in that something is occurring between the parts, over time, which maintains the system. A system is different than a heap or a collection.

- System is a collection of parts that interact with one another to function as a whole. However, a system is more than the sum of its parts – it is the product of their interactions.

Characteristics of a System

- *Environment:* A system does not exist in a vacuum, it exists and functions in an environment containing other systems

- *Subsystem*: A system that is a component of a larger system

- *Boundary*: A system separated from its environment

- *Interface*: Several systems may share the same environment

- *Open System*:Interacts with other systems

- *Closed System*: Does not interact

- *Adaptive System*: Modify themselves to meet the demands of a changing environment

Systems thinking

- Systems thinking is a mind set or way of viewing the world as a system.
- It helps to see the big picture; it also helps to break problems down to their components to avoid complexity.

- "A system is bigger than the sum of its components"

Information System

Information System

- An **information system** (IS) is a set of interrelated components that collect, manipulate, store, and disseminate data and information and provide a feedback mechanism to meet an objective

- **Examples:** ATMs; airline reservation systems; course enrollment systems

Information System

- Information system is an arrangement of people, data, processes, communication, and information technology that interact to capture, transmit, store, retrieve, manipulate and/or display information needed to support and improve day-to-day operations in a business as well as support the problem solving and decision making needs of management and other users.

Computer-based Information System (CBIS)

- **Computer-based information system (CBIS)** uses computer technology to perform input, processing & output activities

- **CBIS** consists of:
  - **Hardware**
  - **Software**
  - **Databases**
  - **Telecommunications & networks**
  - **People**
  - **Procedures** that are configured to collect and process data into information

Types of Information Systems

- **Based on the part of the business that they support (Business types)**
- Sales, Manufacturing, Finance, etc.
  - HRMS   Human Resource Management System
  - BS   Billing System
  - FMS   Finance Management System
  - MMS   Materials Management System
  - PMS   Project Management System
  - AMS   Audit Management System
  - FMS   Fleet Management System

Types of Information Systems

- Transaction Processing Systems
- Management Information Systems
- Decision Support Systems
- Executive Information Systems -- Expert Systems
- Office Automation Systems
- Knowledge Work Systems
- Enterprise Resource Planning (ERP) Systems
- Geographical Information Systems
- E-commerce Systems
- Multi-media Systems
  - **differences in:**
    - users
    - size, scope
    - complexity, certainty, familiarity

Organizational Information System

- In an organization of any size, there is an organization function responsible for the technology, activities and personnel to support its technology-enabled work systems and the information and communication needs of the organization.

Information System

- Information systems and the organizations they support are complex, artificial, and purposefully designed.

- They are composed of people, structures, technologies, and work systems

- In organizations, the term Information System (IS) refers to both:

  - the systems that deliver information and communication services to an organization

  - the organization function that plans, develops, operates, and manages the information systems

Information systems management

Information systems management

- The management of the systems, activities, and data that allow information to be effectively acquired, stored, processed, accessed, communicated and archived.

- Information System Management includes the manipulation, , re-organization, analysis, graphing , charting and presentation of data for specific management and decision-making purpose

IS/IT Department

- Why do you need to know about IS/IT department?
- What are the responsibilities of the IS/IT department?
- How is the IS/IT department organized?
- What IS/IT related jobs exist?
- What are your responsibilities?

Why do you need to know about IS/IT department?

- Need to know the duties and responsibilities of the IT department is to be an effective user of IT resources
- To be a better informed and more effective manager/executive

What are the responsibilities of the IS/IT dept?

There are 4 major responsibilities
- Plan for information systems and IT infrastructure
- Develop and adapt information systems and IT infrastructure
- Maintain and operate IS and IT infrastructure
- Protect infrastructure and data

Plan for information systems and IT infrastructure

- Position its activities to further advance the competitive strategy and improve decision making

- Test new technologies and adapt infrastructure to meet business goals

- Agile enterprise: quickly and effectively modify IT and IS activities to ever changing business and market conditions

Develop and adapt information systems and IT infrastructure

- IT infrastructure such as computers, networks, servers, etc. must be deployed and applied to advancing the business strategy

- Software and systems such as email and VPN access must also be created and applied

Maintain IS and operate and maintain IT infrastructure

- Systems not only setup, but they must be maintained, adjusted, and repaired

- Maintaining network connectivity is a crucial element of IT department's responsibilities since loss of connectivity can have far reaching consequences

Protect infrastructure and data

- Major threats come from human error, malicious human activity, and natural events and disasters

- IT departments need to understand the risks and specify safeguards against them

- Work with management to assess cost-benefit of implementing potentially costly safeguards