Introduction to Systems and Information Systems

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Today's Objectives

You will be able to:

- Understand the concept of systems
- Elaborate on the elements of a system
- Define the types of system
- Explain different types of information systems
- Discuss the importance of information system for business

Introduction

- A system is a collection of components that are interrelated and work together to perform a function.
- Examples:
  - Software engineers: programs performing a task
  - Electrical engineers: electricity supply
  - Transport services: city bus system
- Systems integrate entities to achieve defined objectives.

Characteristics of a System

1. **Core Objective** – defines purpose of system
2. **Interdependence** – subsystems depend on each other
3. **Integration** – all parts woven into one
4. **Interaction** – change in one affects others
5. **System Organization** – workflow, communication, chain of command

Elements of a System

1. Inputs
2. Processor
3. Control
4. Environment
5. Output
6. Feedback
7. Boundaries / Interface

Inputs

Characteristics of good inputs:

- Accuracy
- Timeliness
- Relevance
- Reliability
- Cost Effectiveness
- Sufficient Quantity

Processor, Control, Environment

- **Processor** – transforms input into output using programs/software.
- **Control** – monitors and regulates system activities.
- **Environment** – external factors influencing system performance.

Output, Feedback, Boundaries

- **Output** – end result (product, service, information).
- **Feedback** – compares actual vs. expected output.
- **Boundaries/Interface** – limitations defining system scope and integration with other systems.

Types of Systems

1. Open and Closed Systems
2. Physical and Abstract Systems
3. Deterministic and Probabilistic Systems
4. Man-Made Information Systems

Open vs Closed Systems

Open Systems

- Interact with environment
- Adaptable, effective

Closed Systems

- Do not interact with environment
- Rare, conceptual, short-lived

Physical vs Abstract Systems

Physical Systems:

- Tangible, measurable, static or dynamic
- Example: Refrigeration system

Abstract Systems:

- Conceptual, theoretical models
- Example: Einstein's Theory of Relativity

Deterministic vs Probabilistic Systems

Deterministic Systems:

- Predictable, known outputs for known inputs
- Certain interrelationships

Probabilistic Systems:

- Uncertain outcomes
- Controlled by chance events
- Provide probable estimates

Man-Made Information Systems

- Formal Information System – memos, instructions, official flow
- Informal Information System – employee-based, problem-solving
- Computer-Based System – dependent on IT (e.g., railway reservation, banking system)

Computer-Based Information Systems (CBIS)

- **Definition:** Arrangement of people, data, processes, and technology to support operations, problem-solving, and decision-making.
- Can be manual or computerized

Major Types:

- Invoicing, Accounts (receivable/payable)
- Purchase and Sales Order Processing
- Payroll preparation
- Inventory control systems

Summary

- Systems are structured sets of components working toward objectives
- Elements include input, processing, output, feedback
- Systems are classified as open/closed, physical/abstract, deterministic/probabilistic
- Man-made systems include formal, informal, and computer-based
- CBIS play a vital role in supporting business operations