System Analysis

Syllabus

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5.	• **System Analysis** • Introduction and types of System • Principles of System Development • Organization as a System • Measurement of System Performance • System control • System Modeling • Structured System Analysis	5

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Unit	Contents	Lectures
5.	• **System Analysis …** • Information Systems Input Process Output Store Control	

Introduction to System

- System is defined as a collective entity consisting of groups of elements that are interdependent, interrelated and that interact to achieve certain predefined objectives.
- System is having following layers
  - Conceptual
  - Logical
  - Control
  - Operational

Conceptual Layer of System

- In conceptual layer, the system objectives, system scope and interface with other systems are defined.

Logical Layer of System

- In logical layer, the rules and regulations, functions, processes, procedures, data flows and process flows are defined.

Control Layer of System

- In control layer, the controls based on the constraints are defined to achieve the desired results.

Operation Layer of System

- In operation layer, the user interfaces, data entry, operation flows and maintenance structure are defined.

Types of System

- System is classified on the basis of the nature of outputs and openness of the system as classification criteria.
- There are following types of system
  - Deterministic
  - Probabilistic
  - Closed
  - Open

Principle(s) of System Development

- System is basically built with the principles to ensure effective system design.
- The principles used in the development of the system are
  - Decomposition
  - Simplification
  - Decoupling

Organization of System

- In order to achieve the effective and efficient functioning of the system, it is desirable to understand the organization of the system itself.
- A functional system operates on a business platform that prevail is any business organization system.
- There are five interrelated components working to achieve an organizational goal.
- They are
  - Task

Organization of System …

- Technology
- Structure
- People
- Culture

How the Organization of System Affect the Task?

- Task
  - Current Task
  - Method used to Resolve the Current Task
  - The Complexity of Task
  - The Performance of Current Method
  - Task Management

How the Organization of System Affect the Technology?

- Technology
  - Current Technology
  - Effect of Current Technology on New Technology
  - Level of usage of
    - Tools
    - Standards
    - Methods

How the Organization of System Affect the Structure?

- Structure
  - Business Structure
  - Management Structure
  - Worker Structure
  - Organization Hierarchy Structure

How the Organization of System Affect the People?

- People
  - Capacity
  - Capability
  - Maturity

How the Organization of System Affect the Culture?

- Culture
  - Attitudes
  - Behaviour
  - Adaptation Skills
  - Learning

Measurement of System Performance

- There are two measures through which the measurement of the system performance can be done.
- They are
  - **Effectiveness**
    - Measures the Quality of the Output
  - **Efficiency** measures the
    - Effort
    - Cost
    - Time involved to achieve the system output

System Control

- System and control are two faces of same coin. They are non separable.
- In order to maintain the effectiveness and efficiency of the system under consideration, we have to ensure that the states system objectives are to be achieved at any cost.
- As we know that the system is dynamic and the changes are bound to occur due to the influence of various environmental factors.

System Control …

- Stress is given on the development of the Information System that is smart enough to anticipate that when, where and how the system is going to be out of the control?
- Control is defined as the system function that compares the current output with the predetermined standard, whereas feedback is defined as a system function that provides information on the degree of deviation that is experienced between the current system output and the predetermined standard.

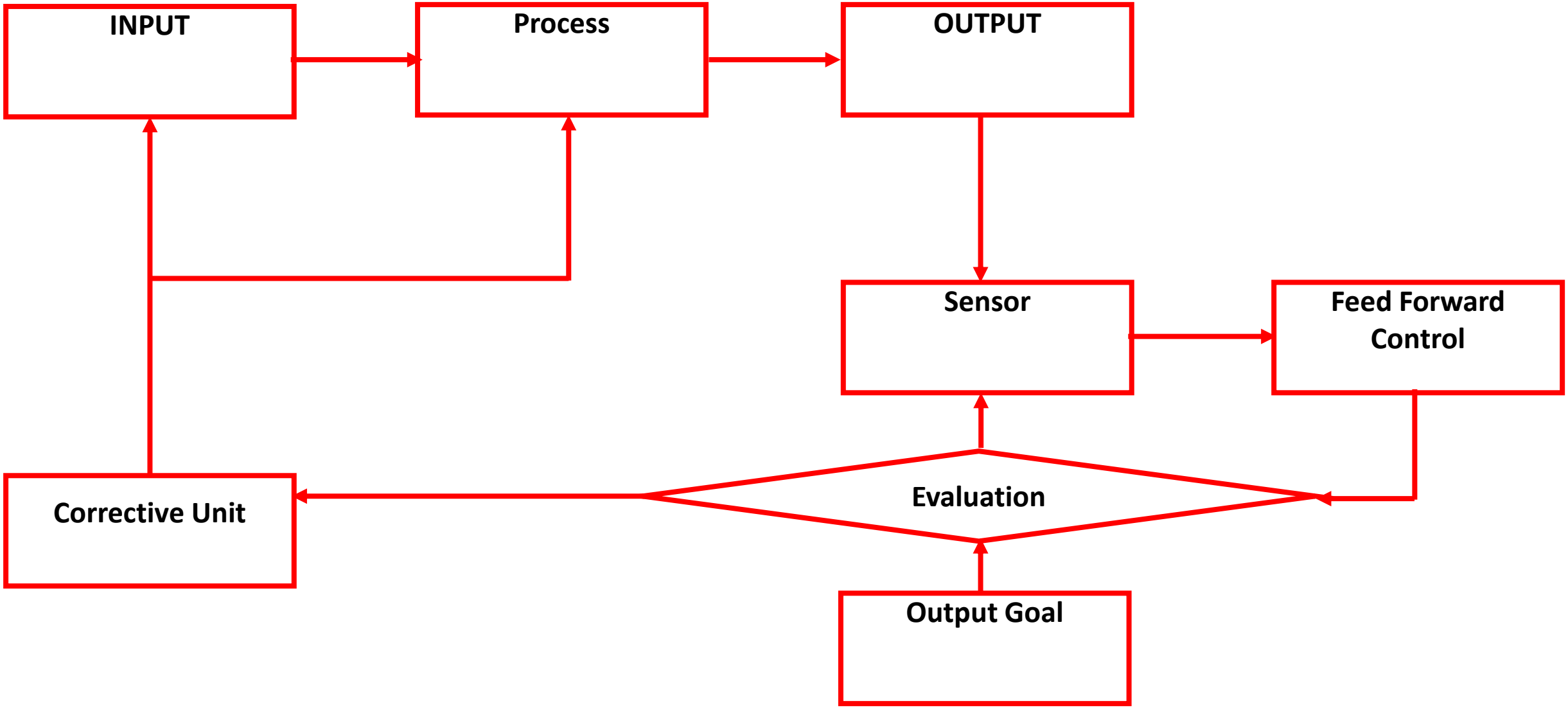
System Control …

- The information achieved at the feedback stage is used to design the corrective mechanism.
- Corrective mechanism is defined as the system component that acts on input and process the same to obtain correct output of the desired standard.

Elements of System Control

- Setting of the Standard of Performance
- Measurement of Performance against the above Standard
- Correction of the deviation from the laid down standard.
- The example of System Control System is “Feed Forward Control”.

Elements of System Control …



Elements of System Control

- Setting of the Standard of Performance
- Measurement of Performance against the above Standard
- Correction of the deviation from the laid down standard.
- The example of System Control System is “Feed Forward Control”.

Feed Forward Control System

- Input
  - Physical
  - Managerial
  - Data
  - Information

Feed Forward Control System …

- Process
  - Manipulation
  - Transaction
  - Processing
  - Decision Making

Feed Forward Control System …

- Output
  - Tangible Output(s)
  - Physical Output(s)
  - Output Measures

Feed Forward Control System …

- Sensor
  - Output Metrics

Feed Forward Control System …

- Feed Forward Control
  - Forecasting
  - Projecting
  - Analysis

Feed Forward Control System …

- Corrective Unit
  - Management Decision

Feed Forward Control System …

- Output Goal
  - Physical Standards
  - Output Metrics

System Modelling

- UML Tools are used understand and model the system under consideration.
- The model henceforth designed is used for the analysis of the system.
- The software engineer develops a model to represent the system view under consideration and to explain the behaviour of various components of the system.

Structured System Analysis

- Structured System Analysis is the process that tries to reveal different system perspectives.
- At the end of the analysis, the system engineer can
  - Understand the environment of the system
  - Create a new system model out of Business Process Engineering
  - Conceptualize System Organization Structure and Workflows.
  - Construct Behaviour Model of Data, Process and Application

Structured System Analysis …

- Acquire Information about Critical Problems, Processes and Mission Critical Applications
- Ascertain the Economic, Operational, technical and Organizational Feasibility of the System.

Information System

- Input
- Process
- Output
- Store
- Control