

Introduction to Systems Analysis and Design Concepts and Environment

[Chapter 1]

System Analysis and Design

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Real-Life business sub system

1. Production sub system:

- Related to production of goods and services.
- Main problems involved are:
 - Plant Location
 - Plant layout
 - Production policy(how much unit has to be produced)
 - Purchase and inventory control.
 - Production planning and control
 - Quality and cost control.



Real-Life business sub system

2. Materials Management sub system
 - Purchase of material(quality and cost)
 - Storage and handling of material.
3. Financial Management sub system
 - Proper utilization of funds
 - Various issues involved like dividend policy etc.
4. Personnel Management sub system
 - Deals with people at work
 - Planning man-power
 - Recruitment
 - HR policies
5. Marketing Management sub system
 - Marketing strategies
 - Increasing the sales and thus the profit.



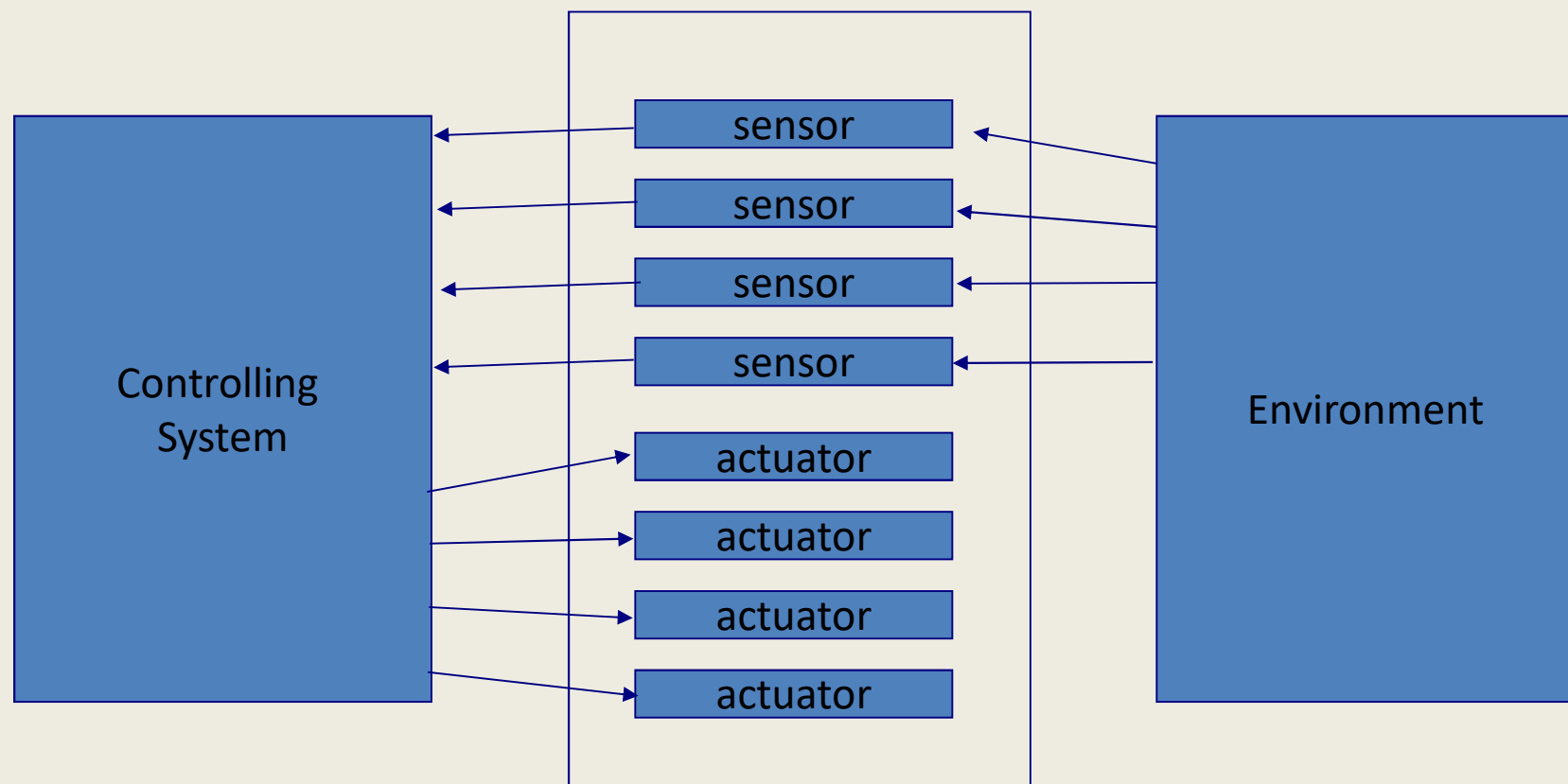
Real-Time system

- Real-time systems have been defined as: "those systems in which the correctness of the system depends not only on the logical result of the computation, but also on the **time** at which the results are produced"
- Real-time systems often are comprised of a
 - *Controlled system*
 - *environment.*
 - Controlling system: acquires information about environment using sensors and controls the environment with actuators.



Real-Time system

Controlled System



Hard versus soft real time system



- **Hard:** failure to meet constraint is a fatal fault.
- Validation system always meets timing constraints.
 - Deterministic constraints
 - Probabilistic constraints
 - Constraints in terms of some usefulness function.
- **Soft:** late completion is undesirable but generally not fatal.
- No validation or only demonstration job meets some statistical constraint.
- Occasional missed deadlines or aborted execution is usually considered tolerable.
- Often specified in probabilistic terms



Distributed system

- A distributed system is a collection of independent computers that appear to the users of the system as a single system.
- Examples:
 - Network of workstations
 - Distributed manufacturing system (e.g., automated assembly line)
 - Network of branch office computers

Advantages of Distributed Systems



- **Economics:** cost effective way to increase computing power.
- **Speed:** a distributed system may have more total computing power than a mainframe.
- Ex. 10,000 CPU chips, each running at 50 MIPS. Not possible to build 500,000 MIPS single processor since it would require 0.002 nsec instruction cycle.
- **Reliability:** If one machine crashes, the system as a whole can still survive. Higher availability and improved reliability.
- **Incremental growth:** Computing power can be added in small increments. Modular expandability



- **Data sharing:** allow many users to access to a common data base
- **Resource Sharing:** expensive peripherals like color printers
- **Communication:** enhance human-to-human communication, e.g., email, chat
- **Flexibility:** spread the workload over the available machines

Disadvantages of Distributed Systems



- **Software:** difficult to develop software for distributed systems
- **Network:** saturation, lossy transmissions
- **Security:** easy access also applies to secrete data

Basic Principles of a successful system



So,

- System should be of use for the user.
- Ready in time.
- Visible benefits
- Maintained effectively
- Well documented.