



# Service and System thinking

## Department of Computer Systems and Communications

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### Key concepts of Systems Thinking

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## Contemplative Questions

- What is systems thinking?
- Why do 'systems thinkers' get promoted?
- How does the field of information systems benefit from concepts of systems theory?
- How can we use these concepts in the real world?



# Systems Thinking

- A system is an interrelated set of business procedures used within one business unit working together for a purpose
- A system has nine characteristics
- A system exists within an environment
- A boundary separates a system from its environment

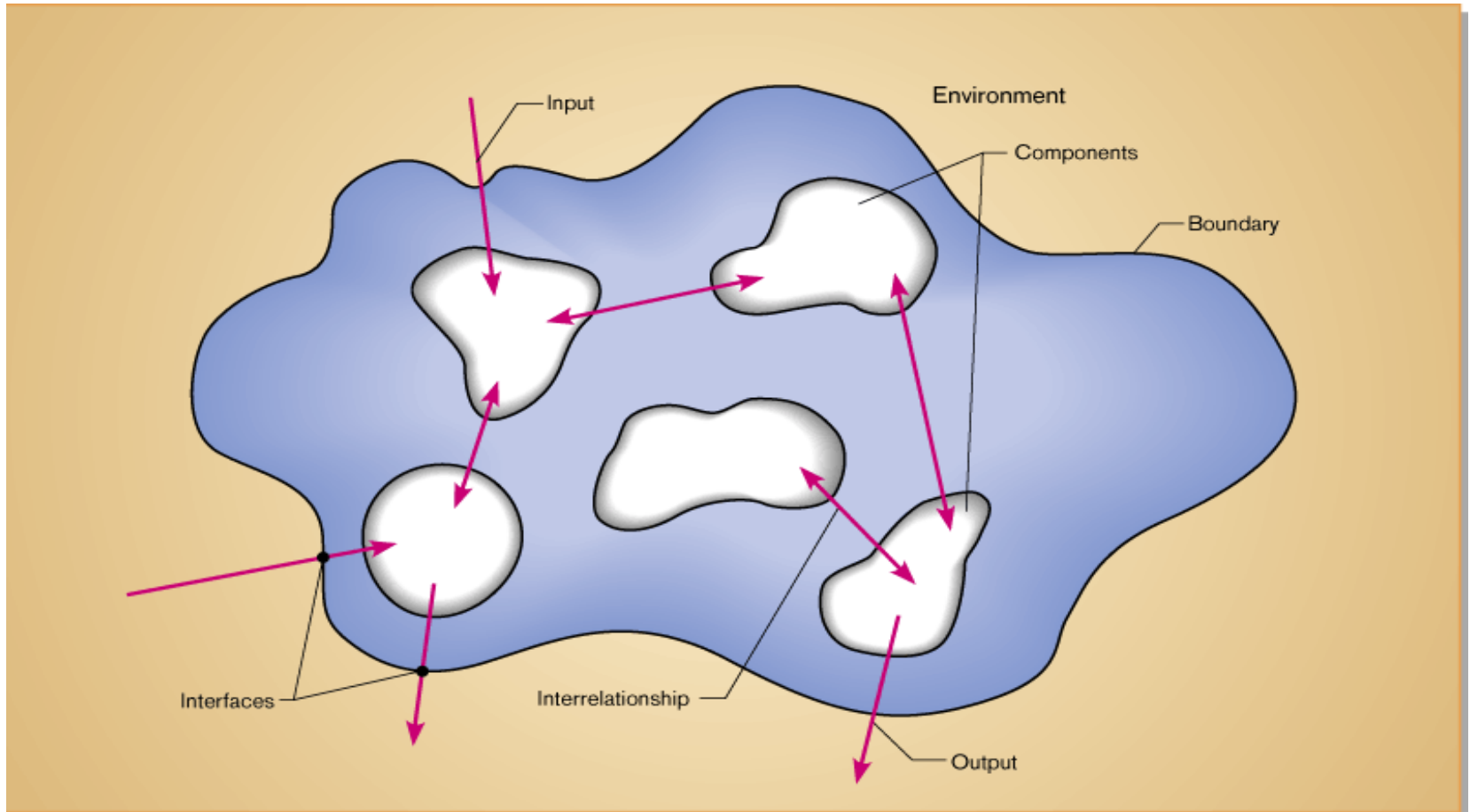


# Characteristics of a System

- Components
- Interrelated Components
- Boundary
- Purpose
- Environment
- Interfaces
- Input
- Output
- Constraints



# Characteristics of a System



## Important System Concepts

- The process of breaking down a system into smaller components
- Allows the systems analyst to:
  - Break a system into small, manageable subsystems
  - Focus on one area at a time
  - Concentrate on component pertinent to one group of users
  - Build different components at independent times



# Important System Concepts

## Modularity

- Process of dividing a system into modules of a relatively uniform size
- Modules simplify system design

## Coupling

- Subsystems that are dependent upon each other are coupled

## Cohesion

- Extent to which a subsystem performs a single function

Which is better:

More or less modularity?

High or low coupling?

High or low cohesion?



# Logical vs. Physical Modeling

- **Logical System Description**
  - Portrays the purpose and function of the system
  - Does not tie the description to a specific physical implementation
- **Physical System Description**
  - Focuses on how the system will be materially constructed





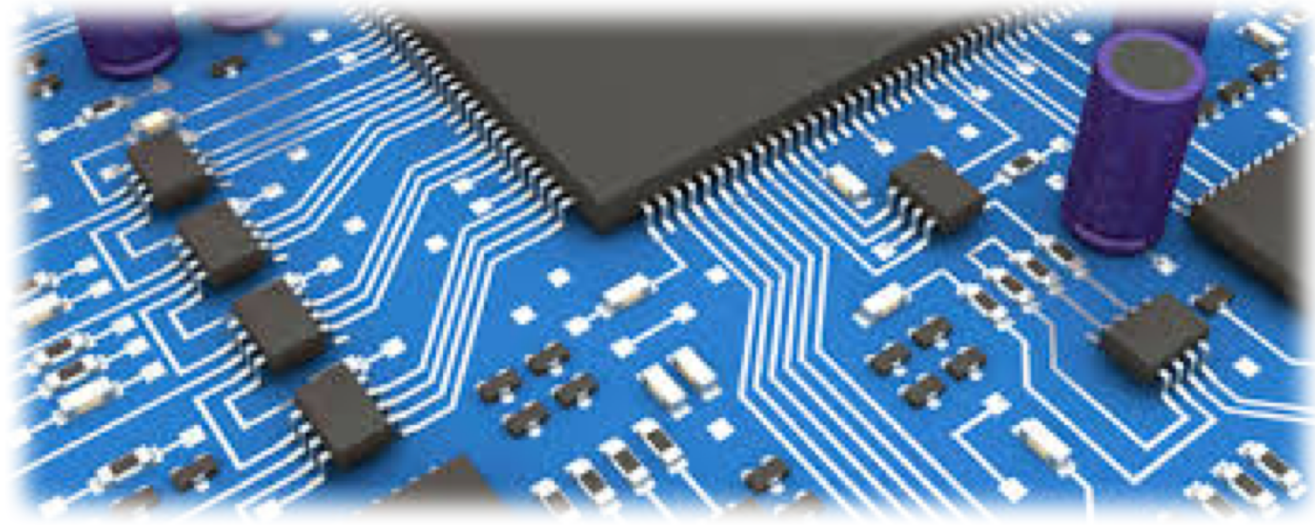
# Benefits

- Identification of a system leads to abstraction
- From abstraction you can think about essential characteristics of specific system
- Abstraction allows analyst to gain insights into specific system, to question assumptions, provide documentation and manipulate the system without disrupting the real situation



# Applying Systems Thinking to Information Systems

- Information systems are subsystems in larger organizational systems
- Data flow diagrams represent information systems as systems
  - Inputs
  - Outputs
  - System boundaries
  - Environment
  - Subsystems
  - Interrelationships





**Questions ???**

