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

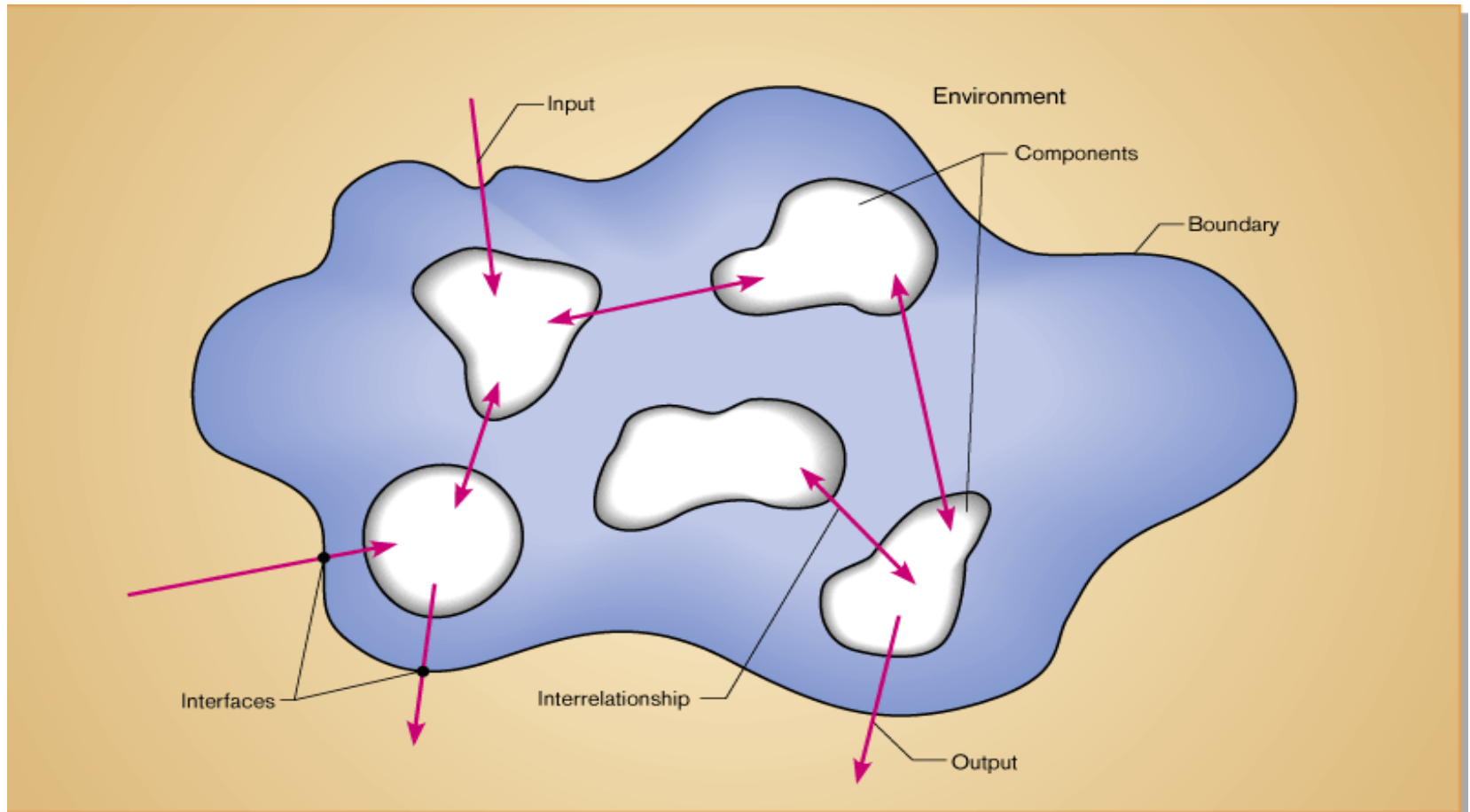- A boundary separates a system from its environment

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**

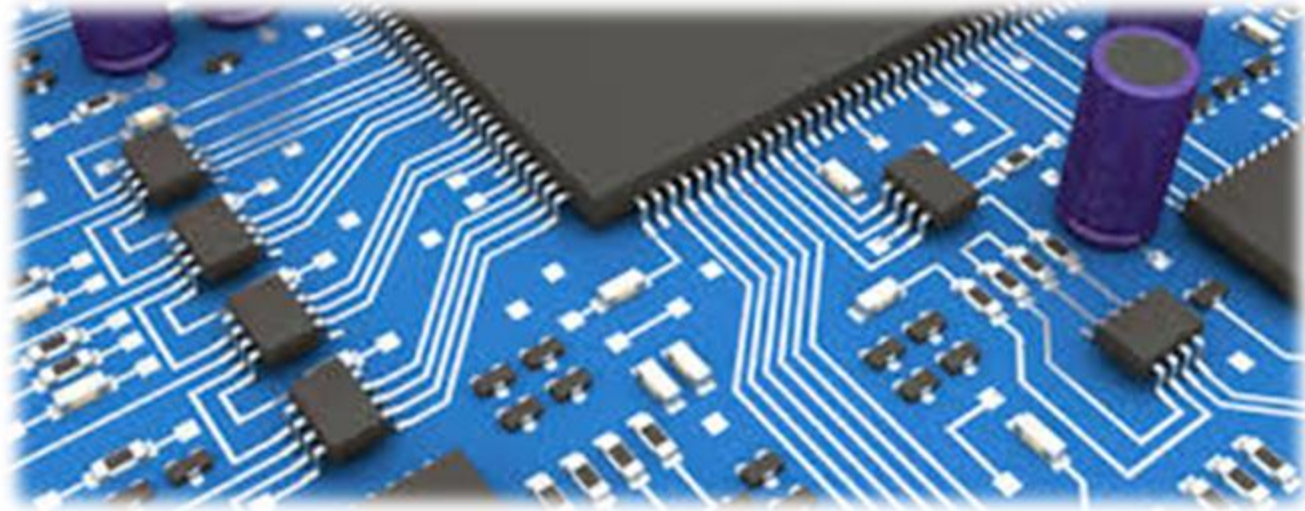   ◦ Focuses on how the system will be materially constructed

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 ???