King Saud University

College of Engineering

IE – 462: "Industrial Information Systems"

Fall – 2022 (1ˢᵗ Sem. 1444 H)

Introduction (Chapter 1)

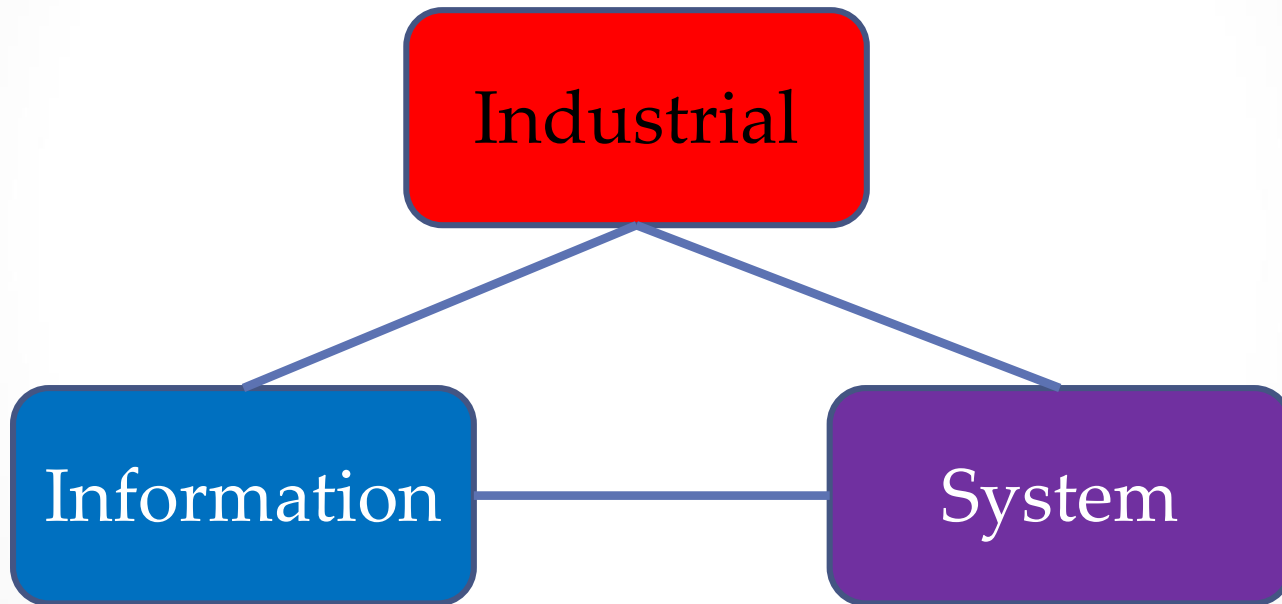*part 1 – Fundamentals Concepts regarding Information*

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Lesson Overview

Part 1:

- What is information?

- What is a system?

- What are Information Technologies (IT)?
    o IT role in industry / manufacturing
    o Types of software

- Why IS in industry?

Industrial Information System
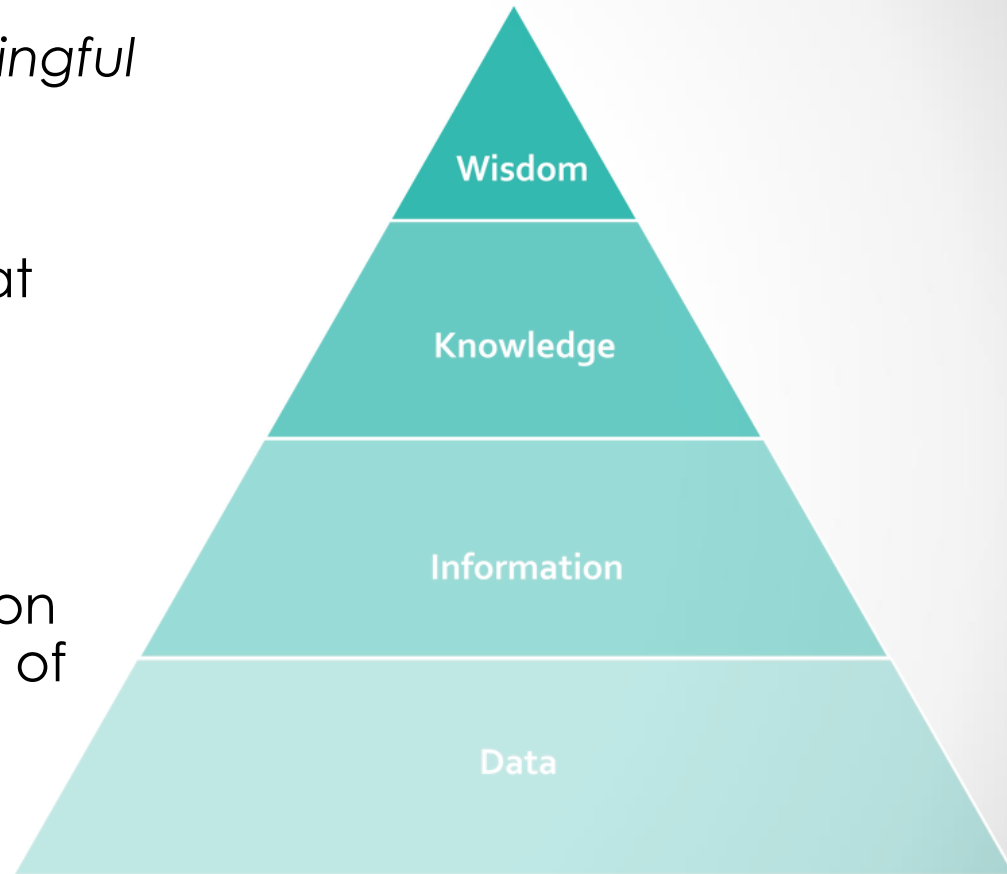
What is Information?

- **Information**:
  - Data put within a *meaningful context*
  - It is also *processed data* (data is raw material that proceeds to provide information)
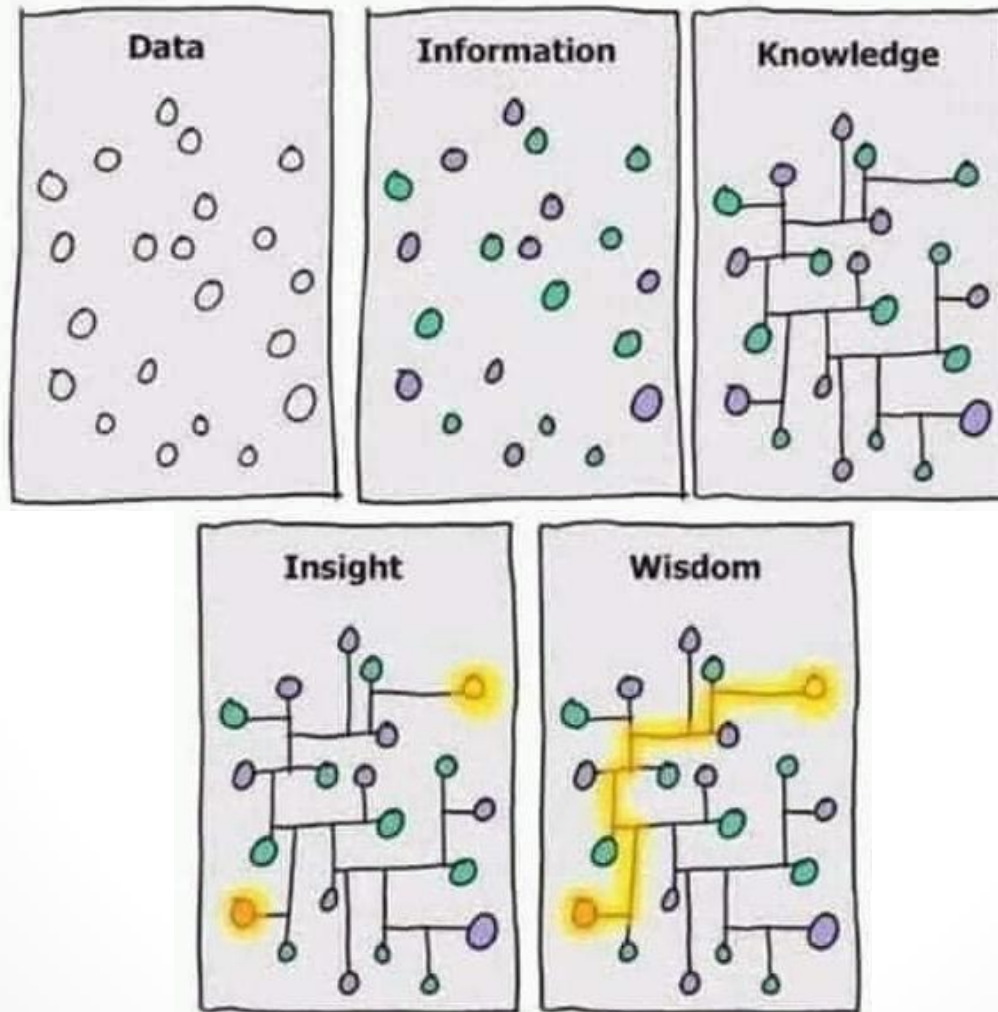
- **Knowledge**:
  - relationship or connection between several pieces of Information

- Information and knowledge are necessary for decision making

Wisdom

Knowledge

Information

Data

DIKW Pyramid

What is Information?

Definition of a System

- **General system definition**:
  - any collection of component elements that work together to perform certain task for achieving a known goal

- Systems are usually:
  - **hierarchical** and are

  - either **physical or logical systems** (e.g. university, power stations, mathematical models, automobiles, information system)

- **Information system**:
  - refers to collection or combination of programs, procedures, data or equipment

  - used in processing data (e.g. billing system, inventory systems)
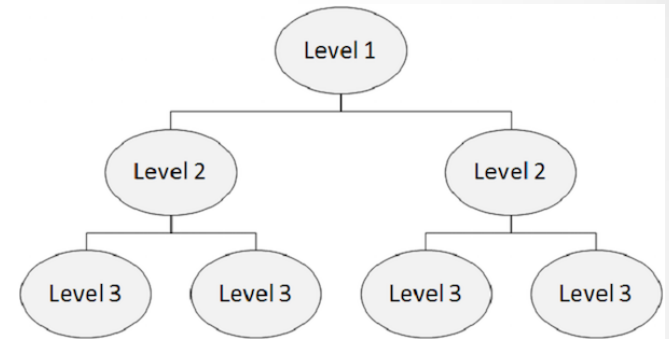
What is a System?
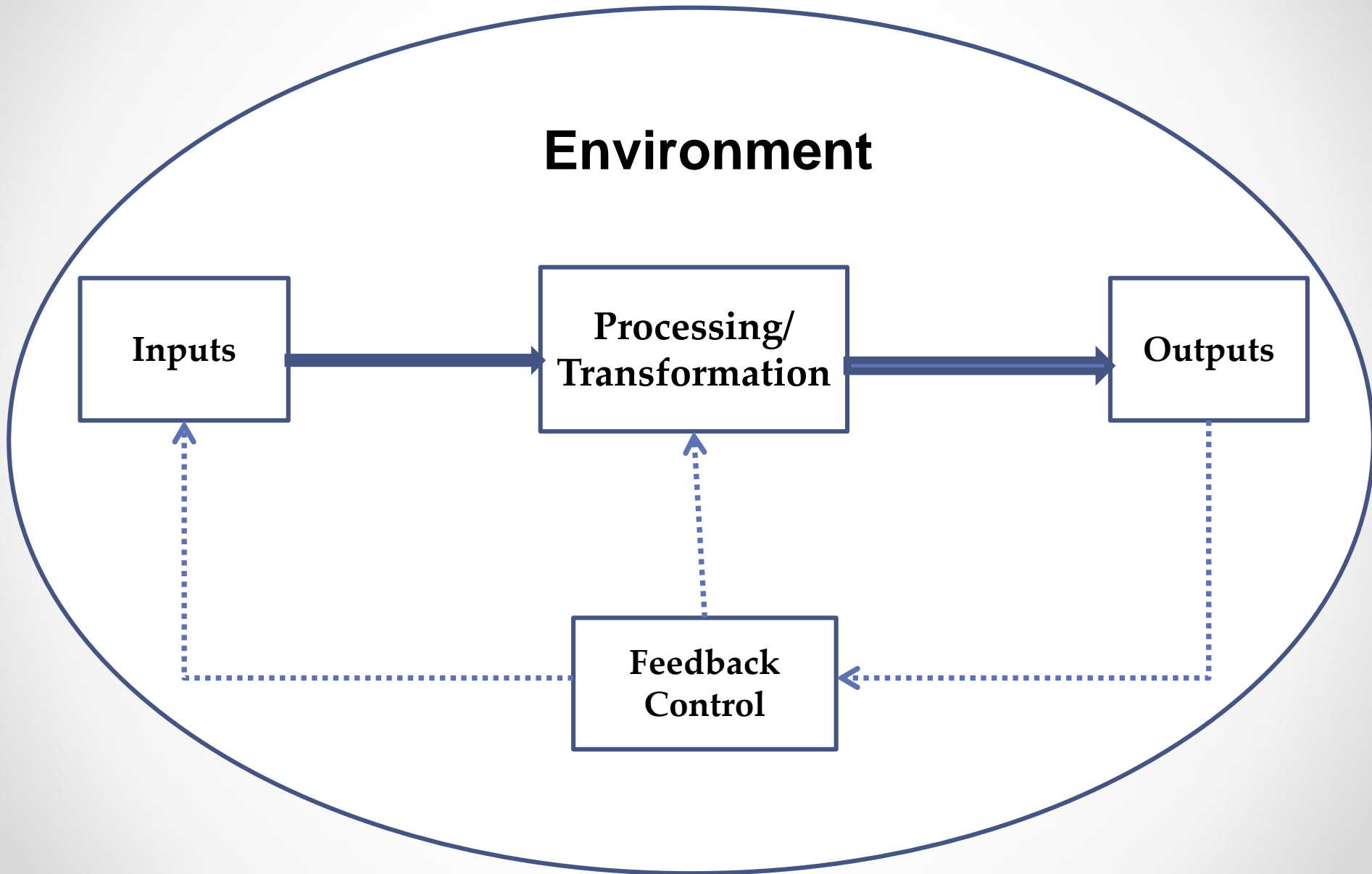
Classification of Systems

- Closed and Open system:
  - o **Closed system:** does not interact with environment

  - o **Open system:** interacts with environment; either affects or is affected by the environment

- Static and Dynamic systems:
  - o **Static system:** its components or goal does not change with time

  - o **Dynamic system:** its elements, their contents and goal may change with time

What are Information Technologies (IT)?

- Information needs to be stored, processed, and presented through some media, or technology, aka **IT**

- IT includes:
  - Hardware (e.g. computer systems, equipment, and devices)

  - Software

  - Communication technologies

IT Role in Industry / Manufacturing

- It is necessary to *manage* both
  - o **Material flow** (material processing) and

  - o **Information flow** (manufacturing information processing)

- IT:
  - o One of the major factors of productivity improvement

  - o Enables firms to integrate decision functions in subsystems required to manufacture and distribute a product

  - o e.g. in sales, purchasing, production planning, quality control, process control, and supply chain logistics

Computer Software

- **Information System** (IS):

    o Is a [computer software](#)

    o It is broad term given to the instructions that direct the operations of the hardware

- Basic types of software:

    o **Application software**

    o **End-user software**

    o **System development software**

    o **Systems software**

Types of software

1. **Application software**:

- o Process data for business activities, scientific applications, etc.

- o e.g. accounting, inventory, sales forecasting, application programs, CAD-CAM
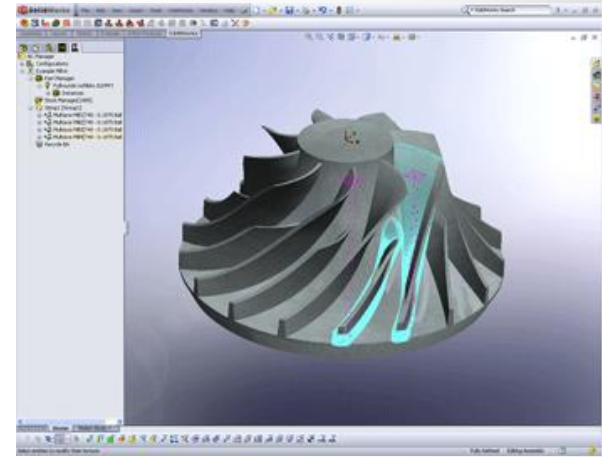
2. **End-user software**:

- o Multi-purpose software

- o e.g. spreadsheet (MS Excel), word processor (MS Word), Graphics package (Photoshop)

- o This is software directly used by the user, without programming

Types of software

3. **System Development Software:**
   - used by programmers and systems analysts
     in developing and constructing
     specific programs, and information systems

   - e.g. JAVA, PHP, ORACLE,
     Computer-aided Software Engineering

4. **System Software/Operating systems**
   - used to control internal operations of computer systems

   - e.g. operating systems, and
     data communication programs
     (Windows, Linux, MAC)
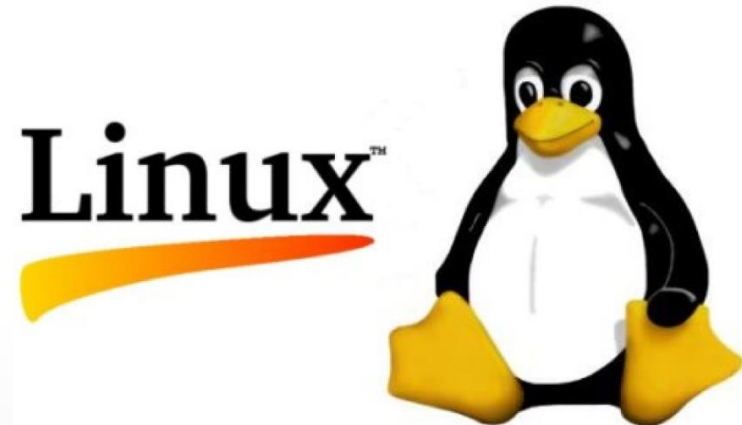
Why IS in Industry?

- Industrial firm:
    - o Set of activities, or processes, that interact with each other (creating and [exchanging information](#))

- Example:
    - o When *quality control* gives final approval to use material

    - o This is *information* passed on to *production* before production personnel can *process* the material