ACS-1803
Introduction to Information Systems

Instructor: Kerry Augustine

## Introduction to Information Systems

Lecture Outline 1

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## Introduction to Information Systems

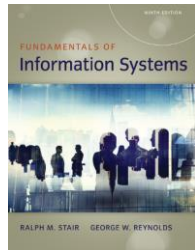▸ Instructor: Kerry Augustine
  k.augustine@uwinnipeg.ca

▸ Textbook:
  ▸ Stair, Ralph and Reynolds, George: *Fundamentals of Information Systems, Nineth Edition.*

▸ *Course Syllabus and Website*

  https://courses.acs.uwinnipeg.ca/1803-052/

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## Principles and Learning Objectives

▸ The value of information is directly linked to how it helps decision makers achieve the organization's goals
  ▸ Distinguish data from information and describe the characteristics used to evaluate the quality of data
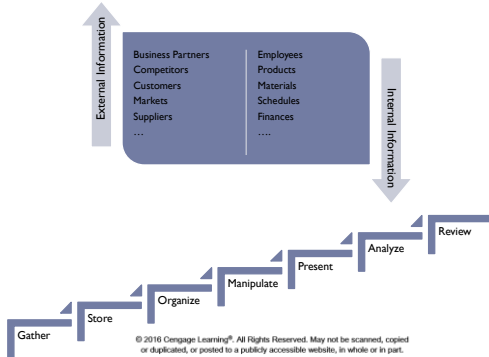
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## How do Computers Help Manage Organizations?

- ▸ Expediting tasks
  - ▸ Direct use of common application software (word processing, spread sheets, data management)
- ▸ Streamlining processes
  - ▸ Specifically developed <u>application systems</u> for different business areas (inventory system, library system)
- ▸ Managing Information
  - ▸ Information drives the organization in an information-based society

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## Managing Information



Business Partners
Competitors
Customers
Markets
Suppliers
…

Employees
Products
Materials
Schedules
Finances
….

External Information

Internal Information

Review
Analyze
Present
Manipulate
Organize
Store
Gather

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## Information as an Asset

- ▸ Valuable information helps people perform tasks more efficiently and effectively
  - ▸ Inaccurate data can result in loss of potential new customers and reduced customer satisfaction
- ▸ If an organization's information is not accurate or complete:
  - ▸ People can make poor decisions, costing thousands, or even millions, of dollars
  - ▸ Managers use experience, best guesses, luck…
  - ▸ Results in:
    - ▸ Over/under production
    - ▸ Misallocation of resources
    - ▸ Poor response time
  - ▸ End result: Poor outcomes, raise in costs, loss of customers

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## Data, Information, and Knowledge

- **Data:** raw facts
- **Information:** collection of data organized in such a way that they have value beyond the facts themselves
- **Process:** set of logically related tasks performed to achieve a defined outcome
  - Turning data into information is a process
- **Knowledge:** awareness and understanding of a set of information and the ways it can be made useful to support a task
  - The process of defining relationships among data to create useful information requires knowledge

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## Data, Information, and Knowledge (continued)
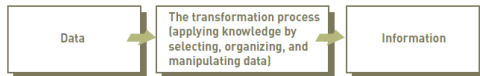
| Data | Represented by |
|------|----------------|
| Alphanumeric data | Numbers, letters, and other characters |
| Image data | Graphic images and pictures |
| Audio data | Sound, noise, or tones |
| Video data | Moving images or pictures |

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## Data, Information, and Knowledge (continued)

| Data | The transformation process (applying knowledge by selecting, organizing, and manipulating data) | Information |
|------|------|------|

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## The Value of Information

▸ Directly linked to how it helps decision makers achieve their organization's goals
▸ Valuable information:
  ▸ Helps people and their organizations perform tasks more efficiently and effectively
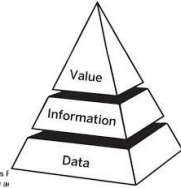
Value
Information
Data

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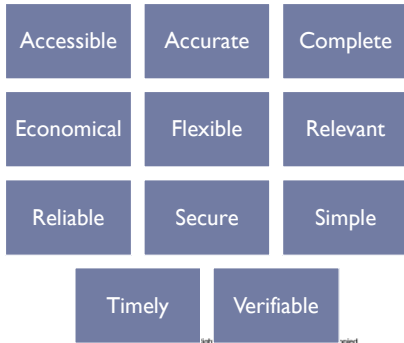---

## The Characteristics of Valuable Information

| | | |
|---|---|---|
| Accessible | Accurate | Complete |
| Economical | Flexible | Relevant |
| Reliable | Secure | Simple |
| Timely | Verifiable | |

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## Input, Processing, Output, Feedback

▸ **Input:** Activity of gathering and capturing raw data
▸ **Processing:** Converting data into useful outputs
▸ **Output:** Production of useful information, usually in the form of documents and reports
▸ **Feedback:** Information from the system that is used to make changes to input or processing activities
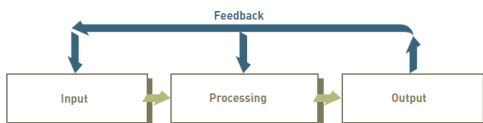
Feedback

Input → Processing → Output

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## Why Learn about Information Systems

- **Organizations** are the essence of economic, social, and political development in any society
- Information is one of an organization's most valuable resources
- Information helps decision makers achieve an organization's goals
- Information Systems change organizations and the way we live
  - Technology used for innovation (processes, products), Decision-making
- Professionals in technology and management require Information systems knowledge to participate in and lead organizational work
- To Consider:
  - What are examples of information do organizations require?
  - How is information managed?

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## Information Systems

- A set of interrelated components that collect, manipulate, and disseminate data and information and provide feedback to meet an objective

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## What is an information System

An Information System (IS) is a set of interrelated elements that:

- Collect (input)
- Manipulate (process)
- Store
- Disseminate (output) data and information
- Provide a corrective reaction (feedback mechanism) to meet an objective

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## Computer Information Systems – Component Groups

▸ Application components:
  ▸ Screens, menus, databases
▸ Technological components:
  ▸ *computer* and *telecommunication* technology (ICT – information and communication technology) – this is the backbone
    ▸ Hardware, software, telecommunications
▸ Organizational Components:
  ▸ Users, procedures

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## Manual and Computer-based Information Systems

▸ An information system can be Manual or Computerized
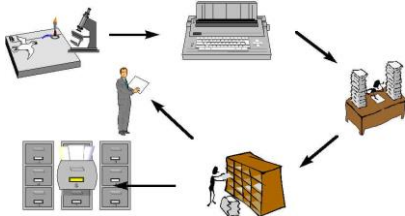
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## Information Systems - Elements

▸ Hardware:
  ▸ Consists of computer equipment used to perform input, processing, and output activities
▸ Software:
  ▸ Consists of the computer programs that govern the operation of the computer
▸ Database:
  ▸ Organized collection of facts and information, typically consisting of two or more related data files

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## Information Systems - Elements

- Telecommunications, Networks, and the Internet:
  - The electronic transmission of signals for communications
  - Networks: Connect computers and equipment to enable electronic communication
- People:
  - The most important element in most management information systems
- Procedures:
  - Include strategies, policies, methods, and rules for using the MIS
  - Procedure defines the steps to follow to achieve a specific end result
    - Such as enter a customer order, pay a supplier invoice, or request a current inventory report
  - Using a CBIS involves setting and following many procedures, including those for the
    - Operation, maintenance, and security of the system

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## Components of a Computer-based Information System (CBIS)

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## Three Fundamental Types of Information Systems

- Information systems can be divided into three types:
  - **Personal IS** – includes information systems that improve the productivity of individual users
  - **Group IS** – includes information systems that improve communications and support collaboration among members of a workgroup
  - **Enterprise IS** – includes information systems that organizations use to define structured interactions among their own employees and/or external customers, suppliers, government agencies, etc…

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## Three Fundamental Types of Information Systems

▸ For each type of IS, certain key organizational complements must be in place:
  ▸ Well-trained workers
  ▸ System support
  ▸ Better teamwork
  ▸ Redesigned processes
  ▸ New decision rights

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## Three Fundamental Types of Information Systems

TABLE **1.3** Examples and characteristics of each type of information system

| | Personal IS | Group IS | Enterprise IS |
|---|---|---|---|
| Examples | Personal productivity software, decision-support system | Email, instant messaging, project management software | Transaction processing systems, enterprise systems, interorganizational systems |
| Benefits | Improved productivity | Increased collaboration | Increased standardization and ability to monitor work |
| Organizational complements (including well-trained workers, better teamwork, redesigned processes, and new decision rights) | • Does not bring complements with it<br>• Partial benefits can be achieved without all complements being in place | • At least some complements must be in place when IS "goes live"<br>• Allows users to implement and modify complements over time | • Full complements must be in place when IS "goes live" |
| Manager's role | • Ensure that employees understand and connect to the change<br>• Encourage use<br>• Challenge workers to find new uses | • Demonstrate how technology can be used<br>• Set norms for participation | • Identify and put into place the full set of organizational complements prior to adoption<br>• Intervene forcefully and continually to ensure adoption |

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## The Role of Information Systems in Business

▸ Operational excellence:
  ▸ Improvement of efficiency to attain higher profitability
  ▸ Information systems, technology an important tool in achieving greater efficiency and productivity
  ▸ Walmart's Retail Link system links suppliers to stores for superior replenishment system



Alamy

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