ACS-1803
Introduction to Information Systems

Instructor: Victor Balogun

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Lecture Outline 1

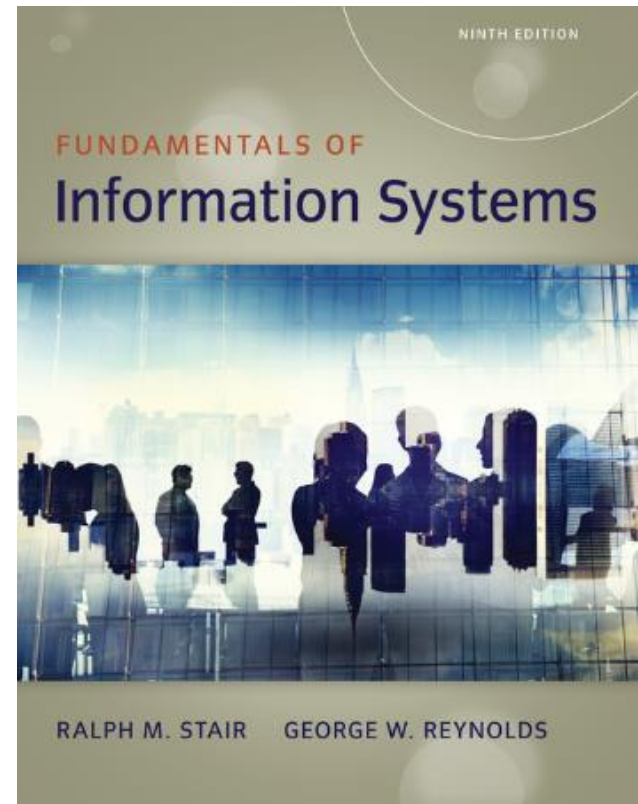# Introduction to Information Systems

▸ **Instructor: Victor Balogun**

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▸ **Textbook:**

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

About me

- Bachelor and Masters – Computer Science
- PhD – Computer Science
  - University of Manitoba, Canada
  - University of Idaho, USA (Dissertation)

- Previous and Current Teaching Experiences:
  - ACS Dept, University of Winnipeg
  - Faculty of Engineering, University of Idaho, USA
  - Department of Computer Science, University of Manitoba, Canada

- Certifications:
  - ITIL Certification in IT Service Management
  - PRINCE2 Certification in Project Management

What are the Learning Objectives?

▸ Distinguish data from information and describe the characteristics used to evaluate the quality of data

▸ Identify the basic types of business information systems and discuss who uses them, how they are used, and what kinds of benefits they deliver

▸ Identify the major steps of the systems development process and state the goal of each

▸ Identify the value-added processes in the supply chain and describe the role of information systems within them

▸ Identify some of the strategies employed to lower costs or improve service

▸ Define the term competitive advantage and discuss how organizations are using information systems to gain such an advantage

▸ Define the types of roles, functions, and careers available in information systems

Why of the Learning Objectives?

▸ The value of information is directly linked to how it helps decision makers achieve the organization's goals

▸ Knowing the potential impact of information systems and having the ability to put this knowledge to work can result in a successful personal career, organizations that reach their goals, and a society with a higher quality of life

▸ System users, business managers, and information systems professionals must work together to build a successful information system

▸ The use of information systems to add value to the organization can also give an organization a competitive advantage

Why Learn About Information Systems in Organizations?

- IS is a key to unlocking the potential of any new or modified system
- Information systems used by:
  - Sales representatives
  - Managers
  - Financial advisors
- Information systems:
  - Indispensable tools to help you achieve your career goals
  - Businesses can use information systems to increase revenues and reduce costs

MARKETING

EXTERNAL DESIGN   DESIGN

FINANCE & ADMINISTRATION

PRODUCTION

SALES

VENDORS

CUSTOMER

= VISIBILITY INFORMATION ASSET

- Client Customers
- Client Departments
- Client Partners
- Information Pathways
- Department Communication

6

What is an Information System

- https://www.youtube.com/watch?v=Qujsd4vkqFI&t=8s

What is Information System (IS)?

▸ Information System (IS):

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

Information Vs Data?

‣ Information:
  ‣ One of an organization's most valuable resources
  ‣ Often confused with the term *data*
‣ Future (Microsoft 2020)
‣ Information System Definition Video
‣ https://www.youtube.com/watch?v=Qujsd4vkqFI
‣

The Role of Information Systems in Business Today

▶ **New products, services, and business models:**

  ▶ Business model: describes how company produces, delivers, and sells product or service to create wealth

  ▶ Information system/Technology is a major tool for enabling new products, services, business models

The Role of Information Systems in Business Today

▸ Customer and supplier intimacy:

  ▸ Serving customers well leads to customers returning, which raises revenues and profits.

    ▸ Example: High-end hotels that use computers to track customer preferences and used to monitor and customize environment

  ▸ Intimacy with suppliers allows them to provide vital inputs, which lowers costs.

    ▸ Example: Wal-Mart's information system which links sales records to contract manufacturer

The Role of Information Systems in Business Today

‣ **Improved decision making**

  ‣ Without accurate information:

    ‣ Managers must use forecasts, best guesses, luck

    ‣ Results in:

      ☐ Overproduction, underproduction

      ☐ Misallocation of resources

      ☐ Poor response times

    ‣ Poor outcomes raise costs, lose customers

  ‣ Example: Verizon's Web-based digital dashboard to provide managers with real-time data on customer complaints, network performance, line outages, and so on

The Role of Information Systems in Business Today

▸ Operational excellence:

  ▸ Improvement of efficiency to attain higher profitability

  ▸ Information systems/technology is an important tool in achieving greater efficiency and productivity

  ▸ Walmart's Retail Link system links suppliers to stores for superior replenishment system

Alamy

The Role of Information Systems in Business Today

▸ Competitive advantage

  ▸ Delivering better performance

  ▸ Charging less for superior products

  ▸ Responding to customers and suppliers in real time

  ▸ Examples: Apple, Walmart, UPS

Data, Information, and Knowledge

- Data:
  - Raw facts
- Information:
  - Collection of facts organized in such a way that they have value beyond the facts themselves
- Process:
  - Set of logically related tasks
- Knowledge:
  - Awareness and understanding of a set of information

Types of Data

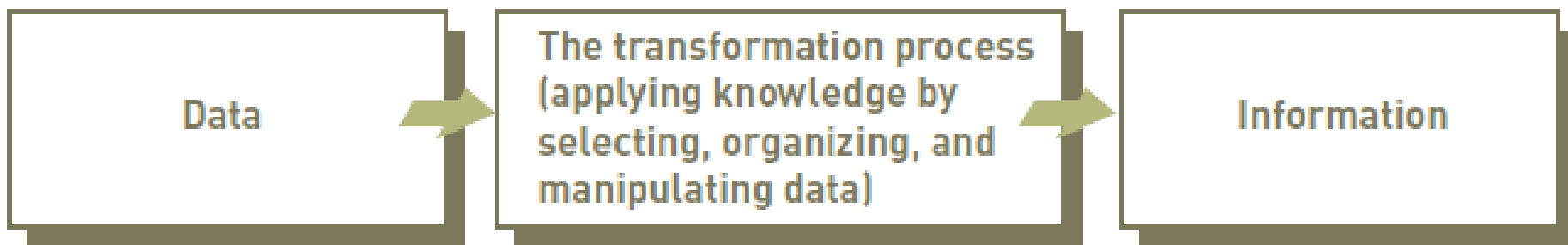| Data	Represented by
Alphanumeric data	Numbers, letters, and other characters
Image data	Graphic images and pictures
Audio data	Sound, noise, or tones
Video data	Moving images or pictures

Table 1.1

Types of Data

The Process of Transforming Data into Information

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

Figure 1.2

The Process of Transforming Data into Information

The Characteristics of Valuable Information

▸ If an organization's information is not accurate or complete:

    ▸ People can make poor decisions, costing thousands, or even millions, of dollars

▸ Depending on the type of data you need:

    ▸ Some characteristics become more important than others

The Characteristics of Valuable Information

Characteristics	Definitions
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. (This is commonly called garbage in, garbage out [GIGO].)
Complete	Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.
Economical	Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it.
Flexible	Flexible information can be used for a variety of purposes. For example, information on how much inventory is on hand for a particular part can be used by a sales representative in closing a sale, by a production manager to determine whether more inventory is needed, and by a financial executive to determine the total value the company has invested in inventory.

The Characteristics of Valuable Information (cont'd)

Characteristics	Definitions
Relevant	Relevant information is important to the decision maker. Information showing that lumber prices might drop might not be relevant to a computer chip manufacturer.
Reliable	Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up might not be reliable.
Secure	Information should be secure from access by unauthorized users.
Simple	Information should be simple, not overly complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important.
Timely	Timely information is delivered when it is needed. Knowing last week's weather conditions will not help when trying to decide what coat to wear today.
Verifiable	Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information.

The Value of Information

- Directly linked to how it helps decision makers achieve their organization's goals
- Valuable information:
 - Can help people and their organizations perform tasks more efficiently and effectively

What is an Information System?

▸ 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

What is an Information System?

Feedback

Input → Processing → Output
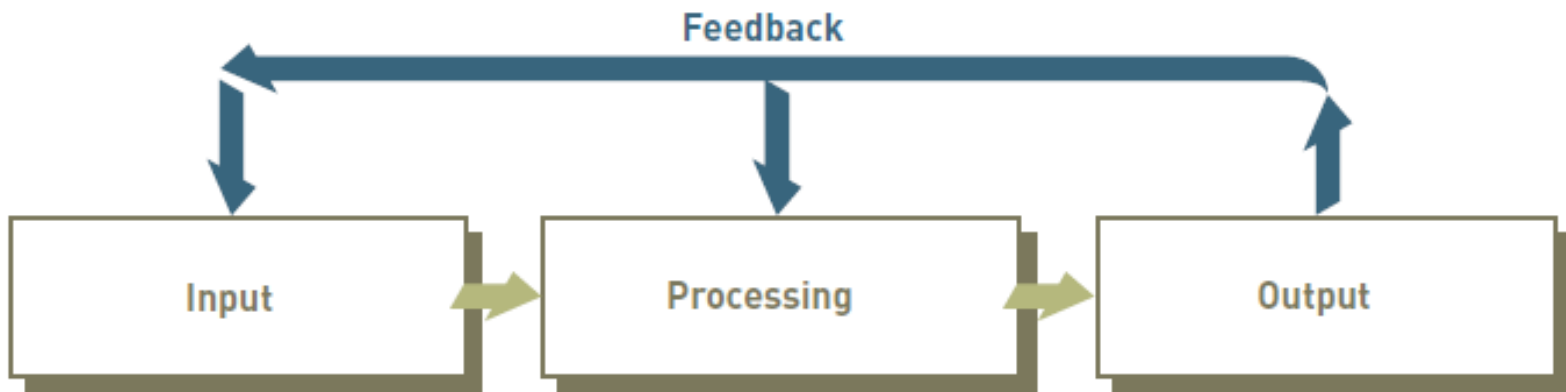
Figure 1.5

The Components of an Information System

Feedback is critical to the successful operation of a system.

Input, Processing, Output, Feedback

▸ Input:
  - ▸ Activity of gathering and capturing raw data

▸ Processing:
  - ▸ Converting data into useful outputs

▸ Output:
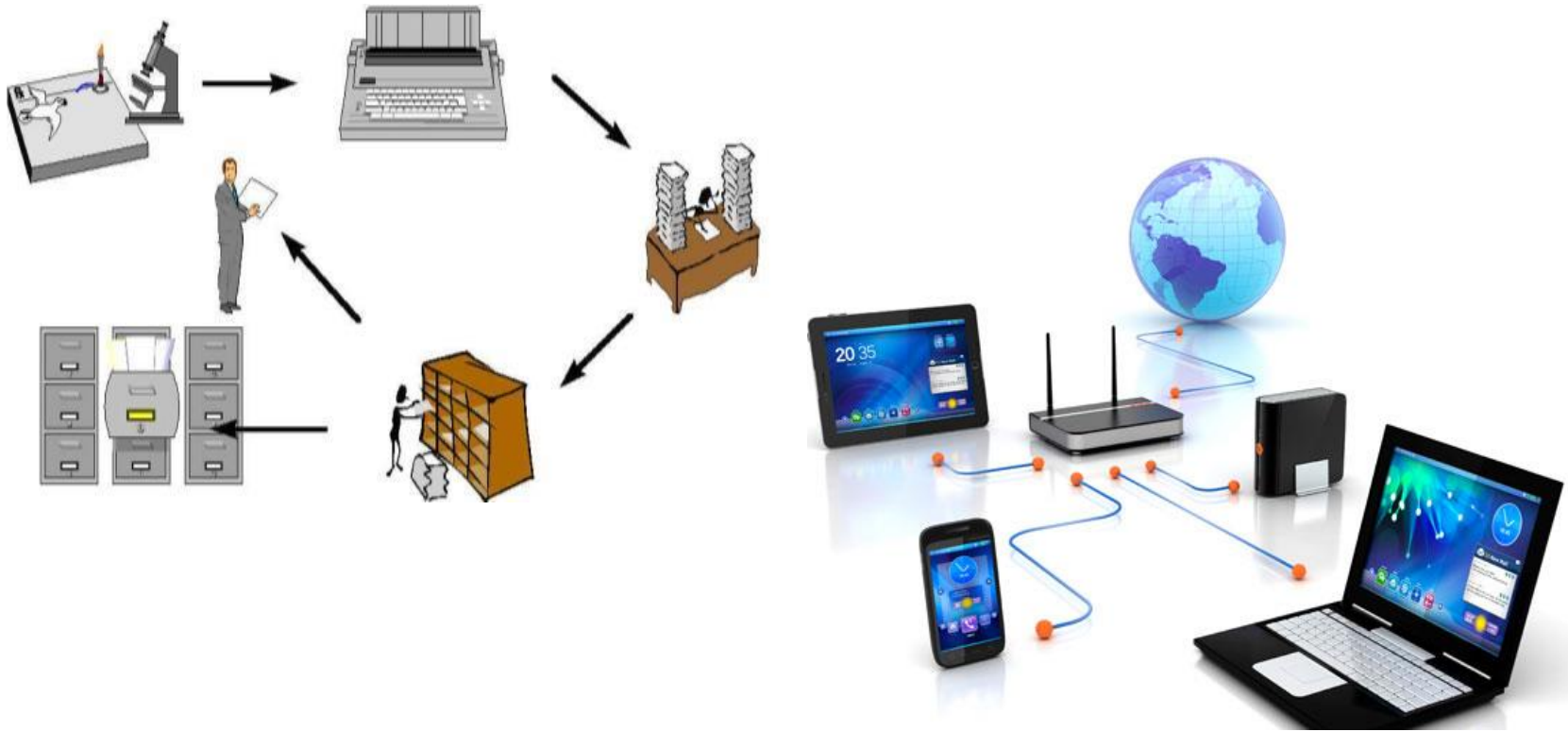 - ▸ Production of useful information, usually in the form of documents and reports

▸ Feedback:
  - ▸ Information from the system that is used to make changes to input or processing activities

Manual and Computer-based Information Systems

▸ An information system can be:

    ▸ Manual or computerized

Manual and Computer-based Information Systems

▸ Example:

　▸ Investment analysts manually draw charts and trend lines to assist them in making investment decisions

▸ **Management Information Systems (MIS):**

　▸ Follow stock indexes and markets and suggest when large blocks of stocks should be purchased or sold

Management Information Systems (MIS)

- https://www.youtube.com/watch?v=qiLXJ0lhN2g
- Single set of hardware, software, databases, telecommunications, people, and procedures
  - Composed of Application, Technical, and Organizational components
  - Configured to collect, manipulate, store, and process data into information

Hardware

Software

Telecommunications

People

Procedures

27

Management Information Systems (MIS)

▶ 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

Management Information Systems (MIS)

▸ **Telecommunications, Networks, and the Internet:**

> ▸ The electronic transmission of signals for communications

▸ Networks:

> ▸ Connect computers and equipment to enable electronic communication

▸ Internet:

> ▸ World's largest computer network, consisting of thousands of interconnected networks, all freely exchanging information

Management Information Systems (MIS)

▸ People:
  ▸ The most important element in most management information systems

▸ Procedures:
  ▸ Include strategies, policies, methods, and rules for using the MIS

Components of an MIS

- **Application** Components **(Application Software, Databases)**
  - Outer: menu screens, input screens query screens, reports
  - Application components are most directly related to the business situation that the system supports
- **Technical** Components **(Hardware, Telecommunications)**
  - Hardware, system software, telecommunication technology
  - These "house" the application components
- **Organizational** Components **(People, Processes)**
  - Who does What, Where, and How with this system, in the organization? (Procedures)