

## Chapter 1. Introduction to Information Systems

### 1.1 Why Should I Study Information Systems?

- Information technologies are so deeply embedded in your lives (i.e. you practice **continuous computing**, surrounded by a **movable information network**).

- Your personal information network is created by **constant cooperation** between:

(1) the **digital devices** you carry;

(2) the wired and wireless **networks** that you access as you move about;

(3) **Web-based tools** for finding information and communicating and collaborating with other people.

- You can **pull** information from the Web and **push** your ideas back to the Web.

- Why we study information system and information technology?

→ An "**informed user**" will **survive** and **compete** in an environment that has been radically changed by information technology. (See MIS on page 4 of the textbook.)

- Try following websites:

<http://www.domystuff.com>

<http://www.vworker.com>

<http://www.webgrity.com>

<http://www.b2kcorp.com>

<http://www.globetask.com>

<http://www.quru.com>

<https://www.elance.com>

[www.simplyhired.com](http://www.simplyhired.com)

- Information Technology Jobs (See Table 1.1 on page 6 of the textbook)

### 1.2 Overview of Computer-Based Information Systems

- Regardless of the name of MIS department the **functional area** deals with the **planning** for—and the **development, management, and use of—information technology tools** to help people perform all the tasks related to information

processing and management.

- **Information technology** relates to any **computer-based tool** that people use to work with information and to support the information and information processing needs of an organization.
- An information system **collects, processes, stores, analyzes, and disseminates** information for a specific purpose. The **purpose** of information systems has been defined as **getting the right information to the right people, at the right time, in the right amount, and in the right format.**
- Data vs. Information vs. Knowledge
  - **Data:** **elementary description** of things, events, activities and transactions that are recorded, classified and stored but are **not organized to convey any specific meaning** (ex) a student grade in a class, the number of hours an employee worked in a certain week, a stream of voltage levels representing ones and zeros
  - **Information:** data **organized** so that they **have meaning and value** to the Recipient (ex) A GPA is data, but a student's name coupled with his or her GPA is information.  
(ex) A value such as 8505551212 stored in a file on a computer is a form of data. To give that datum meaning, we could need to describe its type, give it a name, and identify a context.

(Note) The recipient interprets the meaning and draws conclusions and implications from the information.

- **Knowledge:** **data and/or information** organized and processed to convey understanding, experience, **accumulated learning** and expertise as they apply to a current problem or activity  
(ex) A company has found over time that students with GPA over 3.0 have had the most success in its management program.  
→ That company may decide to interview only those students with GPA over 3.0.  
(ex) Beer and diaper

(ex) Ouch! (: Data) → Got hurt!! (: Information)  
 → Shouldn't do it again!!! (: Knowledge)

- See the table example for data, information, and knowledge on the page 11 of the textbook. (Note) The same data items, with no context, can mean entirely different things in different contexts.
- A Computer-based information systems (CBIS) are information systems that use computer technology to perform some or all of their intended tasks. The term "information system" is typically used synonymously with "computer-based information system."
- The basic components of computer- based information systems:
  - Hardware is a device such as a processor, monitor, keyboard or printer
  - Software is a program or collection of programs that enable hardware to process data.
  - Database is a collection of related files or tables containing data.
  - Network is a connecting system (wireline or wireless) that permits different computers to share resources.
  - Procedures are the set of instructions about how to combine the above components in order to process information and generate the desired output.
  - People are those individuals who use the hardware and software, interface with it, or uses its output.

(Note) More formally, information systems (computer-based information systems / information technology systems) are combination of H/W, S/W, infrastructure, and trained personnel organized to facilitate planning, control, coordination, and decision making.

- Major Capabilities of Information Systems:
  - Perform high-speed, high-volume numerical computations
  - Provide fast, accurate communication and collaboration within and among organizations
  - Store huge amounts of information in small space
  - Allow quick, inexpensive access to vast amounts of information worldwide
  - Interpret vast amounts of data quickly and efficiently

- Increase effectiveness and efficiency of people working in groups in one place or around the world
  - Automate semiautomatic business process and manual tasks
- Information Technology inside organization (Figure 1.4, page 12 of the textbook)
- IT components (H/W, S/W, DB and Network) forms the information technology platform.
  - IT personnel use these components to (1) develop information systems, (2) oversee security and risk, and (3) manage data. (Note) (1), (2), and (3) are cumulatively called "information technology services".
  - IT components + IT Personnel+ IT services = IT infrastructure
  - An application (app or application program) is a computer program designed to support a specific task or business process.
  - Each functional area or department within a business organization uses dozens of application programs.
  - The collection of application programs in a single department is usually referred to as a departmental information system (a.k.a. a functional area information system). (ex) Accounting IS, Finance IS, Human Resources IS, etc.
- Breadth of Support of Information Systems
- Certain information systems support parts of organizations (FAIs), others support entire organizations (ERP and TPS), and still others support groups of organizations (SCM, B2B, B2C, etc.).
  - Enterprise resource planning systems (ERP) tightly integrate the functional area ISs via a common database. ERP systems are designed to correct a lack of communication among the functional area ISs. ERP systems were an important innovation because the various functional area ISs were often developed as standalone systems and did not communicate effectively (if at all) with one another.

(ex) Oracle (<https://www.oracle.com/applications/enterprise-resource-planning/index.html>)

SAP ([http://www.tutorialspoint.com/sap/sap\\_introduction.htm](http://www.tutorialspoint.com/sap/sap_introduction.htm)  
<https://www.youtube.com/watch?v=LYCEQqSM08I>)

- **Transaction processing systems (TPS)** support the **monitoring, collection, storage,** and **processing** of data from the organization's **business transactions**.

(ex) Payroll, order processing, reservations, employee records, etc. These systems collect and store data about transaction which are activities that change stored data (i.e. the TPS collects data continuously, typically in real time, and provides the input data for the corporate databases).

<http://study.com/academy/lesson/transaction-processing-systems-tps-manual-and-automated-systems.html>

<https://www.youtube.com/watch?v=qRgozVYMwgY>

- **Interorganizational information systems** connect two or more organizations.

(ex) **Supply Chain Management** systems support an organization's supply chain that describes the **flow of materials, information, money, and services** from suppliers of raw materials through factories and warehouses to the end customers.

(ex) [https://www.youtube.com/watch?v=UhbNOF\\_6N\\_E](https://www.youtube.com/watch?v=UhbNOF_6N_E)  
<https://www.youtube.com/watch?v=IZPO5RclZEo>

**Electronic commerce (e-commerce)** systems enable organizations to conduct transactions, called **business-to-business (B2B)** electronic commerce, and customers to conduct transactions with businesses, called **business-to-consumer (B2C)** electronic commerce. E-commerce systems typically are **Internet-based**. **Figure 1.5** (page 13 of the textbook) illustrates B2B and B2C electronic commerce.

- Information systems that support particular employee within the organization:

- **Office automation systems (OASs)** typically support the clerical staff,

lower and middle managers, and knowledge workers, enabling them to develop documents, schedule resources, and communicate.

(ex) MS Office, E-chart at hospital, etc. for paperless office

- **Business intelligence (BI) systems** provide computer-based support for complex, non-routine decisions, primarily for managers and knowledge workers. (ex) Data warehouses, Data Mining tools
- **Expert systems (ES)** attempt to duplicate the work of human experts by applying reasoning capabilities, knowledge, and expertise within a specific domain. (ex) AI reasoning tools, Robot revolution
- **(Digital) Dashboards** provide rapid access to timely information and access to structured information in the form of reports.  
(ex) Executive dashboards are tailored to the information needs of executives

### 1.3 How Does IT Impact Organizations?

- IT impacts entire industries. (ex) book, music. Video, software, etc.
- IT reduces the number of middle managers because IT makes managers more productive.
- IT changes the manager's job because IT can change the manner in which managers make many of their decisions (i.e. can complete task more efficiently and effectively).
- As computers gain in intelligence and capabilities, the competitive advantage of replacing people with machine is increasingly rapid.
- IT impacts employees at work.  
(ex) employee's health and safety,  
more opportunities for people with disabilities

### 1.4 Importance of Information Systems to Society

- IT affects our quality of life.  
(ex) expanded workplace, flexibility, employees on "constant call"

- **Robot revolution** is on the way. (ex) nursebots, Roomba
- Improvements in **healthcare**.  
(ex) electronic medical record systems, electronic prescribing, telehealth