

# **IFT121 – INTRODUCTION TO INFORMATION SYSTEM**

**2022/2023 SESSION**

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## **COURSE OUTLINE**

### **IFT121 – Introduction to Information Systems**

**2 Units**

This course demonstrates how information is used by organisations to conduct business and solve problems. This course presents information systems principles and demonstrates how they form an integral part of modern organisations. Topics include **systems concepts; organisational processes; technological aspects of information systems; the Internet; information technology security and ethical issues; database management; and systems development life cycle.**

## **MODULE ONE**

### **1.0 Information System Definition**

Information systems use information technology to collect, create, and distribute useful data. Note that data is the most basic element of any information system.

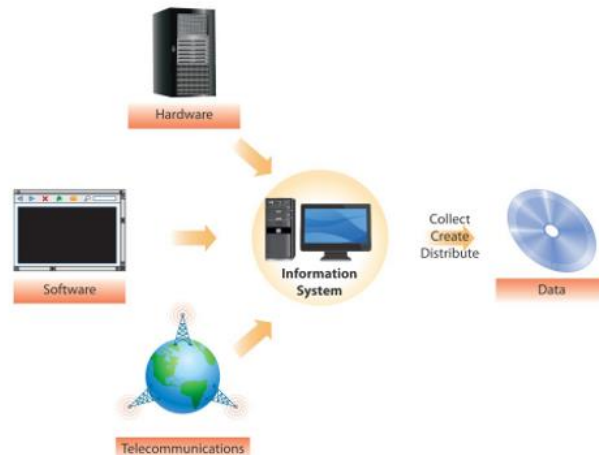
Information technology includes hardware, software, and telecommunications networks.

Hardware refers to physical computer equipment, such as a computer, tablet, or printer, as well as components like a computer monitor or keyboard.

Software refers to a program or set of programs that tell the computer to perform certain tasks.

Telecommunications networks refer to a group of two or more computer systems linked together with communications equipment.

Traditionally the term information technology referred to the hardware, software, and networking components of an information system, the difference is shrinking, with many using the terms IS and IT synonymously. In Figure 1.1, we show the relationships among these IS components.



**Figure 1.1:** An IS use IT to collect, create and distribute data

## 1.1 DATA

In order to understand how information systems (IS) work, it is important to distinguish between *raw, unformatted data* and *information*.

**Unformatted data**, or simply data, are raw symbols, such as words and numbers. Data have no meaning in and of themselves, and are of little value until processed. For example, if someone gives you a number, 41709, the number is of no value until the context is defined, either for an NIN number of a Post-office box number.

**Information:** Data can be formatted, organized, or processed to be useful; it is transformed into information, which can be defined as a representation of reality, and can help to answer questions about who, what, where, and when. An information systems, are used to transform raw data into useful information.

**Knowledge:** This is the ability to understand information, form opinions, and make decisions or predictions based on the information. For example, you know that only one NIN identity number can uniquely identify each individual, this knowledge can assist you to find out any other information you need about any individual in the NIN system.

## 1.2 THE COMPONENTS OF INFORMATION SYSTEMS

The other IS components are the software, hardware and telecommunication infrastructure. Computer hardware has replaced physical files storage in filing cabinets. Also, computer hardware provides the technologies to input and process data and output useful information; software enables organizations to utilize the hardware to execute their business processes and competitive strategy by providing the computer hardware with instructions on what processing functions to perform.

Finally, the telecommunications networks allow computers to share information and services, enabling the global collaboration, communication, and commerce as we see today.

### **1.2.1 People**

Aside the hardware, software and telecoms equipment, another vital infrastructure is the people. The IS field includes a vast collection of people who develop, maintain, manage, and study information systems. These are individuals—whether they are end-users, managers, or IT professionals—have their own set of skills, attitudes, preconceptions, and personal agendas that determine what they are able to do and what they will elect to do as part of the IS.

Major features of IS people are their skills, interests, and motivations when designing and implementing a new IS or when troubleshooting an existing IS that is not performing as expected.

### **1.2.2 Process**

The process component of an information system is defined here as the series of steps necessary to complete a business activity.

For example, consider a Store manager. The store manager must follow the following process to restock his inventory:

- (1) check the inventory and identify the needed items;
- (2) call individual suppliers for quotes and delivery dates;
- (3) compare the various quotes;
- (4) select one or more suppliers for each of the needed items based on the terms of the agreement (e.g., availability, quality, delivery);
- (5) call these suppliers and place the orders;
- (6) receive the goods upon delivery, checking the accuracy and quality of the shipped items; and
- (7) pay the suppliers.

Note that any potential discrepancy between the business processes as designed by the organization and the manner in which it is actually enacted is often the root cause of IS failure.

Hence, when designing a new IS or when confronted with IS failure, identify possible or existing obstacles that may make it difficult for people to accurately follow the business process.

### **1.2.3 Organizations:**

Having talked about the technology side of information systems: data, information, as well as the people side of information systems, let us turn to the Organizations that use the IS.

The organizational structure component (or “structure” for short) refers to the organizational design (hierarchy, decentralized, loose coupling); reporting (functional, divisional, matrix); and relationships (communication and reward mechanisms) within the information system.

Understanding the structure component is crucial because user resistance, incentive systems, and relationships are often silent enemies of IS success that go undetected before, and sometimes even after, IS failure becomes apparent.

Organizations use information systems for the following reasons:

- i. to become more productive and profitable,
- ii. to gain competitive advantage,
- iii. to reach more customers, and/or
- iv. To improve customer service.

This holds true for all types of organizations you can think of, therefore the four components of an information system are IT (infrastructure), people, processes, and structure (Organization).

### 1.3 TYPES OF INFORMATION SYSTEMS

Organizations use various types of information systems as shown in the table below:

**TABLE 1.7** Categories of Information Systems Used in Organizations

Category of System	Purpose	Sample Application(s)
Transaction processing system	Process day-to-day business event data at the operational level of the organization	Grocery store checkout cash register with connection to network, student registration system
Management information system	Produce detailed information to help manage a firm or part of a firm	Inventory management and planning system, student enrollment by major and by course
Decision support system	Provide analysis tools and access to databases in order to support quantitative decision making	Product demand forecasting system, loan and investment analysis
Intelligent system	Emulate or enhance human capabilities	Automated system for analyzing bank loan applications, evaluate complex medical data
Business intelligence system	Methods and systems for analyzing data warehouses to better understand various aspects of a business	Online Analytical Processing (OLAP) system
Office automation system (personal productivity software)	Support a wide range of predefined day-to-day work activities of individuals and small groups	Word processor, spreadsheet, presentation software, electronic mail client
Collaboration system	Enable people to communicate, collaborate, and coordinate with each other	Electronic mail system with automated, shared calendar
Knowledge management system	Collection of technology-based tools to enable the generation, storage, sharing, and management of knowledge assets	Knowledge portal for finding answers to common questions
Social software	Facilitates collaboration and knowledge sharing	Social network, connecting colleagues and friends
Geographic information system	Create, store, analyze, and manage spatial data	Site selection for new shopping mall
Functional area information system	Support the activities within a specific functional area of the firm	Planning system for personnel training and work assignments
Customer relationship management system	Support interaction between the firm and its customers	Sales force automation, lead generation
Enterprise resource planning system	Support and integrate all facets of the business, including planning, manufacturing, sales, marketing, and so on	Financial, operations, and human resource management
Supply chain management system	Support the coordination of suppliers, product or service production, and distribution	Procurement planning
Electronic commerce system	Enable customers to buy goods and services from a firm's Web site	Amazon.com, eBay.com, Nordstrom.com

For example, transaction processing systems (TPS) are used by a broad range of organizations to efficiently process customer transactions, it also generates a tremendous amount of data that can

be used by the organization to learn about customers and product(s) trends. Large data warehouses are then used to process and analyze the data to provide purchase recommendations to future customers.

TPS data also provide input into a variety of information systems within organizations, such as *decision support systems, intelligent systems, data mining and visualization systems, etc.*

In the past, these IS categories were distinct within organization. Today, many organizations have replaced standalone systems with *enterprise systems* that span the entire organization. Likewise, with the Internet—and *systems integration*—connecting separate information systems and data to improve business processes and decision making—it is difficult to say that any given information system fits into only one of these categories (e.g., that a system is a management information system only and nothing else).

In addition, many of these systems are not housed within organizations any more, but are located “in the cloud,” and accessed via the user’s browser when needed.

Given that many modern-day information systems span several of these IS categories, it is still useful to understand these categories, in order to gain insight into different approaches, goals, features, and functions of modern information systems.

#### **1.4 SYSTEMIC EFFECTS**

It should be noted from the ongoing that all the four components discussed so far are necessary to ensure that the information system is successful and delivers the functionality it was intended to provide.

Dropping any of the IS components would not work since the components would not work in isolation but rather they interact with one another. Therefore, the *systemic effects*, imply that changes in one component (e.g., the introduction of a new software application, a process redesign, a new organization chart, or turnover among employees) affect all other components of the system and, if not properly managed, its outputs.

#### **1.5 WHY DO ORGANIZATIONS BUILD IS?**

An organization introduces information systems in order to improve efficiency and effectiveness. Hence, an organization must capture relevant data that are then manipulated, or processed, to produce an output that will be useful to the appropriate users, either internal or external to the firm (e.g., customers).

These data and information are typically accumulated, or stored, for future retrieval and use.

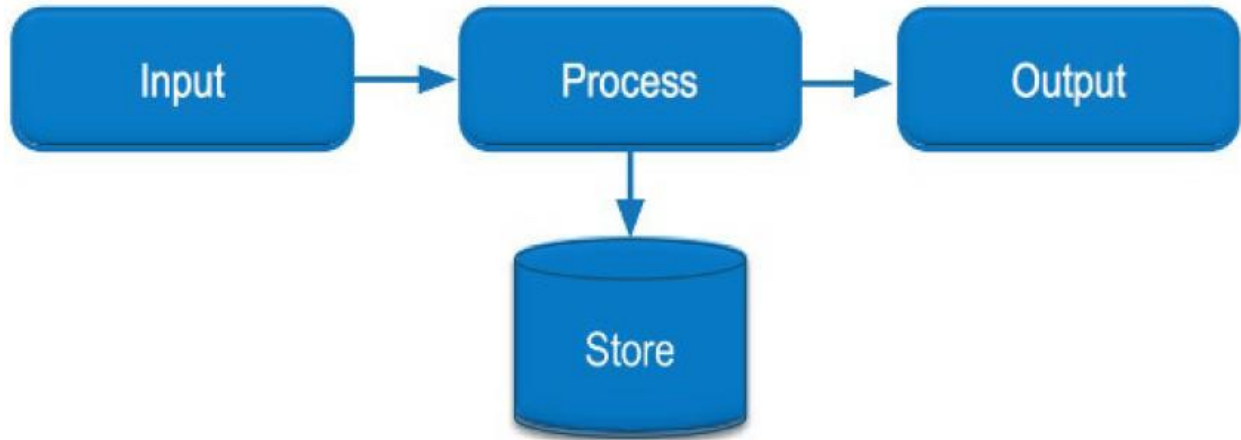
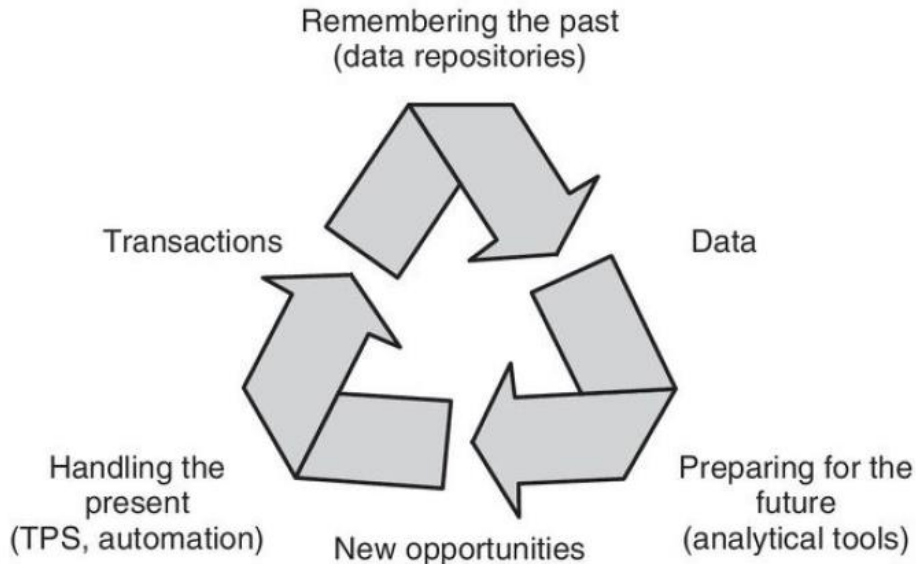


Figure: 1.2: Information processing in an IS

## 1.6 THE IS CYCLE

The information systems cycle indicates the transition of business data from The beginning in transaction processing systems, to storage in data repositories, and finally to their use in analytical tools. See figure 1.3.

Data are typically produced as a result of daily transactions (e.g., purchases at a retail outlet, transport fare tickets, etc.). Such transactional data, when not disposed of, can be accumulated in data repositories (storage) and create a record of past transactions (past records). Using analytical tools, the stored data can be used to find patterns, test assumptions, and inform accurate decision making or forecast.



**Figure 1.3:** The Information System Life Cycle

## 1.7 COMPETITIVE ADVANTAGE THROUGH IS

Apart from the use of IS to enable efficiency and provide a return on investment (ROI), IS introduction can also be used to strategically edge out competitors (or rivals), hence the Competitive advantage of IS. This is because data that are gathered from different sources, stored, processed, and used as a source of sustained competitive advantage

## **1.8 ETHICAL ISSUES IN INFORMATION SYSTEMS**

Computer ethics is used to describe moral issues and standards of conduct as they pertain to the use of information systems. Information systems ethics include **information privacy, accuracy, property, and accessibility** (“PAPA”).

Ethical issues are practices and behavior that surround what is good (ethical) and what is bad (unethical). Attempting to draw a distinction between good and evil, that is. Due to the rapid pace of the IT trends and the slow pace of legislation, some formal explicit rules lag behind the possibilities offered by new technologies.

Unethical practices abound in societies. For instance, copying or downloading a music or software over the web is more attractive than to order to buy original software or music copies. Perhaps, as an IS manager you are reading off other people’s emails from the mail server, just because you have access to the mail server and hence the individual email accounts. Another unethical practice is to disclose confidential information you gained as an IS officer to a third party.

Ethically, IS officers should focus on good practices by keeping fidelity of information and shun unethical practices.

## **1.9 INFORMATION PRIVACY**

Information privacy is concerned with what information do you want others to know about you and how to share it appropriately in the workplace or through other transactions. Personal information, such as National Identity numbers, ATM card numbers, medical histories, etc. are better known to you and those you have trusted to share them with.

To protect your private information, you should always review the privacy policy of all companies you do business with or interact with over the internet and refuse to do business with those that do not have a clear policy or do not respect your privacy.

### **1.9.1 TIPS FOR DATA PRIVACY**

The following tips can safeguard your privacy:

- Be cautious of revealing your true identity;
- Visit sites anonymously;
- Avoid Cookies left on your computer;
- Beware of you online posts;

EXERCISES

REFERENCES

SOLUTION TO EXERCISES