Overview of Unit 1

The first unit of the course B329 Systems Analysis and Design is organized into six sections, of which this overview is the first.

The second section provides an overview of systems analysis and design. After the introduction and list of unit objectives, it explains what is meant by a system, how information systems (IS) are developed and used in organizations, and how they are tied with organizational goals and objectives.

As systems analysts act as an interface between the system users, owners and builders, and as they work in a fast-moving and volatile technological environment, they need to possess certain unique characteristics. These characteristics are explained in the third section.

The fourth section covers some recent business trends that have had important implications for IS in the way they are designed, implemented and used. Particularly, we will discuss the ramifications of changes brought about by business process reengineering, total quality management, globalization of the economy and electronic commerce.

The fifth section provides an overview of IS building blocks. Differences between data, information and knowledge will be discussed, and a classification of IS will be provided. In addition, we will present a framework for IS architecture, and explain how different people have different perspectives of a system.

The conclusion contains a summary of Unit 1, a self-test, references, a glossary of terms and answers to the self-test. It also introduces the Orient-Pacific Insurance Corporation case, which will be used throughout this study guide. As with other units, you will first be given a problem statement, through which you will be asked to answer some questions or perform a task related to various aspects of systems analysis and design.

Remember, this study unit material is more than a guide through your textbook. It contains important information and lecture material in addition to instructions on when and what to read. You will need to refer to your textbook frequently, so please make sure you are familiar with its structure and content. In particular you will refer to the case study that is continued throughout the book. Since each chapter in the book starts with an episode associated with this case, it is important that you follow this case closely in order to understand the role that people play in various processes involved in systems development.

There is also an accompanying Course Guide for B329 Systems Analysis and Design. Please look at the course objectives, which outline the learning tasks you should complete while working through this course. Keep these in mind throughout the course as they will enable you to assess your learning.
Introduction

Organizations, large and small, are dynamic systems that rely on information for their survival. It is inconceivable to think of any organization that could survive without using or exchanging information. As such, companies need information systems (IS) to manage the flow, processing and use of information within and outside their boundaries. A useful framework to study IS is a model developed by Stohr and Knosynski (1992) and shown in Figure 1.1.

![Figure 1.1 An organizational framework to study information technology](image)

Based on this framework, organizations develop an internal structure so that people can perform their tasks, which would in turn help the company achieve its objectives (e.g., making profits, improving customer services, etc.) Information systems, as part of information technology, are central in linking all parts of the organization: they help people perform and coordinate their tasks with a view to achieving organizational objectives.

IS development process involves activities related to the analysis, design and implementation of systems used by different groups of people in the company. Because all business systems are ultimately designed to be used one way or another by people, in the analysis and design processes we need to pay special attention to the people. In light of the important role that people play in systems analysis and design, good communication is vital in understanding the requirements of the users of the system under study. This is one of the main jobs of the systems analyst.

The above framework also highlights the importance of the so-called organizational equilibrium in that a change in any of the major parts of the firm requires changes in one or more of the other components. For example, a new IS may lead to changes in the way people perform their tasks, in the way an organization is structured or in the way an organization interacts with its environment (e.g., suppliers and customers). So when analysing or designing an IS, try to use this model as a guide to see the interrelationships between different organizational components and the system under study.
Objectives

By the end of Unit 1, you should be able to:

1. **Describe** the characteristics of a business system.

2. **Describe** the aims and purposes of IS analysis and design.

3. **Describe** the systems analyst’s role and responsibilities in the modern organization, especially in solving business problems.

4. **Characterize** the qualities of a systems analyst.

5. **Explain** the implications of new business trends such as, business process reengineering, total quality management, globalization of business, and electronic commerce, for the systems analyst.

6. **Distinguish** between data, information and knowledge.

7. **Describe** six classes of information systems and how they interoperate.

8. **Define** an information systems architecture, and **describe** its role in systems development.

9. **Explain** the various roles that stakeholders (users, designer and builder, owners) play in different stages of the IS analysis and design process.

10. **Explain** why IS architecture is viewed differently in light of different focuses (data, processes, interfaces, geography) of an information system.
The idea of a system

The idea of systems goes back to the beginning of history. You encounter systems every day, in both your private and professional lives. Some of the systems with which you are already familiar include the school that you attended, the Mass Transit Railway (MTR), your body and, if you work, your organization.

Systems that interact with their environment are called open or dynamic systems; those that do not are called closed or static systems. In our daily life we almost always deal only with open systems.

We can define an open system as a set of interrelated components that interact with one another and with their surroundings to accomplish some purpose or objective. Components are affected by being in the system. The behaviour of the system is changed if the components leave it. The components of the system may be physical objects, but they can equally be abstract concepts. It depends on the system. To a large extent, the definition of a system depends on the observer — the system is something that, for some reason, the observer wants to treat as a whole.

Consider the examples given at the beginning of this topic. The school you attended has buildings, teachers and pupils as components. These all interact to provide an education for pupils. The MTR has trains, track, stations, employees and travellers as components that interact to transport travellers from one place to another. The organization where you work has buildings, departments, employees and customers as components that interact to produce goods or provide services to the customer.
Overview and purposes of systems analysis and design

In the framework presented in Figure 1.1, the main purpose of IS was to facilitate the flow and co-ordination of information between major organizational components and between an organization and its environment. In other words, IS are developed to help companies achieve their objectives by, among other things:

- facilitating **transactions**, e.g., order processing
- providing accurate summary information, e.g., daily sales figures
- improving decision-making, such as sales forecasting
- improving communications and co-ordination within and outside the company, e.g., group decision support and electronic data interchange (EDI).

The purpose of **systems analysis** is to gain an understanding of a business process, or set of processes, within an existing system. Processes and data required by those processes must be defined. You can then identify what is required of the system now and what is likely to be required of it in future.

As a result of this analysis you can produce a statement of requirements for a new system which can overcome problems of the existing system. So, systems analysis clarifies problems and shapes solutions to them.

The purpose of **systems design** is to specify a new system that meets the requirements you have identified in the analysis stage. The result of systems design is a set of specifications or ‘blueprints’ that define the technical content of a new system. These specifications are used to construct a system in much the same way as architectural plans are used to construct buildings.

**Reading**

‘Why study systems analysis and design methods?’, pp. 8–9 in your text.

This reading reinforces Objective 2 of Unit 1.
Characteristics of systems analysts

Systems analysts are people who communicate with management and users at all levels. They understand business problems before proposing solutions to those problems. They develop technical specifications for the development of computer-based solutions and assist in the implementation of computer-based information systems. Therefore, they must have a wide range of knowledge, skills and experience, which are outlined below.

Knowledge

Systems analysts require:

- a working knowledge of information systems development techniques
- general business and industry knowledge
- in-depth knowledge of business processes
- a working knowledge of information technology.

**Knowledge of information systems development techniques**: Systems analysts must be trained in formal development techniques. Basic concepts and principles are most important, as no tool, technique, process or methodology works successfully in all situations. There are many tools and techniques that can be used in the analysis, development and documentation of information systems. This course covers some of the tools and techniques that you need to become a professional systems analyst.

**Knowledge of general business and industry**: Systems analysts must be able to communicate with management and users to help define their problems and requirements. An understanding of business procedures and industry practices is vital in establishing credibility with non-technical staff. In addition, while it is not necessary to have detailed knowledge of specific business applications, an appreciation of typical applications can be very valuable. Typical business applications include financial accounting, management accounting, production operations, inventory control, personnel management and marketing.

**Knowledge of business processes**: As we will discuss in the next section, systems analysts are increasingly required to understand the inner working of various business processes.

**Knowledge of information technology**: Systems analysts must be aware of both existing technologies and trends. As discussed before, systems analysts act as a bridge between business people and technical staff. As such, they need to understand the implications of new technologies for businesses.
Skills

Systems analysts require strong interpersonal communications skills and problem-solving skills.

Interpersonal communication skills: Systems analysts must communicate effectively, both orally and in writing. They require training in report writing, technical writing, interviewing, presentations, conducting meetings and active listening. In a less formal sense, interpersonal skills that help you work effectively with other people are also important. Systems analysts must inspire confidence in and develop effective working relationships with other participants in the development process.

Problem-solving skills: Problem-solving skills are difficult to identify. They are likely to include creativity, imagination, insight, attention to detail, persistence, flexibility and, above all, common sense. The analysis phase is the most abstract of all systems development phases. This is because the product of analysis is, for the most part, a paper specification. Systems analysts must visualize a system which does not yet exist. Hence they need to be flexible and able to deal with change and uncertainty.

Experience

Finally, in addition to knowledge and skills, there is no substitute for experience in systems analysis and design. Only the experience of developing an actual system will, in the end, make you a ‘good’ systems analyst. No textbook or course alone can fully prepare you for the ‘real world’.

Reading

‘Preparing for a career as a system analyst,’ pp. 24–29 in your text.

This reading reinforces Objectives 3 and 4 of Unit 1.

Self-test 1.1

MATCHING

Match the skill set performed by the systems analyst with the descriptions.

A working knowledge of information systems and technology
B computer programming experience and expertise
C general business knowledge
D problem-solving skills
E interpersonal communication skills
F interpersonal relations skills
G flexibility and adaptability
H character and ethics
I systems analysis and design skills

1 The ability to break down a large business problem into component parts, analyze various aspects, and then assemble a system to solve the problem.

2 Composed of three skill subsets of concepts and principles, tools, and techniques.

3 The ability to communicate effectively, both orally and in writing.

4 The awareness of existing technologies and techniques and of future trends to apply to the end-user’s operations.

6 Proficiency in at least one high-level programming language and one fourth generation language or applications generator.

7 The analyst’s role as a politician mediating disputes and acting as an agent of change.

8 A familiarity with specific business applications or functions, in order to gain knowledge of problems and needs.

9 The analyst’s ability to safeguard sensitive information and earn the confidence and trust of system users.

10 The ability to realize that each project requires its own unique approach.
Business trends

Total quality management (TQM)

Businesses have increasingly become aware that in order to compete successfully they need to focus on the quality of their products and services. **TQM** refers to methods and techniques used to ensure quality improvement and management within a business. Ensuring TQM requires not only careful and continuous monitoring of various processes involved in development and deployment of products and services, but perhaps more importantly, the recognition that everybody and every function in business is responsible for quality.

Systems analysts play a dual role in improving quality within the organization. As regards the software development process itself, they are encouraged to follow the accepted software engineering control guidelines, such as ISO 9001, to ensure that the application under development is error free and that it performs according to specifications. More importantly, in designing new systems or modifying the existing systems, systems analysts are encouraged to look for quality problems in business processes under study with a view to improving these situations. Within the context of the latter role, systems analysts need to understand the business processes which are being automated before they can make suggestions for improvement.

Business process reengineering (BPR)

Also called business process redesign, **BPR** was popularized as a response to inefficiencies in the existing processes in a company. In the 1980s many companies realized that they had been using computers to perform some of their major processes without ever assessing whether these processes were undertaken in the most efficient (e.g., the most economical) and/or effective (e.g., adding value to their business) way. In many instances computers were used to automate an inefficient process without ever addressing the manual inefficiencies. BPR allowed companies to take a fresh look at their existing business processes with an eye to finding ways to reduce cost and to improve value added to their business. Systems analysis and design is at the heart of many BPR projects. In fact BPR projects use some of the tools and techniques that are commonly used in systems analysis and design.

Globalization of the economy

As perhaps one of the most over-used business terms of late, **globalization of the economy** refers to the removal of geographical barriers to business. In the 1980s many companies in fully industrial nations faced fierce competition brought about by emerging countries that were able to produce products at lower costs or that were of a higher quality. In tandem with this development, the increase in purchasing power of people in these countries allowed industrialized countries to expand their international markets.
Because of cultural factors, globalization of business has brought about new challenges for systems analysts. Companies operating in several countries need to design systems that can serve distributed networked environments supporting multiple languages, currencies, regulations, etc.

Electronic commerce

One of the most important business trends of recent years relates to electronic commerce. With proliferation of the Internet and other computer-mediated means such as electronic data interchange, a growing number of firms have started conducting their businesses electronically. Electronic commerce frees companies from geographical and time-related constraints, enabling them to do business almost anywhere and at any time. Because electronic commerce affects many processes involved in business transactions, systems analysts need to understand its ramifications. We will discuss some of these issues in Unit 13 where we will cover issues related to Internet application design.

Reading

‘Modern business trends and implications,’ pp. 20–24 in your text.

This reading reinforces Objective 5 of Unit 1. Not only do these business trends have important implications for systems analysis and design, they have also fundamentally changed the way businesses structure themselves, perform their daily activities and undertake strategic initiatives.
Data, information, information systems

Data are the raw material of an information system: names, numbers, descriptions, counts of things, statistics, the text of memos, correspondence, plans and reports, among others. Data are any fact or idea in a form that can be stored or manipulated. Data represent raw facts in isolation from the use to which they are put.

Information is data which have been organized to be meaningful to the person or group using it. Useful information can be obtained from data by selecting particular items (e.g., extracting name and address from a personnel record), by aggregating data (e.g., totalling sales over a certain time period) or by transforming it (e.g., converting sales into monetary terms). Information must have value. It tells people something that they do not already know or confirms something they suspect.

An information system creates, collects and stores data. It then processes the data into useful information. Information is a product of data and processing. This is an important concept of systems analysis and design, and one that you should remember. An information system may also be concerned with ‘knowledge’. How does knowledge differ from data and information? A dictionary definition of knowledge suggests the distinction:

• acquaintance with a fact; perception, or certain information of, a fact or matter; state of being aware of being informed
• the fact or condition of knowing; having information acquired by study or research; acquaintance with ascertained truths, facts or principles
• the body of truths or facts accumulated by people in the course of time.

Reading
‘The product — information systems,’ pp. 45–51 in your text.

This reading reinforces Objective 6 of Unit 1.
Categories of information systems

There are six types of IS used in organizations:

**Transaction processing systems (TPS)** are systems that relate to operational aspects of business; as such they are designed to processes business transactions (e.g., orders, invoices, payroll).

**Management information systems (MIS)**, also called information reporting systems, are designed to provide management with reports that they routinely need.

**Decision support systems (DSS)** are designed to support managers in their decision-making processes. Unlike MIS, which relate to structured decisions, DSS are concerned with the semi-structured and unstructured decisions that cannot be predicted in advance.

**Expert systems** are designed to capture the knowledge of a decision-maker. These systems usually rely on artificial intelligence.

**Office information systems (OIS)** are designed to support office activities through improved work flow and communications among office workers.

**Work group information systems** are designed to meet the needs of a group of users with a view to improving productivity.

---

**Reading**

‘The product — information systems,’ pp. 45–51 in your text.

This reading reinforces Objective 7 of Unit 1. It is important to understand the differences between these categories of IS because each category has certain unique characteristics that may affect one or more phases involved in the analysis and design.
A framework for information systems architecture

An information systems architecture is a grand scheme that shows the way information resources should be deployed. It is a framework within which different people with different perspectives can organize and view the building blocks of information systems. It is a road map of the desired future state of information use and management in an organization.

An IS architecture usually outlines the systems component (data, processes, interfaces, networks), type of processing (single, multiple, remote) and standards (operating systems, communications protocols). We will discuss this topic in more detail in Unit 10.

Reading

‘A framework for information systems architecture,’ p. 51 in your text.

This reading reinforces Objective 8 of Unit 1.
The people side of information systems (Perspectives)

The process of systems analysis and design involves many different people. The most important of these stakeholders are users, systems developers and owners. Each of these participants has a unique role to play and a different interest in an information system. More importantly, each stakeholder has his/her own perspective of IS.

System users

System users are people who have a stake in the information produced by a system. They are also referred to as end-users, customers or clients. Users play a very important role in systems analysis and design. They:

- know and understand the business processes to be supported by an information system. This is the knowledge from which the requirements of a new system will be defined. These requirements specify what a system is to do, what information is to be produced and what level of performance is necessary.

- may need to help resolve conflicts, if the specified requirements of different users are not compatible.

- review and approve the system development documents that define the requirements. General and specific requirements must be confirmed. Specific requirements include the time that information is needed or the format or presentation of information.

- are a source of information about the existing system. They must communicate with the system developers, and vice versa.

System designers and builders

While systems analysts are problem-solvers who bring a systems approach to the solution of business problems and the identification of information processing needs, systems designers and systems builders bring technical knowledge and practical experience to the specification of computer-based information systems. They are professionals that translate users’ requirements into technical solutions through the design of appropriate IS.

System owners

System owners are usually from management ranks. They are primarily concerned with the system’s justification and acceptance in terms of the value returned by the system. System owners play an important role in systems analysis and design because they:
• need to know what is happening in the organization and whether it can be done better. They are interested in what might be developed and how it can make the organization work better.

• decide whether or not there is a need for a new information system, particularly one that is computer-based. They relate that need to the aims, objectives and policies of the organization.

• establish priorities and allocate funding to systems development projects. They are interested in what resources are required to develop a new system, how long it will take and how much it will cost.

• make decisions about a development project. They decide between alternatives and make trade-offs. They decide, at specific checkpoints, whether to abort or continue a project.

**Reading**

‘Information workers,’ pp. 9–13 in your text.

This reading reinforces Objective 9 of Unit 1. Make sure you understand the different roles that each stakeholder plays in a systems project. Ignoring the people side of systems results usually adversely affects the long-term success of a system.

**Self-test 1.2**

**MATCHING**

I Match the term with the appropriate definition:

A system owners

B system users

C system designer

D system builder

1 The technical specialists who construct, test, and deliver the system into operation.

2 The people who actually use the system to perform or support the work to be completed.

3 They pay for the system to be built and maintained.

4 The technical specialists who design the system to meet the users’ requirements.
II Match the term with the appropriate definition:

A Data

B Processes

C Interfaces

1 How the system interacts with people and other systems.

2 The raw material used to create useful information.

3 The activities that carry out the mission of the business.
Different focuses of information systems

In the previous section we noted that each of the stakeholders of a system has a different perspective regarding various aspects of that system. These aspects of systems can be broken down into the following three main system focuses:

- **Data** — the raw material
- **Processes** — the activities performed to carry out business objectives
- **Interfaces** — the interaction between a system and people and other systems

When combined with the perspectives of the major system stakeholders, these focuses constitute the building blocks of the information systems. It is important to see that a system’s architecture is viewed differently depending on the perspective of different stakeholders (users, developers, owners) and their focus (data, processes, interfaces).

**Reading**


This reading reinforces the last Objective of Unit 1. It is essential that you become familiar with these three focuses and how they fit into the IS framework presented in Figure 2.3 of your text. The components of this framework will be revisited throughout the course.
Conclusion

In this unit you learned about the roles that IS analysts play in today’s modern organizations. You also learned about information systems, their different categories and their building blocks. You should now have the necessary background to proceed with the specific study of systems analysis and design. In the next unit of this course, Unit 2, you will learn about IS development life cycles and methodologies, as well as the applications of computer-aided systems engineering (CASE) tools. For the time being, review the summary on pages 30 and 67 in your text. Do you feel you understand the Key Terms outlined on pages 31 and 68? If not, review the relevant topics. If you feel comfortable with the topics presented in this unit, go on to the last self-test.

Self-test 1.3

This is your first self-test in B329 Systems Analysis and Design. As you can see, it presents you with a combination of multiple-choice and review questions. It allows you to assess for yourself whether or not you have achieved the objectives for this unit. Please attempt to answer all self-test questions before looking at their answers at the end of the unit.

1. Distinguish between data and information.

Questions 2-7: Choose the best answer.

2. Which of the following is an example of a transaction processing system?
   A. A system which records the daily activity on accounts in a particular bank.
   B. A system that enables a manager to predict the effect on the financial status of an organization should inflation increase.
   C. A system which allows a manager to check on merchandise which has fallen below the target inventory figure.
   D. A system which takes the knowledge of several expert auto mechanics and makes this knowledge available to auto mechanics in a nationwide network.

3. Systems that involve procedures for reviewing the results of day-to-day operations and calling attention to situations that require special attention or decisions are:
   A. decision support systems.
   B. transaction processing systems.
   C. strategic planning systems.
   D. management information systems.
4 Systems whose goal is to give an organization a competitive advantage within an industry are:
   A management information systems.
   B strategic systems.
   C decision support systems.
   D expert systems.

5 An example of a decision support system is:
   A a system which records the daily activity on accounts in a particular bank.
   B a system that allows a manager to predict the effect on the financial status of an organization should inflation increase.
   C a system which allows a manager to check on merchandise which has fallen below the target inventory figure.
   D a system which takes the knowledge of several expert auto mechanics and makes this knowledge available to auto mechanics in a nationwide network

6 The purpose of systems analysis is:
   A to develop a computer solution to a business problem.
   B to examine existing business systems.
   C to describe the business requirements of the existing system.
   D to gain an understanding of a business process or set of processes (an existing system) and to define what is required of the system now and what is likely to be required of it in the future.

7 The purpose of systems design is:
   A to examine existing business systems.
   B to specify the new system that meets the identified requirements.
   C to describe the business requirements of the existing system.
   D to build or code a computer-based information system.

8 What are the roles of a systems analyst?

9 What knowledge and skills does a systems analyst (or systems designer) require?

10 Why does each of the following business trends have important implications for systems analysis and design: (a) TQM, (b) BPR, (c) globalization of business and (d) electronic commerce?

11 What are the six major IS categories?

12 Who are the major stakeholders of IS?

13 What are the three major focuses of IS?
Once you have attempted to answer these self-test questions, you can refer to the answer key at the end of Unit 1.

Now turn back to objectives of Unit 1. Do you feel you have met them? Assess yourself against them by asking if you can do each of the listed tasks. If you feel you cannot, turn back to the topic that is associated with that objective. Read through it again, then recheck your understanding.

You have now completed Unit 1. If you feel you need a break from your study, this is a good place to stop.
References

*B329 Systems Analysis and Design* is self-instructional. Everything you need is included. You should be able to meet the learning objectives and successfully complete your assessment activities on the basis of your study units and your set textbook. The following references are *not prescribed reading*. However, they may be helpful if you want to further your study of the topics presented in this unit.


Glossary

This glossary provides brief definitions of the main technical terms you encountered in Unit 1. You should also refer to the glossary on pages 692-724 of your textbook. However, you should note that the textbook glossary covers the entire course and contains many terms that you will encounter in the latter parts of the course. The definitions given here are offered in addition to, or in place of, those in your textbook glossary. They do not correspond word for word with the definitions in the textbook, but neither do they contradict them.

**Business process reengineering:** A set of techniques and principles that allow companies to take a fresh look at their existing business processes with an eye to finding ways to reduce cost and to improve value added to their business.

**Classification of IS:** There are at least six categories of information systems: TPS, MIS, DSS, OIS, expert systems, and personal and group information systems.

**Computer-based information system:** A total, coordinated information system that includes computers, people, procedures and all the resources necessary to handle input, processing, output and storage of data useful to some aspect of the organization.

**Data:** Text and numbers used to represent objects and events in the real world; raw facts in isolation that convey meaning but are, generally, not useful by themselves.

**Decision support systems (DSS):** Systems that are designed to support managers in their decision-making processes. Unlike MIS, which relate to structured decisions, DSS are concerned with the semi-structured and unstructured decisions that cannot be predicted in advance.

**Electronic commerce:** New ways of doing business via electronic means such as the Internet.

**Expert systems:** Systems designed to capture the knowledge of a decision-maker. These systems usually rely on artificial intelligence.

**Globalization of the economy:** A phenomenon referring to the removal of geographical barriers to business.

**Information system:** The modelling of a real-world, physical system using data to represent the objects in that physical system; the system stores, not people, but the data (name, address, occupation, etc.) which describes them.

**Information systems architecture:** A grand scheme that shows the way information resources should be deployed.

**Information:** Data that is organized in a way that is meaningful to the person using it in a particular context.

**Knowledge:** The fact or condition of knowing; having information acquired by study or research; acquaintance with ascertained truths, facts or principles
Management information systems (MIS): Also called information reporting systems, the systems designed to provide management with reports that they routinely need.

Office information systems (OIS): Systems designed to support office activities through improved work flow and communications among office workers.

Organizational equilibrium: The concept that a change in one of the major components of an organization needs to be compensated for by changes in or more other components.

Personal and group information systems: Systems designed to meet the needs of an individual or a group of users with a view to improving productivity.

Perspective: The way each stakeholder views an IS.

Stakeholders: People involved with IS one way or the other: systems users, developers and owners.

System: A set of interrelated components with a common goal.

System focuses: The four major aspects of a system that affect the stakeholders’ perspective: data, processes, interfaces and geography.

System owners: Usually from management ranks, they are primarily concerned with the system’s justification and acceptance in terms of the value returned by the system.

System users: Those who actually use a computer-based information system.

Systems analysis: A set of techniques, principles and body of knowledge concerned with understanding the existing business processes with a view to defining business requirements of a new or improved system.

Systems analyst: A liaison between users and technical people who is able to understand business needs and to determine ways to improve business processes.

Systems design: A body of techniques and principles concerned with specification of a new system that meets the requirements identified in the analysis stage. The result of systems design is a set of specifications or ‘blueprints’ that define the technical content of a new system.

Systems designers and systems builders: Those who bring technical knowledge and practical experience to the specification of computer-based information systems.

Total quality management: A set of methods and techniques used to ensure quality improvement and management within a business.

Transaction processing systems (TPS): Systems that relate to operational aspects of business; as such they are designed to processes business transactions (e.g., orders, invoices, payroll).

Transactions: Simple events, such as an order, that contain data about organizational activities.
Answer key for self-test questions

These are the solutions to the self-test questions in Unit 1. Have you attempted to complete all self-test questions on your own before looking at the answers? We strongly recommend that you do.

**Self-test 1.1**

D  1 The ability to break down a large business problem into component parts, analyze various aspects, and then assemble a system to solve the problem.

I  2 Composed of three skill subsets of concepts and principles, tools, and techniques.

E  3 The ability to communicate effectively, both orally and in writing.

A  4 The awareness of existing technologies and techniques and of future trends to apply to the end-user’s operations.

B  6 Proficiency in at least one high-level programming language and one fourth generation language or applications generator.

F  7 The analyst’s role as a politician mediating disputes and acting as an agent of change.

C  8 A familiarity with specific business applications or functions, in order to gain knowledge of problems and needs.

H  9 The analyst’s ability to safeguard sensitive information and earn the confidence and trust of system users.

G  10 The ability to realize that each project requires its own unique approach.

**Self-test 1.2**

I  Match the term with the appropriate definition:

D  1 The technical specialists who construct, test, and deliver the system into operation.

B  2 The people who actually use the system to perform or support the work to be completed.

A  3 They pay for the system to be built and maintained.

C  4 The technical specialists who design the system to meet the users’ requirements.
II Match the term with the appropriate definition:

C  1 How the system interacts with people and other systems.
A  2 The raw material used to create useful information.
B  3 The activities that carry out the mission of the business.

**Self-test 1.3**

1 Data is raw material gathered from one or more sources. Information is the processed or ‘finished’ data.

2 A a system that records the daily activity on accounts in a particular bank.

3 D management information systems.

4 B strategic systems.

5 B a system that allows a manager to predict the effect on the financial status of an organization should inflation increase.

6 D to gain an understanding of a business process or set of processes (an existing system) and to define what is required of the system now and what is likely to be required of it in the future.

7 B to specify the new system that meets the identified requirements.

8 A systems analyst is a problem-solving specialist who brings a systematic perspective to the analysis of information processing needs and the design and development of computer-based solutions to these problems.

9 A systems analyst requires a working knowledge of information systems development techniques, general business and industry knowledge and a working knowledge of information technology. A systems analyst also requires interpersonal communications skills and problem-solving skills.

10 (a) Systems analysts and designers use TQM principles to ensure that the application under development is error-free and that it performs according to specifications. They are also encouraged to look for quality problems in business processes under study with a view to improving these situations.

(b) Because BPR is concerned with the redesign of business processes, it relies on some of the techniques and tools used in systems analysis and design.

(c) Because companies operate in several countries, we need to design systems that can serve distributed environment, supporting multiple languages, currencies, regulations, etc.

(d) Because such electronically mediated transactions affect many processes involved in a business transactions, systems analysts need to understand the ramifications of electronic commerce.
TPS, which are designed to processes business transactions; MIS, which are designed to provide management with reports that they routinely need; DSS, which are designed to support managers in their decision-making processes; expert systems, which are designed to capture the knowledge of a decision-maker; OIS, which are designed to support office activities; personal and group information systems, which are designed to meet the needs of an individual of a group of users.

The major stakeholders of IS are users, owners, and designers and builders.

The major focuses of IS are data, processes and interfaces.
Unit 1

Introduction to IS analysis and design
Course Team (Original course)

Project Manager: Steve Elliot, OUHK

Course developers: University of Technology, Sydney
Craig McDonald, Consultant
David Wilson, Consultant

Course designer: Shannon Timmers, OUHK

Course Team (Revised course)

Course developers: Ali F Farhoomand, Consultant
Lester W Yee, Consultant

Course designer: Linda Chung, OUHK

Course co-ordinator: John Mak, OUHK

Member: Nigel Leung, OUHK

External course assessor

Professor N V Balasubramanian, City University of Hong Kong

Production

ETPU Publishing Team

Copyright © The Open University of Hong Kong, 1998.

All rights reserved.
No part of this material may be reproduced in any form
by any means without permission in writing from the
President, The Open University of Hong Kong.

The Open University of Hong Kong
30 Good Shepherd Street
Ho Man Tin, Kowloon
Hong Kong
## Contents

Overview of Unit 1 ........................................... 1
Introduction .................................................... 2
Objectives ....................................................... 3
The idea of a system ......................................... 4
Overview and purposes of systems analysis and design 5
Characteristics of systems analysts ........................ 6
   Knowledge ............................................... 6
   Skills .................................................. 7
   Experience ........................................... 7
Business trends .............................................. 9
   Total quality management (TQM) .................... 9
   Business process reengineering (BPR) ............... 9
   Globalization of the economy ....................... 9
   Electronic commerce .................................. 10
Data, information, information systems .................. 11
Categories of information systems ....................... 12
A framework for information systems architecture .......... 13
The people side of information systems (Perspectives) .... 14
   System users ........................................ 14
   System designers and builders ..................... 14
   System owners ..................................... 14
Different focuses of information systems .................. 17
Conclusion .................................................... 18
References .................................................... 21
Glossary ....................................................... 22
Answer key for self-test questions ....................... 24