# Introduction to Systems Analysis and Design

**Chapter 1 – Introduction to Systems Analysis and Design**: Chapter 1 provides an introduction to systems analysis and design by describing the role of information technology in today’s dynamic business environment.

### Questions

1. What is information technology and why is it important? Suggest three fictitious headlines that might be added to Figure 1-1.

*Information technology (IT) is a combination of hardware and software products and services that companies use to manage, access, communicate, and share information. Your students should be able to suggest many interesting headlines. You might want to hold a class contest and reward the most creative headline writers.*

1. Why would a systems analyst have to act as a translator? What groups might be involved?

*To succeed, analysts often must act as translators. For example, when they describe business processes to programmers, they must speak a language that programmers will understand clearly. Typically, the analyst builds a series of models, diagrams, decision tables, and uses other descriptive tools and techniques. Similarly, when communicating with managers, the analyst often must translate complex technical issues into words and images that nontechnical people can grasp. To do this, the analyst uses various presentation skills, models, and communication methods.*

1. Write a business profile for a large business in your town. You can use your imagination to supply details you might not know.

*A business profile is an overview that defines a company’s overall functions, processes, organization, products, services, customers, suppliers, competitors, constraints, and future direction. Students should be able to identify a large local firm, supply the basic information, and fill in the details.*

1. What strategies are Wal-Mart and Lowes using to gain more online customers?

*Most successful brick-and-mortar firms, such as Lowe’s, Costco, Target, and Wal-Mart, have expanded their Web-based marketing channels to increase sales and serve customers better. This strategy combines the convenience of online shopping and the alternative of hands-on purchasing for those who prefer that option.*

1. Identify the main components of an information system. What is a mission-critical system?

*An information system has five main components: hardware, software, data, processes, and people. A mission-critical system**is one that is vital to a company’s operations. An order processing system, for example, is mission-critical because the company cannot do business without it.*

1. Compare enterprise computing systems to transaction processing systems. Provide three examples of each type of system.

*Enterprise computing systems support company-wide data management requirements. Airline reservations, asset management, and credit card billing systems are examples of enterprise computing systems. Transaction processing (TP) systems process data generated by day-to-day business operations. Examples of TP systems include customer billing, accounts receivable, and warranty claim processing.*

1. What are the four organizational levels common to many businesses? Which level typically requires data that supports long-term strategic planning and the overall business enterprise? What level of worker might rely heavily on transaction processing systems?

*Four organizational levels are operational personnel, lower management, middle management, and top management. Top managers need summary-level information; one-time, what-if information; and external information to support the strategic planning process. Operational personnel are the main users of transaction processing systems.*

1. Describe three systems development tools and three development methods.

*Systems analysts use modeling, prototyping, and computer-aided systems engineering (CASE) tools. Modeling produces a graphical representation of a concept or process, whereas prototyping involves the creation of an early working model of the information or its components. A systems analyst uses CASE tools to perform various systems development tasks.*

*Three popular system development methods are structured analysis, which is a traditional method that still is widely used, object-oriented analysis (O-O), which is a more recent approach that many analysts prefer, and agile methods, also called adaptive methods, which include the latest trends in software development.*

1. What are the phases of the SDLC waterfall model? Who was Barry Boehm, and what did he have to say about spiral models?

*The SDLC waterfall model consists of five phases: systems planning, systems analysis, systems design, systems implementation, and systems operation and support. During the systems planning phase, you identify the nature and scope of the problems discovered in the systems request and conduct a preliminary investigation. The purpose of the systems analysis phase is to learn exactly what takes place in the current system, determine and fully document in detail what should take place, and make recommendations to management on the alternative solutions and their costs. The purpose of the systems design phase is to determine how to construct the information system to best satisfy the documented requirements. Systems implementation is the phase during which the information system actually is constructed.*

*Spiral models initially were suggested in the 1990s by Barry Boehm, a noted software engineering professor. He stated that each iteration, or phase, of the model must have a specific goal that is accepted, rejected, or changed by the user, or client. The spiral model produces feedback and enhancements, which enable the team to reach the overall project goal. Spiral model activities include planning, risk analysis, engineering, and evaluation. The repeated iterations produce a series of prototypes, which evolve into the finished system. Notice that these phases resemble SDLC tasks, which also can be iterative.*

10. Review the IBM history. Describe three distinct phases the company has gone through in reaction to changing mark conditions.

*IBM’s history truly is remarkable. IBM is a 100-year old globe-spanning company with several hundred thousand employees. It has succeeded in part by constantly adapting to its changing business environment. For example, while it was once known primarily as a hardware company, today IBM makes a significant part of its revenue from software and services. It also invests in its people and tries to hire the best talent available. It has more patents and more Noble Prize winners than any other IT company in history.*

### Discussion Topics

1. Some experts believe that the growth in e-commerce will cause states and local governments to lose tax revenue, unless Internet transactions are subject to sales tax. What is one argument that supports this view, and one that opposes it?

*This issue has sparked strong differences of opinion among national and state leaders, consumer advocacy groups, and trade associations whose members offer online sales and services. Those who believe that Internet transactions should not be taxed often point to other sales channels, such as mail order firms that conduct no physical operations within a state or locality, and therefore do not collect sales tax. Should the Internet be treated differently? Opponents of a tax-free Internet often cite the impact on local and state government, and suggest that* ***all*** *channels should operate on a level playing field. You might ask your students to research and debate this issue. Also, you might follow this topic as news occurs during the course.*

1. Are top managers likely to be more effective if they have IT experience? Why or why not?

*Some possible arguments for a “Yes” answer:*

1. *Information technology (IT) management has a broad understanding of the information processing of the company instead of the narrower view held by managers from other areas of the company.*
2. *IT management deals with all functional company areas so members of IT management know and interrelate with the people who lead and who work in these areas. Because they provide needed services to these areas, IT management personnel have the support of the key personnel from these areas.*
3. *Information systems development and maintenance is complex and requires extraordinary management skills to operate successfully. These same skills are necessary in top-level management positions.*
4. *Computer technology dominates many companies today. Today's technology leaders should be tomorrow's business leaders.*

*Some possible arguments for a “No” answer:*

1. *IT management is more comfortable dealing with computers and with procedures, and less comfortable dealing with people. Top-level management positions require a strong interest in people and strong skills in dealing with people.*
2. *Whether a firm is product-oriented or service-oriented, it must make a profit to survive. Future company leaders should, therefore, come from the production, service, or financial areas, because these areas are the most important to a company. Possibly, in Internet-dependent firms, the best choice would be an IT manager — but only if he or she had extraordinary business skills apart from technical ability.*
3. *It is unwise to restrict prospects for top-level management positions to one specific area of the company. Competent leaders are apt to rise from many different departments.*
4. *People who have worked in several different functional areas are better rounded than those restricted to just one area. So, unless the IT manager has worked outside the IT department, he or she essentially is a specialist and is at a disadvantage compared to someone with more general knowledge and skills.*
5. Should the IT director report to the company president, or somewhere else? Does it matter?

*No clear organizational pattern exists. Perhaps the strongest case for having the IT department report to the president is that information technology is a vital corporate asset, and should not be “owned” by a particular department or function. IT can have a huge impact on profitability, and deserves equal attention from the top executive.*

*However, not everyone agrees with this view, and many would argue that IT should report to the chief financial officer, because financial functions require the most IT support. Also, the operation of the IT department represents a large expense for most companies, and the chief financial officer probably is in the best position to monitor and control this expense.*

4. Will online transactions eventually replace person-to-person contact? Why or why not?

*IT professionals agree that computer technology is changing the way companies do business. Many brick-and-mortar firms are launching large-scale B2B and B2C ventures that profoundly will affect traditional business practices and operations. Few observers think that IT will replace person-to-person contact totally, although many clerical and administrative functions will become automated. The real question is how these changes will affect people in an information-oriented society. Many observers feel that the implications of huge quantities of information and 24/7 access can cut in both directions.*

*Reasonable people differ on these issues, and you might want to propose a debate among your students. For additional background and viewpoints about the impact of computer technology on traditional person-to-person interaction, students can perform research on the Internet and compare the views of technology-based publications such as InfoWorld, to mainstream business publications such as Fortune, Forbes, and the Harvard Business Review, among others.*

5. The BYOD movement has serious implications for IT professionals, such as managing applications on user devices and security implications. Do you think BYOD is a net positive or a net negative for the enterprise? Explain your answer.

*Systems analysts need to know about the role of apps and the effect of the “bring your own device” (BYOD) movement in the enterprise.*

*BYOD can negatively affect the enterprise by introducing security risks, by increasing incompatibilities among employee devices, and by reducing productivity as employees are forced to maintain and update the software on their devices themselves.*

*BYOD can positively affect the enterprise by lowering capital costs for employee equipment, by off-loading tasks from the IT support department and therefore letting them focus on more high-level concerns, and by increasing productivity as employees use devices they are familiar with from outside usage.*

### Projects

1. Contact four people at your school who use information systems. List their positions, the systems they use, and the business functions they perform.

*Students can perform this task as individuals or work in teams. It might be interesting to compare and discuss the various ways in which the departments manage information.*

1. Research newspaper, business magazine articles, or the Web to find IT companies whose stock is traded publicly. Choose a company and pretend to buy $5,000 of its stock. Why did you choose that company? What is the current price per share? Report each week to your class.

*To perform the task, students will need a basic understanding of the stock market. Sites such as Yahoo! offer financial information and analysis links and resources. If students need fundamental information about investing in stocks, you might direct them to the material at* [*www.free-financial-advice.net/stock-market.html*](http://www.free-financial-advice.net/stock-market.html)*. Industry leader Vanguard also offers free online information about investing at* [*www.vanguard.com*](http://www.vanguard.com)*. Also, many school and community libraries can assist students in learning about financial terms and concepts, including stock market investments.*

1. Visit at least three Web sites to learn more about agile system development and spiral models. Prepare a list of the sites you visited and a summary of the results.

*Many sites describe and discuss agile methods. Students should have no trouble finding material on agile methods and spiral models and preparing a summary of the results. Several sites are shown in the text, and a simple search will produce a list of many more.*

1. Explore the Critical Thinking Community Web site at criticalthinking.org. Identify three important topics currently being discussed, and describe your findings.

*You might encourage students to explore beyond the suggested link, and challenge them to identify additional resources and issues. Also consider asking them to examine their own approach to learning, and whether they would consider themselves to be critical thinkers.*

1. Read about the corporate culture of three leading IT companies, such as that from Google shown in Figure 1-27. Compare each statement of values and describe the type of employee you think each company is looking for.

*It would be insightful for examine a traditional company, such as IBM, which has an established but dynamic corporate culture that has withstood the test of time. Newer companies such as Facebook are also quite large, but their culture originates in a different space than that of IBM. The culture of a Silicon Valley startup is different yet again, and the type of employee they seek may have different professional goals – particularly if they are at the start of their career.*