# Chapter 1

# Systems, Roles, and Development Methodologies

## Key Points and Objectives

1. Information is an organizational resource that must be managed as carefully as other resources.
2. The three primary roles of a systems analyst are:
   1. Supporting expert
   2. Consultant
   3. Agent of change
3. Qualities of a systems analyst are:
4. A problem solver
5. A communicator
6. Strong personal and professional ethics
7. Self-disciplined
8. Self-motivated
9. Systems analysis and design is a systematic approach to identifying problems, opportunities, and objectives; analyzing the information flows in organizations; and designing computerized information systems to solve a problem.
10. User involvement throughout the systems project is a critical success factor.
11. The systems development life cycle is a systematic approach to solving business problems.
12. The human-computer interaction (H C I) is a human-centered approach that places an emphasis on human needs before the needs of an organization or a system.
13. The human-computer interaction should be included into every phase of the systems development life cycle.
14. The systems development life cycle is divided into seven phases:
    1. Identifying problems, opportunities, and objectives
    2. Determining human information requirements
    3. Analyzing system needs
    4. Designing the recommended system
    5. Developing and documenting software
    6. Testing and maintaining the system
    7. Implementing and evaluating the system
15. System maintenance is removing undetected errors and enhancing existing software.
16. Systems are enhanced for the following reasons:
    1. Adding additional features to the system
    2. Business and governmental requirements change over time
    3. Technology, hardware, and software are rapidly changing
    4. Industry Update: Improving information security. Ongoing patching of security vulnerabilities in systems to prevent malware intrusions and data breaches are a critical part of systems maintenance.
17. C A S E tools are software packages for systems analysis and design.
18. Reasons for using C A S E tools are:
    1. To increase analyst productivity
    2. To facilitate communication among analysts and users
    3. To provide continuity between life cycle phases
19. The agile approach is based on:
    1. Values
    2. Principles
    3. Core practices
20. The four values of the agile approach are:
    1. Communication
    2. Simplicity
    3. Feedback
    4. Courage
21. Four resources may be adjusted for successful completion of an agile project:
    1. Time
    2. Cost
    3. Quality
    4. Scope
22. An agile project is interactive and incremental.
23. The agile development process has five distinct stages:
    1. Exploration
    2. Planning
    3. Iterations to the first release
    4. Productionizing
    5. Maintenance
24. The planning game spells out rules that help formulate the agile development team from their business customers.
25. Scrum is an agile method focused on extremely quick releases.
26. Object-oriented (O-O) analysis and design is used to build object-oriented programs. This includes not only data, but the instructions about operations that manipulate the data.
27. The Unified Modeling Language (U M L) is a standardized object-oriented modeling language.
28. Object-oriented methodologies focus on small, quick iterations of development.
29. Object-oriented phases include:
    1. Define the use case model
    2. Begin drawing U M L diagrams
    3. Develop class diagrams
    4. Draw statechart diagrams
    5. Modify the U M L diagrams
    6. Develop and document the system
30. Open source software (O S S) provides both software and the program source code used to create the software. Many users and programmers may provide modifications to the programs. Open source software may be categorized into four types of communities:
    1. Ad hoc
    2. Standardized
    3. Organized
    4. Commercial
31. Open source communities differ from each other on six key dimensions:
    1. General structure
    2. Environment
    3. Goals
    4. Methods
    5. User community
    6. Licensing
32. There are several reasons for participating in open source communities
    1. Rapidity with which new software can be developed and tested
    2. Faster to have a committed group of experts develop, test, and debug code
    3. This fosters creativity
    4. Have many good minds work with innovative applications
    5. Potential to reduce development costs
    6. Bolster their self-image
    7. Contribute something worthwhile to the software development community

## Consulting Opportunity 1.1 (p. 3)

**Healthy Hiring: Ecommerce Help Wanted**

The qualifications that the systems analysis team should be looking for when hiring their new ecommerce development team member should focus on interpersonal skills as well as technical skills. The system development project is not analyzing an existing business area and does not have to focus on how the current system works or the problems present in the current system. This implies that the analysis team will have to do extensive work with the users to define the new system before writing any program code.

One of the primary qualities of the new analyst is to get along well with the other team members as well as users. A second quality is the ability to learn new languages rather than know specific languages. Because this is a new project and the software used to develop ecommerce websites as well as the other systems needed to support ecommerce is rapidly changing.

In this situation, it is important that the team members have some basic business understanding, because ecommerce is much more than just building a website. However, it is probably advantageous if the team members do not possess identical skills and competencies. Team member skills that complement one another will help the team as it encounters project complexities and has to draw on a broad base of experience and knowledge.

The personality traits that are desirable in a systems analyst who will be working in ecommerce development are good interpersonal and team player skills, good communication skills, curiosity, creativity, the ability to deal with stress and pressure, an understanding of how systems are put together, diagramming and design skills, and skills related to coding, testing, and debugging software.

## HyperCase Experience 1

As stated in the general introduction, it is strongly suggested that students review the instructions. Click on the link on the home page. This will enable them to understand the principles of how to use the HyperCase environment and assist them in having a valuable learning experience with it.

You may wish to make assignments starting with the exercises, and have the students download the Visible Analyst files and restore them into their copy of Visible Analyst. The Visible Analyst project name is MRE. A review session or class discussion of what they learned would be a useful learning experience. Students may also download the Visio files and the repository Web page.

The students should also go to the reception area and take a stroll around the building, clicking on links and examining the office environment. Have the students print out the telephone directory.

## Answers to Review Questions

1. *List the advantages of using systems analysis and design techniques in approaching computerized information systems for business.*

System analysis and design techniques provide the analyst with a systematic procedure for analyzing data input, UML diagrams or data flow, and information output; furthermore, the techniques can improve the functioning of business.

1. *Why is security of information systems an important consideration in systems development and design*

Developing privacy controls and security by design, from the outset of systems design, is much more desirable and effective than adding it to older, legacy systems.

1. *List three roles that the systems analyst is called upon to play. Provide a definition for each one.*

The three roles of a system analyst are:

* 1. Consultant—hired from outside an organization to address information systems issues within that organization.
  2. Supporting Expert—serves as a resource for those who are managing a systems project.
  3. Change Agent—an analyst who serves as a catalyst for change, develops a plan for change, and works with others in facilitating that change.

1. *What personal qualities are helpful to the systems analyst? List them.*

Personal qualities helpful to systems analysts include:

* 1. Problem-solving abilities
  2. Communication skills
  3. Computer experience
  4. Self-discipline and self-motivation
  5. Project management capabilities

1. *List and briefly define the seven phases of the systems development life cycle (S D L C).*

The seven phases of the S D L C are:

* 1. Identifying problems, opportunities, and objectives—recognizing problems and opportunities confronting the business and determining business objectives.
  2. Determining information requirements—understanding what information users need to perform their jobs.
  3. Analyzing system needs—structured analysis of information needs and decision making.
  4. Designing the recommended system—logical design of the information system.
  5. Developing and documenting software—structured development of software and documentation.
  6. Testing and maintaining the system—testing and revising the system.
  7. Implementing and evaluating the system—training users and reviewing system.

1. *What are C A S E tools used for?*

The reasons for using C A S E tools are:

* 1. Increasing analyst productivity
  2. Improving analyst-user communication
  3. Integrating life cycle activities

1. *Define what is meant by the agile approach?*

The agile approach is based on values, principles, and core practices. It values communication, simplicity, feedback, and courage.

1. *What is the meaning of the phrase “the planning game”?*

The planning game spells out rules that can help formulate the agile development team’s relationship with their business customers. The rules are a basis for building and maintaining a relationship.

1. *What are the stages in agile development?*

The five stages in agile development are exploration, planning, iterations to the first release, productionizing, and maintenance.

1. *What is Scrum?*

Scrum is an agile method focused on extremely quick releases.

1. *Define term* object-oriented analysis and design*.*

Object-oriented analysis and design are techniques intended to facilitate the development of systems that must change rapidly in response to dynamic business environments.

1. *What is U M L?*

UML is the Unified Modeling Language, a standardized object-oriented language used to break down a system into a use case model.

1. *What is open source software?*

Open source software is when many users and programmers can study, share, and modify the code, or computer instructions.

1. *What is the role of a systems analyst in the development of open source software?*

They must first prove themselves worthy members of the group, and then strike up and maintain relationships that are mutually beneficial.

1. *List two reasons an organization may want its analysts to participate in an open source community.*

Two reasons that an organization may want its analysts to participate in an open source community are curiosity about software benefits and to achieve collective design.

## Central Pacific University—Problems

1. *From the introductory conversation Chip and Anna shared, which elements mentioned might suggest the use of C A S E tools?*

C A S E tools would be used to help Chip and Anna communicate with each other and share portions of the design that they have completed.

Because there are many users for the Computer System, C A S E tools will help to facilitate communication among the users and analyst and document the information that they have received as a result of interviews, document analysis, and questionnaires.