SOLUTIONS MANUAL

INFORMATION SYSTEMS
PROJECT MANAGEMENT

A PROCESS AND TEAM APPROACH

MARK A. FULLER · JOSEPH S. VALACICH · JOEY F. GEORGE

CHAPTER 2 – THE PROJECT MANAGEMENT LIFE CYCLE

CHAPTER OBJECTIVES

1. Describe the project management life cycle.
2. Explain the five parts of the information systems development life cycle.
3. Understand the project management context.
4. Read Gantt charts and project network diagrams.
5. Gain a basic understanding of software that supports project management.
6. Comprehend project management processes.

CHAPTER OVERVIEW

This chapter defines the concept of the project management life cycle, and compares it with the information systems development life cycle. The chapter also explores the business context in which project management occurs. Further, the chapter exposes the student to Gantt charts and project network diagrams, and discusses the various types of software that can support project management and produce these types of outputs. Finally, project management processes and the various activities that occur in each are described.

CHAPTER OUTLINE

Introduction
What Is the Project Management Life Cycle?
Project Management and Systems Development or Acquisition
  Phase 1: Systems Planning
  Phase 2: Systems Analysis
  Phase 3: Systems Design
  Phase 4: Systems Implementation
  Phase 5: Systems Maintenance
The Project Management Context
  Project Stakeholders
  Organizational Influences
  Social, Economic, and Environmental Influences
  Key General Management Skills
Technology and Techniques to Support the Project Management Life Cycle
  Network Diagrams and Project Life Cycles
  Estimating Project Times Using PERT
  An Introduction to Microsoft Project
Project Management Processes
  Project Processes
  Process Groups
  Process Interactions
  Mapping Project Management Processes
The Project Management Life Cycle and the PMBOK
Chapter Summary

List of Cases/Common Chapter Elements:
Opening Case: EDS Follows a Spiral Project Life Cycle to Develop an Inventory System
Global Implications: Adding More People to a Project does not Always Work
Common Problems: Where Do You Go for Help?
Ethical Dilemma: Dual Use of Information Technologies
Tips from the Pros: How to Avoid Wasting Time on Projects
Running Case: The Project Management Life Cycle
Chapter Case: Sedona Management Group and the Project Management Life Cycle

TEACHING TIPS/ADDITIONAL INFORMATION

This chapter introduces the students to the project management life cycle and the systems development life cycle. Here, it should be emphasized that the SDLC is a special form of project life cycle. The different phases of the SDLC can be illustrated using examples of software packages the students are familiar with (e.g., different office suites).

When discussing the project management context, the instructor may also highlight the influence of a project's opponents as part of the stakeholders that should be managed. Good non-IS examples include opponents of a planned highway; IS examples can focus on employees fearing to lose their jobs due to a new information system. Examples of different organizational cultures can include examples of Google's culture (http://www.google.com/corporate/culture.html). Examples for standards could include certain interface standards.

After a brief discussion of key management skills, it will be helpful to guide the students through the critical path and PERT examples. Here, a hands-on exercise (such as Exercise 2) will help the students better understand how to derive the critical path of a project. Then, a brief overview of Microsoft project can be given to show the critical path of the preceding example.

Finally, the different project groups should be discussed, also in terms the instructor's course outline. Here, the instructor can foreshadow when each of the respective processes will be discussed throughout the course.

The chapter case "Sedona Management Group and the Project Management Life Cycle" helps to illustrate the different concepts provided in the chapter. Further, it sets the stage for the project assignment, which is to describe the different phases of the SDLC and what activities each team will perform in each stage.

When using the movie *Lost in La Mancha,* the instructor can illustrate the changing resource needs throughout the project. Further, the scheduling problems shown in the move can be used as examples for critical activities.

ANSWERS TO MATCHING EXERCISE

Match each of the key terms above with the definition that best fits it.

1. _____ A smaller part of a project.
   Answer: Phase

2. _____ Review of the deliverables at the end of a phase of the project.
   Answer: Phase exits

3. _____ A common methodology for systems development that marks the phases or steps of information systems development.
   Answer: Systems Development Life Cycle

4. _____ The first phase of the SDLC, where the need for a new or enhanced system is identified and the proposed system's scope is determined.
   Answer: Systems planning

5. _____ The second phase in the SDLC, where the systems requirements are determined and an alternative is chosen among a set of alternatives to best meet these requirements within the cost, labor, and technical levels to which the organization is willing to commit.
   Answer: Systems analysis

6. _____ The third phase in the SDLC, where the descriptions of the recommended alternative are converted into logical and then physical system specifications.
   Answer: Systems design

7. _____ Specifications that focus on the origin, flow, and processing of data in a system, but are not tied to any specific hardware and systems software platform.
   Answer: Logical design

8. _____ Structured systems design that can be broken down into smaller and smaller units for conversion into instructions written in a programming language.
   Answer: Physical design

9. _____ The fourth phase in the SDLC, where system specifications are turned into a working system that is tested and then put into use.
   Answer: Systems implementation

10. _____ The final phase in the SDLC, where programmers make the changes that users ask for and modify the system to reflect changing business conditions.
    Answer: Systems maintenance

11. _____ A traditional hierarchical organization, sometimes thought of as resembling a pyramid, with top management at the fulcrum, direct workers at the bottom, and middle managers in between.
    Answer: Functional organization structure

12. _____ A type of organization structure where people from different functional backgrounds work with each other throughout the lifetime of the project.
    Answer: Projectized organization structure

13. _____ A type of organizational structure that typically crosses functional design (on one axis) with some other design characteristic (on the other axis).
    Answer: Matrix organization structure

14. _____ An organizational unit created to centralize and coordinate the projects within an organization.
    Answer: Project management office (PMO)

15. _____ A document approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or characteristics for products, processes, or services with which compliance is not mandatory.
    Answer: Standard

16. _____ A document that specifies product, process, or service characteristics, including the applicable administrative provisions, with which compliance is mandatory.
    Answer: Regulation

17. _____ The longest path through a network diagram illustrating the shortest time in which a project can be completed.
    Answer: Critical path

18. _____ The amount of time that an activity can be delayed without delaying the project.
    Answer: Slack time

19. _____ A series of continuous actions that bring about a particular result, end, or condition.
    Answer: Process

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What is the project management life cycle?

    Answer:
    Projects are divided into smaller parts called phases. Taking all of the work required in a project and breaking it down into smaller parts makes a project easier to understand and to manage. All of the phases considered together are known as the project life cycle. Each phase in a project is marked by the completion of deliverables, all of which have been defined during the project's early phases. The end of a phase is marked by a review of the deliverables. These review points are sometimes called phase exits, stage gates, or kill points.

2. List and explain the five phases of the information systems development life cycle.

    Answer:
    The first phase in the SDLC, **systems planning**, has two primary activities. First, someone identifies the need for a new or enhanced system. The second task in the systems planning phase is to investigate the system and determine the proposed system's scope.

    The second phase in the SDLC is **systems analysis**, where the systems requirements are determined and an alternative is chosen among a set of alternatives to best meet these requirements within the cost, labor, and technical levels to which the organization is willing to commit.

    The third phase in the SDLC is **systems design**, where the descriptions of the recommended alternative are converted into logical and then physical system specifications.

    The fourth phase in the SDLC is **systems implementation**, where the system specifications are turned into a working system that is tested and then put into use.

    The fifth phase in the SDLC is **systems maintenance,** where programmers make the changes that users ask for and modify the system to reflect changing business conditions.

3. Are all project management life cycles the same? Explain your answer.

    Answer: No. Project management cycles may differ, as many organizations adapt a generic life cycle to meet their particular requirements.

4. What is the organizational context in which projects exist? Why should project managers be aware of this organizational context?

   Answer: Projects typically do not exist in a vacuum; rather, they exist within a larger organization. The organizational context in which a project is embedded can influence the project. Three different elements of an organization that can affect a project are the organization's culture, its structure, and the role its project management office (if it has one) plays.

5. Name three types of organizational structures and how they affect project management.

   Answer:

	Functional	**Matrix**			**Projectized**
		Weak	Balanced	Strong	
Project manager's authority	Little or none	Limited	Low to moderate	Moderate to high	High to almost total
Resource availability	Little or none	Limited	Low to moderate	Moderate to high	High to almost total
Who controls the project budget	Functional manager	Functional manager	Mixed	Project Manager	Project Manager
Project manager's role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Full-time	Full-time	Full-time

6. What is the broader, extra-organizational context in which projects exist? Why should project managers be aware of this extra-organizational context?

   Answer: The broader extra-organizational context includes:
   1. Standards and regulations,
   2. Internationalization,
   3. Culture, and
   4. Social-economic-environmental sustainability.

   These factors can influence the outcomes of the project due to their influence on project scope and project team management.

7. What is the difference between a standard and a regulation?

   Answer: A standard is a "document approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or characteristics for products, processes, or services with which compliance is **not** mandatory" (ISO, 1994). Similarly, a regulation is defined as a "document, which lays down product, process, or service characteristics, including the applicable administrative provisions, with which compliance is mandatory" (ISO, 1994). Standards may eventually become de facto regulations, driven by market pressures or by habit.

8. What general management skill sets are useful for project managers? Why?

   Answer: Leadership is a broad term and encompasses many areas related to working with others. To lead means, among other things, establishing direction, aligning people with that direction, motivating people to work hard and do their best, and inspiring others to succeed, often by example. A project manager is sometimes expected to be the project leader.

   Communicating – exchanging information – is something we all do every day, but it is also something most of us do not do well. There are many dimensions to communicating. It can be written or oral, involve speaking and listening, be internal or external, formal or informal, vertical or horizontal. Successful project managers need to know about these different forms in order to be able to choose the appropriate media, establish a clear and precise writing style, develop good presentation techniques, and learn how to successfully run and manage a meeting.

   Negotiation involves coming to terms and reaching an agreement. Negotiating is a constant part of project management. The three key elements of any project, scope, cost, and schedule are subject to continual negotiation, as are contracts, personnel assignments, and resource allocation.

   Solving problems has two aspects: problem definition and decision making. Defining a problem sounds trivial and obvious, but correctly defining a problem means the difference between solving the correct problem and solving something else. Defining a problem correctly means distinguishing between causes and symptoms. Definition involves gathering information and problem finding. Decision making involves analysis of the problem, which leads to possible solutions and a choice among them. Project managers need to be able to solve various problems encountered during the management of a project.

   Influencing the organization is another management skill set. Since a project exists within an organizational context, its successful completion is intertwined with the organization and its operation. The project manager must not only understand the organizational context, he or she must also be able to influence the context in the project's favor. Influencing the organization is the ability to get things done.

Project managers need to figure out how to get other people to do project tasks and to do them well. **Motivating team members** to succeed means energizing them to achieve at high levels and to overcome obstacles to change.

9. What is the key difference between a Gantt chart and a network diagram? When should a Gantt chart be used? When should a network diagram be used?

    Answer: Gantt visually shows the duration of tasks whereas a network diagram visually shows the sequence dependencies between tasks.

    Gantt visually shows the time overlap of tasks whereas a network diagram does not show time overlap but does show which tasks could be done in parallel.

    Some forms of Gantt charts can visually show slack time available within an earliest start and latest finish duration. A network diagram shows this by data within activity rectangles.

    Because Gantt charts do not show how tasks must be ordered (precedence) but simply show when a task should begin and when it should end, they are often more useful for depicting relatively simple projects or subparts of a larger project, the activities of a single worker, or for monitoring the progress of activities compared to scheduled completion dates.

    A network diagram should be used when tasks are well-defined and have a clear beginning and endpoint, can be worked on independently of other tasks, and are ordered.

10. What is a critical path on a network diagram?

    Answer: The critical path of a network diagram is represented by the sequence of connected activities that produce the longest overall time period. All nodes and activities within this sequence are referred to as being "on" the critical path. The critical path represents the shortest time in which a project can be completed.

11. What are the benefits of using project management software?

    Answer: The key benefit of using project management software is that it allows to use automated tools to create project timelines, estimate costs, assign resources, etc., rather than having to rely on manual techniques. Creating and updating these documents becomes much easier, as does tracking the progress of the project.

12. What is a project management process?

    Answer: Project management processes describe, organize, and complete the work of the project, and they are applicable to most projects.

13. Name and define the five project management process groups.

   Answer: Initiating – This involves authorizing a project or process to begin.

   Planning – One of the most extensive sets of processes, planning involves defining goals and selecting the best way to achieve them. Many of the activities that are the subject of management techniques and of project management software involve planning processes.

   Executing – Once the project is planned, the next step is carrying out the plan. Executing processes involves coordinating people and other resources to carry out the plan.

   Monitoring and Controlling – Controlling processes are designed to regularly monitor and measure progress during execution in order to identify variances from the plan and to take corrective action when necessary.

   Closing – The counterpart to the initiating process, closing processes occur when it is time for the formal acceptance of a project and for bringing it to an end.

14. How many project management processes are associated with planning? Why?

   Answer: There are 21 processes associated with planning. These processes outline all the processes needed during the planning stage. Planning involves defining goals and selecting best way to achieve them. Many of the activities that are the subject of management techniques and of project management software involve planning processes.


ANSWERS TO CHAPTER EXERCISES

1. A project has been defined to contain the following list of activities along with their required times for completion.

| Activity No.	Activity	Time (Weeks)	Immediate Predecessors
1	Collect requirements	2	–
2	Analyze processes	3	1
3	Analyze data	3	2
4	Design processes	7	2
5	Design data	6	2
6	Design screens	1	3,4
7	Design reports	5	4,5
8	Program	4	6,7
9	Test and document	8	7
10	Install	2	8, 9

a. Draw a network diagram chart for the activities.
b. Calculate the earliest expected completion time. **27 weeks**
c. Show the critical path. **1-2-4-7-9-10**
d. What would happen if activity 6 were revised to take six weeks instead of one week?
   The start of activity 8 would be delayed by 1 week. However, activity 8 has enough slack time, so that the critical path would remain unaffected and the duration of the project would not change.
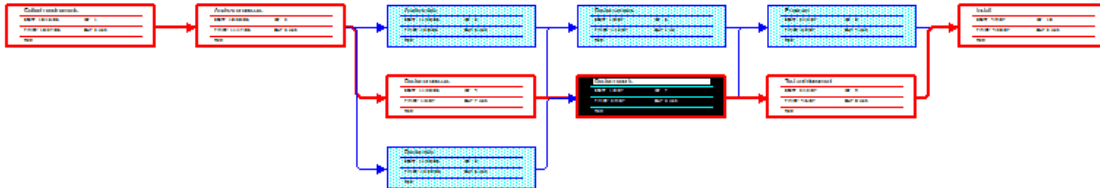
2. Construct a Gantt chart for the project defined in Problem 1.

   Answer:
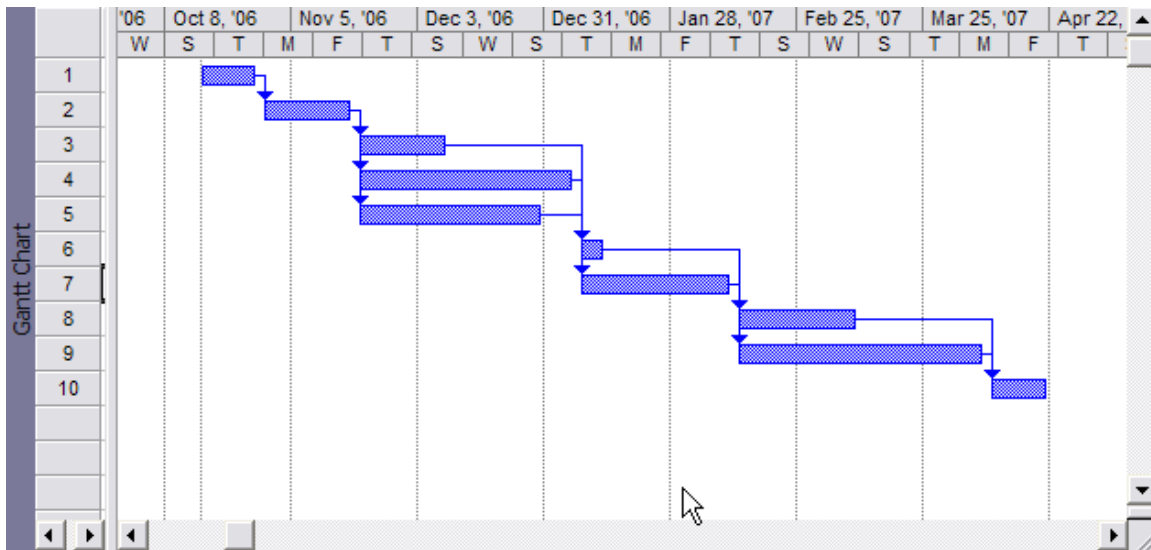
3. Look again at the activities outlined in Problem 1. Assume that your team is in its first week of the project and has discovered that each of the activity duration estimates is wrong. Activity 2 will take only two weeks to complete. Activities 4 and 7 will each take three times longer than anticipated. All other activities will take twice as long to complete as previously estimated. In addition, a new activity, number 11, has been added. It will take one week to complete and its immediate predecessors are activities 10 and 9. Adjust the PERT chart and recalculate the earliest expected completion times.

    Answer: The earliest completion time will be 63 weeks.

4. Various vendors make add-in programs for Microsoft Project. One such vendor is called Critical Tools, Inc. (http://www.criticaltools.com/). One of their add-ins for Project is called PERT Chart EXPERT. One of the features of PERT Chart EXPERT is that it enables the user to create timescaled PERT charts. For this exercise, go to the Web site for PERT Chart EXPERT (http://www.criticaltools.com/pertmain.htm) and investigate what a timescaled PERT chart would look like. As you investigate the Web site, you'll find a page that compares timescaled to non-timescaled charts. Explain what a timescaled PERT chart is and how it compares to regular PERT charts in Project. Why would a project manager want to use timescaled charts? Continue to explore the Web site and report on the other features of PERT Chart EXPERT, as well as its price, compatibility and system requirements. Your instructor may also want you to download the demo and report about it as well.

    Answer:
    A timescaled PERT chart displays a time dimension among with the sequencing of activities. In other words, rather than being a pure "logic diagram," a timescaled PERT chart incorporates some benefits of a Gantt chart. Reports on other features will vary.

5. Write a research paper on the Sarbanes-Oxley Act of 2002 and its potential effects on project management.

    Answer: Student answers will vary.