Chapter 2:
The Project Management and Information Technology Context

Information Technology Project Management, Fourth Edition

Learning Objectives

- Describe the systems view of project management and how it applies to information technology projects.

- Understand organizations, including the four frames, organizational structures, and organizational culture.

- Explain why stakeholder management and top management commitment are critical for a project's success.

Learning Objectives

- Understand the concept of a project phase and the project life cycle and distinguish between project development and product development.

- Discuss the unique attributes and diverse nature of information technology projects.
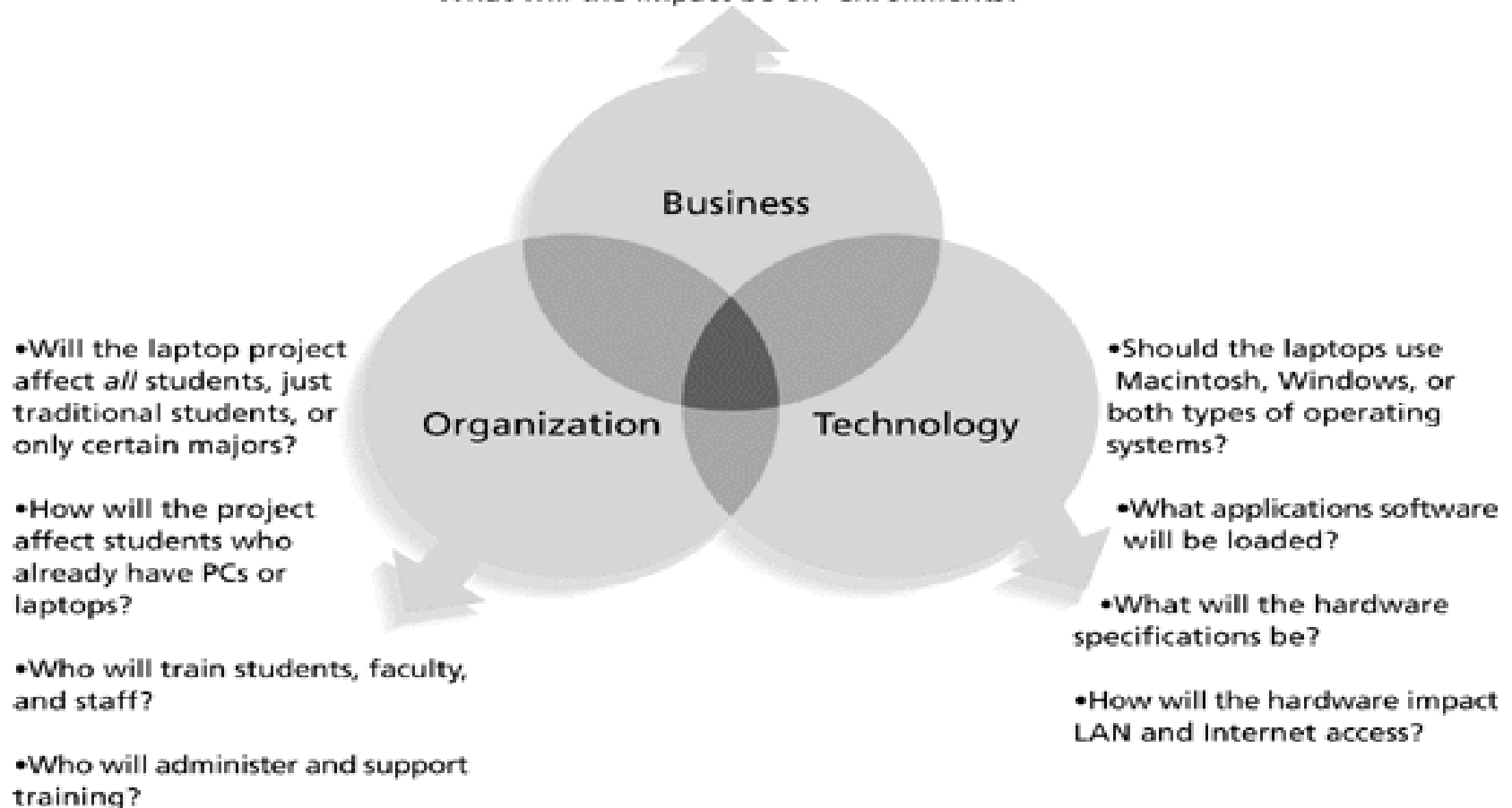
Projects Cannot Be Run in Isolation

- Projects must operate in a broad organizational environment.

- Project managers need to use **systems thinking:**
  - Taking a holistic view of a project and understanding how it relates to the larger organization.

- Senior managers must make sure projects continue to support current business needs.

A Systems View of Project Management

- The term **systems approach** emerged in the 1950s to describe a holistic and analytical approach to solving complex problems.

- Three parts include:
  - **Systems philosophy**: View things as systems, which are interacting components that work within an environment to fulfill some purpose.
  - **Systems analysis**: Problem-solving approach.
  - **Systems management**: Address business, technological, and organizational issues before making changes to systems.

Figure 2-1. Three Sphere Model for Systems Management

•What will the laptop project cost the college?

•What will it cost students?

•What will support costs be?

•What will the impact be on enrollments?

Business

Organization

Technology

•Will the laptop project affect *all* students, just traditional students, or only certain majors?

•How will the project affect students who already have PCs or laptops?

•Who will train students, faculty, and staff?

•Who will administer and support training?

•Should the laptops use Macintosh, Windows, or both types of operating systems?

•What applications software will be loaded?

•What will the hardware specifications be?

•How will the hardware impact LAN and Internet access?

Understanding Organizations

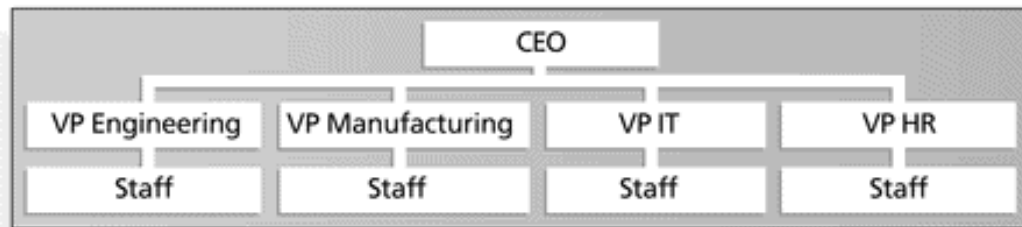|	
Structural frame: Focuses on roles and responsibilities, coordination, and control. Organization charts help define this frame.	**Human resources frame:** Focuses on providing harmony between needs of the organization and needs of people.
Political frame: Assumes organizations are coalitions composed of varied individuals and interest groups. Conflict and power are key issues.	**Symbolic frame:** Focuses on symbols and meanings related to events. Culture is important.

Many Organizations Focus on the Structural Frame

- Most people understand what organizational charts are.

- Many new managers try to change organizational structure when other changes are needed.

- Three basic organizational structures:

  - **Functional**: Functional managers report to the CEO.

  - **Project**: Program managers report to the CEO.

  - **Matrix**: Middle ground between functional and project structures; personnel often report to two or more bosses; structure can be a weak, balanced, or strong matrix.

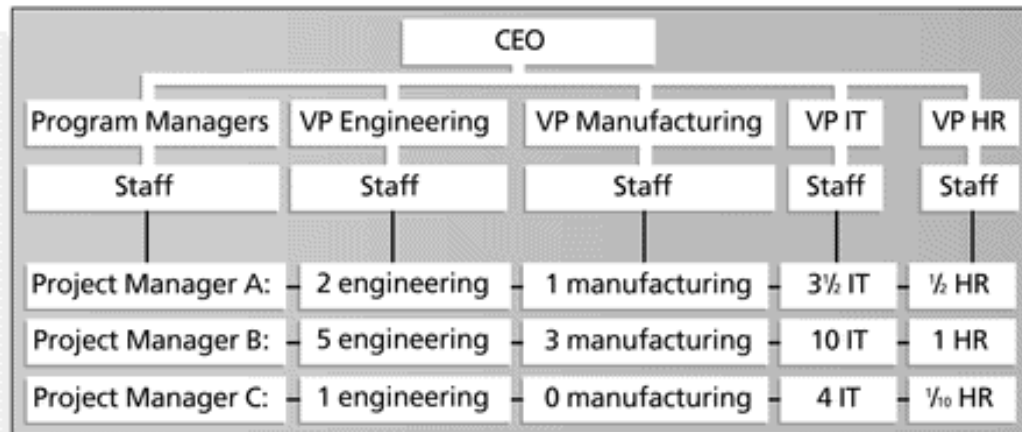# Figure 2-2. Functional, Project, and Matrix Organizational Structures

Functional

		CEO		
VP Engineering	VP Manufacturing		VP IT	VP HR
Staff	Staff		Staff	Staff

Project

	CEO	
Program Manager A	Program Manager B	Program Manager C
Staff	Staff	Staff

Matrix

		CEO		
Program Managers	VP Engineering	VP Manufacturing	VP IT	VP HR
Staff	Staff	Staff	Staff	Staff
Project Manager A:	2 engineering	1 manufacturing	3½ IT	½ HR
Project Manager B:	5 engineering	3 manufacturing	10 IT	1 HR
Project Manager C:	1 engineering	0 manufacturing	4 IT	¹⁄₁₀ HR

Table 2-1. Organizational Structure Influences on Projects

Project Characteristics	Organizational Structure Type				
	Functional	Matrix			Project
		Weak Matrix	*Balanced Matrix*	*Strong Matrix*	
Project manager's authority	Little or none	Limited	Low to Moderate	Moderate to high	High to almost total
Percent of performing organization's personnel assigned full-time to project work	Virtually none	0-25%	15-60%	50-95%	85-100%
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
Common title for project manager's role	Project Coordinator/ Project Leader	Project Coordinator/ Project Leader	Project Manager/ Project Officer	Project Manager/ Program Manager	Project Manager/ Program Manager
Project management administrative staff	Part-time	Part-time	Part-time	Full-time	Full-time

PMBOK Ⓡ Guide, 2000, 19, and *PMBOK Ⓡ Guide 2004*, 28.

Organizational Culture

- **Organizational culture** is a set of shared assumptions, values, and behaviors that characterize the functioning of an organization.

- Many experts believe the underlying causes of many companies' problems are not the structure or staff, but the culture.

Ten Characteristics of Organizational Culture

- Member identity*
- Group emphasis*
- People focus
- Unit integration*
- Control

- Risk tolerance*
- Reward criteria*
- Conflict tolerance*
- Means-ends orientation
- Open-systems focus*

*Project work is most successful in an organizational culture where these characteristics are highly prevalent and where the other characteristics are balanced.

Stakeholder Management

- Project managers must take time to identify, understand, and manage relationships with all project stakeholders.

- Using the four frames of organizations can help you meet stakeholder needs and expectations.

- Senior executives and top management are very important stakeholders.

Importance of Top Management Commitment

- Several studies cite top management commitment as one of the key factors associated with project success.

- Top management can help project managers:
  - Secure adequate resources.
  - Get approval for unique project needs in a timely manner.
  - Receive cooperation from people throughout the organization.
  - Learn how to be better leaders.

Need for Organizational Commitment to Information Technology (IT)

- If the organization has a negative attitude toward IT, it will be difficult for an IT project to succeed.

- Having a Chief Information Officer (CIO) at a high level in the organization helps IT projects.

- Assigning non-IT people to IT projects also encourages more commitment.

Need for Organizational Standards

- Standards and guidelines help project managers be more effective.

- Senior management can encourage:
  - The use of standard forms and software for project management.
  - The development and use of guidelines for writing project plans or providing status information.
  - The creation of a project management office or center of excellence.

Project Phases and the Project Life Cycle

- A **project life cycle** is a collection of project phases that defines:
    - What work will be performed in each phase.
    - What deliverables will be produced and when.
    - Who is involved in each phase.
    - How management will control and approve work produced in each phase.
- A **deliverable** is a product or service produced or provided as part of a project.

More on Project Phases

- In the early phases of a project life cycle:
    - Resource needs are usually lowest.
    - The level of uncertainty (risk) is highest.
    - Project stakeholders have the greatest opportunity to influence the project.
- In the middle phases of a project life cycle:
    - The certainty of completing a project increases.
    - More resources are needed.
- In the final phase of a project life cycle:
    - The focus is on ensuring that project requirements were met.
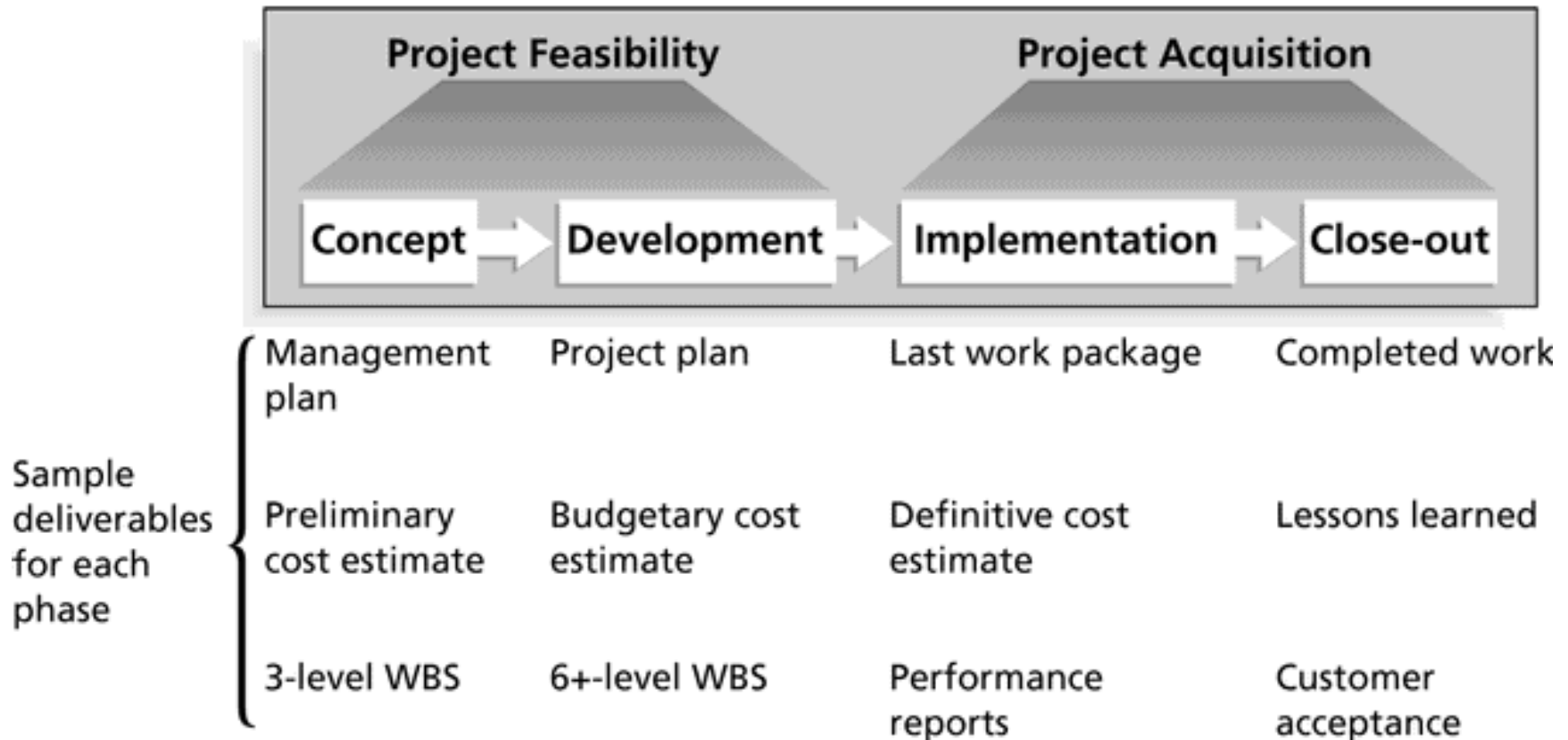   - The sponsor approves completion of the project.

Project Phases

- Project Feasibility
  - Concept
    - Develop a very high level or summary plan for the project-describes the need for the project and basic underlying concepts.
      - Rough cost estimation
      - Overview of the work
      - Work Breakdown Structure (WBS)
  - Development
    - Explain the concept
      - Create more detailed project plans
      - More accurate cost estimate
      - More through WBS

Project Phases

- Project Acquisition
  - Implementation
    - Creates a definitive or very accurate cost estimate
    - Deliver the required work
    - Provide performance reports to stakeholders
  - Close-out
    - All of the work is completed
    - Customer accept the entire project
    - Document experiences on the project

Figure 2-3. Phases of the Traditional Project Life Cycle

	Project Feasibility		Project Acquisition	
	Concept	**Development**	**Implementation**	**Close-out**
Sample deliverables for each phase	Management plan	Project plan	Last work package	Completed work
	Preliminary cost estimate	Budgetary cost estimate	Definitive cost estimate	Lessons learned
	3-level WBS	6+-level WBS	Performance reports	Customer acceptance

Product Life Cycles

- Products also have life cycles.

- A **systems development life cycle (SDLC)** is a framework for describing the phases involved in developing information systems.

- Systems development projects can follow:

  - **Predictive life cycle**: The scope of the project can be clearly articulated and the schedule and cost can be predicted.

  - **Adaptive Software Development (ASD) life cycle**: Projects are mission driven and component based, and use time-based cycles to meet target dates.

Predictive Life Cycle Models

- **Waterfall model**: Has well-defined, linear stages of systems development and support.

- **Spiral model**: Shows that software is developed using an iterative or spiral approach rather than a linear approach.

- **Incremental build model**: Provides for progressive development of operational software.

- **Prototyping model**: Used for developing prototypes to clarify user requirements.

- **Rapid Application Development (RAD) model**: Used to produce systems quickly without sacrificing quality.
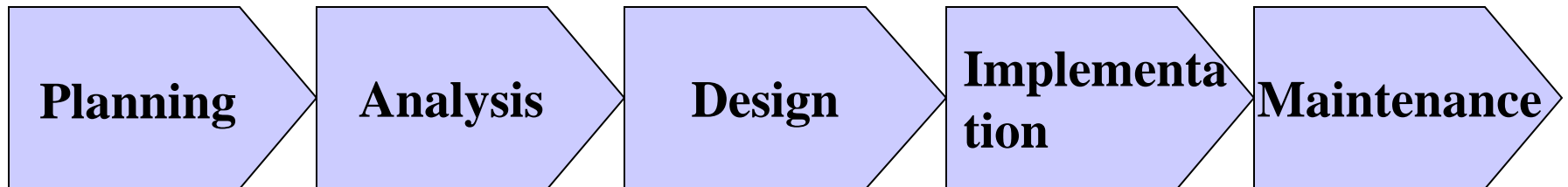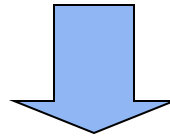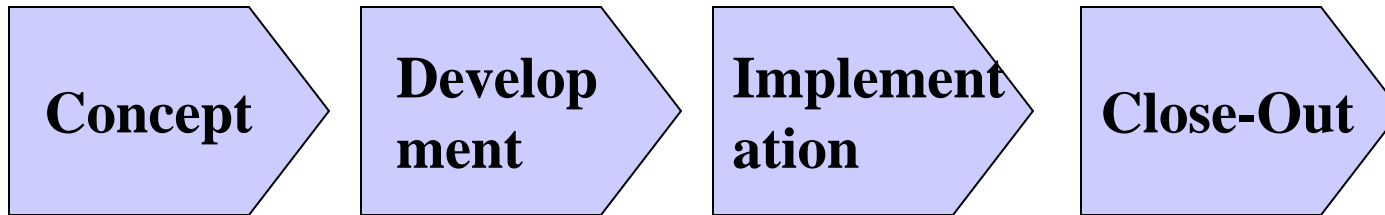
Adaptive Life Cycle Models

- **Extreme programming (XP)**: Developers program in pairs and must write the tests for their own code. XP teams include developers, managers, and users.

- **Scrum**: Iterative development in which repetitions are referred to as sprints, which normally last thirty days. Teams often meet each day for a short meeting, called a scrum, to decide what to accomplish that day. Works best for object-oriented technology projects and require strong leadership to coordinate the work.

The Importance of Project Phases and Management Reviews

- A project should successfully pass through each of the project phases in order to continue on to the next.

- Management reviews, also called **phase exits** or **kill points**, should occur after each phase to evaluate the project's progress, likely success, and continued compatibility with organizational goals.

The PLC vs the SDLC

Project Life Cycle

Concept → Development → Implementation → Close-Out

System Development Life Cycle

Planning → Analysis → Design → Implementation → Maintenance

The Context of IT Projects

- IT projects can be very diverse in terms of size, complexity, products produced, application area, and resource requirements.

- IT project team members often have diverse backgrounds and skill sets.

- IT projects use diverse technologies that change rapidly. Even within one technology area, people must be highly specialized.

Chapter Summary

- Project managers need to take a systems approach when working on projects.

- Organizations have four different frames: structural, human resources, political, and symbolic.

- The structure and culture of an organization have strong implications for project managers.

- Projects should successfully pass through each phase of the project life cycle.

- Project managers need to consider several factors due to the unique context of information technology projects.