Chapter 2:
The Project Management and Information Technology Context

Learning Objectives

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

- Analyze a formal organization using the structural, human resources, political, and symbolic organizational frames

- Explain the differences among functional, matrix, and project organizational structures

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

Learning Objectives

- Understand the concept, development, implementation, and close-out phases of the project life cycle

- Distinguish between project development and product development

- Discuss the unique attributes and diverse nature of information technology projects

- List the skills and attributes of a good project manager in general and in the information technology field
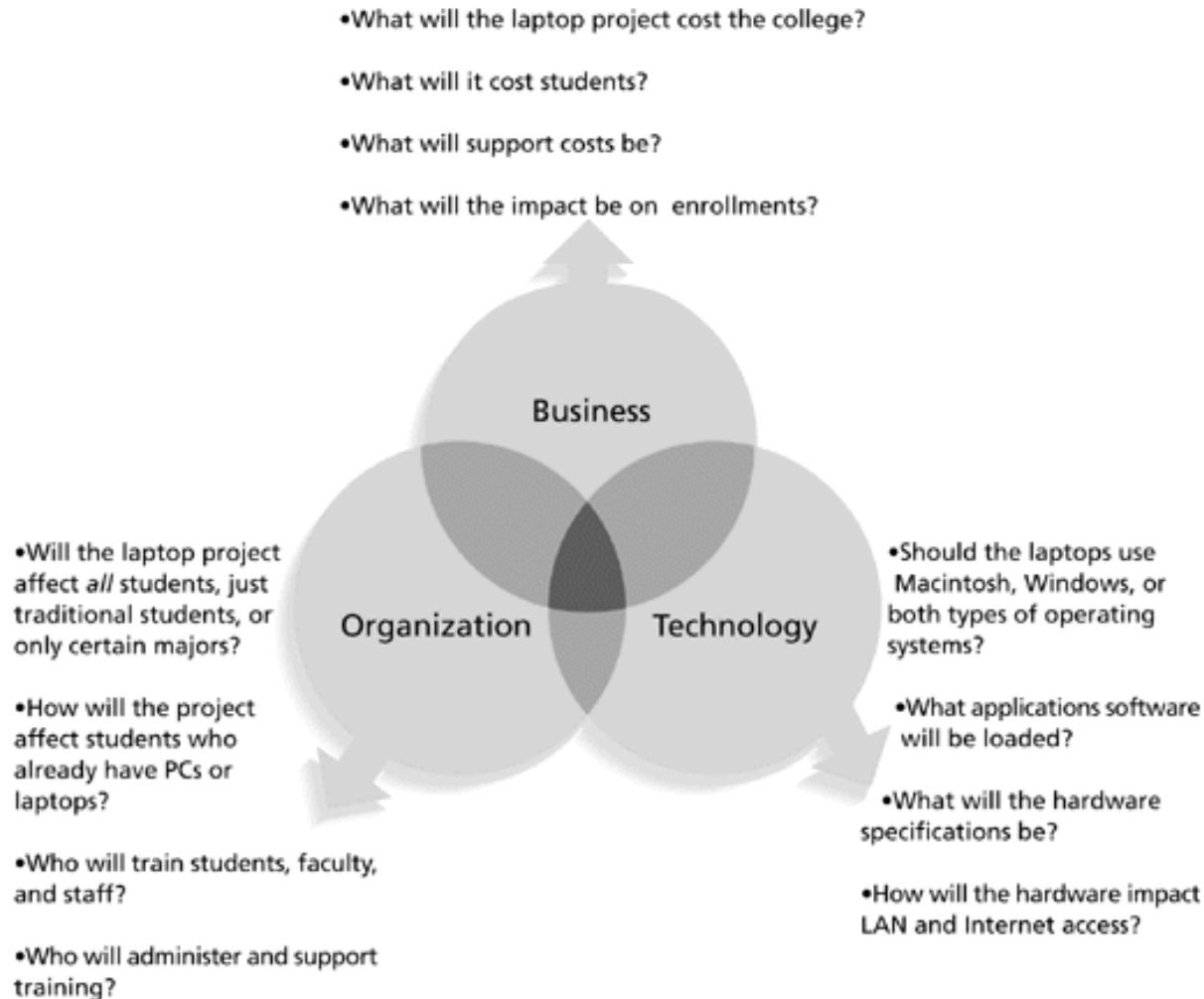
Projects Cannot Be Run in Isolation

- Projects must operate in a broad organizational environment

- Project managers need to take a holistic or systems view of a project and understand how it is situated within the larger organization

- See example in opening and closing case to illustrate this concept

A Systems View of Project Management

- A systems approach emerged in the 1950s to describe a more analytical approach to management and problem solving

- Three parts include:
  - Systems philosophy: View things as systems, interacting components working 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

•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?

Organization

Technology

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

•What applications software will be loaded?

•What will the hardware specifications be?

•Who will train students, faculty, and staff?

•Who will administer and support training?

•How will the hardware impact LAN and Internet access?

Understanding Organizations

Structural frame: Focuses on roles and responsibilities, coordination and control. Organizational 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.

What Went Wrong?

Many enterprise resource planning (ERP) projects fail due to organizational issues. For example, Sobey's Canadian grocery store chain abandoned its two-year, $90 million ERP system due to organizational problems.

As Dalhousie University Associate Professor Sunny Marche states, "The problem of building an integrated system that can accommodate different people is a very serious challenge. You can't divorce technology from the sociocultural issues. They have an equal role." Sobey's ERP system shut down for five days and employees were scrambling to stock potentially empty shelves in several stores for weeks. The system failure cost Sobey's more than $90 million and caused shareholders to take an 82-cent after-tax hit per share.*
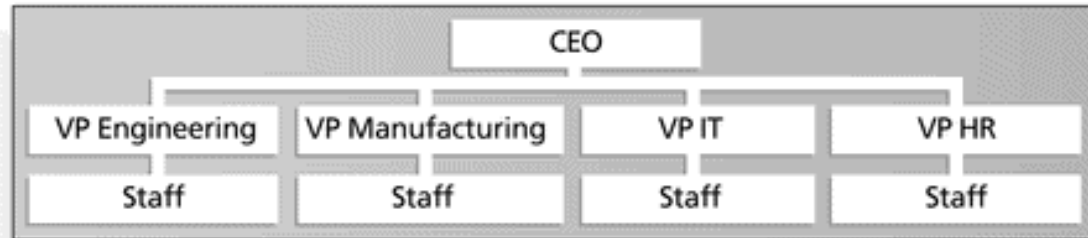
*Hoare, Eva. "Software hardships," The Herald, Halifax, Nova Scotia (2001)

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

- 3 basic organizational structures
  - functional
  - project
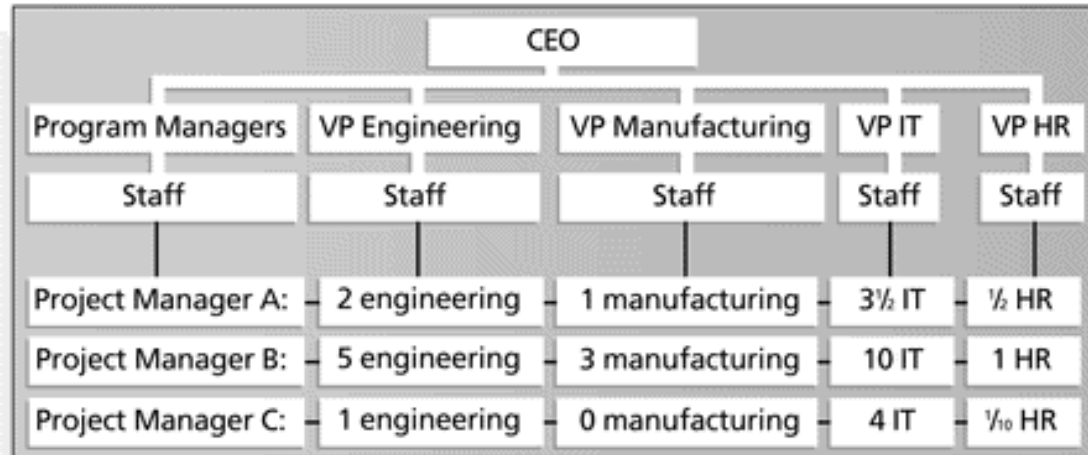 - matrix

Basic 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

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

Table 2-1. Organizational Structure Influences on Projects

Table 2-1: Organizational Structure Influences on Projects

	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%
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.

The organizational structure influences the project manager's authority, but project managers need to remember to address the human resources, political, and symbolic frames, too.

Recognize the Importance of Project Stakeholders

- Recall that project stakeholders are the people involved in or affected by project activities

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

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

- Senior executives are very important stakeholders

Table 2-2. What Helps Projects Succeed?

According to the Standish Group's report "CHAOS 2001: A Recipe for Success," the following items help IT projects succeed, in order of importance:

- **Executive support**
- User involvement
- Experienced project manager
- Clear business objectives
- Minimized scope
- Standard software infrastructure
- Firm basic requirements
- Formal methodology
- Reliable estimates

Need for 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, and 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

- Project phases vary by project or industry, but some general phases include
  - concept
  - development
  - implementation
  - support

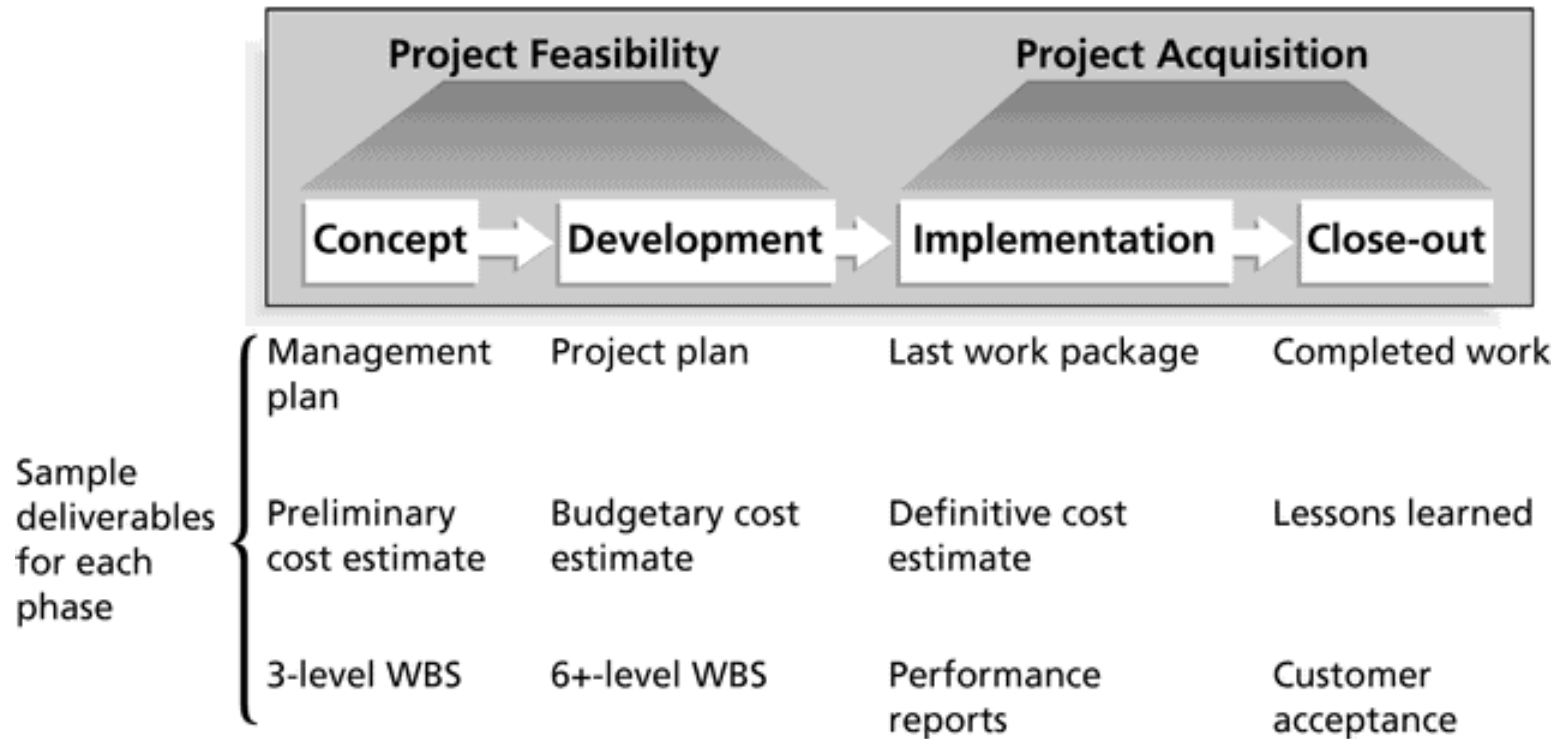# Phases of the Project Life Cycle

Figure 2-3. Phases of the Project Life Cycle

Product Life Cycles

- Products also have life cycles

- The Systems Development Life Cycle (SDLC) is a framework for describing the phases involved in developing and maintaining information systems

- Systems development projects can follow
  - predictive models: the scope of the project can be clearly articulated and the schedule and cost can be predicted
  - adaptive models: projects are mission driven and component based, using time-based cycles to meet target dates

Predictive Life Cycle Models

- The waterfall model has well-defined, linear stages of systems development and support
- The spiral model shows that software is developed using an iterative or spiral approach rather than a linear approach
- The incremental release model provides for progressive development of operational software
- The prototyping model is used for developing prototypes to clarify user requirements
- The RAD model is 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: Repetitions of iterative development are referred to as sprints, which normally last thirty days. Teams often meet every day for a short meeting, called a scrum, to decide what to accomplish that day. Works best for object-oriented technology projects and requires strong leadership to coordinate the work

Distinguishing Project Life Cycles and Product Life Cycles

- The project life cycle applies to all projects, regardless of the products being produced

- Product life cycle models vary considerably based on the nature of the product

- Most large IT systems are developed as a series of projects

- Project management is done in all of the product life cycle phases

Why Have 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

What Went Right?

"The real improvement that I saw was in our ability to—in the words of Thomas Edison—know when to stop beating a dead horse.…Edison's key to success was that he failed fairly often; but as he said, he could recognize a dead horse before it started to smell...as a result he had 14,000 patents and was very successful…In IT we ride dead horses—failing projects—a long time before we give up. But what we are seeing now is that we are able to get off them; able to reduce cost overrun and time overrun. That's where the major impact came on the success rate."

Cabanis, Jeannette, "'A Major Impact': The Standish Group's Jim Johnson On Project Management and IT Project Success," PM Network, PMI, September 1998, p. 7

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

Table 2-3. Fifteen Project Management Job Functions*

- Define scope of project
- Identify stakeholders, decision-makers, and escalation procedures
- Develop detailed task list (work breakdown structures)
- Estimate time requirements
- Develop initial project management flow chart
- Identify required resources and budget
- Evaluate project requirements

- Identify and evaluate risks
- Prepare contingency plan
- Identify interdependencies
- Identify and track critical milestones
- Participate in project phase review
- Secure needed resources
- Manage the change control process
- Report project status

*Northwest Center for Emerging Technologies, "Building a Foundation for Tomorrow: Skills Standards for Information Technology,"Belleview, WA, 1999

Suggested Skills for Project Managers

- Project managers need a wide variety of skills
- They should be comfortable with change, understand the organizations they work in and with, and be able to lead teams to accomplish project goals
- Project managers need both "hard" and "soft" skills. Hard skills include product knowledge and knowing how to use various project management tools and techniques, and soft skills include being able to work with various types of people

Suggested Skills for a Project Manager

- Communication skills: listening, persuading
- Organizational skills: planning, goal-setting, analyzing
- Team Building skills: empathy, motivation, esprit de corps
- Leadership skills: set examples, be energetic, have vision (big picture), delegate, be positive
- Coping skills: flexibility, creativity, patience, persistence
- Technological skills: experience, project knowledge

Table 2-4. Most Significant Characteristics of Effective and Ineffective Project Managers

Effective Project Managers	**Ineffective Project Managers**
• Lead by example	• Set bad examples
• Are visionaries	• Are not self-assured
• Are technically competent	• Lack technical expertise
• Are decisive	• Are poor communicators
• Are good communicators	• Are poor motivators
• Are good motivators	
• Stand up to upper management when necessary	
• Support team members	
• Encourage new ideas	