Modern Systems Analysis and Design
Seventh Edition
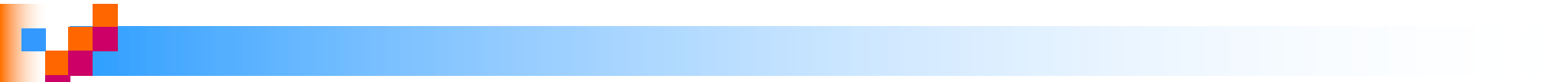
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Chapter 4
Identifying and Selecting Systems Development Projects

Learning Objectives

✓ Describe the project identification and selection process.

✓ Describe corporate strategic planning and information systems planning process.

✓ Explain the relationship between corporate strategic planning and information systems planning.

✓ Describe how information systems planning can be used to assist in identifying and selecting systems development projects.

Learning Objectives (Cont.)

✓ Analyze information systems planning matrices to determine affinity between information systems and IS projects and to forecast the impact of IS projects on business objectives.

✓ Describe the three classes of Internet electronic commerce applications: business-to-consumer, business-to-employee, and business-to-business.

Identifying and Selecting Systems Development Projects

FIGURE 4-1
Systems development life cycle with project identification and selection highlighted

Three main steps:
1. Identifying potential development projects
2. Classifying and ranking IS development projects
3. Selecting IS development projects

✓ **Project Identification and Selection**
Project Initiation and Planning

Planning

Analysis

Design

Implementation

Maintenance
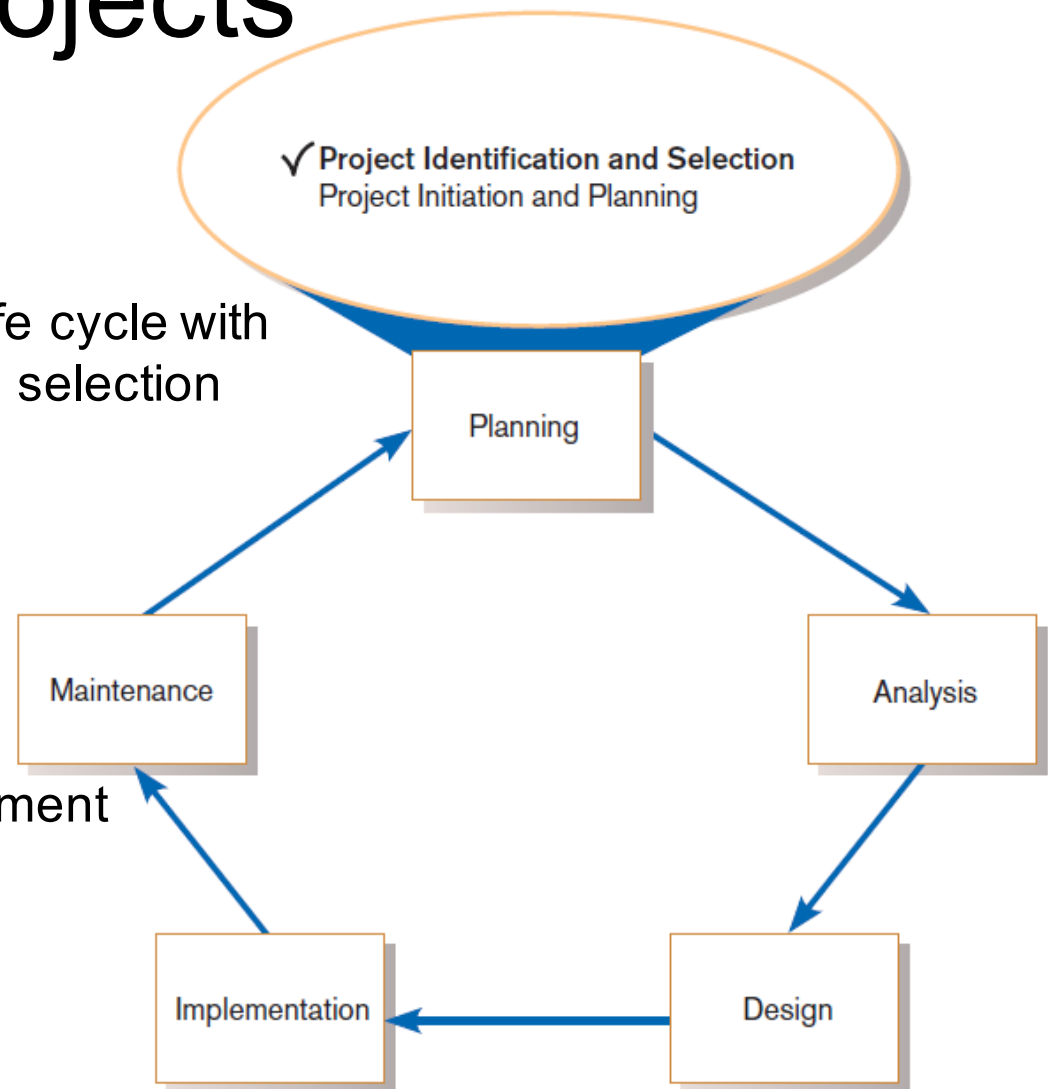
The Process of Identifying and Selecting IS Development Projects

1. *Identifying potential development projects*
   - Identification from a stakeholder group
     - Each stakeholder group brings their own perspective and motivation to the IS decision.

The Process of Identifying and Selecting IS Development Projects (Cont.)

- ☐ *Top-down source* are projects identified by top management or by a diverse steering committee.

- ☐ *Bottom-up source* are project initiatives stemming from managers, business units, or the development group.

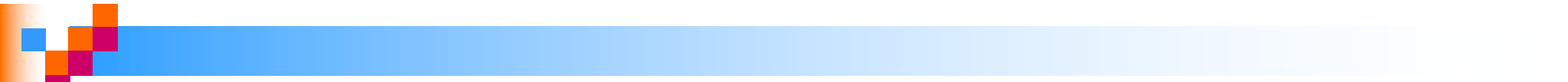- ☐ The process varies substantially across organizations.

The Process of Identifying and Selecting IS Development Projects (Cont.)

TABLE 4-1 Characteristics of Alternative Methods for Making Information Systems Identification and Selection Decisions

Selection Method	Characteristics
Top Management	Greater strategic focus
	Largest project size
	Longest project duration
	Enterprise-wide consideration
Steering Committee	Cross-functional focus
	Greater organizational change
	Formal cost-benefit analysis
	Larger and riskier projects
Functional Area	Narrow, nonstrategic focus
	Faster development
	Fewer users, management layers, and business functions involved
Development Group	Integration with existing systems focus
	Fewer development delays
	Less concern with cost-benefit analysis

(*Source:* Based on McKeen, Guimaraes, and Wetherbe, 1994; GAO, 2000.)

The Process of Identifying and Selecting IS Development Projects (Cont.)

2. *Classifying and ranking IS development projects*

    - Using value chain analysis or other evaluation criteria

        - **Value chain analysis**: Analyzing an organization's activities to determine where value is added to products and/or services and the costs incurred for doing so; usually also includes a comparison with the activities, added value, and costs of other organizations for the purpose of making improvements in the organization's operations and performance

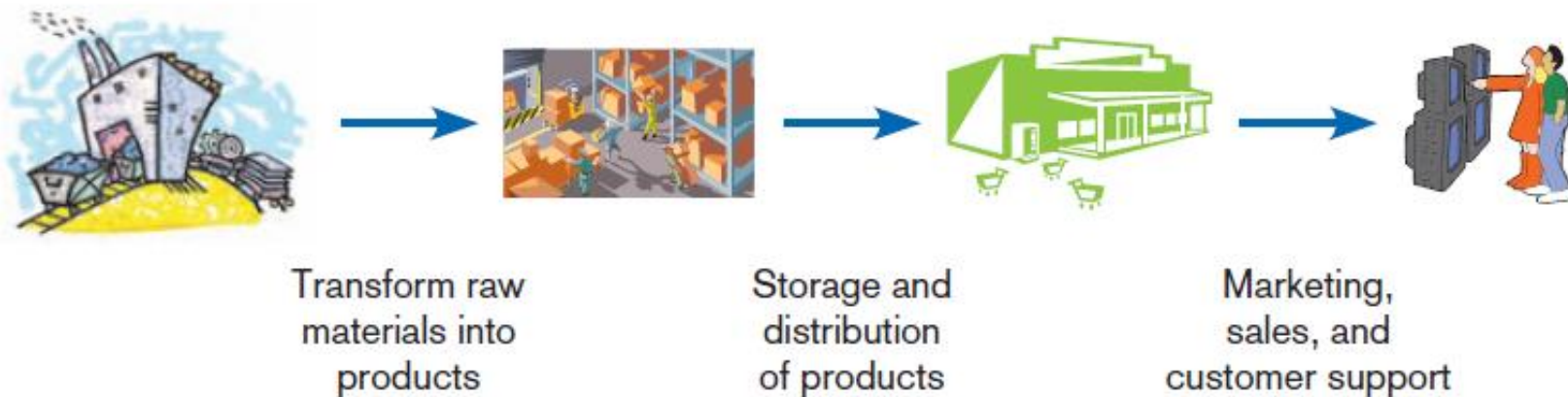# The Process of Identifying and Selecting IS Development Projects (Cont.)
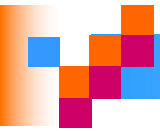

Transform raw materials into products

Storage and distribution of products

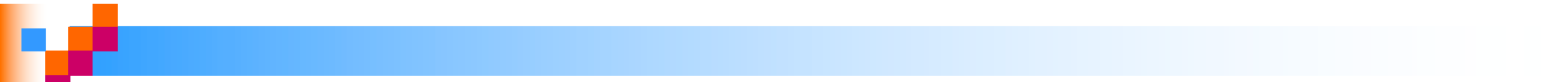Marketing, sales, and customer support

FIGURE 4-2
Organizations can be thought of as a value chain, transforming raw materials into products for customers.

The Process of Identifying and Selecting IS Development Projects (Cont.)

TABLE 4-2 Possible Evaluation Criteria When Classifying and Ranking Projects

Evaluation Criteria	Description
Value Chain Analysis	Extent to which activities add value and costs when developing products and/or services
Strategic Alignment	Extent to which the project is viewed as helping the organization achieve its strategic objectives and long-term goals
Potential Benefits	Extent to which the project is viewed as improving profits, customer service, and so forth, and the duration of these benefits
Resource Availability	Amount and type of resources the project requires and their availability
Project Size/Duration	Number of individuals and the length of time needed to complete the project
Technical Difficulty/Risks	Level of technical difficulty to successfully complete the project within given time and resource constraints

The Process of Identifying and Selecting IS Development Projects (Cont.)

3. *Selecting IS development projects*
   - Based on various factors
   - Both short- and long-term projects considered
   - Most likely to achieve business objectives selected
   - A very important and ongoing activity

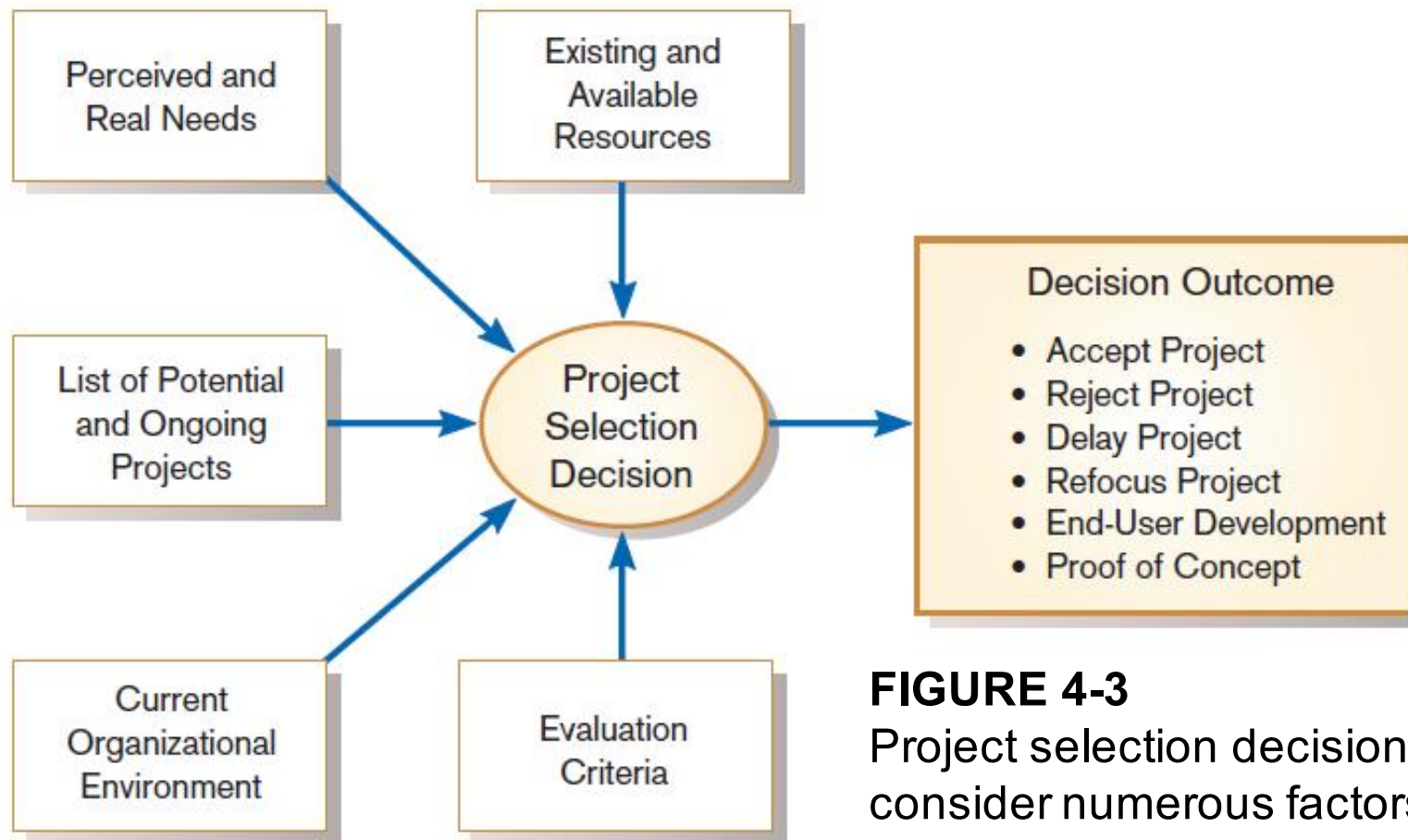# The Process of Identifying and Selecting IS Development Projects (Cont.)

FIGURE 4-3
Project selection decisions must consider numerous factors and can have numerous outcomes.

The Process of Identifying and Selecting IS Development Projects (Cont.)

- One method for deciding among different projects or alternative designs:
  - For each requirement or constraint:

    Score = weight X rating
  - Each alternative: sum scores across requirements/constraints
  - Alternative with highest score wins

The Process of Identifying and Selecting IS Development Projects (Cont.)

Criteria	Weight	Alternative A		Alternative B		Alternative C	
		Rating	Score	Rating	Score	Rating	Score
Requirements							
Real-time data entry	18	5	90	5	90	5	90
Automatic reorder	18	1	18	5	90	5	90
Real-time data query	14	1	14	5	70	5	70
	50		122		250		250
Constraints							
Developer costs	15	4	60	5	75	3	45
Hardware costs	15	4	60	4	60	3	45
Operating costs	15	5	75	1	15	5	75
Ease of training	5	5	25	3	15	3	15
	50		220		165		180
Total	100		342		415		430

FIGURE 4-4
Alternative projects and system design decisions can be assisted using weighted multicriteria analysis.

Deliverables and Outcomes

- Primary deliverable from the first part of the planning phase is a schedule of specific IS development projects.

- Outcome of the next part of the planning phase—project initiation and planning—is the assurance that careful consideration was given to project selection and each project can help the organization reach its goals.

Deliverables and Outcomes (Cont.)

- **Incremental commitment**: a strategy in systems analysis and design in which the project is reviewed after each phase and continuation of the project is rejustified
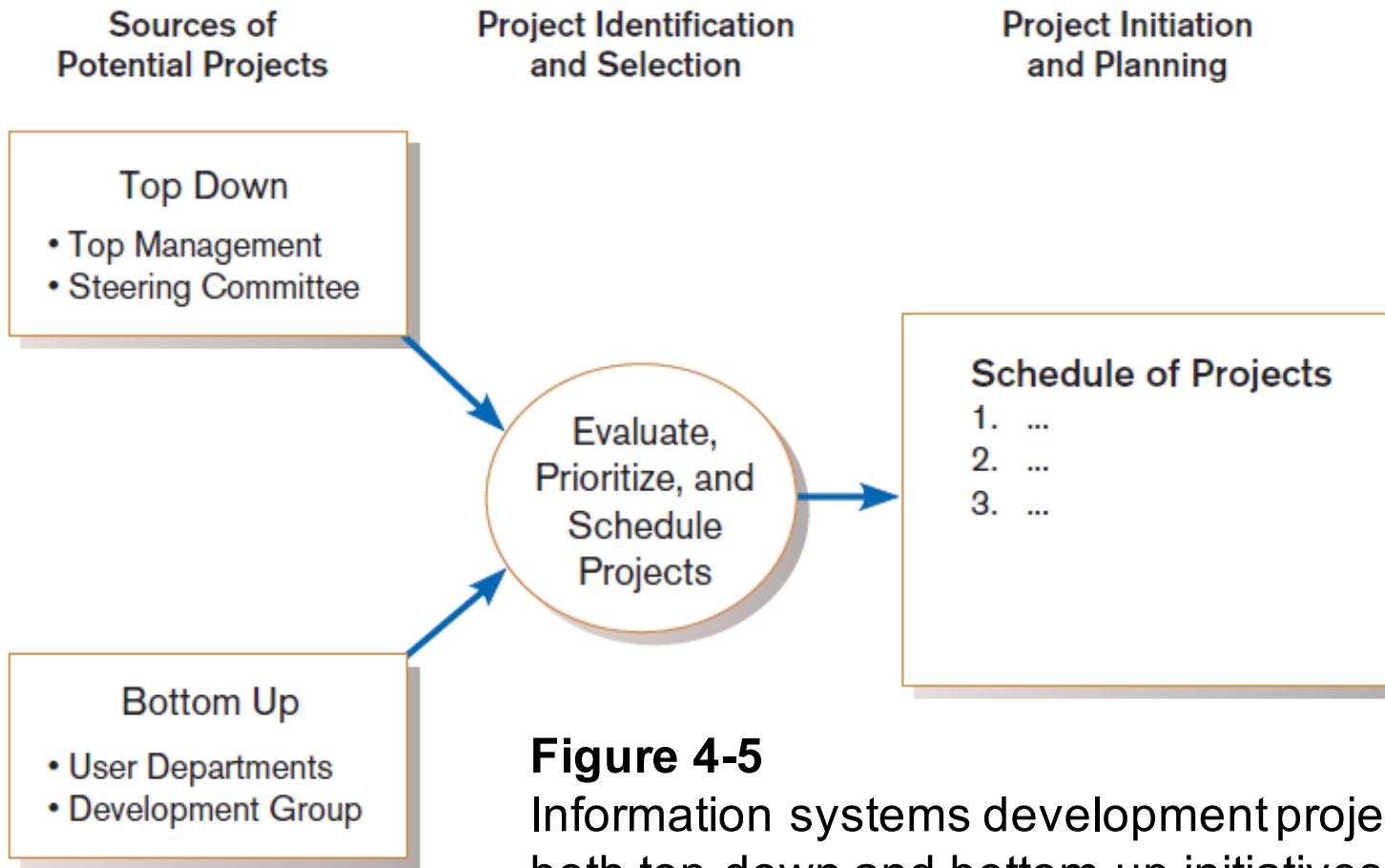
Deliverables and Outcomes (Cont.)

Sources of Potential Projects

Project Identification and Selection

Project Initiation and Planning

Top Down
- Top Management
- Steering Committee

Evaluate, Prioritize, and Schedule Projects

Schedule of Projects
1. ...
2. ...
3. ...

Bottom Up
- User Departments
- Development Group

Figure 4-5
Information systems development projects come from both top-down and bottom-up initiatives.

Corporate and Information Systems Planning

- To benefit from a planning-based approach for identifying and selecting projects, an organization must:
  - ☐ Analyze its information needs thoroughly.
  - ☐ Plan its projects carefully.

Reasons for Importance of Improved Planning

- Increasing cost of information systems (40% of organizational expense)

- Lack of cross-organizational applications and systems

- Systems don't address critical strategic problems

- Too much data redundancy, lack of data quality

- High system maintenance costs

- Long application backlogs

Corporate Strategic Planning

- Ongoing process that defines mission, objectives, and strategies of an organization

- Corporate strategy involves:
  - ☐ Mission statement
  - ☐ Objective statements
  - ☐ Description of competitive strategy

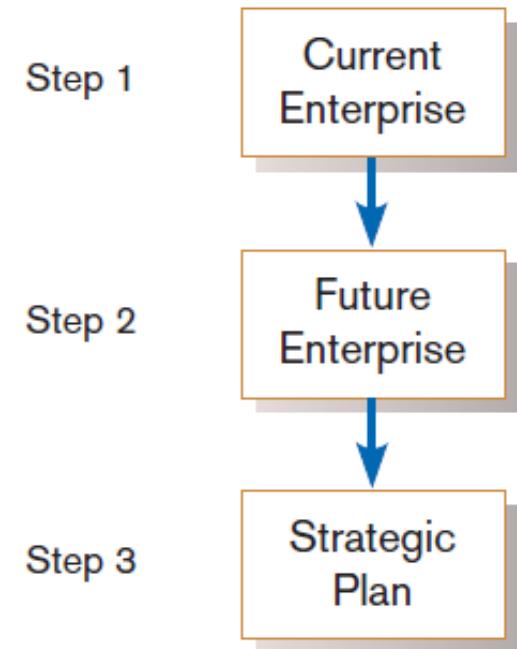|	
Step 1	Current Enterprise
Step 2	Future Enterprise
Step 3	Strategic Plan

Figure 4-6
Corporate strategic planning is a three step Process.

Corporate Strategic Planning (Cont.)

- **Mission statement**: a statement that makes it clear what business a company is in

Pine Valley Furniture
Corporate Mission Statement

We are in the business of designing, fabricating, and selling to retail stores high-quality wood furniture for household, office, and institutional use. We value quality in our products and in our relationships with customers and suppliers. We consider our employees our most critical resource.

Figure 4-7
Mission statement (Pine Valley Furniture)

Corporate Strategic Planning (Cont.)

- **Objective statement**: a series of statements that express an organization's qualitative and quantitative goals for reaching a desired future position

Corporate Strategic Planning (Cont.)

Pine Valley Furniture
Statement of Objectives

1. PVF will strive to increase market share and profitability (prime objective).

2. PVF will be considered a market leader in customer service.

3. PVF will be innovative in the use of technology to help bring new products to market faster than our competition.

4. PVF will employ the fewest number of the highest-quality people necessary to accomplish our prime objective.

5. PVF will create an environment that values diversity in gender, race, values, and culture among employees, suppliers, and customers.

FIGURE 4-8
Statement of Corporate Objectives (Pine Valley Furniture)

Corporate Strategic Planning (Cont.)

- **Competitive strategy**: the method by which an organization attempts to achieve its mission and objectives

- Main types:
  - ☐ Low-cost producer
  - ☐ Product differentiation
  - ☐ Product focus or niche

Corporate Strategic Planning (Cont.)

TABLE 4-3 Generic Competitive Strategies

Strategy	Description
Low-Cost Producer	This strategy reflects competing in an industry on the basis of product or service cost to the consumer. For example, in the automobile industry, the South Korean–produced Hyundai is a product line that competes on the basis of low cost.
Product Differentiation	This competitive strategy reflects capitalizing on a key product criterion requested by the market (for example, high quality, style, performance, roominess). In the automobile industry, many manufacturers are trying to differentiate their products on the basis of quality (e.g., "At Ford, quality is job one.").
Product Focus or Niche	This strategy is similar to both the low-cost and differentiation strategies but with a much narrower market focus. For example, a niche market in the automobile industry is the convertible sports car market. Within this market, some manufacturers may employ a low-cost strategy and others may employ a differentiation strategy based on performance or style.

(*Source:* Based on The Free Press, a Division of Simon & Schuster Adult Publishing Group, from Porter, 1980. Copyright © 1980, 1998 by The Free Press. All rights reserved.)

Information Systems Planning (ISP)

- An orderly means of assessing the information needs of an organization and defining the systems, databases, and technologies that will best meet those needs

- ISP must be done in accordance with the organization's mission, objectives, and competitive strategy.

Information Systems Planning (Cont.)

FIGURE 4-10
Parallel activities of corporate strategic planning and information systems planning

Corporate Strategic Planning

Information Systems Planning

Current Enterprise

Current Situation:
- listing of manual and automated processes
- listing of manual and automated data
- technology inventory
- human resources inventory

Future Enterprise

Future Situation:
- blueprints of manual and automated processes
- blueprints of manual and automated data
- technology blueprints
- human resources blueprints

Strategic Plan

Schedule of Projects:

Electronic Commerce
Payroll Maintenance
Job Tracking
Corporate Intranet

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Information Systems Planning (Cont.)

- **Top-down planning** attempts to gain a broad understanding of information system needs of the entire organization and offers:
  - ☐ Broader perspective.
  - ☐ Improved integration.
  - ☐ Improved management support.
  - ☐ Better understanding.

Information Systems Planning (Cont.)

- **Bottom-up planning** identifies IS development projects based on solving specific operational business problems or taking advantage of specific opportunities.
  - ☐ Can be faster and less costly, so may be beneficial in certain circumstances.

Information Systems Planning (Cont.)

FUNCTIONS:
- business planning
- product development
- marketing and sales
- production operations
- finance and accounting
- human resources

...

DATA ENTITIES:
- customer
- product
- vendor
- raw material
- order
- invoice
- equipment

...

INFORMATION SYSTEMS:
- payroll processing
- accounts payable
- accounts receivable
- time card processing
- inventory management

...

**FIGURE 4-11**
Information systems planning information
(Pine Valley Furniture)

Information Systems Planning (Cont.)

- **Functional Decomposition**: breaking high-level abstract information into smaller units for more detailed planning

Information Systems Planning (Cont.)

FIGURE 4-12
Functional decomposition of information systems planning information (Pine Valley Furniture)

(*Source:* Microsoft Corporation.)
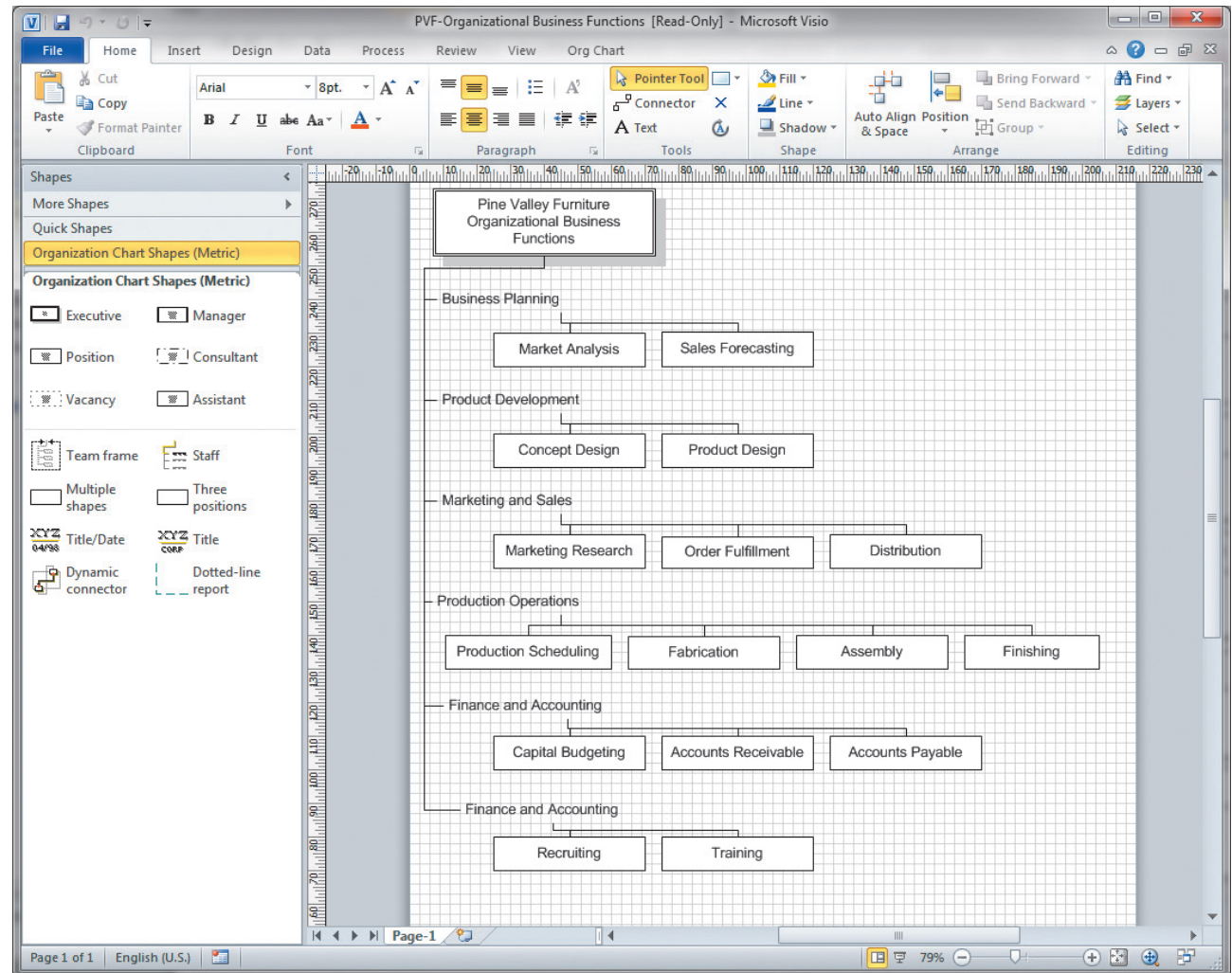
Information Systems Planning (Cont.)

- IS planning matrices describe relationships between pairs of organizational elements (location, function, business unit, objective, process, data, information system).

Types of Planning Matrices

- Location-to-Function
- Location-to-Unit
- Unit-to-Function
- Function-to-Objective
- Function-to-Process
- Function-to-Data Entity

- Process-to-Data Entity
- Process-to-Information System
- Data Entity-to-Information System
- Information System-to-Objective

Information Systems Planning (Cont.)

	Customer	Product	Vendor	Raw Material	Order	Work Center	Equipment	Employees	Invoice	Work Order	...
Marketing and Sales											
Marketing Research	X	X									
Order Fulfillment	X	X			X				X		
Distribution	X	X									
Production Operation											
Production Scheduling						X	X	X		X	
Fabrication						X	X	X		X	
Assembly						X	X	X		X	
Finishing						X	X	X		X	
Finance and Accounting											
Capital Budgeting					X	X	X				
Accounts Receivable	X	X	X	X	X				X		
Accounts Payable											
...											

FIGURE 4-13
Data Entity-to-Function matrix (Pine Valley Furniture)

IS Plan Components

- ## Organizational Mission, Objectives, and Strategy
  - □ Brief description of mission, objectives, and strategy of the organization

- ## Information Inventory
  - □ Summary of processes, functions, data entities, and information needs of the enterprise

IS Plan Components (Cont.)

- **Mission and Objectives of IS**
  - Primary role IS will play in the organization to transform enterprise from current to future state

- **Constraints on IS Development**
  - Limitations imposed by technology and current levels of financial, technical, and personnel resources

IS Plan Components (Cont.)

- **Systems Needs and IS Strategy**
  - ☐ Summarize overall information systems needs in the company and set long-term (2-5 year) strategies for filling the needs

- **Short Term Plan**
  - ☐ Detailed inventory of present projects and systems and detailed plan for the current year

IS Plan Components (Cont.)

- ## Conclusions

  - ☐ Unknown but likely events that can affect the plan, presently known business change elements and their impact on the plan
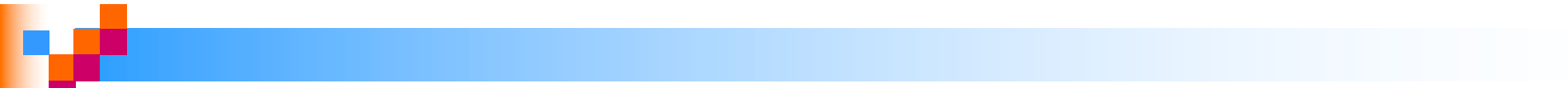
Information Systems (IS) Plan

Information Systems Plan:
- I. Organizational Mission
- II. Informational Inventory
- III. Mission and Objectives of IS
- IV. Constraints
- V. Long-Range IS Strategies
- VI. Short-Term Plan
- VII. Conclusions
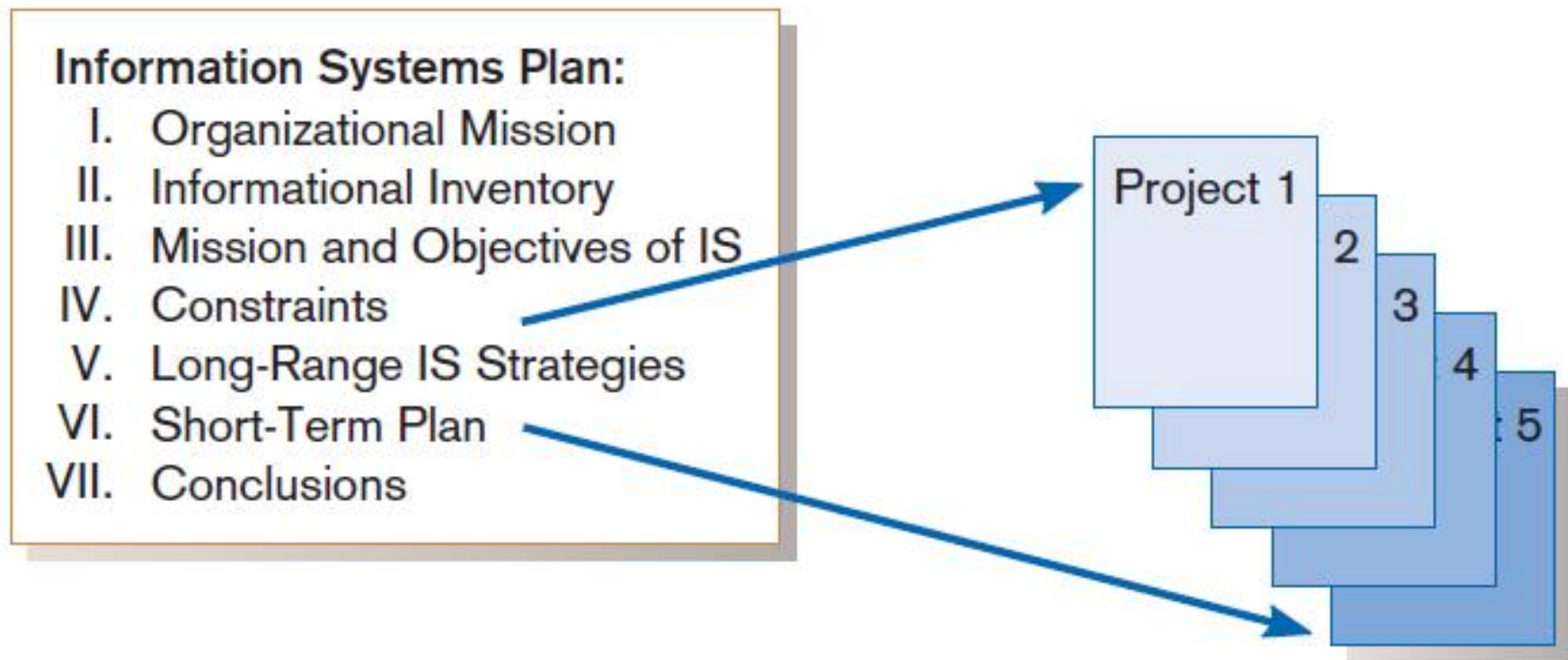
Project 1
2
3
4
5

FIGURE 4-16
Systems development projects flow from the information systems plan.
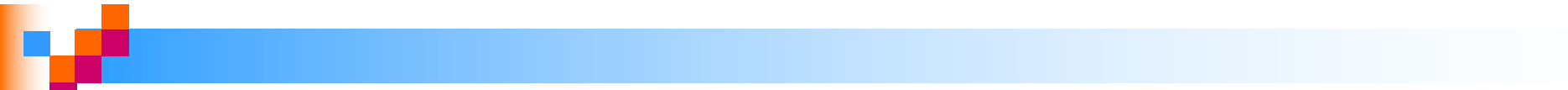
Electronic Commerce Applications and Internet Basics

- **Internet**: a large worldwide network of networks that use a common protocol to communicate with each other

- **Electronic Commerce** (**EC**): Internet-based communication to support day-to-day business activities

- **Business-to-consumer (B2C)**: electronic commerce between businesses and consumers

Electronic Commerce Applications and Internet Basics (Cont.)

- **Business-to-business (B2B)**: electronic commerce between business partners, such as suppliers and intermediaries

- **Business-to-employee (B2E)**: electronic commerce between businesses and their employees

- **Electronic data interchange (EDI)**: the use of telecommunications technologies to directly transfer business documents between organizations

Electronic Commerce Applications and Internet Basics (Cont.)

TABLE 4-5   Unknowns That Must Be Dealt with When Designing and Building Internet Applications

User	• Concern: Who is the user? • Example: Where is the user located? What is the user's expertise, education, or expectations?
Connection Speed	• Concern: What is the speed of the connection and what information can be effectively displayed? • Example: Modem, Cable Modem, DSL, Satellite, Broadband, Cellular
Access Method	• Concern: What is the method of accessing the net? • Example: Web browser, Personal Digital Assistant (PDA), Web-enabled Cellular Phone, Tablet, Web-enabled Television

Summary

- In this chapter you learned how to:
  - ✓ Describe the project identification and selection process.
  - ✓ Describe corporate strategic planning and information systems planning.
  - ✓ Explain the relationship between corporate strategic planning and IS planning.

Summary (Cont.)

- ✓ Describe how IS planning can assist in system development project identification and selection.

- ✓ Analyze IS planning matrices.

- ✓ Describe three classes of E-Commerce applications.