Planning:

Identifying and Selecting System Development Projects

Prepared by:

Hiranya Prasad Bastakoti

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Introduction

- During the first phase of the systems development life cycle (SDLC) planning, two primary activities are performed.

- The first, project identification and selection, focuses on the activities during which the need for a new or enhanced system is recognized.

- This activity does not deal with a specific project but rather identifies the portfolio of projects to be undertaken by the organization.

- Thus, project identification and selection is often thought of as a "preproject" step in the life cycle.

- Project identification and selection consists of three primary activities:

    - Identifying potential development projects

    - classifying and ranking projects,

    - and selecting projects for development

Identifying and Selecting Systems Development Projects

FIGURE 4-1
Systems development life cycle with project identification and selection highlighted
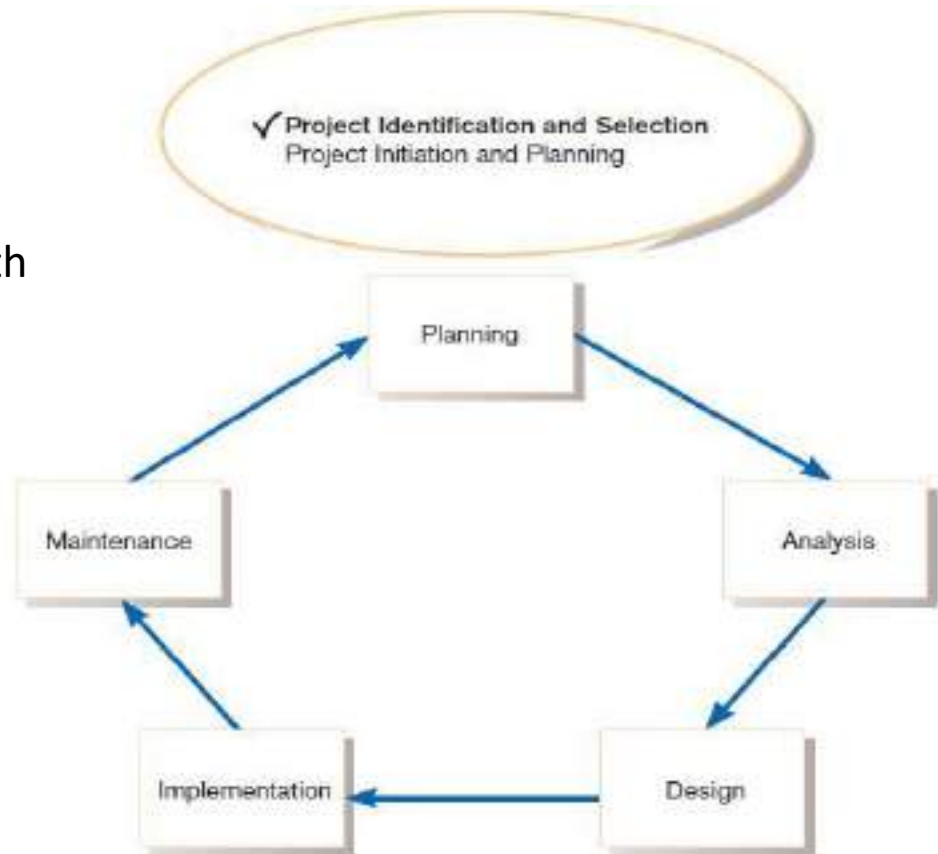
The Process of Identifying and Selecting IS Development Projects

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

- *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 for making products and/or services to determine where value is added and costs are incurred.
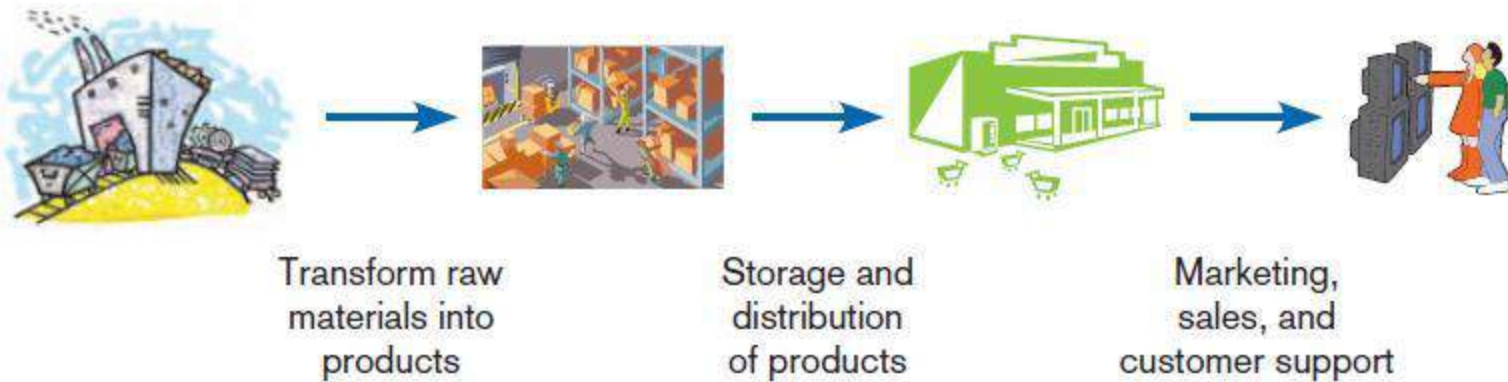
The Process of Identifying and Selecting IS Development Projects (Cont.)

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

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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.)

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

The Process of Identifying and Selecting IS Development Projects (Cont.)
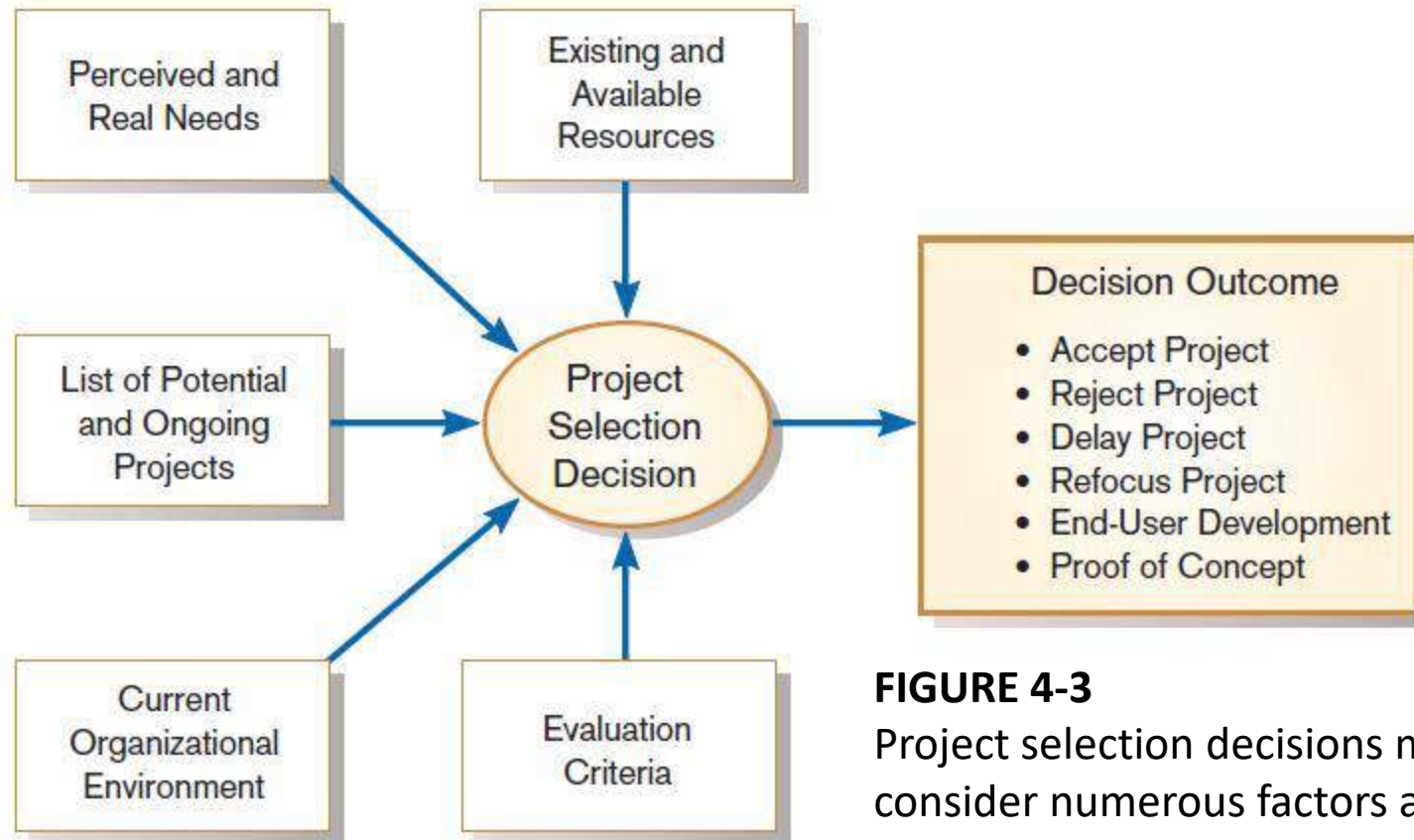
FIGURE 4-3
Project selection decisions must consider numerous factors and can have numerous outcomes.

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

- One method for deciding among different projects or alternative designs is:

  - 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
Constraints							
Developer cost	15	4	60	5	75	3	45
Hardware cost	15	4	60	4	60	3	45
Operating cost	5	5	25	1	5	5	25
Total	100		145		140		115

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
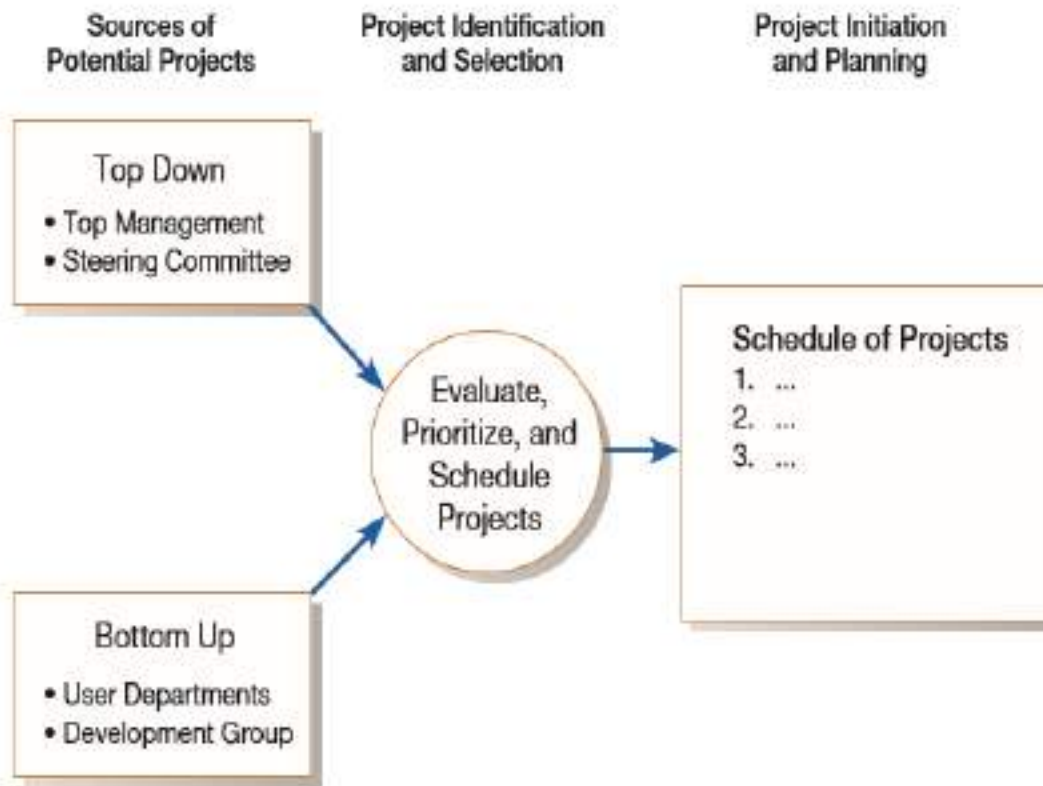
Deliverables and Outcomes

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

- To move to the next part of the planning phase *project initiation and planning* .

- The outcome of this phase is the assurance that careful consideration was given to project selection and each project can help the organization reach its goals.

Deliverables and Outcomes

- **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.

Sources of Potential Projects | Project Identification and Selection | Project Initiation and Planning

Top Down
- Top Management
- Steering Committee

Bottom Up
- User Departments
- Development Group

Evaluate, Prioritize, and Schedule Projects

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

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.

Corporate Strategic Planning

- An ongoing process that defines the mission, objectives, and strategies of an organization

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

Corporate Strategic Planning (Cont.)

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

  is in.

Corporate Strategic Planning (Cont.)- Mission statement

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.)
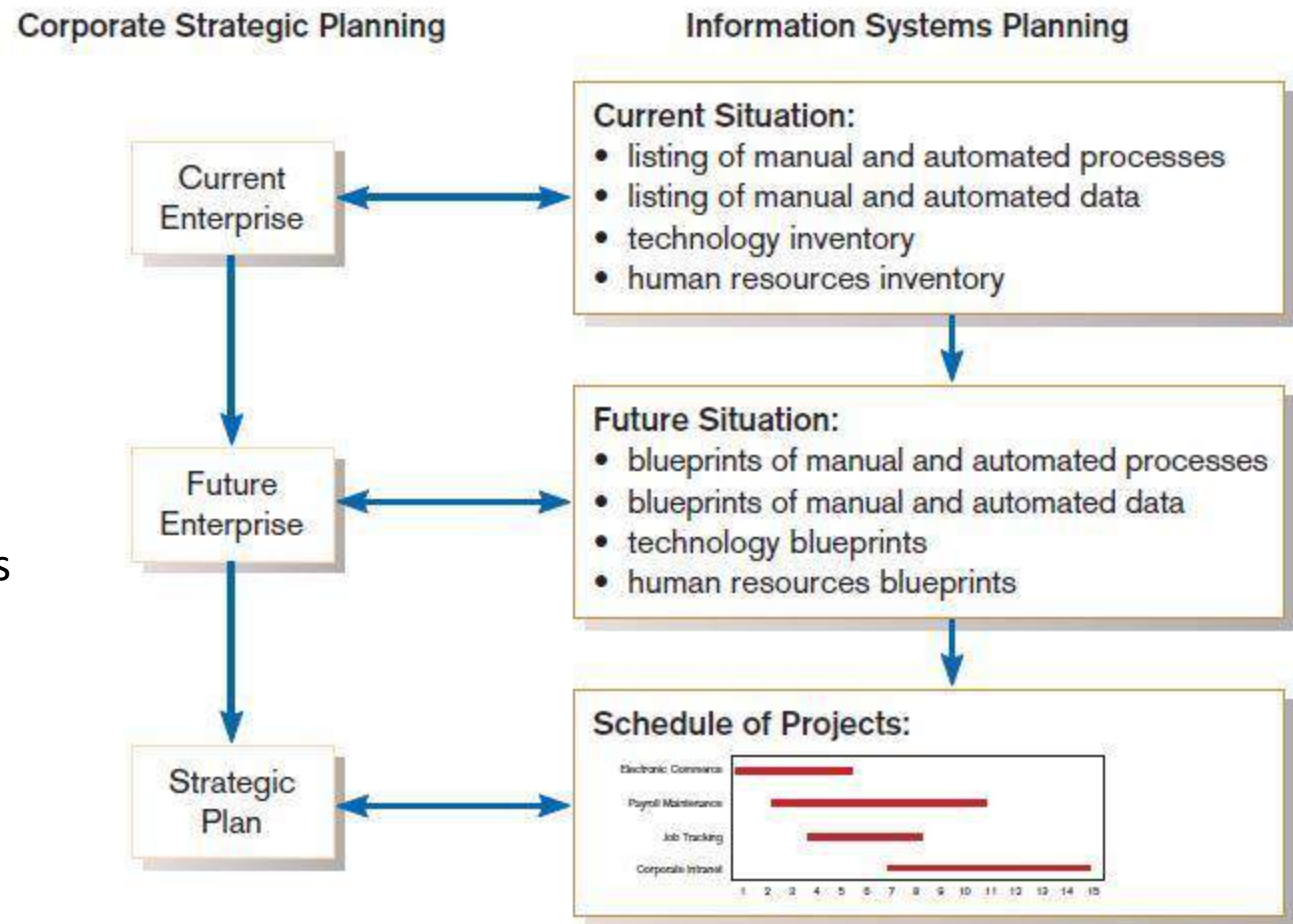
TABLE 4-3 Generic Competitive Strategies

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 (for example, "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 while others may employ a differentiation strategy based on performance or style.

Information Systems Planning (ISP)

- An orderly means of assessing the information needs of an organization and defining 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.)

Corporate Strategic Planning

Information Systems Planning

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

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

Current Enterprise

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

Future Enterprise

Schedule of Projects:

Strategic Plan

Information Systems Planning (Cont.)

- A numerous methodologies such as business system planning (BSP) and Information Engineering (IE) have been developed to support ISP process, most contain the following three activities.

Information Systems Planning (Cont.)

1. Top-down planning attempts to gain a broad understanding of information system needs of the entire organization and offers a lot of advantages:

 – Broader perspective.

 – Improved integration

 – Improved management support.

 – Better understanding.

Information Systems Planning (Cont.)

2. 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.

Business Functions, Data Entities, and Information Systems of PVF

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
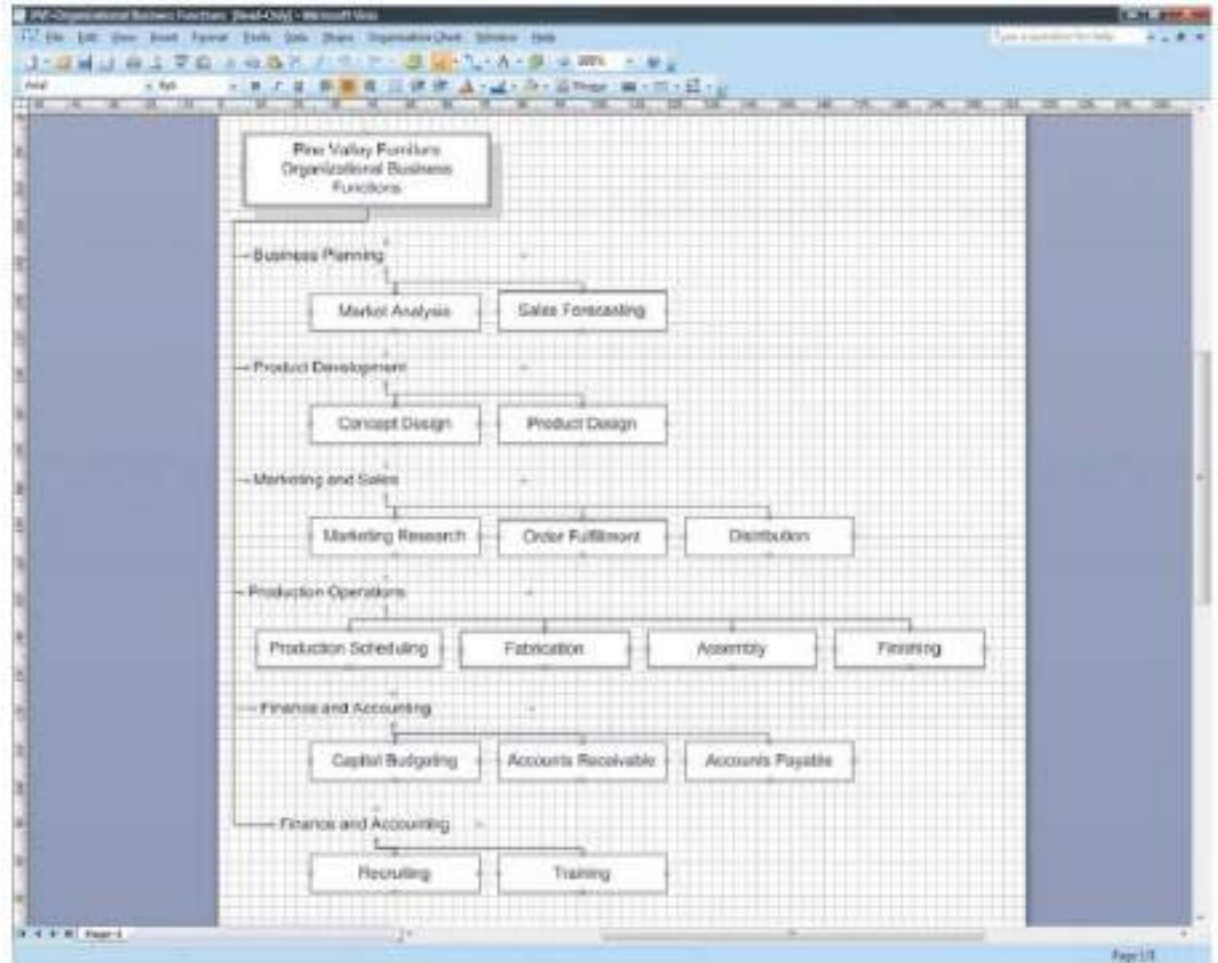(Pine Valley Furniture)

Information Systems Planning of Pine Valley Furniture (PVF)

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

Information Systems Planning of Pine Valley Furniture (PVF)

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

Information Systems Planning of Pine Valley Furniture (PVF)

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

Information Systems Planning of Pine Valley Furniture (PVF)

	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

- Briefly describe mission, objectives, and strategy of the organization.

- Provide summary of current and future processes, functions, data entities, and information needs of the enterprise.

IS Plan Components (Cont.)

- Describe primary role IS will play in the organization to transform enterprise from current to future state.

- Describe limitations imposed by technology and current levels of financial, technical, and personnel resources.
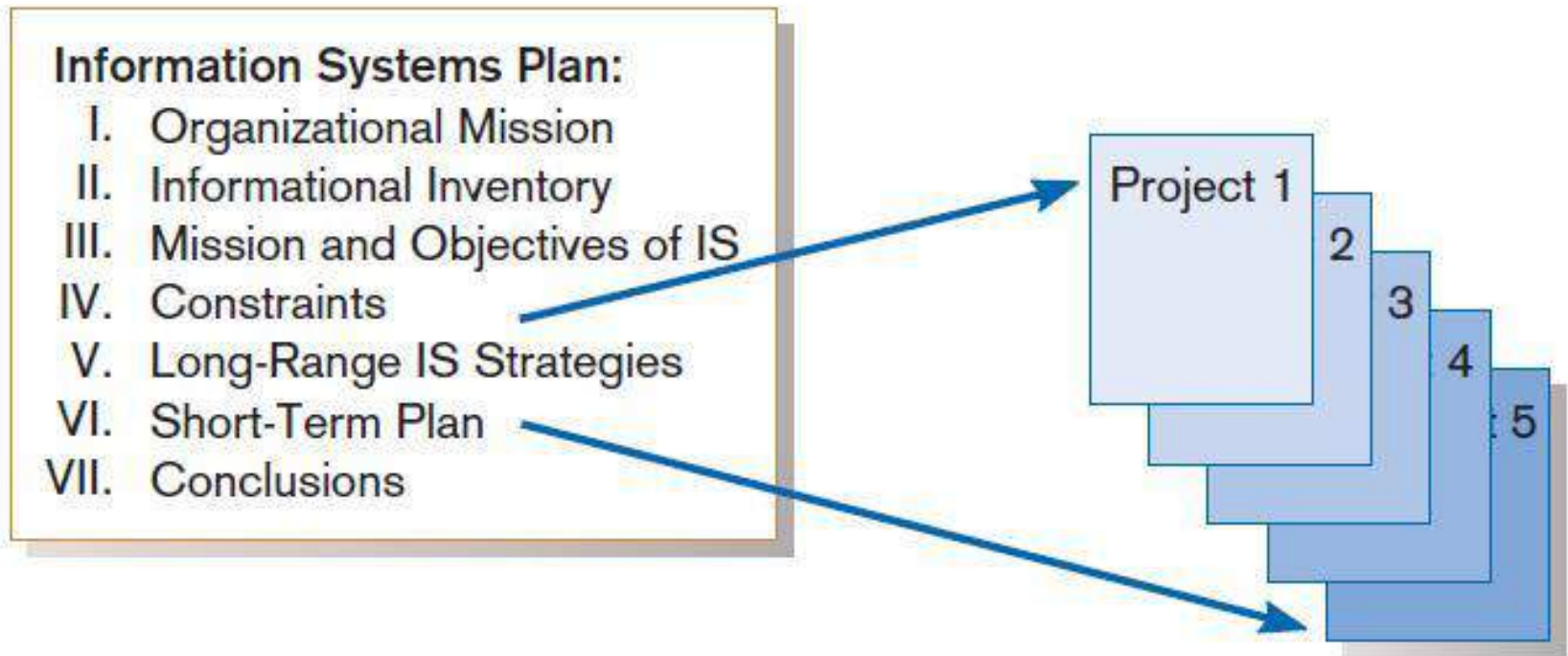
IS Plan Components (Cont.)

- Summarize overall information systems needs in the company and set long-term strategies for filling the needs.

- Show detailed inventory of present projects and systems and detailed plan for the current year.

IS Plan Components (Cont.)

- Describe 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

Review Questions

1. Define the following terms:
   a. Mission; objective statements; competitive strategy
   b. Corporate strategic planning; ISP
   c. Top-down planning; bottom-up planning
2. Describe the project identification and selection process.
3. Describe several project evaluation criteria.
4. Describe value chain analysis and how organizations use this technique to evaluate and compare projects.
5. Discuss several factors that provide evidence for the need for improved ISP today.
6. Describe the steps involved in corporate strategic planning.
7. What are three generic competitive strategies?
8. Describe what is meant by ISP and the steps involved in the process.
9. List and describe the advantages of top-down planning over other planning approaches.