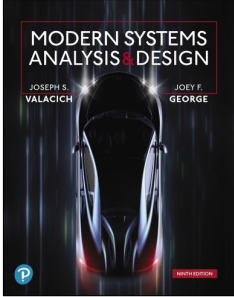



Modern Systems Analysis and Design
Ninth Edition



Chapter 4
Identifying and Selecting
Systems Development
Projects

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved


1

Learning Objectives

4.1 Describe the project identification and selection process

4.2 Describe the corporate strategic planning and information systems planning process


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

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

2

Introduction

- Obtaining integrated, enterprise-wide computing presents significant challenges for both corporate and information system management
- The acquisition, development, and maintenance of information systems consume resources for most organizations
- This leads to the need to have a formal process for identifying and selecting projects

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

3

Identifying and Selecting Systems Development Projects

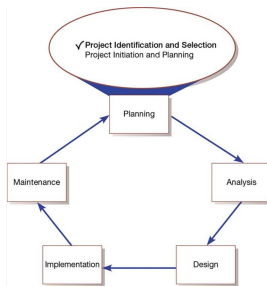
4.1 Describe the project identification and selection process

- Identifying and selecting systems development projects is part of the first phase (Planning) of the SDLC
- Many firms follow a very formal process for selecting projects
- Requests come from a variety of sources:
 - By managers needing to replace aging existing systems
 - By managers wanting to make a system more efficient
 - By managers needing a new system

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

4

Figure 4-1: Systems Development Life Cycle with Project Identification and Selection Highlighted



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

5

Identifying and Selecting Projects (1 of 3)

4.1 Describe the project identification and selection process

- Project identification and selection consists of three primary activities:
 1. Identifying potential development projects
 - By key member of top management
 - By steering committee (**top-down source**)
 - By user departments (**bottom-up source**)
 - By development group or senior IS manager

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved


6

Identifying and Selecting Projects (2 of 3)

4.1 Describe the project identification and selection process

2. Classifying and ranking IS development projects

- Using value chain analysis or other evaluation criteria
 - **Value chain analysis** – used in analyzing an organization’s activities to determine where value is added to products and/or services and the costs incurred for doing so; it 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

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved


7

Identifying and Selecting Projects (3 of 3)

4.1 Describe the project identification and selection process

3. Selecting IS development projects

- Based on various factors with short- and long-term projects
- Numerous factors must be considered as shown in Figure 4-3


 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

8

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 Fuller et al., 2018; McKeen et al., 1994; GAO, 2000)

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

9

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


 Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

10

Figure 4-2: Organizations Can Be Thought of as a Value Chain, Transforming Raw Materials into Products for Customers

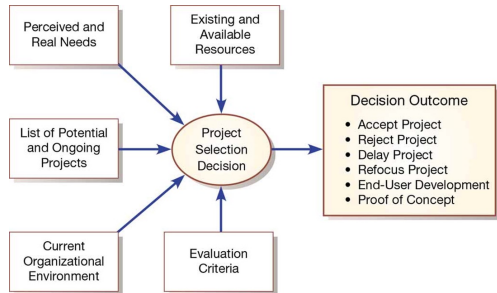



(Sources: Left to right: Bram van Broekhoven/Shutterstock; Alexey Fursov/Shutterstock; Hacohob/Shutterstock; Syda Productions/Shutterstock)

 Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

11

Figure 4-3: Project Selection Decisions Must Consider Numerous Factors and Can Have Numerous Outcomes



 Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

12

Figure 4-4: Alternative Projects and System Design Decisions Can Be Assisted Using Weighted Multicriteria Analysis

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

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

13

Deliverables and Outcomes

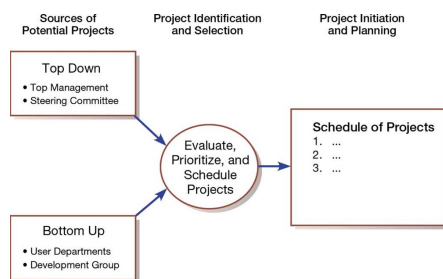
4.1 Describe the project identification and selection process

- Primary deliverable from first phase of planning is schedule of specific IS development projects
- Project initiation and planning is next phase
- **Incremental commitment** is a strategy in systems analysis and design in which the project is reviewed after each phase and continuation of the project is rejustified

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

14

Figure 4-5: Information Systems Development Projects Come From Both Top-Down and Bottom-Up Initiatives



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

15

Corporate and Information Systems Planning

4.2 Describe the corporate strategic planning and information systems planning process

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

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

16

Factors for Improved Systems Project Identification & Selection

4.2 Describe the corporate strategic planning and information systems planning process

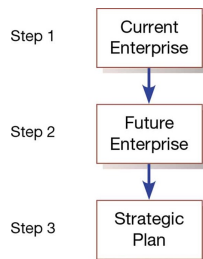
1. Increased cost of IS (40% of organizational expense)
2. Lack of cross-organizational applications and systems
3. Systems don't address critical strategic problems
4. Data redundancy out of control, lack of data quality
5. High systems maintenance cost
6. Application backlogs extend three years or more

A disciplined approach is a prerequisite for more effectively applying IS in order to reach organizational goals

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

17

Figure 4-6: Corporate Strategic Planning is a Three-Step Process



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

18

Corporate Strategic Planning

4.2 Describe the corporate strategic planning and information systems planning process

- **Corporate strategic planning** – ongoing process that defines the mission, objectives, and strategies of an organization
- **Mission statement** – statement that makes it clear what business a company is in
- **Objective statement** – series of statements that express an organization’s qualitative and quantitative goals for reaching a desired future position

19

Figure 4-7: Mission Statement (Pine Valley Furniture)

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.

20

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

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.

21

Competitive Strategy

4.2 Describe the corporate strategic planning and information systems planning process

- **Competitive strategy** –method by which an organization attempts to achieve its mission and objectives
- Three strategies
 - Low-cost producer
 - Product differentiation
 - Product focus or niche

22

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 automotive industry, many manufacturers are trying to differentiate their products on the basis of quality (e.g., "At Ford, quality is job one.")
Product Focus of Niche	This strategy is similar to both the low-cost and differentiation strategies but with a much lower 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.

23

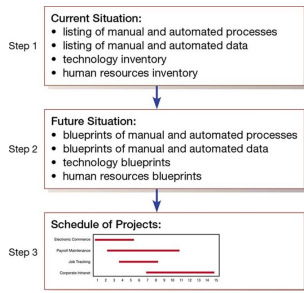
Information Systems Planning (1 of 3)

4.2 Describe the corporate strategic planning and information systems planning process

- **Information systems planning (ISP)** – orderly means of assessing the information needs of an organization and defining new systems, databases, and technologies that will best satisfy those needs

24

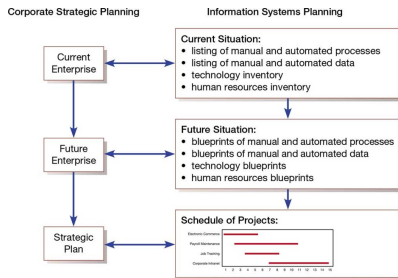
Figure 4-9: Information Systems Planning is a Three-Step Process



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

25

Figure 4-10: Parallel Activities of Corporate Strategic Planning and Information Systems Planning



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

26

Information Systems Planning (2 of 3)

4.2 Describe the corporate strategic planning and information systems planning process

- **Top-down planning** – generic methodology that attempts to gain a broad understanding of the information systems needs of the entire organization
- Advantages:
 - Broader perspective
 - Improved integration
 - Improved management support
 - Better understanding


Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

27

Information Systems Planning (3 of 3)

4.2 Describe the corporate strategic planning and information systems planning process

- **Bottom-up planning** – generic information systems planning methodology that identifies and defines IS development projects based upon solving operational business problems or taking advantage of some business opportunities


 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

28

Table 4-4: Advantages to the Top-Down Planning Approach over Other Planning Approaches

Advantage	Description
Broader Perspective	If not viewed from the top, information systems may be implemented without first understanding the business from general management's viewpoint.
Improved Integration	If not viewed from the top, totally new management information systems may be implemented rather than planning how to evolve existing systems.
Improved Management Support	If not viewed from the top, planners may lack sufficient management acceptance of the role of information systems in helping them achieve business objectives.
Better Understanding	If not viewed from the top, planners may lack the understanding necessary to implement information systems across the entire business rather than simply to individual operating costs.


(Source: Based on IBM, 1982; Slater, 2002; Overby, 2008)

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

29

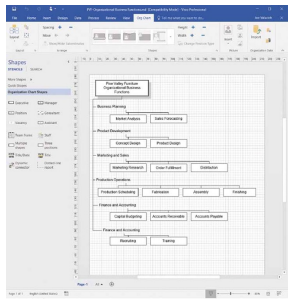
Figure 4-11: Information Systems Planning Information (Pine Valley Furniture)

FUNCTIONS: <ul style="list-style-type: none"> • business planning • product development • marketing and sales • production operations • finance and accounting • human resources ... 	DATA ENTITIES: <ul style="list-style-type: none"> • customer • product • vendor • raw material • order • invoice • equipment ... 	INFORMATION SYSTEMS: <ul style="list-style-type: none"> • payroll processing • accounts payable • accounts receivable • time card processing • inventory management ...
--	---	--

 Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

30

Figure 4-12: Functional Decomposition of Information Systems Planning Information



(Source: Microsoft Corporation)



Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

31

Types of Planning Matrices

4.2 Describe the corporate strategic planning and information systems planning process

- 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 systems
- Data entity-to-Information system
- Information system-to-objective



Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

32

Figure 4-13: Data Entity-to-Function Matrix (Pine Valley Furniture)

	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											
...											



Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

33

Figure 4-14: Making Sense Out of Planning Matrices

During the information systems planning process, before individual projects are identified and selected, a great deal of "behind the scenes" analysis takes place. During this planning period, which can span from six months to a year, IS planning team members develop and analyze numerous matrices like those described in the associated text. Matrices are developed to represent the current and the future views of the organization. Matrices of the "current" situation are called "as-is" matrices. In other words, they describe the world "as" it currently "is." Matrices of the target or "future" situation are called "to-be" matrices. Contrasting the current and future views provides insights into the relationships existing in important business information, and most important, forms the basis for the identification and selection of specific development projects. Many CASE tools provide features that will help you make sense out of these matrices in at least three ways:

1. **Management of Information.** A big part of working with complex matrices is managing the information. Using the dictionary features of the CASE tool repository, terms (such as business functions and process and data entities) can be defined or modified in a single location. All planners will therefore have the most recent information.
2. **Matrix Construction.** The reporting system within the CASE repository allows matrix reports to be easily produced. Because planning information can be changed at any time by many team members, an easy method to record changes and produce the most up-to-date reports is invaluable to the planning process.
3. **Matrix Analysis.** Possibly the most important feature CASE tools provide to planners is the ability to perform complex analyses within and across matrices. This analysis is often referred to as affinity clustering. Affinity refers to the extent to which information holds things in common. Thus, affinity clustering is the process of arranging matrix information so that clusters of information with some predetermined level or type of affinity are placed next to each other on a matrix report. For example, an affinity clustering of a Process-to-Data Entity matrix would create roughly a block-diagonal matrix with processes that use similar data entities appearing in adjacent rows and data entities used in common by the same processes grouped into adjacent columns. This general form of analysis can be used by planners to identify items that often appear together (or should). Such information can be used by planners to most effectively group and relate information (e.g., data to processes, functions to locations, and so on). For example, these data entities used by a common set of processes are candidates for a specific database. And those business processes that relate to a strategically important customer will likely receive more attention when managers from those areas request system changes.

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

34

Affinity Clustering

4.2 Describe the corporate strategic planning and information systems planning process

- **Affinity clustering** – process of arranging planning matrix information so that clusters of information with a predetermined level or type of affinity are placed next to each other on a matrix report
- **Affinity** – extent to which information holds things in common
- Example: Function-to-data entity matrix
 - Functions with similar data entities placed in adjacent rows
 - Data entities used in common by processes in adjacent columns

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

35

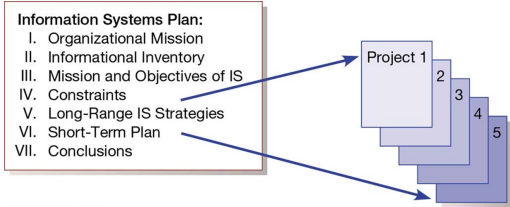
Figure 4-15: Outline of an Information Systems Plan

- I. **Organizational Mission, Objectives, and Strategy**
Briefly describes the mission, objectives, and strategy of the organization. The current and future views of the company are also briefly presented (i.e., where we are, where we want to be).
- II. **Informational Inventory**
This section provides a summary of the various business processes, functions, data entities, and information needs of the enterprise. This inventory will view both current and future needs.
- III. **Mission and Objectives of IS**
Description of the primary role IS will play in the organization to transform the enterprise from its current to future state. While it may later be revised, it represents the current best estimate of the overall role for IS within the organization. This role may be as a necessary cost, an investment, or a strategic advantage, for example.
- IV. **Constraints on IS Development**
Briefly describes limitations imposed by technology and current level of resources within the company—financial, technological, and personnel.
- V. **Overall Systems Needs and Long-Range IS Strategies**
Presents a summary of the overall systems needed within the company and the set of long-range (2–5 years) strategies chosen by the IS department to fill the needs.
- VI. **The Short-Term Plan**
Shows a detailed inventory of present projects and systems and a detailed plan of projects to be developed or advanced during the current year. These projects may be the result of the long-range IS strategies or of requests from managers that have already been approved and are in some stage of the life cycle.
- VII. **Conclusions**
Contains likely but not-yet-certain events that may affect the plan, an inventory of business change elements as presently known, and a description of their estimated impact on the plan.

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

36

Figure 4-16: Systems Development Projects Flow from the Information Systems Plan



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

37

Internet Basics

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

- **Internet** – large, worldwide network of networks that use a common protocol to communicate with each other
- **Internet of Things (IoT)** – broad class of physical objects that feature an Internet address and connectivity that communicate between these objects and other Internet enabled devices and systems
- **Electronic commerce (EC)** – Internet-based communication to support day-to-day government, business, and consumer activities

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

38

EC Business Models

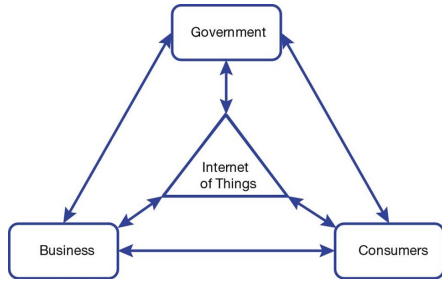
4.3 Describe the three classes of Internet electronic commerce applications: business-to-consumer, business-to-employee, and business-to-business

- A broad range of business models include:
 - Business-to-Business (B2B)
 - Business-to-Consumer (B2C)
 - Consumer-to-Consumer (C2C)
 - Consumer-to-Business (C2B)
 - Business-to-Government (B2G)
 - Government-to-Business (G2B)
 - Government-to-Citizen (G2C)
 - Thing-to-Thing (T2T)

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

39

Figure 4-17: The Internet of Everything



Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

40

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

Factor	Unknowns That Must Be Dealt With
User	<ul style="list-style-type: none"> Concern: Who is the user? Example: Where is the user located? What is the user's expertise or education? What are the user's expectations?
Connection Speed	<ul style="list-style-type: none"> Concern: What is the speed of the connection and what information can be effectively transported? Example: WiFi, cellular
Access Method	<ul style="list-style-type: none"> Concern: What is the connection device? Example: Web browser, tablet, smartphone, smart watch

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

41

Summary

- In this chapter you learned how to:
 - Describe the project identification and selection process
 - Describe the corporate strategic planning and information systems planning process
 - Describe the three classes of Internet electronic commerce applications: business-to consumer, business-to-employee, and business-to-business

Pearson Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved

42

Copyright



This work is protected by United States copyright laws and is provided solely for the use of instructors in teaching their courses and assessing student learning. Dissemination or sale of any part of this work (including on the World Wide Web) will destroy the integrity of the work and is not permitted. The work and materials from it should never be made available to students except by instructors using the accompanying text in their classes. All recipients of this work are expected to abide by these restrictions and to honor the intended pedagogical purposes and the needs of other instructors who rely on these materials.



Copyright © 2020, 2017, 2014 Pearson Education, Inc. All Rights Reserved
