Chapter 13

Redesigning the Organization with Information Systems

Objectives

1. How could building a new system change the way an organization works?

2. How can a company make sure that the new information systems it builds fit its business plan?

3. What are the steps required to build a new information system?

Objectives

4. What alternative methods for building information systems are available?

5. Are there any techniques or system-building approaches to help us build e-commerce and e-business applications more rapidly?

Management Challenges

1. Major risks and uncertainties in systems development

2. Determining when new systems and business processes can have the greatest strategic impact

Linking Information Systems to the Business Plan

Information Systems Plan

- Road map indicating direction of systems development: the rationale, the current situation, the management strategy, the implementation plan, and the budget

Establishing Organizational Information Requirements

Enterprise Analysis (Business Systems Planning)

- Analysis of organization-wide information requirements
- Identifies key entities and attributes

Systems as Planned Organizational Change

Process/data class matrix

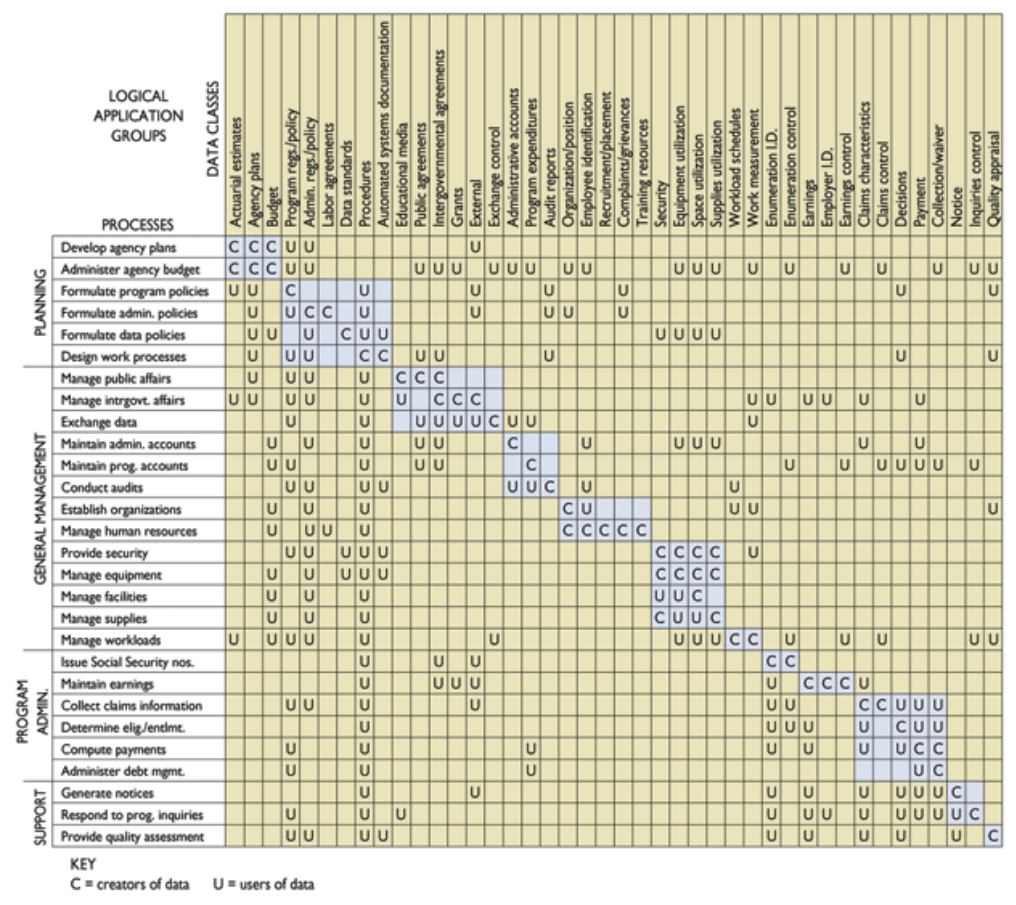

Figure 13-1

Establishing Organizational Information Requirements

Strategic Analysis or Critical Success Factors

- Critical Success Factors (CSFs): A small number of easily identifiable operational goals shaped by industry, firm, manager, and broader environment. Used to determine information requirements of organization

Systems as Planned Organizational Change

Using CSFs to develop systems

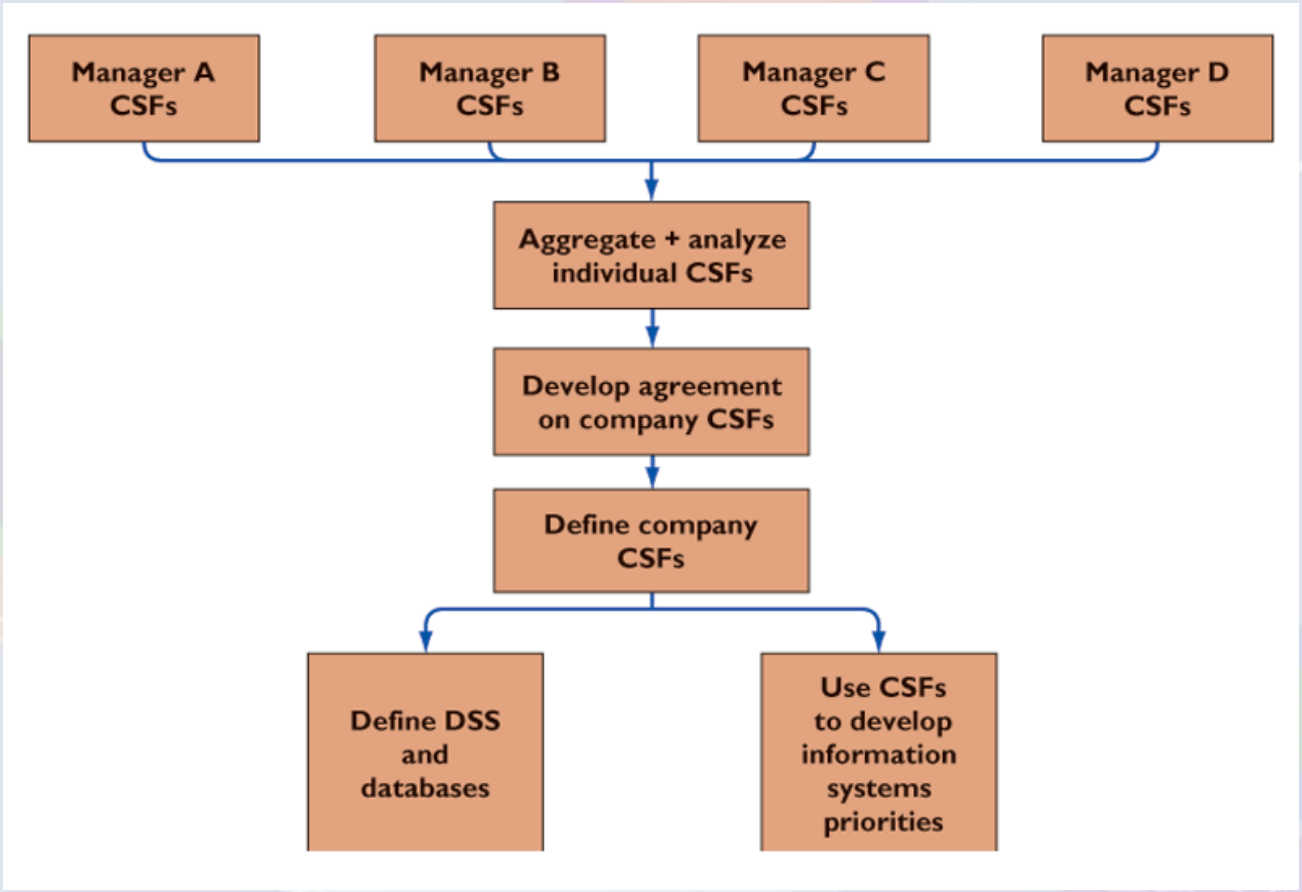

Figure 13-2

Systems Development and Organizational Change

The Spectrum of Organizational Change

- Automation: Speeding up performance
- Rationalization of procedures: Streamlining of operating procedures

Systems Development and Organizational Change

The Spectrum of Organizational Change

- Business process reengineering: Radical design of business processes
- Paradigm shift: Radical reconceptualization

Systems as Planned Organizational Change

Organizational change carries risks and rewards

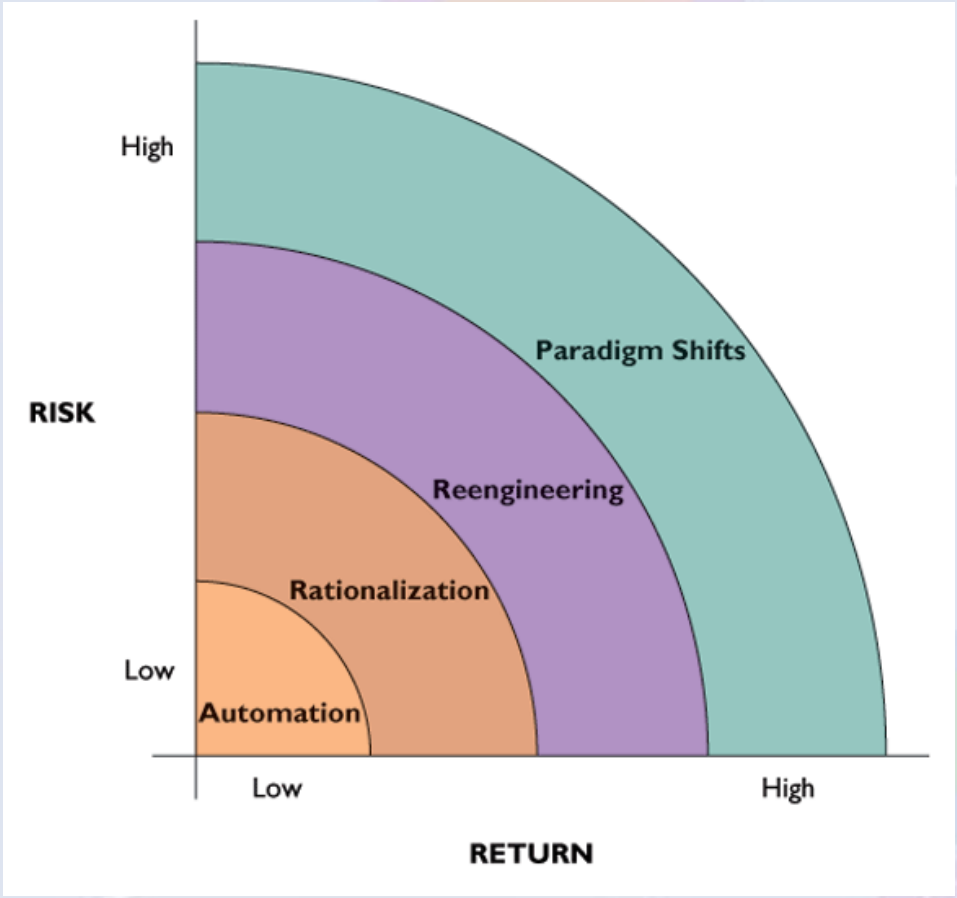

Figure 13-3

Business Process Reengineering

Workflow Management

- The process of streamlining business procedures so that documents can be moved easily and efficiently from one location to another

Steps in Effective Reengineering

- Senior management needs to develop broad strategic vision
- Management must understand and measure performance of existing processes as baseline
- Information technology should be allowed to influence process design from start
- IT infrastructure should be able to support business process changes

Business Process Reengineering and Process Improvement

Redesigning mortgage processing in the United States

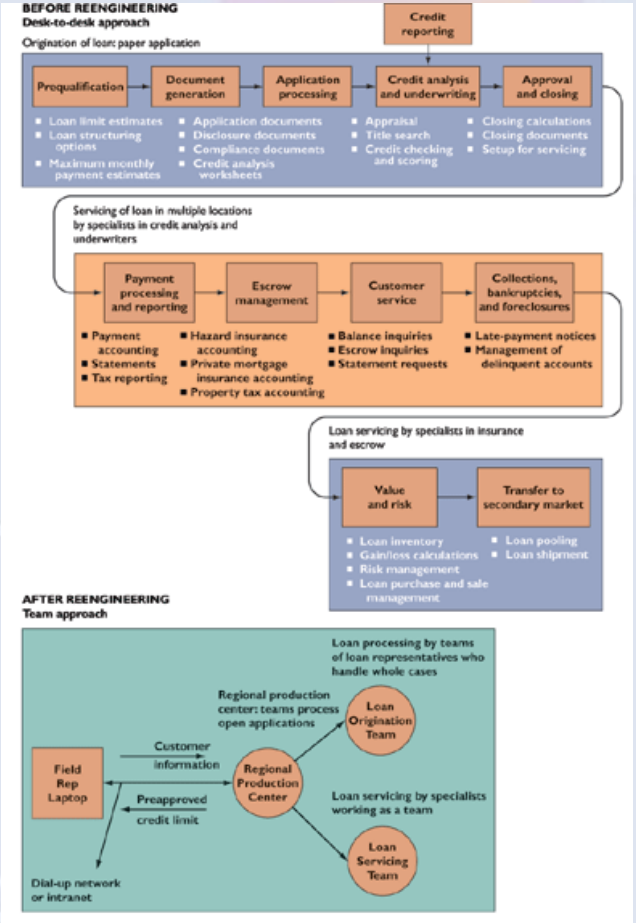

Figure 13-4

Process Improvement: Business Process Management, Total Quality Management (TQM), and Six Sigma

- Business Process Management (BPM): Enables organizations to manage incremental process changes required simultaneously in many areas of business. Provides a methodology for dealing with the organization's need to optimize numerous internal business processes and processes shared with other companies

Process Improvement: Business Process Management, Total Quality Management (TQM), and Six Sigma

- Total Quality Management (TQM): A concept that makes quality control a responsibility to be shared by all people in an organization
- Six Sigma: A specific measure of quality representing 3.4 defects per million opportunities

Process Improvement: Business Process Management, Total Quality Management (TQM), and Six Sigma

How Information Systems Contribute to Total Quality Management

- Simplify product or production process
- Enable benchmarking
- Use customer demands as guide to improve products and services

Process Improvement: Business Process Management, Total Quality Management (TQM), and Six Sigma

How Information Systems Contribute to Total Quality Management

- Reduce cycle time
- Improve the quality and precision of the design
- Increase the precision of production

Overview

- Systems Development: Activities that go into producing an information system solution to an organizational problem of opportunity

- Systems Analysis: Analysis of a problem that the organization will try to resolve with an information system

Overview of Systems Development

The systems development process

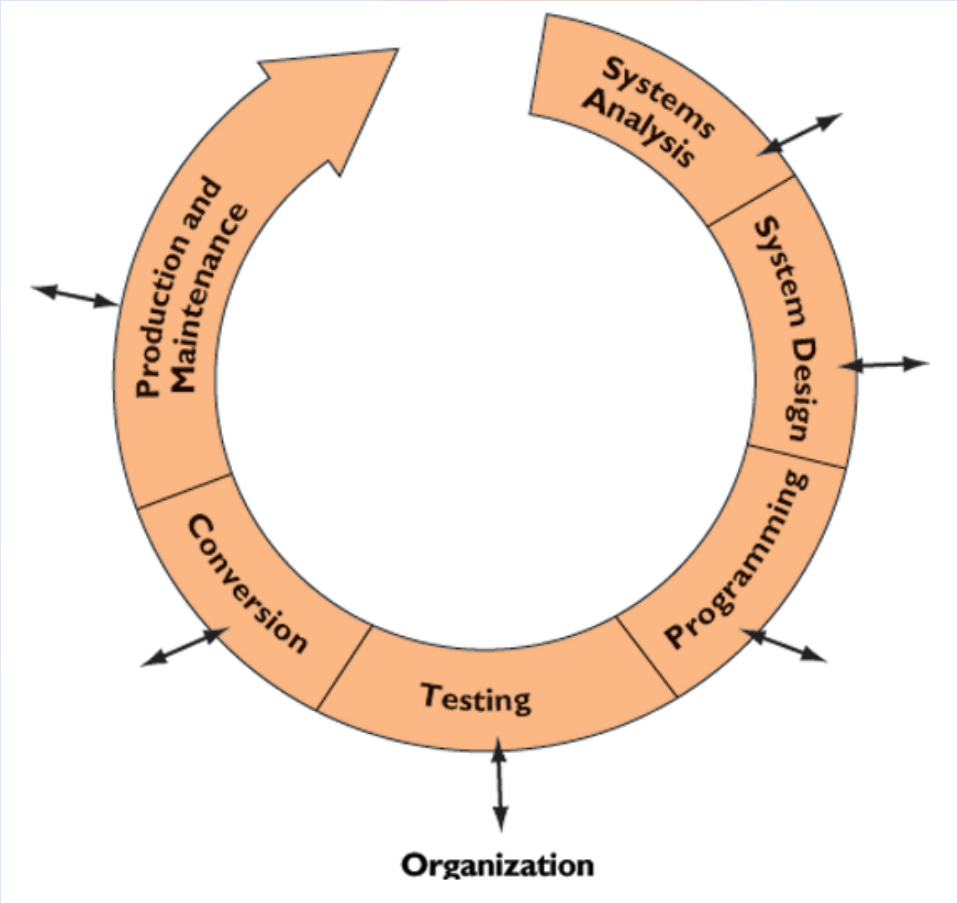

Figure 13-5

Systems Analysis

- Feasibility Study: As part of the systems analysis process, the way to determine whether the solution is achievable, given the organization's resources and constraints

Systems Analysis

Establishing Information Requirements

- Stating information needs that new system must satisfy
- Identifying who, when, where, and how components of information

Systems Design

- Systems Design: Details how a system will meet information requirements as determined by the systems analysis

Completing the Systems Development Process

- Programming: Process of translating system specifications prepared during the design stage into program code
- Testing: Process that determines whether the system produces desired results under known conditions

Completing the Systems Development Process

- Unit Testing: Process of testing each program separately
- Systems Testing: Tests functioning of the information system as a whole
- Acceptance Testing: Provides final certification that system is ready to be used in production setting
- Test Plan: Prepared by development team. Includes preparations for the series of tests to be performed

Completing the Systems Development Process

Conversion

- Conversion: Process of changing from the old system to the new system
- Parallel Strategy: Conservative conversion approach where both the old system and the potential replacement are run together

Completing the Systems Development Process

Conversion

- Direct Cutover: Risky conversion approach whereby the new system replaces the old system on an appointed day
- Pilot Study: Strategy to introduce the new system to a limited area of the organization until it is proven to be fully functional

Completing the Systems Development Process

Conversion

- Phased Approach: Introduces new system replacement in stages
- Documentation: Descriptions of how an information system works from both a technical and end-user standpoint

Completing the Systems Development Process

Production and Maintenance

- Production: Stage after new system is installed and the conversion is complete
- Postimplementation Audit: Formal review process conducted after a system has been placed in production
- Maintenance: Changes in hardware, software, documentation, or procedures of production system to correct errors

Overview of Systems Development

A sample test plan to test a record change

Procedure	Address and Maintenance "Record Change Series"		Test Series 2		
	Prepared By:		Date:	Version:	
Test Ref.	Condition Tested	Special Requirements	Expected Results	Output On	Next Screen
2.0	Change records				
2.1	Change existing record	Key field	Not allowed		
2.2	Change nonexistent record	Other fields	"Invalid key" message		
2.3	Change deleted record	Deleted record must be available	"Deleted" message		
2.4	Make second record	Change 2.1 above	OK if valid	Transaction file	V45
2.5	Insert record		OK if valid	Transaction file	V45
2.6	Abort during change	Abort 2.5	No change	Transaction file	V45

Figure 13-6

Traditional Systems Lifecycle

Systems Lifecycle

- Traditional methodology for developing information system that partitions the systems development process into formal stages that must be completed sequentially

Prototyping

- Prototyping: Process of building experimental system quickly and inexpensively for demonstration and evaluation so that users can better determine information requirements

- Prototype: Preliminary working version of information system for demonstration and evaluation purposes

Prototyping

- Iterative: A process of repeating over and over again the steps to build system

Prototyping

Steps in Prototyping

1. Identify the user's basic requirements
2. Develop initial prototype
3. Use the prototype
4. Revising and enhancing the prototype

Alternative Systems-Building Approaches

The prototyping process

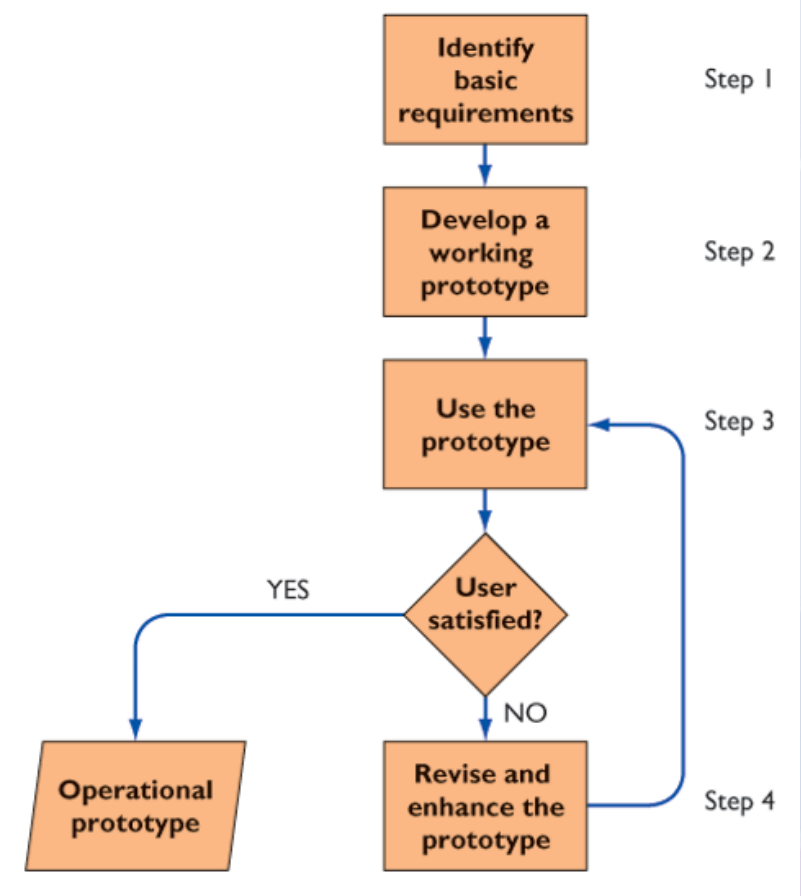

Figure 13-7

Advantages and Disadvantages of Prototyping

Advantage

- Useful in designing information system's end-user interface

Disadvantage

- Rapid prototyping can gloss over essential steps in systems development

Application Software Packages

- Application software packages: Set of prewritten, precoded application software programs commercially available for sale or lease
- Customization: Modification of software package to meet organization's unique requirements without destroying the software's integrity

Application Software Packages

- Request for Proposal (RFP): Detailed list of questions submitted to vendors of software or other services to determine how well vendor's product can meet organization's specific requirements

Alternative Systems-Building Approaches

The effects of customizing a software package on total implementation costs

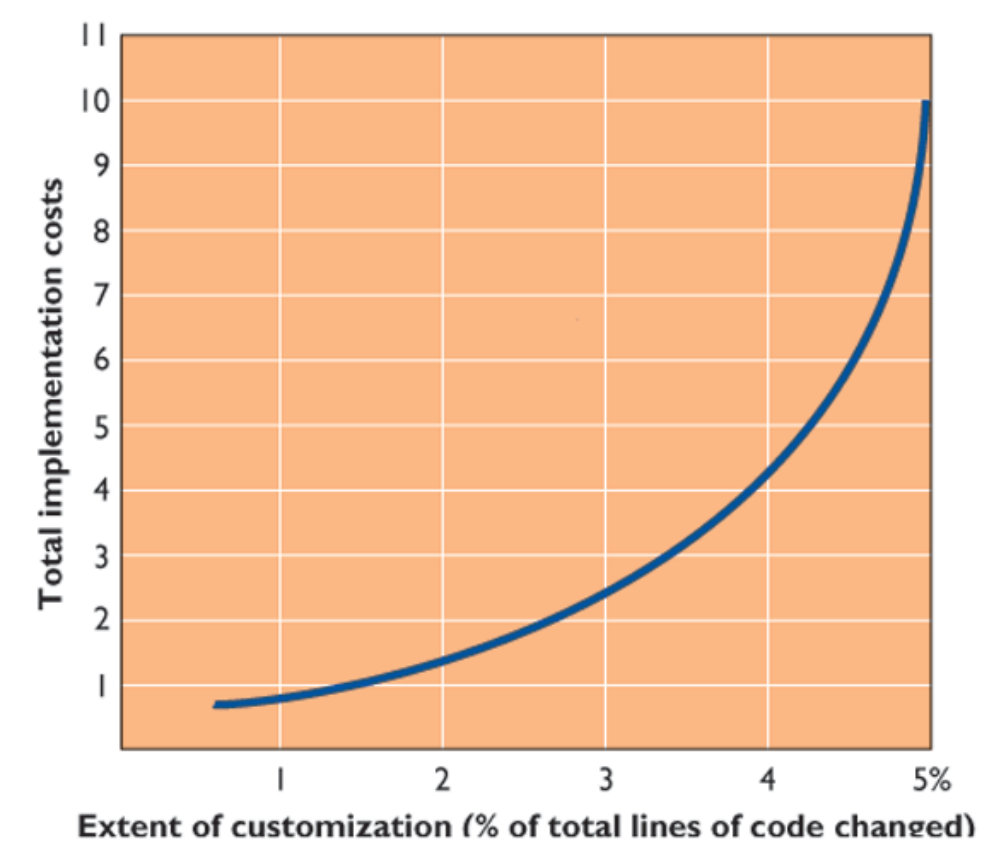

Figure 13-8

End-User Development

- Development of information systems by end users with little or no formal assistance from technical specialists
- Allows users to specify their own business needs

End-User Development

Managing End-User Development

- Information Center: A special facility within an organization that provides training and support for end-user computing

Alternative Systems-Building Approaches

End user versus systems lifecycle development

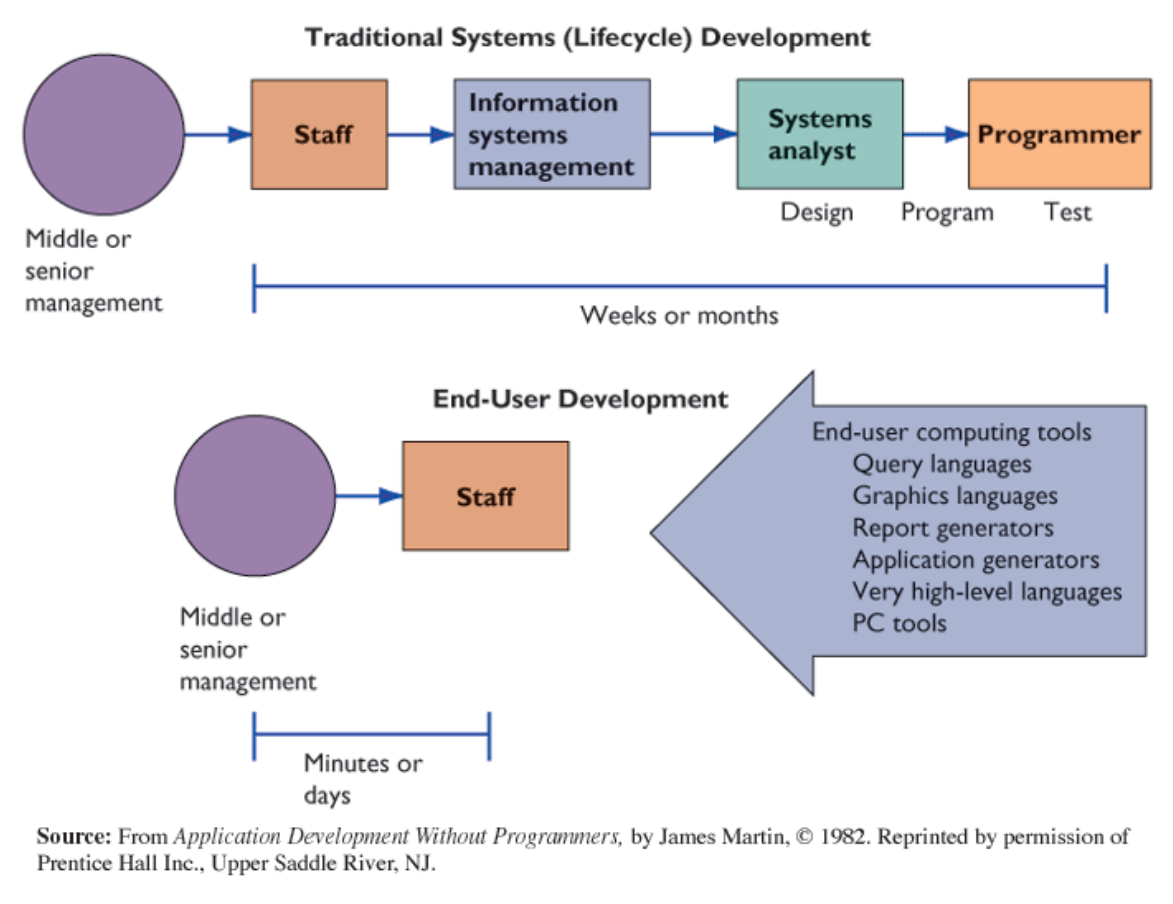

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Figure 13-9

Alternative Systems-Building Approaches

Outsourcing

- Practice of contracting computer center operations, telecommunications networks, or applications development to external vendors

Window on Management

Outsourcing Moves into High Gear

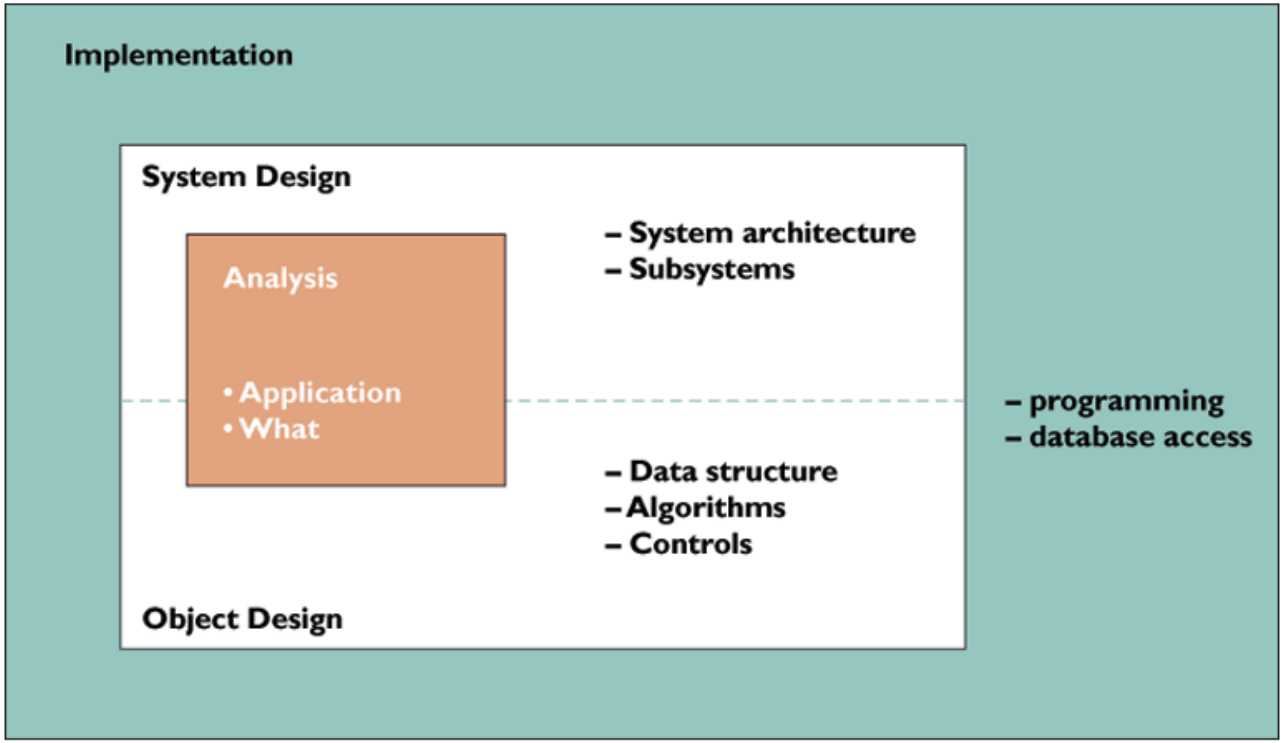
- What are the management benefits of outsourcing?
- What management, organization, and technology issues must be addressed when deciding whether to outsource systems development?

Object-Oriented Development and Component-Based Development

- Object-Oriented Development: Approach to systems development that uses the object as the basic unit of systems analysis and design.
- Component-Based Development: Building large software systems by combining pre-existing software components

Application Development for the Digital Firm

Object-oriented development



Source: *Modern Systems Analysis and Design* (3rd ed.) by Jeffrey A. Hoffer, Joey F. George, and Joseph S. Valacich, copyright 2002. Reprinted by permission of Prentice Hall Inc., Upper Saddle River, NJ.

Figure 13-10

Rapid Application Development (RAD)

- Process for developing systems in a short time period
- Uses prototyping, fourth-generation tools, and close teamwork among users and systems specialists

Joint Application Design (JAD)

- Process to accelerate the generation of information requirements by having end users and information systems specialists work together in intensive design sessions

Web Services and Service-Oriented Computing

- Software components deliverable over Internet
- Enable one application to communicate with another with no translation required
- Standards and protocols: XML, SOAP, WSDL, UDDI

Application Development for the Digital Firm

How Dollar Rent A Car uses Web services

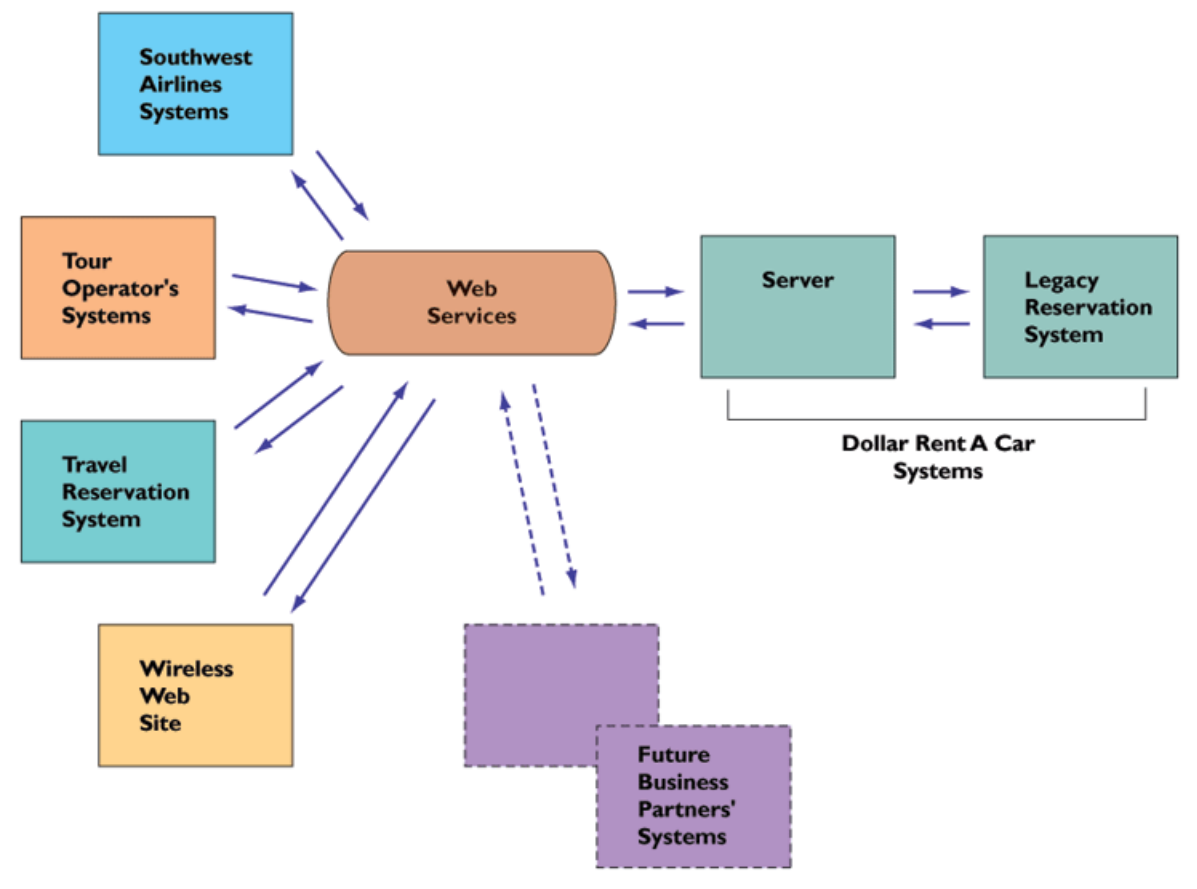
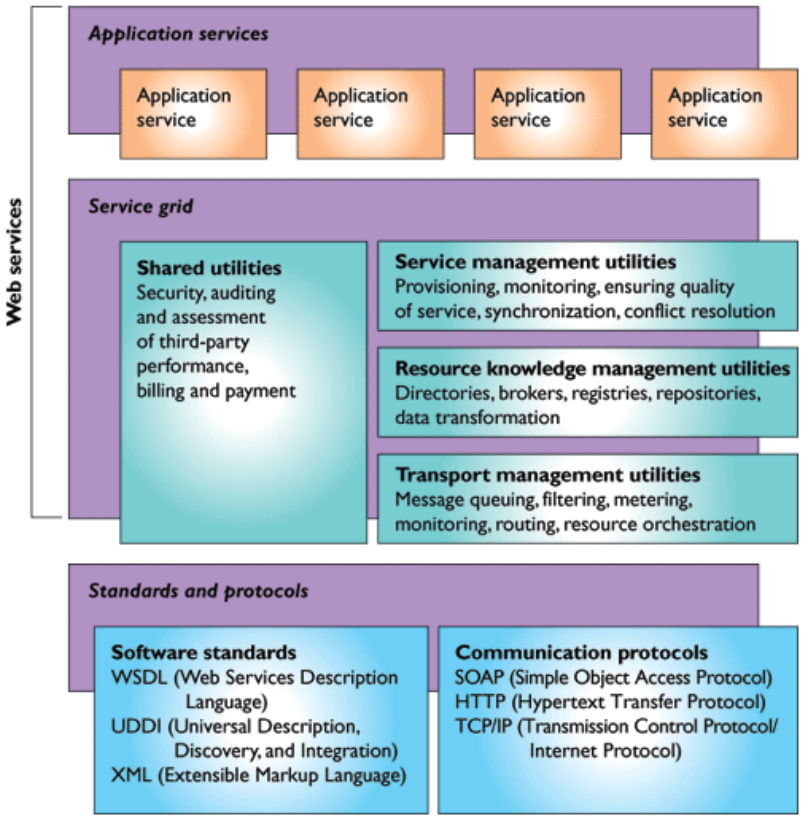


Figure 13-11

Application Development for the Digital Firm

The Web services architecture



Source: "Your Next IT Strategy" by John Hagel, III, and John Seeley Brown, *Harvard Business Review*, October 2001. Reprinted by permission.

Figure 13-12

Window on Technology

Web Services at Work

- What are the benefits of using Web services technology?
- How can it provide value to firms?
- What management, organization, and technology issues must be addressed when implementing Web services?

Chapter 13 Case Study

Celanese Recentralizes with a New Enterprise System

1. Analyze Celanese using the competitive forces and value chain models.

2. How important is Celanese's centralized enterprise system to its business strategy? Why? What is its business value to the company?

Chapter 13 Case Study

Celanese Recentralizes with a New Enterprise System

3. What management, organization, and technology challenges did Celanese face as it tried to implement OneSAP? Which were the most difficult? Why?

4. How successful was Celanese in meeting these challenges? What problems did it solve? How? Which problems remained unsolved?