

Management Information Systems

MANAGING THE DIGITAL FIRM, 12TH EDITION, GLOBAL EDITION

Chapter 3

INFORMATION SYSTEMS,
ORGANIZATIONS, AND STRATEGY

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CHAPTER 3: INFORMATION SYSTEMS, ORGANIZATIONS,
AND STRATEGY

Learning Objectives

- Identify and describe important features of organizations that managers need to know about in order to build and use information systems successfully.
- Demonstrate how Porter’s competitive forces model helps companies develop competitive strategies using information systems.
- Explain how the value chain and value web models help businesses identify opportunities for strategic information system applications.

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Learning Objectives (cont.)

- Demonstrate how information systems help businesses use synergies, core competencies, and network-based strategies to achieve competitive advantage.
- Assess the challenges posed by strategic information systems and management solutions.

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Verizon or AT&T: Which Company Has the Best Digital Strategy?

- Problem: High-stakes competition in the wireless market
- Solutions:
 - AT&T is marketing leading-edge devices
 - Has 43% of U.S. smartphone users, but poorer network
 - Verizon is investing in updating, expanding, and improving network
 - Fewer smartphone customers, but most reliable in U.S.
- Demonstrates IT’s central role in defining competitive strategy

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Organizations and Information Systems

- Information technology and organizations influence one another
 - Complex relationship influenced by organization’s
 - Structure
 - Business processes
 - Politics
 - Culture
 - Environment, and
 - Management decisions

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Organizations and Information Systems

THE TWO-WAY
RELATIONSHIP
BETWEEN
ORGANIZATIONS
AND INFORMATION
TECHNOLOGY

This complex two-way relationship is mediated by many factors, not the least of which are the decisions made—or not made—by managers. Other factors mediating the relationship include the organizational culture, structure, politics, business processes, and environment.

FIGURE 3-1

```
graph LR; Orgs((Organizations)) --> Mediating[Mediating Factors  
Environment  
Culture  
Structure  
Business Processes  
Politics  
Management Decisions]; Mediating --> IT((Information Technology)); IT --> Orgs
```

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- What is an organization?
 - Technical definition:
 - Stable, formal social structure that takes resources from environment and processes them to produce outputs
 - A formal legal entity with internal rules and procedures, as well as a social structure
 - Behavioral definition:
 - A collection of rights, privileges, obligations, and responsibilities that is delicately balanced over a period of time through conflict and conflict resolution

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THE TECHNICAL MICROECONOMIC DEFINITION OF THE ORGANIZATION

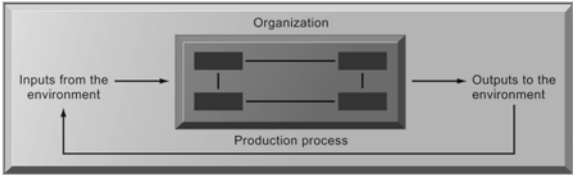


FIGURE 3-2 In the microeconomic definition of organizations, capital and labor (the primary production factors provided by the environment) are transformed by the firm through the production process into products and services (outputs to the environment). The products and services are consumed by the environment, which supplies additional capital and labor as inputs in the feedback loop.

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THE BEHAVIORAL VIEW OF ORGANIZATIONS

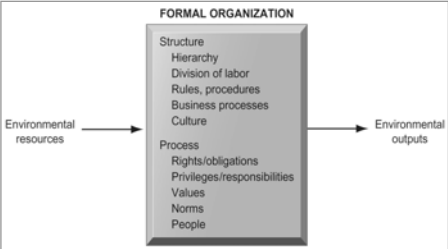


FIGURE 3-3 The behavioral view of organizations emphasizes group relationships, values, and structures.

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- Features of organizations
 - Use of hierarchical structure
 - Accountability, authority in system of impartial decision making
 - Adherence to principle of efficiency
 - Routines and business processes
 - Organizational politics, culture, environments and structures

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- Routines and business processes
 - Routines (standard operating procedures)
 - Precise rules, procedures, and practices developed to cope with virtually all expected situations
 - Business processes: Collections of routines
 - Business firm: Collection of business processes

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ROUTINES, BUSINESS PROCESSES, AND FIRMS

All organizations are composed of individual routines and behaviors, a collection of which make up a business process. A collection of business processes make up the business firm. New information system applications require that individual routines and business processes change to achieve high levels of organizational performance.

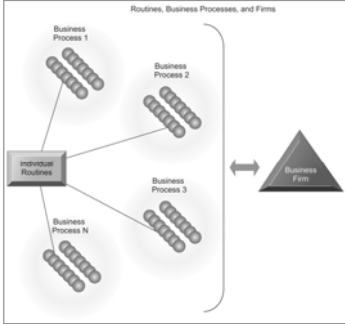


FIGURE 3-4

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- **Organizational politics**
 - **Divergent viewpoints lead to political struggle, competition, and conflict**
 - **Political resistance greatly hampers organizational change**

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- **Organizational culture:**
 - **Encompasses set of assumptions that define goal and product**
 - What products the organization should produce
 - How and where it should be produced
 - For whom the products should be produced
 - **May be powerful unifying force as well as restraint on change**

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- **Organizational environments:**
 - **Organizations and environments have a reciprocal relationship**
 - **Organizations are open to, and dependent on, the social and physical environment**
 - **Organizations can influence their environments**
 - **Environments generally change faster than organizations**
 - **Information systems can be an instrument of environmental scanning, act as a lens**

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ENVIRONMENTS AND ORGANIZATIONS HAVE A RECIPROCAL RELATIONSHIP

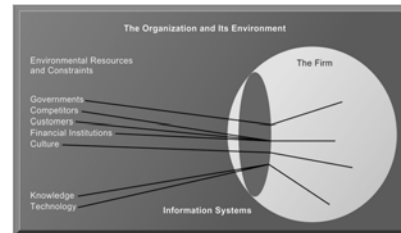


FIGURE 3-5

Environments shape what organizations can do, but organizations can influence their environments and decide to change environments altogether. Information technology plays a critical role in helping organizations perceive environmental change and in helping organizations act on their environment.

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- **Disruptive technologies**
 - **Technology that brings about sweeping change to businesses, industries, markets**
 - **Examples: personal computers, word processing software, the Internet, the PageRank algorithm**
 - **First movers and fast followers**
 - **First movers – inventors of disruptive technologies**
 - **Fast followers – firms with the size and resources to capitalize on that technology**

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- **5 basic kinds of organizational structure**
 - **Entrepreneurial:**
 - Small start-up business
 - **Machine bureaucracy:**
 - Midsized manufacturing firm
 - **Divisionalized bureaucracy:**
 - Fortune 500 firms
 - **Professional bureaucracy:**
 - Law firms, school systems, hospitals
 - **Adhocracy:**
 - Consulting firms

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- Other organizational features
 - Goals
 - Constituencies
 - Leadership styles
 - Tasks
 - Surrounding environments

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How Information Systems Impact Organizations and Business Firms

- Economic impacts
 - IT changes relative costs of capital and the costs of information
 - Information systems technology is a factor of production, like capital and labor
 - IT affects the cost and quality of information and changes economics of information
 - Information technology helps firms contract in size because it can reduce transaction costs (the cost of participating in markets)
 - Outsourcing

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- Transaction cost theory
 - Firms seek to economize on transaction costs (the costs of participating in markets)
 - Vertical integration, hiring more employees, buying suppliers and distributors
 - IT lowers market transaction costs for a firm, making it worthwhile for firms to transact with other firms rather than grow the number of employees

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THE TRANSACTION COST THEORY OF THE IMPACT OF INFORMATION TECHNOLOGY ON THE ORGANIZATION

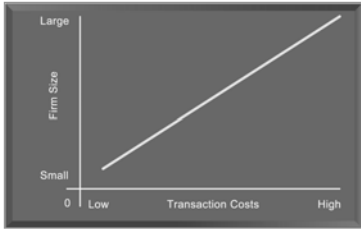


FIGURE 3-6

Firms traditionally grew in size to reduce market transaction costs. IT potentially reduces the firms market transaction costs. This means firms can outsource work using the market, reduce their employee head count and still grow revenues, relying more on outsourcing firms and external contractors.

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- Agency theory:
 - Firm is nexus of contracts among self-interested parties requiring supervision
 - Firms experience agency costs (the cost of managing and supervising) which rise as firm grows
 - IT can reduce agency costs, making it possible for firms to grow without adding to the costs of supervising, and without adding employees

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THE AGENCY THEORY OF THE IMPACT OF INFORMATION TECHNOLOGY ON THE ORGANIZATION

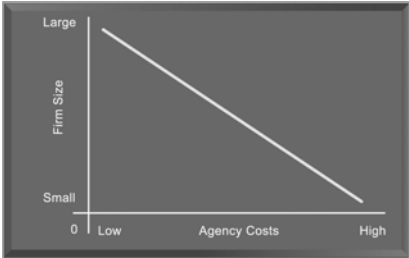


FIGURE 3-7

As firms grow in size and complexity, traditionally they experience rising agency costs.

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- **Organizational and behavioral impacts**
 - **IT flattens organizations**
 - Decision making pushed to lower levels
 - Fewer managers needed (IT enables faster decision making and increases span of control)
 - **Postindustrial organizations**
 - Organizations flatten because in postindustrial societies, authority increasingly relies on knowledge and competence rather than formal positions

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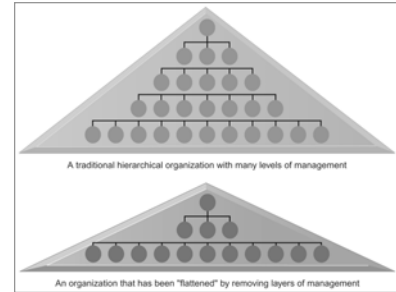
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FLATTENING ORGANIZATIONS

Information systems can reduce the number of levels in an organization by providing managers with information to supervise larger numbers of workers and by giving lower-level employees more decision-making authority.

FIGURE 3-8



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- **Organizational resistance to change**
 - Information systems become bound up in organizational politics because they influence access to a key resource – information
 - Information systems potentially change an organization's structure, culture, politics, and work
 - Most common reason for failure of large projects is due to organizational and political resistance to change

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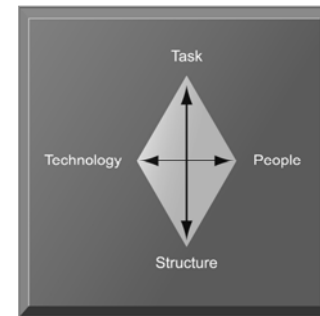
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ORGANIZATIONAL RESISTANCE AND THE MUTUALLY ADJUSTING RELATIONSHIP BETWEEN TECHNOLOGY AND THE ORGANIZATION

Implementing information systems has consequences for task arrangements, structures, and people. According to this model, to implement change, all four components must be changed simultaneously.

FIGURE 3-9



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- **The Internet and organizations**
 - The Internet increases the accessibility, storage, and distribution of information and knowledge for organizations
 - The Internet can greatly lower transaction and agency costs
 - Example: Large firm delivers internal manuals to employees via a corporate Web site, saving millions of dollars in distribution costs

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- **Central organizational factors to consider when planning a new system:**
 - Environment
 - Structure
 - Hierarchy, specialization, routines, business processes
 - Culture and politics
 - Type of organization and style of leadership
 - Main interest groups affected by system; attitudes of end users
 - Tasks, decisions, and business processes the system will assist

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Using Information Systems to Achieve Competitive Advantage

- Why do some firms become leaders in their industry?
- Michael Porter's competitive forces model
 - Provides general view of firm, its competitors, and environment
 - Five competitive forces shape fate of firm
 1. Traditional competitors
 2. New market entrants
 3. Substitute products and services
 4. Customers
 5. Suppliers

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PORTER'S COMPETITIVE FORCES MODEL

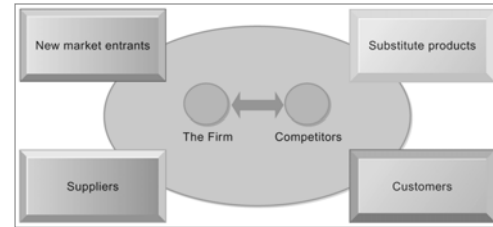


FIGURE 3-10

In Porter's competitive forces model, the strategic position of the firm and its strategies are determined not only by competition with its traditional direct competitors but also by four other forces in the industry's environment: new market entrants, substitute products, customers, and suppliers.

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- Traditional competitors
 - All firms share market space with competitors who are continuously devising new products, services, efficiencies, switching costs
- New market entrants
 - Some industries have high barriers to entry, e.g. computer chip business
 - New companies have new equipment, younger workers, but little brand recognition

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- Substitute products and services
 - Substitutes customers might use if your prices become too high, e.g. iTunes substitutes for CDs
- Customers
 - Can customers easily switch to competitor's products? Can they force businesses to compete on price alone in transparent marketplace?
- Suppliers
 - Market power of suppliers when firm cannot raise prices as fast as suppliers

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- Four generic strategies for dealing with competitive forces, enabled by using IT
 - Low-cost leadership
 - Product differentiation
 - Focus on market niche
 - Strengthen customer and supplier intimacy

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- Low-cost leadership
 - Produce products and services at a lower price than competitors while enhancing quality and level of service
 - Examples: Wal-Mart
- Product differentiation
 - Enable new products or services, greatly change customer convenience and experience
 - Examples: Google, Nike, Apple

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- **Focus on market niche**
 - Use information systems to enable a focused strategy on a single market niche; specialize
 - Example: Hilton Hotels
- **Strengthen customer and supplier intimacy**
 - Use information systems to develop strong ties and loyalty with customers and suppliers; increase switching costs
 - Example: Netflix, Amazon

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- **The Internet’s impact on competitive advantage**
 - Transformation, destruction, threat to some industries
 - E.g. travel agency, printed encyclopedia, newspaper
 - Competitive forces still at work, but rivalry more intense
 - Universal standards allow new rivals, entrants to market
 - New opportunities for building brands and loyal customer bases

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- **Business value chain model**
 - Views firm as series of activities that add value to products or services
 - Highlights activities where competitive strategies can best be applied
 - Primary activities vs. support activities
 - At each stage, determine how information systems can improve operational efficiency and improve customer and supplier intimacy
 - Utilize benchmarking, industry best practices

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THE VALUE CHAIN MODEL

This figure provides examples of systems for both primary and support activities of a firm and of its value partners that can add a margin of value to a firm's products or services.

FIGURE 3-11

The diagram illustrates the Value Chain Model. It is divided into two main sections: Support Activities and Primary Activities. Support activities include Administration and Management (Electronic scheduling and messaging systems), Human Resources (Workforce planning systems), Technology (Computer-aided design systems), and Procurement (Computerized ordering systems). Primary activities include Inbound Logistics (Automated warehousing systems), Operations (Computer-controlled machining systems), Sales and Marketing (Computerized ordering systems), Service (Equipment maintenance systems), and Outbound Logistics (Automated shipment scheduling systems). These activities are represented as blocks within a large arrow pointing right, labeled 'Firm Value Chain'. Below this, the 'Industry Value Chain' is shown as a sequence of boxes: Suppliers' Suppliers, Suppliers, Firm, Distributors, and Customers. Dashed lines connect the firm's value chain to the industry value chain, specifically linking the firm to its suppliers and distributors.

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- **Value web:**
 - Collection of independent firms using highly synchronized IT to coordinate value chains to produce product or service collectively
 - More customer driven, less linear operation than traditional value chain

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THE VALUE WEB

The value web is a networked system that can synchronize the value chains of business partners within an industry to respond rapidly to changes in supply and demand.

FIGURE 3-12

The diagram illustrates the Value Web. It shows a central node labeled 'Industry Firms' with 'ERP Systems' and 'Core Transaction Systems'. This central node is connected to several other nodes: 'Strategic Alliance and Partner Firms' at the top, 'Suppliers' and 'Suppliers' Suppliers' on the left, 'Customers' and 'Customers' Customers' on the right, 'Indirect Suppliers' at the bottom, and 'Supply Chain Management Systems' and 'Supplier Extranets' on the bottom left. 'Customer Relationship Management Systems' and 'Net Marketplaces' are also shown at the bottom. The entire network is depicted as a web of interconnected nodes and lines, representing a highly synchronized system.

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- **Information systems can improve overall performance of business units by promoting synergies and core competencies**
 - Synergies
 - When output of some units used as inputs to others, or organizations pool markets and expertise
 - Example: merger of Bank of NY and JPMorgan Chase
 - Purchase of YouTube by Google

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- **Core competencies**
 - Activity for which firm is world-class leader
 - Relies on knowledge, experience, and sharing this across business units
 - Example: Procter & Gamble's intranet and directory of subject matter experts

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- **Network-based strategies**
 - Take advantage of firm's abilities to network with each other
 - Include use of:
 - Network economics
 - Virtual company model
 - Business ecosystems

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- **Traditional economics: Law of diminishing returns**
 - The more any given resource is applied to production, the lower the marginal gain in output, until a point is reached where the additional inputs produce no additional outputs
- **Network economics:**
 - Marginal cost of adding new participant almost zero, with much greater marginal gain
 - Value of community grows with size
 - Value of software grows as installed customer base grows

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- **Virtual company strategy**
 - Virtual company uses networks to ally with other companies to create and distribute products without being limited by traditional organizational boundaries or physical locations
 - E.g. Li & Fung manages production, shipment of garments for major fashion companies, outsourcing all work to over 7,500 suppliers

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- **Business ecosystems**
 - Industry sets of firms providing related services and products
 - Microsoft platform used by thousands of firms
 - Wal-Mart's order entry and inventory management
 - **Keystone firms:** Dominate ecosystem and create platform used by other firms
 - **Niche firms:** Rely on platform developed by keystone firm
 - Individual firms can consider how IT will help them become profitable niche players in larger ecosystems

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AN ECOSYSTEM STRATEGIC MODEL

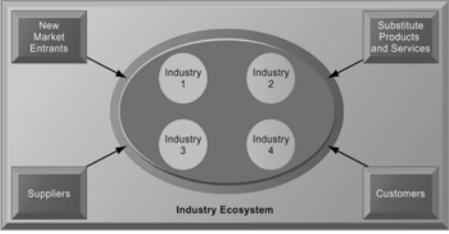


FIGURE 3-13

The digital firm era requires a more dynamic view of the boundaries among industries, firms, customers, and suppliers, with competition occurring among industry sets in a business ecosystem. In the ecosystem model, multiple industries work together to deliver value to the customer. It plays an important role in enabling a dense network of interactions among the participating firms.

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Using Information Systems for Competitive Advantage: Management Issues

- **Sustaining competitive advantage**
 - Because competitors can retaliate and copy strategic systems, competitive advantage is not always sustainable; systems may become tools for survival
- **Performing strategic systems analysis**
 - What is structure of industry?
 - What are value chains for this firm?
- **Managing strategic transitions**
 - Adopting strategic systems requires changes in business goals, relationships with customers and suppliers, and business processes

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