Information Systems

• Strategic Uses of Information Technology. Information technologies can support many competitive strategies. They can help a business cut costs, differentiate and innovate in its products and services, promote growth, develop alliances, lock in customers and suppliers, create switching costs, raise barriers to entry, and leverage its investment in IT resources. Thus, information technology can help a business gain a competitive advantage in its relationships with customers, suppliers, competitors, new en- trants, and producers of substitute products. Refer to Figures 2.3 and 2.5 for summaries of the uses of information technology for strategic advantage.

• Building a Customer-Focused Business. A key strategic use of Internet technologies is to build a company that develops its business value by making customer value its strategic focus. Customer-focused companies use Internet, intranet, and extranet e-commerce Web sites and services to keep track of their customers' preferences; to supply products, services, and information anytime or anywhere; and

to provide services tailored to the individual needs of the customers.

• Reengineering Business Processes. Information technology is a key ingredient in reengineering business operations because it enables radical changes to business processes that dramatically improve their efficiency and effectiveness. Internet technologies can play a major role in supporting innovative changes in the design of work flows, job require- ments, and organizational structures in a company.

• Becoming an Agile Company. A business can use information technology to help it become an agile Chapter 2 | Competing with Information Technology | 7 1 company. Then it can prosper in rapidly changing markets with broad product ranges and short model lifetimes in which it must process orders in arbi- trary lot sizes; it can also offer its customers cus- tomized products while it maintains high volumes of production. An agile company depends heavily on Internet technologies to help it respond to its customers with customized solutions, and to coop- erate with its customers, suppliers, and other busi- nesses to bring products to market as rapidly and cost effectively as possible.

• Creating a Virtual Company. Forming virtual

companies has become an important competitive strategy in today's dynamic global markets. Internet and other information technologies play a key role in providing computing and telecommunications resources to support the communications, coordination, and information flows needed. Managers of a virtual company depend on IT to help them manage a network of people, knowledge, financial, and physical resources provided by many business partners to take advantage of rapidly changing market opportunities.

• Building a Knowledge-Creating Company. Lasting competitive advantage today can only come from the innovative use and management of organizational knowledge by knowledge-creating companies and learning organizations. Internet technologies are widely used in knowledge management systems to support the creation and dissemination of business knowledge and its integration into new products, services, and business processes.

These are the key terms and concepts of this chapter. The page number of their first reference appears in parentheses.

1. Agile company (64)

agile company, a business must use four basic strategies. First, the business must ensure that customers perceive the products or services of an agile company as solutions to their individual problems. Thus, it can price products on the basis of their value as solutions, rather than their cost to produce. Second, an agile company cooper- ates with customers, suppliers, other companies, and even with its competitors. This cooperation allows a business to bring products to market as rapidly and cost-effectively as possible, no matter where resources are located or who owns them. Third, an agile company organizes so that it thrives on change and uncertainty. It uses flexible organiza- tional structures keyed to the requirements of different and constantly changing cus- tomer opportunities. Fourth, an agile company leverages the impact of its people and the knowledge they possess. By nurturing an entrepreneurial spirit, an agile company provides powerful incentives for employee responsibility, adaptability, and innovation

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Figure 2.13 summarizes another useful way to think about agility in business. This framework emphasizes the roles that customers, business partners, and information technology can play in developing and maintaining the strategic agility of a company. Notice how information technology can enable a company to develop relationships

FIGURE 2.13
How information technology can help a company be an agile competitor, with the help of customers and business partners.

Type of Agility	Description	Role of IT	Example
Customer	Ability to co-opt customers in the exploitation of innovation opportunities • As sources of innovation ideas • As co-creators of innovation • As users in testing ideas or helping other users learn about the idea	Technologies for building and enhancing virtual customer communities for product design, feedback, and testing	eBay customers are its de facto product development team because they post an average of 10,000 messages each week to share tips, point out glitches, and lobby for changes
Partnering	Ability to leverage assets, knowledge, and competencies of suppliers, distributors, contract manufacturers, and logistics providers in the exploration and exploitation of innovation opportunities	Technologies facilitating interfirm collaboration, such as collaborative platforms and portals, supply chain systems	Yahoo! has accomplished a significant transformation of its service from a search engine into a portal by initiating numerous partnerships to provide content and other media-related services from its Web site
Operational	Ability to accomplish speed, accuracy, and cost economy in the exploitation of innovation opportunities	Technologies for modularization and integration of business processes	Ingram Micro, a global wholesaler, has deployed an integrated trading system allowing its customers and suppliers to connect directly to its procurement and ERP systems

SOURCE: V. Sambamurthy, Anandhi Bhaharadwaj, and Varun Grover, "Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms," *MIS Quarterly*, June 2003, p. 246.

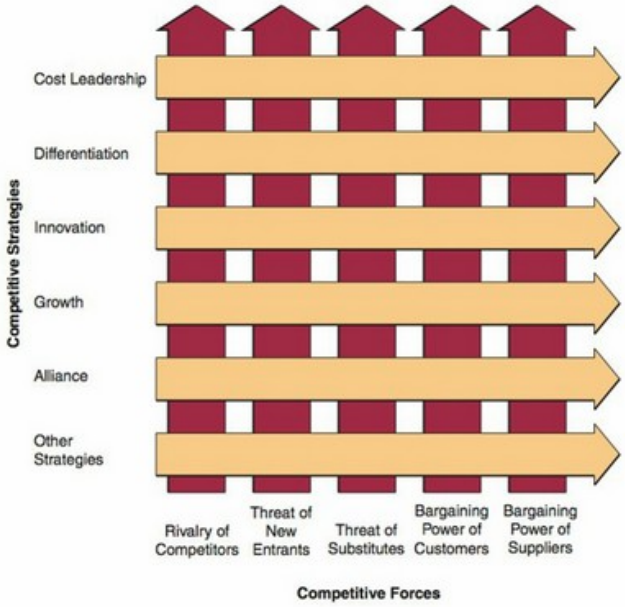
2. Business process reengineering (61)

One of the most important implementations of competitive strategies is business process reengineering (BPR), often simply called reengineering. Reengineering is a fundamental rethinking and radical redesign of business processes to achieve dra- matic improvements in cost, quality, speed, and service. BPR combines a strategy of promoting business innovation with a strategy of making major improvements to business processes so that a company can become a much stronger and more success- ful competitor in the marketplace.

3. Competitive forces (49)

to confront five competitive forces that shape the structure of competition in its industry.

FIGURE 2.2
Businesses can develop competitive strategies to counter the actions of the competitive forces they confront in the marketplace.



4. Competitive strategies (53)

one or more of the five basic competitive strategies.
• Cost Leadership Strategy. Becoming a low-cost producer of products and ser- vices in the industry or finding ways to help suppliers or customers reduce their costs or increase the costs of competitors.
• Differentiation Strategy. Developing ways to differentiate a firm's products and services from those of its competitors or reduce the differentiation advantages of competitors. This strategy may allow a firm to focus its products or services to give it an

advantage in particular segments or niches of a market.

- Innovation Strategy. Finding new ways of doing business. This strategy may involve developing unique products and services or entering unique markets or market niches. It may also involve making radical changes to the business processes for producing or distributing products and services that are so different from the way a busi- ness has been conducted that they alter the fundamental structure of an industry.
- Growth Strategies. Significantly expanding a company's capacity to produce goods and services, expanding into global markets, diversifying into new products and services, or integrating into related products and services.
- Alliance Strategies. Establishing new business linkages and alliances with cus- tomers, suppliers, competitors, consultants, and other companies. These linkages may include mergers, acquisitions, joint ventures, formation of virtual companies, or other marketing, manufacturing, or distribution agreements between a busi- ness and its trading partners.

FIGURE 2.4
Examples of how, over time, companies have used information technology to implement five competitive strategies for strategic advantage.

and suppliers (and therefore lock out competitors) by building valuable new relationships with them. These business relationships can become so valuable to customers or suppliers that they deter them from abandoning a company for its competitors or intimidate them into accepting less profitable business arrangements. Early attempts to use information systems technology in these relationships focused on significantly improving the quality of service to customers and suppliers in a firm's distribution,

Strategy	Company	Strategic Use of Information Technology	Business Benefit
Cost Leadership	Dell Computer	Online build to order	Lowest-cost producer
	Priceline.com	Online seller bidding	Buyer-set pricing
	eBay.com	Online auctions	Auction-set prices
Differentiation	AVNET Marshall	Customer/supplier of e-commerce	Increase in market share
	Moen Inc.	Online customer design	Increase in market share
	Consolidated Freightways	Customer online shipment tracking	Increase in market share
Innovation	Charles Schwab & Co.	Online discount stock trading	Market leadership
	Federal Express	Online package tracking and flight management	Market leadership
	Amazon.com	Online full-service customer systems	Market leadership
Growth	Citicorp	Global intranet	Increase in global market
	Walmart	Merchandise ordering by global satellite network	Market leadership
	Toys 'R' Us Inc.	POS inventory tracking	Market leadership
Alliance	Walmart/Procter & Gamble	Automatic inventory replenishment by supplier	Reduced inventory cost/ increased sales
	Cisco Systems	Virtual manufacturing alliances	Agile market leadership
	Staples Inc. and Partners	Online one-stop shopping with partners	Increase in market share

FIGURE 2.3
A summary of how information technology can be used to implement the five basic competitive strategies. Many companies are using Internet technologies as the foundation for such strategies.

Basic Strategies in the Business Use of Information Technology

Lower Costs
- Use IT to substantially reduce the cost of business processes.
- Use IT to lower the costs of customers or suppliers.

Differentiate
- Develop new IT features to differentiate products and services.
- Use IT features to reduce the differentiation advantages of competitors.
- Use IT features to focus products and services at selected market niches.

Innovate
- Create new products and services that include IT components.
- Develop unique new markets or market niches with the help of IT.
- Make radical changes to business processes with IT that dramatically cut costs; improve quality, efficiency, or customer service; or shorten time to market.

Promote Growth
- Use IT to manage regional and global business expansion.
- Use IT to diversify and integrate into other products and services.

Develop Alliances
- Use IT to create virtual organizations of business partners.
- Develop interenterprise information systems linked by the Internet and extranets that support strategic business relationships with customers, suppliers, subcontractors, and others.

5. Create switching costs (55)

A major emphasis in strategic information systems has been to find ways to create switching costs in

the relationships between a firm and its customers or suppliers. In other words, investments in information systems technology can make customers or suppliers dependent on the continued use of innovative, mutually beneficial interenter- prise information systems. They then become reluctant to pay the costs in time, money, effort, and inconvenience that it would take to switch to a company's competitors.

6. Customer value (57)
. This strategic focus on customer value recognizes that quality, rather than price, has be- come the primary determinant in a customer's perception of value. Companies that consistently offer the best value from the customer's perspective are those that keep track of their customers' individual preferences; keep up with market trends; supply products, services, and information anytime and anywhere; and provide customer ser- vices tailored to individual needs. Thus, Internet technologies have created a strategic opportunity for companies, large and small, to offer fast, responsive, high-quality products and services tailored to individual customer preferences

7. Interenterprise information systems (65)
It has also developed alliances and extranet links that form interenterprise information systems with suppliers, customers, subcon- tractors, and competitors. Thus, virtual companies create flexible and adaptable virtual workgroups and alliances keyed to exploit fast-changing business opportunities

8. Knowledge-creating company (67)
ompany, and quickly building the new knowledge into their products and services. Knowledge-creating companies exploit two kinds of knowledge. One is explicit knowledge, which is the data, documents, and things written down or stored on com- puters. The other kind is tacit knowledge, or the “how-tos” of knowledge, which resides in workers. Tacit knowledge can often represent some of the most important informa- tion within an organization. Long-time employees of a company often “know” many things about how to manufacture a product, deliver the service, deal with a particular vendor, or operate an essential piece of equipment. This tacit knowledge is not re- corded or codified anywhere because it has evolved in the employee’s mind through years of experience. Furthermore, much of

this tacit knowledge is never shared with anyone who might be in a position to record it in a more formal way because there is often little incentive to do so or simply, “Nobody ever asked.”

9. Knowledge management system (67)
owledge management has thus become one of the major strategic uses of infor- mation technology. Many companies are building knowledge management systems (KMS) to manage organizational learning and business know-how. The goal of such systems is to help knowledge workers create, organize, and make available important business knowledge, wherever and whenever it’s needed in an organization

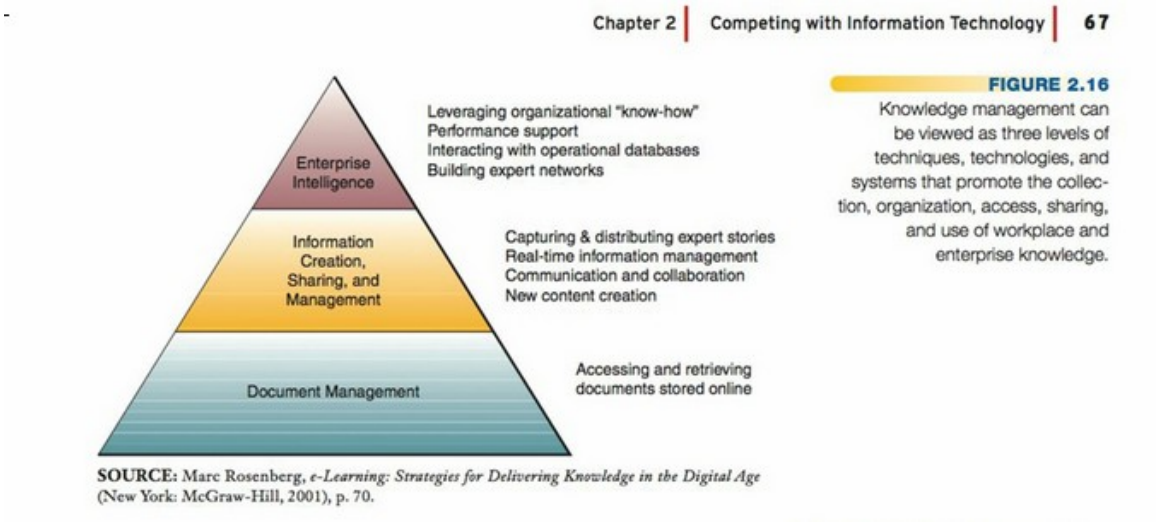


FIGURE 2.16
Knowledge management can be viewed as three levels of techniques, technologies, and systems that promote the collection, organization, access, sharing, and use of workplace and enterprise knowledge.

10. Leverage investment in IT (55)

the firm can leverage investment in IT by developing new products and services that would not be possible without a strong IT capability. An important current example is the development of corporate intranets and extranets by many companies, which enables them to leverage their previous investments in Internet browsers, PCs, servers, and client/server networks.

11. Lock in customers and suppliers (54)

Investments in information technology can allow a business to lock in customers and suppliers (and therefore lock out competitors) by building valuable new relation- ships with them. These business relationships can become so valuable to customers or suppliers that they deter them from abandoning a company for its competitors or intimidate them into accepting less profitable business arrangements.

12. Raise barriers to entry (55)

, a firm could also raise barriers to entry that would discourage or delay other companies from entering a market. Typically, these barriers increase the amount of investment or the complexity of the technology required to compete in an industry or a

market segment. Such actions tend to discourage firms already in the industry and deter external firms from entering the industry.

13. Strategic information systems (49)

This role is accomplished through a strategic information architecture: the collection of strategic information systems that supports or shapes the competitive position and strategies of a business enterprise. So a strategic information system can be any kind of information system (e.g., TPS, MIS, and DSS) that leverages information technology to help an organization gain a competitive advantage, reduce a competitive disadvan- tage, or meet other strategic enterprise objectives.

14. Value chain (59)

The value chain concept, developed by Michael Porter, is illustrated in Figure 2.8. It views a firm as a series, chain, or network of basic activi- ties that add value to its products and services and thus add a margin of value to both the firm and its customers. In the value chain conceptual framework, some business activities are primary processes; others are

support processes. Primary processes are those business activities that are directly related to the manufacture of products or the delivery of services to the customer. In contrast, support processes are those business ac- tivities that help support the day-to-day operation of the business and that indirectly contribute to the products or services of the organization.

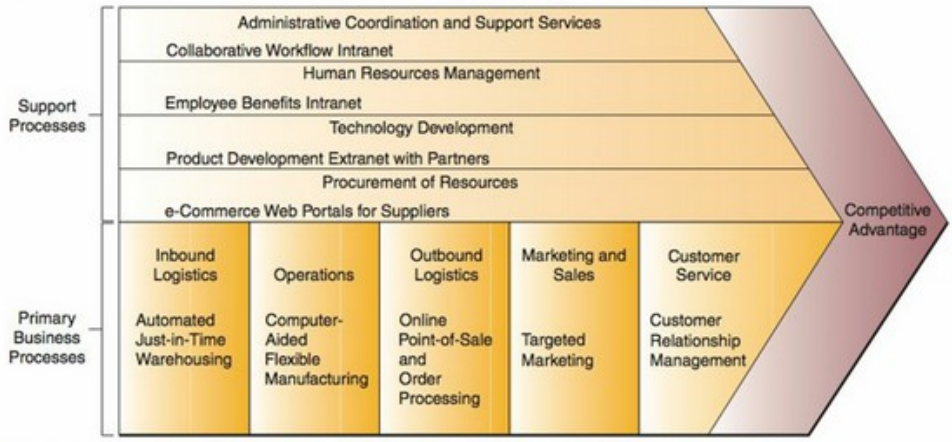


FIGURE 2.8
The value chain of a firm. Note the examples of the variety of strategic information systems that can be applied to a firm's basic business processes for competitive advantage.

Value Chain Examples

Figure 2.8 provides examples of how and where information technologies can be applied to basic business processes using the value chain framework. For example, the figure illustrates that collaborative workflow intranets can increase the communications and collaboration required to improve administrative coordination and support services dramatically. An employee benefits intranet can help the human resources management function provide employees with easy, self-service access to their benefits information. Extranets enable a company and its global business partners to use the

15. Virtual company (65)

In today's dynamic global business environment, forming a virtual company can be one of the most

important strategic uses of information technology. A virtual company (also called a virtual corporation or virtual organization) is an organization that uses in- formation technology to link people, organizations, assets, and ideas.

Match one of the key terms and concepts listed previously with one of the brief examples or definitions that follow. Try to find the best fit for answers that seem to fit more than one term or concept. Defend your choices.

1. A business must deal with customers, suppliers, competitors, new entrants, and substitutes.
Agile company

2. Cost leadership, differentiation of products, and new product innovation are examples.
Competitive strategies

3. Using investments in technology to keep firms out of an industry. **Lock in customers and suppliers**

4. Making it unattractive for a firm's customers or suppliers to switch to its competitors. **Create switching costs**

5. Strategies designed to increase the time, money,

and effort needed for customers or suppliers to change to a firm's competitors.
Competitive strategies

6. Information systems that reengineer business processes or promote business innovation are examples. **Business process reengineering**

7. This strategic focus recognizes that quality, rather than price, has become the primary determinant in customers choosing a product or service. **Customer value**

8. Highlight show strategic information systems can be applied to a firm's business processes and can support activities for competitive advantage.

9. A business finding strategic uses for the computing and telecommunications capabilities it has developed to run its operations.

10. Information technology helping a business make radical improvements in business processes.
Reengineering Business Processes
11. A business can prosper in rapidly changing markets while offering its customers individualized

solutions to their needs.

12. A network of business partners formed to take advantage of rapidly changing market opportunities. **Virtual Company**

13. Learning organizations that focus on creat- ing, disseminating, and managing business knowledge. **Knowledge-creating company**

14. Information systems that manage the cre- ation and dissemination of organizational knowledge. **Knowledge management system**

15. Using the Internet and extranets to link a company's information systems to those of its customers and suppliers**. Interenterprise information systems**

1. Suppose you are a manager being asked to develop computer-based applications to gain a competitive advantage in an important market for your com- pany. What reservations might you have about doing so? Why?

2. How could a business use information technology to increase switching costs and lock in its cus-

tomers and suppliers? Use business examples to support your answers.

3. How could a business leverage its investment in information technology to build strategic IT capabilities that serve as a barrier to new entrants into its markets?

4. Review the Real World Challenge introduced in the chapter. In such a major transformative project where no one can really envision what the end product (or end company) will look like, how should organizations set out to create these technology-enabled solutions? What kind of approaches would work best? Worst?

5. What strategic role can information play in business process reengineering?

6. HowcanInternettechnologieshelpabusinessform strategic alliances with its customers, suppliers, and others?

7. How could a business use Internet technologies to form a virtual company or become an agile competitor?

8. ConsidertheRealWorldSolutiondiscussedinthe chapter. Do you think CenterPoint Properties' success is the result of the new business model or the new technology deployed to support it (i.e., CUB)? Is it possible to distinguish one from the other? What are the implications for other companies as they seek to reinvent themselves in the future?

9. Information technology can't really give a company a strategic advantage because most competitive advantages don't last more than a few years and soon become strategic necessities that just raise the stakes of the game. Discuss.

10. MIS author and consultant Peter Keen says: "We have learned that it is not technology that creates a competitive edge, but the management process that exploits technology." " What does he mean? Do you agree or disagree? Why?

Format page 73

1. End-User Computing Skills Assessment Not all programs are written by dedicated pro- grammers. Many knowledge workers write their own software using familiar word processing, spreadsheet, presentation, and database tools. This textbook contains end-user computing exercises representing a real-world programming challenge. This first exercise will allow your course instructor to assess the class. Assess your skills in each of the following areas: a. Word processing: Approximately how many words per minute can you type? Do you use styles to manage document formatting? Have you ever set up your own mail-merge template and data source? Have you created your own macros to handle repetitive tasks? Have you ever added branching or looping logic in your macro programs? b. Spreadsheets: Do you know the order of opera- tions your spreadsheet program uses (what does “55*2^2-10” equal)? Do you know how to automatically sort data in a spreadsheet? Do you know how to create graphs and charts from spreadsheet data? Can you build pivot tables from spreadsheet data? Do you know the difference between a relative and a fixed cell reference? Do you know how to use func- tions in your spreadsheet equations? Do you know how to use the IF function? Have you created your own

macros to handle repetitive tasks? Have you ever added branching or looping logic in your macro programs? c. Presentations: Have you ever used presentation software to create presentation outlines? Have you added your own multimedia content to a presentation? Do you know how to add charts and graphs from spreadsheet software into your presentations so that they automatically update when the spreadsheet data change? d. Database: Have you ever imported data into a database from a text file? Have you ever writ- ten queries to sort or filter data stored in a da- tabase table? Have you built reports to format your data for output? Have you built forms to aid in manual data entry? Have you built func- tions or programs to manipulate data stored in database tables? e. File Management: Can you store or locate a specific file on a particular storage device? If you receive an attachment on an e-mail, can you store it on your hard drive in a location where you can find it again? Can you create a specific folder for a group of related files, then Chapter 2 | Competing with Information Technology | 7 3 navigate to it when necessary, or direct some- one else to that location? f. Internet: Do you know how to navigate your way around the Internet? If someone gives you a specific

URL, can you access that loca- tion? Do you know what a URL is? Can you modify your home page on your favorite Web browser? Do you know how to use an anti- virus program? Can you use the Status Bar to determine if a link is trying to spoof you to another site? E-mail is arguably the largest use of the Internet today. Can you send and re- ceive e-mail, build a mailing list, and send and receive attachments? 2. Marketing: Competitive Intelligence Strategic Marketing Marketing professionals use information systems to gather and analyze information about their competitors. They use this information to assess their product's position relative to the competition and make strategic marketing decisions about their product, its price, its distribution (place), and how to best manage its promotion. Michael Bloomberg, founder of Bloomberg (www.bloomberg.com), and others have made their fortunes gathering and selling data about businesses. Marketing profes- sionals find information about a business's indus- try, location, employees, products, technologies, revenues, and market share useful when planning marketing initiatives. During your senior year you will find your- self in close competition for jobs. You can take the same intelligence-gathering approach used by

professional marketers when planning how to sell your own skills. Use the following questions to help you prepare for your job search. a. Product: Which business majors are presently in greatest demand by employers? Use entry- level salaries as the primary indicator for demand. b. Product: Which colleges or universities in your region pose the greatest competitive threat to students with your major? c. Price:Whatistheaveragesalaryforentry-level employees in your major and geographic region? Is salary your top concern? Why or why not? d. Place: Which areas of the country are cur- rently experiencing the greatest employment growth? e. Promotion: What is your marketing plan? Describe how you plan to get your name and qualifications in front of prospective employers. How can the Internet help you get noticed?