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SEVENTH EDITION

MANAGEMENT INFORMATION SYSTEMS

JAMES A. O'BRIEN

GEORGE M. MARAKAS

MANAGEMENT INFORMATION SYSTEMS

Seventh Edition

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To your love, happiness, and success

About the Authors

James A. O'Brien is an adjunct professor of Computer Information Systems in the College of Business Administration at Northern Arizona University. He completed his undergraduate studies at the University of Hawaii and Gonzaga University and earned an MS and PhD in Business Administration from the University of Oregon. He has been professor and coordinator of the CIS area at Northern Arizona University, professor of Finance and Management Information Systems and chairman of the Department of Management at Eastern Washington University, and a visiting professor at the University of Alberta, the University of Hawaii, and Central Washington University.

Dr. O'Brien's business experience includes working in the Marketing Management Program of the IBM Corporation, as well as serving as a financial analyst for the General Electric Company. He is a graduate of General Electric's Financial Management Program. He has also served as an information systems consultant to several banks and computer services firms.

Jim's research interests lie in developing and testing basic conceptual frameworks used in information systems development and management. He has written eight books, including several that have been published in multiple editions, as well as in Chinese, Dutch, French, Japanese, or Spanish translations. He has also contributed to the field of information systems through the publication of many articles in business and academic journals, as well as through his participation in academic and industry associations in the field of information systems.

George M. Marakas is an associate professor of Information Systems at the School of Business at the University of Kansas. His teaching expertise includes Systems Analysis and Design, Technology-Assisted Decision Making, Electronic Commerce, Management of IS Resources, Behavioral IS Research Methods, and Data Visualization and Decision Support. In addition, George is an active researcher in the area of Systems Analysis Methods, Data Mining and Visualization, Creativity Enhancement, Conceptual Data Modeling, and Computer Self-Efficacy.

George received his PhD in Information Systems from Florida International University in Miami and his MBA from Colorado State University. Prior to his position at the University of Kansas, he was a member of the faculties at the University of Maryland, Indiana University, and Helsinki School of Economics. Preceding his academic career, he enjoyed a highly successful career in the banking and real estate industries. His corporate experience includes senior management positions with Continental Illinois National Bank and the Federal Deposit Insurance Corporation. In addition, George served as president and CEO for CMC Group, Inc., a major RTC management contractor in Miami, Florida, for three years.

Throughout his academic career, George has distinguished himself both through his research and in the classroom. He has received numerous national teaching awards and his research has appeared in the top journals in his field.

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In addition to this text, he is also the author of three best-selling textbooks in information systems: *Decision Support Systems for the 21st Century*, *Systems Analysis and Design: An Active Approach*, and *Data Warehousing, Mining, and Visualization: Core Concepts.*

Beyond his academic endeavors, George is also an active consultant and has served as an advisor to a number of organizations including the Central Intelligence Agency, Brown & Williamson, the Department of the Treasury, the Department of Defense, Xavier University, Citibank Asia-Pacific, Nokia Corporation, Professional Records Storage, Inc., and United Information Systems, among many others. His consulting activities are concentrated primarily on electronic commerce strategy, design and deployment of global IT strategy, workflow reengineering, e-business strategy, and ERP and CASE tool integration.

George is also an active member of a number of professional IS organizations and is an avid golfer, a 2nd Degree Black Belt in Tae Kwon Do, a PADI master scuba diver trainer and IDC staff instructor, and a member of Pi Kappa Alpha fraternity.

Preface

A Business and Managerial Perspective

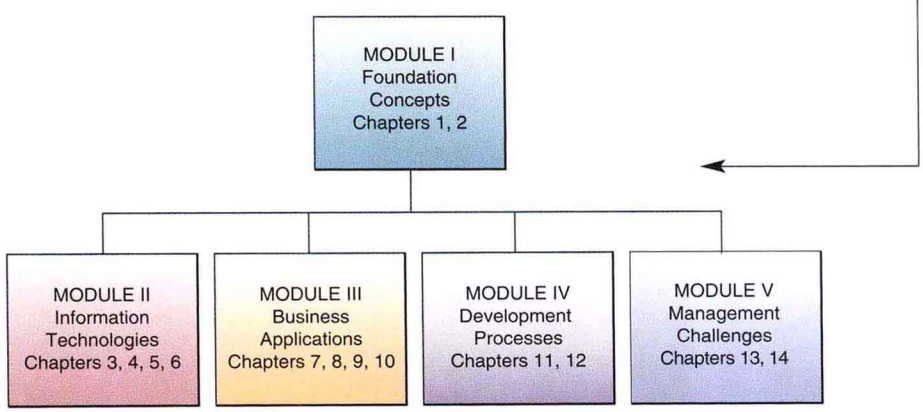
The Seventh Edition is designed for business students who are or who will soon become business professionals. By teaching students how to use and manage information technologies to revitalize business processes, improve business decision making, and gain competitive advantage, O'Brien equips students with the information necessary to become skilled knowledge workers and IS specialists in tomorrow's fast changing and dynamic business world. Thus, this text emphasizes the essential role of Internet technologies in providing a platform for business, commerce, and collaboration processes among all business stakeholders in today's networked enterprises and global markets.

This is the business and managerial perspective that this text brings to the study of information systems. Of course, as in all O'Brien texts, this edition:

- Loads the text with real world cases, examples, and exercises about real people and companies in the business world.
- Organizes the text around a simple five-area framework that emphasizes the IS knowledge a business professional needs to know.
- Places a major emphasis on the strategic role of information technology in providing business professionals with tools and resources for managing business operations, supporting decision making, enabling enterprise collaboration, and gaining competitive advantage.

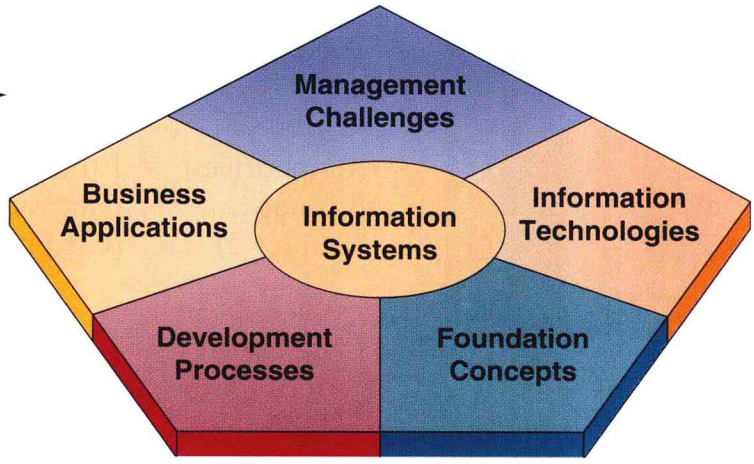
Modular Structure of the Text

The text is organized into modules that reflect the five major areas of the framework for information systems knowledge: Foundation Concepts, Information Technologies, Business Applications, Development Processes, and Management Challenges. Also, each chapter is organized into at least two distinct sections. This is done to avoid proliferation of chapters, as well as to provide better conceptual organization of the text and each chapter. This organization increases instructor flexibility in assigning course material since it structures the text into modular levels (i.e., modules, chapters, and sections) while reducing the number of chapters that need to be covered.



An Information Systems Framework

O'Brien uses a five-area IS framework to reduce the complexity of MIS. On each chapter opener the appropriate area is highlighted depending on what is being covered in that chapter.



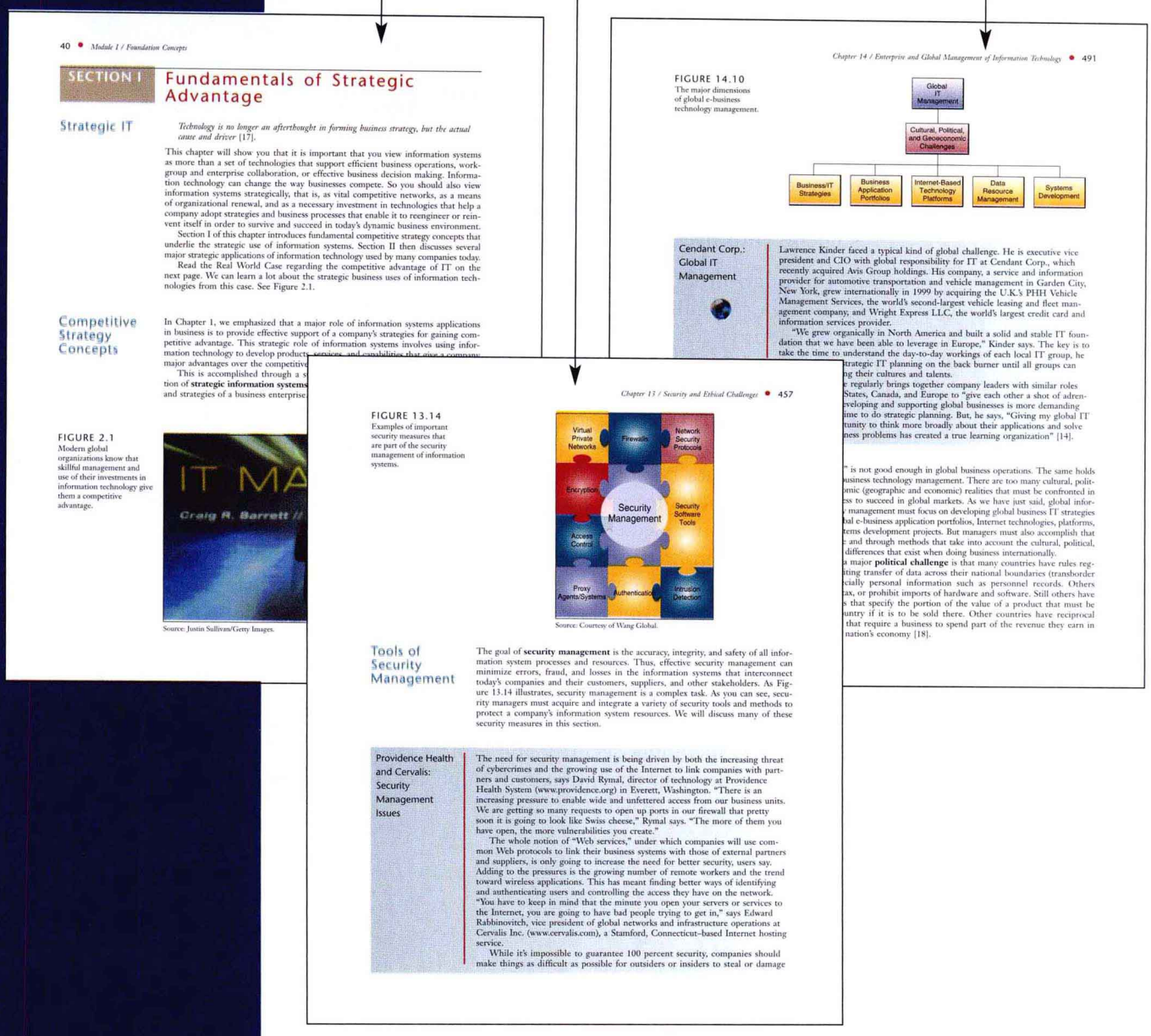
This text reduces the complexity of a course in management information systems by using a conceptual framework that organizes the knowledge needed by business students into five major areas:

- **Foundation Concepts.** Fundamental business information systems concepts including trends, components, and roles of information systems (Chapter 1) and competitive advantage concepts and applications (Chapter 2). Other behavioral, managerial, and technical concepts are presented where appropriate in selected chapters.
- **Information Technologies.** Includes major concepts, developments, and managerial issues involved in computer hardware, software, telecommunications network and data resource management technologies (Chapters 3, 4, 5, and 6). Other technologies used in business information systems are discussed where appropriate in selected chapters.
- **Business Applications.** How businesses use Internet and other information technologies to support their business processes, e-business and e-commerce initiatives, and business decision making (Chapters 7, 8, 9, and 10).
- **Development Processes.** Developing and implementing business/IT strategies and systems using several strategic planning and application development approaches (Chapters 11 and 12).
- **Management Challenges.** The challenges of business/IT technologies and strategies, including security and ethical challenges and global IT management (discussed in many chapters, but emphasized in Chapters 13 and 14).

Strategic, International, and Ethical Coverage

This edition also contains substantial text material and real world cases and examples reflecting strategic issues and uses of information technology for . . .

- Competitive advantage (Chapter 2)
- Ethical and security issues and challenges (Chapter 13)
- International and global business issues and practices (Chapter 14).



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SECTION I **Fundamentals of Strategic Advantage**

Strategic IT

Technology is no longer an afterthought in forming business strategy, but the actual cause and driver [17].

This chapter will show you that it is important that you view information systems as more than a set of technologies that support efficient business operations, workgroup and enterprise collaboration, or effective business decision making. Information technology can change the way businesses compete. So you should also view information systems strategically, that is, as vital competitive networks, as a means of organizational renewal, and as a necessary investment in technologies that help a company adopt strategies and business processes that enable it to reengineer or reinvent itself in order to survive and succeed in today's dynamic business environment.

Section I of this chapter introduces fundamental competitive strategy concepts that underlie the strategic use of information systems. Section II then discusses several major strategic applications of information technology used by many companies today.

Read the Real World Case regarding the competitive advantage of IT on the next page. We can learn a lot about the strategic business uses of information technologies from this case. See Figure 2.1.

Competitive Strategy Concepts

In Chapter 1, we emphasized that a major role of information systems applications in business is to provide effective support of a company's strategies for gaining competitive advantage. This strategic role of information systems involves using information technology to develop products, services, and capabilities that give a company major advantages over the competitive

This is accomplished through a s
tion of **strategic information systems**
and strategies of a business enterprise

FIGURE 2.1
Modern global organizations know that skillful management and use of their investments in information technology give them a competitive advantage.

Source: Justin Sullivan/Getty Images.

Chapter 14 / Enterprise and Global Management of Information Technology • 491

FIGURE 14.10
The major dimensions of global e-business technology management.

Cendant Corp.: Global IT Management

Lawrence Kinder faced a typical kind of global challenge. He is executive vice president and CIO with global responsibility for IT at Cendant Corp., which recently acquired Avis Group holdings. His company, a service and information provider for automotive transportation and vehicle management in Garden City, New York, grew internationally in 1999 by acquiring the U.K.'s PHH Vehicle Management Services, the world's second-largest vehicle leasing and fleet management company, and Wright Express LLC, the world's largest credit card and information services provider.

"We grew organically in North America and built a solid and stable IT foundation that we have been able to leverage in Europe," Kinder says. The key is to take the time to understand the day-to-day workings of each local IT group, he

trategic IT planning on the back burner until all groups can
g their cultures and talents.
e regularly brings together company leaders with similar roles
States, Canada, and Europe to "give each other a shot of adren-
veloping and supporting global businesses is more demanding
ime to do strategic planning. But, he says, "Giving my global IT
tunity to think more broadly about their applications and solve
ness problems has created a true learning organization" [14].

" is not good enough in global business operations. The same holds
usiness technology management. There are too many cultural, polit-
omic (geographic and economic) realities that must be confronted in
ss to succeed in global markets. As we have just said, global infor-
management must focus on developing global business IT strategies
bal e-business application portfolios, Internet technologies, platforms,
tems development projects. But managers must also accomplish that
and through methods that take into account the cultural, political,
differences that exist when doing business internationally.
a major **political challenge** is that many countries have rules reg-
iting transfer of data across their national boundaries (transborder
cially personal information such as personnel records. Others
ax, or prohibit imports of hardware and software. Still others have
s that specify the portion of the value of a product that must be
untry if it is to be sold there. Other countries have reciprocal
that require a business to spend part of the revenue they earn in
nation's economy [18].

Chapter 13 / Security and Ethical Challenges • 457

FIGURE 13.14
Examples of important security measures that are part of the security management of information systems.

Source: Courtesy of Wang Global.

Tools of Security Management

The goal of **security management** is the accuracy, integrity, and safety of all information system processes and resources. Thus, effective security management can minimize errors, fraud, and losses in the information systems that interconnect today's companies and their customers, suppliers, and other stakeholders. As Figure 13.14 illustrates, security management is a complex task. As you can see, security managers must acquire and integrate a variety of security tools and methods to protect a company's information system resources. We will discuss many of these security measures in this section.

Providence Health and Cervalis: Security Management Issues

The need for security management is being driven by both the increasing threat of cybercrimes and the growing use of the Internet to link companies with partners and customers, says David Rymal, director of technology at Providence Health System (www.providence.org) in Everett, Washington. "There is an increasing pressure to enable wide and unfettered access from our business units. We are getting so many requests to open up ports in our firewall that pretty soon it is going to look like Swiss cheese," Rymal says. "The more of them you have open, the more vulnerabilities you create."

The whole notion of "Web services," under which companies will use common Web protocols to link their business systems with those of external partners and suppliers, is only going to increase the need for better security, users say. Adding to the pressures is the growing number of remote workers and the trend toward wireless applications. This has meant finding better ways of identifying and authenticating users and controlling the access they have on the network. "You have to keep in mind that the minute you open your servers or services to the Internet, you are going to have bad people trying to get in," says Edward Rabbinowitch, vice president of global networks and infrastructure operations at Cervalis Inc. (www.cervalis.com), a Stamford, Connecticut-based Internet hosting service.

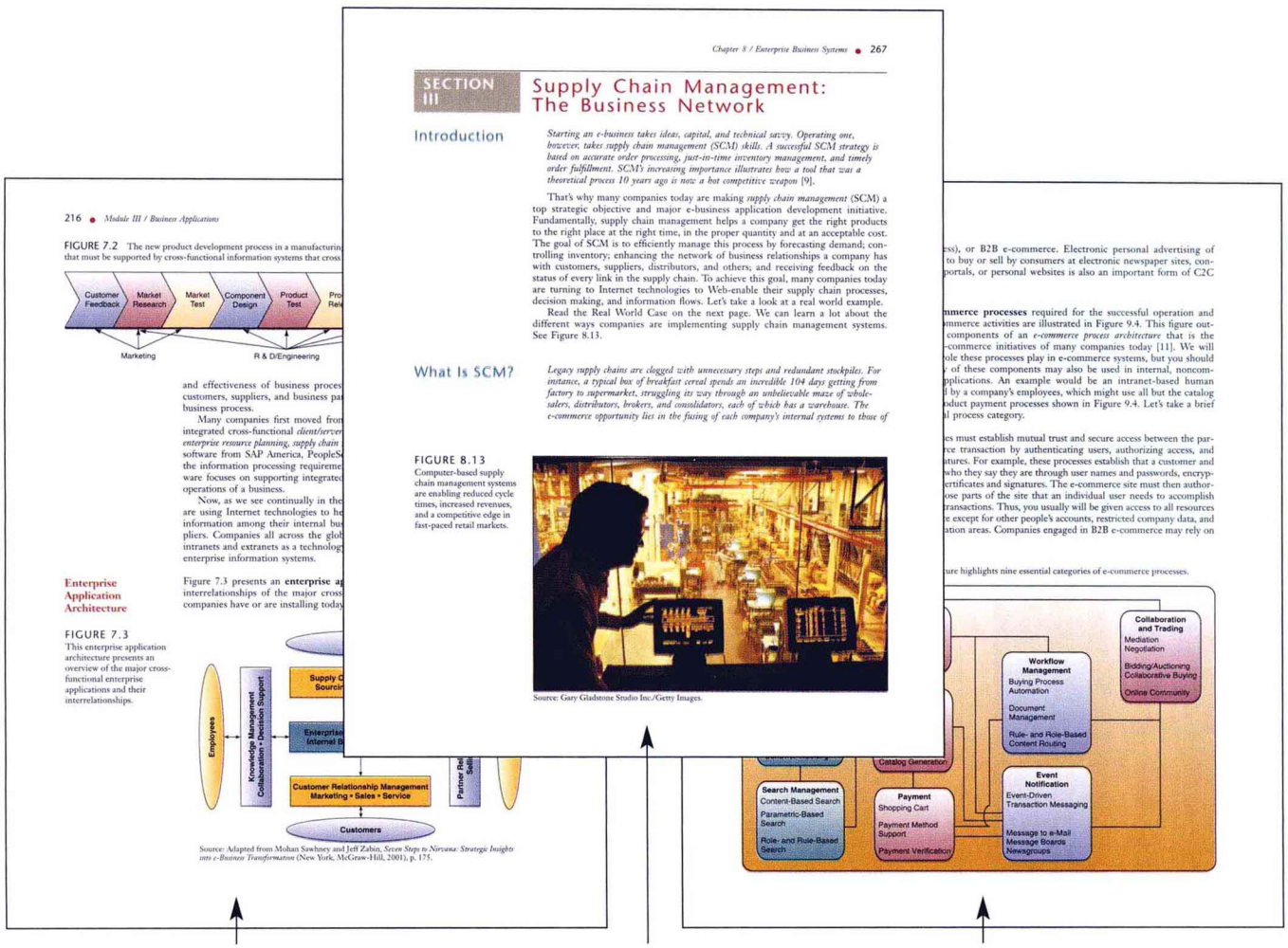
While it's impossible to guarantee 100 percent security, companies should make things as difficult as possible for outsiders or insiders to steal or damage

These chapters demonstrate the strategic and ethical challenges of managing information technology for competitive advantage in today's dynamic global business markets.

Realistic Coverage of e-Business and e-Commerce

Recently coined, yet already clichéd, the expression "e-business is business" speaks the truth . . .

Contrary to popular opinion, e-business is not synonymous with e-commerce. E-business is much broader in scope, going beyond transactions to signify use of the Net, in combination with other network technologies and forms of electronic communication, to enable any type of business activity [1].



- Functional and cross-functional business systems (Chapter 7)
- Enterprise business systems (Chapter 8)
- Electronic commerce (Chapter 9)

Today, businesses of all sizes and types are using Internet technologies to enable all kinds of business activities. That's what e-business really is. The new Seventh Edition recognizes that Internet-enabled business processes are becoming so fundamentally pervasive in business that the term *e-business* is becoming redundant in many instances. Therefore this edition has significantly reduced its use of that term, while concentrating the e-business coverage that today's business students need into two chapters on e-business applications (Chapter 7, Chapter 8) and one chapter on e-commerce (Chapter 9). The text material and real world cases and examples in these chapters provide students with a solid e-business foundation for their studies and work in business.

Real World Emphasis

Real World Cases

Each chapter includes four one-page case studies that illustrate how prominent businesses and organizations have attempted to implement many of the concepts in each chapter. All cases are timely and promote critical thinking. For a full list of cases examined within the Seventh Edition, turn to the inside front cover.

REAL WORLD CASE 3

Aviall Inc.: From Failure to Success with Information Technology

Joseph Lacik, Jr., doesn't try to measure the return on investment of his company's e-business website. The fact that Dallas-based Aviall Inc. (www.aviall.com) was saved from financial disaster by a controversial multimillion-dollar IT project that included developing the website as one key element is all the return he needs to see. That investment, in the words of Larry DeBoever, chief strategy officer at the IT consulting firm Experio Solutions Corp. in Dallas, "turned Aviall from a catalog business into a full-scale logistics business" that hundreds of aviation parts manufacturers and airlines large and small depend on for ordering, inventory control, and demand forecasting. He says the new approach ties Aviall more tightly to customers such as Rolls-Royce PLC. "Aviall is now the logistics back end for the aviation firms," says DeBoever, whose company was retained to help with portions of Aviall's systems integration work. "And they did it even though the airline industry shrank over the last three years."

In early 2000, with quarterly sales dropping and Aviall on the ropes, "We invested $30 million to $40 million to build this infrastructure," says Lacik, vice president of information services at Aviall Services, a unit of Aviall. "Our competitors thought we were insane. Some investors asked for my resignation." But the results of the project have been extremely successful and represent a huge comeback

Of course, even with planning, some of the systems integration was more difficult than expected. One major reason was the sheer size of the project. The new combined system has to properly access and deal with customized pricing charts for 17,000 customers who receive various types of discounts, and it has to deal with an inventory of 380,000 different aerospace parts.

The development of Aviall.com was one of the least expensive parts of the project, at a cost of about $3 million, Lacik says. But it provides big benefits. When customers order products on the Aviall website, it costs the company about 39 cents per order, compared with $9 per transaction if an Aviall employee takes the order over the phone. New supply chain functions are also possible, such as the ability for customers to transfer their orders from an Excel spreadsheet directly to the website. Customers can also receive price and availability information on aerospace parts in less than five seconds—a real-time feature that hadn't been available before the BroadVision system was installed, Lacik says.

The process also frees the company's sales force from routine order taking and follow-up, thus allowing them to spend more time developing relationships with customers. What's more, the website helps Aviall build relationships with suppliers by providing them with customer ordering data that enables them to better match production with demand. The website now generates $60 million of the company's $800 million in annual revenue, or 7.5 percent, up from less than 2 percent a year ago. "Over the next three to five years, it could become more than 30 percent," Lacik says.

Case Study Questions

1. Why do you think that Aviall failed in their implementation of an enterprise resource planning system? What could they have done differently?
2. How has information technology brought new business success to Aviall? How did IT change Aviall's business model?
3. How could other companies use Aviall's approach to the use of IT to improve their business success? Give several examples.

Source: Adapted from Steve Alexander, "Website Adds Inventory Control and Forecasting," *Computerworld*, February 24, 2003, p. 45. Copyright © 2003 by Computerworld, Inc., Framingham, MA 01701. All rights reserved.

REAL WORLD CASE 1

Hilton Hotels Corporation: Data-Driven Hospitality

Hilton Hotels Corporation has learned that customers are more satisfied when they have a problem and the hotel staff takes care of it than if the stay goes flawlessly. Giving hotel staff the information to make critical recoveries is the reason Hilton, during one of the industry's worst downturns in decades, piled $50 million into a custom-built customer relationship management (CRM) information system that has been integrated to cover 22 million guests in every property across the eight brands that Hilton owns. "The hospitality industry is a people business," says CIO Tim Harvey. "It doesn't do any good to have great customer information that's only in the reservations system and available to the call center. We need to have it common across all systems."

Hilton is putting its CRM system, called OnQ, to the test in a high-stakes expansion program. As the industry regains momentum, Hilton is opening an estimated 275 hotels by the end of 2005. OnQ is the IT centerpiece of a 2-year-old Hilton CRM strategy, officially known as "Customers really matter." The strategy is pinned on the idea that employees with a clearer idea of who customers are and what their past Hilton experiences have been can engineer constant improvement.

There are plenty of risks in the strategy. For one, Hilton needs to present its deep customer histories clearly enough that employees at the front desks, where turnover averages more than 100 percent a year, can put it to use. And Hilton is trying to use the integrated information system to build loyalty with customers across an incredibly diverse mix of eight hotel brands—so the same customer is recognized checking into a $79 room at Hampton Inn in Davenport, Iowa, or a $540 suite at the Hilton Hawaiian Village in Honolulu.

The risk Harvey and his team know they need to guard against is hitting a hotel staff with so much information, or doing it in such a disruptive way, that it prevents employees from interacting with guests and making judgments.

A lot of love and sweat went into building OnQ, a system that's about 70 percent custom-coded. The custom components include a property-management system, the CRM application, and a hotel owner-reporting module.

The system is delivered as an IT service to the franchise dominated chain. Hilton owns just 52 of its 2,216 hotels, and franchisees license the software, paying Hilton annual fees that work out to about three-fourths of 1 percent of a hotel's revenue.

Hilton's IT leadership is stacked with hotel industry veterans who have no trouble defining IT success in terms of how quickly guests get to their rooms and whether the rooms are what they asked for. Harvey looks at it this way: If guests are disappointed, eventually Hilton's shareholders will be, too. "We are passionate that our brand is only as good as our customers think we are," he says.

OnQ's $50 million price tag makes it by far Hilton's largest technology investment of the past several years.

For OnQ to fulfill its mission, it needs to do more than deliver information; it needs to be a decision-support tool. For example, if a guest has complained in the past about being bumped from an overbooked hotel and moved to another Hilton property, the system will highlight that history should the same situation come up, thus making it less likely a hotel will ask that customer to "walk" again.

One way OnQ already is yielding measurable benefits is in its ability to match customer reservations with profile database records. Before the system's deployment, just 2 of every 10 guest reservations could be matched to an existing profile. With OnQ, it's matching 4.7, and Hilton says that number can be closer to 6.

Such success brings a smile to the face of Chuck Scoggins, senior director of Hilton.com and a key figure in the OnQ development project. Each customer profile includes a variety of information, from credit card data and stay histories to frequent-flier miles and room preferences, all of which can be used to match people to their profiles. The company considers its matching technology, which lets the front desk search through 180 million records and get answers almost instantly, to be critical intellectual property. "These are our algorithms, and we believe they're the best in the industry," Scoggins says. That's why Hilton continues to custom-build most of its software instead of buying off the shelf. "I'm reluctant to replace something we've worked so hard on until we can be sure it will be a significant improvement," Scoggins says.

While OnQ helps Hilton run its existing operations, the system's real return will be measured by whether it lets the company reinvent what it does and what it offers customers.

Harvey hasn't lost sight of the more distant future. Hilton's 540-person IT staff spends about $132 million a year—about 2 percent of revenue—on IT. About $1 million of that goes to true research and development investigating emerging technologies. "Too often, we forget to think about innovation in the rush to meet business objectives," Harvey says. "We get so intent on trying to deliver, but that thinking outside of the box is crucial to our future success."

Case Study Questions

1. What are the benefits and drawbacks of the OnQ system at Hilton?
2. What does Hilton have to do to create a competitive advantage through OnQ? Provide some specific examples.
3. Is it possible to have too much information about a customer? Explain.

Source: Adapted from Tony Kontzer, "Data Driven Hospitality," *InformationWeek*, August 2, 2004. Copyright © 2004 CMP Media LLP.

O'Brien set the standard for bringing corporate reality into the information systems classroom.

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Real World Examples.

Each chapter contains a number of supportive examples that help to reinforce and illustrate how corporations apply specific IS concepts.

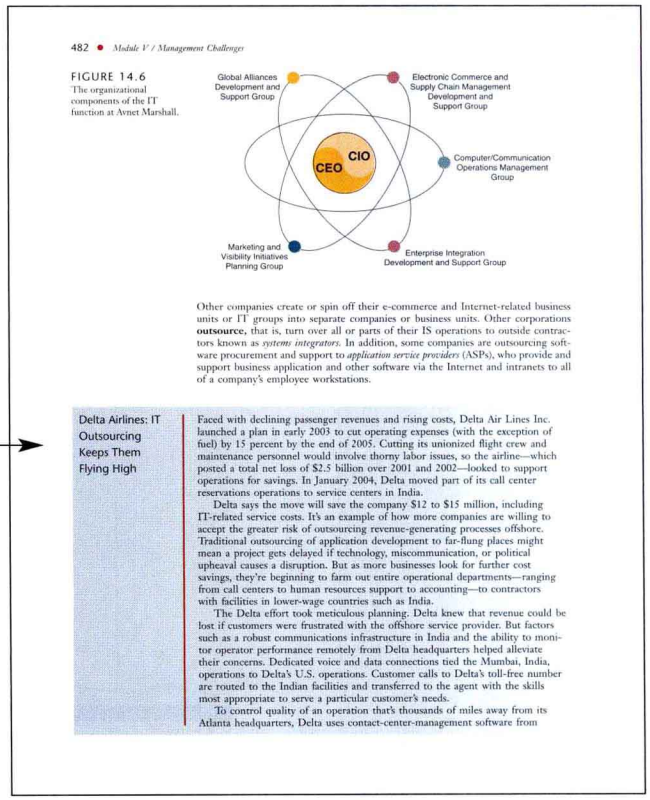

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FIGURE 14.6
The organizational components of the IT function at Avnet Marshall.

Other companies create or spin off their e-commerce and Internet-related business units or IT groups into separate companies or business units. Other corporations **outsource**, that is, turn over all or parts of their IS operations to outside contractors known as *systems integrators*. In addition, some companies are outsourcing software procurement and support to *application service providers* (ASPs), who provide and support business application and other software via the Internet and intranets to all of a company's employee workstations.

Delta Airlines: IT Outsourcing Keeps Them Flying High

Faced with declining passenger revenues and rising costs, Delta Air Lines Inc. launched a plan in early 2003 to cut operating expenses (with the exception of fuel) by 15 percent by the end of 2005. Cutting its unionized flight crew and maintenance personnel would involve thorny labor issues, so the airline—which posted a total net loss of $2.5 billion over 2001 and 2002—looked to support operations for savings. In January 2004, Delta moved part of its call center reservations operations to service centers in India.

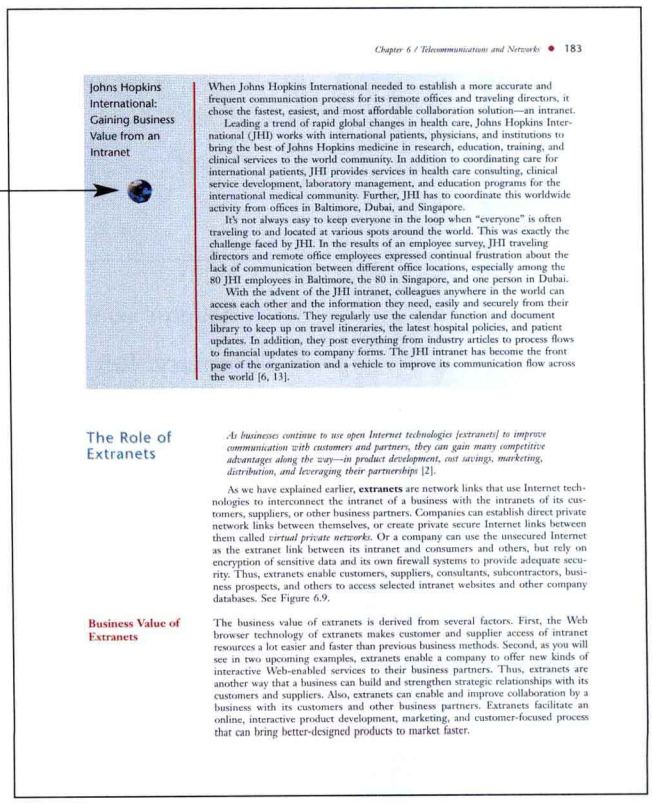
Delta says the move will save the company $12 to $15 million, including IT-related service costs. It's an example of how more companies are willing to accept the greater risk of outsourcing revenue-generating processes offshore. Traditional outsourcing of application development to far-flung places might mean a project gets delayed if technology, miscommunication, or political upheaval causes a disruption. But as more businesses look for further cost savings, they're beginning to farm out entire operational departments—ranging from call centers to human resources support to accounting—to contractors with facilities in lower-wage countries such as India.

The Delta effort took meticulous planning. Delta knew that revenue could be lost if customers were frustrated with the offshore service provider. But factors such as a robust communications infrastructure in India and the ability to monitor operator performance remotely from Delta headquarters helped alleviate their concerns. Dedicated voice and data connections tied the Mumbai, India, operations to Delta's U.S. operations. Customer calls to Delta's toll-free number are routed to the Indian facilities and transferred to the agent with the skills most appropriate to serve a particular customer's needs.

To control quality of an operation that's thousands of miles away from its Atlanta headquarters, Delta uses contact-center-management software from

Global Icon.

At least one *international* real world example is presented in each chapter. These examples are identified with a global icon.



Chapter 6 / Telecommunications and Networks • 183

Johns Hopkins International: Gaining Business Value from an Intranet

When Johns Hopkins International needed to establish a more accurate and frequent communication process for its remote offices and traveling directors, it chose the fastest, easiest, and most affordable collaboration solution—an intranet.

Leading a trend of rapid global changes in health care, Johns Hopkins International (JHI) works with international patients, physicians, and institutions to bring the best of Johns Hopkins medicine in research, education, training, and clinical services to the world community. In addition to coordinating care for international patients, JHI provides services in health care consulting, clinical service development, laboratory management, and education programs for the international medical community. Further, JHI has to coordinate this worldwide activity from offices in Baltimore, Dubai, and Singapore.

It's not always easy to keep everyone in the loop when "everyone" is often traveling to and located at various spots around the world. This was exactly the challenge faced by JHI. In the results of an employee survey, JHI traveling directors and remote office employees expressed continual frustration about the lack of communication between different office locations, especially among the 80 JHI employees in Baltimore, the 80 in Singapore, and one person in Dubai.

With the advent of the JHI intranet, colleagues anywhere in the world can access each other and the information they need, easily and securely from their respective locations. They regularly use the calendar function and document library to keep up on travel itineraries, the latest hospital policies, and patient updates. In addition, they post everything from industry articles to process flows to financial updates to company forms. The JHI intranet has become the front page of the organization and a vehicle to improve its communication flow across the world [6, 13].

The Role of Extranets

As businesses continue to use open Internet technologies [extranets] to improve communication with customers and partners, they can gain many competitive advantages along the way—in product development, cost savings, marketing, distribution, and leveraging their partnerships [2].

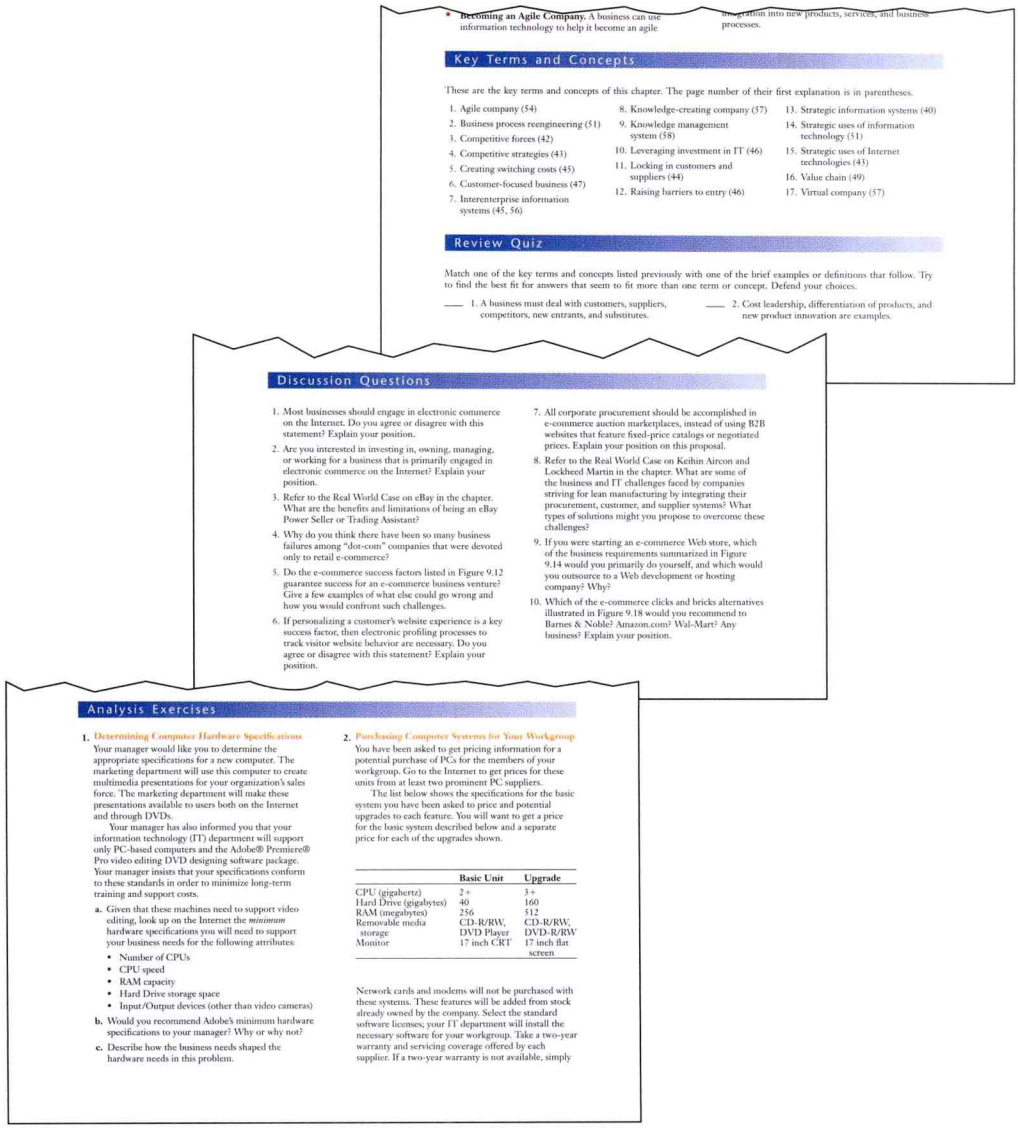
As we have explained earlier, **extranets** are network links that use Internet technologies to interconnect the intranet of a business with the intranets of its customers, suppliers, or other business partners. Companies can establish direct private network links between themselves, or create private secure Internet links between them called *virtual private networks*. Or a company can use the unsecured Internet as the extranet link between its intranet and consumers and others, but rely on encryption of sensitive data and its own firewall systems to provide adequate security. Thus, extranets enable customers, suppliers, consultants, subcontractors, business prospects, and others to access selected intranet websites and other company databases. See Figure 6.9.

Business Value of Extranets

The business value of extranets is derived from several factors. First, the Web browser technology of extranets makes customer and supplier access of intranet resources a lot easier and faster than previous business methods. Second, as you will see in two upcoming examples, extranets enable a company to offer new kinds of interactive Web-enabled services to their business partners. Thus, extranets are another way that a business can build and strengthen strategic relationships with its customers and suppliers. Also, extranets can enable and improve collaboration by a business with its customers and other business partners. Extranets facilitate an online, interactive product development, marketing, and customer-focused process that can bring better-designed products to market faster.

End-of-Chapter Material

Problem solving, analysis, and critical thinking are important skills. End-of-chapter material in each chapter is fortified with a wide variety of thought-provoking questions and creative exercises.



- **Becoming an Agile Company.** A business can use information technology to help it become an agile

integration into new products, services, and business processes.

Key Terms and Concepts

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

1. Agile company (54)
2. Business process reengineering (51)
3. Competitive forces (42)
4. Competitive strategies (43)
5. Creating switching costs (45)
6. Customer-focused business (47)
7. Interenterprise information systems (45, 56)
8. Knowledge-creating company (57)
9. Knowledge management system (58)
10. Leveraging investment in IT (46)
11. Locking in customers and suppliers (44)
12. Raising barriers to entry (46)
13. Strategic information systems (40)
14. Strategic uses of information technology (51)
15. Strategic uses of Internet technologies (43)
16. Value chain (49)
17. Virtual company (57)

Review Quiz

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.

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

Discussion Questions

1. Most businesses should engage in electronic commerce on the Internet. Do you agree or disagree with this statement? Explain your position.
2. Are you interested in investing in, owning, managing, or working for a business that is primarily engaged in electronic commerce on the Internet? Explain your position.
3. Refer to the Real World Case on eBay in the chapter. What are the benefits and limitations of being an eBay Power Seller or Trading Assistant?
4. Why do you think there have been so many business failures among "dot-com" companies that were devoted only to retail e-commerce?
5. Do the e-commerce success factors listed in Figure 9.12 guarantee success for an e-commerce business venture? Give a few examples of what else could go wrong and how you would confront such challenges.
6. If personalizing a customer's website experience is a key success factor, then electronic profiling processes to track visitor website behavior are necessary. Do you agree or disagree with this statement? Explain your position.
7. All corporate procurement should be accomplished in e-commerce auction marketplaces, instead of using B2B websites that feature fixed-price catalogs or negotiated prices. Explain your position on this proposal.
8. Refer to the Real World Case on Keihin Aircon and Lockheed Martin in the chapter. What are some of the business and IT challenges faced by companies striving for lean manufacturing by integrating their procurement, customer, and supplier systems? What types of solutions might you propose to overcome these challenges?
9. If you were starting an e-commerce Web store, which of the business requirements summarized in Figure 9.14 would you primarily do yourself, and which would you outsource to a Web development or hosting company? Why?
10. Which of the e-commerce clicks and bricks alternatives illustrated in Figure 9.18 would you recommend to Barnes & Noble? Amazon.com? Wal-Mart? Any business? Explain your position.

Analysis Exercises

1. **Determining Computer Hardware Specifications**
   Your manager would like you to determine the appropriate specifications for a new computer. The marketing department will use this computer to create multimedia presentations for your organization's sales force. The marketing department will make these presentations available to users both on the Internet and through DVDs.
   Your manager has also informed you that your information technology (IT) department will support only PC-based computers and the Adobe® Premiere® Pro video editing DVD designing software package. Your manager insists that your specifications conform to these standards in order to minimize long-term training and support costs.
   a. Given that these machines need to support video editing, look up on the Internet the *minimum* hardware specifications you will need to support your business needs for the following attributes:
      - Number of CPUs
      - CPU speed
      - RAM capacity
      - Hard Drive storage space
      - Input/Output devices (other than video cameras)
   b. Would you recommend Adobe's minimum hardware specifications to your manager? Why or why not?
   c. Describe how the business needs shaped the hardware needs in this problem.

2. **Purchasing Computer Systems for Your Workgroup**
   You have been asked to get pricing information for a potential purchase of PCs for the members of your workgroup. Go to the Internet to get prices for these units from at least two prominent PC suppliers.
   The list below shows the specifications for the basic system you have been asked to price and potential upgrades to each feature. You will want to get a price for the basic system described below and a separate price for each of the upgrades shown.

	Basic Unit	Upgrade
CPU (gigahertz)	2+	3+
Hard Drive (gigabytes)	40	160
RAM (megabytes)	256	512
Removable media storage	CD-R/RW, DVD Player	CD-R/RW, DVD-R/RW
Monitor	17 inch CRT	17 inch flat screen

Network cards and modems will not be purchased with these systems. These features will be added from stock already owned by the company. Select the standard software licenses; your IT department will install the necessary software for your workgroup. Take a two-year warranty and servicing coverage offered by each supplier. If a two-year warranty is not available, simply

Each chapter contains complete pedagogical support in the form of:

- **Summary.** Revisits key chapter concepts in a bullet point summary.
- **Key Terms and Concepts.** With page numbers to reference where they are discussed in the text.
- **Review Quiz.** Provides a self-assessment for your students. Great for review before an important exam.
- **Discussion Questions.** Whether assigned as homework or used for in-class discussion, these complex questions will help your students develop critical thinking skills.
- **Analysis Exercises.** Each innovative scenario presents a business problem that asks students to use and test their IS knowledge through analytical, Web-based, spreadsheet, and/or databases skills.
- **Two Closing Case Studies.** Reinforce important concepts with prominent examples from businesses and organizations. Discussion questions follow each case study.

Changes in the Seventh Edition

Besides providing new real world cases, the Seventh Edition includes significant changes to the Sixth Edition's content that update and improve its coverage, many of them suggested by an extensive faculty review process. Highlights of key changes in this edition include:

- Because IS is a global conversation, the new edition has been infused with international real world examples that illustrate important chapter concepts, giving your students a worldwide perspective. These examples are identified with global icons next to their titles.
- Hardware and Software have been moved to the beginning of the text as Chapter 3 and Chapter 4. Together these two chapters help to refresh students' knowledge of important foundational IT concepts while providing the building blocks for later technological discussions.
- Chapter 1 now starts with an introduction to the fundamental roles of information systems in business and an overview of the managerial challenges of IT in Section I. The more conceptual material on the components of information systems is then covered in Section II.
- Introductory coverage of competitive advantage issues in Chapter 2 has been further simplified at the urging of reviewers by removing several topics previously covered, including Internet value chains, e-business/e-commerce strategy development, and total quality management.
- Chapter 4 on Computer Software has been strengthened with new material on business application software, application service providers, XML and Java, and Web services.
- Chapter 5 on Data Resource Management has been restructured to improve its sequence of topics and improved with the addition of material on database software and traditional file processing, which has returned at the urging of reviewers, to contrast it with the modern database management approach.
- Electronic Business Systems (now Chapter 7) has been reorganized into Enterprise Business Systems in Section I and Functional Business Systems in Section II.
- The content of Section I in Chapter 14, Enterprise and Global Management of Information Technology, has been revised to focus primarily on the management of information technology by expanding coverage of topics on the key management processes and challenges involved and by moving some of the conceptual material on the impact of IT on managers and organizations to other chapters.
- The Appendix has been updated with six new detailed cases exploring relevant and timely IS issues.
- All other chapters have been updated with new text material, and most in-text real world examples that illustrate topics throughout the text have been replaced with more current examples. In addition, most of the photos and software screen shots in the text have been replaced with updated content.

Supplements

Supplements:

- Online Learning Center
- Instructor's Manual
- Test Bank
- PowerPoint Presentation
- PowerPoint Animations
- Image Library
- MBA MIS Cases
- MISource CD
- Classroom Performance System
- Problem Solving Video Vignettes
- Application Cases for MIS

Instructor's Resource CD-ROM

Available to adopting faculty, the Instructor's Resource CD contains all of the supplements in one convenient place: Instructor's Manual, TestBank, PPTs, Image Library, and MIS Cases.

Instructor's Manual (IM)

To help ease your teaching burden, each chapter is supported by solutions to Real World Case questions, Discussion Questions, and Analysis Exercises.

Test Bank

Averaging around 150 accurate and challenging questions per chapter, choose from over 2,000 true/false, multiple-choice, and fill-in-the-blank questions of varying levels of difficulty. Complete answers with page references are provided for all test questions.

Computerized Test Bank

This computerized package allows instructors to custom design, save, and generate tests. The test program permits instructors to edit, add, or delete questions from the test bank; analyze test results; and organize a database of tests and student results.

PowerPoint Slides

A complete set of visually stimulating PowerPoint slides accompanies each chapter providing a lecture outline plus key figures and tables from the text. The slides can be edited or manipulated to fit the needs of a particular course.

PowerPoint Animations

Video animations explaining basic computer and MIS concepts are complimentary and are provided throughout the PowerPoint presentation. These help to create a riveting and imaginative lecture.

Image Library

Text figures and tables, as permission allows, are provided in a format by which they can be imported into PowerPoint for class lectures.

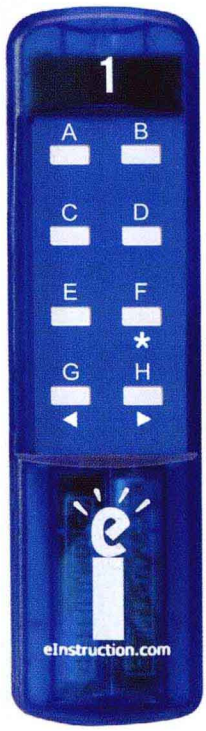
MBA MIS Cases

Developed by Richard Perle of Loyola Marymount University, these 14 cases allow you to add MBA-level analysis to your course.

Empowered Instruction

Classroom Performance System

Engage students and assess real-time lecture retention with this simple yet powerful wireless application. You can even deliver tests that instantly grade themselves.

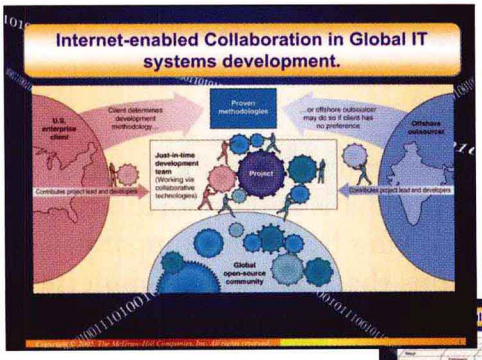


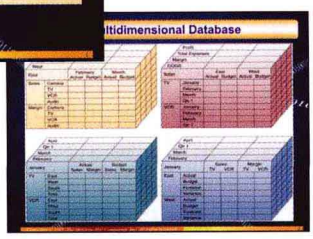
MIS Case Videos

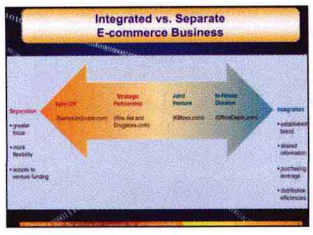
Choose from our library of original video cases to illustrate important concepts or generate class discussions.

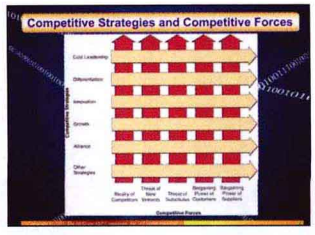
PowerPoint Presentation

Robust, detailed, and designed to keep students engaged.







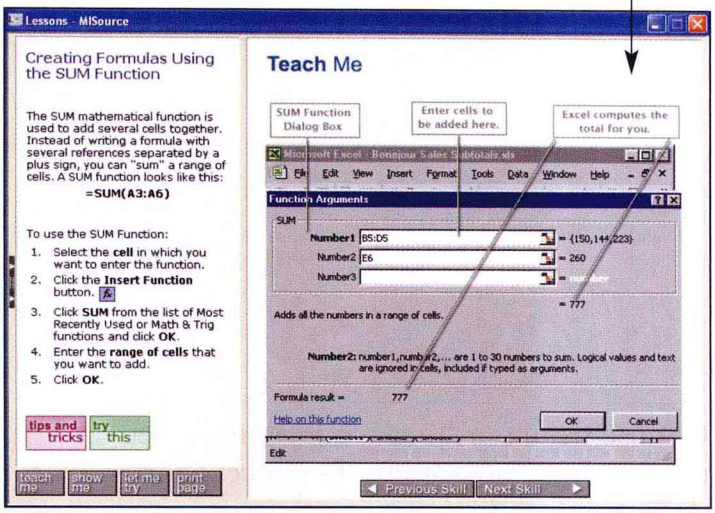


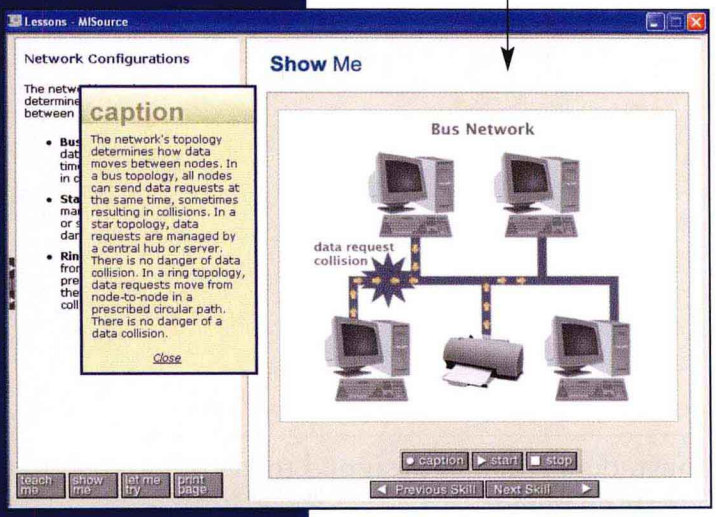
MISOURCE

Software Skills & Computer Concepts

MISource provides animated tutorials and simulated practice of the core skills in Microsoft Excel, Access, and PowerPoint. MISource also animates 47 important computer concepts.

Spend less time reviewing software skills and computer literacy.





MIS Practice and Principles

MISource includes three video vignettes about the problems and opportunities facing a growing beverage company. Use the questions that follow each vignette as homework assignments or for discussion. Animated presentations of data mining, online transaction processing, and the systems development life cycle give students more perspective of real world business problems.

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