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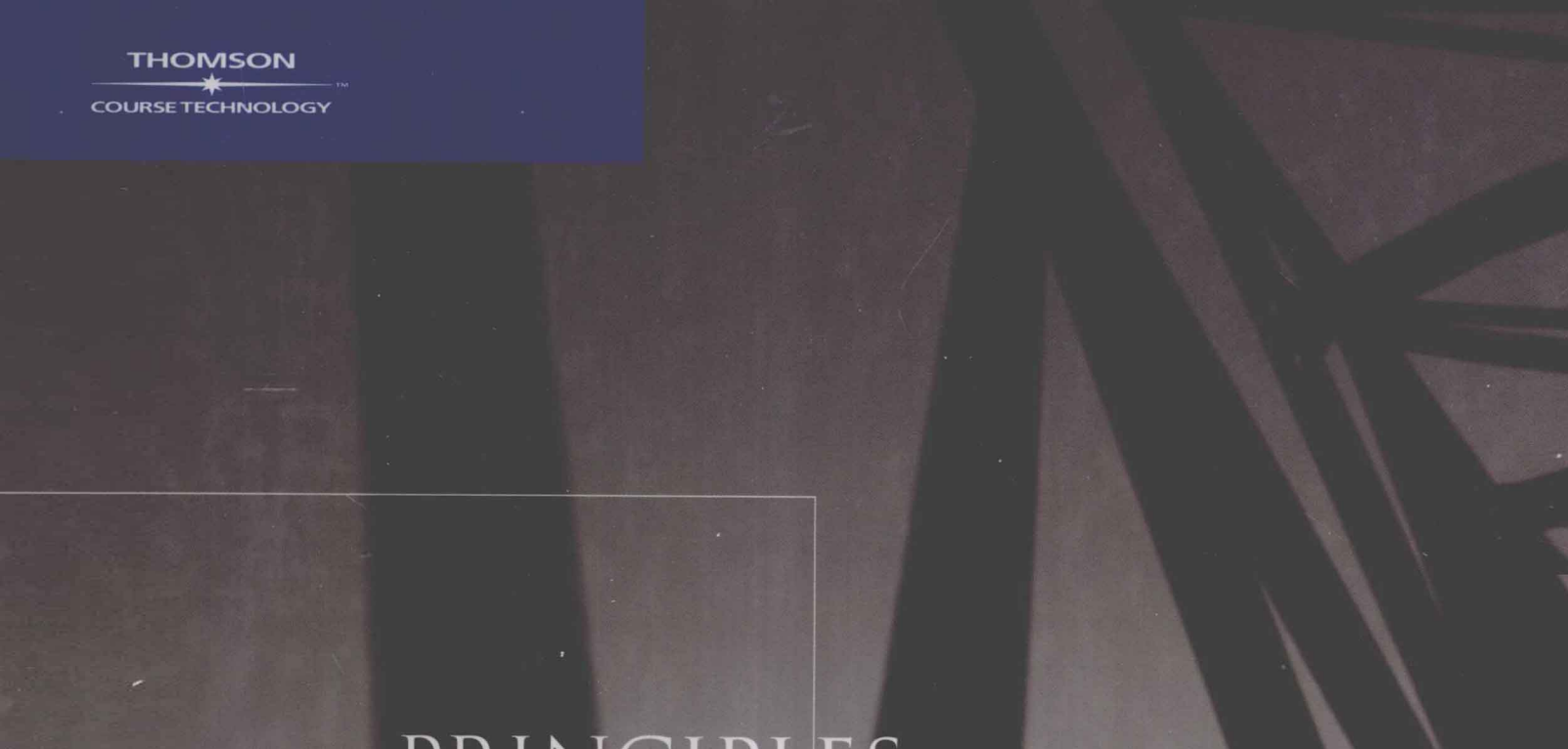

PRINCIPLES OF INFORMATION SYSTEMS

SEVENTH EDITION

RALPH STAIR • GEORGE REYNOLDS

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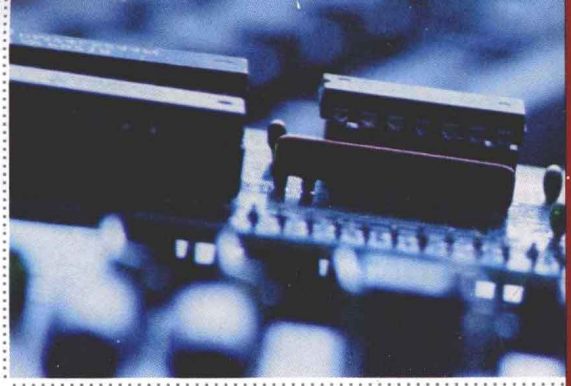

SEVENTH EDITION

Principles of Information Systems

A Managerial Approach

Seventh Edition

Ralph M. Stair
Florida State University

George W. Reynolds
The University of Cincinnati

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Principles of Information Systems, A Managerial Approach, Seventh Edition
by Ralph M. Stair and George W. Reynolds

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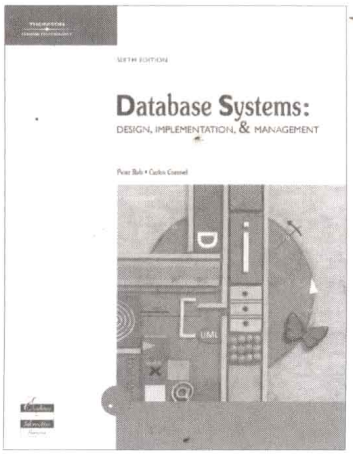

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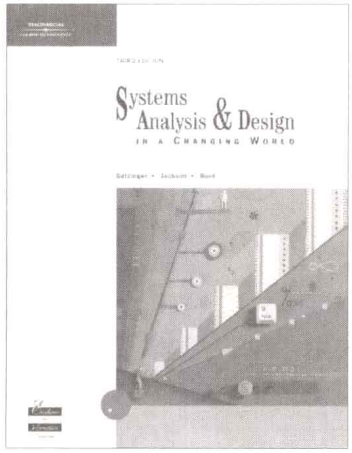

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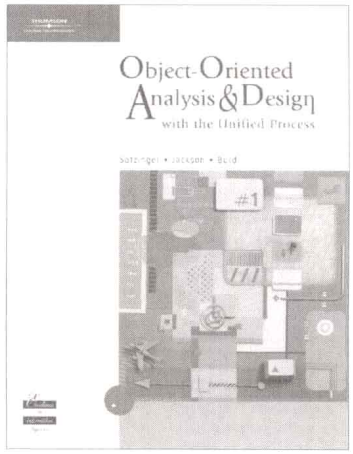

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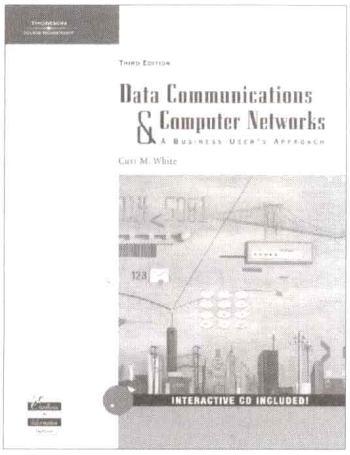

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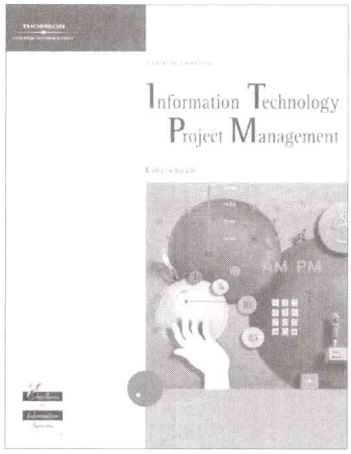

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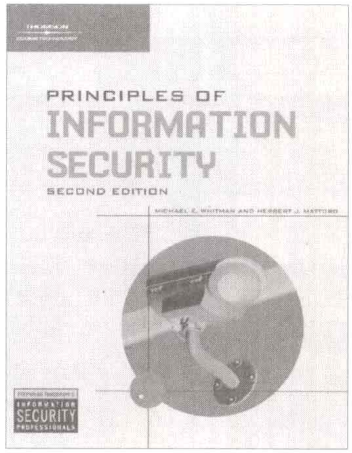

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For Lila and Leslie
—Ralph M. Stair

To my grandchildren: Michael, Jacob, Jared, Fievel, and Aubrey Danielle
—George W. Reynolds

PREFACE

People in nearly every line of work and in every type of organization make use of information systems. Chances are, regardless of your future role, you will need to understand what information systems can and cannot do and be able to use them to help you accomplish your work. You will be expected to discover opportunities to use information systems and to participate in the design of solutions to business problems employing information systems. You will be challenged to identify and evaluate IS options. To be successful, you must be able to view information systems from the perspective of business and organizational needs. For your solutions to be accepted, you must recognize and address their impact on fellow workers, customers, suppliers, and other key business partners. For these reasons, a course in information systems is essential for students in today's high-tech world.

Principles of Information Systems: A Managerial Approach, Seventh Edition, continues the tradition and approach of the previous editions. Our primary objective is to provide the best IS text and accompanying materials for the first information technology course required of all business students. Through surveys, questionnaires, focus groups, and feedback that we have received from current and past adopters, as well as others who teach in the field, we have been able to develop the highest-quality set of teaching materials available.

Principles of Information Systems: A Managerial Approach, Seventh Edition, stands proudly at the beginning of the IS curriculum and remains unchallenged in its position as the only IS principles text offering the basic IS concepts that every business student must learn to be successful. In the past, instructors of the introductory course faced a dilemma. On one hand, experience in business organizations allows students to grasp the complexities underlying important IS concepts. For this reason, many schools delayed presenting these concepts until students completed a large portion of the core business requirements. On the other hand, delaying the presentation of IS concepts until students have matured within the business curriculum often forces the one or two required introductory IS courses to focus only on personal computing software tools and, at best, merely to introduce computer concepts.

This text has been written specifically for the introductory course in the IS curriculum. *Principles of Information Systems: A Managerial Approach, Seventh Edition*, treats the appropriate computer and IS concepts together with a strong managerial emphasis on meeting business and organizational needs.

APPROACH OF THE TEXT

Principles of Information Systems: A Managerial Approach, Seventh Edition, offers the traditional coverage of computer concepts, but it places the material within the context of addressing business and organizational needs. Placing IS concepts in this context and taking a general management perspective has always set the text apart from general computer books; thus, it appeals not only to MIS majors but also to students from other fields of study. The text isn't overly technical. Instead, it deals with the role that information systems play in an organization and the key principles a manager needs to grasp to be successful. These principles of information systems are distilled and presented in a way that is both understandable and relevant. In addition, this book offers an overview of the entire IS discipline, while giving students a solid foundation for further study in advanced IS courses such as programming, systems analysis and design, project management, database management, data communications, Web site and systems development, electronic commerce applications, and decision support. As such, it serves the needs of both general business students and those who will become IS professionals.

The overall vision, framework, and pedagogy that made the previous editions so popular have been retained in the seventh edition, offering a number of benefits to students. We continue to present IS concepts with a managerial emphasis. While the fundamental vision

of this market-leading text remains unchanged, the seventh edition more clearly highlights established principles and draws out new ones that have emerged as a result of business, organizational, and technological change.

IS Principles First, Where They Belong

Exposing students to fundamental IS principles is an advantage for students who do not later return to the discipline for advanced courses. Since most functional areas in business rely on information systems, an understanding of IS principles helps students in other course work. In addition, introducing students to the principles of information systems helps future business function managers avoid mishaps that often result in unfortunate consequences. Furthermore, presenting IS concepts at the introductory level creates interest among general business students who may later choose information systems as a field of concentration.

Author Team

Ralph Stair and George Reynolds have teamed up again for the seventh edition. Together, they have more than 60 years of academic and industrial experience. Ralph Stair brings years of writing, teaching, and academic experience to this text. He has written more than 22 books and a large number of articles while at Florida State University. George Reynolds brings a wealth of computer and industrial experience to the project, with more than 30 years of experience working in government, institutional, and commercial IS organizations. He has also authored 14 texts and is an assistant professor at the University of Cincinnati, where he teaches the introductory IS course. The Stair and Reynolds team brings a solid conceptual foundation and practical IS experience to students.

GOALS OF THIS TEXT

Because *Principles of Information Systems: A Managerial Approach, Seventh Edition* is written for all business majors, we believe it is important not only to present a realistic perspective on information systems in business but also to provide students with the skills they can use to be effective business leaders in their organization. To that end, this book has four main goals:

1. To provide a core of IS principles with which every business student should be familiar
2. To offer a survey of the IS discipline that will enable all business students to understand the relationship of IS courses to their curriculum as a whole
3. To present the changing role of the IS professional
4. To show the value of the discipline as an attractive field of specialization

By achieving these goals, this text will enable students, regardless of their major, to understand and use fundamental IS principles so that they can function more efficiently and effectively as workers, managers, decision makers, and organizational leaders.

IS Principles

Principles of Information Systems: A Managerial Approach, Seventh Edition, although comprehensive, cannot cover every aspect of the rapidly changing IS discipline. The authors recognize this and provide students an essential core of guiding IS principles to use as they face the career challenges ahead. Think of principles as basic truths, rules, or assumptions that remain constant regardless of the situation. As such, they provide strong guidance in the face of tough decisions. A set of IS principles is highlighted at the beginning of each chapter, as are the chapter's learning objectives. Then these principles are applied to solve real-world problems from the opening vignettes to the end-of-chapter material. The ultimate goal of *Principles of Information Systems* is to develop effective, thinking employees by instilling them with principles to help guide their decision making and actions.

Survey of the IS Discipline

This text not only offers the traditional coverage of computer concepts but also provides students with a solid grounding in the business uses of technology. In addition to serving general business students, this book offers an overview of the entire IS discipline and solidly prepares future IS professionals for advanced IS courses and their careers in the rapidly changing IS discipline.

Changing Role of the IS Professional

As business and the IS discipline have changed, so too has the role of the IS professional. Once considered a technical specialist, today the IS professional operates as an internal consultant to all functional areas of the organization, being knowledgeable about their needs and competent in bringing the power of information systems to bear throughout the organization. The IS professional views issues through a global perspective that encompasses the entire organization and the broader industry and business environment in which it operates.

The scope of responsibilities of an IS professional today is not confined to just his/her employer but encompasses the entire interconnected network of suppliers, customers, competitors, regulatory agencies, and other entities—no matter where they are located. This broad mission creates a new challenge: how to help an organization survive in a highly interconnected, highly competitive global environment. In accepting that challenge, the IS professional plays a pivotal role in shaping the business itself and ensuring its success. To survive, businesses must now strive for the highest level of customer satisfaction and loyalty through competitive prices and ever-improving product and service quality. The IS professional assumes the critical responsibility of determining the organization's approach to both overall cost and quality performance and therefore plays an important role in the continued survival of the organization. This new duality in the role of the IS employee—a professional who exercises a specialist's skills with a generalist's perspective—is reflected throughout the book.

IS as a Field for Further Study

Despite the downturn in the economy at the start of the 21st century, especially in technology-related sectors, the outlook for computer and IS managers is bright. In fact, employment of computer and IS managers is expected to grow much faster than the average occupation through the year 2012. Technological advancements are boosting the employment of computer-related workers; in turn, this will create demand for managers to direct these workers. In addition, job openings will result from the need to replace managers who retire or move into other occupations.

A career in information systems can be exciting, challenging, and rewarding! This text shows the value of the discipline as an appealing field of study and the IS graduate as an integral part of today's organizations. Perhaps more than ever before, the IS professional must be able to align IS and organizational goals and to ensure that IS investments are justified from a business perspective. So, bright and interested students are needed in the IS discipline. Upon graduation, IS graduates at many schools are among the highest paid of all business graduates. Throughout this text, we prepare students for their careers by highlighting the many challenges and opportunities available to IS professionals.

CHANGES IN THE SEVENTH EDITION

We have implemented a number of exciting changes to the text in response to user feedback on how the text can be aligned even more closely with IS principles and concepts and the ways the course is now being taught. A summary of these changes follows:

- *Unifying Theme.* In this edition, we stress the global aspects of information systems as a major theme. As organizations increasingly find themselves competing in a global

marketplace, they must recognize the resulting implications on their information systems. Globalization is profoundly changing businesses, markets, and society. With its years of service to the IS discipline, this text retains the traditions and strengths of past successes while helping future managers and decision makers face tomorrow's global challenges.

- *All New World Views Cases.* While the text has always stressed the global factors affecting information systems, these factors are emphasized even more in this edition through the World Views Cases. These cases, written by instructors outside the United States and about real organizations outside the United States, provide the reader with solid insight into the IS issues facing foreign-based or multinational companies.
- *All New Vignettes Emphasize International Aspects.* In addition to the World Views Cases, all of the chapter opening vignettes raise actual issues from foreign-based or multinational companies.
- *Why Learn About Features.* Each chapter has a new "Why Learn About" section at the beginning of the chapter to pique student interest. The section sets the stage for students by briefly describing the importance of the chapter's material to business students—whatever their chosen field.
- *Information Systems @ Work Special Interest Boxes.* Highlighting current topics and trends in today's headlines, these boxes show how information systems are used in a variety of business career areas.
- *Career Exercises.* New end-of-chapter Career Exercises ask students to research how a topic discussed in the chapter relates to a business area of their choice. Students are encouraged to use the Internet, the college library, or interviews to collect information about business careers.
- *All New Videos and Video Questions.* New video segments are provided for each chapter of the seventh edition. These segments demonstrate key chapter concepts. Students can actually see IS principles at work in a variety of settings and then answer questions to help them apply what they have learned.
- *Thoroughly Revised End-of-Chapter Material.* The material at the end of each chapter has been thoroughly updated. Summaries linked to the principles, key terms, self-assessment questions, review questions, discussion questions, problem-solving exercises, team activities, and Web exercises have been replaced and revised to reflect the theme of the seventh edition and to give students the opportunity to explore the latest technology in a business setting.
- *All New Cases.* Three new end-of-chapter cases provide a wealth of practical information for students and instructors. Each case explores a chapter concept or problem that a real-world company or organization has faced. The cases can be assigned as individual homework exercises or serve as a basis for class discussion.

CHAPTER CHANGES

Each chapter has been completely updated with the latest topics and examples. Here is a summary of some of the changes.

Chapter 1, An Introduction to Information Systems

This chapter is full of new boxes, photos, figures, tables, examples, and more than 40 current references. The new opening vignette focuses on Boehringer Ingelheim, which is among the world's 20 largest pharmaceutical companies, with $7.6 billion in revenue and 32,000

employees in 60 nations. The new "Why Learn About" section motivates students by showing them the importance of information systems to achieve their career goals. The new "Information Systems @ Work" box stresses the use of information systems by Delta's low-fare, all-digital spin-off, Song airline, which uses technology, state-of-the-art information systems, and good old-fashioned customer service to win customers. Figure 1.6 contains new examples of models, and Figure 1.8 contains new images. The section on "Computer-Based Information Systems" includes many new examples and photos. Table 1.4 is new to this edition, revealing the many powerful uses of the Internet. The section on "Business Information Systems" includes a new figure that shows how these systems evolved from early transaction processing systems of the 1950s to the advanced decision support and special-purpose systems of today. This section also includes new examples and a new photo of the use of B2B (business-to-business) applications. Mobile commerce (m-commerce) is introduced in this chapter. The new "Ethical and Societal Issues" box includes information on the dangers of *phishing*—the use of e-mail and Web sites as bait to lure consumers into revealing private information. There is a new photo on the use of ERP. The section on "Virtual Reality" contains new examples and new photos of a head-mounted display and a data glove. Figure 1.18 is new to this edition, showing the most common attacks to information systems today, and Figure 1.19 reveals the huge costs of these attacks. The all-new end-of-chapter cases include information on Tyndall Federal Credit Union, which provides banking services to military personnel at Tyndall Air Force Base in Panama City, Florida; the Queen Mary 2 (QM2), the largest and most expensive cruiseship ever built; and MyFamily.com, Inc., a leading online subscription business for researching family history.

Chapter 2, Information Systems in Organizations

The material on organizational change has been enhanced to include sustaining and disruptive change. Christiansen, who wrote the business best-sellers *Inventor's Dilemma* and the more recent *Inventor's Solution*, discusses these types of change. The six-sigma quality program has been introduced and demonstrated with several examples. The material on competitive advantage has been strengthened with material from Jim Collin's best-selling business book *Good to Great*. Specifically, we introduce the notion of technology acceleration with new examples and a new table. The productivity paradox has been introduced, as recommended by a reviewer. The careers in information systems section has been updated with new positions, such as the chief technology officer (CTO), and several examples and direct quotes from CTOs. The Clinger-Cohen Act, which requires CIOs for certain federal agencies, has also been included, as requested by a reviewer.

Chapter 3, Hardware: Input, Processing, and Output Devices

The new "Why Learn About Hardware?" and "Information Systems @ Work" features help demonstrate why a business major needs to understand this chapter's concepts. In addition, the chapter has been broadened to a managerial focus on what a non-IS decision maker needs to know about hardware. The latest information on processors, main memory, secondary storage devices, and input/output devices is covered, including such topics as smart phones, tablet PCs, and MP3 players. There is added coverage of grid computing and utility computing. More than 60 new references and examples appear throughout the chapter. The material on computer system types has been modified to conform to the Gartner Group's industry standard definitions for the various types of computer systems. The section on selecting/upgrading computer systems has been updated to include a subsection on printers and DVD burners. Also, the need for proper disposal of computer hardware is discussed.

Chapter 4, Software: Systems and Application Software

New to this edition is a section that divides operating systems into four general categories: single computer with a single user, single computer with multiple users, multiple computers, and special-purpose computers. The section on common hardware functions has been streamlined, and the section on file management now describes file types and conventions.

The section on personal computer operating systems has been revamped to include current operating systems and developments—including Windows XP, Apple, and Linux—and to reduce material on older operating systems. The section on Windows Server has been updated to include a discussion of Windows Server 2003, and the discussion of enterprise operating systems has also been updated and streamlined. Reflecting industry trends, a new section on operating systems for small computers and special-purpose devices has been included, with coverage of Palm OS, Windows Embedded, and Windows Mobile developments. Examples of utility programs have been thoroughly revised. A new section on middleware has been included. The material on proprietary and off-the-shelf software has been revised to address reviewer comments. The material on personal application software has been updated. For example, the material on Excel now includes Solver. The material on software suites now includes more information about open-source suites. There is a new section on other personal application software, which focuses on project management, financial management and tax preparation, educational and reference, desktop publishing, computer-aided design, and statistical software. There is a new section on application software for information, decision support, and specialized purposes. The section on fifth generation languages has been changed to emphasize visual and object-oriented languages and is now forward thinking in its title, "Languages beyond the Fourth Generation." Finally, the section on open-source software near the end of the chapter has been expanded and includes a new table listing different open-source software products.

Chapter 5, Organizing Data and Information

The material on the traditional approach to database management has been reduced slightly. The material in the section on the database approach has been updated, including Table 5.2 on the disadvantages of the database approach. Because hierarchical and network models are no longer widely used, that material has been cut drastically. The section on data cleanup has been updated with an example. Instructors who want to cover normalization will be able to use the example as a starting point. The section on database management systems has been updated to include a discussion of flat files, single-user, and multiuser databases. The section on manipulating data and generating reports includes new material on query-by-example (QBE) and new examples of SQL. Based on a reviewer suggestion, SQL commands have been introduced in a new table to show students how SQL can be used for a variety of database purposes, such as selecting, projecting, joining, and security. The section on popular database management systems has been updated, and a new section on special-purpose database systems has been added, which contains a number of new examples of real organizations using specialized-database systems. A new section on using databases with other software has also been added. Finally, the section on database applications has been updated with new material and new examples, such as Oracle's Warehouse Management software, which can incorporate data from radio-frequency identification (RFID) technology. There is also a new section on visual, audio, and other databases near the end of the chapter. As with other chapters, the end-of-chapter material has been updated.

Chapter 6, Telecommunications and Networks

An expanded section on voice and data convergence discusses the "big picture" of how we are changing from a telecommunications infrastructure based on POTS (plain old telephone service) using twisted pair copper wires intended for analog voice communication signals, circuit switching, and "dumb" voice telephones to a new infrastructure for transmitting digital data signals based on packet switching through fiber-optic links with intelligent user devices that provide addressing information. The focus is on converting all signals to a digital form and using a single digital network to carry all communications (including voice and data). The coverage of cellular transmission has been expanded and updated to include a discussion of the features and characteristics of 1G, 2G, 2.5G, 3G, and Multichannel Multipoint Distribution System cellular communications. Personal area networks and metropolitan area networks have been added under the discussion of network types. The

discussion of communications protocols has been simplified and streamlined with additional protocols including frame relay, FireWire, IEEE 802.11 g, IEEE 802.16 (WiMax), and IEEE 802.20 (Mobile Broadband Wireless Access). A discussion on the role of a hub has been added under the section on "Network Switching Devices." The use of call centers and electronic funds transfer was added to the discussion of telecommunications applications.

Chapter 7, The Internet, Intranets, and Extranets

Chapter 7 was significantly revamped and reorganized to reflect the dynamic nature of the Internet. There are more than 70 new references for current examples throughout the chapter. The major section on Internet services was moved later in the chapter, expanded to include Web applications, and retitled "Internet and Web Applications." This important change allowed us to cover the technology first and the applications of the technology next in one unified section. A new table on the use of broadband to connect to the Internet has been included, comparing the transmission times for a full-length movie: two weeks over a standard modem, two days over cable or satellite, and about 20 seconds over a T-1 line. In the section on the Web, we have introduced the notion of Web portals and provided examples. The section on Web browsers has been updated and enhanced, and the section on search engines now includes more sophisticated search parameters and approaches. Additional languages and applications have been included in the section on Java and Internet programming languages. The discussion of developing Web content has been updated to include new Web authoring software and the importance of content management systems (CMS). An important addition to the seventh edition is a new section on Web services, which discusses the approach and standards that are used. The section on "Internet and Web Applications" has been totally updated. We have new material on Internet cell phones and handheld computers. There are also new sections on career information and online job searches and Web logs, or blogs. The new material on voice over Internet Protocol is introduced by a powerful quote from the chairman of the U.S. Federal Communications Commission that stresses the increasing importance of this technology and its implications to the traditional long-distance phone companies. There is a new table of sales on Web sites. The section on music, radio, and video on the Internet has been updated. The sections on intranets and extranets have been updated, along with the section on net issues. For example, we now have a new table on the source of Internet attacks expressed in percentages. Of course, the end-of-chapter material has been totally updated to reflect these changes.

Chapter 8, Electronic Commerce

A brief summary of the status of e-commerce around the world has been added. M-commerce is introduced as a new business model. In addition to examples of m-commerce, the technology required is discussed, and the anywhere/anytime capability of m-commerce is addressed. Web services are discussed, including a definition, use of standards, examples, and a Gartner Group forecast of the growth of Web services. Phishing is discussed as a serious threat to e-commerce. The role of the Federal Trade Commission in regulating Internet activities is briefly addressed. The use of Web site customer experience technology to analyze the usability of a site is discussed.

Chapter 9, Transaction Processing and Enterprise Resource Planning Systems

New material has been added concerning the various laws to control the operation and use of these systems: Sarbanes-Oxley, Graham-Leach-Bliley, and the Health Insurance Portability and Accountability Act. Current examples of companies being affected by these acts have been added. The material on business resumption planning and disaster recovery has been modified so that the definition of these terms is consistent with current industry thinking. Radio-frequency identification (RFID) technology is mentioned as a new technology that is revolutionizing TPSs. The list of vendors providing customer relationship management (CRM) systems has been updated for currency. An interesting example of the difficulties GM had implementing a CRM system in China is presented. The list of vendors providing ERP

systems has been updated to reflect recent industry acquisitions. There is brief discussion of the competition in the ERP arena between Oracle and PeopleSoft, as well as PeopleSoft's recent acquisition of JD Edwards. New examples of companies trying to deal with international systems are added. The section on ERP has been modified to focus on just what is an ERP and what business processes are involved and affected.

Chapter 10, Information and Decision Support Systems

The section on inputs to a management information system emphasizes supply chain management to a great extent in this new edition. Data mining is included in the section on outputs of a management information system. The section on the uses and management of funds discusses return on investment (ROI). The manufacturing MIS section includes a discussion of smart labels. Design and engineering aspects of the manufacturing MIS discuss the involvement of customers and also include the importance of scheduling software and the notion of 3D computer-aided design (CAD) tools. In the section on quality of and testing for the manufacturing MIS, we discuss total quality management and continuous improvement. The marketing MIS section describes the importance of group sales meetings and contains increased coverage and examples of CRM software and systems. The section on promotion and advertising includes an example of Choice Stream, which sends people e-mail about entertainment choices according to their preferences. This section also includes a discussion of richness and reach, two important marketing concepts. Rich media advertising and the increasing use of Internet advertising are also included. A new section on outplacement has been included in the material on the human resource MIS. There are a number of new examples on the use of a geographic information system (GIS). The section on group support systems (GSSs) and groupware has been enhanced to include the use of newer wireless systems, including Blackberry and other mobile communications devices and systems.

Chapter 11, Specialized Information Systems

The title of the chapter has been changed from "Specialized Business Information Systems" to "Specialized Information Systems" to reflect the unique applications in nonprofit and military organizations. The chapter begins with a new example of chess master Garry Kasparov competing against an artificial intelligence (AI) software package that runs on a PC called Deep Junior. The section on robotics has many new examples, from NASA to entertainment. The section on vision systems also has new examples, including the use of vision systems to inspect wine bottles in California and attach windscreens on Jaguar S-Type cars. The chapter also discusses the use of natural language processing by a hardware company to develop a Web site that allows customers to find what they need. The section on neural networks has examples on improving motor coordination in robots, reading bar codes, and preventing fraud and terrorism. The chapter also has a new section on other AI applications, which highlights the use of genetic algorithms and intelligent agents and provides numerous examples of these applications. There are also many new examples of expert systems. The section on virtual reality has been updated with new examples such as the following: the use of virtual reality by an automotive company to help design cars and factories; the use of a virtual reality interface device to help people play chess with computers; SimCity, a virtual reality game; and a virtual reality Web site by Disney. The last section on other specialized systems has been completely revised with new examples that range from small microchips planted in the brain to the use of game theory and the development of small networks, called smart dust, by the University of California at Berkeley. There is also new material on informatics, including bioinformatics and medical informatics.

Chapter 12, Systems Investigation and Analysis

The material on project management has been strengthened with new examples and quotes. The importance of good project leadership has been emphasized. The effect of the Sarbanes-Oxley Act on systems development is also been emphasized with several examples. The section on developing a competitive advantage also has new examples, including the efforts of Fuji

and Kodak to develop Web sites for storing and sharing photos. The importance of scalability has been emphasized in the section on performance objectives. In the section on Web-based systems development, the discussion of HTML, XML, and other Web tools is new. We have increased the scope of the former "Systems Development and E-Commerce" section to "Systems Development, the Internet, Intranets, Extranets, and E-Commerce." New tools and techniques have been introduced, and the section has been updated to reflect the changes to Chapter 7. The material on prototyping has also been updated. Rapid application development (RAD) tools by IBM and others have been highlighted in the section on RAD. The section on outsourcing has been expanded to include on-demand computing, along with new material and examples. The section on factors affecting systems development success has new material and examples. The material on CASE tools has been streamlined and updated to include new tools, such as VRCASE. As requested by a reviewer, we have deleted the discussion of upper and lower CASE tools. New material on scalability has been added to the objectives of a systems development project.

Chapter 13, Systems Design, Implementation, Maintenance, and Review

In the section on software design, we have added information about software developed to comply with the Sarbanes-Oxley Act. In the section on personnel design, the use of outsourcing jobs to India by a London, England, travel agency is discussed. The elements of good interactive dialogue are now summarized in a table to streamline the discussion. The section on disaster planning has been updated and integrated into a new section titled "Disaster Planning and Recovery." There is a new table on systems controls that highlights input, processing, output, database, telecommunications, and personnel controls. There is also new material on "on-demand" or "utility" computing, with several new examples. How individuals and organizations can dispose of older systems is also discussed. Reusable software is also emphasized, with new examples. The section on cross-platform development includes new tools, including Web services and .NET by Microsoft®. The material on integrated development environments (IDEs) has been enhanced to include newer programming tools and approaches, including Microsoft's Visual Studio .NET. The software acquisition section now emphasizes that software is increasingly being viewed as a utility or a service, not a product to be purchased. A new section on systems operation has been added that includes information about support, training, and help desks. The section on systems maintenance includes new information on legacy systems.

Chapter 14, Security, Privacy, and Ethical Issues in Information Systems and the Internet

Many new topics have been added including the following: the Computer Assisted Passenger Prescreening System for airline safety, the Controlling the Assault of Non-Solicited Pornography and Marketing (CAN-SPAM) Act, the Sarbanes-Oxley Act, the Health Insurance Portability and Accountability Act, the 2003 Computer Crime and Security Survey, cyberterrorism, identity theft, virus variants, biometrics, the Children's Internet Protection Act, the Child Online Protection Act, the Gramm-Leach-Bliley Act, software vulnerabilities, spyware, and cyberstalking.

WHAT WE HAVE RETAINED FROM THE SIXTH EDITION

The seventh edition builds on the strengths of past editions; it retains the focus on IS principles and strives to be the most current text on the market.

- *Overarching Principle.* This book continues to stress a single-all-encompassing theme: The right information, if it is delivered to the right person, in the right fashion, and at the right time, can improve and ensure organizational effectiveness and efficiency.
- *Information Systems Principles.* Information System Principles summarize key concepts that every student should know. This important feature is a convenient summary of key ideas presented at the start of each chapter.
- *Learning Objectives Linked to Principles.* Carefully-crafted learning objectives are included with every chapter. The learning objectives are linked to the Information Systems Principles and reflect what a student should be able to accomplish after completing a chapter.
- *Summary Linked to Principles.* Each chapter includes a detailed summary, and each section of the summary is tied to an Information System Principle.
- *Ethical and Societal Issues Special Interest Boxes.* Each chapter includes an "Ethical and Societal Issues" box that presents a timely look at the ethical challenges and the societal impact of information systems. Ethics remains a compelling issue for today's business and IS students, and they gain exposure to ethical and societal issues by grappling with the in-depth questions related to the company scenarios. All boxes relate to the issues discussed in the chapters.
- *Current Examples, Boxes, Cases, and References.* As we have in each edition, we take great pride in presenting the most recent examples, boxes, cases, and references throughout the text. Some of these were developed at the last possible moment, literally weeks before the book went into publication. Information on new hardware and software, the latest operating systems, application service providers, the Internet, electronic commerce, ethical and societal issues, and many other current developments can be found throughout the text. Our adopters have come to expect the best and most recent material. We have done everything we can to meet or exceed these expectations.
- *Self-Assessment Tests.* This popular feature helps students review and test their understanding of key chapter concepts.

STUDENT RESOURCES

MIS Companion CD

We are pleased to include in every textbook a free copy of Thomson Course Technology's MIS Companion CD, which is composed of training lessons in Excel, Access, and MIS concepts. The Companion CD's content is integrated throughout the book. Wherever you see the CD icon in the chapter margins, you know that you can find additional related material on the CD.

Student Online Companion Web Site

We have created an exciting online companion, password protected for students to utilize as they work through the seventh edition of *Principles of Information Systems*. In the front of this text you will find a key code that provides full access to a robust Web site, located at *www.course.com/mis/stair*. This Web resource includes the following features:

- **Videos**
  Links to 14 topical video clips, one relating to every chapter in the book, can be found on this Web site. Questions corresponding to the respective video clips are

featured at the end of each chapter in the book. These exercises reinforce the concepts taught and provide the students with more critical thinking opportunities.

- **PowerPoint Slides**
  Direct access is offered to the book's PowerPoint presentations, which cover the key points from each chapter. These presentations are a useful study tool.
- **Classic Cases**
  A frequent request from adopters is that they wish to have a broader selection of cases to choose from. To meet this need, a set of over 85 cases from the fourth, fifth, and sixth editions of the text are included here. These are the authors' choices of the "best cases" from these editions and span a broad range of companies and industries.
- **Links to Useful Web Sites**
  Chapters in *Principles of Information Systems, Seventh Edition*, reference many interesting Web sites. This resource takes you to links you can follow directly to the home pages of those sites so that you can explore them. There are additional links to Web sites that the authors, Ralph Stair and George Reynolds, think you would be interested in checking out.
- **Hands-On Activities**
  Use the Hands-On Activities to test your comprehension of IS topics and enhance your skills using Microsoft Office applications and the Internet. Using these links, you can access three critical-thinking exercises per chapter; each activity asks you to work with an Office tool or do some research on the Internet.
- **Test Yourself on IS**
  This tool allows you to access 20 multiple-choice questions for each chapter, test yourself, and then submit your answers. You will immediately find out which questions you got right and which you got wrong. For each question that you answer incorrectly, you are given the correct answer and the page in your text where that information is covered. Special testing software randomly compiles 20 questions from a database of 50 questions, so you can quiz yourself multiple times on a given chapter and get some new questions each time.
- **Glossary of Key Terms**
  The glossary of key terms from the text is available to search.
- **Online Readings**
  This feature provides you access to a computer database that contains articles relating to hot topics in information systems.

INSTRUCTOR RESOURCES

The teaching tools that accompany this text offer many options for enhancing a course. And, as always, we are committed to providing one of the best teaching resource packages available in this market.

Instructor's Manual

An all-new *Instructor's Manual* provides valuable chapter overviews; highlights key principles and critical concepts; offers sample syllabi, learning objectives, and discussion topics; and features possible essay topics, further readings and cases, and solutions to all of the end-of-chapter questions and problems, as well as suggestions for conducting the team activities. Additional end-of-chapter questions are also included.