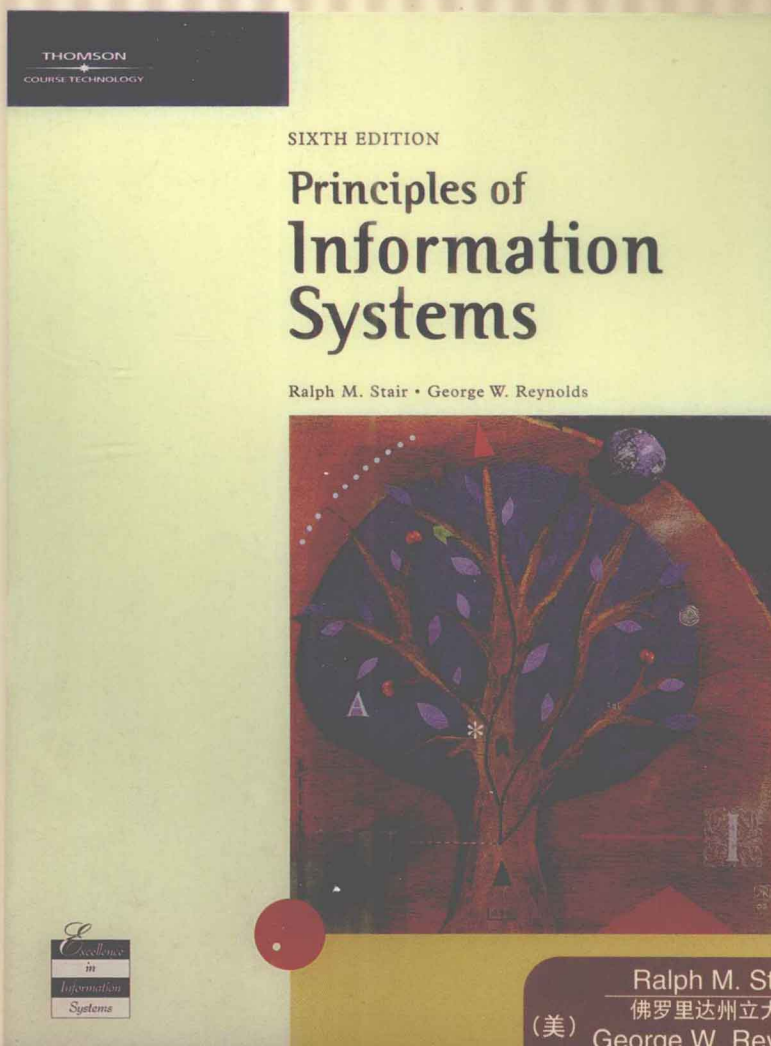


信息系统原理

(英文版·第6版)



Ralph M. Stair
佛罗里达州立大学
(美) George W. Reynolds 著
辛辛那提大学



机械工业出版社
China Machine Press

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A Managerial Approach

(Sixth Edition)

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Principles of Information Systems, A Managerial Approach, Sixth Edition

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出版者的话

文艺复兴以降，源远流长的科学精神和逐步形成的学术规范，使西方国家在自然科学的各个领域中取得了垄断性的优势；也正是这样的传统，使美国在信息技术发展的六十多年间名家辈出、独领风骚。在商业化的进程中，美国的产业界与教育界越来越紧密地结合，计算机学科中的许多泰山北斗同时身处科研和教学的最前线，由此而产生的经典科学著作，不仅擘划了研究的范畴，还揭橥了学术的源变，既遵循学术规范，又自有学者个性，其价值并不会因年月的流逝而减退。

近年，在全球信息化大潮的推动下，我国的计算机产业发展迅猛，对专业人才的需求日益迫切。这对计算机教育界和出版界都既是机遇，也是挑战；而专业教材的建设在教育战略上显得举足轻重。在我国信息技术发展时间较短、从业人员较少的现状下，美国等发达国家在其计算机科学发展的几十年间积淀的经典教材仍有许多值得借鉴之处。因此，引进一批国外优秀计算机教材将对我国计算机教育事业的发展起积极的推动作用，也是与世界接轨、建设真正的世界一流大学的必由之路。

机械工业出版社华章图文信息有限公司较早意识到“出版要为教育服务”。自1998年开始，华章公司就将工作重点放在了遴选、移译国外优秀教材上。经过几年的不懈努力，我们与Prentice Hall, Addison-Wesley, McGraw-Hill, Morgan Kaufmann等世界著名出版公司建立了良好的合作关系，从它们现有的数百种教材中甄选出Tanenbaum, Stroustrup, Kernighan, Jim Gray等大师名家的一批经典作品，以“计算机科学丛书”为总称出版，供读者学习、研究及收藏。大理石纹理的封面，也正体现了这套丛书的品位和格调。

“计算机科学丛书”的出版工作得到了国内外学者的鼎力襄助，国内的专家不仅提供了中肯的选题指导，还不辞劳苦地担任了翻译和审校的工作；而原书的作者也相当关注其作品在中国的传播，有的还专诚为其书的中译本作序。迄今，“计算机科学丛书”已经出版了近百个品种，这些书籍在读者中树立了良好的口碑，并被许多高校采用为正式教材和参考书籍，为进一步推广与发展打下了坚实的基础。

随着学科建设的初步完善和教材改革的逐渐深化，教育界对国外计算机教材的需求和应用都步入一个新的阶段。为此，华章公司将加大引进教材的力度，在“华章教育”的总规划之下出版三个系列的计算机教材：除“计算机科学丛书”之外，对影印版的教材，则单独开辟出“经典原版书库”；同时，引进全美通行的教学辅导书“Schaum's Outlines”系列组成“全美经典学习指导系列”。为了保证这三套丛书的权威性，同时也为了更好地为学校和老师服务，华章公司聘请了中国科学院、北京大学、清华大学、国防科技大学、复旦大学、上海交通大学、南京大学、浙江大学、中国科技大学、哈尔滨工业大学、西安交通大学、中国人民大学、北京航空航天大学、北京邮电大学、中山大学、解放军理工大学、郑州大学、湖北工学院、中国国

家信息安全测评认证中心等国内重点大学和科研机构在计算机的各个领域的著名学者组成“专家指导委员会”，为我们提供选题意见和出版监督。

这三套丛书是响应教育部提出的使用外版教材的号召，为国内高校的计算机及相关专业的教学度身订造的。其中许多教材均已为M. I. T., Stanford, U.C. Berkeley, C. M. U. 等世界名牌大学所采用。不仅涵盖了程序设计、数据结构、操作系统、计算机体系结构、数据库、编译原理、软件工程、图形学、通信与网络、离散数学等国内大学计算机专业普遍开设的核心课程，而且各具特色——有的出自语言设计者之手、有的历经三十年而不衰、有的已被全世界的几百所高校采用。在这些圆熟通博的名师大作的指引之下，读者必将在计算机科学的宫殿中由登堂而入室。

权威的作者、经典的教材、一流的译者、严格的审校、精细的编辑，这些因素使我们的图书有了质量的保证，但我们的目标是尽善尽美，而反馈的意见正是我们达到这一终极目标的重要帮助。教材的出版只是我们的后续服务的起点。华章公司欢迎老师和读者对我们的工作提出建议或给予指正，我们的联系方式如下：

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For Lila and Leslie

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To Ginnie, Tammy, Kim, Kelly, and Kristy

—GWR

P R E F A C E

Education in information systems is critical for workers in every discipline. Today, information systems are used for business processes from communications to order processing to customer support and in business functions ranging from marketing to human resources to accounting and finance. Chances are, regardless of your future occupation, you need to understand what information systems can and cannot do and be able to use them to help you accomplish your work. You may even be asked to suggest new uses for information systems and participate in the design of solutions to business problems employing information systems. You will be challenged to identify and evaluate information systems 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 identify 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, Sixth Edition, continues the tradition and approach of the previous editions. Our primary objective is to provide the best information systems 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, Sixth 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 principles course in the IS curriculum. *Principles of Information Systems: A Managerial Approach*, Sixth Edition, treats the appropriate computer and IS concepts together with a strong managerial emphasis.

APPROACH OF THE TEXT

Principles of Information Systems: A Managerial Approach, Sixth Edition, offers the traditional coverage of computer concepts, but it places the material within the context of business and information systems. Placing IS concepts in a business context has always set the text apart from general computer books and makes it appealing not only to MIS majors but also to students from other courses of

study. It approaches MIS from a general management perspective. The text isn't overly technical but rather deals with the role that information systems play in an organization and the general concepts a manager needs to be aware of to be successful. The text stresses principles of IS, which are brought together and presented in a way that is both understandable and relevant. In addition, this book offers an overview of the entire IS discipline, as well as solid preparation for further study in advanced IS courses. It serves both general business students and those who will become IS professionals. In particular, this book provides a solid groundwork from which to build advanced courses in such areas as programming, project management, database management, data communications, Web site and systems development, electronic commerce applications, and decision support.

The overall vision, framework, and pedagogy that made the previous editions so popular have been retained in the sixth edition, offering a number of benefits to students. We continue to present IS concepts with a managerial emphasis. While much of the fundamental vision of this market-leading text remains unchanged, the sixth edition more clearly highlights established principles and draws out new ones that have emerged as a result of corporate and technological change.

IS PRINCIPLES FIRST, WHERE THEY BELONG

Exposing students to fundamental IS principles provides a service to those 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 functional area managers avoid mishaps that often result in unfortunate consequences. Furthermore, presenting IS principles at the introductory level creates interest among general business students who will later choose information systems as a field of concentration.

AUTHOR TEAM

Ralph Stair and George Reynolds have teamed up again for the sixth edition. Together, they have more than fifty years of academic and industrial experience. Ralph Stair brings years of writing, teaching, and academic experience to this text. He has written more than twenty 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 thirty years of experience working in government, institutional, and commercial IS organizations. He has also authored fourteen texts and is an adjunct professor at the University of Cincinnati, teaching 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*, Sixth Edition, is written for all business majors, we believe it is important not only to present a realistic perspective on IS in business but also to provide students with the skills they can use to be effective business leaders in their organization. To that end, *Principles of Information Systems: A Managerial Approach*, Sixth Edition, 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

Achieving these goals will enable students, regardless of their major, to understand and use fundamental information systems principles so that they can function efficiently and effectively as business employees and managers. *Principles of Information Systems, A Managerial Approach*, Sixth Edition, is written for all business majors and presents a realistic perspective of IS in business that can provide students with the knowledge and understanding that they can use to be effective leaders in their companies.

IS PRINCIPLES

Principles of Information Systems: A Managerial Approach, Sixth Edition, although comprehensive, cannot cover every aspect of the rapidly changing IS discipline. The authors, recognizing this, provide students with 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 in the chapter opener of each chapter. The application of these principles to solve real-world problems is driven home 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 stresses the broad framework to provide students with solid grounding in 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 dedicated specialist, the IS professional now operates as an internal consultant to all functional areas, being knowledgeable about various needs and competent in bringing the power of information systems to bear throughout the business. 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 ranges not only throughout the organization but also throughout the entire interconnected network of suppliers, customers, competitors, and other entities, no matter where they are located. This broad scope offers IS professionals 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 ultimate 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 ongoing 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

A career in IS can be exciting, challenging, and rewarding! It is important to show the value of the discipline as an appealing field of study and that the IS graduate is no longer a technical recluse. Today, perhaps more than ever before, the IS professional must be able to align IS and corporate goals and to ensure that IS investments are justified from a business perspective. The need to draw bright and interested students into the IS discipline is part of our ongoing responsibility. Upon graduation, IS graduates at many schools are among the highest paid of all business graduates. Throughout this text, the many challenges and opportunities available to IS professionals are highlighted and emphasized.

CHANGES IN THE SIXTH EDITION

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

- *International Emphasis.* 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 for their information systems. Globalization is profoundly changing businesses, markets, and society. With its years of service to the information systems discipline, this text retains the traditions and strengths of past successes while helping future managers and decision makers face tomorrow's global challenges.
- *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 introduction of a new feature, *World Views Cases*. These cases, written by instructors outside the United States, provide the reader with real 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.
- *All New "IS Principles in Action" Boxes.* Closely tied to each chapter's principles, these supplemental Special Interest Boxes show how organizations have followed information systems principles to improve decision making and achieve organizational goals.
- *New Self-Assessment Tests.* End-of-chapter self-assessment tests help students review and test their understanding of key chapter concepts.
- *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.
- *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, review questions, discussion questions, problem-solving exercises, team activities, and Web exercises have been replaced and revised to reflect the theme of the sixth edition and to give students the opportunity to explore the latest technology in a business setting.
- *Database Normalization Supplement.* A brief supplement on data normalization has been developed for those instructors who want to discuss this topic in the database chapter. The supplement is available for download, for instructors and students, at www.course.com, via the "Students Download" link, on the web page for this book.

WHAT WE HAVE RETAINED FROM THE FIFTH EDITION

The sixth edition builds on what has worked well in the past; 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 System Principles.* Information System Principles summarize key concepts that every student should know. Presented at the start of each chapter, this important feature is showcased in a convenient summary of key ideas.
- *Learning Objectives Linked to Principles.* Carefully crafted learning objectives are included with every chapter. The learning objectives are linked to the Information System 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, which presents a timely look at ethical challenges and the societal impact of information systems. The boxes are related to the issues discussed in the chapters.
- *Current Examples, Boxes, Cases, and References.* As in each edition, we take great pride in presenting the most recent examples, boxes, cases, and references throughout the text. Some of these examples 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, terrorism’s effects on business and information systems, 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.

INSTRUCTOR RESOURCES

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

ELECTRONIC INSTRUCTOR'S MANUAL WITH SOLUTIONS

This all-new updated *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 or 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.

EXAMVIEW®

ExamView® is a powerful objective-based test generator that enables instructors to create paper-, LAN-, or Web-based tests from test banks designed specifically for their Course Technology text. Instructors can utilize the ultra-efficient QuickTest Wizard to create tests in less than five minutes by taking advantage of Course Technology's question banks or customizing their own exams from scratch.

POWERPOINT PRESENTATIONS

This book comes with impressive Microsoft PowerPoint slides for each chapter. These slides are included to serve as a teaching aid for classroom presentation, to make available to students on the network for chapter review, or to be printed for classroom distribution. Instructors can add their own slides for additional topics they introduce to the class.

FIGURE FILES

Figure Files allow instructors to create their own presentations using figures taken directly from the text.

CLASSIC CASES

A frequent request from adopters is that they wish to have a broader selection of cases from which to choose. To meet this need, a set of seventy cases from the fourth and fifth editions of the text are included in the Instructor Resources. These classics are the authors' choices of the "best cases" from these editions and span a broad range of companies and industries.

DISTANCE LEARNING

Course Technology, the premiere innovator in management information systems publishing, is proud to present online courses in WebCT and Blackboard, as well as at MyCourse 2.0 to provide the most complete and dynamic learning experience possible.

- *MyCourse 2.0.* MyCourse 2.0 is a flexible, easy-to-use management tool that gives instructors true customization over the online components of their course. It allows them to personalize their course home page, schedule course activities and assignments, post messages, administer tests, and much more. MyCourse 2.0 is hosted by Thomson Learning, allowing for hassle-free maintenance and student access at all times.
- *Blackboard and WebCT Level 1 Online Content.* If you use Blackboard or WebCT, the test bank for this textbook is available at no cost in a simple, ready-to-use format. Go to www.course.com and search for this textbook to download the test bank.
- *Blackboard and WebCT Level 2 Online Content.* Blackboard Level 2 and WebCT Level 2 are also available for *Principles of Information Systems*, Sixth Edition. Level 2 offers course management and access to a Web site that is fully populated with content for this book. Students purchase the *Blackboard User Guide* (ISBN 0-7895-6165-4) or the *WebCT User Guide* (0-7895-6163-8). The *User Guides* include a password that allows student access to Level 2.

For more information on how to bring distance learning to your course, instructors should contact their Course Technology sales representative.

ONLINE DATABASE NORMALIZATION SUPPLEMENT

By reviewer request, a database normalization supplement is available for download, for instructors and students, from www.course.com on the Web page for this book. This supplement takes the reader through the three initial steps of data normalization and makes this process easy to understand through a useful set of figures demonstrating the process for a hypothetical database.

CNN FOR MIS

A video package, developed with CNN, includes 12 video clips on a range of MIS topics from all over the world. The videos are free to instructors or may be bundled with the text for a small additional cost.

ACKNOWLEDGMENTS

A book of this size and undertaking requires a strong team effort. We would like to thank all of our fellow teammates at Course Technology and Elm Street Publishing Services for their dedication and hard work. Special thanks to Barrie Tysko, our Product Manager. Our appreciation goes out to all the many people who worked behind the scenes to bring this effort to fruition, including Janet Aras, our Associate Product Manager, and Christine Spillett, Associate Production Manager. We would like to acknowledge and thank the folks at Elm Street Publishing Services for their hard work on the manuscript. Karen Hill, our development editor, deserves special recognition for her tireless effort and help in all stages of this project. Heather Johnson, our project editor, shepherded the book through the production process. Melissa Morgan, Angel Chavez, Leah Strauss, and Jan Huskisson helped with the illustrations, production, text permissions, and the final stages of the book.

We are grateful to the sales force at Course Technology and Thomson Learning in the U.S. and around the globe, whose efforts make this all possible. You helped to get valuable feedback from current and future adopters. As Course Technology product users, we know how important you are.

While we had input from many reviewers, we would like especially to recognize Professor Gordon Everest of the University of Minnesota for his many valuable suggestions for the sixth edition and our new database normalization supplement. We would also like to thank Ken Baldauf for his excellent help in writing many of the boxes and cases for this edition. Ken also provided invaluable feedback for many topics discussed in the book.

Ralph Stair would like to thank the Department of Information and Management Sciences, College of Business Administration, at Florida State University for their support and encouragement. He would also like to thank his family, Lila and Leslie, for their support.

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TO OUR PREVIOUS ADOPTERS AND POTENTIAL NEW USERS

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Amy Woszczyński, *Kennesaw State University*
Judy Wynekoop, *Florida Gulf Coast University*
Myung Yoon, *Northeastern Illinois University*

FOCUS GROUP CONTRIBUTORS FOR THE THIRD EDITION

Mary Brabston, *University of Tennessee*
Russell Ching, *California State University—Sacramento*
Virginia Gibson, *University of Maine*
Bill C. Hardgrave, *University of Arkansas*
Al Harris, *Appalachian State University*
Stephen Lunce, *Texas A & M International*
Merle Martin, *California State University—Sacramento*
Mark Serva, *Baylor University*
Paul van Vliet, *University of Nebraska—Omaha*



OUR COMMITMENT

We are committed to listening to our adopters and readers and to developing creative solutions to meet their needs. The field of IS continually evolves, and we strongly encourage your participation in helping us provide the freshest, most relevant information possible.

We welcome your input and feedback. If you have any questions or comments regarding *Principles of Information Systems: A Managerial Approach*, Sixth Edition, please contact us through Course Technology or your local sales representative, via e-mail at mis@course.com, via the Internet at www.course.com.