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Essentials of Management Information Systems

Eighth Edition

Kenneth C. Laudon
New York University

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Upper Saddle River, New Jersey 07458

CIP data on file with Library of Congress.

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10 9 8 7 6 5 4 3 2 1
ISBN-13: 978-0-13-602579-5
ISBN-10: 0-13-602579-X

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The Laudons have two daughters, Erica and Elisabeth, to whom this book is dedicated.

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Preface

We wrote this book for business school students who wanted an in-depth look at how business firms use information technologies and systems to achieve corporate objectives. Information systems are one of the major tools available to business managers for achieving operational excellence, developing new products and services, improving decision making, and achieving competitive advantage.

When interviewing potential employees, business firms often look for new hires who know how to use information systems and technologies for achieving bottom-line business results. Regardless of whether you are an accounting, finance, management, operations management, marketing, or information systems major, the knowledge and information you find in this book will be valuable throughout your business career.

It's a New World of Business

A continuing stream of information technology innovations from the Internet to wireless networks to digital phone and cable systems are continuing to transform the business world. These innovations are enabling entrepreneurs and innovative traditional firms to create new products and services, develop new business models, and transform the day-to-day conduct of business. In the process, some old businesses, even industries, are being destroyed while new businesses are springing up.

For instance, the emergence of online music stores—driven by millions of consumers who prefer iPods and MP3 players—has forever changed the older business model of distributing music on physical devices, such as records and CDs. Online video rentals are similarly transforming the old model of distributing films through theaters and then through DVD rentals at physical stores. New high-speed broadband connections to the home have supported these two business changes.

E-commerce is back, generating over $200 billion in revenues in 2007, and growing at 25 percent a year. It is forever changing how firms design, produce and deliver their products and services. E-commerce has reinvented itself again, disrupting the traditional marketing and advertising industry and putting major media and content firms in jeopardy. MySpace and Facebook, along with other social networking sites such as YouTube, Photobucket, and Second Life, exemplify the new face of e-commerce in the 21st Century. They sell services. When we think of e-commerce we tend to think of selling physical products. While this iconic vision of e-commerce is still very powerful and the fastest growing form of retail in the U.S., growing up alongside is a whole new value stream based on selling services, not goods. It's a services model of e-commerce. Information systems and technologies are the foundation of this new services-based e-commerce.

Likewise, the management of business firms has changed: With new mobile phones, high-speed wireless Wi-Fi networks, and wireless laptop computers, remote salespeople on the road are only seconds away from their managers' questions and oversight. The growth of enterprise-wide information systems with extraordinarily rich data means that managers no longer operate in a fog of confusion, but instead have online, nearly instant, access to the really important information they need for accurate and timely decisions. In addition to their public uses on the Web, wikis and blogs are becoming important corporate tools for communication, collaboration, and information sharing.

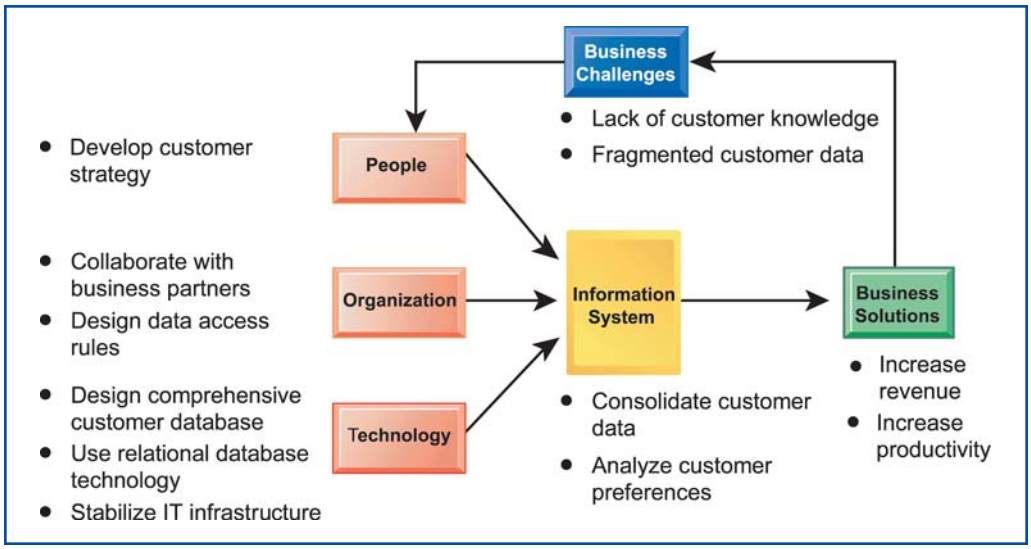
The Eighth Edition: The Complete Solution for the MIS Curriculum

Since its inception, this text has helped to define the MIS course around the globe. This edition continues to be authoritative, but is also more customizable, flexible, and geared to meeting the needs of different colleges, universities, and individual instructors. This book is now part of a complete learning package that includes the core text and an extensive Companion Web site.

The core text consists of 12 chapters with hands-on projects covering the most essential topics in MIS. The Companion Web site provides more in-depth coverage of chapter topics, video cases, career resources, additional case studies, supplementary chapter material, interactive quizzes, and data files for hands-on projects.

THE CORE TEXT

The core text provides an overview of fundamental MIS concepts using an integrated framework for describing and analyzing information systems. This framework shows information systems composed of people, organization, and technology elements and is reinforced in student projects and case studies.



A diagram accompanying each chapter-opening case graphically illustrates how people, organization, and technology elements work together to create an information system solution to the business challenges discussed in the case.

Chapter Organization

Each chapter contains the following elements:

- A chapter-opening case describing a real-world organization to establish the theme and importance of the chapter
- A diagram analyzing the opening case in terms of the people, organization, and technology model used throughout the text
- A series of Student Learning Objectives
- Two Interactive Sessions with Case Study Questions and MIS in Action projects
- A Hands-On MIS section featuring a Dirt Bikes USA running case project, a hands-on application software project, and a project to develop Internet skills
- A Learning Tracks section identifying supplementary material on the Companion Web site
- A chapter Review Summary keyed to the Student Learning Objectives

- A list of Key Terms that students can use to review concepts
- Review Questions for students to test their comprehension of chapter material
- Discussion Questions raised by the broader themes of the chapter
- A Video Case (available on the Companion Web site)
- A Teamwork project to develop teamwork and presentation skills
- A chapter-ending case study for students to apply chapter concepts

KEY FEATURES

We have enhanced the text to make it more interactive, leading-edge, and appealing to both students and instructors. The eighth edition includes the following features and learning tools:

Business-Driven with Real-World Examples

The text helps students see the direct connection between information systems and business performance. It describes the main business objectives driving the use of information systems and technologies in corporations all over the world: operational excellence; new products and services; customer and supplier intimacy; improved decision making; competitive advantage; and survival. In-text examples and case studies show students how specific companies use information systems to achieve these objectives.

Real-world examples from business and public organizations are used throughout the text to illustrate text concepts. All the case studies describe companies or organizations that are familiar to students, such as Google, MySpace, Photobucket, Wal-Mart, iTunes, NASCAR, Amazon, the NBA, and JetBlue.

Student Learning-Focused

Student Learning Objectives are organized around a set of study questions to focus student attention. Each chapter concludes with a Review Summary and Review Questions organized around these study questions.

Interactivity

There's no better way to learn about MIS than by doing MIS! We provide different kinds of hands-on projects where students can work with real-world business scenarios and data, and learn first hand what MIS is all about. These projects heighten student involvement in this exciting subject.

- **Hands-On MIS**. Each chapter concludes with a Hands-On MIS section containing three types of projects: a running case project, a hands-on application software exercise using Microsoft Excel, Access, or Web page development tools, and a project that develops Internet business skills.
- **Interactive Sessions**. Two short cases in each chapter have been redesigned as Interactive Sessions to be used in the classroom (or on Internet discussion boards) to stimulate student interest and active learning. Each case concludes with two types of activities: *Case Study Questions* and *MIS in Action*. The *Case Study Questions* provide topics for class discussion, Internet discussion, or written assignments. *MIS in Action* features hands-on Web activities for exploring issues discussed in the case more deeply.

Students practice using software in real-world settings for achieving operational excellence and enhancing decision making.

IMPROVING DECISION MAKING: USING DATABASES TO ANALYZE SALES TRENDS

Software skills: Database querying and reporting
Business skills: Sales trend analysis

You can find out how information systems improve management decision making in this exercise. Rather than guessing or relying on estimates and experience, managers today rely on information stored in databases. In this project, you will start out with raw transactional sales data and use Microsoft Access database software to develop queries and reports that help managers make better decisions about product pricing, sales promotions, and inventory replenishment. A part of the database is shown in the following figure.

On the Laudon Web site for Chapter 1, you can find a Store and Regional Sales Database developed in Microsoft Access. The database contains raw data on weekly store sales of computer equipment in various sales regions. You will use Access to manage the data and turn them into useful business information.

The database includes fields for store identification number, sales region number, item number, item description, unit price, units sold, and the weekly sales period when the sales were made.

Develop some reports and queries to make this information more useful for running the business. Sales and production managers want answers to the following questions:

- Which products should be restocked?
- Which stores and sales regions would benefit from a promotional campaign and additional marketing?
- When (what time of year) should products be offered at full price, and when should discounts be used?

You can easily modify the database table to find and report your answers. Print your reports and results of queries.

Store & Region Sales Database : Table

ID	Store No	Sales Region	Item No	Item Description	Unit Price	Units Sold	Week Ending
1	1	South	2005	17" Monitor	$229.00	28	10/27/2007
2	1	South	2005	17" Monitor	$229.00	30	11/24/2007
3	1	South	2005	17" Monitor	$229.00	9	12/29/2007
4	1	South	3006	101 Keyboard	$19.95	30	10/27/2007
5	1	South	3006	101 Keyboard	$19.95	35	11/24/2007
6	1	South	3006	101 Keyboard	$19.95	39	12/29/2007
7	1	South	6050	PC Mouse	$8.95	28	10/27/2007
8	1	South	6050	PC Mouse	$8.95	3	11/24/2007
9	1	South	6050	PC Mouse	$8.95	38	12/29/2007
10	1	South	8500	Desktop CPU	$849.95	25	10/27/2007

Record: 1 of 96

Each Dirt Bikes USA running case project requires students to use application software, Web tools, or analytical skills to solve a problem encountered by a simulated real-world company.

3.5 Hands-On MIS

The projects in this section give you hands-on experience analyzing a company's competitive strategy, using a database to improve decision making about business strategy, and using Web tools to configure and price an automobile.

IMPROVING DECISION MAKING: ANALYZING COMPETITIVE STRATEGY:

Dirt Bikes USA

Software skills: Web browser software and presentation software
Business skills: Value chain and competitive forces analysis, business strategy formulation

This project provides an opportunity for you to develop the competitive strategy for a real-world business. You will use the Web to identify Dirt Bikes's competitors and the competitive forces in its industry. You'll use value chain analysis to determine what kinds of information systems will provide the company with a competitive advantage.

Dirt Bikes's management wants to be sure it is pursuing the right competitive strategy. You have been asked to perform a competitive analysis of the company using the Web to find the information you need. Prepare a report that analyzes Dirt Bikes using the value chain and competitive forces models. Your report should include the following:

- Which activities at Dirt Bikes create the most value?
- How does Dirt Bikes provide value to its customers?
- What other companies are Dirt Bikes's major competitors? How do their products compare in price to those of Dirt Bikes? What are some of the product features they emphasize?
- What are the competitive forces that can affect the industry?
- What competitive strategy should Dirt Bikes pursue?
- What information systems best support that strategy?
- (Optional) Use electronic presentation software to summarize your findings for management.

INTERACTIVE SESSION: TECHNOLOGY — The Databases Behind MySpace

MySpace.com, the popular social networking site, has experienced one of the greatest growth spurts in the history of the Internet. The site launched in November 2003 and by May 2007, it had 175 million member accounts. The challenge for MySpace has been to avoid technological letdowns that degrade Web site performance and frustrate its rapidly expanding network of users.

The technical requirements of a site like MySpace are vastly different from other heavily trafficked Web sites. Generally, a small number of people change the content on a news site a few times a day. The site may retrieve thousands of read-only requests from its underlying database without having to update the database. On MySpace, tens of millions of users are constantly updating their content, resulting in an elevated percentage of database interactions that require updates to the underlying database. Each time a user views a profile on MySpace, the resulting page is stitched together from database lookups that organize information from multiple tables stored in multiple databases residing on multiple servers.

In its initial phases, MySpace operated with two Web servers communicating with one database server and a Microsoft SQL Server database. Such a setup is ideal for small to medium-size sites because of its simplicity. At MySpace, the setup showed signs of stress as more users came aboard. At first, MySpace reduced the load by adding Web servers to handle the increased user requests. But when the number of accounts stretched to 500,000 in 2004, one database server was not sufficient. Deploying additional database servers is more complicated than adding Web servers because the data must be divided among multiple databases without any loss in accessibility or performance. MySpace deployed three SQL Server databases. One served as a master database, which received all new data and copied them to the other two databases. These databases focused on retrieving data for user page requests.

As MySpace approached 2 million accounts, the database servers approached their input/output capacity, which refers to the speed at which they could read and write data. This caused the site to lag behind in content updates. MySpace switched to a vertical partitioning model in which separate databases supported distinct functions of the Web site, such as the log-in screen, user profiles, and blogs.

However, the distinct functions also had occasion to share data, and this became problematic when the site reached 3 million accounts. Furthermore, some functions of the site grew too large to be served by only one database server. After considering a scale-up strategy of investing in more powerful and expensive servers, MySpace instead scaled out by adding many cheaper servers to share the database workload.

The more economical solution of a distributed architecture required a new design in which all of the servers combined to work as one logical computer. Under this design, the workload still needed to be spread out, which was accomplished by dividing the user accounts into groups of 1 million, and putting all the data related to those accounts in a separate instance of SQL Server.

Despite these gains in efficiency, the workload was not distributed evenly, which would sometimes cause an overload in the storage area for a particular database. MySpace tried to correct this issue manually, but the work was demanding and not an effective use of resources. So, MySpace switched to a virtualized storage architecture, which ended the practice of attaching disks dedicated to specific applications in favor of a single pool of storage space available to all applications. Under this arrangement, databases could write data to any available disk, thus eliminating the possibility of an application's dedicated disk becoming overloaded.

In 2005, MySpace also fortified its infrastructure by installing a layer of servers between the database servers and the Web servers to store and serve copies of frequently accessed data objects so that the site's Web servers wouldn't have to query the database servers with lookups as frequently.

Despite all these measures, MySpace still overloads more frequently than other major Web sites. Users have expressed frustration at not being able to log in or view certain pages. Log-in errors occur at a rate of 20 to 40 percent some days. Site activity continues to challenge the limitations of the technology. So far, the site's continued growth suggests that users are willing to put up with periodic "Unexpected Error" screens. MySpace developers continue to redesign the Web site's database, software, and storage systems to keep pace with its exploding growth, but their job is never done.

Sources: David F. Carr, "Inside MySpace.com," *Baseline Magazine*, January 16, 2007; Mark Brunelli, "Oracle Database 10g Powers Growing MySpace.com Competitor," SearchOracle.com, January 31, 2007; and Saul Hansell, "For MySpace, Making Friends Was Easy. Big Prophet Is Tougher," *The New York Times*, April 23, 2006.

Each chapter contains two Interactive Sessions on People, Organizations, or Technology using real-world companies to illustrate chapter concepts and issues.

CASE STUDY QUESTIONS

1. Describe how MySpace uses databases and database servers.
2. Why is database technology so important for a business such as MySpace?
3. How effectively does MySpace organize and store the data on its site?
4. What data management problems have arisen? How has MySpace solved, or attempted to solve, these problems?

MIS IN ACTION

Explore MySpace.com, examining the features and tools that are not restricted to registered members. Then answer the following questions:

1. Based on what you can view without registering, what are the entities in MySpace's database?
2. Which of these entities have some relationship to individual members?
3. Select one of these entities and describe the attributes for that entity.

MIS in Action projects encourage students to learn more about the companies and issues discussed in the case studies.

Assessment and AACSB Assessment Guidelines

The Association to Advance Collegiate Schools of Business (AACSB) is a not-for-profit corporation of educational institutions, corporations and other organizations that seeks to improve business education primarily by accrediting university business programs. As a part of its accreditation activities, the AACSB has developed an Assurance of Learning Program designed to ensure that schools do in fact teach students what they promise. Schools are required to state a clear mission, develop a coherent business program, identify student learning objectives, and then prove that students do in fact achieve the objectives.

We have attempted in this book to support AACSB efforts to encourage assessment-based education. The front end papers of this edition identify student learning objectives and anticipated outcomes for our Hands-on MIS projects. On the Laudon Web site is a more inclusive and detailed assessment matrix that identifies the learning objectives of each chapter and points to all the available assessment tools for ensuring students in fact do achieve the learning objectives. Because each school is different and may have different missions and learning objectives, no single document can satisfy all situations. The authors will provide custom advice on how to use this text in colleges with different missions and assessment needs. Please e-mail the authors or contact your local Prentice Hall representative for contact information.

For more information on the AACSB Assurance of Learning Program, and how this text supports assessment-based learning, please visit the Web site for this book.

Customization and Flexibility: New Learning Track Modules:

Our **Learning Tracks** feature gives instructors the flexibility to provide in-depth coverage of the topics they choose. A Learning Tracks section at the end of each chapter directs students to short essays or additional chapters on the Laudon Companion Web site. This supplementary content takes students deeper into MIS topics, concepts and debates; reviews basic technology concepts in hardware, software, database design, telecommunications, and other areas; and provide additional hands-on software instruction. The Eighth Edition includes new Learning Tracks on The Booming Job Market in IT Security, Hot New Careers in E-Commerce, Computer Forensics, Sarbanes-Oxley, Service Level Agreements, Building a Web Page, Excel Pivot Tables, and additional coverage of Computer Hardware and Software technology.

Author-Certified Test Bank and Supplements

- **Author-Certified Test Bank.** The authors have worked closely with skilled test item writers to ensure that higher level cognitive skills are tested. Test bank multiple choice questions include questions on content, but also include many questions that require analysis, synthesis, and evaluation skills.
- **Interactive PowerPoint Lecture Slides.** In addition to illuminating key concepts, class slides include four to five Interactive Sessions where students are encouraged to discuss in class the cases in the chapter or related issues in MIS, management, and business.

Globalization

This edition has even more global emphasis than previous editions. New material on globalization (Chapter 1), global workgroup collaboration (Chapter 2), software localization (Chapter 4), global security threats (Chapter 7), global supply chains (Chapter 8), global marketplaces (Chapter 9), managing global systems projects (Chapter 11), and offshore outsourcing (Chapter 11), accompanied by numerous examples of multinational and non-U.S. companies, show how to use IS in a global business environment.

Expanded Treatment of Project Management

A new chapter on *Building Information Systems and Managing Projects* (Chapter 11) teaches students how to implement MIS projects to obtain genuine business value.

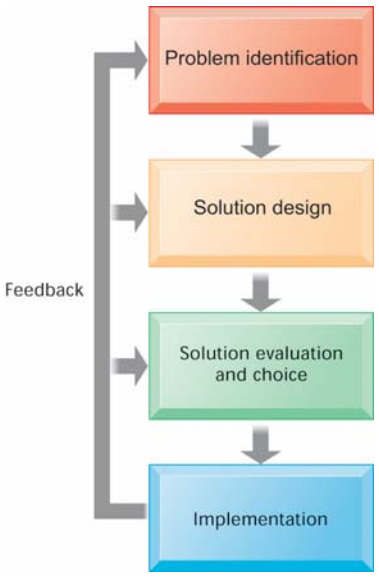
New Leading-Edge Topics

The Laudons are always in the forefront in identifying what's new in MIS. This edition includes new coverage of the following leading-edge topics:

- Globalization
- Virtualization
- Multicore processing
- Cloud computing
- Ajax
- Web 2.0
- Business uses of wikis and blogs
- Social networking
- Social shopping
- Social bookmarking
- Service level agreements
- Offshore outsourcing

A Problem-Solving Perspective

Chapter 1 introduces a four-step problem-solving method that students can use throughout the course and for analyzing case studies. Students will learn how to identify a business problem, design alternative solutions, choose the correct solution, and implement the solution. We use the problem-solving perspective throughout the text to show how real-world companies identified and ultimately solved key business challenges using information systems and technologies.



This four-step method helps students analyze information systems problems and develop solutions.

Career Resources

Career resources are integrated throughout the learning system. Each chapter shows why students need to know about the chapter and how this knowledge will help them in their future career. The Companion Web site offers extensive Career Resources, including job-hunting guides and instructions on how to build a Digital Portfolio demonstrating the business knowledge, application software proficiency, and Internet skills acquired from using the text. The portfolio can be included in a resume or job application or used as a learning assessment tool for instructors.

COMPANION WEB SITE

The Laudon/Laudon text is supported by an excellent Web site at **http://www.prenhall.com/laudon** that reinforces and enhances text material with Learning Tracks supplements, the Dirt Bikes U.S.A. running case, video cases, data files for the Hands-on MIS projects, Career Resources and Digital Portfolio guide, an Interactive Study Guide, International Resources, additional case studies, and a special PowerPoint slide show on IT Careers custom-prepared by Ken Laudon. The Web site also features a secure password-protected faculty area from which instructors can obtain AACSB assessment tools and download the Instructor's Manual and suggested answers to the Hands-on MIS and other projects. The site has an improved online syllabus tool to help professors add their own personal syllabi to the site in minutes.

Instructional Support Materials

Instructor's Resource CD-ROM

Most of the support materials described in the following sections are conveniently available for adopters on the Instructor's Resource CD-ROM. The CD includes the Instructor's Manual, Lecture Notes, Test Item File, PowerPoint slides, and the helpful lecture tool "Image Library."

Image Library (on Web and Instructor's Resource CD-ROM)

The Image Library is an impressive resource to help instructors create vibrant lecture presentations. Almost every figure and photo in the text is provided and organized by chapter for convenience. These images and lecture notes can be imported easily into Microsoft PowerPoint to create new presentations or to add to existing ones.

Instructor's Manual (on Web and Instructor's Resource CD-ROM)

The Instructor's Manual features not only answers to review, discussion, case study, and group project questions but also an in-depth lecture outline, teaching objectives, key terms, teaching suggestions, and Internet resources. This supplement can be downloaded from the secure faculty section of the Laudon Web site and is also available on the Instructor's Resource CD-ROM.

Test Item File (on Web and Instructor's Resource CD-ROM)

The Test Item File is a comprehensive collection of true-false, multiple-choice, fill-in-the-blank, and essay questions. The questions are rated by difficulty level and the answers are referenced by section. An electronic version of the Test Item File is available in TestGen and TestGen conversions are available for BlackBoard or WebCT course management systems. All TestGen files are available for download at the Instructor Resource Center.

PowerPoint Slides (on Web and Instructor's Resource CD-ROM)

Electronic color slides created by Azimuth Interactive Corporation, Inc., are available in Microsoft PowerPoint. The slides illuminate and build on key concepts in the text. Faculty can download the PowerPoint slides from the Web site, and they are also provided on the Instructor's Resource CD-ROM.

Microsoft Office Tutorial Software

For instructors seeking application software training to use with this text, Prentice Hall is pleased to offer student training in Microsoft Office 2007. This item is not available as a stand-alone item but can be packaged with the Laudon/Laudon text at an additional charge. Contact your local Prentice Hall representative for more details.

Acknowledgments

The production of any book involves valued contributions from a number of persons. We would like to thank all of our editors for encouragement, insight, and strong support for many years. We thank Bob Horan for guiding the development of this edition and Kelly Loftus for her role in managing the project.

We praise Carol Samet for overseeing production for this project and thank Diane Austin for her fine photo research. Our special thanks go to our supplement authors for their work. We are indebted to Kenneth Rosenblatt for his assistance in the writing and production of the text and to Megan Miller for her help during production. We thank Diana R. Craig for her assistance with database topics.

Special thanks to colleagues at the Stern School of Business at New York University; to Professor Edward Stohr of Stevens Institute of Technology; to Professors Al Croker and Michael Palley of Baruch College and New York University; to Professor Lawrence Andrew of Western Illinois University; to Professors Walter Brenner and Lutz Kolbe of the University of St. Gallen; to Professor Donald Marchand of the International Institute for Management Development; and to Professor Daniel Botha of Stellenbosch University who provided additional suggestions for improvement. Thank you to Professor Ken Kraemer, University of California at Irvine, and Professor John King, University of Michigan, for more than a decade's long discussion of information systems and organizations. And a special remembrance and dedication to Professor Rob Kling, University of Indiana, for being my friend and colleague over so many years.

We also want to especially thank all our reviewers whose suggestions helped improve our texts. Reviewers for this edition include the following:

Joseph Blankenship, Youngstown State University
Nora Braun, Augsburg College
Rochelle Cadogan, Viterbo University
Wade Chumney, Belmont University
Angela Clark, University of South Alabama
Preston Clark, Cornell University
C. Lee Clarke, Augsburg College
Emilio Collar Jr., Western Connecticut State University
Jack Cook, Rochester Institute of Technology
Terry Freed, Penn State Harrisburg
Robert Fulkerth, Golden Gate University
Albert Hayashi, Loyola Marymount University
Patrick Jeffers, Iowa State University
Keith Jenkins, Judson College
Boyd Jones, The Catholic University of America
Larry Larson, University of Redlands
Farrokh Mamaghani, St. John Fisher College
Bernard Merkle, California Lutheran University
Fiona Fui-Hoon Nah, University of Nebraska-Lincoln
Laszlo Pook, Metropolitan State College of Denver
Michael Powers, Franklin University
David Rosi, Lower Columbia College
Werner Schenk, St. John Fisher College
Corinne Smolizza, St. Francis College
Timothy Stanton, Mount St. Mary's University
Claire Theriault-Perkins, University of Maine at Augusta
Bradley Watson, Franklin University
Marie Wright, Western Connecticut State University
James Yao, Montclair State University
Michael Yates, Robert Morris College

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