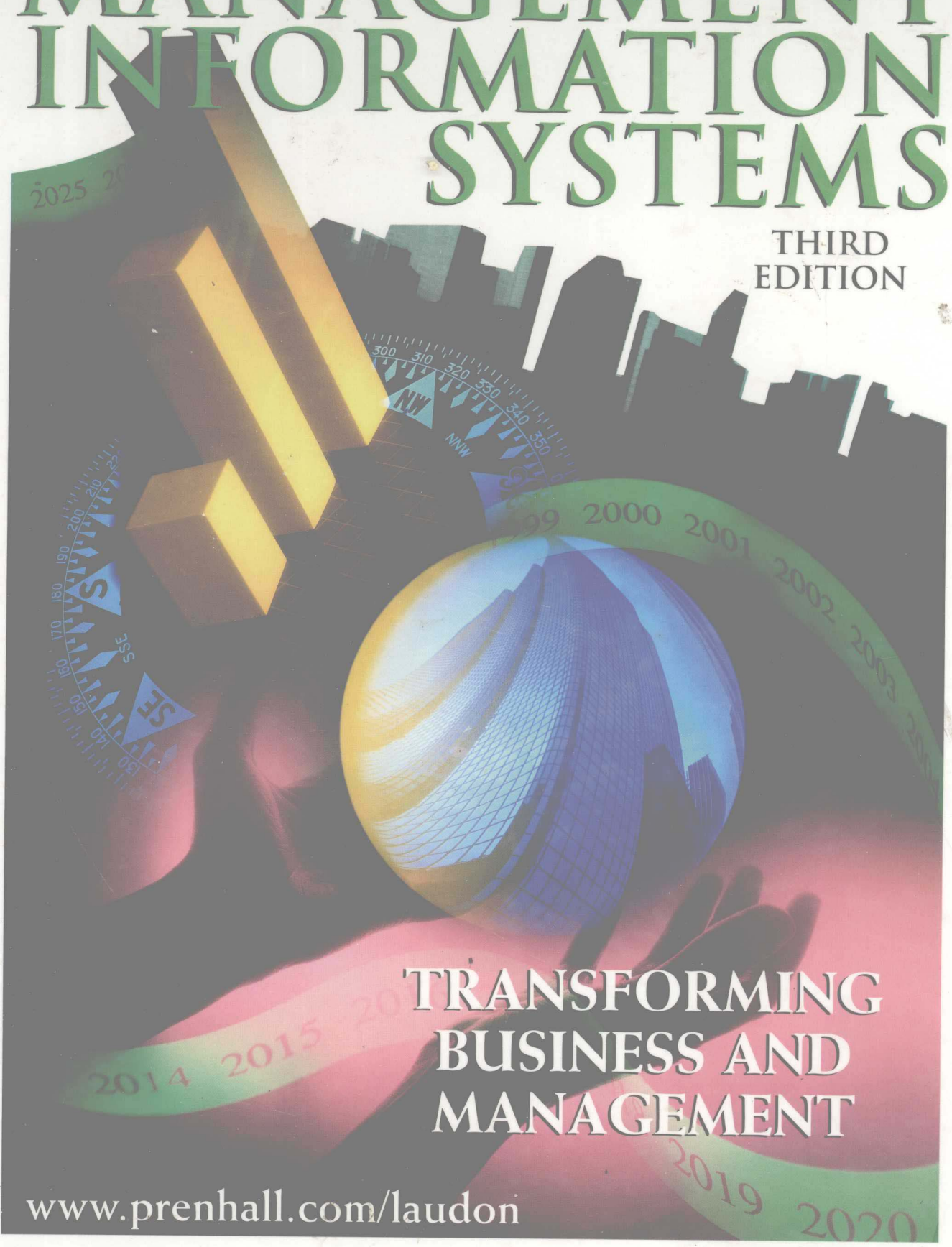


ESSENTIALS OF MANAGEMENT INFORMATION SYSTEMS



THIRD
EDITION

TRANSFORMING
BUSINESS AND
MANAGEMENT

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KENNETH C. LAUDON • JANE P. LAUDON

THIRD EDITION

Essentials of Management Information Systems

*Transforming Business
and Management*

Kenneth C. Laudon

New York University

Jane Price Laudon

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**for Erica
and Elisabeth**



Kenneth C. Laudon is a Professor of Information Systems at New York University's Stern School of Business. He holds a B.A. in Economics from Stanford and a Ph.D. from Columbia University. He has authored 14 books dealing with information systems, organizations, and society. Professor Laudon has also written over forty articles concerned with the social, organizational, and management impacts of information systems, privacy, ethics, and multimedia technology.

Professor Laudon's current research is on the planning and management of large-scale information systems for the 1990s and multimedia information technology. He has received grants from the National Science Foundation to study the evolution of national information systems at the Social Security Administration, the IRS, and the FBI. A part of this research is concerned with computer-related organizational and occupational changes in large organizations, changes in management strategy, and understanding productivity change in the knowledge sector.

Ken Laudon has testified as an expert before the United States Congress. He has been a researcher and consultant to the Office of Technology Assessment (United States Congress) and to the Office of the President, several executive branch agencies, and Congressional Committees. Professor Laudon also acts as an in-house educator for several consulting firms and as a consultant to Fortune 500 firms on system infrastructure planning and longer term strategies. Ken works with the The Concours Group to provide advice to firms developing enterprise systems. His hobbies include celestial navigation and ocean sailboat racing.



Jane Price Laudon is a management consultant in the information systems area and the author of seven books. Her special interests include systems analysis, data management, MIS auditing, software evaluation, and teaching business professionals how to design and use information systems.

Jane received her Ph.D. from Columbia University, her M.A. from Harvard University, and her B.A. from Barnard College. She has taught at Columbia University and the New York University Stern School of Business. She maintains a lifelong interest in Oriental languages and civilizations.

The Laudons have two daughters, Erica and Elisabeth.

Essentials of Management Information Systems: Transforming Business and Management reflects a deep understanding of MIS research and teaching as well as practical experience designing and building real-world systems.

International Case Studies ICS 1

From Geelong and District Water Board to Barwon Water: An Integrated IT Infrastructure Joel B. Barolsky and Peter Weill, University of Melbourne (Australia) ICS 1

Ginormous Life Insurance Company Len Fertuck, University of Toronto (Canada) ICS 8

From Analysis to Interface Design—The Example of Cuparla Gerhard Schwabe, Stephan Wilczek, and Helmut Krcmar, University of Hohenheim (Germany) ICS 10

Citibank Asia-Pacific: Rearchitecting Information Technology Infrastructure for the Twenty-First Century Boon Siong Neo and Christina Soh, Information Management Research Center (IMARC), Nanyang Business School, Nanyang Technological University (Singapore) ICS 13

Heineken Netherlands B.V.: Reengineering IS/IT to Enable Customer-Oriented Supply Chain Management Donald A. Marchand, Thomas E. Vollmann, and Kimberly A. Bechler, International Institute for Management Development (Switzerland) ICS 20

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Preface

Essentials of Management Information Systems: Transforming Business and Management (Third Edition) is based on the premise that it is difficult, if not impossible, to manage a modern organization without at least some knowledge of information systems—what they are, how they affect the organization and its employees, and how they can make businesses more competitive and efficient. Information systems have become essential for creating competitive firms, managing global corporations, and providing useful products and services to customers. This book provides an introduction to management information systems that undergraduate and MBA students will find vital to their professional success.

The Information Revolution in Business and Management: The New Role of Information Systems

Globalization of trade, the emergence of information economies, and the growth of the Internet and other global communications networks have recast the role of information systems in business and management. The Internet is becoming the foundation for new business models, new business processes, and new ways of distributing knowledge. Companies can use the Internet and networking technology to conduct more of their work electronically, seamlessly linking factories, offices, and sales forces around the globe. When corporate managers at firms such as the Marriott Corporation use information systems to examine their daily operations, they can find out exactly which rooms are occupied and what the revenue is from hundreds of hotels all over the world. This digital integration of the firm, from the warehouse to the executive suite, is becoming a reality. Accordingly we have changed the subtitle of this text to *Transforming Business and Management*.

New to the Third Edition

The Internet has created a universal platform for buying and selling goods. Its technology now also provides powerful capabilities for driving important business processes inside the company. This edition more fully explores the electronic business uses of the Internet for the internal management of the firm as well as the Internet's growing role in electronic commerce. It also provides a complete set of tools for integrating the Internet and multimedia technology into the MIS course. The following features and content reflect this new direction:

New Tools for Interactive Learning

A **Tools for Interactive Learning** section concluding each chapter shows students how they can extend their knowledge of each chapter with projects and exercises on the Laudon Web site and the optional CD-ROM multimedia edition.

TOOLS FOR INTERACTIVE LEARNING	
<p>■ INTERNET: The Internet Connection for this chapter will take you to the Rosenbluth Travel Web site, where you can complete an exercise to analyze how Rosenbluth uses the Web and communications technology in its daily operations. You can use the interactive software at the Goodyear Web site in an Electronic Commerce project to assist customers in making tire purchases. You can also use the Interactive Study Guide to test your knowledge of the topics in the chapter and get instant feedback where you need more practice.</p>	 <p>■ CD-ROM: If you purchase and use the Multimedia Edition CD-ROM with this chapter, you can perform an interactive exercise to select an appropriate network topology for a series of business scenarios and identify the main issue your selection presents to management. You also can find a video demonstrating the capabilities of personal communication services, an audio overview of the major themes of this chapter, and bullet text summarizing the key points of the chapter.</p>

Students and instructors can see at a glance exactly how the Web can be used to enhance student learning for each chapter.

Students can also see immediately how the chapter can be used in conjunction with the optional CD ROM.

New Management Wrap-Up Overviews of Key Issues

Management Wrap-Up sections at the end of each chapter summarize key issues using the authors' management, organization, and technology framework for analyzing information systems.

Focus on Electronic Commerce and Electronic Business

The Internet, electronic commerce, and electronic business are introduced in Chapter 1 and integrated throughout the text and the entire learning package. A full chapter, entitled *The Internet: Electronic Commerce and Electronic Business* (Chapter 9), describes the underlying technology, capabilities, and benefits of the Internet, with expanded treatment of electronic commerce, Internet business models, and the use of intranets for the internal management of the firm.

Internet, Electronic Commerce, and Electronic Business Integrated into Every Chapter

Every chapter contains a **Window On** box, case study, or in-text discussion of electronic commerce, electronic business, or the use of the Internet in changing a particular aspect of information systems.

Enhanced Laudon & Laudon Web Site for Management Problem Solving and Interactive Learning

The Laudon & Laudon Web site has been enhanced to provide a wide array of capabilities for interactive learning and management problem solving that have been carefully prepared for use with the text. They include:

Interactive Study Guide and Internet Connections for Each Chapter For each chapter of the text, the Web site features an Interactive Study Guide and Internet Connection exercise.

- The on-line Interactive Study Guide helps students review and test their mastery of chapter concepts with a series of multiple-choice, true-false, and essay questions.
- Internet Connections noted by marginal icons in the chapter direct students to exercises and projects on the Laudon Web site related to organizations and



Management Wrap-Up

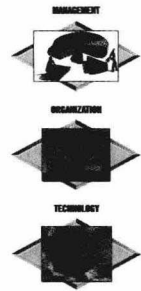
To obtain meaningful benefits from the Internet, managers need to determine how its technologies can support their business goals. Planning should carefully consider network costs, the costs and benefits of Internet computing, and new personnel requirements. Managers also should anticipate making organizational changes to take advantage of these technologies and plan to maintain some measure of management control over the process.

The Internet can dramatically reduce transaction and agency costs and is fueling new business models. By using the Internet and other networks for electronic commerce, organizations can exchange purchase and sale transactions directly with customers and suppliers, eliminating inefficient middlemen. Organizational processes can be streamlined by using the Internet and intranets to make communication and coordination more efficient. To take advantage of these opportunities, organizational processes must be redesigned.

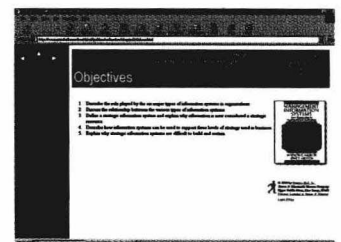
The Internet is creating a universal computing platform by using the TCP/IP network reference model and other standards for storing, retrieving, formatting, and displaying information. Web-based applications integrating voice, data, video, and audio are providing new products, services, and tools for communicating with employees and customers. Organizations can create intranets, internal networks based on Internet and Web technology, to reduce network costs and overcome connectivity problems. Key technology decisions should consider network reliability, security, bandwidth, and relationships to legacy systems, as well as the capabilities of Internet and other networking technologies.

For Discussion:

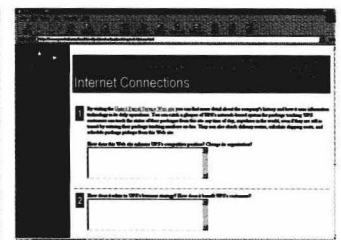
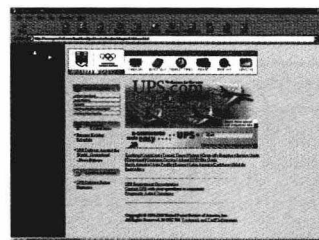
1. The Internet is creating a business revolution and transforming the role of information systems in organizations. Do you agree? Why or why not?
2. What management, organization, and technology factors would you consider when deciding whether to build an intranet for your company?



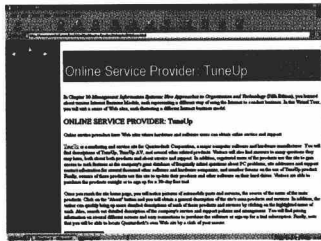
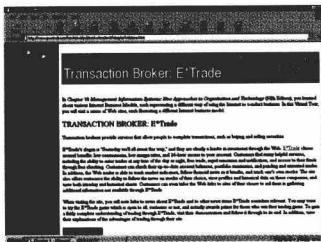
Management Wrap-Up provides a quick overview of the key issues in each chapter, reinforcing the authors' management, organization, and technology framework.



Student responses to questions are automatically graded and can be e-mailed to the instructor.



Students are presented with a problem to develop a budget for annual shipping costs. To obtain the information required by the solution, they can input data on-line and use the interactive software at this Web site to perform the required calculations or analysis.

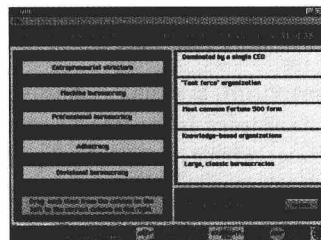


Students visit a series of Web sites illustrating different business uses of the Internet and then apply what they have learned to designing an Internet business strategy for a new company.

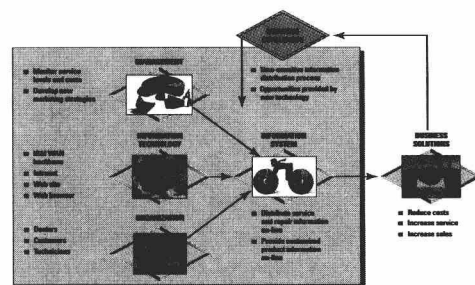
International Web Sites Links to Web sites of non-U.S. countries are provided for users interested in more international material.

Unique Features of This Text

Essentials of Management Information Systems: Transforming Business and Management (Third Edition) has many unique features designed to create an active, dynamic learning environment.



Students can reinforce and extend their knowledge of chapter concepts with interactive exercises on the CD-ROM.



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

concepts in that chapter. Included are Web-based exercises and interactive Electronic Commerce exercises that apply chapter concepts to using the Web for management problem solving.

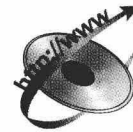
A Virtual Tour of Electronic Commerce Sites Students can take a tour of electronic commerce sites on the Web, where they can explore the various Internet business models and electronic commerce capabilities discussed in the text. Students can use what they have learned on the tour to complete a comprehensive electronic commerce project.

Additional Case Studies The Web site contains additional case studies with hyperlinks to the Web sites of the organizations they discuss.

Technology Updates The Web site provides technology updates to keep instructors and students abreast of leading-edge technology changes.

Technology Integrated with Content

An interactive CD-ROM multimedia version of the text can be purchased as an optional item. In addition to the full text and bullet text summaries by chapter, the CD-ROM features interactive exercises, simulations, audio/video overviews explaining key concepts, on-line quizzes, hyperlinks to the exercises on the Laudon Web site, technology updates, and more. Students can use the CD-ROM as an interactive supplement or as an alternative to the traditional text.



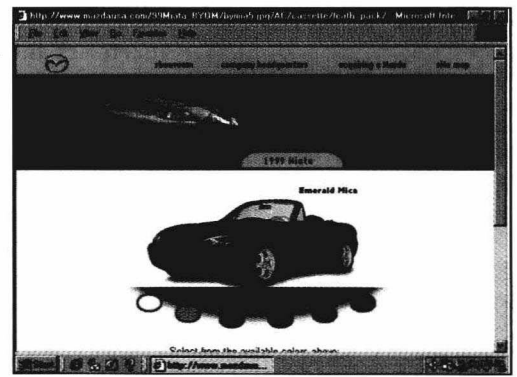
Integrated Framework for Describing and Analyzing Information Systems

An integrated framework portrays information systems as being composed of management, organization, and technology elements. This framework is used throughout the text to describe and analyze information systems and information system problems.

Real-World Examples

Real-world examples drawn from business and public organizations are used throughout to illustrate text concepts. More than 100 companies in the United States and nearly 100 organizations in Canada, Europe, Australia, Asia, and Africa are discussed.

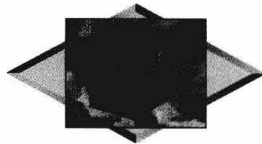
Each chapter contains three Window On boxes (Window on Management, Window on Organizations, Window on Technology) that present real-world examples illustrating the management, organization, and technology issues in the chapter. Each Window On box concludes with a section called *To Think About* containing questions for students to apply chapter concepts to management problem solving. The themes for each box are:



Each chapter opens with a vignette illustrating the themes of the chapter by showing how a real-world organization meets a business challenge using information systems.



Window on Management: Management problems raised by systems and their solution; management strategies and plans; careers and experiences of managers using systems.



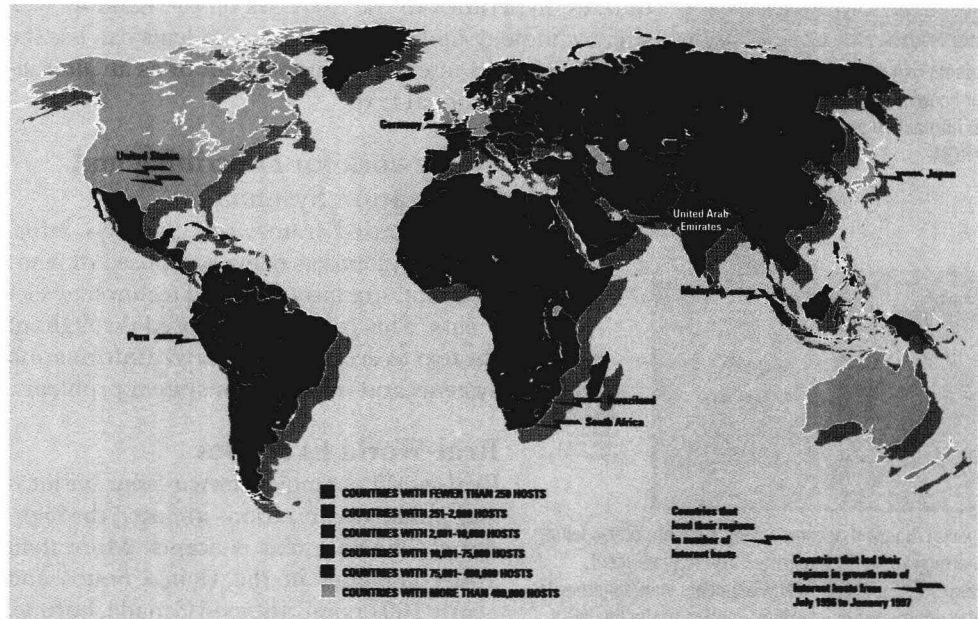
Window on Technology: Hardware, software, telecommunications, data storage, standards, and systems-building methodologies.



Window on Organizations: Activities of private and public organizations using information systems; experiences of people working with systems.

A Truly International Perspective

In addition to a full chapter on managing international information systems (Chapter 15), all chapters of the text are illustrated with real-world examples from nearly one hundred corporations in Canada, Europe, Asia, Latin America, Africa, Australia, and



Each chapter contains at least one Window On box, case study, or opening vignette drawn from a non-U.S. firm, and often more.

the Middle East. The text concludes with five major international case studies contributed by leading MIS experts in Canada, Europe, Singapore, and Australia—Len Fertuck, University of Toronto (Canada); Helmut Krcmar, Stephan Wilczek, and Gerhard Schwabe, University of Hohenheim (Germany); Donald Marchand, Thomas Vollmann, and Kimberly Bechler, International Institute for Management Development (Switzerland); Boon Siong Neo and Christina Soh, Nanyang Technological University (Singapore); and Peter Weill and J. B. Barolsky, University of Melbourne, (Australia).

Attention to Small Businesses and Entrepreneurs

A diamond-shaped symbol identifies in-text discussions and specially designated chapter-opening vignettes, Window On boxes, and ending case studies that highlight the experiences and challenges of small businesses and entrepreneurs using information systems.



Pedagogy to Promote Active Learning and Management Problem Solving

Essentials of Management Information Systems: Transforming Business and Management (Third Edition) contains many features that encourage students to learn actively and to engage in management problem solving.

Group Projects: At the end of each chapter is a group project that encourages students to develop teamwork and oral and written presentation skills. The group projects have been enhanced in this edition to make even better use of the Internet. For instance, students might be asked to work in small groups to evaluate the Web sites of two competing businesses or to develop a corporate ethics code on privacy that considers e-mail privacy and the monitoring of employees using networks.

Management Challenges Section: Each chapter begins with several challenges relating to the chapter topic that managers are likely to encounter. These challenges are multifaceted and sometimes pose dilemmas. They make excellent springboards for class discussion. Some of these Management Challenges are: finding the right Internet business model; overcoming the organizational obstacles to building a database environment; and agreeing on quality standards for information systems.

Case Studies: Each chapter concludes with a case study based on a real-world organization. These cases help students synthesize chapter concepts and apply this new knowledge to concrete problems and scenarios. Major international case studies and electronic case studies at the Laudon & Laudon Web site provide additional opportunities for management problem solving.

Book Overview

Part One is concerned with the organizational foundations of systems and their emerging strategic role. It provides an extensive introduction to real-world systems, focusing on their relationship to organizations, management, and important ethical and social issues.

Parts Two and Three provide the technical foundation for understanding information systems, describing hardware, software, storage, and telecommunications technologies. Part Three concludes by describing how all of the information technologies work together through the Internet to support electronic commerce and electronic business.

Part Four focuses on the process of redesigning organizations using information systems, including reengineering of critical business processes. We see systems analysis and design as an exercise in organizational design, one that requires great sensitivity to the right tools and techniques, quality assurance, and change management.

Part Five describes the role of information systems in capturing and distributing organizational knowledge and in enhancing management decision making. It shows how knowledge management, work group collaboration, and individual and group decision making can be supported by the use of knowledge work, artificial intelligence, decision support, and executive support systems.

Part Six concludes the text by examining the special management challenges and opportunities created by the pervasiveness and power of contemporary information systems and the global connectivity of the Internet: ensuring security and control and developing global systems. Throughout the text emphasis is placed on using information technology to redesign the organization's products, services, procedures, jobs, and management structures; numerous examples are drawn from multinational systems and global business environments.

Chapter Outline

Each chapter contains the following:

- A detailed outline at the beginning to provide an overview
- An opening vignette describing a real-world organization to establish the theme and importance of the chapter
- A diagram analyzing the opening vignette in terms of the management, organization, and technology model used throughout the text
- A list of learning objectives
- Management Challenges related to the chapter theme
- Marginal glosses of key terms in the text
- An Internet Connection icon directing students to related material on the Internet
- A Management Wrap-Up tying together the key management, organization, and technology issues for the chapter, with questions for discussion
- A chapter summary keyed to the learning objectives
- A list of key terms that the student can use to review concepts
- Review questions for students to test their comprehension of chapter material
- A group project to develop teamwork and presentation skills
- A Tools for Interactive Learning section showing specifically how the chapter can be integrated with the Laudon Web site and optional CD-ROM edition of the text
- A chapter-ending case study that illustrates important themes

Instructional Support Materials

Instructor's Resource CD-ROM

Many of the support materials described below are now conveniently provided for adopters on the Instructor's Resource CD-ROM. The CD includes the Instructor's Resource Manual, Test Item File, Windows PH Custom Test, Transparencies, and the innovative lecture tool, *Presentation Manager, PowerPoint Edition*.

Instructor's Manual

The Instructor's Manual, written by Professor Glenn Bottoms of Gardner-Webb University, 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

The Test Item File is a comprehensive collection of true-false, multiple choice, fill-in-the-blank, and essay questions, written by Dr. Lisa Miller of the University of Central Oklahoma. The questions are rated by difficulty level and answers are referenced by section. An electronic version of the Test Item File is available as the Windows PH Custom Test on the Instructor's Resource CD-ROM.

PowerPoint Slides

Over one hundred electronic color slides created by Dr. Edward Fisher of Central Michigan University are available in Microsoft PowerPoint, Versions 4.0 and 97. The slides illuminate and build upon key concepts in the text. In addition, the version 97 set contains hyperlinks to the Laudon Web site within each chapter. The PowerPoints can be downloaded from the Web site and are available on the Instructor's Resource CD-ROM within Presentation Manager.

Color Transparencies

One hundred full-color transparency acetates are available to adopters. These transparencies, taken from figures in the text, provide additional visual support to class lectures. The transparency masters are available as Acrobat files on the Web site and on the Instructor's Resource CD-ROM.

Presentation Manager, PowerPoint Edition

Presentation Manager, PowerPoint Edition is a truly user-friendly, PC-compatible presentation program that provides instructors with over one hundred images from the text, plus a prearranged set of PowerPoint slides, all to create dynamic classroom presentations. Figure and photo images are organized by chapter, as are the pre-made PowerPoint slides. Instructors can integrate their own images and modify or add notes for each image as well. This presentation program is available on the Instructor's Resource CD-ROM.

Video

Video clips are provided to adopters to enhance class discussion and projects. These clips highlight real-world corporations and organizations and illustrate key concepts found in the text.

Web Site

The Laudon/Laudon text is once again supported by an excellent Web site at <http://www.prenhall.com/laudon> that truly reinforces and enhances text material with Electronic Commerce Projects, Internet Exercises, an Interactive Study Guide, and International Resources. Please see its complete description found earlier in this preface.

Tutorial Software

For instructors looking for Application Software support to use with this text, Prentice Hall is pleased to offer CBT CD-ROMs for Microsoft Office 97 and, soon, for Office 2000. These exciting tutorial CDs are fully certified up to the expert level of the Microsoft Office User Specialist (MOUS) Certification Program. They are not available as stand-alone items but can be packaged with the Laudon/Laudon text at an additional charge. Please contact your local Prentice Hall representative for more details.

Software Cases

A series of optional management software cases called *Solve it! Management Problem Solving with PC Software* has been developed to support the text. *Solve it!* consists of 10 spreadsheet cases, 10 database cases, and 6 Internet projects drawn from real-world businesses, plus a data disk with the files required by the cases. The cases are graduated in difficulty. The case book contains complete tutorial documentation showing how to use spreadsheet, database, and Web browser software to solve the problems. A new version of *Solve it!* with all new cases is published every year. *Solve it!* must be adopted for an entire class. It can be purchased directly from the supplier, Azimuth Corporation, 124 Penfield Ave., Croton-on-Hudson, New York 10520 (telephone: 914-271-6321).

Acknowledgments

The production of any book involves many value contributions from a number of persons. We would like to thank all of our editors for encouragement, insight, and strong support for many years. Our editor David Alexander did an outstanding job in guiding the development of this edition, and we feel very fortunate to work with him. We remain grateful to PJ Boardman, Jim Boyd, and Sandy Steiner for their support of this project. We thank Executive Marketing Manager Nancy Evans for her superb marketing work and her continuing contributions to our texts. Thanks go as well to Sales Director Kris King for her suggestions for improving this edition. We commend Lori Cardillo for directing the preparation of ancillary materials and Anne Graydon for overseeing production of this text.

We remain deeply indebted to Marshall R. Kaplan for his invaluable assistance in the preparation of this edition. Special thanks to Dr. Glenn Bottoms of Gardner-Webb University, Dr. Edward Fisher of Central Michigan University, and Lisa Miller of the University of Central Oklahoma for their work on supporting materials.

The Stern School of Business at New York University and the Information Systems Department provided a very special learning environment, one in which we and others could rethink the MIS field. Special thanks to Professors Edward Stohr, Jon Turner, Vasant Dhar, Ajit Kambil, and Stephen Slade for providing critical feedback and support where deserved. Professor William H. Starbuck of the Management Department at NYU provided valuable comments and insights.

Professors Gordon Everest of the University of Minnesota, Al Croker and Michael Palley of Baruch College and NYU, Professor Kenneth Marr of Hofstra University, Professor Sassan Rahmatian of California State University, Fresno, Professor Lisa Friedrichsen of the Keller Graduate School of Management, and Dr. Edward Roche of the Concours Group provided additional suggestions for improvement. We continue to remember the late Professor James Clifford of the Stern School as a wonderful friend and colleague who also made valuable recommendations for improving our discussion of files and databases.

One of our goals was to write a book that was authoritative, synthesized diverse views in the MIS literature, and helped define a common academic field. A large number of leading scholars in the field were contacted and assisted us in this effort. Reviewers and consultants for *Essentials of Management Information Systems: Transforming Business and Management* are listed in the back endpapers of the book. We thank them for their contributions. Consultants for this new edition include: Marianne Hill of Furman University; Jack Hogue of the University of North Carolina, Charlotte; Evans Adams of Fort Lewis College; Jack Powell of the University of South Dakota; Erma Wood of the University of Arkansas, Little Rock; Solomon Antony of Oakland University; Stephanie Robbins of the University of North Carolina, Charlotte; Marcel Robelis of the University of North Dakota; Patricia McQuaid of California Polytechnic Institute, and Jeff Zhang of Langston University. It is our hope that this group endeavor contributes to a shared vision and understanding of the MIS field.

—K.C.L.
J.P.L.

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