MANAGEMENT INFORMATION SYSTEMS

SIXTH EDITION

ORGANIZATION AND TECHNOLOGY IN THE NETWORKED ENTERPRISE

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Management Information Systems

Organization and Technology in the Networked Enterprise

Sixth Edition

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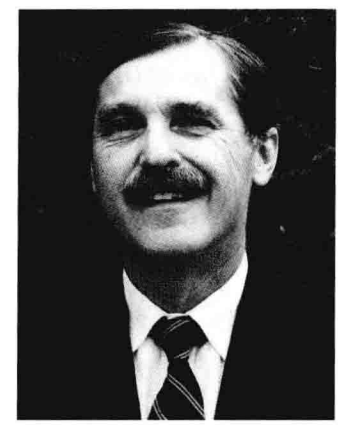


Kenneth C. Laudon is a Professor of Information Systems at New York University's Stern School of Business. He holds a B.A. in Economics from Stanford and a Ph.D. from Columbia University. He has authored eleven books dealing with information systems, organizations, and society. Professor Laudon has also 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 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 ideology, changes in public policy, 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 on systems planning and strategy to several Fortune 500 firms. Ken works with the Concours Group to provide advice to firms developing enterprise systems.

Ken Laudon's hobby is sailing.

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 Graduate School of Business. She maintains a lifelong interest in Oriental languages and civilizations.

The Laudons have two daughters, Erica and Elisabeth.

Management Information Systems: Organization and Technology in the Networked Enterprise reflects a deep understanding of MIS research and teaching as well as practical experience designing and building real world systems.

Preface

Management Information Systems: Organization and Technology in the Networked Enterprise (Sixth 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. Companies such as Coca-Cola, Dell Computer, and Safeway UK are extending these networks to suppliers, customers, and other groups outside the organization so they can react instantly to customer demands and market shifts. When Coca-Cola corporate managers use information systems to examine their daily operations, they will be able to find out exactly which bottling plant and which channel were used to sell Coca-Cola in a 500 milliliter bottle in any supermarket throughout the world. This digital integration within the firm and without, from the warehouse to the executive suite, is starting to become a reality. Accordingly, we have changed the subtitle of this text to *Organization and Technology in the Networked Enterprise.*

New to the Sixth Edition

The Internet has created a universal platform for buying and selling goods. Its technology also provides powerful capabilities for driving important business processes inside the company and for linking such processes electronically to those of other organizations. This edition more fully explores the electronic business uses of the Internet for the management of the firm as well as the Internet's growing role in electronic commerce. It includes detailed treatment of enterprise resource planning (ERP) systems and related technology for creating extended enterprises that electronically link the firm to suppliers and other industry partners. The text 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:

Detailed Coverage of Enterprise Resource Planning (ERP) and Extended Enterprises

We introduce enterprise resource planning (ERP) in Chapter 1 and provide descriptions, discussions, and case studies of ERP systems throughout the text. We have added an entirely new chapter (Chapter 18) with detailed treatment of the management, organization, and technology issues surrounding the implementation of ERP systems and the use of these systems, the Internet, and other technologies to link with other organizations in industry-wide networks and global supply chains.

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.

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.

Tools for Interactive Learning

❍ **Internet**

The Internet Connection for this chapter will take you to a Web site where you can view an interactive demonstration of an intranet. You can complete an exercise to evaluate how companies can use intranets to reduce agency costs and make the management process more efficient. You can also use the Interactive Study Guide to test your knowledge of the topics in this chapter and get instant feedback when you need more practice.

❍ **CD-ROM**

If you purchase and use the Multimedia Edition CD-ROM with this chapter, you will find an interactive exercise which asks you to apply the correct model of organizational decision making to solve a set of problems. You can also find an audio overview of the major themes of this chapter and bullet text summarizing the key points of the chapter.

Focus on Electronic Commerce and Electronic Business

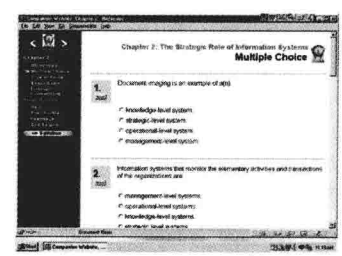
The Internet, electronic commerce, and electronic business are introduced in Chapter 1 and integrated throughout the text and the entire learning package. A full chapter, entitled The Internet: Electronic Commerce and Electronic Business (Chapter 10), describes the underlying technology, capabilities, 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

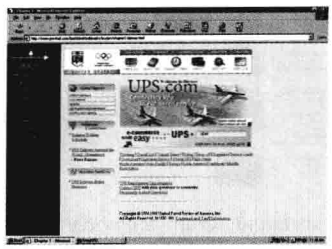
Every chapter contains a Window On box, case study, or in-text discussion of electronic commerce, electronic business, or the use of the Internet in changing a particular aspect of information systems.

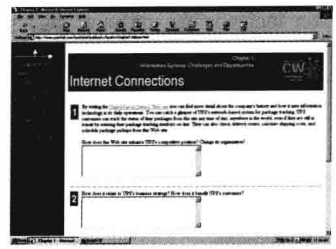
Enhanced Laudon & Laudon Web Site for Management Problem Solving and Interactive Learning

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:



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.

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 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.

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.

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.

International Web Sites

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

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

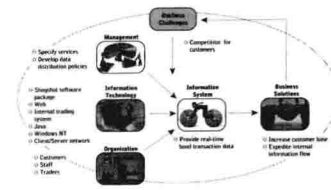
Unique Features of This Text

Management Information Systems: Organization and Technology in the Networked Enterprise (Sixth Edition) has many unique features designed to create an active, dynamic learning environment.

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.



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.

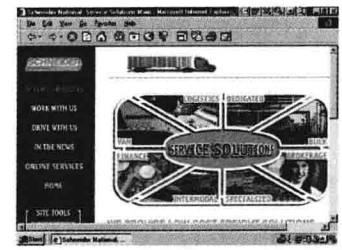
Integrated Framework for Describing and Analyzing Information Systems

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.

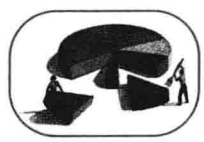
Real-World Examples

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 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.

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.

A Truly International Perspective

In addition to a full chapter on managing international information systems (Chapter 17), all chapters of the text are illustrated with real-world examples from one hundred corporations in Canada, Europe, Asia, Latin America, Africa, Australia, and the Middle East. 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 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

Management Wrap-Up

Management

Information technology provides tools for managers to carry out both their traditional and newer roles, allowing them to monitor, plan, and forecast with more precision and speed than ever before and to respond more rapidly to the changing business environment. However, some managerial roles cannot be easily supported by information systems, and managers will need to overcome psychosocial biases and resistance to change to find meaningful ways to use the Internet and other technologies to transform the management process.

Organization

It's clear that there are new ways of organizing work, which are enabled in part by new technology. The central organizational issue is whether traditional organizations can change their internal structures—their business processes—to permit new ways of organizing and managing to emerge.

Technology

Each of the three schools of management can draw on information technology to enhance managerial effectiveness. Networks and communication and collaboration tools are especially useful for supporting managerial work in the "new" organization where more work is distributed among small groups and task forces and more responsibility is given to employees.

For Discussion

1. How would each of the three schools of management use information systems to make managers and organizations more effective?
2. Identify and describe a decision you had to make, such as selecting a college or a major. Use Simon's model of decision-making stages and suggest how an information system might have helped you make the decision.

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

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

Management Information Systems: Organization and Technology in the Networked Enterprise (Sixth 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 part-ending case studies, 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.

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

Part Three 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 Four 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, group collaboration, artificial intelligence, decision support, and executive support systems.

Part Five 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, control, developing global systems, and building enterprisewide systems and industrial networks. 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

Instructor's Resource CD-ROM (013-040202-8)

Most of the support material described below is 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 Test Manager, Transparency Masters, PowerPoint Slides, and the helpful lecture tool "Image Library."

Image Library

The Image Library is a wonderful resource to help instructors create vibrant lecture presentations. Just about every figure and photo found in the text is provided and organized by chapter for your convenience. Lecture notes are supplied for each image and are housed within each chapter folder. Along with the lecture notes, a complete listing of the images and their copyright information are also provided. These images and lecture notes can be easily imported into Microsoft PowerPoint to create new presentations or to add to existing sets.

Instructor's Manual (013-040201-X)

The Instructor's Manual, written by Dr. 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/Laudon Web site and is also available on the Instructor's Resource CD-ROM.

Test Item File (013-040204-4)

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 Central Oklahoma University. The questions are rated by difficulty level and the answers are referenced by section. An electronic version of the Test Item File is available as the **Windows PH Test Manager,** also found on the Instructor's Resource CD-ROM.

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

Over one-hundred electronic color slides created by Dr. Edward Fisher of Central Michigan University are available in Microsoft PowerPoint, Version 97. The slides illuminate and build on key concepts in the text. In addition, they contain 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 Image Library.

Color Transparencies (013-040207-9)

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 also available as Acrobat files on the Web site and on the Instructor's Resource CD-ROM.

Video (013-040208-7)

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. The Web site also features a secure, password-protected faculty area, from which instructors can download the Instructor's Manual, PowerPoint Slides, and Transparency Masters. 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 valuable 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 Nancy Evans, Director of Strategic Marketing, for her superb marketing work and her continuing contributions to our texts. Thanks go as well to CIS Senior Marketing Manager Kris King and to CIS Sales Directors Matt Denham, Sharon Koch, Iain Macdonald, and Dana Simmons for their suggestions for improving this edition. We commend Lori Cerreto for directing the preparation of ancillary materials and Anne Graydon and Michael Jennings for overseeing production of this text under an extraordinarily ambitious schedule. We thank Shirley Webster for her energetic photo research work and Katherine Evancie for her careful copy editing.

We remain deeply indebted to Marshall R. Kaplan for his invaluable assistance in the preparation of the text and to James Doughty for his help with this edition. Special thanks to Dr. Glenn Bottoms of Gardner-Webb University, Dr. Edward Fisher of Central Michigan University, and Dr. 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, and Roy Radner for providing critical feedback and support where deserved. Professor William H. Starbuck of the Management Department at NYU provided valuable comments and insights in our joint graduate seminar on organization theory.

The Concours Group has provided stimulation, insight, and new research on enterprise systems and industrial networks. We remain especially grateful to Dr. Edward Roche for his contributions and to Jim Ware, Walt Dulaney, Vaughn Merlyn and Peter Boggis of the Concours Group for ideas and feedback.

Professor Gordon Everest of the University of Minnesota, Professors Al Croker and Michael Palley of Baruch College and NYU, Professor Sassan Rahmatian of California State University, Fresno, Professor Lisa Friedrichsen of the Keller Graduate School of Management, and Professor Kenneth Marr 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 *Management Information Systems: Organization and Technology in the Networked Enterprise* are listed in the back endpapers of the book. We thank them for their contributions. Consultants for this new edition include: John Anderson, Northeastern State University; Laurie Eakins, East Carolina University; David Fickbohm, Golden Gate University; Graham Peace, Duquesne University; and Sasan Rahmatian, California State University–Fresno. 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.

Business Process Redesign Project

Healthlite Yogurt Company

Healthlite Yogurt Company is a market leader in the expanding U.S. market for yogurt and related health products. Healthlite is experiencing some sharp growing pains. With the growing interest in low-fat, low-cholesterol health foods, spurred on by the aging of the baby boomers, Healthlite's sales have tripled over the past five years. At the same time, however, new local competitors, offering fast delivery from local production centers and lower prices, are challenging Healthlite for retail shelf space with a bevy of new products. Without shelf space, products cannot be retailed in the United States, and new products are needed to expand shelf space. Healthlite needs to justify its share of shelf space to grocers and is seeking additional shelf space for its new yogurt-based products such as frozen desserts and low-fat salad dressings.

Healthlite's biggest challenge, however, has not been competitors but the sweep of the second hand. Yogurt has a very short shelf life. With a shelf life measured in days, yogurt must be moved very quickly.

Healthlite maintains its U.S. corporate headquarters in Danbury, Connecticut. Corporate headquarters has a central mainframe computer that maintains most of the major business databases. All production takes place in processing plants that are located in New Jersey, Massachusetts, Tennessee, Illinois, Colorado, Washington, and California. Each processing plant has its own minicomputer, which is connected to the corporate mainframe. Customer credit verification is maintained at corporate headquarters, where customer master files are maintained and order verification or rejection is determined. Once processed centrally, order data are then fed to the appropriate local processing plant minicomputer.

Healthlite has 20 sales regions, each with approximately 30 sales representatives and a regional sales manager. Healthlite has a 12-person marketing group at corporate headquarters and a corporate director of sales and marketing. Each salesperson is able to store and retrieve data for assigned customer accounts using a terminal in the regional office linked to the corporate mainframe. Reports for individual salespeople (printouts of orders, rejection notices, customer account inquiries, etc.) and for sales offices are printed in the regional offices and mailed to them.

Sometimes, the only way to obtain up-to-date sales data is for managers to make telephone calls to subordinates and then piece the information together. Data about sales and advertising expenses and customer shelf space devoted to Healthlite products are maintained manually at the regional offices. Each regional office maintains its own manual records of customer shelf space and promotional campaigns. The central computer contains only consolidated, companywide files for customer account data and order and billing data. The aging mainframe runs programs built back in the early 1980s.

The existing order processing system requires sales representatives to write up hardcopy tickets to place orders through the mail or by fax. Each ticket lists the amount and kind of product ordered by the customer account. Approximately one hundred workers at Healthlite corporate headquarters open, sort, keypunch, and process 500,000 order tickets per week. Frequently orders are delayed when the fax machines break down. This order information is transmitted every evening from the mainframe to a minicomputer at each of Healthlite's

processing sites. This daily order specifies the total yogurt and yogurt product demand for each processing center. The processing center then produces the amount and type of yogurt and yogurt-related products ordered and then ships the orders out. Shipping managers at the processing centers assign the shipments to various transportation carriers, who deliver the product to receiving warehouses located in the regions.

Rapid growth, fueled by Healthlite's "health" image and its branching into new yogurt-based products, has put pressures on Healthlite's existing information systems. By mid-1999, growth in new products and sales had reached a point where Healthlite was printing new tickets for the sales force every week. The firm was choking on paper. For each order, a salesperson filled out at least two forms per account. Some sales representatives have more than 80 customers.

As it became bogged down in paper, Healthlite saw increased delays in the processing of its orders. Since yogurt is a fresh food product, it could not be held long in inventory. Yet Healthlite had trouble shipping the right goods to the right places in time. It was taking between four and fourteen days to process and ship out an order, depending on mail delivery rates. Healthlite also found accounting discrepancies of $1.5 million annually between the sales force and headquarters.

Communication between sales managers and sales representatives has been primarily through the mail or by telephone. For example, regional sales managers have to send representatives letters with announcements of promotional campaigns or pricing discounts. Sales representatives have to write up their monthly reports of sales calls and then mail this information to regional headquarters.

Healthlite is considering new information system solutions. First of all, the firm would like to solve the current order entry crisis and develop immediately a new order processing system. Management would also like to make better use of information systems to support sales and marketing activities and to take advantage of new Web-based information technologies. In particular, management wants a sales-oriented Web site to help market the products but is unsure how this will fit into the sales effort. Management wants to know how these new technologies can assist the local groceries and large chains who sell the product to the actual consumer.

Senior management is prepared to make a considerable investment in a plan for rescuing the company's systems and business operations. However, management is looking for a modest reduction in sales force head count as new, more effective systems come on-line and to help pay for the systems investment. While senior management wants the company to deploy contemporary systems, they do not want to experiment with new technologies and are only comfortable using technology that has proven itself in real-world applications.

Sales and Marketing Information Systems: Background

Sales and marketing are vital to the operation of any business. Orders must be processed and related to production and inventory. Sales of products in existing markets must be monitored and new products developed for new markets. The firm must be able to respond to rapidly changing market demands, proliferation of new products and competing firms, shortened product life spans, changing consumer tastes, and new government regulations.

Firms need sales and marketing information in order to do product planning, make pricing decisions, devise advertising and other promotional campaigns, forecast market potential for new and existing products, and determine channels of distribution. They must also monitor the efficiency of the distribution of their products and services.

The sales function of a typical business captures and processes customer orders and produces invoices for customers and data for inventory and production. A typical invoice is illustrated here.

Healthlite Yogurt, Inc.

Customer:

Highview Supermarket

223 Highland Avenue

Ossining, New York 10562

Order Number: 679940
Customer Number: #00395
Date: 04/15/99

Quantity	SKU#	*Description*	*Unit Price*	*Amount*
100	V3392	8 oz Vanilla	.44	44.00
50	S4456	8 oz Strawberry	.44	22.00
65	L4492	8 oz Lemon	.44	28.60
Shipping:				10.00
Total Invoice:				104.60

Data from order entry are also used by a firm's accounts receivable system and by the firm's inventory and production systems. The production planning system, for instance, builds its daily production plans based on the prior day's sales. The number and type of product sold will determine how many units to produce and when.

Sales managers need information to plan and monitor the performance of the sales force. Management also needs information on the performance of specific products, product lines, or brands. Price, revenue, cost, and growth information can be used for pricing decisions, for evaluating the performance of current products, and for predicting the performance of future products.

From basic sales and invoice data, a firm can produce a variety of reports with valuable information to guide sales and marketing work. For weekly, monthly, or annual time periods, information can be gathered on which outlets order the most, on what the average order amount is, on which products move slowest and fastest, on which salespersons sell the most and least, on which geographic areas purchase the most of a given product, and on how current sales of a product compare to last year's product.

The Assignment

Either alone, or with a group of three or four of your classmates, develop a proposal for redesigning Healthlite's business processes for sales, marketing, and order processing that would make the company more competitive. Your report should include the following:

- An overview of the organization—its structure, products, and major business processes for sales, marketing, and order processing.
- An analysis of Healthlite's problems: What are Healthlite's problems? How are these problems related to existing business processes and systems? What management, organization, and technology factors contributed to these problems?
- An overall management plan for improving Healthlite's business and system situation. This would include a list of objectives, a time-frame, major milestones, and an assessment of the costs and benefits of implementing this plan.
- Identification of the major changes in business processes required to achieve your plan.

- Identification of the major new technology components of your plan that are required to support the new business processes. If your solution requires a new system or set of systems, describe the functions of these systems, what pieces of information these systems should contain, and how this information should be captured, organized, and stored.
- A sample data entry screen or report for one of the new systems, if proposed.
- A description of the steps you would take as a manager to handle the conversion from the old system to the new.
- Quality assurance measures.

Your report should also describe the organizational impact of your solution. Consider human interface issues, the impact on jobs and interest groups, and any risks associated with implementing your solution. How will you implement your solution to take these issues into account?

It is important to establish the scope of the system. It should be limited to order processing and related sales and marketing activities. You do not have to redesign Healthlite's manufacturing, accounts receivable, distribution, or inventory control systems for this exercise.