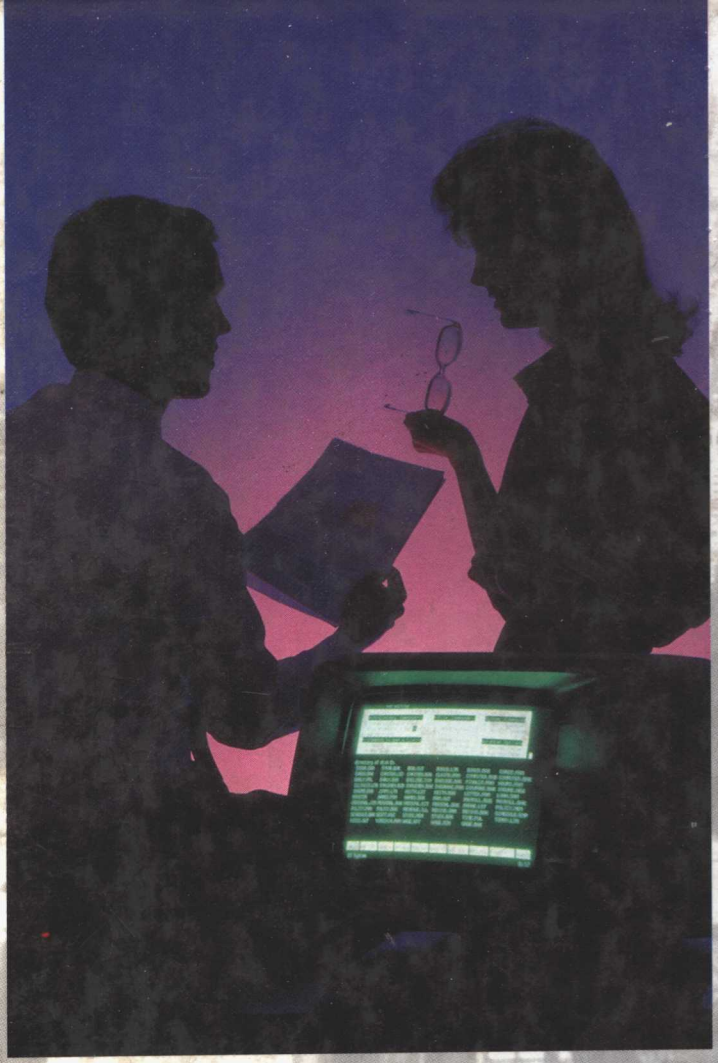

COMPUTERS AND INFORMATION SYSTEMS IN BUSINESS

ROBERT A. SZYMANSKI

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Robert A. Szymanski

MERRILL PUBLISHING COMPANY
A Bell & Howell Information Company
Columbus | Toronto | London | Melbourne

Published by Merrill Publishing Company
A Bell & Howell Information Company
Columbus, Ohio 43216

This book was set in Meridien.

Administrative Editor: Vernon R. Anthony
Developmental Editor: Peggy H. Jacobs
Production Editor: Sharon Rudd
Art Coordinator: Lorraine Woost
Cover Designer: Brian Deep
Text Designer: Cynthia Brunk
Photo Editor: Terry L. Tietz

Library of Congress Catalog Card Number: 89–62923
International Standard Book Number:
0–675–20905–6
Printed in the United States of America
1 2 3 4 5 6 7 8 9—94 93 92 91 90

Front cover photo: Steve Chenn/Westlight
Back cover photo: Pierce Kopp/Westlight
Background cover photo: Larry Hamill

Title page photo (pp. ii–iii): courtesy of International Business Machines Corp.

Part opener photos: pp. xix, xxvi, xxviii–1, 404–405, Larry Hamill; pp. xx, xxii, xxiv, 78–79, 212–213, 322–323, courtesy of International Business Machines Corp. Part opener background photo (pp. xxviii–1, 78–79, 212–213, 322–323, 404–405): Larry Hamill.

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Preface

Based on the premise that information is essential to survival in the business world and that computers and information systems are essential to the best use of information, this book explains how computers and information systems work, where they work, and how they affect a business's physical, political, and ethical environment. The text reflects my commitment to students and their need to prepare for the demands of the Information Age. Whether a student wishes simply to understand the use of computers and information systems and their role in today's business world, to use computers and information systems to manage information in his or her work place, or to design information systems, this text offers comprehensive up-to-date information.

Computers in Preparation of This Text

The existence of this textbook confirms the relevance and importance of Information Age technologies to business. From the contract negotiation stage, when the publishing company ran computer budgeting and production analyses, to the drafting, revising, and typesetting of the manuscript, the computer was a team member in creating the finished product and presenting it in a way that is pleasing to the reader.

The manuscript was prepared using microcomputer and word processing software, then sent on floppy diskette to the editor. After the necessary copy-editing changes, the manuscript was transmitted electronically through the telephone lines to a compositor's larger computers and typesetting equipment located in another state. There, exact margins were set and text lines justified; then the text was retransmitted electronically to the publisher for further corrections. Final composition of the pages was executed on computer; then pages were printed out for editorial review. Final film was sent to the printer, and computer-controlled presses produced the finished book.

While computers played an important role in the preparation of this text, so did a talented group of publishing professionals. Computers and people working together—that partnership is responsible for making this book, as well as numerous other business ventures, possible.

Note to the Student

Computers will play an important part in your future, whether in your personal life or at your work place. Some experts think that, eventually, the person who does not know how to use a computer will be just as handicapped at his or her job as the person today who cannot read.

To be computer literate, you should know how and where computers and information systems can be used, the kinds of tasks they perform, how they affect our society and economy, and how to use them to benefit your own career and life. If you are taking this course to familiarize yourself with the world of computers and information systems, *Computers and Information Systems in Business* serves as an interesting and informative guide on your journey to computer literacy. If you intend to become a computer professional, this book will give you the broad-based background you will need to pursue more advanced course work in the area.

Key Features of the Text

To present thorough coverage of concepts, hardware and software, computer systems, information systems, and other related topics that educators have indicated they feel important, these features have been incorporated:

- **Understandable coverage of the major functional areas of a business,** through the use of subchapters called Application Modules, which can be used to give the beginning student an understanding of business functions and the role of computers and information systems in them.
- **Readability** at the appropriate reading level and a conversational writing style that holds the student's interest
- **Effective motivation,** provided to the student through an opening section in each chapter called Impact on Management Problem Solving and Decision Making, which answers the question "Why is the material in this chapter important to study?"
- **Sound and effective pedagogy** designed to facilitate student interest in and understanding of the subject matter
- **Encouragement to think and apply concepts** through the use of minicases at the end of Chapters 2 through 12. The Case Analysis section in Chapter 1 instructs the student about how to solve and get the most out of the minicases.
- **Current examples** of computer applications that relate concepts to actual situations
- **Comprehensive coverage** that, beyond the usual core coverage, includes discussions of such contemporary issues as:
    - Artificial intelligence
    - Expert systems
    - Computer-assisted software engineering (CASE)
    - Information resource management (IRM)
    - Increasing use of networks and communication technology
    - Work monitoring

- Robotics
- Legal issues and computer-related legislation
- Trends in new chip technologies, optoelectronics, parallel processing, and communication
- Popular types of application packages

- **Written for everyone**—not only introductory level students who may be interested in continuing their study of computers and information systems as a career, but also students who plan to enter noncomputer fields

Pedagogy

These pedagogical devices were chosen with both the student and the instructor in mind:

- **Chapter objectives** alert students and instructors to the major points or concepts to be gleaned from the chapter.
- **Chapter outlines** preview chapter topics and organization so students can see the relationships among the topics covered.
- **Profiles** acquaint students with the various issues that concern modern MIS management and expose them to the wide variety of personalities and backgrounds of MIS managers.
- **Highlight boxes** focus on interesting illustrations of current computer uses and issues.
- **Summaries** review major concepts in the chapter.
- **Key terms** spotlight words that are important to understanding the material. They are listed alphabetically at the end of each chapter.
- **Review questions** check the student's understanding of the main topics in the chapter. They appear at the end of each chapter as a self-test.
- **Minicases** let the student apply the chapter's concepts to a business situation. In lieu of minicases Chapter 1 contains a discussion of how to solve and get the most out of the minicases presented in subsequent chapters.
- **Application Modules** provide coverage of the major functional areas of a business and the role computers and information systems play in each. These subchapters (one per part) offer flexibility in structuring course content. If students do not have a sufficient understanding of the basic functional areas of a business, the Application Modules can be assigned. Covering this material can significantly increase a student's understanding and appreciation of the material presented in Chapter 2.
- A **glossary,** at the end of the book, contains definitions of all key terms and serves as a handy reference.
- An **index** supplies a detailed guide to text and Application Module topics.

Finally, full-color functional illustrations and more than 60 photographs clarify concepts, depict applications, and show equipment.

Coverage

Comprehensive coverage of topics in the text includes chapters on hardware, software, data communications, information systems, and business concerns and trends. Basic concepts and how these concepts are integrated into business situations and activities are also discussed. Each chapter opens with a section entitled Impact on Management Problem Solving and Decision Making that explains the relevance of the chapter to the student's larger understanding of business.

Because microcomputers are the easiest-to-use computers and because most people (many of whom never become involved with larger systems) will encounter them in their daily work lives, I have included significant coverage of microcomputers throughout the text.

In addition to the core text, two opportunities for hands-on computer lab experience are provided:

- The appendix offers hands-on instruction in the BASIC programming language.
- An affordable worktext provides tutorials for VP-Planner Plus (or Lotus 1-2-3), dBase III, and WordPerfect 5.0. Limited student versions of VP-Planner Plus and dBase III Plus are available from the publisher on a site-license basis.

Organization

The text is divided into five logical parts. Part One (Chapters 1 and 2) provides an overview of computers and information systems, Part Two (Chapters 3 through 5) describes business computer systems, and Part Three (Chapters 6 through 8) explains business information systems concepts. Part Four (Chapters 9 and 10) describes business information systems development, while Part Five (Chapters 11 and 12) discusses the implications of business information systems for business and social concerns and trends. The text also contains an appendix covering structured programming concepts and providing instruction in the BASIC programming language.

Chapter 1, "Computer and Information System Concepts," introduces the student to the concepts of data, information, computers, and information systems. It describes examples of where computers are used, briefly explains how they work and what they can and cannot do, and describes their role in an information system.

Chapter 2, "Information Systems in Business," describes the types of information needed by managers and offers a brief overview of the major types of business information systems. It also surveys the application of information systems in functional areas of business as well as in selected industries. The chapter closes with a brief discussion of the history of computers that provides the student with a summary of events and significant people and their contributions.

Chapter 3, "Components of Business Computer Systems," opens with a discussion of data representation and then examines the internal design and operation of the central processing unit. Input and output concepts and devices for both large and small systems are described, as are secondary storage devices and media.

Chapter 4, "Software for Business Computer Systems," discusses system and application software. Operating systems for both large and small computers are described. The basic instructions that are found in any programming language and the major categories of programming languages are also presented. The chapter introduces the five major microcomputer application packages and distinguishes among the various types of integrated packages.

Chapter 5, "Data Communication," explains how data are transferred from one computer to another and describes applications of data communications. Network topologies, local-area networks, wide-area networks, and distributed data processing are also described.

Chapter 6, "File and Database Organization and Access," describes the data hierarchy and discusses the different types of files and file storage and access methods. Batch and real-time updating processes are presented, and ways of validating file input are described. Database processing is also addressed with discussions of the kinds of databases, database structures, database management systems, database design concepts, concerns with managing databases, and distributed databases.

Chapter 7, "Principles of Business Information Systems," describes the functions and role of transaction processing systems, management information systems, decision support systems, and knowledge-based (expert) systems.

Chapter 8, "Office Information Systems," describes the various parts of an office information system and its role in a business.

Chapter 9, "System Analysis," describes the system analysis phase of the development of an information system.

Chapter 10, "System Design and Implementation," describes the system design and implementation phases of the development of an information system.

Chapter 11, "Impact of Information Systems and the Information Resource," discusses the impact business information systems have had on corporate strategy and social concerns such as privacy of data, computer crime, electronic work monitoring, health and safety, and computer ethics. In addition, the implications of information as a resource and the management of that resource are examined.

Chapter 12, "Trends in Business Information Systems," describes some technological trends—artificial intelligence, Josephson junction, parallel processing, new chip technologies, communication technologies, optoelectronics, and software innovations. Competition at the interna-

tional level is discussed, and society's response to the proliferation of business information systems is also presented. The chapter closes with a discussion of trends in information system use.

The Appendix, "Structured Programming Concepts/The BASIC Programming Language," describes why it is important to learn about programming, presents structured programming concepts, and introduces the student to the BASIC programming language.

The Instructional Package

- **Worktext for VP-Planner Plus (or Lotus), dBase III Plus, and WordPerfect 5.0** is a hands-on guide to help students learn basic functions of a spreadsheet, database, and word processor.
- **Instructor's Resource Manual** contains chapter-by-chapter lecture outlines, answers to all questions in the text and worktext, and suggestions for using alternative instructional material.
- **Computerized Test Bank** includes 1,000 true/false, short answer, multiple choice, and fill-in questions. This versatile test bank program allows the instructor to generate tests, edit existing questions, and add new questions.
- **Printed Test Bank** is a hard copy version of all questions in the computerized test bank.
- **Transparency Package** consists of 75 full-color overhead transparencies that illustrate concepts presented in the text.
- **Videotapes**—Adopters of *Computers and Information Systems in Business* can purchase instructional tapes directly from the following companies at a discounted rate.
    - International Business Machines Corporation (IBM)—Using Your IBM PC, Merrill version
      A ninety-minute tape divided into seven lessons on how to use the IBM PC

      Lesson 1—Assembling Your System
      Lesson 2—Using Your Keyboard
      Lesson 3—About Disks
      Lesson 4—The Disk Directory
      Lesson 5—Programming Languages
      Lesson 6—Installing DOS
      Lesson 7—Programming in BASIC
    - American Micro Media—A series of ten videotapes, each running approximately thirty minutes. New terms are explained as they are introduced, and a review of concepts appears approximately every ten minutes.

      Electronic Words—explains key concepts related to word processors
      Keeping Track—explains key concepts related to data management packages

Computer Calc—explains key concepts of electronic spreadsheets
Computer Talk—explains key communications concepts
Computer Images—explains key graphics concepts
Computer Crime—focuses on crime awareness, prevention, and ethics
Computer Career—describes how computers affect the work place
Computer Peripherals—explains differences among computer systems
Computer Music—shows how computer sounds are generated
Computer Business—explores microcomputers and office automation

ACKNOWLEDGMENTS

So many people were involved in the development, production, and creative aspects of this project that the list of names could go on and on. All of the professionals I worked with at Merrill Publishing provided support, enthusiasm, and helpful suggestions. Special acknowledgment, however, goes to my administrative editor and friend, Vernon Anthony, who once again steadfastly led me through every phase of the publication process. The developmental editorial support of Peggy Jacobs is unrivaled. Everyone in Merrill's production, art, and design departments is to be commended for their creativity, patience, and hard work. In particular I thank Sharon Rudd, production editor, Lorry Woost, art coordinator, Cindy Brunk, text designer, and Brian Deep, cover designer. A special thanks goes to my wife, Laura, for her helpful suggestions and tireless efforts at typing and proofing this project. I am grateful to Don Szymanski, Donna Pulschen, and Norma Morris for their support in this project. Additionally, I am grateful to the organizations and businesses that provided photographs and technical materials for use in this book.

Special appreciation goes to these contributing authors: Kirk Arnett, Mississippi State University; Anthony Fabbri, University of Louisville; Thomas Harris, Ball State University; M. B. Khan, California State University; and Merle Martin, California State University.

Finally, I thank these reviewers for their thoughtful comments about the manuscript: Kenneth Forsythe, University of Wisconsin; Randy Weinberg, Saint Cloud University; Charles Small, Abilene University; David Yen, Miami University; Greg Smith, Colorado State University; G. W. Willis, Baylor University; John Schillak, University of Wisconsin; Dwight Hazlett, Texas A&I University; Robert Panian, University of Northern Michigan; Gerald Evans, University of Montana; Karen Forcht, James Madison University; Chang-tseh Hsieh, University of Southern Mississippi; Carey T. Hughes, University of North Texas; and David Paradise, Texas A&M University.

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