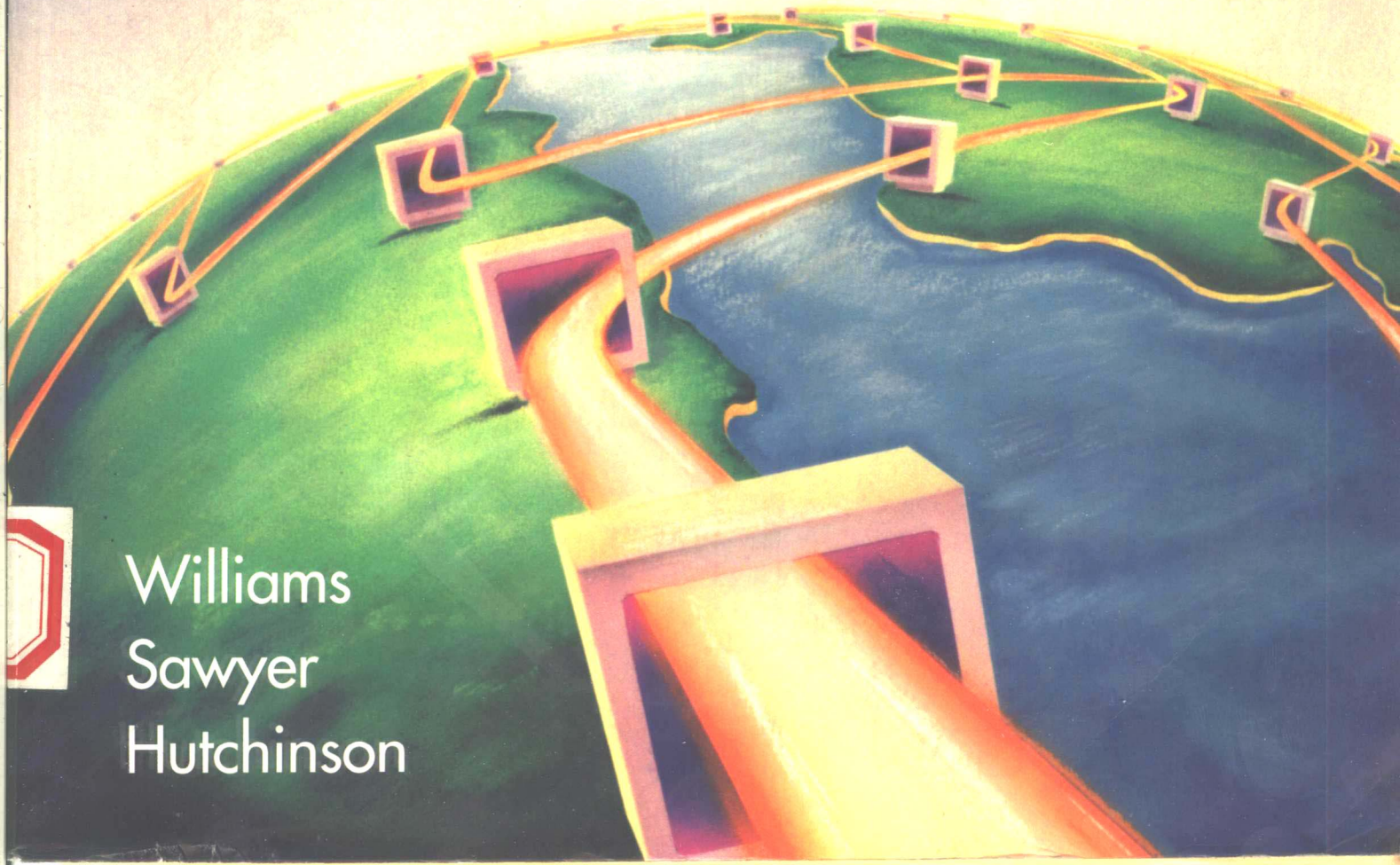
Using Information Technology

A Practical Introduction to Computers & Communications

Second Edition



Williams
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A Practical Introduction to Computers & Communications

Second Edition

Brian K. Williams
Stacey C. Sawyer
Sarah E. Hutchinson

Irwin McGraw-Hill

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Preface to the Instructor

A new generation of computing is well under way. The 1980s "second wave" model of stand-alone desktop PCs, which overtook the "first wave" model of mainframes, is now giving way to a "third wave" model driven by communications technologies. For evidence we need only look to the daily headlines: The 1996 Telecommunications Act. The rise of the Internet and the World Wide Web. The browser wars. Search engines. Cable modems. Network PCs. Java. *Information technology*—the fusion of computing and communications—is creating far-reaching changes in the way we work, the way we live, and even in the way we think.

The Audience for & Promises of This Book

Using Information Technology: A Practical Introduction to Computers & Communications, Second Edition, is intended for use as a concepts textbook to accompany a one-semester or one-quarter introductory course on computers or microcomputers. It is, we hope, a book that will make a difference in the lives of our readers.

The **key features** of *Using Information Technology*, Second Edition, are as follows. We offer:

1. **Careful revision in response to extensive instructor feedback.**
2. **Thorough coverage of computers and information systems—in just 12 chapters.**
3. **Emphasis on unification of computer and communications systems.**
4. **Emphasis on practicality.**
5. **Emphasis throughout on ethics.**
6. **Use of techniques for reinforcing student learning.**
7. **Up-to-the-minute material—in the book and on our Web site.**

We elaborate on these features next.

Key Feature #1: Careful Revision in Response to Extensive Instructor Feedback

We were delighted to learn from our publisher that the First Edition of *Using Information Technology* was apparently the most successful new text in the field in 1995, with over 300 schools adopting both comprehensive and brief versions. An important reason for this success, we feel, was all the valuable contributions of the reviewers.

Both the printed version of the First Edition and the manuscript and proofs of the Second Edition underwent a highly disciplined and wide-ranging

reviewing process. This process of expert appraisal drew on instructors who were both users and nonusers, who were from a variety of educational institutions, and who expressed their ideas in both written form and in focus groups.

We have sometimes been overwhelmed with the amount of information, but we have tried to respond to all consensus criticisms and countless individual suggestions. It is not an exaggeration to say that every page of the SECOND EDITION has been influenced by instructor feedback. The result, we think, is **a book reflecting the wishes of most instructors.** In particular, we have addressed the following matters:

- **Old Chapters 1 and 2 combined into one:** We combined old Chapters 1 and 2 into a single chapter, so that there would be less introductory material for the student to get through. Some instructors had found some of the old introductory material too technical for a first chapter and had expressed the wish to have the "overview" material moved closer to the beginning. The new chapter reflects their wishes.
- **Storage and database material made two chapters:** We split the old "Storage & Databases" chapter into two chapters. The majority of instructors felt that our previous coverage of databases was inappropriate when combined with a discussion of storage and moreover was too scant. We have remedied these deficiencies.
- **Input and output material made two chapters:** The single chapter "Input & Output" became two chapters because of the amount of new material that has become available.
- **"Promises" chapter and "Challenges" chapter combined into one and resequenced:** Many instructors felt that our previous Chapter 11 ("The Promises of the Digital Age") and Chapter 12 ("The Challenges of the Digital Age") were too long. Moreover, a few felt that ending the book with a discussion of problems rather than promises was inappropriate. Thus, we have combined these into one chapter and reordered the material per the title "Society & the Digital Age: Challenges & Promises."

In addition to these major structural changes, we have made hundreds of line-by-line and word-by-word adjustments to conform with instructor's requests.

Key Feature #2: Thorough Coverage of Computers & Information Systems—in Just 12 Chapters

This is, of course, a book about computers and information systems, and we cover these subjects thoroughly, without abridgment. However, many instructors have told us that having the material presented in **just 12 chapters**, rather than the customary 14 or 15 or more, better suits their teaching approach.

Chapters are organized according to the topic coverage of traditional introductory computer texts. Thus, most instructors can continue to follow their present course outlines.

NOTE: The text allows for **a good deal of instructor flexibility.** After Chapter 1, the remaining 11 chapters may be taught in any sequence, or selectively omitted, at the instructor's discretion. To make this possible, the authors have occasionally **repeated the definitions of key terms throughout the text** (also a part of the book's deliberate strategy of reinforcement).

The end-of-chapter essay appearing in the Experience Box is optional material, but may be assigned if the instructor wishes. Experience Boxes, too, may be read out of sequence.

Key Feature #3: Emphasis on Unification of Computers & Communications

The text emphasizes the technological merger of the computer, communications, consumer electronics, and media industries through the exchange of information in the digital format used by computers. This is the relatively new phenomenon known as **technological convergence.**

This theme covers much of the technology currently found under such phrases as *the Information Superhighway, the Multimedia Revolution,* and *the Digital Age: mobile computing, the Internet, Web search tools, online services, workgroup computing, the virtual office, video compression, PC/TVs, information appliances, "intelligent agents,"* and so on.

The theme of convergence is given in-depth treatment in five chapters—the introduction, systems software, communications, databases, and challenges and promises (Chapters 1, 3, 8, 9, 12)—and is also brought out in examples throughout other chapters.

Key Feature #4: Emphasis on Practicality

We'd like to make this book a "keeper" for students. Thus, we not only cover fundamental concepts but also offer a great deal of **practical advice.** This advice, of the sort found in computer magazines and general-interest computer books, is expressed principally in two kinds of boxes—Experience Boxes and README boxes:

- **The Experience Box:** Appearing at the end of each chapter, the Experience Box is optional material that may be assigned at the instructor's discretion. However, students will find the subjects covered are of immediate value.

  Some examples: "Becoming a Mobile Computer User"; "How to Buy Software"; "How to Buy a Multimedia System"; "Telling Computer Magazines Apart." Five of the Experience Boxes show students how to benefit from going online. They include "Finding Useful Online Databases: Directories & Search Engines" and "Online Résumés: Career Strategy for the Digital Age."
- **README boxes:** README boxes consist of optional material of two types—Practical Matters, and Case Studies:

  Practical Matters offer practical advice—such as tips for practicing online etiquette or avoiding viruses.

  Case Studies offer behind-the-scenes looks at information technology—such as how a salesperson uses a portable PC to download technical material from a mainframe, or how an expert is interviewed to construct an expert system.

Key Feature #5: Emphasis Throughout on Ethics

New to this edition! Many texts discuss ethics only once, usually in one of the final chapters. We believe this topic is too important to be treated last or lightly. Thus, **we cover ethical matters in 19 places** throughout the book, as indicated by the special sign shown here in the margin. For example, the all-important question of what kind of software can be legally copied is dis-

cussed in Chapter 2 ("Applications Software"), an appropriate place for students just starting software labs. Other ethical matters discussed are the manipulation of truth through digitizing of photographs, intellectual property rights, netiquette, censorship, privacy, and computer crime.

A list of pages of ethics coverage appears on the inside front cover. Instructors wishing to teach all ethical matters as a single unit may refer to this list.

Key Feature #6: Reinforcement for Learning

Having individually or together written over a dozen successful textbooks and scores of labs, the authors are vitally concerned with reinforcing students in acquiring knowledge and developing critical thinking. Accordingly, we offer the following *to provide learning reinforcement:*

- **Interesting writing:** Studies have found that textbooks **written in an imaginative style** significantly improve students' ability to retain information. Thus, the authors have employed a number of journalistic devices—such as the short biographical sketch, the colorful fact, the apt direct quote—to make the material as interesting as possible. We also use real anecdotes and examples rather than fictionalized ones.
- **Key terms and definitions in boldface:** Each **key term AND its definition is printed in boldface** within the text, in order to help readers avoid any confusion about which terms are important and what they actually mean.
- **Learning objectives to aid students:** ***New to this edition!*** Lists of learning objectives at the start of chapters are common in textbooks—and most students simply skip them. Because we believe learning objectives are excellent instruments for reinforcement, we have crafted ours to make them more helpful to students. We do this by **tying the numbered learning objectives to the end-of-chapter summary.** That is, we have numbered the objectives. Then, in the summary at the end of the chapter, we have given corresponding numbers to the terms and concepts that relate to the particular objectives.

  For example, in Chapter 2, *Learning Objective 2* is "After reading this chapter, you should be able to: 2. Discuss the ethics of copying software." Terms and concepts appearing in the end-of-chapter summary that relate to this objective—such as "copyright," "freeware," and "intellectual property"—are identified with the notation *LO 2.*
- **"Preview & Review" presents abstracts of each section for learning reinforcement:** Each main section heading throughout the book is followed by **an abstract or précis entitled Preview & Review.** This enables the student to get a *preview* of the material before reading it and then to *review* it afterward, for maximum learning reinforcement.
- **Innovative chapter summaries for learning reinforcement:** The chapter summary is especially innovative—and especially helpful to students. In fact, research through student focus groups has shown that this format was clearly first among five different choices of summary formats. Each concept is discussed under **two columns, headed "What It Is/What It Does" and "Why It's Important."**

  Each concept or term is also given a cross-reference page number that refers the reader to the main discussion within the chapter.

  In addition, as mentioned, the term or concept is also given a number (such as *LO 1, LO 2,* and so on) corresponding to the appropriate learning objective at the beginning of the chapter.

- **Cross-referencing system for key terms and concepts:** ***New to this edition!*** Wherever important key terms and concepts appear throughout the text that students might need to remind themselves about, we have added **"check the cross reference"** information, as in: (✓ p. 111). In student focus groups during the last two years, this device was found to rank *first* out of 20-plus study/learning aids.
- **Material in "bite-size" portions:** Major ideas are presented **bite-size form,** with generous use of advance organizers, bulleted lists, and new paragraphing when a new idea is introduced.
- **Short sentences:** Most sentences have been kept short, the majority not exceeding **22–25 words** in length.
- **Innovative use of art:** Artwork in the book is designed principally to be **didactic.** There are no unnecessary space-filling photo "galleries," for instance. To support learning concepts, photographs are often coupled with *additional* information—an elaboration of the discussion in the text, some how-to advice, an interesting quotation, or a piece of line art.
- **End-of-chapter exercises:** For practice purposes, students will benefit from *several exercises* at the end of each chapter: **short-answer questions, fill-in-the-blank questions, multiple-choice questions,** and **true-false questions.** Answers to selected exercises appear in the back of the book.

  In addition, we present several **projects/critical-thinking questions,** generally of a practical nature, to help students absorb the material.
- **Internet exercises:** ***New to this edition!*** In keeping with the practical and communications orientation of the book, we present **exercises on the use of the Internet** at the end of every chapter. Exercise topics include *sending and retrieving e-mail, performing research on the Web, navigating newsgroups, using FTP to download files, using Gopher and Veronica,* and more.

  Internet connection and software requirements: In general, the exercises assume an Internet setup is readily available to most college students. In Chapters 1–2, we assume students connect to the Internet using a command-line Unix interface. In Chapters 3–12, we assume students use the Navigator Netscape 2.0 or 2.01 Web browser. If these are not compatible with your setup, please check out Irwin's UIT Web site *(http://www.irwin.com/cit/uit)* for information regarding the publisher's additional Internet offerings.

Key Feature #7: Up-to-the-Minute Material—in the Text & on the Irwin Web Site

New to this edition! The number of technological developments that have occurred since we wrote the first edition has been awesome, and every day seems to bring reports of something new and important. As we write this, our August 1996 publication date is only three months away. However, because our publisher has allowed us to do several steps concurrently (writing, reviewing, editing, production), readers will find probably a hundred or more 1996 references in the notes to the book. As evidence for our being current, our text includes coverage of the following material:

Advanced TV. AT&T Internet offer. Avatars. Cable modems. Cyberdog. Cybersickness. Data mining. Data warehouses. DVD-ROMs. E-money. Genetic algorithms. Intelligent agents. Internet PC. Intranets. Java. Microsoft Exchange.

Microsoft Internet Explorer. PC/TVs. Pippin. Search engines. SIPC (Microsoft's Simply Interactive Personal Computer) standards. Spiders. Telecommunications Act of 1996. 3-D displays. 3-D sound. Vchip. VRML. VBNS. Web indexes. Windows 95 (latest information). Yahoo. Zip drives. . . . And more.

Still, we recognize that a Gutenberg-era lag exists between our last-minute scribbling and the book's publication date. And of course we also realize that fast-moving events will unquestionably overtake some of the facts in this book by the time it is the student's hands. Accordingly, after publication we are periodically offering instructors updated material and other interaction on the Irwin UIT Web Site *(http://www.irwin.com/cit/uit)*.

Complete Course Solutions: Supplements That Work—Four Distinctive Offerings

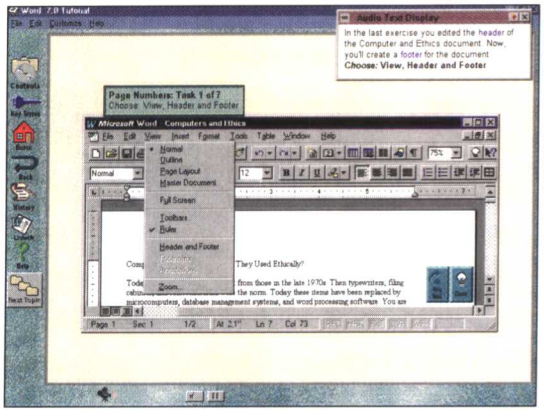
It's not important how many supplements a textbook has but whether they are truly useful, accurate, and of high quality. Irwin presents **four distinctive kinds of supplement offerings** to complement the text:

1. **Application software tutorials**
2. **Interactive software**
3. **Classroom presentation software**
4. **Instructor support materials, including software support program**

We elaborate on these below.

Supplement Offering #1: Application Software Tutorials—Two Types

Our publisher, Richard D. Irwin, offers two different series of application software tutorials, or lab manuals, which present two different hands-on approaches to learning software. An Irwin sales representative can explain the specific software covered in each series.



- **The Irwin Advantage Series for Computer Education:** Written by Sarah E. Hutchinson and Glen J. Coulthard, the *Irwin Advantage Series for Computer Education* covers the complete Microsoft Office Professional with your choice of either one comprehensive spiral-bound package or individual editions featuring full-color layouts and large screen captures.

  Manuals are available for Microsoft *Windows 3.1* and *Windows 95*, as well as for Microsoft *Word*, *Excel*, *Access*, and *PowerPoint*, both for Windows 3.1 and for Window 95. A manual called *Integrated Microsoft Office* is also available for Windows 3.1 and Windows 95.

  Each tutorial leads students through step-by-step instructions not only for the most common methods of executing commands but also for alternative methods. Each lesson begins with a case scenario and concludes with case problems, showing the real-world application of the software. Quick Reference guides summarizing important functions and shortcuts appear throughout. Annotated Toolbar screen

shots provide easy and quick reference. Boxes introduce unusual functions that will enhance the user's productivity. Hands-on exercises and short-answer questions allow students to practice their skills.

- **The Irwin Effective Series:** Written specifically for the first-time computer user, by Fritz J. Erickson and John A. Vonk, this series is based on the premise that success breeds confidence and confident students learn more effectively. Exercises embedded within each lesson allow students to experience success before moving on to a more advanced topic. The "why" as well as the "how" is always carefully explained. Each lesson features several applications projects and a comprehensive problem for student solution.

  Manuals are available for Microsoft *Windows 3.1* and *Windows 95*, as well as for Microsoft *Word, Excel, Access,* and *Works* for both Windows 3.1 and Windows 95 and for *PowerPoint* for Windows 95.

Important Note—Custom Publishing: The contents of these products can be tailored to meet your course needs through *custom publishing.* Titles or specific lessons from several titles in these series can be combined. *Irwin will happily send you an examination copy of the custom-published text you want so you can see exactly what your students will get.* Ask your Irwin sales representative for details.

Supplement Offering #2: Interactive Software—Two Types

Irwin offers two types of interactive software to accompany the text—*Info Tech, Version 2.0* and *Internet: A Knowledge Odyssey.*

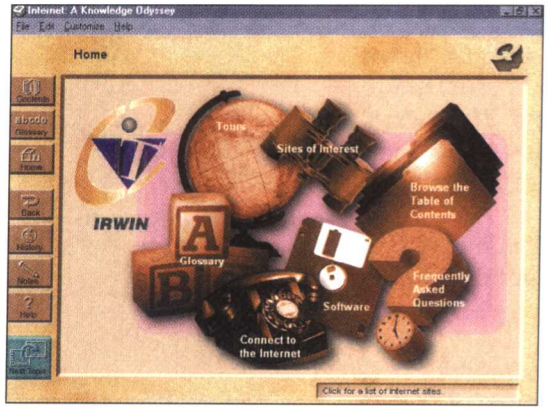
- **Info Tech, Version 2.0:** Developed by Irwin New Media and Tony Baxter, *Info Tech, Version 2.0* is a revised, updated, and expanded version of interactive multimedia software provided with the first edition. The CD-ROM gives students with several self-paced learning modules, on topics ranging from applications software to networks. Combining text, illustrations, and animation, the Info Tech interactive tool may also be used by instructors in a lecture setting.

  Info Tech 2.0 includes coverage of:

Data Into Information
Application Software
User Interfaces
Processors
Secondary Storage
Peripheral Devices
Backing Up Data
Multimedia
Data Representation
Networks
The Internet
Querying a Database
Client/Server
Encryption/Decryption
Security . . . and more.

Each module provides three levels of learning: (1) The *introduction level* provides text and animated enhancement of computer concepts. (2) the *exploratory level* allows the user to experiment with various scenarios and see the immediate results. (3) The *practice level* poses cases and problems for which the user must provide solutions based on information learned in the first two levels.

System requirements: (a) IBM PC or compatible with at least 2 MB of RAM running Windows 3.1 or Windows 95, or (b) Macintosh with at least 2 MB of RAM running System 6.01 or later; CD-ROM drive.

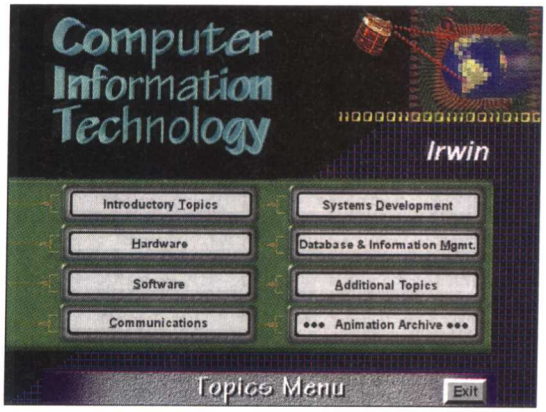


- **Internet: A Knowledge Odyssey:** A multimedia CD-ROM developed by MindQ Publishing, Inc., *Internet: A Knowledge Odyssey, Business Edition,* explains the history and workings of the Internet through 14 self-paced, interactive guided tours, 400 hyperlinked glossary terms, 90 minutes of video clips, and optional audio narration. Available to students for less than $10 (when packaged with other Irwin products), the CD-ROM also allows students to connect directly to specific sites on the Internet, automatically launching their Internet applications and inserting the correct URL address. Details and an evaluation copy are available from an Irwin representative.

  System requirements: IBM PC or compatible 486SX or higher with at least 4 MB of RAM running Windows 3.1 or Windows 95, SVGA graphics card (256 colors), and CD-ROM drive.

Supplement Offering #3: Classroom Presentation Software—Two Options

To help instructors enhance their lecture presentations, Irwin makes available software in two options, in a PowerPoint version and an Astound version. Both segment the course into seven topical modules: *introductory topics, hardware, software, communications, systems development, database and information management,* and *additional topics.*



- **Irwin CIT Classroom Presentation Software—PowerPoint option:** Developed by the Quality & Excellence Institute and Linda Behrens, the *PowerPoint version* of this classroom presentation software is a graphics-intensive set of lecture slides that helps instructors explain topics that may otherwise be difficult to present. The PowerPoint version, available on several 3.5-inch diskettes, offers lecture outline material with various graphics, backgrounds, and transitions.

  System requirements: IBM PC or compatible with at least 2 MB of RAM running Windows 3.1. An LCD panel is needed if the images are to be shown to a large audience.

- **Irwin CIT Classroom Presentation Software—Astound option:** Also from the same developers, the *Astound version* of classroom presentation software is a CD-ROM that allows instructors to make true multimedia lecture-enhancement presentations. A flexible menu-driven tool, the Astound version offers a complete lecture outline and a navigation interface, topical menus, animations, audio, and video clips. An Irwin sales representative can provide a demonstration of this tool.

  System requirements: IBM PC or compatible running Windows 3.1 or higher with a '486 processor (66 MHz or higher recommended) and at least 4 MB of RAM, SVGA graphics capability, and at least a dual-speed CD-ROM drive.

Supplement Offering #4: Instructor Support Materials

We offer the instructor the following other kinds of supplements and support to complement the text:

- **Instructor's Resource Guide:** This complete guide, prepared by Linda Behrens, supports instruction in any course environment. The *Instructor's Resource Guide* includes: *a student questionnaire, course planning and evaluation grid, suggestions for writing course objectives, suggested pace and coverage for courses of various lengths, suggestions for using the exercises in various class structures,* and *projects for small and large classes.*

  For each chapter, the IRG provides an overview, chapter outline, lecture notes, notes regarding the boxes (README boxes) from the text, solutions, and suggestions and additional information to enhance your course.
- **Color transparencies:** There are *150 full-color transparency acetates* available to the instructor. Transparencies have been specially *upsized*—enlarged and enhanced for clear projection.
- **Test bank:** The test bank, prepared by Margaret Batchelor, contains *2000 different questions,* which are directly referenced to the text. Specifically, it contains *true/false, multiple-choice,* and *fill-in questions,* categorized by difficulty and by type; *short-essay questions; sample midterm exam; sample final exam;* and *answers to all questions.*
- **Computerized testing software:** Called *Computest,* Irwin's popular computerized testing software is a *user-friendly, menu-driven, microcomputer-based test-generating system* that is free to qualified adopters. Containing all the questions from the test bank described above, Computest's Version 4 allows instructors to customize test sheets, entering their own questions and generating review sheets and answer keys.

  Available for DOS, Windows, and Macintosh formats, Computest has advanced printing features that allow instructors to print all types of graphics; Windows and Macintosh versions use easily remembered icons. All versions support over 250 dot-matrix and laser printers.

  System requirements: (a) IBM PC or compatible with at least 2 MB of RAM running Windows 3.1 or (b) Macintosh with at least 2 MB of RAM running System 6.01 or later; CD-ROM drive or 3.5-inch diskette drives.
- **Videos:** A broad selection from *21 new video segments* of the acclaimed PBS television series, *Computer Chronicles,* is available. Each video is approximately 30 minutes long. The videos cover topics ranging from computers and politics, to CD-ROM, to visual programming languages, to the Internet.
- **Instructor's data disks:** Instructor's data disks are avaliable for instructors whose students are using the tutorials for software education in the Irwin Advantage Series for Computer Education and Irwin Effective Series. These are *diskettes containing files* used in the DOS-, Windows 3.X–, and Windows 95–based software labs. Specifically, the diskettes contain the letters and memos that the student will use in the word processing labs, sample budgets and other files that the students will retrieve and modify in the spreadsheet labs, and the data and reports that the student will work with in the database labs.
- **Phone, fax, and e-mail instructor support services:** Richard D. Irwin's College New Media Department offers *telephone- or computer-linked support services to instructors* in matters related to Irwin software, such as

Computest and data disks used for the student tutorials in the Irwin Advantage Series or Effective Series. Software support analysts are available to help solve technical questions not covered in the documentation for any Irwin software product.

Three kinds of support are offered: (1) toll-free telephone numbers, available 9:00 A.M. to 5 P.M. Central, Monday through Friday (except holidays); (2) support-on-demand FAX-BACK service, available 24 hours a day, seven days a week; (3) e-mail, accessible 24 hours a day. Directions for getting this support appear in the *Instructor's Resource & Lecture Guide.*

- **Irwin Web site:** It's appropriate that a text with a strong communications focus also find a way to employ the new communications technologies available. Accordingly, a text-specific Irwin UIT Web Site has been developed as a place to go for periodic updates of text material, relevant links, downloads of supplements, an instructors' forum for sharing information with colleagues, and other value-added features.

Instructor Scenarios for Using the Text

USING INFORMATION TECHNOLOGY, SECOND EDITION, was carefully designed based on marketplace feedback. We have written the kind of book that many instructors asked for, and the materials are designed to serve a consensus kind of course.

Thus, to serve the new generation of students we are presenting a book that, we hope, reads like a magazine, offers many illustrations, and helps the reader learn through many extra pedagogical features—README boxes, Experience Boxes, section Preview & Reviews, innovative end-of-chapter summaries ("What It is/What It Does," and "Why It's Important"), and end-of-chapter exercises. *Actual material on which the student is to be tested—the general text—constitutes only slightly more than half of each chapter,* as determined from representative chapters. In Chapter 3, for instance, general text constitutes 20 of the 43 pages. (The rest consists of chapter opening, panels, boxes, suggested resources, section summaries, end-of-chapter summaries, and end-of-chapter exercises.)

Since the book consists of 12 chapters, readings may be assigned at the rate of slightly over a chapter a week in a quarter system, less than a chapter a week in a semester system. For instructors whose courses are less than 3 units or who must teach students software labs in addition to computer concepts, there are other options. Any one or combination of the following scenarios will allow instructors to teach selectively from this book without loss of continuity:

- **Scenario 1—Teach all "ethics" segments as one component:** Rather than discuss ethical matters just in one place, we have spread this topic around through the book, as indicated by the special sign shown here. All the pages of ethics coverage are indicated on the inside front cover. Instructors wishing to teach all ethical matters as a single component (as toward the end of the semester or quarter) may direct students to read the ethics material in the order shown on that list.

- **Scenario 2—Skip the Experience Boxes:** Some instructors may wish to assign all 12 chapters but not the end-of-chapter essays we call Experiences Boxes. All Experience Boxes are considered optional (not testable) material, but some instructors may wish to pick and choose which they assign, and some instructors may wish not to assign any.

- **Scenario 3—Skip chapters on systems and software development:** Some instructors may choose to forego Chapter 10, "Information Systems: Management & Development," and Chapter 11, "Software Development: Programming & Languages."
- **Scenario 4—Skip the last chapter:** Chapter 12, "Society & the Digital Age: Challenges & Promises," could be skipped. Instead, for a discussion of security and ergonomic issues, the instructor may choose to assign the Chapter 5 Experience Box: "Good Habits: Protecting Your Computer System, Your Data, & Your Health."
- **Scenario 5—skip chapters on applications and systems software:** Instructors whose courses include software labs may feel their students are already getting enough knowledge about applications and systems software that they do not need to read Chapters 2 and 3. (Chapter 2 is "Applications Software: Tools for Thinking & Working." Chapter 3 is "Systems Software: The Power Behind the Power.")

In addition, it bears repeating that, once the overview chapter (Chapter 1) has been assigned, any of the chapters that follow it may be taught out of order. Key terms have been defined anew as they appear in each chapter.

With these kinds of options, we feel sure that most instructors will be able to tailor the text to their particular course.

Acknowledgments

Three names are on the front of this book, but a great many others are powerful contributors to its development.

First among the staff of Richard D. Irwin is our sponsoring editor, Garrett Glanz, our lifeline, who did a fantastic job of supporting us and of coordinating the many talented people whose efforts on development and supplementary materials help strengthen our own. Garrett, you've been sensational. We're also grateful to Garrett's predecessor, Paul Ducham, for his initial spadework on this edition. It should go without saying that we owe a lot to our publisher, Tom Casson, who was not only the midwife on the first edition but has been one of our great fans on the second. Tom, it was good to feel your presence here.

We also appreciate the cheerfulness and efficiency of other people in Tom's and Garrett's group—the good and great Michelle Hudson, Carrie Berkshire, Linda Eiermann, and Sharon Pass. Mike Beamer did yeoman work on advertising pieces for us. Irwin's top management—the very supportive John Black, as well as David Littlehale, Jerry Saykes, and Jeff Sund—actively backed our revision, and we are extremely grateful to them. Many others at Irwin have also closely assisted us, and we would like to single out Laurie Entringer, Matt Baldwin, and Gladys True, who worked actively with us. In addition, we owe Bill Bayer, Lew Gossage, Charlie Hess, Bob Lange, Merrily Mazza, Keith McPherson, Evelyn Mosley-Harris, and Charlene Perez our special thanks. We appreciate having you all in our corner.

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Focus Group Participants

Patrick Callan
Concordia University

Joe Chambers
Triton College

Hiram Crawford
Olive Harvey College

Edouard Desautels
University of Wisconsin–Madison

William Dorin
Indiana University–Northwest

Bonita Ellis
Wright City College

Charles Geigner
Illinois State University

Julie Giles
DeVry Institute of Technology

Dwight Graham
Prairie State College

Stan Honacki
Moraine Valley Community College

Tom Hrubec
Waubonsee Community College

Alan Iliff
North Park College

Julie Jordahl
Rock Valley College

John Longstreet
Harold Washington College

Pattie Riden
Western Illinois University

Behrooz Saghafi
Chicago State University

Naj Shaik
Heartland Community College

Survey Respondents

Nancy Alderdice
Murray State University

Margaret Allison
University of Texas-Pan American

Angela Amin
Great Lakes Junior College

Connie Aragon
Seattle Central Community College

Gigi Beaton
Tyler Junior College

William C. Brough
University of Texas–Pan American

Jeff Butterfield
University of Idaho

Helen Corrigan-McFadyen
Massachusetts Bay Community College

James Frost
Idaho State Universtiy

Candace Gerrod
Red Rocks Community College

Julie Heine
Southern Oregon State College

Jerry Humphrey
Tulsa Junior College

Jan Karasz
Cameron University

Alan Maples
Cedar Valley College

Norman Muller
Greenfield Community College

Paul Murphy
Massachusetts Bay Community College

Sonia Nayle
Los Angeles City College

Janet Olpert
Cameron University

Pat Ormond
Utah Valley State College

Marie Planchard
Massachusetts Bay Community College

Fernando Rivera
University of Puerto Rico–Mayaguez Campus

Naj Shaik
Heartland Community College

Jack Shorter
Texas A&M University

Randy Stolze
Marist College

Ron Wallace
Blue Mountain Community College

Steve Wedwick
Heartland Community College

Reviewers

Nancy Alderdice
Murray State University

Sharon Anderson
Western Iowa Tech Community College

Bonnie Bailey
Morehead State University

David Brent Bandy
University of Wisconsin–Oshkosh

Robert Barrett
Indiana University
Purdue University at Fort Wayne

Anthony Baxter
University of Kentucky

Virginia Bender
William Rainey Harper College

Warren Boe
University of Iowa

Randall Bower
Iowa State University

Phyllis Broughton
Pitt Community College

J. Wesley Cain
City University, Bellevue

Judy Cameron
Spokane Community College

Kris Chandler
Pikes Peak Community College

William Chandler
University of Southern Colorado

John Chenoweth
East Tennessee State University

Ashraful Chowdhury
Dekalb College

Erline Cocke
Northwest Mississippi Community College

Robert Coleman
Pima County Community College

Glen Coulthard
Okanagan University

Robert Crandall
Denver Business School

John Durham
Fort Hays State University

John Enomoto
East Los Angeles College

Ray Fanselau
American River College

Eleanor Flanigan
Montclair State University

Ken Frizane
Oakton Community College

James Frost
Idaho State University

Jill Gebelt
Salt Lake Community College

Charles Geigner
Illinois State University

Frank Gillespie
University of Georgia

Myron Goldberg
Pace University

Sallyann Hanson
Mercer County Community College

Albert Harris
Appalachian State University

Jan Harris
Lewis & Clark Community College

Michael Hasset
Fort Hays State University

Martin Hochhauser
Dutchess Community College

James D. Holland
Okaloosa-Waltoon Community College

Wayne Horn
Pensacola Junior College

Christopher Hundhausen
University of Oregon

Jim Johnson
Valencia Community College

Jorene Kirkland
Amarillo College

Victor Lafrenz
Mohawk Valley Community College

Stephen Leach
Florida State University

Chang-Yang Lin
Eastern Kentucky University

Paul Lou
Diablo Valley College

Deborah Ludford
Glendale Community College

Peter MacGregor
Estrella Mountain Community College

Donna Madsen
Kirkwood Community College

Kenneth E. Martin
University of North Florida

Curtis Meadow
University of Maine

Marty Murray
Portland Community College

Charles Nelson
Rock Valley College

Wanda Nolden
Delgado Community College

E. Gladys Norman
Linn-Benton Community College

John Panzica
Community College of Rhode Island

Rajesh Parekh
Iowa State University