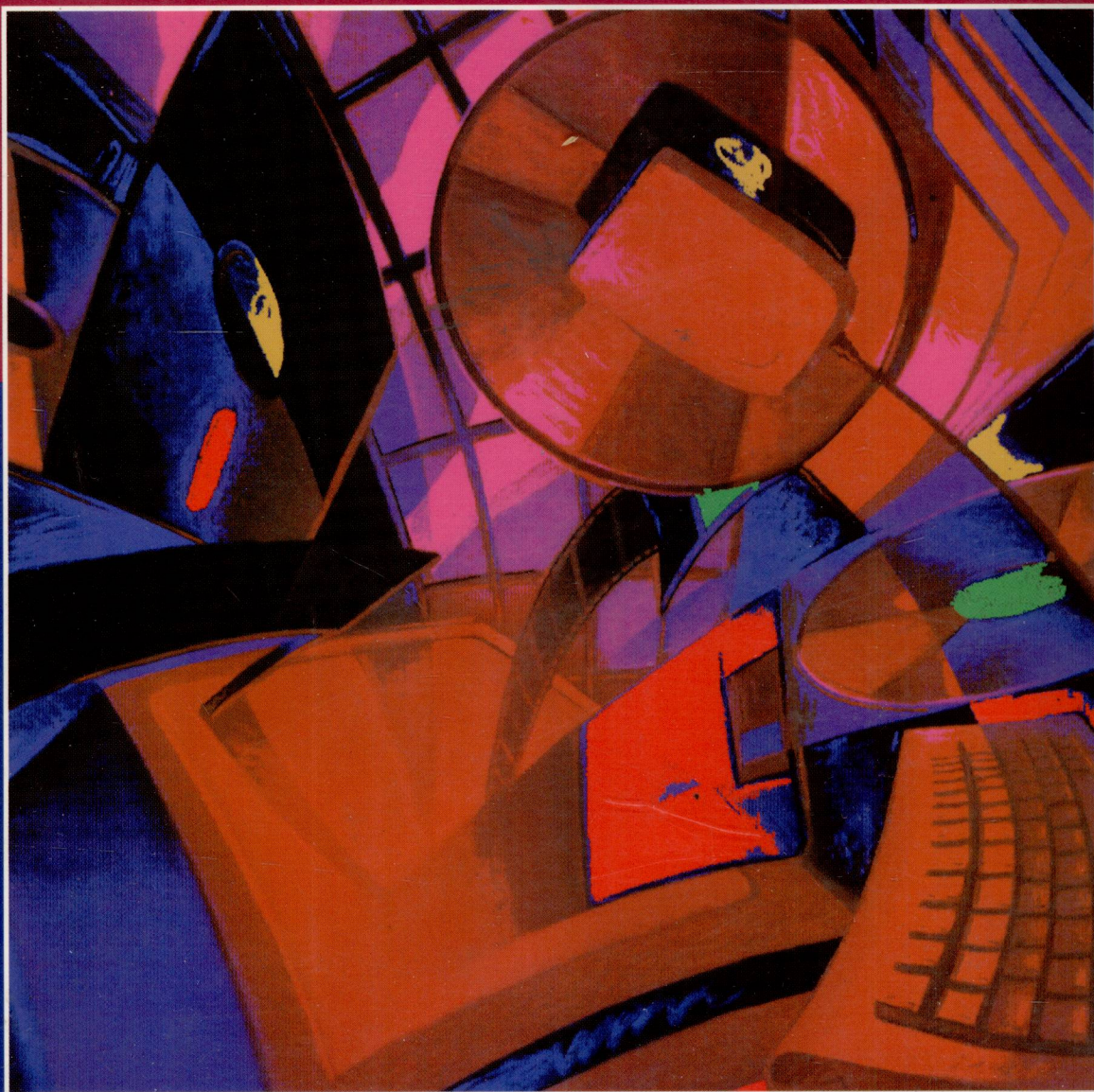


# COMPUTER ESSENTIALS



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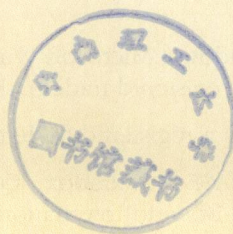
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# ***Computer Essentials***

***Sarah E. Hutchinson***

***Stacey C. Sawyer***



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**IRWIN**

**Advantage**

**Series for**

**Computer**

**Education**

*Burr Ridge, Illinois*

*Boston, Massachusetts*

*Sydney, Australia*



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# Preface

## Why We Wrote This Book: Meeting the Needs of Users

---

*Computer Essentials* is written for future computer users—people for whom the computer will be an everyday tool for working with reports, spreadsheets, databases, and the like. It is not intended for specialists who will write programs or design computer systems.

We wrote this book in order to provide instructors and students with the most useful information possible for a concise introductory computer course. Specifically, we offer the following five important features.

### 1. Practicality and Completeness

A textbook, we feel, should above all be *practical and complete*. It should give users all the information they need to understand the basics of information systems and to effectively use a microcomputer at work or at home. Thus we try to avoid the weaknesses we've seen elsewhere of stressing software to the detriment of hardware coverage or of being too encyclopedic. We try to give users just what they need to know to use a computer competently for business or personal purposes.

### 2. Flexible, Reasonably Priced Software Labs

We realize that students (and instructors) have a great deal of concern about the cost of textbooks. Accordingly, we offer many *reasonably priced*, separately bound software tutorials. These hands-on tutorials from *Irwin's Advantage Series for Computer Education* include the following:

dBASE III Plus	Paradox 3.5
dBASE IV	Paradox 4.0/4.5
dBASE for Windows	Paradox 4.5 for Windows
DOS 3.3	Quattro 1.01
DOS 5.0	Quattro Pro 3.0
DOS 6.0	Quattro Pro 4.0
Excel for the Macintosh	Quattro Pro 5.0 for Windows
Excel 3.0 for Windows	QBASIC
Excel 4.0 for Windows	System 7.0/7.1 for the Macintosh
Excel 5.0 for Windows	Windows 3.1
Filemaker Pro for the Macintosh	Word for the Macintosh
Lotus 1-2-3 release 2.01 and 2.2	Word 2.0 for Windows
Lotus 1-2-3 release 2.3	Word 6.0 for Windows
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Lotus 1-2-3 for Windows release 1.01	WordPerfect 6.0
Lotus 1-2-3 for Windows release 4.0	WordPerfect 6.0 for Windows

Additional tutorials will be added to the series as the need arises.



### 3. Avoidance of Clutter

Our market research finds that many instructors have become tired of the cluttered, over-illustrated look and style of many introductory texts. Thus, you will not find margin notes, confusing icons, cartoons, and other such distractions here.

Also, we have attempted to use color to enhance content, not overpower it. We use four specific colors to indicate input (red), storage (blue), processing (gray), and output (yellow).

### 4. Interesting, Readable Style

We are gratified that reviewers have consistently found our writing style praiseworthy. Our primary goal is to reach students by making our explanations as clear, relevant, and interesting as possible.

### 5. Effective Pedagogy

We have carefully developed our learning aids to maximize students' comprehension and learning:

- ▼ *Chapter previews and outlines:* Each chapter opens with a list of chapter objectives, a brief outline of the chapter's content, and an introductory section called "Why Is This Chapter Important?" which explains why the material in the chapter is important to the user.
- ▼ *Chapter summaries:* Each chapter concludes with a useful summary section to help students review.
- ▼ *Key terms:* All the important terms covered—and the numbers of the pages on which they are defined—appear in a section called Key Terms at the end of each chapter. All key terms are also listed and defined in the glossary in the back of the book.
- ▼ *Self-tests and exercises:* Fill-in-the-blank tests, short-answer exercises, and projects test students' comprehension and encourage them to learn more about microcomputers on their own.
- ▼ *Career boxes:* One- or two-page boxes show students how computers are used in some common and uncommon ways in business and the professions.
- ▼ *Episodes:* Four running-case episodes appear at the back of the book. These episodes—without being overly technical—help the students understand how a computer system is conceived and used in a real business: Professor Pizza.
- ▼ *Glossary:* All boldface key terms are included, with their definitions, in the comprehensive glossary at the back of the book. We have also listed many terms that are not included among the key terms but that might crop up in students' readings.

### Supplements That Work

---

It's not important how many supplements a book has but whether they're truly useful, accurate, and of high quality. We offer a number of supplements that you will find useful.



- ▼ *Instructor's Resource Manual with Transparency Masters*, prepared by Phil Koneman, Colorado Christian University (text available also on DOS or Windows disk). This supplement contains:
  - Course planning guidelines
  - Chapter outlines
  - Lecture notes
  - Teaching tips
  - Suggestions for using transparencies and transparency masters
  - Approximately 100 transparency masters
- ▼ *Color Transparencies*
  - 65 full-color overhead transparencies of key illustrations and tables are available to qualified adopters.
- ▼ *Test Bank*, prepared by Anne Breene, Texas A&M
  - True/false, multiple choice, fill-in-the blank questions graded in difficulty
  - Sample midterm exam
  - Sample final exam
  - Answers to test questions
- ▼ *Irwin's Computerized Testing Software: Computest 3*
  - This computer-based test bank is available to qualified adopters.
- ▼ *Videos*
  - These 21 videos are from the acclaimed PBS series, *Computer Chronicles*. Each video is approximately 30 minutes long. The videos cover topics ranging from computers and politics to CD-ROM and visual programming languages.

## ***Customer Designed Solutions (CDS)***

---

The preceding supplements are available with Hutchinson/Sawyer, *Computers and Information Systems: 1994-1995 Edition* and/or *Computer Essentials*.

In addition, Irwin is proud to offer adopters an exciting new *customization* program. Now it's possible to order chapters from either text in a sequence that best fits the needs of your course. You may also order a *combination* of chapters from both texts. In addition, you may order an array of lab manuals (see above) from the Irwin Advantage Series to accompany any customized text.

Your custom product will be spiral bound and shipped to your bookstore approximately six weeks from the time you place your order. The only limitation to an order is that the custom text not exceed 1.75 inches. For more information about CDS, please contact your local Irwin representative or Faculty Service at 1-800-323-4560.



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Finally, we thank our cohort in computer book publishing, Brian Williams, for all his expert advice—at least for the advice that we took.

## Write to Us

Finally, we need to know: Was this book truly useful to students? We'd like to hear from you about any improvements we might make. Write to us in care of our publisher, Richard D. Irwin.

Sarah E. Hutchinson  
Stacey C. Sawyer



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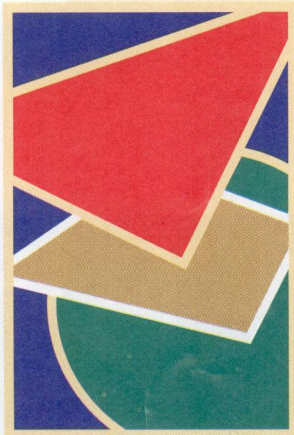
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# Overview of the Computer: The Power Tool for Your Future



**M**ost employers do not expect potential employees to be computer experts. However, many expect them to be prepared to use computers as everyday tools to solve job-related problems. Two questions a job seeker being interviewed may be asked today are, “What do you know about computers?” and “What kind of software are you familiar with?” The more you know about computers, the better you’ll be handle such questions—and the more effective you’ll be in your career.

## PREVIEW

When you have completed this chapter you will be able to:

- ▼ Define what it means to be computer literate and computer competent
- ▼ Describe the four main types of computer systems
- ▼ Explain what a computer system is by focusing on hardware, software, data/information, procedures, people, and connectivity
- ▼ Briefly describe the four phases of a computer-based information system: input, processing, output, storage
- ▼ Name the three main parts of a microcomputer system
- ▼ Distinguish between batch and on-line processing
- ▼ Describe how data is organized in a computer system
- ▼ Briefly describe the five generations of computer development
- ▼ Discuss the difference between general computer users and several types of computer professionals



# WHY IS THIS CHAPTER IMPORTANT?

## CHAPTER TOPICS

Becoming Computer Literate  
and Computer Competent



Types of Computers:  
Supercomputers, Mainframes,  
Minicomputers,  
Microcomputers



What a Computer System Is:  
Parts and Phases



Batch and On-Line Processing



Hardware



Software



Data and Information



Procedures



People: Users and Computer  
Professionals



Connectivity



The Evolution of Computers

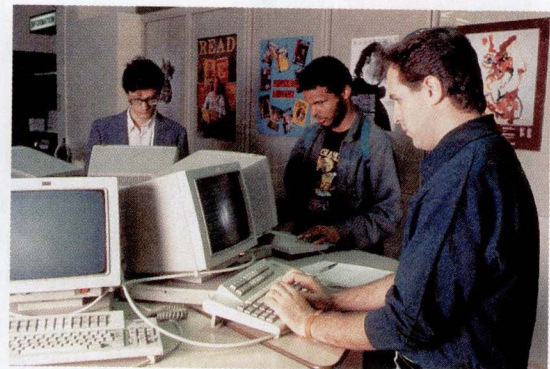
**T**he automatic teller machine. The supermarket checkout scanner. The library on-line book-search system. The cheerful but mechanical-sounding telephone voice that tells you "Please hang up and dial your call again."

These are all special-purpose computer devices. If you did not come in contact with one of these today, no doubt you encountered something similar. Like most people, then, you are already a computer user, interacting directly or indirectly with these devices several times a day. (See Figure 1.)

We assume you're reading this book, however, because you want to become a true computer user—to become "computer literate" and "computer competent." You want to go beyond pushbuttons and artificial voices and learn to use this technology as a problem-solving tool in your own career. This chapter will start you on your way by giving you a brief overview of computers, computer systems, and data processing. Subsequent chapters will cover these topics in greater detail.



(a)



(b)



(c)



(d)

FIGURE 1

Computers in daily life. As these commonplace examples show, today it is almost impossible to avoid using a computer. (a) shopping with a bank card; (b) using a computer to locate books at a New York public library; (c) using an automatic teller machine (ATM); (d) monitoring and analyzing a tennis game.



## Becoming Computer Literate and Computer Competent

**Computer literacy** is having an understanding of what a computer is and how to use it as a resource. Literacy, which is understanding, needs to be distinguished from competency, which is having a skill. **Computer competency** is having some skill with a computer so that you can use it to meet your information needs and improve your productivity.

To help you achieve this kind of competence, we will help you learn the following:

- ▼ **Terms:** You should master the terminology used to describe computers and their operations.
- ▼ **Functions:** You should learn the functions of the parts of a computer system.
- ▼ **Uses:** You should learn how to use a computer to produce the information or perform the tasks you need done.

## Types of Computers

**A computer is a device made of electronic and electromechanical parts.** The word *electromechanical* means both electronic and mechanical.

At present, computers come in four basic sizes and shapes. (See Table 1.) They are:

1. Supercomputers
2. Mainframes
3. Minicomputers
4. Microcomputers

**TABLE 1**

The Four Kinds of Computers\*

	MICROCOMPUTER	MINICOMPUTER	MAINFRAME	SUPERCOMPUTER
<b>Main memory (RAM)</b>	512,000– 32,000,000 characters	8,000,000– 50,000,000 characters	32,000,000– 200,000,000 characters	100,000,000– 2,000,000,000 characters
<b>Storage</b>	360,000– 300,000,000 characters	120,000,000– 1,000,000,000+ characters	500,000,000–? characters	No limitation
<b>Processing speed</b>	700,000– 10,000,000 instructions per second	8–40 mips <sup>†</sup>	30 mips and up	200 mips and up
<b>Cost</b>	\$500–20,000	\$10,000– \$475,000	\$250,000 and up	\$10,000,000 and up

\*The figures in this table represent average approximations. These numbers change rapidly as changing technology blurs the distinctions between categories.

<sup>†</sup>mips = million instructions per second



FIGURE 2

Supercomputer. Cray super-computer.



## Supercomputers

**Supercomputers are the largest and most powerful kinds of computers, costing millions of dollars.** (See Figure 2.) They are generally owned by large organizations and are used principally for research, oil exploration, weapons development, or weather forecasting. A supercomputer is maintained in a special room or environment and is about 50,000 times faster than a microcomputer. You probably would have contact with a supercomputer if you worked in the areas of defense and weaponry, weather forecasting, or scientific research; at one of several large universities; or for the National Aeronautics and Space Administration.

## Mainframes

**Mainframe computers are large computers costing up to \$10 million that can process billions of characters of data.** (See Figure 3.) They are used by banks, airlines, universities, government agencies, and other large organizations. The mainframe computer, which required a special room with air conditioning, was the backbone of the computer industry for many years. Today, however, its popularity has declined as smaller-size desktop computers, often hooked together in networks, have gained in power and speed.

FIGURE 3

Mainframe computer. Unisys mainframe (behind the people).



## Minicomputers

**Minicomputers are computers costing thousands of dollars that are smaller than mainframes in processing speeds and data-storing capacities.** (See Figure 4.) Until recently, these refrigerator-size devices were frequently used in medium-size companies or in divisions of large companies for special tasks, such as accounting or certain manufacturing activities. The use of minicomputers is declining as microcomputers become more powerful.

## Microcomputers

**Microcomputers are small computers costing only a few hundred or few thousand dollars.** (See Figure 5.) This is the type of computer you will no doubt use. A 1992 survey found that 85% of a sampling of U.S. workers and 88% of Canadian workers use a microcomputer on the job.

Microcomputers are of two types, personal computers and workstations.

FIGURE 4

Minicomputer. Vax 6000.

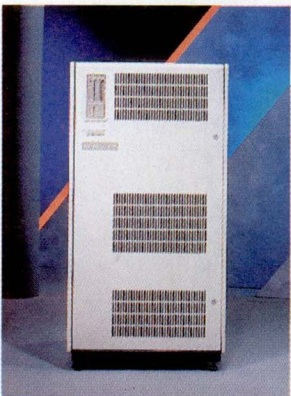


FIGURE 5

Microcomputer. Macintosh Classic II.

