Computing Essentials

Making IT work for you

INTRODUCTORY 2021

The O'Leary Series

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- *Computing Essentials 2019*
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INTRODUCTORY 2021

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Dedication

We dedicate this edition to Nicole and Katie—our inspiration.

Brief Contents

1 Information Technology, the Internet, and You 2

2 The Internet, the Web, and Electronic Commerce 24

3 Application Software 54

4 System Software 82

5 The System Unit 106

6 Input and Output 132

7 Secondary Storage 162

8 Communications and Networks 184

9 Privacy, Security, and Ethics 212

10 Information Systems 242

11 Databases 264

12 Systems Analysis and Design 288

13 Programming and Languages 312

The Evolution of the Computer Age 343

The Computer Buyer's Guide 354

Glossary 358

Index 379

Contents

1 INFORMATION TECHNOLOGY, THE INTERNET, AND YOU 2

Introduction *4*
Information Systems *4*
People *6*
Software *7*
System Software *7*
Application Software *8*
Making IT work for you:
Free Antivirus Program *9*
Hardware *10*
Types of Computers *10*
Cell Phones *11*
Personal Computer Hardware *11*
Data *13*
Connectivity and the Mobile Internet *14*
Careers in IT *15*
A Look to the Future: Using and Understanding Information Technology *16*

Visual Summary *17*
Key Terms *20*
Multiple Choice *21*
Matching *22*
Open-Ended *22*
Discussion *23*

2 THE INTERNET, THE WEB, AND ELECTRONIC COMMERCE 24

Introduction *26*
The Internet and the Web *26*
Making IT work for you:
Online Entertainment *28*
Internet Access *30*
Providers *30*
Browsers *30*
Web Utilities *32*
Filters *32*
File Transfer Utilities *32*
Internet Security Suites *33*
Communication *34*
Social Networking *34*
Blogs, Microblogs, Podcasts, and Wikis *35*
Messaging *36*
E-mail *37*
Search Tools *39*
Search Engines *39*
Content Evaluation *39*
Electronic Commerce *40*
Security *41*
Cloud Computing *42*
The Internet of Things *43*
Careers in IT *44*
A Look to the Future: Home Smart Home *45*

Visual Summary *46*
Key Terms *50*
Multiple Choice *51*
Matching *52*
Open-Ended *52*
Discussion *53*

3 APPLICATION SOFTWARE 54

Introduction *56*
Application Software *56*
User Interface *56*
Common Features *58*
General-Purpose Applications *58*
Word Processors *58*
Spreadsheets *61*
Presentation Software *63*
Database Management Systems *64*
Specialized Applications *65*
Graphics Programs *65*
Video Game Design Software *66*
Web Authoring Programs *67*
Other Specialized Applications *68*
Mobile Apps *68*
Apps *68*
App Stores *69*
Software Suites *70*
Office Suites *70*
Cloud Computing *70*
Specialized and Utility Suites *70*
Careers in IT *71*

Making IT work for you:
Cloud Office Suites 72
A Look to the Future: VR and AR Applications in the Workplace 74

Visual Summary 75
Key Terms 78
Multiple Choice 79
Matching 80
Open-Ended 80
Discussion 81

4
SYSTEM SOFTWARE 82

Introduction 84
System Software 84
Operating Systems 85
Functions 85
Features 86
Categories 87
Mobile Operating Systems 88
Desktop Operating Systems 89
Windows 89
macOS 89
UNIX and Linux 90
Virtualization 90
Utilities 91

Making IT work for you:
Virtual Assistant 92

Operating System Utilities 94
Utility Suites 97
Careers in IT 97
A Look to the Future: Making Better Computers by Making Them More Human 98

Visual Summary 99
Key Terms 102
Multiple Choice 103
Matching 104
Open-Ended 104
Discussion 105

5
THE SYSTEM UNIT 106

Introduction 108
System Unit 108
Smartphones 108
Tablets 108
Laptops 109
Desktops 109

Making IT work for you:
Gaming 110

Wearable Computers 112
Components 112
System Board 113
Microprocessor 114
Microprocessor Chips 115
Specialty Processors 115
Memory 116
RAM 116
ROM 116
Flash Memory 116
Expansion Cards and Slots 117
Bus Lines 118
Expansion Buses 118
Ports 119
Standard Ports 119
Specialized Ports 119
Cables 120
Power Supply 120
Electronic Data and Instructions 121
Numeric Representation 121
Character Encoding 122
Careers in IT 123
A Look to the Future: Brain–Computer Interfaces 124

Visual Summary 125
Key Terms 128
Multiple Choice 129
Matching 130
Open-Ended 130
Discussion 131

6
INPUT AND OUTPUT 132

Introduction 134
What Is Input? 134
Keyboard Entry 134
Keyboards 135
Pointing Devices 136
Touch Screen 136
Mouse 136
Game Controllers 136
Scanning Devices 137
Optical Scanners 137
Card Readers 138
Bar Code Readers 138
RFID Readers 138
Character and Mark Recognition Devices 139
Image Capturing Devices 139
Digital Cameras 139
Webcams 140

Audio-Input Devices *140*
Voice Recognition Systems *140*
What Is Output? *141*
Monitors *141*
Features *141*
Flat-Panel Monitors *142*
E-book Readers *142*
Other Monitors *143*
Printers *144*
Features *144*
Inkjet Printers *145*
Laser Printers *145*
3D Printers *145*
Other Printers *145*
Audio-Output Devices *146*
Combination Input and Output Devices *146*
Headsets *146*
Multifunctional Devices *147*
Virtual Reality Head-Mounted Displays and Controllers *147*
Drones *147*

Making IT work for you:
Headphones *148*

Robots *150*
Ergonomics *150*
Portable Computers *152*
Careers in IT *152*
A Look to the Future: The Internet of Things *153*

Visual Summary *154*
Key Terms *158*
Multiple Choice *159*
Matching *160*
Open-Ended *160*
Discussion *161*

7 SECONDARY STORAGE *162*

Introduction *164*
Storage *164*
Solid-State Storage *165*
Solid-State Drives *165*
Flash Memory Cards *166*
USB Drives *166*
Hard Disks *167*
Internal Hard Disks *167*
External Hard Disks *167*
Network Drives *167*
Performance Enhancements *168*
Optical Discs *169*
Cloud Storage *170*

Making IT work for you:
Cloud Storage *172*

Mass Storage Devices *174*
Enterprise Storage System *174*
Storage Area Network *175*
Careers in IT *175*
A Look to the Future: Next-Generation Storage *176*

Visual Summary *177*
Key Terms *180*
Multiple Choice *180*
Matching *181*
Open-Ended *182*
Discussion *182*

8 COMMUNICATIONS AND NETWORKS *184*

Introduction *186*
Communications *186*
Connectivity *186*
The Wireless Revolution *187*
Communication Systems *187*
Communication Channels *188*
Wireless Connections *188*
Physical Connections *189*
Connection Devices *190*
Modems *190*
Connection Service *190*

Making IT work for you:
The Mobile Office *192*

Data Transmission *194*
Bandwidth *194*
Protocols *194*
Networks *195*
Terms *195*
Network Types *197*
Local Area Networks *197*
Home Networks *197*
Wireless LAN *198*
Personal Area Network *198*
Metropolitan Area Networks *198*
Wide Area Networks *199*
Network Architecture *199*
Topologies *200*
Strategies *201*
Organizational Networks *201*
Internet Technologies *201*
Network Security *202*
Careers in IT *203*

A Look to the Future: Telepresence Lets You Be There without Actually Being There 204

Visual Summary 205
Key Terms 208
Multiple Choice 209
Matching 210
Open-Ended 210
Discussion 211

9 PRIVACY, SECURITY, AND ETHICS 212

Introduction 214
People 214
Privacy 214
Big Data 215
Private Networks 217
The Internet and the Web 217
Online Identity 220
Major Laws on Privacy 221
Security 221
Cybercrime 221
Social Engineering 223
Malicious Software 223
Malicious Hardware 223
Measures to Protect Computer Security 224

Making IT work for you: Security and Technology 229

Ethics 230
Cyberbullying 230
Copyright and Digital Rights Management 230
Plagiarism 231
Careers in IT 232

A Look to the Future: End of Anonymity 233

Visual Summary 234
Key Terms 237
Multiple Choice 238
Matching 239
Open-Ended 239
Discussion 240

10 INFORMATION SYSTEMS 242

Introduction 244
Organizational Information Flow 244
Functions 244
Management Levels 246
Information Flow 247
Computer-Based Information Systems 248
Transaction Processing Systems 249
Management Information Systems 251
Decision Support Systems 252
Executive Support Systems 253
Other Information Systems 255
Expert Systems 256
Careers in IT 256

A Look to the Future: IBM's Watson: The Ultimate Information-Finding Machine 257

Visual Summary 258
Key Terms 260
Multiple Choice 261
Matching 262
Open-Ended 262
Discussion 263

11 DATABASES 264

Introduction 266
Data 266
Data Organization 267
Key Field 268
Batch versus Real-Time Processing 268
Databases 269
Need for Databases 270
Database Management 270
DBMS Structure 272
Hierarchical Database 272
Network Database 273
Relational Database 273
Multidimensional Database 274
Object-Oriented Database 275
Types of Databases 276
Individual 276
Company 276
Distributed 277
Commercial 277
Database Uses and Issues 278
Strategic Uses 278
Security 278
Careers in IT 279

A Look to the Future: The Future of Crime Databases 280

Visual Summary 281
Key Terms 284
Multiple Choice 285
Matching 286
Open-Ended 286
Discussion 287

12
SYSTEMS ANALYSIS AND DESIGN 288

Introduction 290
Systems Analysis and Design 290
Phase 1: Preliminary Investigation 292
Defining the Problem 292
Suggesting Alternative Systems 293
Preparing a Short Report 293
Phase 2: Systems Analysis 294
Gathering Data 294
Analyzing the Data 294
Documenting Systems Analysis 296
Phase 3: Systems Design 296
Designing Alternative Systems 296
Selecting the Best System 297
Writing the Systems Design Report 297
Phase 4: Systems Development 298
Acquiring Software 298
Acquiring Hardware 298
Testing the New System 299
Phase 5: Systems Implementation 299
Types of Conversion 299
Training 300
Phase 6: Systems Maintenance 300
Prototyping and Rapid Applications Development 301
Prototyping 301
Rapid Applications Development 301
Careers in IT 302
A Look to the Future: The Challenge of Keeping Pace 303

Visual Summary 304
Key Terms 308
Multiple Choice 309
Matching 310
Open-Ended 310
Discussion 311

13
PROGRAMMING AND LANGUAGES 312

Introduction 314
Programs and Programming 314
What Is a Program? 314
What Is Programming? 314
Step 1: Program Specification 316
Program Objectives 316
Desired Output 316
Input Data 316
Processing Requirements 317
Program Specifications Document 317
Step 2: Program Design 318
Top-Down Program Design 318
Pseudocode 319
Flowcharts 319
Logic Structures 321
Step 3: Program Code 322
The Good Program 322
Coding 322
Step 4: Program Test 324
Syntax Errors 324
Logic Errors 324
Testing Process 324
Step 5: Program Documentation 326
Step 6: Program Maintenance 327
Operations 327
Changing Needs 327
CASE and OOP 328
CASE Tools 328
Object-Oriented Software Development 329
Generations of Programming Languages 330
Machine Languages: The First Generation 330
Assembly Languages: The Second Generation 330
High-Level Procedural Languages: The Third Generation 330
Task-Oriented Languages: The Fourth Generation 331
Problem and Constraint Languages: The Fifth Generation 332
Careers in IT 333
A Look to the Future: Your Own Programmable Robot 334

Visual Summary 335
Key Terms 339
Multiple Choice 340
Matching 341
Open-Ended 341
Discussion 342

The Evolution of the Computer Age 343

The Computer Buyer's Guide 354

Glossary 358

Index 379

New to Computing Essentials 2021

To increase student motivation and engagement, a focus on smartphones has been added by increasing content and providing marginal tips offering practical advice for efficient smartphone use. While the coverage of other topics has not been reduced, this change offers a gateway to demonstrate the relevance of all types of computers to their lives. Additionally, every chapter's Making IT Work for You, Privacy, Ethics, and Environment features have been carefully revaluated, enhanced, and/or replaced. Also, every chapter's Look to the Future has been revised to show that the expected breakthroughs of tomorrow are rooted in today's advances. More specific new coverage includes the following:

Chapter 1:	Expanded discussion of smartphones and cell phones
Chapter 2:	Added coverage of Web 4.0 Expanded coverage of Twitter Expanded coverage of mobile browsers Expanded coverage of web utilities and filters Expanded discussion of social networks, including LinkedIn and Facebook Expanded coverage of podcasts Added coverage of fake news and deepfakes
Chapter 3:	Added coverage of features, including Find and Replace Enhanced layout of figures Reorganized topics to increase emphasis of video editors Expanded coverage of mobile apps
Chapter 4:	Added coverage of voice assist tools Added coverage of macOS Mojave and Dark Mode Added comparison of search programs for Android, iOS, Windows, and macOS Added comparison of storage management programs for Android, iOS, Windows, and macOS Added comparison of backup programs for Android, iOS, Windows, and macOS
Chapter 5:	Reorganized sequence of topics to better compare different types of system units Enhanced figures comparing different types of system units Increased coverage of coprocessors and GPU (graphics processing units)
Chapter 6:	Updated and expanded coverage of stylus, handwriting recognition software, and touch screens Updated features of monitors including specifics regarding dot (pixel) pitch Added coverage of flexible screens Added features of printers including connectivity Expanded coverage of 3D printers
Chapter 7:	Added coverage of network and hybrid drives Expanded coverage of SSDs (solid-state drives) Added coverage of Ultra HD Blu-ray (UHD BD)
Chapter 8:	Updated salary range for network administrators in Careers in IT
Chapter 9:	Expanded coverage of privacy concerns specifically related to smartphone use Added coverage of big data and digital footprints Expanded coverage of deep web and dark web Added comparison of viewing and deleting browser histories using Android Chrome and iOS Safari Expanded coverage of spyware for smartphones including Pegasus Added coverage of two-factor authentication and two-step authentication
Chapter 11:	Added coverage of NoSQL

Preface

The 20th century brought us the dawn of the digital information age and unprecedented changes in information technology. In fact, the rate of change is clearly increasing. As we begin the 21st century, computer literacy is undoubtedly becoming a prerequisite in whatever career you choose.

The goal of *Computing Essentials* is to provide you with the basis for understanding the concepts necessary for success. *Computing Essentials* also endeavors to instill an appreciation for the effect of information technology on people, privacy, ethics, and our environment and to give you a basis for building the necessary skill set to succeed in the 21st century.

Times are changing, technology is changing, and this text is changing too. As students of today, you are different from those of yesterday. You put much effort toward the things that interest you and the things that are relevant to you. Your efforts directed at learning application programs and exploring the web seem, at times, limitless. On the other hand, it is sometimes difficult to engage in other equally important topics such as personal privacy and technological advances.

At the beginning of each chapter, we carefully lay out why and how the chapter's content is relevant to your life today and critical to your future. Within each chapter, we present practical tips related to key concepts through the demonstration of interesting applications that are relevant to your lives. Topics presented focus first on outputs rather than processes. Then, we discuss the concepts and processes.

Motivation and relevance are the keys. This text has several features specifically designed to engage and demonstrate the relevance of technology in your lives. These elements are combined with a thorough coverage of the concepts and sound pedagogical devices.

Visual Learning

VISUAL CHAPTER OPENERS


chapter 2 The Internet, the Web, and Electronic Commerce

Why should I read this chapter?

The Internet has changed the world, and will continue to have an amazing impact on our day-to-day lives. For example, Internet-connected homes of the future hold the promise of sorting our recycling, adjusting our thermostats, and even monitoring our health.

This chapter covers the things you need to know to be prepared for this ever-changing digital world, including:

- Impact—how Internet technology is changing your world.
- Hardware—how to connect your life to the Internet, including Wi-Fi, cell phones, and tablets.
- Applications—how to get ahead using social networking, streaming technology, and cloud computing.

Learning Objectives

After you have read this chapter, you should be able to:

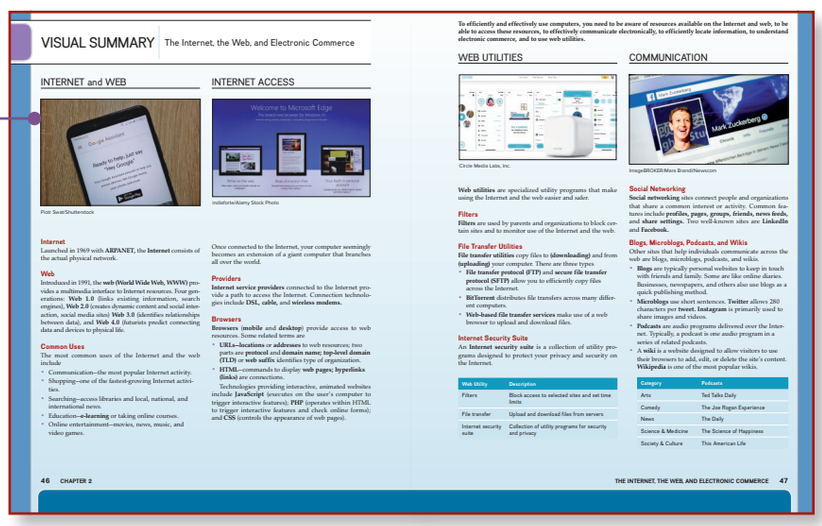
1. Explain the origins of the Internet and the web.
2. Explain how to access the web using providers and browsers.
3. Compare different web utilities, including filters, file transfer utilities, and Internet security suites.
4. Compare different Internet communications, including social networking, blogs, microblogs, podcasts, wikis, text messaging, instant messaging, and e-mail.
5. Describe search tools, including search engines.
6. Describe how to evaluate the accuracy of information presented on the web.
7. Identify electronic commerce, including B2C, C2C, B2B, and security issues.
8. Describe cloud computing, including the three-way interaction of clients, Internet, and service providers.
9. Discuss the Internet of Things (IoT) and the continuing development of the Internet to allow everyday objects to send and receive data.

25

Each chapter begins with a Why Should I Read This? feature that presents a visually engaging and concise presentation of the chapter's relevance to the reader's current and future life in the digital world. Then a list of chapter learning objectives is presented providing a brief introduction to what will be covered in the chapter.

VISUAL SUMMARIES

Visual summaries appear at the end of every chapter and summarize major concepts covered throughout the chapter. Like the chapter openers, these summaries use graphics to reinforce key concepts in an engaging and meaningful way.


VISUAL SUMMARY The Internet, the Web, and Electronic Commerce

INTERNET and WEB

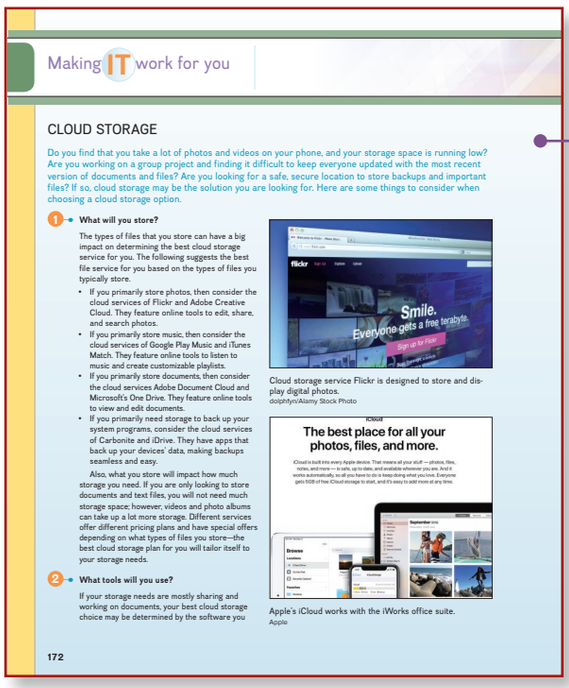
INTERNET ACCESS

WEB UTILITIES

COMMUNICATION

Unique Content

MAKING IT WORK FOR YOU



Making IT work for you

CLOUD STORAGE

Do you find that you take a lot of photos and videos on your phone, and your storage space is running low? Are you working on a group project and finding it difficult to keep everyone updated with the most recent version of documents and files? Are you looking for a safe, secure location to store backups and important files? If so, cloud storage may be the solution you are looking for. Here are some things to consider when choosing a cloud storage option.

1 What will you store?

The types of files that you store can have a big impact on determining the best cloud storage service for you. The following suggests the best file service for you based on the types of files you typically store.

- If you primarily store photos, then consider the cloud services of Flickr and Adobe Creative Cloud. They feature online tools to edit, share, and search photos.
- If you primarily store music, then consider the cloud services of Google Play Music and iTunes Match. They feature online tools to listen to music and create customizable playlists.
- If you primarily store documents, then consider the cloud services Adobe Document Cloud and Microsoft's One Drive. They feature online tools to view and edit documents.
- If you primarily need storage to back up your system programs, consider the cloud services of Carbonite and iDrive. They have apps that back up your devices' data, making backups seamless and easy.

Also, what you store will impact how much storage you need. If you are only looking to store documents and text files, you will not need much storage space; however, videos and photo albums can take up a lot more storage. Different services offer different pricing plans and have special offers depending on what types of files you store—the best cloud storage plan for you will tailor itself to your storage needs.

2 What tools will you use?

If your storage needs are mostly sharing and working on documents, your best cloud storage choice may be determined by the software you

Cloud storage service Flickr is designed to store and display digital photos.
dolphfyn/Alamy Stock Photo

The best place for all your photos, files, and more.

Apple's iCloud works with the iWorks office suite.
Apple

172

Special-interest topics are presented in the Making IT Work for You section found within nearly every chapter. These topics include Online Entertainment, Gaming, Virtual Assistants, and the Mobile Office.

PRIVACY, ETHICS, AND ENVIRONMENT

Nearly every chapter has an Environment box located in the margin adjacent to the coverage of related technologies. Topics include plagiarism of online materials, editing images to promote a particular message, and the use of monitoring software.

Nearly every chapter has a Privacy box located in the margin adjacent to the coverage of related technologies. Topics include protecting personal information when using a free Wi-Fi network or when disposing of an outdated computer.

Nearly every chapter has an Ethics box located in the margin adjacent to the coverage of related technologies. Topics include proper disposal of older CRT monitors, empty inkjet cartridges, and old computers.

environment

Daily newspapers are an important part of the free press; however, the traditional printed newspaper comes at a cost of millions of trees. Many national and local news organizations offer a digital version of their papers. Using the digital version instead of the paper version can deliver the news quickly, cheaply, and sustainably. If you want to save a tree, use the digital version of your favorite newspaper or magazine.

privacy

Did you know that one type of specialty processor is devoted exclusively to protecting your privacy? Called cryptoprocessors, these microchips perform encoding and decoding of data faster and more securely than a CPU. These specialized chips exist in ATMs, TV set-top boxes, and credit card machines.

ethics

Many of the electronic devices purchased in the United States are manufactured in other countries. Some of these manufacturers pay extremely low wages, have unsafe or unacceptable work conditions, and pollute local environments. Do you think that consumers have an ethical responsibility regarding where and/or how products are manufactured?

Figure 2-10 Facebook profile
ImageBROKER/Mara Brandl/Newscom

Communication

As previously mentioned, communication is the most popular Internet activity, and its impact cannot be overestimated. At a personal level, friends and family can stay in contact with one another even when separated by thousands of miles. At a business level, electronic communication has become a standard way to stay in touch with suppliers, employees, and customers. Some popular types of Internet communication are social networking, blogs, microblogs, podcasts, wikis, e-mail, and messaging.

Social Networking

Social networking is one of the fastest-growing and most significant Web 2.0 applications. Social networking sites focus on connecting people and organizations that share a common interest or activity. These sites typically provide a wide array of tools that facilitate meeting, communicating, and sharing. There are hundreds of social networking sites, but they share some common features:

- **Profiles** are created by individuals to share information about them. These profiles often include photos, personal details, and contact information. (See Figure 2-10.)
- **Pages** are created by companies to promote their business. These pages often include hours of operations, upcoming sales, and information about their products.
- **Groups** are communities of individuals who share a common interest and come together online to share information and discuss specific topics. Groups are typically organized around topics, events, or ideas. They are popular among clubs and organizations to coordinate activities or share information.
- **Friends** are a list of other members on a social media site that you want to communicate with.
- **News feed** is the first page you see after logging into a social networking site. It typically consists of a collection of recent posts from friends, trending topics on the site, people's responses to your posts, and advertisements.
- **Share settings** on your social media account determine who can see your posts. The most common options include sharing with everyone, just your friends, or just a subset of your friends.

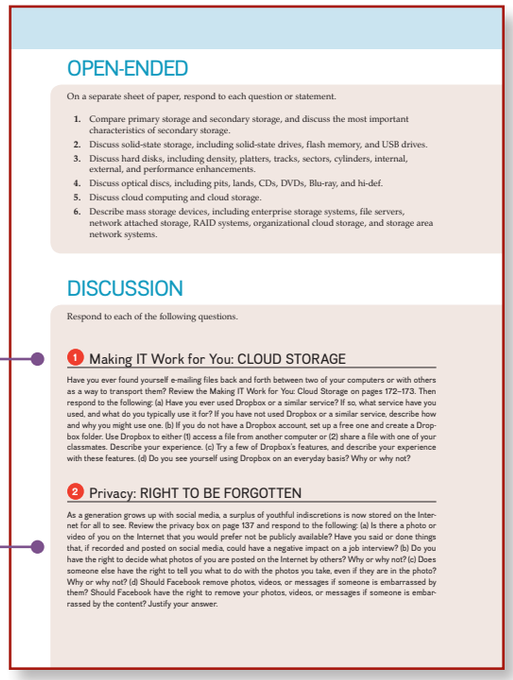
Unique End-of-Chapter Discussion Materials

MAKING IT WORK FOR YOU

Making IT Work for You discussion questions are carefully integrated with the chapter's Making IT Work for You topics. The questions facilitate in-class discussion or written assignments focusing on applying specific technologies into a student's day-to-day life. They are designed to expand a student's awareness of technology applications.

PRIVACY

Privacy discussion questions are carefully integrated with the chapter's marginal Privacy box. The questions facilitate in-class discussion or written assignments focusing on critical privacy issues. They are designed to develop a student's ability to think critically and communicate effectively.



OPEN-ENDED

On a separate sheet of paper, respond to each question or statement.

1. Compare primary storage and secondary storage, and discuss the most important characteristics of secondary storage.
2. Discuss solid-state storage, including solid-state drives, flash memory, and USB drives.
3. Discuss hard disks, including density, platters, tracks, sectors, cylinders, internal, external, and performance enhancements.
4. Discuss optical discs, including pits, lands, CDs, DVDs, Blu-ray, and hi-def.
5. Discuss cloud computing and cloud storage.
6. Describe mass storage devices, including enterprise storage systems, file servers, network attached storage, RAID systems, organizational cloud storage, and storage area network systems.

DISCUSSION

Respond to each of the following questions.

1 Making IT Work for You: CLOUD STORAGE

Have you ever found yourself e-mailing files back and forth between two of your computers or with others as a way to transport them? Review the Making IT Work for You: Cloud Storage on pages 172–173. Then respond to the following: (a) Have you ever used Dropbox or a similar service? If so, what service have you used, and what do you typically use it for? If you have not used Dropbox or a similar service, describe how and why you might use one. (b) If you do not have a Dropbox account, set up a free one and create a Dropbox folder. Use Dropbox to either (1) access a file from another computer or (2) share a file with one of your classmates. Describe your experience. (c) Try a few of Dropbox's features, and describe your experience with these features. (d) Do you see yourself using Dropbox on an everyday basis? Why or why not?

2 Privacy: RIGHT TO BE FORGOTTEN

As a generation grows up with social media, a surplus of youthful indiscretions is now stored on the Internet for all to see. Review the privacy box on page 137 and respond to the following: (a) Is there a photo or video of you on the Internet that you would prefer not be publicly available? Have you said or done things that, if recorded and posted on social media, could have a negative impact on a job interview? (b) Do you have the right to decide what photos of you are posted on the Internet by others? Why or why not? (c) Does someone else have the right to tell you what to do with the photos you take, even if they are in the photo? Why or why not? (d) Should Facebook remove photos, videos, or messages if someone is embarrassed by them? Should Facebook have the right to remove your photos, videos, or messages if someone is embarrassed by the content? Justify your answer.

DISCUSSION

Respond to each of the following questions.

1 Making IT Work for You

Making it a habit of keeping current with technology applications can be a key to your success. Numerous full-page spreads identified as *Making IT Work for You* are presented in the following chapters. These sections address some of today's most interesting and useful applications. They include online entertainment in Chapter 2, online office suites in Chapter 3, and cloud storage in Chapter 7. Select one that you find the most interesting and then respond to the following: (a) Why did you select this application? (b) Have you used this application? If so, when and how? If not, do you plan to in the near future? (c) Go to the chapter containing your selected application, and locate the application's Making IT Work for You coverage. Review and briefly describe its contents. (d) Did you find the coverage useful? Why or why not?

2 Privacy

Privacy is one of the most critical issues facing society today. Numerous Privacy boxes appear in the margins of the upcoming chapters presenting a variety of privacy issues. These issues include apps that constantly track your movements without your knowledge or consent in Chapter 3; public Wi-Fi connections that record all of your personal communications in Chapter 8; and protection of personal privacy while using social networking sites such as Facebook in Chapter 9. Select one that you find the most interesting, and then respond to the following: (a) Why did you select this issue? (b) Do you have knowledge of or experience with the issue? If so, describe your knowledge or experience. If not, do you consider the issue to be important for protecting your privacy? (c) Go to the chapter containing your selected issue, locate the Privacy box, read it, and describe its contents. (d) Did you find the coverage thought-provoking? Why or why not?

3 Ethics

Computer ethics are guidelines for the morally acceptable use of computers in our society. Numerous Ethics boxes appear in the margins of the upcoming chapters presenting a variety of ethical issues. These issues include image editing in Chapter 3, unauthorized use of webcams in Chapter 6, and unauthorized monitoring or eavesdropping of Internet activity in Chapter 8. Select one issue that you find the most interesting and then respond to the following: (a) Why did you select this issue? (b) Do you have knowledge of or experience with the issue? If so, describe your knowledge or experience. If not, do you consider the issue critical for individuals or organizations? (c) Go to the chapter containing your selected issue, locate the Ethics box, read it, and describe its contents. (d) Did you find the coverage thought-provoking? Why or why not?

4 Environment

Almost everyone agrees that protecting our environment today is more important than ever before. Numerous Environment boxes appear in the margins of the upcoming chapters. These boxes present a variety of environmental topics, including digital media benefits in Chapter 2, operating systems reducing energy consumption in Chapter 4, and recycling old inkjet cartridges in Chapter 6. Select one that you find the most interesting and then respond to the following: (a) Why did you select this topic? (b) Go to the chapter containing your selected topic, locate the Environment box, read it, and describe its contents. (c) Did you find the coverage thought-provoking? Why or why not?

Design Elements: Concept Check icons: Dizzle52/Getty Images; Making IT Work for You: cifotart/Shutterstock

CHAPTER 1 23

ETHICS

Ethics discussion questions are carefully integrated with the chapter's marginal Ethics boxes. The questions facilitate in-class discussion or written assignments focusing on ethical issues relating to technology. They are designed to develop a student's ability to think critically and communicate effectively.

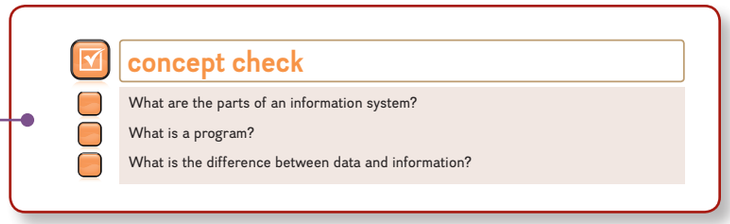
ENVIRONMENT

Environment discussion questions are carefully integrated with the chapter's marginal Environment boxes. The questions facilitate in-class discussion or written assignments focusing on environmental issues relating to technology. They are designed to develop a student's ability to think critically and communicate effectively.

Reinforcing Key Concepts

CONCEPT CHECKS

Located at points throughout each chapter, the Concept Check cues you to note which topics have been covered and to self-test your understanding of the material presented.

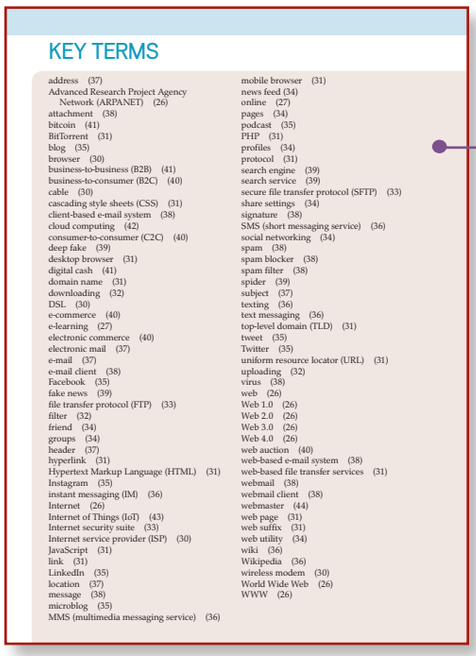

concept check

What are the parts of an information system?

What is a program?

What is the difference between data and information?

KEY TERMS

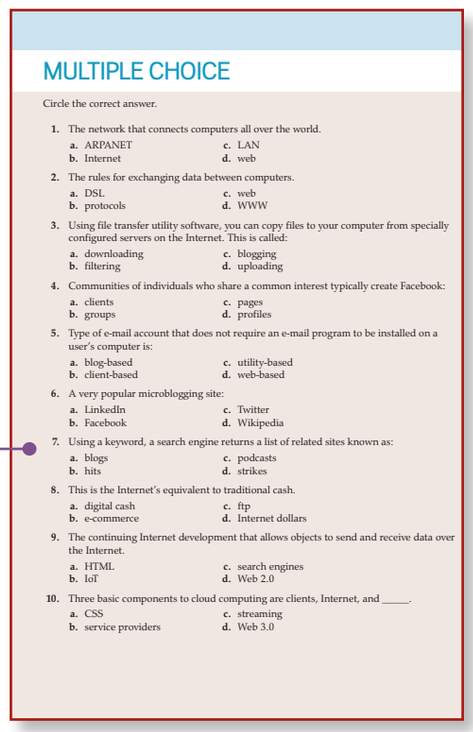

KEY TERMS

address (37)
Advanced Research Project Agency Network (ARPANET) (26)
attachment (38)
bitcoin (41)
BitTorrent (31)
blog (35)
browser (30)
business-to-business (B2B) (41)
business-to-consumer (B2C) (40)
cable (30)
cascading style sheets (CSS) (31)
client-based e-mail system (38)
cloud computing (42)
consumer-to-consumer (C2C) (40)
deep fake (39)
desktop browser (31)
digital cash (41)
domain name (31)
downloading (32)
DSL (30)
e-commerce (40)
e-learning (27)
electronic commerce (40)
electronic mail (37)
e-mail (37)
e-mail client (38)
Facebook (35)
fake news (39)
file transfer protocol (FTP) (33)
filter (32)
friend (34)
groups (34)
header (37)
hyperlink (31)
Hypertext Markup Language (HTML) (31)
Instagram (35)
instant messaging (IM) (36)
Internet (26)
Internet of Things (IoT) (43)
Internet security suite (33)
Internet service provider (ISP) (30)
JavaScript (31)
link (31)
LinkedIn (35)
location (37)
message (38)
microblog (35)
MMS (multimedia messaging service) (36)
mobile browser (31)
news feed (34)
online (27)
pages (34)
podcast (35)
PHP (31)
profiles (34)
protocol (31)
search engine (39)
search service (39)
secure file transfer protocol (SFTP) (33)
share settings (34)
signature (38)
SMS (short messaging service) (36)
social networking (34)
spam (38)
spam blocker (38)
spam filter (38)
spider (39)
subject (37)
texting (36)
text messaging (36)
top-level domain (TLD) (31)
tweet (35)
Twitter (35)
uniform resource locator (URL) (31)
uploading (32)
virus (38)
web (26)
Web 1.0 (26)
Web 2.0 (26)
Web 3.0 (26)
Web 4.0 (26)
web auction (40)
web-based e-mail system (38)
web-based file transfer services (31)
webmail (38)
webmail client (38)
webmaster (44)
web page (31)
web suffix (31)
web utility (34)
wiki (36)
Wikipedia (36)
wireless modem (30)
World Wide Web (26)
WWW (26)

Throughout the text, the most important terms are presented in bold and are defined within the text. You will also find a list of key terms at the end of each chapter and in the glossary at the end of the book.

CHAPTER REVIEW

Following the Visual Summary, the chapter review includes material designed to review and reinforce chapter content. It includes a key terms list that reiterates the terms presented in the chapter, multiple-choice questions to help test your understanding of information presented in the chapter, matching exercises to test your recall of terminology presented in the chapter, and open-ended questions or statements to help review your understanding of the key concepts presented in the chapter.

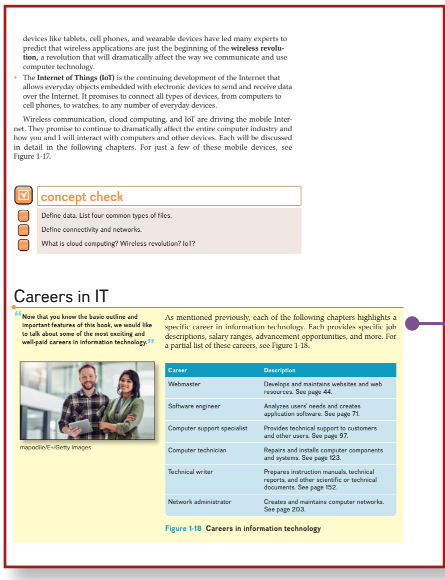

MULTIPLE CHOICE

Circle the correct answer.

1. The network that connects computers all over the world.
   a. ARPANET c. LAN
   b. Internet d. web
2. The rules for exchanging data between computers.
   a. DSL c. web
   b. protocols d. WWW
3. Using file transfer utility software, you can copy files to your computer from specially configured servers on the Internet. This is called:
   a. downloading c. blogging
   b. filtering d. uploading
4. Communities of individuals who share a common interest typically create Facebook:
   a. clients c. pages
   b. groups d. profiles
5. Type of e-mail account that does not require an e-mail program to be installed on a user's computer is:
   a. blog-based c. utility-based
   b. client-based d. web-based
6. A very popular microblogging site:
   a. LinkedIn c. Twitter
   b. Facebook d. Wikipedia
7. Using a keyword, a search engine returns a list of related sites known as:
   a. blogs c. podcasts
   b. hits d. strikes
8. This is the Internet's equivalent to traditional cash.
   a. digital cash c. ftp
   b. e-commerce d. Internet dollars
9. The continuing Internet development that allows objects to send and receive data over the Internet.
   a. HTML c. search engines
   b. IoT d. Web 2.0
10. Three basic components to cloud computing are clients, Internet, and _____.
    a. CSS c. streaming
    b. service providers d. Web 3.0

The Future of Information Technology

CAREERS IN IT


devices like tablets, cell phones, and wearable devices have led many experts to predict that wireless applications are just the beginning of the **wireless revolution,** a revolution that will dramatically affect the way we communicate and use computer technology.

- The **Internet of Things (IoT)** is the continuing development of the Internet that allows everyday objects embedded with electronic devices to send and receive data over the Internet. It promises to connect all types of devices, from computers to cell phones, to watches, to any number of everyday devices.

Wireless communication, cloud computing, and IoT are driving the mobile Internet. They promise to continue to dramatically affect the entire computer industry and how you and I will interact with computers and other devices. Each will be discussed in detail in the following chapters. For just a few of these mobile devices, see Figure 1-17.

concept check

- Define data. List four common types of files.
- Define connectivity and networks.
- What is cloud computing? Wireless revolution? IoT?

Careers in IT

"Now that you know the basic outline and important features of this book, we would like to talk about some of the most exciting and well-paid careers in information technology."

mapodile/E+/Getty Images

As mentioned previously, each of the following chapters highlights a specific career in information technology. Each provides specific job descriptions, salary ranges, advancement opportunities, and more. For a partial list of these careers, see Figure 1-18.

Career	Description
Webmaster	Develops and maintains websites and web resources. See page 44.
Software engineer	Analyzes users' needs and creates application software. See page 71.
Computer support specialist	Provides technical support to customers and other users. See page 97.
Computer technician	Repairs and installs computer components and systems. See page 123.
Technical writer	Prepares instruction manuals, technical reports, and other scientific or technical documents. See page 152.
Network administrator	Creates and maintains computer networks. See page 203.

Figure 1-18 Careers in information technology

Some of the fastest-growing career opportunities are in information technology. Each chapter highlights one of the most promising careers in IT by presenting job titles, responsibilities, educational requirements, and salary ranges. Among the careers covered are webmaster, software engineer, and database administrator. You will learn how the material you are studying relates directly to a potential career path.


A LOOK TO THE FUTURE

Using and Understanding Information Technology

The purpose of this book is to help you use and understand information technology. We want to help you become proficient and to provide you with a foundation of knowledge so that you can understand how technology is being used today and anticipate how technology will be used in the future. This will enable you to benefit from six important information technology developments.

The Internet and the Web

The Internet and the web are considered to be the two most important technologies for the 21st century. Understanding how to efficiently and effectively use the Internet to browse, communicate, and locate information is an essential skill. These issues are presented in Chapter 2, The Internet, the Web, and Electronic Commerce.

Powerful Software

The software that is now available can do an extraordinary number of tasks and help you in an endless number of ways. You can create professional-looking documents, analyze massive amounts of data, create dynamic multimedia web pages, and much more. Today's employers are expecting the people they hire to be able to effectively and efficiently use a variety of different types of software. General-purpose, specialized, and mobile applications are presented in Chapter 3. System software is presented in Chapter 4.

Powerful Hardware

Personal computers are now much more powerful than they used to be. Cell phones, tablets, and communication technologies such as wireless networks are dramatically changing the ways to connect to other computers, networks, and the Internet. However, despite the rapid change of specific equipment, their essential features remain unchanged. To become an efficient and effective end user, you should focus on these features. Chapters 5 through 8 explain what you need to know about hardware. For those considering the purchase of a computer, an appendix—The Computer Buyer's Guide—is provided at the end of this book. This guide provides a very concise comparison of desktops, laptops, tablets, and cell phones.

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Privacy, Security, and Ethics

What about people? Experts agree that we as a society must be careful about the potential of technology to negatively affect our lives. Specifically, we need to be aware of how technology can affect our personal privacy and our environment. Also, we need to understand the role and the importance of organizational and personal ethics. These critical issues are integrated in every chapter of this book as well as extensively covered in Chapter 9.

Organizations

Almost all organizations rely on the quality and flexibility of their information systems to stay competitive. As a member or employee of an organization, you will undoubtedly be involved in these information systems. In order to use, develop, modify, and maintain these systems, you need to understand the basic concepts of information systems and know how to safely, efficiently, and effectively use computers. These concepts are covered throughout this book.

Changing Times

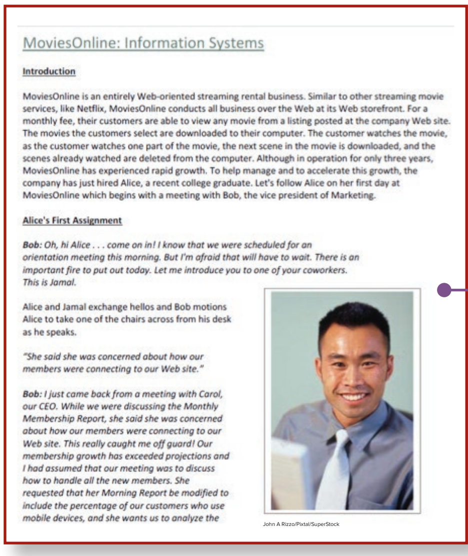
Are the times changing any faster now than they ever have? Almost everyone thinks so. Whatever the answer, it is clear we live in a fast-paced age. The Evolution of the Computer Age section presented at the end of this book tracks the major developments since computers were first introduced.

After reading this book, you will be in a very favorable position compared with many other people in industry today. You will learn not only the basics of hardware, software, connectivity, the Internet, and the web, but also the most current technology. You will be able to use these tools to your advantage.

16

A LOOK TO THE FUTURE

Each chapter concludes with a brief discussion of a recent technological advancement related to the chapter material, reinforcing the importance of staying informed.


MoviesOnline: Information Systems

Introduction

MoviesOnline is an entirely Web-oriented streaming rental business. Similar to other streaming movie services, like Netflix, MoviesOnline conducts all business over the Web at its Web storefront. For a monthly fee, their customers are able to view any movie from a listing posted at the company Web site. The movies the customers select are downloaded to their computer. The customer watches the movie, as the customer watches one part of the movie, the next scene in the movie is downloaded, and the scenes already watched are deleted from the computer. Although in operation for only three years, MoviesOnline has experienced rapid growth. To help manage and to accelerate this growth, the company has just hired Alice, a recent college graduate. Let's follow Alice on her first day at MoviesOnline which begins with a meeting with Bob, the vice president of Marketing.

Alice's First Assignment

Bob: Oh, hi Alice . . . come on in! I know that we were scheduled for an orientation meeting this morning. But I'm afraid that will have to wait. There is an important fire to put out today. Let me introduce you to one of your coworkers. This is Jamal.

Alice and Jamal exchange hellos and Bob motions Alice to take one of the chairs across from his desk as he speaks.

"She said she was concerned about how our members were connecting to our Web site."

Bob: I just came back from a meeting with Carol, our CEO. While we were discussing the Monthly Membership Report, she said she was concerned about how our members were connecting to our Web site. This really caught me off guard! Our membership growth has exceeded projections and I had assumed that our meeting was to discuss how to handle all the new members. She requested that her Morning Report be modified to include the percentage of our customers who use mobile devices, and she wants us to analyze the

John A Rizzo/Pixtal/SuperStock

Found in Connect for Computing Essentials 2021, Using IT at MoviesOnline—A Case Study of a fictitious organization provides an up-close look at what you might expect to find on the job in the real world. You will follow Alice, a recent college graduate hired as a marketing analyst, as she navigates her way through accounting, marketing, production, human resources, and research, gathering and processing data to help manage and accelerate the growth of the three-year-old company.

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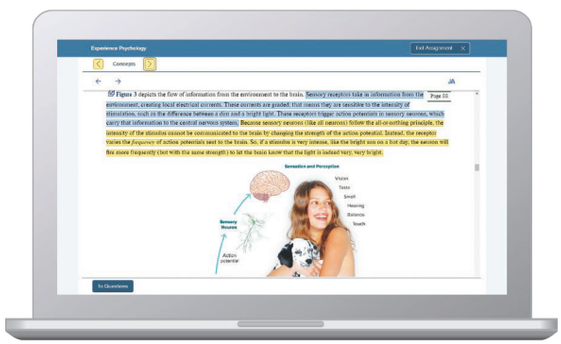

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- Jordan Cunningham, Eastern Washington University

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Support Materials in Connect

The Instructor's Manual offers lecture outlines with teaching notes and figure references. It provides definitions of key terms and solutions to the end-of-chapter material, including multiple-choice and open-ended questions.

The PowerPoint slides are designed to provide instructors with a comprehensive resource for lecture use. The slides include a review of key terms and topics, as well as artwork taken from the text to further explain concepts covered in each chapter.

The testbank contains over 2,200 questions categorized by level of learning (definition, concept, and application). This is the same learning scheme that is introduced in the text to provide a valuable testing and reinforcement tool. Text page references have been provided for all questions, including a level-of-difficulty rating.

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A special thank-you goes to the professors who took time out of their busy schedules to provide us with the feedback necessary to develop the 2021 edition of this text. The following professors offered valuable suggestions on revising the text:

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Columbus State University

James Frost
Idaho State University

Brent Nabors
Clovis Community College

Marti Phillips
Patrick Henry Community College

About the Authors

Courtesy of Timothy O'Leary.

The O'Learys live in the American Southwest and spend much of their time engaging instructors and students in conversation about learning. In fact, they have been talking about learning for over 25 years. Something in those early conversations convinced them to write a book, to bring their interest in the learning process to the printed page.

The O'Learys form a unique team blending youth and experience. Dan has taught at the University of California at Santa Cruz, developed energy-related labs at NASA, and worked as a database administrator and as a consultant in information systems; he is currently a professor at the City College of San Francisco. Tim has taught courses at Stark Technical College in Canton, Ohio, and at Rochester Institute of Technology in upstate New York, and is currently a professor emeritus at Arizona State University. Linda offered her expertise at ASU for several years as an academic advisor. She also presented and developed materials for major corporations such as Motorola, Intel, Honeywell, and AT&T, as well as various community colleges in the Phoenix area.

Tim, Linda, and Dan have talked to and taught numerous students, all of them with a desire to learn something about computers and applications that make their lives easier, more interesting, and more productive.

Each new edition of an O'Leary text, supplement, or learning aid has benefited from these students and their instructors who daily stand in front of them (or over their shoulders).

Computing Essentials

Making IT work for you

INTRODUCTORY 2021

chapter 1

Information Technology, the Internet, and You

Why should I read this chapter?

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The future of computers and digital technology promises exciting challenges and opportunities. Powerful software and hardware systems are changing the way people and organizations interact in their daily life and on the Internet.

This chapter introduces you to the skills and concepts you need to be prepared for this ever-changing digital world, including:

- Information systems—how the critical parts of technology interact.
- Efficiency and effectiveness—how to maximize the use of technology.
- Privacy, ethics, and environment—how to integrate technology with people.
- Software, hardware, and data—understand the technology used in information systems.
- Connectivity and cloud computing—how the Internet, the web, and the wireless revolution are changing how we communicate and interact.

Learning Objectives

After you have read this chapter, you should be able to:

1. Explain the parts of an information system: people, procedures, software, hardware, data, and the Internet.
2. Distinguish between system software and application software.
3. Differentiate between the three kinds of system software programs.
4. Define and compare general-purpose, specialized, and mobile applications.
5. Identify the four types of computers and the five types of personal computers.
6. Describe the different types of computer hardware, including the system unit, input, output, storage, and communication devices.
7. Define data and describe document, worksheet, database, and presentation files.
8. Explain computer connectivity, the wireless revolution, the Internet, cloud computing, and IoT.

Introduction

"Welcome to *Computing Essentials.* I'm Katie, and this is Alan, we work in information technology. On the following pages, we'll be discussing some of the most exciting new developments in computer technology, including smartphones, tablets, and cloud computing. Let me begin this chapter by giving you an overview of the book and showing you some of its special features."

mapodile/E+/Getty Images

The purpose of this book is to help you become a highly efficient and effective computer user. This includes how to use (1) apps and application software; (2) all types of computer hardware, including mobile devices like smartphones, tablets, and laptops; and (3) the Internet. Becoming a highly efficient and effective computer user also requires a full understanding of the potential impact of technology on privacy and the environment as well as the role of personal and organizational ethics.

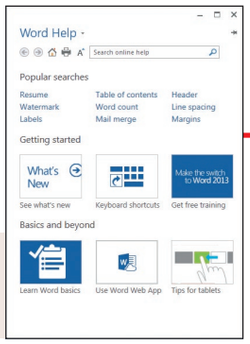
To effectively and efficiently use computers, you need to know the parts of an information system: people, procedures, software, hardware, data, and the Internet. You also need to understand the wireless revolution, the mobile Internet, and the web and to recognize the role of information technology in your personal and professional life.

Information Systems

When you think of a personal computer, perhaps you think of just the equipment itself. That is, you think of the screen or the keyboard. Yet there is more to it than that. The way to think about a personal computer is as part of an information system. An **information system** has several parts: *people, procedures, software, hardware, data,* and *the Internet.* (See Figure 1-1.)

- **People:** It is easy to overlook people as one of the parts of an information system. Yet this is what personal computers are all about—making **people, end users** like you, more productive.
- **Procedures:** The rules or guidelines for people to follow when using software, hardware, and data are **procedures.** These procedures are typically documented in manuals written by computer specialists. Software and hardware manufacturers provide manuals with their products. These manuals are provided in either printed or electronic form.
- **Software:** A **program** consists of the step-by-step instructions that tell the computer how to do its work. **Software** is another name for a program or programs. The purpose of software is to convert **data** (unprocessed facts) into **information** (processed facts). For example, a payroll program would instruct the computer to take the number of hours you worked in a week (data) and multiply it by your pay rate (data) to determine how much you are paid for the week (information).
- **Hardware:** The equipment that processes the data to create information is called **hardware.** It includes smartphones, tablets, keyboards, mice, displays, system units, and other devices. Hardware is controlled by software.
- **Data:** The raw, unprocessed facts, including text, numbers, images, and sounds, are called data. Processed data yields information. Using the previous example of a payroll program, the data (number of hours worked and pay rate) is processed (multiplied) to yield information (weekly pay).
- **Internet:** Almost all information systems provide a way to connect to other people and computers, typically using the Internet. This connectivity greatly expands the capability and usefulness of information systems.

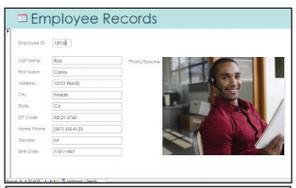
People
are end users who use computers to make themselves more productive.

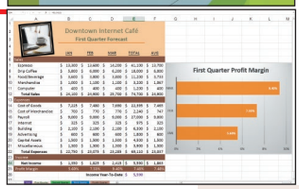


Procedures
specify rules or guidelines for computer operations.

Software
provides step-by step instructions for computer hardware.

Hardware
includes keyboard, mouse, display, system unit, tablets, smartphones, and other devices.





Data
consists of unprocessed facts, including text, numbers, images, and sounds.

Internet
allows computers to connect to people and other computers.

Figure 1-1 Parts of an information system

People: filadendron/E+/Getty Images; **Procedures:** Microsoft Corporation; **Software:** (Windows 10) Aaron Roeth/McGraw-Hill Education; (Office 365) Nor Gal/Shutterstock; **Hardware:** (Smartphone) junior_cinematic/Shutterstock; (Tablet) Colin Hui/Shutterstock; (Laptop) 4X-image/iStock/Getty Images; (Desktop) Scanrail1/Shutterstock; **Data:** Microsoft Corporation; (Rescue puppy or Dog) Zoom Pet Photography/Image Source/Getty Images; (Employee portrait) Sam Edwards/age fotostock; (Coffee) Stockbyte/Getty Images; (Parrot) Maciej Czekajewski/Shutterstock; **Internet:** franckreporter/Getty Images

concept check

- What are the parts of an information system?
- What is a program?
- What is the difference between data and information?

environment

Recycling last year reduced our landfills by over 10 million tons. This success is largely due to voluntary participation of people across the country who have made "reduce, reuse, and recycle" a personal commitment. This includes recycling old computers, cell phones, printers, and displays. Your participation in recycling means fewer one-use products, cleaner water, and cleaner air. But recycling may someday pay off financially too. Many now see waste as a resource, and one that we shouldn't squander by filling up the garbage can instead of the recycling bin. Imagine a future where the garbage collector drops off a check for your contributions to going green.

People

People are surely the most important part of any information system. Our lives are touched every day by computers and information systems. Many times the contact is direct and obvious, such as when we create documents using a word processing program or when we connect to the Internet. (See Figure 1-2.) Other times, the contact is not as obvious.

Throughout this book you will find a variety of features designed to help you become an efficient and effective end user. These features include Making IT Work for You, Tips, Privacy, Environment, Ethics, and Careers in IT.

Figure 1-2 People and computers
goodluz/Shutterstock

- **Making IT Work for You.** Throughout this book you will find Making IT Work for You features that present numerous interesting and practical IT applications. For just a few of the Making IT Work for You topics, see Figure 1-3.
- **Tips.** We all can benefit from a few tips or suggestions. Throughout this book you will find numerous tips to make your computing safer, more efficient, and more effective. These tips range from the basics of keeping your computer system

Application	Description
Free Antivirus Program	Protect your computer by installing and using a free antivirus program. See page 9.
Cloud Office Suites	Create and collaborate with others online to make better documents and presentations. See page 72.
Gaming	Delve into the world of video games and find the best video game hardware for you. See page 110.
Cloud Storage	Move your files online to synch files between devices or free up space on your digital devices. See page 172.
The Mobile Office	Get work done on the road; whether a business trip or your daily commute, these tools will help you make the most of your time. See page 192.

Figure 1-3 Making IT Work for You applications

running smoothly to how to protect your privacy while surfing the web. For a partial list of the tips presented in the following chapters, see Figure 1-4.

- **Privacy.** One of the most critical issues today is how to protect the privacy of our personal information. Throughout this book you will find Privacy boxes in the margin that present information about protecting our privacy.
- **Environment.** Today it is more important than ever that we be aware of our impact on the environment. In this chapter and the following ones, you will find Environment boxes in the margin that present important relevant environmental information.
- **Ethics.** Most people agree that we should behave ethically. That is, we should follow a system of moral principles that direct our everyday lives. However, for any given circumstance, people often do not agree on the ethics of the situation. Throughout this book you will find numerous Ethics boxes posing a variety of different ethical/unethical situations for your consideration.
- **Careers in IT.** One of the most important decisions of your life is to decide upon your life's work or career. Perhaps you are planning to be a writer, an artist, or an engineer. Or you might become a professional in **information technology (IT).** Each of the following chapters highlights a specific career in information technology. This feature provides job descriptions, projected employment demands, educational requirements, current salary ranges, and advancement opportunities.

Are you getting the most out of your cell phone? Here are just a few of the tips to make your computing safer, more efficient, and more effective. tips

1. **Low battery.** Do you find that your cell phone's battery keeps its charge for less time than it used to? Here are some ways to make your battery last longer. See page 120.
2. **Cell phone cameras.** Capturing life's moments in a photo is easier and faster with a cell phone. But a few simple tips can make the process easier and your photos better. See page 67.
3. **Disaster planning.** Having a cell phone lost or stolen can be devastating. Follow these suggestions to make it easier to get your phone back, or recover its data quickly. See page 226.
4. **Data usage.** Is your cell phone data plan costing you money? Are your cell phone apps using up your data plan without you knowing it? Take control of your data usage with the tips on page 170.
5. **Protecting your identity.** Identity theft is a growing problem and can be financially devastating if you are a victim. Some steps to protect your identity are on page 221.

Figure 1-4 Selected tips

concept check

- Which part of an information system is the most important?
- Describe the Making IT Work for You, Tips, and Privacy features.
- Describe the Environment, Ethics, and Careers in IT features.

Software

Software, as we mentioned, is another name for programs. Programs are the instructions that tell the computer how to process data into the form you want. In most cases, the words *software* and *programs* are interchangeable. There are two major kinds of software: *system software* and *application software.* You can think of application software as the kind you use. Think of system software as the kind the computer uses.

System Software

The user interacts primarily with application software. **System software** enables the application software to interact with the computer hardware. System software is "background" software that helps the computer manage its own internal resources.

Figure 1-5 Windows 10
Microsoft Corporation

Figure 1-6 macOS
Apple

System software is not a single program. Rather, it is a collection of programs, including the following:

- **Operating systems** are programs that coordinate computer resources, provide an interface between users and the computer, and run applications. Smartphones, tablets, and many other mobile devices use **embedded operating systems,** also known as **real-time operating systems (RTOS).** Desktop computers use **stand-alone operating systems** like Windows 10 or macOS. (See Figures 1-5 and 1-6.) Networks use **network operating systems (NOS).**
- **Utilities** perform specific tasks related to managing computer resources. One of the most essential utility programs that every computer system should have is an antivirus program. These programs protect your computer system from **viruses** or malicious programs that are all too often deposited onto your computer from the Internet. These programs can damage software and hardware, as well as compromise the security and privacy of your personal data. If your computer does not have an antivirus program installed on it, you need to get one. To see how you can install a free antivirus program on your computer, see Making IT Work for You: Free Antivirus Program on page 9.

Application Software

Application software might be described as end-user software. Three types of application software are *general-purpose, specialized,* and *apps.*

General-purpose applications are widely used in nearly all career areas. They are the kinds of programs you have to know to be considered an efficient and effective end user. Some of the best known are presented in Figure 1-7.

Specialized applications include thousands of other programs that are more narrowly focused on specific disciplines and occupations. Two of the best known are graphics and web authoring programs.

Mobile apps, also known as **mobile applications** or simply **apps,** are small programs primarily designed for mobile devices such as smartphones and for tablets. There are over 5 million apps. The most popular mobile apps are for social networking, playing games, and downloading music and videos.

Type	Description
Word processors	Prepare written documents
Spreadsheets	Analyze and summarize numerical data
Database management systems	Organize and manage data and information
Presentation software	Communicate a message or persuade other people

Figure 1-7 General-purpose applications

Making IT work for you

FREE ANTIVIRUS PROGRAM

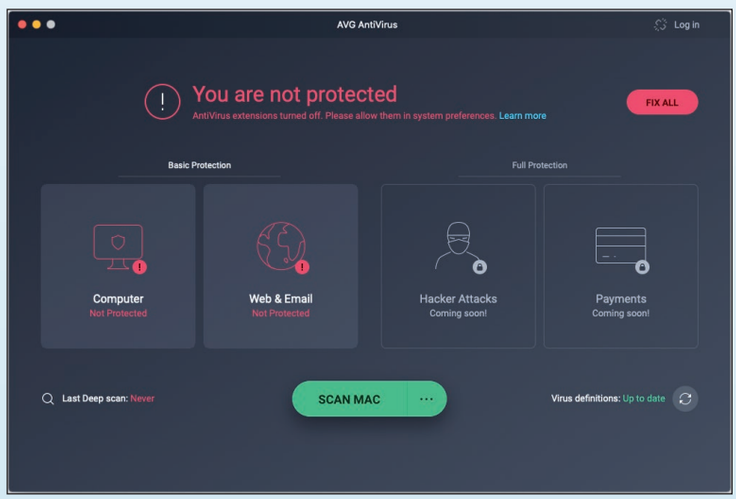
Have you or someone you know had a slower computing experience due to a spyware infection? Even worse, perhaps a malicious piece of software stole crucial, personal information or caused a total system failure. Most of these problems can be averted by having an up-to-date antivirus program running in your computer's memory at all times. This exercise shows you how to download and install a free antivirus program if your computer does not yet have one. (Please note that the web is continually changing, and some of the specifics presented here may have changed.)

Getting Started First, make sure your computer does not have an antivirus or security suite running. If it does, be sure to completely uninstall that program, even if the subscription is expired. Now, follow these steps to install AVG, a popular, free antivirus program:

1. **Visit http://free.avg.com and click the *Download* button. You will be asked to click "save" to save the installation file to your computer.**
2. **Run the installation file and follow the prompts.**
3. **Select *Install Basic* to install the antivirus software. Once the program is installed, it will open automatically.**

Using AVG Generally speaking, your antivirus program watches your system for malware and updates itself automatically. However, you can always download updates manually, set a schedule for full-system scans, and change basic settings for various components of the software.

1. **Click *Scan now* to run a full scan on your computer.**
2. **Just to the right of that, click the button with the white cog to see the scan options, where you can set a schedule for automated scans.**
3. **Click the *back arrow* to reach the main screen, where you can click various elements of the program to configure them. For example, clicking *Web* will allow you to turn on a feature that detects cookies that may be used to track your online activity.**



AVG Technologies

concept check

Describe the two major kinds of software.

Describe two types of system software programs.

Define and compare general-purpose applications, specialized applications, and mobile apps.

Hardware

Computers are electronic devices that can follow instructions to accept input, process that input, and produce information. This book focuses principally on personal computers. However, it is almost certain that you will come in contact, at least indirectly, with other types of computers.

Types of Computers

There are four types of computers: supercomputers, mainframe computers, midrange computers, and personal computers.

- **Supercomputers** are the most powerful type of computer. These machines are special, high-capacity computers used by very large organizations. Supercomputers are typically used to process massive amounts of data. For example, they are used to analyze and predict worldwide weather patterns. IBM's Blue Gene supercomputer is one of the fastest computers in the world. (See Figure 1-8.)
- **Mainframe computers** occupy specially wired, air-conditioned rooms. Although not nearly as powerful as supercomputers, mainframe computers are capable of great processing speeds and data storage. For example, insurance companies use mainframes to process information about millions of policyholders.
- **Midrange computers,** also referred to as **servers,** are computers with processing capabilities less powerful than a mainframe computer yet more powerful than a personal computer. Originally used by medium-size companies or departments of

Figure 1-8 Supercomputer
Everett Collection Historical/Alamy Stock Photo

Figure 1-9 Desktop
Scanrail1/Shutterstock

Figure 1-10 Laptop
4X-image/iStock/Getty Images

large companies to support their processing needs, today midrange computers are most widely used to support or serve end users for such specific needs as retrieving data from a database or supplying access to application software.

- **Personal computers,** also known as **PCs,** are the least powerful, yet the most widely used and fastest-growing type of computer. There are five types of personal computers: *desktops, laptops, tablets, smartphones,* and *wearables.* **Desktop computers** are small enough to fit on top of or alongside a desk yet are too big to carry around. (See Figure 1-9.) **Laptop computers,** also known as **notebook computers,** are portable and lightweight and fit into most briefcases. (See Figure 1-10.) **Tablets,** also known as **tablet computers,** are smaller, lighter, and generally less powerful than laptops. Like a laptop, tablets have a flat screen but typically do not have a standard keyboard. (See Figure 1-11.) Instead, tablets typically use a virtual keyboard that appears on the screen and is touch-sensitive.

  Smartphones are the most widely used personal computer. Smartphones are cell phones with wireless connections to the Internet and processing capabilities. (See Figure 1-12.) Other mobile computers include **wearable devices** like Apple's Watch. (See Figure 1-13.)

Figure 1-11 Tablet
Colin Hui/Shutterstock

Figure 1-12 Smartphone
junior_cinematic/Shutterstock

Figure 1-13 Wearable
Bai-Bua's Dad/Shutterstock

Cell Phones

Many people are not aware that their cell phone is a computer, and this computer has many of the same components as desktops, laptops, and tablets. At one time, cell phones had very limited power and were used almost exclusively for making telephone calls. Now, almost all cell phones are powerful smartphones capable of connecting to the Internet and running any number of apps. In fact, nearly every cell phone purchased today is more powerful than the computers used to land the first person on the moon.

Today, over 99 percent of Americans under the age of 30 own a cell phone, and over 96 percent of those cell phones are smartphones. As a result, the two terms are becoming interchangeable. Reflecting this trend, we will use the term cell phone and smartphone interchangeably.

Personal Computer Hardware

Hardware for a personal computer system consists of a variety of different devices. This physical equipment falls into four basic categories: system unit, input/output, secondary storage, and communication. Because we discuss hardware in detail later in this book, here we will present just a quick overview of the four basic categories.

- **System unit:** The **system unit** is a container that houses most of the electronic components that make up a computer system. Two important components of the system unit are *microprocessors* and *memory.* (See Figure 1-14.) The **microprocessor** controls and manipulates data to produce information. **Memory** is a holding area

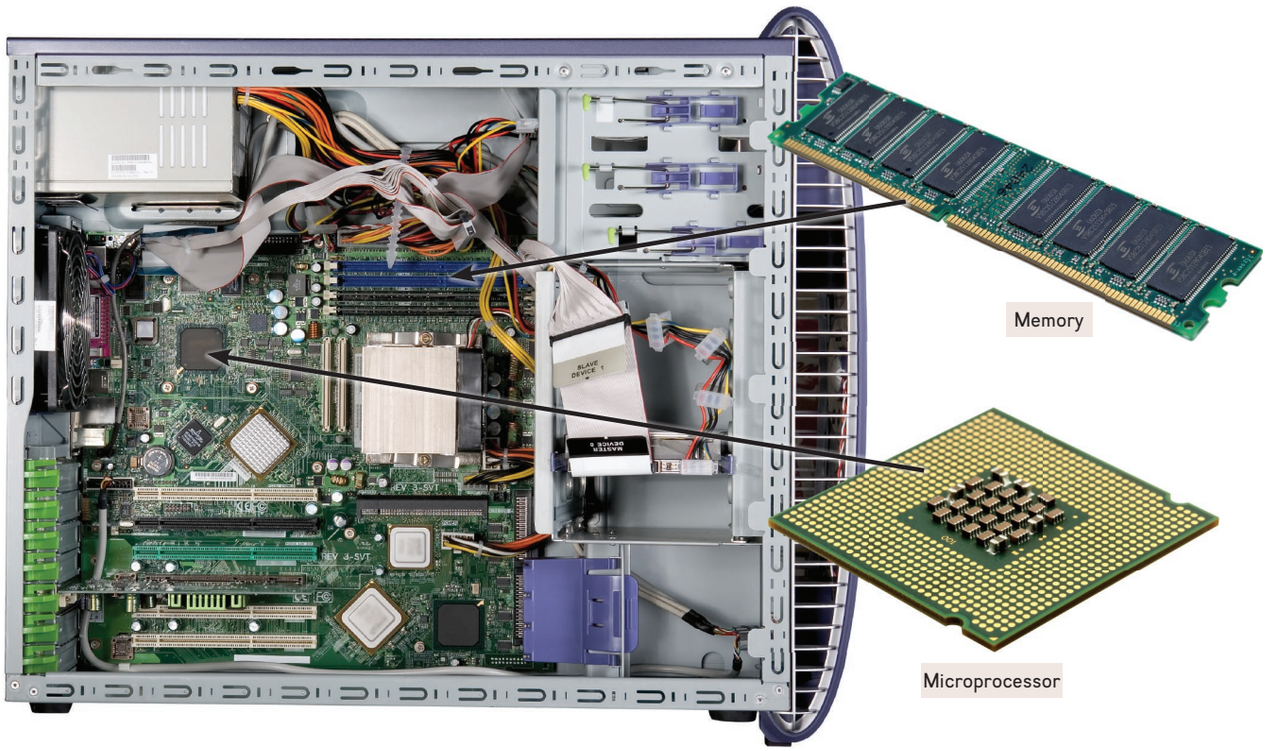


Figure 1-14 System unit
(CPU): EML/Shutterstock; (RAM): Simon Belcher/Alamy Stock Photo; (Microprocessor): leungchopan/iStock/Getty Images

for data, instructions, and information. One type, **random-access memory (RAM),** holds the program and data that are currently being processed. This type of memory is sometimes referred to as *temporary storage* because its contents will typically be lost if the electric power to the computer is disrupted.

- **Input/output: Input devices** translate data and programs that humans can understand into a form that the computer can process. The most common input devices are the **keyboard** and the **mouse. Output devices** translate the processed information from the computer into a form that humans can understand. The most common output device is the **display,** also known as a **monitor.**
- **Secondary storage:** Unlike memory, **secondary storage** holds data and programs even after electric power to the computer system has been turned off. The most important kinds of secondary media are *hard disks, solid-state storage,* and *optical discs.*

  Hard disks are typically used to store programs and very large data files. Using rigid metallic platters and read/write heads that move across the platters, data and information are stored using magnetic charges on the disk's surface. In contrast, **solid-state storage** does not have any moving parts, is more reliable, and requires less power. It saves data and information electronically similar to RAM except that it is not volatile. (See Figure 1-15.) **Optical discs** use laser technology to store data and programs. Three types of optical discs are **compact discs (CDs), digital versatile** (or **video**) **discs (DVDs),** and **Blu-ray discs (BD).**
- **Communication:** At one time, it was uncommon for a personal computer system to communicate with other computer systems. Now, using **communication devices,** a personal computer routinely communicates with other computer systems located as near as the next office or as far away as halfway around the world, using the Internet. A **modem** is a widely used communication device that modifies audio, video, and other types of data into a form that can be transmitted across the Internet.

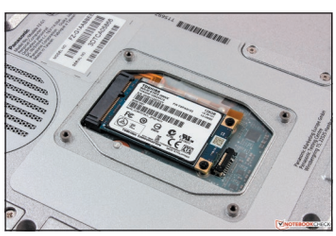


Figure 1-15 Solid-state storage
Bob Dormon/theregister.co.uk

concept check

- What are the four types of computers?
- Describe the five types of personal computers.
- Describe the four basic categories of personal computer hardware.

Data

Data is raw, unprocessed facts, including text, numbers, images, and sounds. As we mentioned earlier, processed data becomes information. When stored electronically in files, data can be used directly as input for the system unit.

Four common types of files (see Figure 1-16) are

- **Document files,** created by word processors to save documents such as memos, term papers, and letters.

Figure 1-16 Four types of files: document, worksheet, database, and presentation

Presentation: Microsoft Corporation; Zoom Pet Photography/Image Source/Getty Images; **Database:** Microsoft Corporation; **Worksheet:** Microsoft Corporation; Stockbyte/Getty Images; **Document:** Maciej Czekajewski/Shutterstock

- **Worksheet files,** created by electronic spreadsheets to analyze things like budgets and to predict sales.
- **Database files,** typically created by database management programs to contain highly structured and organized data. For example, an employee database file might contain all the workers' names, Social Security numbers, job titles, and other related pieces of information.
- **Presentation files,** created by presentation software to save presentation materials. For example, a file might contain audience handouts, speaker notes, and electronic slides.

Connectivity and the Mobile Internet

Connectivity is the capability of your personal computer to share information with other computers. Central to the concept of connectivity is the **network.** A network is a communications system connecting two or more computers. The largest network in the world is the **Internet.** It is like a giant highway that connects you to millions of other people and organizations located throughout the world. The **web** provides a multimedia interface to the numerous resources available on the Internet.

Figure 1-17 Wireless communication devices
(Top-left): Framesira/Shutterstock; (Top-right): leonardo255/123RF; (Bottom-left): manaemedia/Shutterstock; (Bottom-middle): Colin Anderson Productions pty ltd/Getty Images; (Bottom-right): Phil Barker/MacFormat Magazine/Getty Images

The Internet has driven the evolution of computers and their impact on our daily lives. The rate of technological change is accelerating at an ever faster pace. Along with the Internet, three things that are driving the impact of technology on our lives are cloud computing, wireless communication, and the Internet of Things.

- **Cloud computing** uses the Internet and the web to shift many computer activities from a user's computer to computers on the Internet. Rather than relying solely on their computer, users can now use the Internet to connect to the cloud and access more powerful computers, software, and storage.
- **Wireless communication** has changed the way we communicate with one another. The rapid development and widespread use of wireless communication

devices like tablets, cell phones, and wearable devices have led many experts to predict that wireless applications are just the beginning of the **wireless revolution,** a revolution that will dramatically affect the way we communicate and use computer technology.

- The **Internet of Things (IoT)** is the continuing development of the Internet that allows everyday objects embedded with electronic devices to send and receive data over the Internet. It promises to connect all types of devices, from computers to cell phones, to watches, to any number of everyday devices.

Wireless communication, cloud computing, and IoT are driving the mobile Internet. They promise to continue to dramatically affect the entire computer industry and how you and I will interact with computers and other devices. Each will be discussed in detail in the following chapters. For just a few of these mobile devices, see Figure 1-17.

concept check

- Define data. List four common types of files.
- Define connectivity and networks.
- What is cloud computing? Wireless revolution? IoT?

Careers in IT

"Now that you know the basic outline and important features of this book, we would like to talk about some of the most exciting and well-paid careers in information technology."

mapodile/E+/Getty Images

As mentioned previously, each of the following chapters highlights a specific career in information technology. Each provides specific job descriptions, salary ranges, advancement opportunities, and more. For a partial list of these careers, see Figure 1-18.

Career	Description
Webmaster	Develops and maintains websites and web resources. See page 44.
Software engineer	Analyzes users' needs and creates application software. See page 71.
Computer support specialist	Provides technical support to customers and other users. See page 97.
Computer technician	Repairs and installs computer components and systems. See page 123.
Technical writer	Prepares instruction manuals, technical reports, and other scientific or technical documents. See page 152.
Network administrator	Creates and maintains computer networks. See page 203.

Figure 1-18 Careers in information technology

A LOOK TO THE FUTURE

Using and Understanding Information Technology

The purpose of this book is to help you use and understand information technology. We want to help you become proficient and to provide you with a foundation of knowledge so that you can understand how technology is being used today and anticipate how technology will be used in the future. This will enable you to benefit from six important information technology developments.

The Internet and the Web

The Internet and the web are considered to be the two most important technologies for the 21st century. Understanding how to efficiently and effectively use the Internet to browse, communicate, and locate information is an essential skill. These issues are presented in Chapter 2, The Internet, the Web, and Electronic Commerce.

wavebreakmedia/Shutterstock

Powerful Software

The software that is now available can do an extraordinary number of tasks and help you in an endless number of ways. You can create professional-looking documents, analyze massive amounts of data, create dynamic multimedia web pages, and much more. Today's employers are expecting the people they hire to be able to effectively and efficiently use a variety of different types of software. General-purpose, specialized, and mobile applications are presented in Chapter 3. System software is presented in Chapter 4.

Powerful Hardware

Personal computers are now much more powerful than they used to be. Cell phones, tablets, and communication technologies such as wireless networks are dramatically changing the ways to connect to other computers, networks, and the Internet. However, despite the rapid change of specific equipment, their essential features remain unchanged. To become an efficient and effective end user, you should focus on these features. Chapters 5 through 8 explain what you need to know about hardware. For those considering the purchase of a computer, an appendix—The Computer Buyer's Guide—is provided at the end of this book. This guide provides a very concise comparison of desktops, laptops, tablets, and cell phones.

Privacy, Security, and Ethics

What about people? Experts agree that we as a society must be careful about the potential of technology to negatively affect our lives. Specifically, we need to be aware of how technology can affect our personal privacy and our environment. Also, we need to understand the role and the importance of organizational and personal ethics. These critical issues are integrated in every chapter of this book as well as extensively covered in Chapter 9.

Organizations

Almost all organizations rely on the quality and flexibility of their information systems to stay competitive. As a member or employee of an organization, you will undoubtedly be involved in these information systems. In order to use, develop, modify, and maintain these systems, you need to understand the basic concepts of information systems and know how to safely, efficiently, and effectively use computers. These concepts are covered throughout this book.

Changing Times

Are the times changing any faster now than they ever have? Almost everyone thinks so. Whatever the answer, it is clear we live in a fast-paced age. The Evolution of the Computer Age section presented at the end of this book tracks the major developments since computers were first introduced.

After reading this book, you will be in a very favorable position compared with many other people in industry today. You will learn not only the basics of hardware, software, connectivity, the Internet, and the web, but also the most current technology. You will be able to use these tools to your advantage.

VISUAL SUMMARY | Information Technology, the Internet, and You

INFORMATION SYSTEMS

filadendron/E+/Getty Images

The way to think about a personal computer is to realize that it is one part of an **information system.** There are several parts of an information system:

- **People** are an essential part of the system. The purpose of information systems is to make people, or **end users** like you, more productive.
- **Procedures** are rules or guidelines to follow when using software, hardware, and data. They are typically documented in manuals written by computer professionals.
- **Software (programs)** provides step-by-step instructions to control the computer to convert **data** into **information.**
- **Hardware** consists of the physical equipment. It is controlled by software and processes data to create information.
- **Data** consists of unprocessed facts, including text, numbers, images, and sound. **Information** is data that has been processed by the computer.
- The **Internet** allows computers to connect and share information.

To efficiently and effectively use the computer, you need to understand **information technology (IT),** including software, hardware, data, and connectivity.

PEOPLE

goodluz/Shutterstock

People are the most important part of an information system. This book contains several features to demonstrate how people just like you use computers. These features include the following:

- **Making IT Work for You** presents several interesting and practical applications. Topics include using online office suites and cloud storage.
- **Tips** offer a variety of suggestions on such practical matters as how to improve slow computer performance and how to protect your privacy while on the web.
- **Privacy** marginal boxes discuss threats to your personal privacy and suggest ways to protect yourself.
- **Environment** boxes discuss important and relevant environmental issues. The impact of computers and other technologies is more critical today than ever before.
- **Ethics** boxes pose a variety of different ethical/unethical situations for your consideration.
- **Careers in IT** presents job descriptions, employment demands, educational requirements, salary ranges, and advancement opportunities.

To efficiently and effectively use computers, you need to understand the basic parts of an information system: people, procedures, software, hardware, data, and connectivity. You also need to understand the Internet and the web and to recognize the role of technology in your professional and personal life.

SOFTWARE

Microsoft Corporation

Software, or **programs,** consists of system and application software.

System Software

System software enables application software to interact with computer hardware.

- **Operating systems** coordinate resources, provide an interface, and run applications. Three types are **embedded (real-time, RTOS), stand-alone,** and **network (NOS).**
- **Utilities** perform specific tasks to manage computer resources.

Application Software

Application software includes general-purpose, specialized, and mobile applications.

- **General purpose**—widely used in nearly all career areas; programs include browsers, word processors, spreadsheets, database management systems, and presentation software.
- **Specialized**—focus more on specific disciplines and occupations; programs include graphics and web authoring.
- **Apps (mobile apps, mobile applications)**—designed for mobile devices; most popular are for text messaging, Internet browsing, and connecting to social networks.

HARDWARE

Scanrail1/Shutterstock

Hardware consists of electronic devices that can follow instructions to accept input, process the input, and produce information.

Types of Computers

Supercomputer, mainframe, midrange (server), and **personal computers (PCs)** are four types of computers. Personal computers can be **desktop, laptop (notebook computer), tablet, smartphone,** and **wearable.**

Cell Phones

Today, almost all cell phones are smartphones; cell phone and smartphone are becoming interchangeable terms.

Personal Computer Hardware

There are four basic categories of hardware devices:

- **System unit** contains electronic circuitry, including **microprocessors** and **memory. Random-access memory (RAM)** holds the program and data currently being processed.
- **Input/output devices** are translators between humans and computers. **Input devices** include the **keyboard** and **mouse.** The most common output device is the computer **display (monitor).**
- **Secondary storage** holds data and programs. Typical media include **hard disks, solid-state storage,** and **optical discs (CD, DVD,** and **Blu-ray).**
- **Communication devices** allow personal computers to communicate with other computer systems. **Modems** modify audio, video, and other types of data for transmission across the Internet.

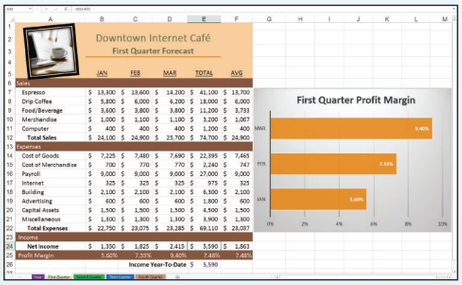
DATA

Data is the raw unprocessed facts about something. Common file types include

- **Document files** created by word processors.

Microsoft Corporation; Maciej Czekajewski/Shutterstock

- **Worksheet files** created by spreadsheet programs.



Microsoft Corporation; Stockbyte/Getty Images

- **Database files** created by database management programs.

Microsoft Corporation; Sam Edwards/age fotostock

- **Presentation files** created by presentation software programs.

Microsoft Corporation; Zoom Pet Photography/ Image Source/Getty Images

CONNECTIVITY AND THE MOBILE INTERNET

Connectivity describes the ability of end users to use resources well beyond their desktops. Central to the concept of connectivity is the **network** or communication system connecting two or more computers. The **Internet** is the world's largest computer **network.** The **web** provides a multimedia interface to resources available on the Internet.

Along with the Internet, three other things are driving the impact of technology:

- **Cloud computing** uses the Internet and the web to shift many computer activities from a user's computer to computers on the Internet.
- **Wireless revolution** has changed the way we communicate and use computer technology. Wireless devices include tablets, cell phones, and watches.
- The **Internet of Things (IoT)** is the continuing development of the Internet that allows everyday objects embedded with electronic devices to send and receive data over the Internet.

CAREERS in IT

Career	Description
Webmaster	Develops and maintains websites and web resources. See page 44.
Software engineer	Analyzes users' needs and creates application software. See page 72.
Computer support specialist	Provides technical support to customers and other users. See page 97.
Computer technician	Repairs and installs computer components and systems. See page 123.
Technical writer	Prepares instruction manuals, technical reports, and other scientific or technical documents. See page 152.
Network administrator	Creates and maintains computer networks. See page 203.

KEY TERMS

application software (7)
apps (7)
Blu-ray disc (BD) (12)
cloud computing (14)
communication device (12)
compact disc (CD) (12)
connectivity (14)
data (4)
database file (14)
desktop computer (11)
digital versatile disc (DVD) (12)
digital video disc (DVD) (12)
display (12)
document file (13)
embedded operating systems (7)
end user (4)
general-purpose application (7)
hard disk (12)
hardware (4)
information (4)
information system (4)
information technology (IT) (7)
input device (12)
Internet (14)
IoT (Internet of Things) (15)
keyboard (12)
laptop computer (11)
mainframe computer (10)
memory (11)
microprocessor (11)
midrange computer (10)
mobile app (application) (7)
modem (12)
monitor (12)
mouse (12)
network (14)
network operating systems (NOS) (7)
notebook computer (11)
operating system (7)
optical disc (12)
output device (12)
PC (11)
people (4)
personal computer (11)
presentation file (14)
procedures (4)
program (4)
random-access memory (RAM) (12)
real-time operating system (RTOS) (7)
secondary storage (12)
server (10)
smartphone (11)
software (4)
solid-state storage (12)
specialized application (7)
stand-alone operating system (8)
supercomputer (10)
system software (7)
system unit (11)
tablet (11)
tablet computer (11)
utility (7)
virus (8)
wearable device (11)
web (14)
wireless communication (14)
wireless revolution (15)
worksheet file (14)

MULTIPLE CHOICE

Circle the correct answer.

1. The keyboard, mouse, display, and system unit are:
   a. hardware **c.** storage devices
   b. output devices **d.** software

2. Programs that coordinate computer resources, provide an interface, and run applications are known as:
   a. application programs **c.** storage systems
   b. operating systems **d.** utility programs

3. A browser is an example of a:
   a. general-purpose application **c.** system application
   b. specialized program **d.** utility program

4. Although not as powerful as a supercomputer, this type of computer is capable of great processing speeds and data storage.
   a. mainframe **c.** laptop
   b. midrange **d.** tablet

5. Apple's Watch is what type of computer?
   a. laptop **c.** tablet
   b. smartphone **d.** wearable

6. RAM is a type of:
   a. computer **c.** network
   b. memory **d.** secondary storage

7. Unlike memory, this type of storage holds data and programs even after electric power to the computer system has been turned off.
   a. primary **c.** ROM
   b. RAM **d.** secondary

8. The type of file created by word processors, for example, memos, term papers, and letters.
   a. database **c.** presentation
   b. document **d.** worksheet

9. Uses the Internet and the web to shift many computer activities from a user's computer to computers on the Internet.
   a. cloud computing **c.** network
   b. high definition **d.** solid-state storage

10. The largest network in the world is [the]:
    a. Facebook **c.** supercomputer
    b. Internet **d.** web

MATCHING

Match each numbered item with the most closely related lettered item. Write your answers in the spaces provided.

a. desktop
b. modem
c. network
d. output
e. presentation
f. program
g. software
h. solid-state
i. system software
j. system unit

___ **1.** Consists of the step-by-step instructions that tell the computer how to do its work.
___ **2.** Another name for a program.
___ **3.** Enables the application software to interact with the computer hardware.
___ **4.** Type of computer that is small enough to fit on top of or alongside a desk yet is too big to carry around.
___ **5.** A container that houses most of the electronic components that make up a computer system.
___ **6.** Devices that translate the processed information from the computer into a form that humans can understand.
___ **7.** Unlike hard disks, this type of storage does not have any moving parts, is more reliable, and requires less power.
___ **8.** The most widely used communication device.
___ **9.** A type of a file that might contain, for example, audience handouts, speaker notes, and electronic slides.
___ **10.** A communications system connecting two or more computers.

OPEN-ENDED

On a separate sheet of paper, respond to each question or statement.

1. Explain the parts of an information system. What part do people play in this system?
2. What is system software? What kinds of programs are included in system software?
3. Define and compare general-purpose applications, specialized applications, and apps. Describe some different types of general-purpose applications. Describe some types of specialized applications.
4. Describe the different types of computers. What is the most common type? What are the types of personal computers?
5. What is connectivity? What is a computer network? What are the Internet and the web? What are cloud computing, the wireless revolution, and IoT?

DISCUSSION

Respond to each of the following questions.

1 Making IT Work for You

Making it a habit of keeping current with technology applications can be a key to your success. Numerous full-page spreads identified as *Making IT Work for You* are presented in the following chapters. These sections address some of today's most interesting and useful applications. They include online entertainment in Chapter 2, online office suites in Chapter 3, and cloud storage in Chapter 7. Select one that you find the most interesting and then respond to the following: (a) Why did you select this application? (b) Have you used this application? If so, when and how? If not, do you plan to in the near future? (c) Go to the chapter containing your selected application, and locate the application's Making IT Work for You coverage. Review and briefly describe its contents. (d) Did you find the coverage useful? Why or why not?

2 Privacy

Privacy is one of the most critical issues facing society today. Numerous Privacy boxes appear in the margins of the upcoming chapters presenting a variety of privacy issues. These issues include apps that constantly track your movements without your knowledge or consent in Chapter 3; public Wi-Fi connections that record all of your personal communications in Chapter 8; and protection of personal privacy while using social networking sites such as Facebook in Chapter 9. Select one that you find the most interesting, and then respond to the following: (a) Why did you select this issue? (b) Do you have knowledge of or experience with the issue? If so, describe your knowledge or experience. If not, do you consider the issue to be important for protecting your privacy? (c) Go to the chapter containing your selected issue, locate the Privacy box, read it, and describe its contents. (d) Did you find the coverage thought-provoking? Why or why not?

3 Ethics

Computer ethics are guidelines for the morally acceptable use of computers in our society. Numerous Ethics boxes appear in the margins of the upcoming chapters presenting a variety of ethical issues. These issues include image editing in Chapter 3, unauthorized use of webcams in Chapter 6, and unauthorized monitoring or eavesdropping of Internet activity in Chapter 8. Select one issue that you find the most interesting and then respond to the following: (a) Why did you select this issue? (b) Do you have knowledge of or experience with the issue? If so, describe your knowledge or experience. If not, do you consider the issue critical for individuals or organizations? (c) Go to the chapter containing your selected issue, locate the Ethics box, read it, and describe its contents. (d) Did you find the coverage thought-provoking? Why or why not?

4 Environment

Almost everyone agrees that protecting our environment today is more important than ever before. Numerous Environment boxes appear in the margins of the upcoming chapters. These boxes present a variety of environmental topics, including digital media benefits in Chapter 2, operating systems reducing energy consumption in Chapter 4, and recycling old inkjet cartridges in Chapter 6. Select one that you find the most interesting and then respond to the following: (a) Why did you select this topic? (b) Go to the chapter containing your selected topic, locate the Environment box, read it, and describe its contents. (c) Did you find the coverage thought-provoking? Why or why not?

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chapter 2

The Internet, the Web, and Electronic Commerce

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Why should I read this chapter?

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The Internet has changed the world, and will continue to have an amazing impact on our day-to-day lives. For example, Internet-connected homes of the future hold the promise of sorting our recycling, adjusting our thermostats, and even monitoring our health.

This chapter covers the things you need to know to be prepared for this ever-changing digital world, including

- Impact—how Internet technology is changing your world.
- Hardware—how to connect your life to the Internet, including Wi-Fi, cell phones, and tablets.
- Applications—how to get ahead using social networking, streaming technology, and cloud computing.

Learning Objectives

After you have read this chapter, you should be able to:

1. Explain the origins of the Internet and the web.
2. Explain how to access the web using providers and browsers.
3. Compare different web utilities, including filters, file transfer utilities, and Internet security suites.
4. Compare different Internet communications, including social networking, blogs, microblogs, podcasts, wikis, text messaging, instant messaging, and e-mail.
5. Describe search tools, including search engines.
6. Describe how to evaluate the accuracy of information presented on the web.
7. Identify electronic commerce, including B2C, C2C, B2B, and security issues.
8. Describe cloud computing, including the three-way interaction of clients, Internet, and service providers.
9. Discuss the Internet of Things (IoT) and the continuing development of the Internet to allow everyday objects to send and receive data.

Introduction

"Hi, I'm Henry, and I'm a webmaster. I'd like to talk with you about the Internet, the web, and electronic commerce, things that touch our lives every day. I'd also like to talk with you about the role the Internet plays with Facebook, LinkedIn, Twitter, and cloud computing."

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It is almost impossible to go a day without being on the Internet in one form or another. Our cell phones, tablets, and computers connect us to the Internet, and there are even Internet-connected TVs, cars, and refrigerators. But what is the Internet? What are the different ways we use the Internet? And how can we tap into the power of the Internet to improve our lives?

The Internet is an interconnected mesh of computers and data lines that connects millions of people and organizations. It is the foundation of the digital revolution and allows people around the world to share words, images, and any digital file almost instantaneously. The web provides an easy-to-use interface to Internet resources. It has become an everyday tool for all of us to use.

To efficiently and effectively use computers, you need to be aware of the resources available on the Internet and the web. Additionally, you need to know how to access these resources, to effectively communicate electronically, to efficiently locate information, to understand electronic commerce, and to use web utilities.

The Internet and the Web

The **Internet** was launched in 1969 when the United States funded a project that developed a national computer network called **Advanced Research Project Agency Network (ARPANET).** The Internet is an immense network that connects together smaller networks all over the globe. The **web,** also known as the **World Wide Web** or **WWW,** was introduced in 1991. Prior to the web, the Internet was all text—no graphics, animations, sound, or video. The web made it possible to include these elements. It provided a multimedia interface to resources available on the Internet.

Today the web is a collection of machines and people sharing amazing content, but not long ago it was a far simpler experience. The web has matured through three generations, commonly called Web 1.0, 2.0, and 3.0.

- **Web 1.0** focused on linking existing information. Google Search and other search engines made it possible for users to search the web to locate web pages of interest. However, to create a web page required a background in computers and programming. Many users could view web content, but few users could create web content.
- **Web 2.0** evolved to support more dynamic content creation and social interaction. Facebook and other social media sites made it so that nontechnical people could be seen and heard on the web. These sites allow almost anyone to post videos, images, and text about their lives. However, the massive amount of social media posts made it difficult to find truly valuable information. Many users could view and create web content, but few could readily locate valuable, timely information on the web.
- **Web 3.0** identifies relationships between data. Siri and Google Assistant are examples of Web 3.0 applications. One of their many capabilities includes maintaining a user's calendar of events and automatically reminding the user when an event is imminent, such as an upcoming flight (see Figure 2-1). As this web technology grows out of its infancy, we can expect to get more personalized, helpful information from our devices.

The future of the World Wide Web beyond Web 3.0 has yet to be determined. Futurists suggest that **Web 4.0** will focus on connecting data and devices into a seamless integration into your physical life. However, there is not universal agreement regarding the specifics of Web 4.0.

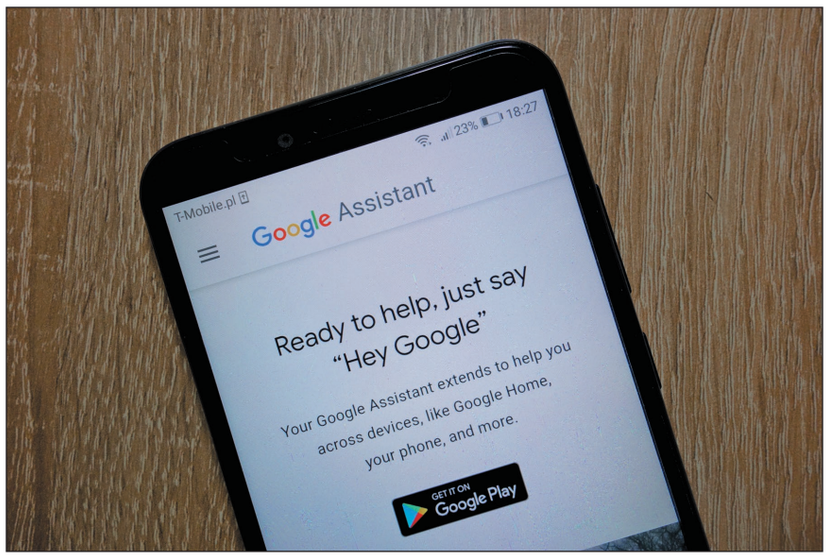

Figure 2-1 Web 3.0 application
Piotr Swat/Shutterstock

It is easy to get the Internet and the web confused, but they are not the same thing. The Internet is the physical network. It is made up of wires, cables, satellites, and rules for exchanging information between computers connected to the network. Being connected to this network is often described as being **online.** The Internet connects millions of computers and resources throughout the world. The web is a multimedia interface to the resources available on the Internet. Every day over a billion users from nearly every country in the world use the Internet and the web. What are they doing? The most common uses are the following:

- **Communicating** is by far the most popular Internet activity. You can exchange texts, e-mails, photos, and videos with your family and friends from almost anywhere in the world. You can reconnect with old friends, meet new people with similar interests, and engage with special-interest communities around the world.
- **Shopping** is one of the fastest-growing Internet applications. You can look for the latest fashions, search for bargains, and make purchases.
- **Searching** for information has never been more convenient. You can access some of the world's largest libraries directly from your home computer.
- **Education** or **e-learning** is another rapidly evolving web application. You can take classes on almost any subject. There are courses just for fun, and there are courses for high school, college, and graduate school credit. Some cost nothing to take and others cost a lot.
- **Online entertainment** options are nearly endless. You can find the latest movies and news, listen your favorite songs, and play video games with friends around the world. To learn more about online entertainment, see Making IT Work for You: Online Entertainment on pages 28 and 29.

The first step to using the Internet and the web is to get connected, or to gain access to the Internet.

ethics

Twitter and other social media organizations ban users who post hateful or violent content. Some people feel that Twitter has an ethical responsibility to monitor and remove offensive or inaccurate content. Others say that censorship is a violation of an individual's right to free speech and that Twitter should never censor content. What do you think? Who should decide what information is shared on Twitter: the company or the users?

concept check

- What is the difference between the Internet and the web?
- Describe how the Internet and the web started. What are the four web generations?
- List and describe five of the most common uses of the Internet and the web.

Making IT work for you

ONLINE ENTERTAINMENT

Would you like to be able to watch your favorite TV shows and movies from anywhere in your home? How about listening to the largest catalog of music the world has ever known? Or to carry a library in your backpack? Want to keep up to date on the news your friends and family are reading? Or to hear about the latest trends in tech news? Online entertainment has got you covered, with entertainment options for TV, movies, music, books, social media, and news feeds.

1. **TV Shows and Movies**—Binge watch your favorite TV shows or movie trilogy with subscription services such as Hulu, Amazon Prime, or Netflix. These services allow you to watch vast libraries of popular mainstream TV and movies as well as original content. Visit www.hulu.com, www.amazon.com/prime, or www.netflix.com to learn more.

   If live TV is more your speed, you can sign up for YouTube TV or go online to CNN, CBS News, or the NBC website. These sites offer live broadcasts of breaking news, sports, and popular TV show episodes. Visit tv.youtube.com, cnn.com, cbsnews.com/live, or nbcnews.com to check it out.

Paid subscription services, like Netflix, offer popular film and TV shows, as well as original content.
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2. **Online Music**—Websites Spotify and Pandora offer access to large music libraries, with everything from contemporary hits to classical music. They offer free versions with commercials or for a small monthly fee, you can get all the music you want with limited commercial interruptions. Go to spotify.com or pandora.com to try out online music.

3. **Online Books**—Digital books allow you to download all your textbooks and store them on your laptop or read the latest best-seller off your tablet. Digital books can be purchased online and read on your digital devices. Amazon's Kindle Store and Barnes and Noble's Nook Store offer large libraries of titles at competitive prices. Go to amazon.com/Kindle-eBooks or barnesandnoble.com to see what they have to offer.

Digital books allow you to read several books at a time on different digital devices without having to carry around tons of books.
Annette Shaff/Shutterstock

4 **Social Media**—Social media websites offer a way to connect and interact with others about news, movies, and everyday life. Thoughts and ideas are posted instantly with sites like Twitter, a popular platform for sharing short messages, videos, and photos. You can follow other Twitter users to get automatic updates on the posts they make, and others can follow you to keep up to date on your posts.

Twitter users include politicians, athletes, and artists. To join the conversation, go to twitter.com and create an account.

Popular social media site Twitter updates your Twitter account with new postings from users around the world.
Castleski/Shutterstock

5 **News Feeds**—Social media services such as Facebook or Twitter are a good way to share and explore news, but they don't offer an experience similar to a newspaper. For a more traditional view of the day's events, consider a news feed service. A news feed application takes articles from news organizations, collects them according to your interest, and presents them like a newspaper—grouped by topic and in chronological order.

One of the best news feed services is Feedly. Go to feedly.com to sign up and explore the many news organizations you can pick and choose from to be displayed when you visit feedly.com.

News feed services, like feedly.com, allow you to search for news sources by publisher or topic, creating a more "newspaper"-like reading experience.
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