

## **Brief Contents**

Preface 19	
Chapter 1	Managing in the Digital World 30
Chapter 2	Gaining Competitive Advantage Through Information Systems 78
Chapter 3	Managing the Information Systems Infrastructure and Services 11
Chapter 4	Enabling Business-to-Consumer Electronic Commerce 160
Chapter 5	Enhancing Organizational Communication and Collaboration Using Social Media 198
Chapter 6	Enhancing Business Intelligence Using Information Systems 236
Chapter 7	Enhancing Business Processes Using Enterprise Information Systems 278
Chapter 8	Strengthening Business-to-Business Relationships via Supply Chain and Customer Relationship Management 312
Chapter 9	Developing and Acquiring Information Systems 346
Chapter 10	Securing Information Systems 388
Technology	Briefing Foundations of Information Systems Infrastructure 438
Acronyms	485
Glossary 4	89

Name Index 507

Organization Index 511

Subject Index 515

9

# Contents

Preface 19		
Chapter 1	Managing in the Digital World 30	
	MANAGING IN THE DIGITAL WORLD: Apple 31	
	Information Systems Today 32	
	The Rise of the Information Age 35	
	■ BRIEF CASE: Technology at Starbucks 35	
	Five IT Megatrends in the Information Age 37	
	■ WHO'S GOING MOBILE: Wearable Technology 41	
	Evolution of Globalization 42	
	The Rise of Outsourcing 43	
	Opportunities and Challenges of Operating in the Digital World 44	
	■ KEY PLAYERS: Wipro and Infosys—The Global Outsourcing Leaders 46	
	Information Systems Defined 46	
	Data: The Root and Purpose of Information Systems 47	
	Hardware, Software, and Telecommunications Networks: The Components of Information Systems 48	
	People: The Builders, Managers, and Users of Information Systems 48  Organizations: The Context of Information Systems 53	
	The Dual Nature of Information Systems 56	
	Case in Point: An Information System Gone Awry: Computer Glitch Grounds Flights 5	,
	Case in Point: An Information System That Works: FedEx 57	
	Information Systems for Competitive Advantage 58  WHEN THINGS GO WRONG: Failure: The Path to Success? 59	
	IS Ethics 59	
	Information Privacy 59	
	COMING ATTRACTIONS: Smart Shirts Saving Lives 60	
	intellectual Property 64	
	ETHICAL DILEMMA: The Human Cost of the Newest Gadgets 65	
	The Need for a Code of Ethical Conduct 66	
	■ INDUSTRY ANALYSIS: Business Career Outlook 67	
	Key Points Review 67 • Key Terms 68 • Review Questions 69 • Self-Study Questions 69 • Problems and Exercises 70 • Application  Exercises 71 • Team Work Exercise 71 • Answers to the Self-Study  Questions 72	
	■ BRIDGING THE DIGITAL DIVIDE 73	
	■ YOUTUBE 74	
Chapter 2	Gaining Competitive Advantage Through Information Systems 78	
	MANAGING IN THE DIGITAL WORLD: The Business of Merging "Groups" and "Coupons" 79	
	Enabling Organizational Strategy Through Information Systems 80 Organizational Decision-Making Levels 80	

Organizational Functional Areas 82

	Information Systems for Automating: Doing Things Faster 84
	Information Systems for Organizational Learning: Doing Things Better 84
	Information Systems for Supporting Strategy: Doing Things Smarter 85
	Sources of Competitive Advantage 86
	■ BRIEF CASE: Wi-Fi in the Sky 87
	Identifying Where to Compete: Analyzing Competitive Forces 88
	Identifying How to Compete: Analyzing the Value Chain 88
	The Role of Information Systems in Value Chain Analysis 89
	The Technology/Strategy Fit 90
	Assessing Value for the IS Infrastructure 90
	■ WHO'S GOING MOBILE: Mobile Platforms 91
Bu	siness Models in the Digital World 92
	Revenue Models in the Digital World 92
	Freeconomics: Why Free Products Are the Future of the Digital World 93
	■ WHEN THINGS GO WRONG: The Pains of Miscalculating Groupon 94
	International Business Strategies in the Digital World 96
	■ ETHICAL DILEMMA: Underground Gaming Economy 98
la	luing Innovations 98
	The Need for Constant IS Innovation 98
	Successful Innovation Is Difficult 99
	Organizational Requirements for Innovation 100
	Predicting the Next New Thing 101
	■ COMING ATTRACTIONS: Google's Project Glass: A Pair of Glasses 10
	The Innovator's Dilemma 102
	■ KEY PLAYERS: The Global Elite 107
	■ INDUSTRY ANALYSIS: Education 108
χė	Points Review 109 • Key Terms 109 • Review Questions 110 Self-Study Questions 110 • Problems and Exercises 111 • Application rcises 112 • Team Work Exercise 112 • Answers to the Self-Study estions 112
	LINKEDIN 113
	STREAMING VIDEO 114
	anaging the Information Systems Infrastructure d Services 116
	MANAGING IN THE DIGITAL WORLD: "I Googled You!" 117
	IS Infrastructure 118
	■ WHO'S GOING MOBILE: Mobile Developments in Developing
(	Countries 120
1	Applications and Databases Supporting Business Processes 121
1	ETHICAL DILEMMA: Putting People's Lives Online 122
	nfrastructure Components 123
	fardware 123
5	system Software 124

#### 15

■ COMING ATTRACTIONS: Internet for Everyone 125

Storage 126

Chapter 3

Networking 127

■ BRIEF CASE: For Sale by Owner: Your Company's Name.com 132 Data Centers 134

## Issues Associated with Managing the IS Infrastructure 134

Rapid Obsolescence and Shorter IT Cycles 135 Big Data and Rapidly Increasing Storage Needs 137

Demand Fluctuations 138 Increasing Energy Needs 138 WHEN THINGS GO WRONG: Dirty Data Centers 139 Cloud Computing 139 What Is Cloud Computing? 140 Managing the Cloud 143 Advanced Cloud Applications 145 ■ KEY PLAYERS: Giants of the Infrastructure 148 Green Computing 151 ■ INDUSTRY ANALYSIS: Movie Industry 152 Key Points Review 152 Key Terms 153 • Review Questions 154 Self-Study Questions 154
 Problems and Exercises 155
 Application Exercises 156 • Team Work Exercise 156 • Answers to the Self-Study Duestions 156 ■ BUILDING FARMS AND CRUSHING CANDY: THE INFRASTRUCTURE BEHIND SOCIAL GAMES 157 ■ THE DEEP WEB 158 Enabling Business-to-Consumer Electronic Commerce 160 MANAGING IN THE DIGITAL WORLD: Taobao and the World of e-Commerce 161 Electronic Business: E-Commerce and E-Government 162 Electronic Commerce Business Models 162 e-Government 163 Business-to-Consumer E-Commerce 164 e-Tailing: Capabilities and Benefits 165 Benefits of e-Tailing 168 ■ ETHICAL DILEMMA: The Ethics of Reputation Management 168 Drawbacks of e-Tailing 170 Electronic Commerce Websites and Internet Marketing 170 Designing Web Sites to Meet Online Consumers' Needs 172 ■ KEY PLAYERS: Behind the Online Storefront: How e-Commerce Giants Help Small Businesses Flourish 172 Internet Marketing 173 ■ WHEN THINGS GO WRONG: Buying Likes 177 Mobile Commerce, Consumer-to-Consumer EC, and Consumer-to-Business EC 178 C2C EC 180 ■ COMING ATTRACTIONS: Carbon Nanocomputers 181 Managing Finances and Navigating Legal Issues in EC 182 ■ BRIEF CASE: CrowdSpring—The Graphic Designers' Marketplace 183 Securing Payments in the Digital World 183 ■ WHO'S GOING MOBILE: Mobile Payments 184 Legal Issues in EC 187 ■ INDUSTRY ANALYSIS: Retailing 189 Key Points Review 190 • Key Terms 191 • Review Questions 191 Self-Study Questions 191 • Problems and Exercises 192 Application Exercises 193 • Team Work Exercise 194 • Answers to

the Self-Study Questions 194

■ ENABLING GLOBAL PAYMENTS AT PAYPAL 196

■ BITCOIN 195

Chapter 4

## Chapter 5 Enhancing Organizational Communication and Collaboration Using Social Media 198

MANAGING IN THE DIGITAL WORLD: Facebook.com 199

The Need for Communication and Collaboration 200

Virtual Teams 200

Groupware 201

Videoconferencing 203

Intranets and Employee Portals 203

#### The Evolving Web 205

Evolving Web Capabilities 206

Evolving Social Interaction 206

The Evolving Workspace 207

Future Web Capabilities 207

BRIEF CASE: Crowdfunding 208

Enterprise 2.0 209

#### Social Media and the Enterprise 209

Enhancing Communication Using Social Media 209 Enhancing Cooperation with Social Media 211

- COMING ATTRACTIONS: Dissolvable Electronics 212
- KEY PLAYERS: The "Other" Social Networking Giants 215

Enhancing Collaboration with Social Media 215 Enhancing Connection with Social Media 220

- WHO'S GOING MOBILE: Going SoLoMo: Yelp 220
- ETHICAL DILEMMA: Negative Impacts of Social Media Use 222

### Managing the Enterprise 2.0 Strategy 223

Organizational Issues 223

- WHEN THINGS GO WRONG: Social Media Meltdown 224 Pitfalls of Web 2.0 Marketing 225
- INDUSTRY ANALYSIS: Online Travel 227

Key Points Review 228 • Key Terms 229 • Review Questions 229

- Self-Study Questions 230 Problems and Exercises 230
- Application Exercises 231
   Team Work Exercise 232
   Answers to the Self-Study Questions 232
  - THE VALUE OF SOCIAL MEDIA GIANTS 233
  - WIKIPEDIA: WHO IS EDITING? 234

## Chapter 6 Enhancing Business Intelligence Using Information Systems 236

MANAGING IN THE DIGITAL WORLD: Gathering Intelligence Using Social Media 237

#### Business Intelligence 238

Why Organizations Need Business Intelligence 238

Databases: Providing Inputs into Business Intelligence Applications 240

- WHEN THINGS GO WRONG: Twitter Fever—Where Good Conscience Meets Bad Intelligence 241
- COMING ATTRACTIONS: Intelligence Through Drones 245

## Business Intelligence Components 249

Information and Knowledge Discovery 249

Business Analytics to Support Decision Making 254

- BRIEF CASE: Quality Assurance Through Call Recording 255
- ETHICAL DILEMMA: Are You Being Tracked? 261

Information Visualization 263

- KEY PLAYERS: SAS, MicroStrategy, and Other Business Intelligence Leaders 267
- WHO'S GOING MOBILE: AroundMe 268
- INDUSTRY ANALYSIS: Healthcare 269

Key Points Review 270 • Key Terms 271 • Review Questions 271

- Self-Study Questions 272 Problems and Exercises 272
- Application Exercises 273
   Team Work Exercise 274
   Answers to the Self-Study Questions 274
  - NSA: NATIONAL SURVEILLANCE AGENCY? 275
  - WEB ANALYTICS 276

### Chapter 7 Enhancing Business Processes Using Enterprise Information Systems 278

MANAGING IN THE DIGITAL WORLD: Amazon.com 279

Core Business Processes and Organizational Value Chains 280

Core Business Processes 280

Organizational Activities Along the Value Chain 282

BRIEF CASE: Crowdsourcing Cinema at Amazon Studios 285

Value Systems: Connecting Multiple Organizational Value Chains 286

#### Enterprise Systems 287

The Rise of Enterprise Systems 287

Supporting Business Processes 288

- ETHICAL DILEMMA: Too Much Intelligence? RFID and Privacy 289
- COMING ATTRACTIONS: Combating Counterfeits Using Liquid Crystal Lasers 292

#### Enterprise Resource Planning 295

Responding to Compliance and Regulatory Demands 296

Choosing an ERP System 296

KEY PLAYERS: The Titans of ERP 297

Enabling Business Processes Using ERP Core Components 298

ERP Installation 301

■ WHO'S GOING MOBILE: Big ERP Systems Embracing Small Mobile Devices 301

ERP Limitations 302

#### Achieving Enterprise System Success 302

Secure Executive Sponsorship 302

Get Help from Outside Experts 303

Thoroughly Train Users 303

■ WHEN THINGS GO WRONG: The Not-So-Beautiful ERP

Implementation 303

Take a Multidisciplinary Approach to Implementations 304

Evolve the Implementation 304

■ INDUSTRY ANALYSIS: The Automobile Industry 305

Key Points Review 305 • Key Terms 306 • Review Questions 306

- Self-Study Questions 306 Problems and Exercises 307
- Application Exercises 308
   Team Work Exercise 308
   Answers to the Self-Study Questions 308
  - SOFTWARE AS A SERVICE: ERP BY THE HOUR 309
  - BIG PROJECT, BIG FAILURE 310

Chapter 8	Strengthening Business-to-Business Relationships via Supply Chain and Customer Relationship Management 312 MANAGING IN THE DIGITAL WORLD: Walmart 313
	Supply Chain Management 314
	What Is a Supply Chain? 314
	Business-to-Business Electronic Commerce: Exchanging Data in Supply
	Networks 314
	Managing Complex Supply Networks 317
	Benefits of Effectively Managing Supply Chains 317
	Optimizing the Supply Chain through Supply Chain Management 319
	■ WHEN THINGS GO WRONG: Switching Switches: Failure
	at a Global Scale 320
	Developing an SCM Strategy 321  ■ BRIEF CASE: The Formula for Success: Demand Media 322
	Supply Chain Planning 322 Supply Chain Execution 323
	Supply Chain Visibility and Analytics 326  Sustamor Relationship Management 326
	Customer Relationship Management 326
	■ COMING ATTRACTIONS: Saving Lives Through 3D Bioprinting 327  ■ KEY PLAYERS: Salesforce.com 330
	Developing a CRM Strategy 330  Architecture of a CRM System 331
	Architecture of a CRM System 331  WHO'S GOING MOBILE: The Power of Mobile CRM 334
	ETHICAL DILEMMA: CRM: Targeting or Exploiting? 338  Ethical Concerns with CRM 338
	INDUSTRY ANALYSIS: Manufacturing 339
	Key Points Review 339 Key Terms 340 • Review Questions 340 • Self-Study Questions 340 • Problems and Exercises 341 • Application Exercises 342 • Team Work Exercise 342 • Answers to the Self-Study Questions 342
	■ SUPPLY CHAIN HAVOC 343
	■ CRM 2.0 344
Chapter 9	Developing and Acquiring Information Systems 346  MANAGING IN THE DIGITAL WORLD: Microsoft Is "Kinecting" Its  Ecosystem 347
	Making the Business Case 348
	Business Case Objectives 348
	The Productivity Paradox 348
	Making a Successful Business Case 350
	■ BRIEF CASE: Software Patent Wars 352
	COMING ATTRACTIONS: IBM's 5 in 5 354
	Presenting the Business Case 356
	■ ETHICAL DILEMMA: Ethical App Development 358
	The Systems Development Process 358
	Custom Versus Off-the-Shelf Software 358
	Open Source Software 360
	Combining Custom, Open Source, and Off-the-Shelf Systems 360 IS Development in Action 361
	The Role of Users in the Systems Development Process 362 Steps in the Systems Development Process 362
	steps in the systems Development Process 362

■ WHO'S GOING MOBILE: Creating Mobile Apps 363

Phase 1: Systems Planning and Selection 363

Phase 2: Systems Analysis 364

Phase 3: Systems Design 365

Phase 4: Systems Implementation and Operation 367

Repeating the SDLC: Systems Maintenance 369

■ KEY PLAYERS: Game Development Studios 371

Other Approaches to Designing and Building Systems 372

## Acquiring Information Systems 373

■ WHEN THINGS GO WRONG: Conquering Computer Contagion 373 External Acquisition 374

Outsourcing Systems Development 378

■ INDUSTRY ANALYSIS: Broadcasting 380

Key Points Review 380 Key Terms 381 • Review Questions 381

- Self-Study Questions 381
   Problems and Exercises 382
- Application Exercises 383
   Team Work Exercise 384
   Answers to the Self-Study Questions 384
  - NEXT GENERATION IDENTIFICATION: FBI, ICE DATABASES EXPAND AND JOIN FORCES 385
  - THE EMERGENCE OF OPEN SOURCE SOFTWARE 386

## Chapter 10 Securing Information Systems 388

MANAGING IN THE DIGITAL WORLD: Not So "Anonymous"—Activists, Hacktivists, or Just Plain Criminals? 389

#### Computer Crime 390

Hacking and Cracking 390

Types of Computer Criminals and Crimes 390

■ ETHICAL DILEMMA: Industrial Espionage 392

Computer Viruses and Other Destructive Code 394

■ WHEN THINGS GO WRONG: The Bug That Almost Killed

the Internet 395

Cyberharassment, Cyberstalking, and Cyberbullying 401

Software Piracy 401

Cybersquatting 403

Federal and State Laws 403

■ WHO'S GOING MOBILE: Mobile Security 405

#### Cyberwar and Cyberterrorism 405

Cyberwar 405

Cyberterrorism 406

■ BRIEF CASE: 3D Crime Scenes 409

## Managing Information Systems Security 409

Assessing Risks 411

Developing a Security Strategy 412

Implementing Controls and Training 415

- COMING ATTRACTIONS: Speeding Security Screening 417
- KEY PLAYERS: White Knights of the Internet Age 421

Monitoring Security 424

The State of Systems Security Management 427

■ INDUSTRY ANALYSIS: Cybercops Track Cybercriminals 427

Key Points Review 428 • Key Terms 428 • Review Questions 429

- Self-Study Questions 429
   Problems and Exercises 430
- Application Exercises 432
   Team Work Exercise 432
   Answers to the Self-Study Questions 433

- STOPPING INSIDER THREATS: EDWARD SNOWDEN AND THE NSA 434
- CHINA'S GREAT (FIRE) WALL 435

## Technology Briefing: Foundations of Information Systems Infrastructure 438

#### Foundational Topics in IS Hardware 439

Input Technologies 439

Processing: Transforming Inputs into Outputs 441

Output Technologies 445

#### Foundational Topics in IS Software 446

System Software 446

Programming Languages and Development Environments 447

Open Source Software 452

#### Foundational Topics in Networking 453

Evolution of Computer Networking 453

Types of Networks 455

Packet Switching 457

Network Standards and Protocols 458

Network Technologies 462

The Internet 468

#### Foundational Topics in Database Management 473

Relational Database Design 473

Key Points Review 478 \* Key Terms 479 \* Review Questions 480

Self-Study Questions 481
 Problems and Exercises 482

Answers to the Foundational Hardware Self-Study Questions 484 .

Answers to the Foundational Software Self-Study Questions 484 •

Answers to the Foundational Networking Self-Study Questions 484 \*

Answers to the Foundational Database Self-Study Questions 484

Acronyms 485

Glossary 489

Name Index 507

Organization Index 511

Subject Index 515