

David M. Kroenke

Randall J. Boyle



10e | 2017

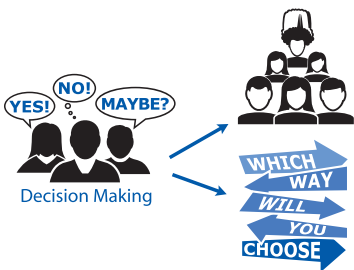
Using MIS

 Pearson

MIS: Engage, Apply, Empower

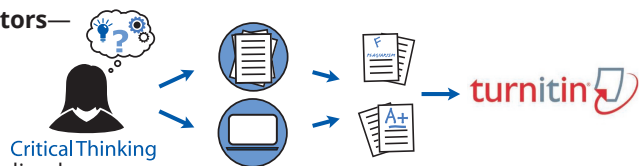


- **Office 2016 Grader Projects**-- Students complete projects in Excel and Access to demonstrate **problem solving, critical thinking, and data analysis skills**. Projects are automatically graded and include feedback. Integrity tokens in each project prevent and detect cheating.



- **Branching, Decision-Making Simulations**—students take on the role of manager as they make a series of decisions based on a realistic business challenge, fostering **decision making** and **problem solving** skills. The simulations change and branch based on their decisions, creating various scenario paths. At the end of each simulation, students receive a grade and a detailed report of the choices they made with the associated consequences included.

- **Writing Space**—Better writers make better **communicators**—who become better managers. Designed to help develop and assess concept mastery and **critical thinking**, the Writing Space offers auto-graded writing assignments, and assisted auto-graded writing assignments so students can receive meaningful, personalized feedback quickly and easily. And because of integration with Turnitin®, Writing Space can check students' work for improper citation or plagiarism.





Technology's Michelangelo Moment

One of the most famous paintings in the world is *The Creation of Adam* painted on the Sistine Chapel's ceiling by Michelangelo. It depicts an image of God reaching out to touch his creation, Adam. Similarly, the cover of *Using MIS 10e* depicts a woman wearing augmented reality glasses reaching out to touch the finger of a robot. This comparison is intended to underscore the increasing importance of digital reality devices, robotics, and emerging technology on our daily lives.

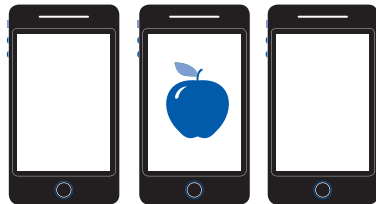
Leading tech companies like Microsoft (HoloLens), Google (Magic Leap), Facebook (Oculus Rift) and Apple are investing heavily in digital reality devices. They expect these new devices to create new types of applications that change the way we live, work, shop, and play. Creativity will be key in making these new 3D holographic applications.

And what about robots? Amazon started using Kiva robots in its fulfillment centers in 2012. Today its 30,000 robots have reduced operating expenses by 20 percent, reduced fulfillment times from 60 minutes down to 15 minutes, and increased inventory capacity by 50 percent. Robots are great at doing repetitive tasks, but not creative tasks like painting ceilings. Think about that when you're considering your career options.

You can read more about both of these innovations in chapter 4. There is also a new running case in chapters 7-12 that looks at a startup using digital reality devices to create an exercise/entertainment application.

This is not a computer book, nor is this a computer course. It's a book about using information technology to help you as a business professional. You might be an information systems major; but more likely you're a marketing, or accounting, or finance, or management, or some other business major. No matter which major, understanding how emerging technology will impact your industry will be critical to your future success.

- **Dynamic Study Modules**—help students learn the language of MIS by continuously assessing their activity and performance in real time by adapting to the student's **knowledge** and confidence on each concept. These are available as graded assignments prior to class, and accessible on smartphones, tablets, and computers.



- **Learning Catalytics™**—is an interactive, student response tool that uses students' smartphones, tablets, or laptops to engage them in more sophisticated tasks and **critical thinking** as well as **collaboration** with other class members. Included with MyLab with eText, Learning Catalytics enables you to generate classroom discussion, guide your lecture, and promote peer-to-peer learning with real-time analytics.

- **Reporting Dashboard**—View, analyze, and report learning outcomes clearly and easily, and get the information needed to keep students on track throughout the course with the new Reporting Dashboard. Available via the MyLab Gradebook and fully mobile-ready, the Reporting Dashboard presents student performance data at the class, section, and program levels in an accessible, visual manner.



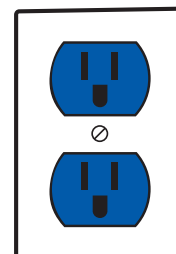
- **Enhanced eText**—keeps students engaged in learning on their own time, while helping them achieve greater conceptual understanding of course material. The embedded videos, simulations, and activities bring learning to life. to apply the very concepts they are reading about. Combining resources that illuminate content with accessible self-assessment, MyLab with Enhanced eText provides students with a complete digital learning experience—all in one place.



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Please email our Accessibility Team at disability.support@pearson.com for the most up-to-date information.

- **LMS Integration**—You can now link from Blackboard Learn, Brightspace by D2L, Canvas, or Moodle to MyISLab. Professors can access assignments, rosters, and resources, and synchronize grades with your LMS gradebook. Single sign-on provides students access to all the personalized learning resources that make studying more efficient and effective.



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Dear Student,

Honestly, this is a fun class. It's fun to take because you'll learn about things that dominate news headlines every day. You'll learn about things like self-driving cars, 3D printing, social media, Big Data, virtual reality, the cloud, and cybersecurity. No, it's not a programming class. It's not intended to be a class where you learn a bunch of boring technical terms and computer code. Not at all.

This class is about using technology to create value. For example, the smartphone sitting next to you is a piece of technology that is probably very valuable to you. It's an amazing piece of hardware that contains software, databases, and artificial intelligent agents. You use it to browse the Web, collaborate with friends, take pictures, post to social media, and make online purchases. More than 85 percent of college students have a smartphone, and 46 percent say they can't live without it. That's value, and they're willing to pay for it.

And that's what information systems are all about. Innovators like Steve Jobs, Bill Gates, Larry Ellison, Mark Zuckerberg, Larry Page, Sergey Brin, and Jeff Bezos have used technology to create value for their customers. As a result, they have made billions of dollars, revolutionized commerce, and created some of the largest companies in the world. And you can do the same thing in your personal life.

You can use technology to get a great job, increase your earning potential, and become indispensable to your future employer. You may not be a superstar entrepreneur like Steve Jobs, but you can exceed beyond your expectations by applying the knowledge you learn in this class. Companies are becoming increasingly dependent on technology. They need people who understand how to use *new* technology to solve *new* types of problems. And that's you.

Think about it. Over time, technology creates new jobs that didn't exist before. Mobile application developers, social media analysts, information security specialists, business intelligence analysts, and data architects didn't exist 20—even 10—years ago. Similarly, the best jobs 20 years from now probably don't currently exist.

The trick to turning information systems to your advantage is being able to predict technological innovations and then get ahead of them. During your career, you will find many opportunities for the innovative application of information systems in business and government—but only if you know how to look for them.

Once found, those opportunities become your opportunities when you—as a skilled, creative, nonroutine problem solver—apply emerging technology to facilitate your organization's strategy. This is true whether your job is in marketing, operations, sales, accounting, finance, entrepreneurship, or another discipline.

Congratulations on deciding to study business. Use this course to help you obtain and then thrive in an interesting and rewarding career. Learn more than just the MIS terminology—understand the ways information systems are transforming business and the many, many ways you can participate in that transformation.

In this endeavor, we wish you, a future business professional, the very best success!

David Kroenke & Randy Boyle

The Guides

Each chapter includes three unique **guides** that focus on current issues in information systems. In each chapter, one of the guides focuses on an ethical issue in business, and the second focuses on security. The third guide focuses on careers

in the field of information systems. The content of each guide is designed to stimulate thought, discussion, and active participation in order to help *you* develop your problem-solving skills and become a better business professional.

Chapter 1

Ethics: Ethics and Professional Responsibility 23
Security: Passwords and Password Etiquette 26
Career Guide: Five-Component Careers 28

Chapter 2

Ethics: Big Brother Wearables 60
Security: Evolving Security 70
Career Guide: Software Product Manager 72

Chapter 3

Ethics: The Lure of Love Bots 86
Security: Hacking Smart Things 100
Career Guide: Director of Architecture 103

Chapter 4

Ethics: Free Apps For Data 142
Security: Poisoned App-les 148
Career Guide: Technical Account Manager 150

Chapter 5

Ethics: Querying Inequality? 166
Security: Big Data . . . Losses 188
Career Guide: Database Engineer 190

Chapter 6

Ethics: Cloudy Profit? 216
Security: From Anthem to Anathema 238
Career Guide: Senior Network Manager 241

Chapter 7

Ethics: Paid Deletion 268
Security: It's Not Me . . . It's You 280
Career Guide: IT Technical Manager 282

Chapter 8

Ethics: Synthetic Friends 312
Security: Digital Is Forever 325
Career Guide: International Content Director 327

Chapter 9

Ethics: MIS-diagnosis 350
Security: Semantic Security 372
Career Guide: Manager, Data and Analytics 374

Chapter 10

Ethics: Securing Privacy 398
Security: Exhaustive Cheating 412
Career Guide: Senior Consultant 414

Chapter 11

Ethics: Training Your Replacement 432
Security: Watching the Watchers 442
Career Guide: Senior Data Analyst 444

Chapter 12

Ethics: Estimation Ethics 466
Security: Psst. There's another Way, You Know . . . 488
Career Guide: Developing Your Personal Brand 490

LEARNING AIDS FOR STUDENTS

We have structured this book so you can maximize the benefit from the time you spend reading it. As shown in the following table, each chapter includes various learning aids to help you succeed in this course.

Resource	Description	Benefit	Example
Guides	Each chapter includes three guides that focus on current issues in information systems. One addresses ethics, one addresses security, and the third addresses information systems careers.	Stimulate thought and discussion. Address ethics and security once per chapter. Learn about real-world IS jobs.	Chapter 5, Ethics Guide: Querying Inequality? Chapter 8, Security Guide: Digital Is Forever Chapter 9, Career Guide: Manager, Data and Analytics
Chapter Introduction Business Example	Each chapter begins with a description of a business situation that motivates the need for the chapter's contents. We focus on two different businesses over the course of the text: Falcon Security, a provider of aerial surveillance and inspection services; and ARES, an augmented reality exercise startup opportunity.	Understand the relevance of the chapter's content by applying it to a business situation.	Chapter 9, opening vignette: Business Intelligence Systems and ARES
Query-Based Chapter Format	Each chapter starts with a list of questions, and each major heading is a question. The Active Review contains tasks for you to perform in order to demonstrate your ability to answer the questions.	Use the questions to manage your time, guide your study, and review for exams.	Chapter 1, Q1-4: How Can You Use the Five Component Model? Chapter 6, Q6-4: How Does the Internet Work?
So What?	Each chapter of this text includes an exercise called "So What?" This feature challenges the students to apply the knowledge they've gained from the chapter to themselves, often in a personal way. The goal is to drive home the relevancy of the chapter's contents to their future professional lives. It presents a current issue in IS that is relevant to the chapter content and asks you to consider why that issue matters to you as a future business professional.	Understand how the material in the chapter applies to everyday situations.	Chapter 2, So What? Augmented Collaboration

Resource	Description	Benefit	Example
2027?	Each chapter concludes with a discussion of how the concepts, technology, and systems described in that chapter might change by 2027.	Learn to anticipate changes in technology and recognize how those changes may affect the future business environment.	Chapter 7, 2027? discusses the future of ERP applications
Active Review	This review provides a set of activities for you to perform in order to demonstrate your ability to answer the primary questions addressed by the chapter.	After reading the chapter, use the Active Review to check your comprehension. Use for class and exam preparation.	Chapter 9, Active Review
Using Your Knowledge	These exercises ask you to take your new knowledge one step further by applying it to a practice problem.	Test your critical-thinking skills.	Chapter 4, Using Your Knowledge
Collaboration Exercises	These exercises and cases ask you to collaborate with a group of fellow students, using collaboration tools introduced in Chapter 2.	Practice working with colleagues toward a stated goal.	Collaboration Exercise 3 discusses how to tailor a high-end resort's information system to fit its competitive strategy
Case Studies	Each chapter includes a case study at the end.	Apply newly acquired knowledge to real-world situations.	Case Study 6, FinQCloud Forever... Well, at Least for the Required Interval
Application Exercises	These exercises ask you to solve situations using spreadsheet (Excel) or database (Access) applications.	Develop your computer skills.	AE10-2 builds on your knowledge from Chapter 10 by asking you to score the websites you visit using WOT
International Dimension	This module at the end of the text discusses international aspects of MIS. It includes the importance of international IS, the localization of system components, the roles of functional and cross-functional systems, international applications, supply chain management, and challenges of international systems development.	Understand the international implications and applications of the chapters' content.	International Dimension QID-3, How Do Inter-enterprise IS Facilitate Global Supply Chain Management?

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TENTH EDITION

Using **MIS**

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BRIEF CONTENTS

Part 1: Why MIS? 1

- 1 The Importance of MIS 3
- 2 Collaboration Information Systems 37
- 3 Strategy and Information Systems 81

Part 2: Information Technology 111

- 4 Hardware, Software, and Mobile Systems 113
- 5 Database Processing 159
- 6 The Cloud 201

Part 3: Using IS for Competitive Advantage 249

- 7 Processes, Organizations, and Information Systems 251
- 8 Social Media Information Systems 293
- 9 Business Intelligence Systems 335

Part 4: Information Systems Management 381

- 10 Information Systems Security 383
- 11 Information Systems Management 423
- 12 Information Systems Development 451

The International Dimension 498

Application Exercises 519

Glossary 538

Index 555

Describes how this course teaches four key skills for business professionals. Defines *MIS*, *information systems*, and *information*.

Describes characteristics, criteria for success, and the primary purposes of collaboration.

Discusses components of collaboration IS and describes collaboration for communication and content sharing. Illustrates use of Google Drive, SharePoint, and other collaboration tools.

Describes reasons why organizations create and use information systems: to gain competitive advantage, to solve problems, and to support decisions.

Describes the manager's essentials of hardware and software technology. Discusses open source, Web applications, mobile systems, and BYOD policies.

Explores database fundamentals, applications, modeling, and design. Discusses the entity-relationship model. Explains the role of Access and enterprise DBMS products. Defines *Big Data* and describes nonrelational and NoSQL databases.

Explains why organizations are moving to the cloud and how they can use the cloud effectively. Describes basic network technology that underlies the cloud and how the Internet works. Explains Web servers, SOA, and Web services standards. Discusses how organizations, including Falcon Security, can use the cloud securely.

Discusses workgroup, enterprise, and inter-enterprise IS. Describes problems of information silos and cross-organizational solutions. Presents CRM, ERP, and EAI. Discusses ERP vendors and implementation challenges.

Describes components of social media IS (SMIS) and explains how SMIS can contribute to organizational strategy. Discusses the theory of social capital and how revenue can be generated using social media. Explains the ways organizations can use ESN and manage the risks of SMIS.

Describes business intelligence and knowledge management, including reporting systems, data mining, and social media-based knowledge management systems.

Describes organizational response to information security: security threats, policy, and safeguards.

Describes the role, structure, and function of the IS department; the role of the CIO and CTO; outsourcing; and related topics.

Discusses the need for BPM and the BPM process. Introduces BPMN. Differentiates between processes and information systems. Presents SDLC stages. Describes agile technologies and scrum and discusses their advantages over the SDLC.

CONTENTS

Part 1: Why MIS?

1: The Importance of MIS 3

- Q1-1** Why Is Introduction to MIS the Most Important Class in the Business School? 5
 - The Digital Revolution 5
 - Evolving Capabilities 6
 - Moore's Law 6
 - Metcalf's Law 7
 - Other Forces Pushing Digital Change 8
 - This Is the Most Important Class in the School of Business 9
- Q1-2** How Will MIS Affect Me? 9
 - How Can I Attain Job Security? 9
 - How Can Intro to MIS Help You Learn Nonroutine Skills? 10
 - What Is the Bottom Line? 14
- Q1-3** What Is MIS? 14
 - Components of an Information System 14
 - Management and Use of Information Systems 15
 - Achieving Strategies 16
- Q1-4** How Can You Use the Five-Component Model? 16
 - The Most Important Component—You 17
 - All Components Must Work 17
 - High-Tech Versus Low-Tech Information Systems 17
 - **So What? A Is for Alphabet** 18
 - Understanding the Scope of New Information Systems 19
 - Components Ordered by Difficulty and Disruption 19
- Q1-5** What Is Information? 19
 - Definitions Vary 20
 - Where Is Information? 20
- Q1-6** What Are Necessary Data Characteristics? 21
 - Accurate 21
 - Timely 21
 - Relevant 22
 - Just Barely Sufficient 22
 - Worth Its Cost 22

Q1-7 2027? 22

- **Ethics Guide:** *Ethics and Professional Responsibility* 23
- **Security Guide:** *Passwords and Password Etiquette* 26
- **Career Guide:** *Five-Component Careers* 28

Case Study 1: zulily 33**2: Collaboration Information Systems** 37**Q2-1** What Are the Two Key Characteristics of Collaboration? 39

Importance of Constructive Criticism 40

Guidelines for Giving and Receiving Constructive Criticism 40

Warning! 41

Q2-2 What Are Three Criteria for Successful Collaboration? 42

Successful Outcome 42

Growth in Team Capability 43

Meaningful and Satisfying Experience 43

Q2-3 What Are the Four Primary Purposes of Collaboration? 43

Becoming Informed 44

Making Decisions 44

Solving Problems 46

Managing Projects 46

Q2-4 What Are the Requirements for a Collaboration Information System? 48

The Five Components of an IS for Collaboration 48

Primary Functions: Communication and Content Sharing 49

Q2-5 How Can You Use Collaboration Tools to Improve Team Communication? 49**Q2-6** How Can You Use Collaboration Tools to Manage Shared Content? 53

Shared Content with No Control 55

Shared Content with Version Management on Google Drive 55

Shared Content with Version Control 58

- **Ethics Guide:** *Big Brother Wearables* 60

Q2-7 How Can You Use Collaboration Tools to Manage Tasks? 62

Sharing a Task List on Google Drive 62

Sharing a Task List Using Microsoft SharePoint 62

- **So What?** *Augmented Collaboration* 63

Q2-8 Which Collaboration IS Is Right for Your Team? 65

Three Sets of Collaboration Tools 66

Choosing the Set for Your Team 67

Don't Forget Procedures and People! 68

Q2-9 2027? 69

- **Security Guide:** *Evolving Security* 70

- **Career Guide:** *Software Product Manager* 72

Case Study 2: Eating Our Own Dog Food 75**3: Strategy and Information Systems 81****Q3-1 How Does Organizational Strategy Determine Information Systems Structure? 83****Q3-2 What Five Forces Determine Industry Structure? 84****Q3-3 How Does Analysis of Industry Structure Determine Competitive Strategy? 85**

- **Ethics Guide:** *The Lure of Love Bots* 86

Q3-4 How Does Competitive Strategy Determine Value Chain Structure? 88

Primary Activities in the Value Chain 88

Support Activities in the Value Chain 89

Value Chain Linkages 89

Q3-5 How Do Business Processes Generate Value? 90**Q3-6 How Does Competitive Strategy Determine Business Processes and the Structure of Information Systems? 92****Q3-7 How Do Information Systems Provide Competitive Advantages? 93**

Competitive Advantage via Products 93

- **So What?** *The Autonomous Race* 94

Competitive Advantage via Business Processes 95

How Does an Actual Company Use IS to Create Competitive Advantages? 96

How Does This System Create a Competitive Advantage? 97

Q3-8 2027? 99

- **Security Guide:** *Hacking Smart Things* 100

- **Career Guide:** *Director of Architecture* 103

Case Study 3: The Amazon of Innovation 106

Part 2: Information Technology

4: Hardware, Software, and Mobile Systems 113

- Q4-1** What Do Business Professionals Need to Know About Computer Hardware? 115
 - Hardware Components 115
 - Types of Hardware 116
 - Computer Data 117
- Q4-2** How Can New Hardware Affect Competitive Strategies? 119
 - Internet of Things 119
 - Digital Reality Devices 121
 - Self-driving Cars 122
 - 3D Printing 125
- Q4-3** What Do Business Professionals Need to Know About Software? 126
 - What Are the Major Operating Systems? 127
 - Virtualization 129
 - Own Versus License 131
 - What Types of Applications Exist, and How Do Organizations Obtain Them? 131
 - What Is Firmware? 132
- Q4-4** Is Open Source Software a Viable Alternative? 133
 - Why Do Programmers Volunteer Their Services? 133
 - **So What?** *New from CES 2016* 134
 - How Does Open Source Work? 135
 - So, Is Open Source Viable? 136
- Q4-5** What Are the Differences Between Native and Web Applications? 136
 - Developing Native Applications 136
 - Developing Web Applications 137
 - Which Is Better? 139
- Q4-6** Why Are Mobile Systems Increasingly Important? 139
 - Hardware 140
 - Software 141
 - Data 141
 - **Ethics Guide:** *Free Apps For Data* 142
 - Procedures 144
 - People 144
- Q4-7** What Are the Challenges of Personal Mobile Devices at Work? 145
 - Advantages and Disadvantages of Employee Use of Mobile Systems at Work 145
 - Survey of Organizational BYOD Policy 146

- Q4-8** 2027? 147
- **Security Guide:** *Poisoned App-les* 148
 - **Career Guide:** *Technical Account Manager* 150
- Case Study 4: The Apple of Your i** 155

5: Database Processing 159

- Q5-1** What Is the Purpose of a Database? 161
- Q5-2** What Is a Database? 163
- Relationships Among Rows 164
 - Metadata 165
 - **Ethics Guide:** *Querying Inequality?* 166
- Q5-3** What Is a Database Management System (DBMS)? 168
- Creating the Database and Its Structures 168
 - Processing the Database 169
 - Administering the Database 169
 - **So What?** *Slick Analytics* 170
- Q5-4** How Do Database Applications Make Databases More Useful? 172
- Traditional Forms, Queries, Reports, and Applications 172
 - Browser Forms, Reports, Queries, and Applications 174
 - Multi-user Processing 175
- Q5-5** How Are Data Models Used for Database Development? 176
- What Is the Entity-Relationship Data Model? 177
- Q5-6** How Is a Data Model Transformed into a Database Design? 180
- Normalization 181
 - Representing Relationships 182
 - Users' Role in the Development of Databases 184
- Q5-7** How Can Falcon Security Benefit from a Database System? 186
- Q5-8** 2027? 187
- **Security Guide:** *Big Data... Losses* 188
 - **Career Guide:** *Database Engineer* 190
- Case Study 5: Searching for Pianos . . .** 194

6: The Cloud 201

- Q6-1** Why Are Organizations Moving to the Cloud? 203
- Cloud Computing 204
 - Why Do Organizations Prefer the Cloud? 205
 - When Does the Cloud Not Make Sense? 206

- Q6-2** How Do Organizations Use the Cloud? 207
- Resource Elasticity 207
 - Pooling Resources 208
 - Over the Internet 209
 - Cloud Services from Cloud Vendors 209
 - Content Delivery Networks 212
 - Using Web Services Internally 213
- Q6-3** What Network Technology Supports the Cloud? 214
- What Are the Components of a LAN? 215
 - **Ethics Guide:** *Cloudy Profit?* 216
 - Connecting Your LAN to the Internet 218
- Q6-4** How Does the Internet Work? 220
- The Internet and the U.S. Postal System 220
 - Step 1: Assemble Package (Packets) 221
 - Step 2: Put Name on Package (Domain Names) 221
 - Step 3: Look Up Address (IP Address) 221
 - Step 4: Put Address on Package (IP Address on Packet) 222
 - Step 5: Put Registered Mail Sticker on Package (TCP) 222
 - Step 6: Ship Package (Packets Transported by Carriers) 223
- Q6-5** How Do Web Servers Support the Cloud? 224
- Three-Tier Architecture 225
 - Watch the Three Tiers in Action! 225
 - Service-Oriented Architecture (SOA) 226
 - A SOA Analogy 226
 - SOA for Three-Tier Architecture 228
 - Internet Protocols 229
 - TCP/IP Protocol Architecture 229
- Q6-6** How Can Falcon Security Use the Cloud? 231
- SaaS Services at Falcon Security 231
 - PaaS Services at Falcon Security 232
 - IaaS Services at Falcon Security 232
- Q6-7** How Can Organizations Use Cloud Services Securely? 232
- Virtual Private Networks (VPNs) 233
 - Using a Private Cloud 233
 - Using a Virtual Private Cloud 235
 - **So What?** *Quantum Learning* 236
- Q6-8** 2027? 237
- **Security Guide:** *From Anthem to Anathema* 238
 - **Career Guide:** *Senior Network Manager* 241
- Case Study 6: FinQcloud Forever . . . Well, at Least for the Required Interval . . . 245**

Part 3: Using IS for Competitive Advantage

7: Processes, Organizations, and Information Systems 251

- Q7-1** What Are the Basic Types of Processes? 253
 - How Do Structured Processes Differ from Dynamic Processes? 254
 - How Do Processes Vary by Organizational Scope? 255
- Q7-2** How Can Information Systems Improve Process Quality? 257
 - How Can Processes Be Improved? 258
 - How Can Information Systems Improve Process Quality? 258
- Q7-3** How Do Information Systems Eliminate the Problems of Information Silos? 259
 - What Are the Problems of Information Silos? 260
 - How Do Organizations Solve the Problems of Information Silos? 261
 - An Enterprise System for Patient Discharge 262
- Q7-4** How Do CRM, ERP, and EAI Support Enterprise Processes? 262
 - The Need for Business Process Engineering 263
 - Emergence of Enterprise Application Solutions 263
 - Customer Relationship Management (CRM) 264
 - Enterprise Resource Planning (ERP) 265
 - **So What? Workflow Problems** 266
 - **Ethics Guide: Paid Deletion** 268
 - Enterprise Application Integration (EAI) 270
- Q7-5** What Are the Elements of an ERP System? 272
 - Hardware 272
 - ERP Application Programs 273
 - ERP Databases 273
 - Business Process Procedures 273
 - Training and Consulting 274
 - Industry-Specific Solutions 275
 - Which Companies Are the Major ERP Vendors? 276
- Q7-6** What Are the Challenges of Implementing and Upgrading Enterprise Information Systems? 276
 - Collaborative Management 276
 - Requirements Gaps 276
 - Transition Problems 277
 - Employee Resistance 277
 - New Technology 277
- Q7-7** How Do Inter-enterprise IS Solve the Problems of Enterprise Silos? 278

Q7-8 2027? 279

- **Security Guide:** *It's Not Me ... It's You* 280
- **Career Guide:** *IT Technical Manager* 282

Case Study 7: A Tale of Two Interorganizational IS 288**8: Social Media Information Systems** 293**Q8-1** What Is a Social Media Information System (SMIS)? 295

- Three SMIS Roles 295
- SMIS Components 298

Q8-2 How Do SMIS Advance Organizational Strategy? 300

- Social Media and the Sales and Marketing Activity 300
- Social Media and Customer Service 301
- Social Media and Inbound and Outbound Logistics 302
- Social Media and Manufacturing and Operations 302
- Social Media and Human Resources 303

Q8-3 How Do SMIS Increase Social Capital? 303

- What Is the Value of Social Capital? 304
- How Do Social Networks Add Value to Businesses? 304
- Using Social Networking to Increase the Number of Relationships 305
 - **So What?** *Enhanced Golf Fan* 306
- Using Social Networks to Increase the Strength of Relationships 307
- Using Social Networks to Connect to Those with More Resources 308

Q8-4 How Do (Some) Companies Earn Revenue from Social Media? 309

- You Are the Product 309
- Revenue Models for Social Media 309
- Does Mobility Reduce Online Ad Revenue? 310
 - **Ethics Guide:** *Synthetic Friends* 312

Q8-5 How Do Organizations Develop an Effective SMIS? 313

- Step 1: Define Your Goals 314
- Step 2: Identify Success Metrics 314
- Step 3: Identify the Target Audience 315
- Step 4: Define Your Value 315
- Step 5: Make Personal Connections 316
- Step 6: Gather and Analyze Data 316

Q8-6 What Is an Enterprise Social Network (ESN)? 317

- Enterprise 2.0 317
- Changing Communication 318
- Deploying Successful Enterprise Social Networks 318

Q8-7 How Can Organizations Address SMIS Security Concerns? 319

- Managing the Risk of Employee Communication 319
- Managing the Risk of Inappropriate Content 320

Q8-8 2027? 322

- **Security Guide:** *Digital is Forever* 325
- **Career Guide:** *International Content Director* 327

Case Study 8: Sedona Social 330**9: Business Intelligence Systems** 335**Q9-1** How Do Organizations Use Business Intelligence (BI) Systems? 338

How Do Organizations Use BI? 339

What Are Typical BI Applications? 339

Q9-2 What Are the Three Primary Activities in the BI Process? 341

Using Business Intelligence to Find Candidate Parts 341

Q9-3 How Do Organizations Use Data Warehouses and Data Marts to Acquire Data? 346

Problems with Operational Data 348

Data Warehouses Versus Data Marts 349

- **Ethics Guide:** *MIS-diagnosis* 350

Q9-4 How Do Organizations Use Reporting Applications? 352

Basic Reporting Operations 352

RFM Analysis 352

Online Analytical Processing (OLAP) 353

Q9-5 How Do Organizations Use Data Mining Applications? 355

Intelligent Machines 356

Unsupervised Data Mining 357

Supervised Data Mining 357

Market-Basket Analysis 358

Decision Trees 359

Q9-6 How Do Organizations Use Big Data Applications? 361

MapReduce 361

- **So What?** *BI for Securities Trading?* 362

Hadoop 363

Q9-7 What Is the Role of Knowledge Management Systems? 364

What Are Expert Systems? 364

What Are Content Management Systems? 366

What Are the Challenges of Content Management? 366

What Are Content Management Application Alternatives? 367

How Do Hyper-Social Organizations Manage Knowledge? 367

Hyper-Social KM Alternative Media 368

Resistance to Knowledge Sharing 368

Q9-8 What Are the Alternatives for Publishing BI? 369

Characteristics of BI Publishing Alternatives 369

What Are the Two Functions of a BI Server? 370

Q9-9 2027? 371

- **Security Guide:** *Semantic Security* 372
- **Career Guide:** *Manager, Data and Analytics* 374

Case Study 9: Hadoop the Cookie Cutter 378

Part 4: Information Systems Management

10: Information Systems Security 383

Q10-1 What Is the Goal of Information Systems Security? 386

- The IS Security Threat/Loss Scenario 386
- What Are the Sources of Threats? 387
- What Types of Security Loss Exist? 388
- Goal of Information Systems Security 390

Q10-2 How Big Is the Computer Security Problem? 390**Q10-3** How Should You Respond to Security Threats? 392**Q10-4** How Should Organizations Respond to Security Threats? 394

- **So What?** *New from Black Hat 2015* 395

Q10-5 How Can Technical Safeguards Protect Against Security Threats? 396

- Identification and Authentication 396
- Single Sign-on for Multiple Systems 397
- Encryption 397
- **Ethics Guide:** *Securing Privacy* 398
- Firewalls 401
- Malware Protection 402
- Design for Secure Applications 403

Q10-6 How Can Data Safeguards Protect Against Security Threats? 404**Q10-7** How Can Human Safeguards Protect Against Security Threats? 405

- Human Safeguards for Employees 405
- Human Safeguards for Nonemployee Personnel 407
- Account Administration 407
- Systems Procedures 409
- Security Monitoring 409

Q10-8 How Should Organizations Respond to Security Incidents? 410**Q10-9** 2027? 411

- **Security Guide:** *Exhaustive Cheating* 412
- **Career Guide:** *Senior Consultant* 414

Case Study 10: Hitting the Target 418**11: Information Systems Management** 423**Q11-1** What Are the Functions and Organization of the IS Department? 425

How Is the IS Department Organized? 426

Security Officers 427

What IS-Related Job Positions Exist? 427

Q11-2 How Do Organizations Plan the Use of IS? 429

Align Information Systems with Organizational Strategy 429

- **So What?** *Managing the IS Department* 430

Communicate IS Issues to the Executive Group 431

Develop Priorities and Enforce Them Within the IS Department 431

Sponsor the Steering Committee 431

Q11-3 What Are the Advantages and Disadvantages of Outsourcing? 431

- **Ethics Guide:** *Training Your Replacement* 432

Outsourcing Information Systems 433

International Outsourcing 435

What Are the Outsourcing Alternatives? 436

What Are the Risks of Outsourcing? 437

Q11-4 What Are Your User Rights and Responsibilities? 439

Your User Rights 439

Your User Responsibilities 440

Q11-5 2027? 441

- **Security Guide:** *Watching the Watchers* 442
- **Career Guide:** *Senior Data Analyst* 444

Case Study 11: Automating Labor 447**12: Information Systems Development** 451**Q12-1** How Are Business Processes, IS, and Applications Developed? 453

How Do Business Processes, Information Systems, and Applications Differ and Relate? 454

Which Development Processes Are Used for Which? 455

Q12-2	How Do Organizations Use Business Process Management (BPM)?	457
	Why Do Processes Need Management?	457
	What Are BPM Activities?	458
Q12-3	How Is Business Process Modeling Notation (BPMN) Used to Model Processes?	460
	Need for Standard for Business Processing Notation	460
	Documenting the As-Is Business Order Process	460
Q12-4	What Are the Phases in the Systems Development Life Cycle (SDLC)?	463
	Define the System	465
	• Ethics Guide: <i>Estimation Ethics</i>	466
	Determine Requirements	468
	Design System Components	470
	System Implementation	471
	Maintain System	472
Q12-5	What Are the Keys for Successful SDLC Projects?	473
	Create a Work Breakdown Structure	473
	Estimate Time and Costs	474
	Create a Project Plan	475
	Adjust Plan via Trade-offs	476
	Manage Development Challenges	478
Q12-6	How Can Scrum Overcome the Problems of the SDLC?	479
	• So What? <i>Banking on IoT</i>	480
	What Are the Principles of Agile Development Methodologies?	481
	What Is the Scrum Process?	482
	How Do Requirements Drive the Scrum Process?	484
Q12-7	2027?	486
	Fetch!	486
	User-Driven Systems	487
	Industry Will Push Change	487
	• Security Guide: <i>Psst. There's another Way, You Know...</i>	488
	• Career Guide: <i>Developing Your Personal Brand</i>	490
	Case Study 12: When Will We Learn?	495
	<i>The International Dimension</i>	498
	<i>Application Exercises</i>	519
	<i>Glossary</i>	538
	<i>Index</i>	555

PREFACE

In Chapter 1, we claim that MIS is the most important class in the business curriculum. That's a bold statement, and every year we ask whether it remains true. Is there any discipline having a greater impact on contemporary business and government than IS? We continue to doubt there is. Every year brings important new technology to organizations, and many of these organizations respond by creating innovative applications that increase productivity and help them accomplish their strategies.

Over the past year, we've seen long-discussed innovations take big leaps forward. Digital reality (sometimes called virtual reality) really took off. Microsoft (HoloLens), Meta (Meta 2), and Facebook (Oculus Rift) released their digital reality devices in early 2016. The reviews for these devices from early adopters were glowing. These devices will create entirely new types of companies and could change the way people live, work, shop, and entertain themselves.

Internet of Things (IoT) smart devices once again dominated the Consumer Electronics Show (CES), which is the industry's annual display of the latest innovative products. Smart refrigerators, smart beds, and smart sensors of every kind were a hit. But it isn't just consumers who are excited for IoT devices; businesses see their potential value, too. More importantly, these businesses recognize the need to collect, store, and analyze the data these devices will generate. As a result, jobs in analytics, business intelligence, and Big Data are all in high demand right now.

In addition to changing the ways we live and gather data, recent innovations are changing the way companies work, too. For example, over the past year Amazon experienced tremendous success using Kiva robots in its fulfillment centers. It expanded their use to 13 warehouses around the world. These 30,000 Kiva robots have reduced operating costs by 20 percent (\$22 million per warehouse); they have also reduced click-to-ship times from 60 minutes to just 15 minutes.¹ If Amazon rolls out these robots to all of its 110 warehouses, it could save billions. Technology—in this case, an automated workforce—is fundamentally changing the way organizations operate. It's enabling them to be more productive, innovative, and adaptable.

Another technological advancement that made huge strides over the past year was self-driving cars. Tesla Motors turned a regular car into a self-driving car by simply pushing out a software update. In 6 months the nearly autonomous vehicles logged more than 100 million miles on autopilot (with a few traffic incidents). Google, Mercedes-Benz, and nearly all other automobile manufacturers are running full tilt to turn their traditional cars into fully autonomous smart cars. The implications for autonomous vehicles go beyond consumers, too. Consider what would happen if Amazon started using self-driving trucks. It could reduce shipping costs by 80 percent!

Of course, not all of this year's technology news has been good. Large-scale data breaches continue to be a major problem. LinkedIn (117 million), Ashley Madison (30 million), Tumblr (65 million), and MySpace (360 million) all suffered enormous data losses. And these are just a fraction of the total number of organizations affected this year. Organizations saw a jump in the number of attacks from highly organized international hacking groups; they also saw the proliferation of cryptographic ransomware.

This edition of the text has been updated for these developments as well as normal revisions that address emergent technologies like cloud-based services, artificial intelligence, machine learning, and so on.

All of these changes highlight the fact that more sophisticated and demanding users push organizations into a rapidly changing future—one that requires continual adjustments in business planning. In order to participate in this business environment, our graduates need to know

how to apply emerging technologies to better achieve their organizations' strategies. Knowledge of MIS is critical to this endeavor. And this pace continues to remind us of Carrie Fisher's statement "The problem with instantaneous gratification is that it's just not fast enough."

Why This Tenth Edition?

To reiterate the preface of earlier editions, we believe it is exceedingly important to make frequent adaptations to this text because of the delays associated with a 2-year revision cycle. Text materials we develop in April of one year are published in January of the next year and are first used by students in September—a minimum 17-month delay.

For some areas of study, a year and a half may not seem long because little changes in that amount of time. But in MIS, entire companies can be founded and then sold for billions of dollars in just a few years. YouTube, for example, was founded in February 2005 and then sold in November 2006 to Google for \$1.65B (21 months). And that wasn't just a one-time fluke. Facebook Inc. started in 2004, led the social media revolution, and became a public company valued at \$341B as of mid-2016. That's a whopping \$28B in growth per year for 12 years! MIS changes fast—very fast. We hope this new edition is the most up-to-date MIS textbook available.

The changes in this tenth edition are listed in Table 1. Substantial changes were made in Chapter 6 to provide some context about where the cloud came from and how it differs from previous architectures. New discussion about scalability and the advantages of cloud-based services is included as well as new graphics that more clearly differentiate between IaaS, PaaS, and SaaS. Chapter content was reorganized around an example that explains how the Internet works by comparing it to the U.S. postal system. Hopefully this new example ties abstract and unfamiliar networking concepts to real-world situations that students have experienced.

TABLE 1: CHANGES IN THE TENTH EDITION

Chapter	Change	Chapter	Change
1	New SoWhat? Feature: A Is for Alphabet		New SoWhat? Feature: New from CES 2016
	New and updated charts for CPU and data storage growth		New Career Guide: Technical Account Manager
	Updated BLS job statistics		Updated industry statistics throughout the chapter
	New 2027? discussion in Q1-7		Expanded augmented/mixed/virtual reality discussion
2	New Ethics Guide: Big Brother Wearables		New Collaboration Exercise: Microsoft HoloLens
	New Career Guide: Software Product Manager	5	New Security Guide: Big Data... Losses
	Discussion of constructive criticism and groupthink		New SoWhat? Guide: Slick Analytics
	New examples of providing and receiving constructive criticism		New Career Guide: Database Engineer
	Expanded discussion of real-time surveying software (Socrative)		Updated images for Microsoft Office 2016 and SharePoint 2016
	Updated So What? Guide about augmented collaboration	6	Reorganized chapter content for Q6-1 through Q6-5
	New 2027? discussion in Q2-9		New Q6-1 discussion about the origin of the cloud
3	New So What? Feature: The Autonomous Race		New Q6-1 cloud adoption examples statistics
	New Career Guide: Technology and Operations Executive		New discussion about scalability
	New Ethics Guide: The Lure of Love Bots		Expanded cloud versus in-house comparison
	New 2027? discussion in Q3-8		New Q6-2 example using transportation as a service
	Updated Amazon case study		New Q6-2 graphics to illustrate differences between IaaS, PaaS, and SaaS
4	New Security Guide: Poisoned App-les		New Q6-2 example and graphics for CDNs
			New Q6-4 example comparing the Internet and the U.S. postal system

Chapter	Change
	New Q6-4 content about DNS, TCP, IP addresses, carriers, and IXPs
	Updated Active Review questions
	Updated 2027? discussion to include AaaS and BaaS
	New SoWhat? Feature: Quantum Learning
	New Career Guide: Senior Network Manager
	Updated industry statistics throughout the chapter
7	New ARES introduction
	New Security Guide: It's Not Me, It's You
	New Career Guide: IT Technical Manager
	New Ethics Guide: Paid Deletion
	Updated Q7-7 for ARES example
8	New ARES introduction
	New SoWhat? Feature: Enhanced Golf Fan
	New Career Guide: International Content Director
	Updated industry statistics throughout the chapter
	New social media chapter examples
9	New ARES introduction
	New Career Guide: Manager, Data and Analytics
	New Ethics Guide: MIS-Diagnosis
	Updated chapter examples using ARES
	Updated Office 2016 figures
	Updated RFM scoring
	New discussion of AI and machine learning
10	New ARES introduction
	New Security Guide: Exhaustive Cheating
	New SoWhat? Feature: New from Black Hat 2015

Chapter	Change
	New Career Guide: IT Security Analyst
	New industry statistics and charts throughout the chapter
11	New ARES introduction
	New Security Guide: Watching the Watchers
	New Career Guide: Director of Architecture
	New Ethics Guide: Training Your Replacement
	New industry statistics and charts throughout the chapter
	Expanded discussion on outsourcing specialized tech skills
	New automated labor case study
12	New ARES introduction
	New SoWhat? Feature: Banking on IoT
	New statistics about agile and scrum use
	New 2027? discussion in Q12-7
International Dimension	Updated section on localization using IBM's Watson
	New legal environment examples in QID-4
	New statistics and discussion about international Internet access (fixed and mobile)
	New Career Guide: Director of Asian Operations
Appl Ex	Updated data files
	New exercise looking up IT job salaries (O*NET and BLS)
	New exercise using an ad blocker (Adblock Plus)
	New exercise creating a mobile application (Microsoft Touch Develop)
	Updated Microsoft Office 2016 compliant files and chapter images

In addition, we've introduced a new "Career Guide" in this edition that let's students read firsthand accounts from people working in information systems jobs. Each of these guides is written by an MIS graduate and answers questions like "How did you get this type of job?" and "What does a typical workday look like for you?" Students taking an introductory course in MIS are often interested in majoring in MIS but aren't sure what it would be like to work in the field. These new guides answer some of the common questions students may have about working in the field.

Also, a secondary goal of these new Career Guides is to encourage female students not to be daunted by gender imbalances in a field that is 70 percent male and 30 percent female.² Half of the Career Guides are written by men and the other half by women. Hopefully, hearing from successful women working in MIS jobs will inspire female students considering a career in MIS.

Chapters 7 through 12 begin with a new discussion of ARES, a cloud-based augmented-reality exercise startup. Chapters 1–6 continue to be introduced by Falcon Security, a privately owned company that provides surveillance and inspection services for companies using flying drones. In addition to motivating the chapter material, both case scenarios provide numerous opportunities for students to practice one of Chapter 1's key skills: "Assess, evaluate, and apply emerging technology to business."

This edition also continues to focus on teaching ethics. Every Ethics Guide asks students to apply Immanuel Kant's categorical imperative, Bentham and Mill's utilitarianism, or both to the business situation described in the guide. We hope you find the ethical considerations

rich and deep with these exercises. The categorical imperative is introduced in the Ethics Guide in Chapter 1 (pages 23–24), and utilitarianism is introduced in the Ethics Guide in Chapter 2 (pages 60–61).

As shown in Table 1, additional changes were made to every chapter, including five new Security Guides, eight new So What? features, five new Ethics Guides, 11 new Career Guides, and updated chapter cases. Additional figures, like the one showing how CDNs work in Chapter 6, were added to make the text more accessible. Numerous changes were made throughout the chapters in an attempt to keep them up-to-date. MIS moves fast, and to keep the text current, we checked every fact, data point, sentence, and industry reference for obsolescence and replaced them as necessary.

Importance of MIS

As stated, we continue to believe we are teaching the single most important course in the business school. The rationale for this bold statement is presented in Chapter 1, starting on page 1. In brief, the argument relies on two observations.

First, processing power, interconnectivity of devices, storage capacity, and bandwidth are all increasing so rapidly that it's fundamentally changing how we use digital devices. Businesses are increasingly finding—and, more importantly, increasingly *required* to find—innovative applications for information systems. The incorporation of Facebook and Twitter into marketing systems is an obvious example, but this example is only the tip of the iceberg. For at least the next 10 years, every business professional will, at the minimum, need to be able to assess the efficacy of proposed IS applications. To excel, business professionals will also need to define innovative IS applications.

Further, professionals who want to emerge from the middle ranks of management will, at some point, need to demonstrate the ability to manage projects that develop these innovative information systems. Such skills will not be optional. Businesses that fail to create systems that take advantage of changes in technology will fall prey to competition that can create such systems. So, too, will business professionals.

The second premise for the singular importance of the MIS class relies on the work of Robert Reich, former Secretary of Labor for the Bill Clinton administration. In *The Work of Nations*,³ Reich identifies four essential skills for knowledge workers in the 21st century:

- Abstract thinking
- Systems thinking
- Collaboration
- Experimentation

For reasons set out in Chapter 1, we believe the MIS course is the single best course in the business curriculum for learning these four key skills.

Today's Role for Professors

What is our role as MIS professors? Students don't need us for definitions; they have the Web for that. They don't need us for detailed notes; they have the PowerPoints. Consequently, when we attempt to give long and detailed lectures, student attendance falls. And this situation is even more dramatic for online courses.

We need to construct useful and interesting experiences for students to apply MIS knowledge to their goals and objectives. In this mode, we are more like track coaches than the chemistry professor of the past. And our classrooms are more like practice fields than lecture halls.⁴

Of course, the degree to which each of us moves to this new mode depends on our goals, our students, and our individual teaching styles. Nothing in the structure or content of this edition assumes that a particular topic will be presented in a nontraditional manner. But every chapter contains materials suitable for use with a coaching approach, if desired.

In addition to the chapter feature titled “So What?” all chapters include a collaboration exercise that students can use for team projects inside and outside of class. As with earlier editions, each chapter contains guides that describe practical implications of the chapter contents that can be used for small in-class exercises. Additionally, every chapter concludes with a case study that can be the basis for student activities. Finally, this edition contains 40 application exercises (see page 519).

Falcon Security and ARES Cases

Each part and each chapter opens with a scenario intended to get students involved emotionally, if possible. We want students to mentally place themselves in the situation and to realize that this situation—or something like it—could happen to them. Each scenario sets up the chapter’s content and provides an obvious example of why the chapter is relevant to them. These scenarios help support the goals of student motivation and learning transfer.

Furthermore, both of these introductory cases involve the application of new technology to existing businesses. Our goal is to provide opportunities for students to see and understand how businesses are affected by new technology and how they need to adapt while, we hope, providing numerous avenues for you to explore such adaptation with your students.

In developing these scenarios, we endeavor to create business situations rich enough to realistically carry the discussions of information systems while at the same time simple enough that students with little business knowledge and even less business experience can understand. We also attempt to create scenarios that will be interesting to teach. This edition introduces the new ARES case and continues the Falcon Security case from the ninth edition.

Falcon Security

The chapters in Parts 1 and 2 are introduced with dialogue from key players at Falcon Security, a privately owned company that provides surveillance and inspection services for companies using flying drones. We wanted to develop the case around an interesting business model that students would want to learn more about. Drones get a lot of attention in the press, but students may not know a lot about how they’re used in business. Drones are getting cheaper and easier to fly and have a lot more functionality than they did just a few years ago. It’s likely that students will see drones deployed widely during their careers.

Falcon Security is considering strengthening its competitive advantage by 3D printing its own drones. Buying fleets of drones is expensive, and the drones become outdated quickly. However, were the company to do so, it would be changing its fundamental business model, or at least adding to it. Making drones would require Falcon Security to hire new employees, develop new business processes, and potentially develop a new IS to support the custom-built drones. All of this is good fodder for Chapter 3 and for underlining the importance of the ways that IS needs to support evolving business strategy.

Ultimately, Falcon Security determines that it does not want to become a drone manufacturer. It could print some drone parts, but not enough to make doing so cost effective. The company would still have to buy a lot of expensive component parts to assemble an airworthy drone, something it’s not sure it can do consistently. Falcon decides to focus on its core strength of providing integrated security services.

Students may object that, in studying Falcon Security, they devoted considerable time to an opportunity that ultimately didn’t make business sense and was rejected. But this outcome is at

least as informative as a successful outcome. The example uses knowledge of processes as well as application of business intelligence to avoid making a serious blunder and wasting substantial money. Falcon Security didn't have to open a factory and 3D-print a fleet of custom-built drones just to find out it would be a mistake. It could make a prototype, *analyze* the costs and benefits, and then avoid making the mistake in the first place. The very best way to solve a problem is not to have it!

ARES

The Augmented Reality Exercise System (ARES) is an embryonic, entrepreneurial opportunity that uses digital reality devices (Microsoft HoloLens), data-gathering exercise equipment, and the cloud to share integrated data among users, health clubs, and employers. ARES allows users to virtually bike with friends, famous cyclists, or even “pacers” mimicking their previous performance.

ARES is based on a real-world prototype developed for the owner of a health club who wanted to connect the workout data of his club members to their workout data at home and to their employers, insurance companies, and healthcare professionals. The prototype was written in C#, and the code runs against an Azure database in the cloud. It used the Windows Phone emulator that is part of Visual Studio.

As reflected in the ARES case, the developers realized it was unlikely to succeed because Dr. Flores was too busy as a cardiac surgeon to make his startup a success. Therefore, he sold it to a successful businessman who changed the staff and the strategy and repurposed the software to take advantage of new digital reality hardware. All of this is described at the start of Chapter 7.

Use of the Categorical Imperative and Utilitarianism in Ethics Guides

Since the introduction of the Ethics Guides into the first edition of this text, we believe there has been a shift in students' attitudes about ethics. Students seem, at least many of them, to be more cynical and callous about ethical issues. As a result, in the seventh edition, we began to use Kant's categorical imperative and Bentham and Mill's utilitarianism to ask students, whose ethical standards are often immature, to adopt the categorical imperative and utilitarian perspectives rather than their own perspectives and, in some cases, in addition to their own perspectives. By doing so, the students are asked to “try on” those criteria, and we hope in the process they think more deeply about ethical principles than they do when we allow them simply to apply their personal biases.

The Ethics Guide in Chapter 1 introduces the categorical imperative, and the guide in Chapter 2 introduces utilitarianism. If you choose to use these perspectives, you will need to assign both of those guides.

2027?

Every chapter concludes with a question labeled “2027?” This section presents our guesses about how the subject of that chapter is likely to change between now and 2027. Clearly, if we had a crystal ball that would give good answers to that question, we wouldn't be writing textbooks.

However, we make what we believe is a reasonable stab at an answer. You will probably have different ideas, and we hope students will have different ideas as well. The goal of these sections is to prompt students to think, wonder, assess, and project about future technology. These sections usually produce some of the most lively in-class discussions.

Why Might You Want Your Students to Use SharePoint?

The difficult part of teaching collaboration is knowing how to assess it. Collaboration assessment is not simply finding out which students did the bulk of the work. It also involves assessing feedback and iteration; that is, identifying who provided feedback, who benefited from the feedback, and how well the work product evolved over time.

Microsoft SharePoint is a tool that can help assess collaboration. It automatically maintains detailed records of all changes that have been made to a SharePoint site. It tracks document versions, along with the date, time, and version author. It also maintains records of user activity—who visited the site, how often, what site features they visited, what work they did, what contributions they made, and so forth. SharePoint makes it easy to determine which students were making sincere efforts to collaborate by giving and receiving critical feedback throughout the project assignment and which students were making a single contribution 5 minutes before midnight the day before the project was due.

Additionally, SharePoint has built-in facilities for team surveys, team wikis, and member blogs as well as document and list libraries. All of this capability is backed up by a rich and flexible security system. To be clear, we do not use SharePoint to run our classes; we use either Blackboard or Canvas for that purpose. However, we do require students to use SharePoint for their collaborative projects. A side benefit is that they can claim, rightfully, experience and knowledge of using SharePoint in their job interviews.

You might also want to use Office 365 because it includes Skype, hosted Exchange, 1TB online storage, and SharePoint Online as an add-on. Microsoft offers Office 365 to academic institutions as a whole or to students directly at reduced educational rates.

Why Are the Chapters Organized by Questions?

The chapters of *Using MIS* are organized by questions. According to Marilla Svinicki,⁵ a leading researcher on student learning at the University of Texas, we should not give reading assignments such as “Read pages 50 through 70.” The reason is that today’s students need help organizing their time. With such a reading assignment, they will fiddle with pages 50 through 70 while texting their friends, surfing the Internet, and listening to their iPods. After 30 or 45 minutes, they will conclude they have fiddled enough and will believe they have completed the assignment.

Instead, Svinicki states we should give students a list of questions and tell them their job is to answer those questions, treating pages 50 through 70 as a resource for that purpose. When students can answer the questions, they have finished the assignment.

Using that philosophy, every chapter in this text begins with a list of questions. Each major heading in the chapter is one of those questions, and the Active Review at the end of each chapter provides students a set of actions to take in order to demonstrate that they are able to answer the questions. Since learning this approach from Professor Svinicki, we have used it in our classes and have found that it works exceedingly well.

How Does This Book Differ from *Experiencing MIS* and from *Processes, Systems, and Information*?

In addition to *Using MIS*, we’ve written an MIS text titled *Experiencing MIS*. These two texts provide different perspectives for teaching this class. The principal difference between *Using MIS* and *Experiencing MIS* is that the latter is modular in design and has a more “in your face” attitude about MIS. Modularity definitely has a role and place, but not every class needs or appreciates the

flexibility and brevity a modular text offers. A shorter, more custom version of *Experiencing MIS* is also available as *MIS Essentials*.

There is also a fourth MIS text titled *Processes, Systems, and Information: An Introduction to MIS* coauthored with Earl McKinney of Bowling Green State University. It represents a third approach to this class and is structured around business processes. It has a strong ERP emphasis and includes two chapters on SAP as well as two chapter tutorials for using the SAP Alliance Global Bikes simulation. Earl has taught SAP for many years and has extensive experience in teaching others how to use the Global Bikes simulation.

In *Using MIS*, we have endeavored to take advantage of continuity and to build the discussion and knowledge gradually through the chapter sequence, in many places taking advantage of knowledge from prior chapters.

The goal in writing these books is to offer professors a choice of approach. We are committed to each of these books and plan to revise them for some time. We sincerely hope that one of them will fit your style and objectives for teaching this increasingly important class.

Instructor Resources

At the Instructor Resource Center, www.pearsonhighered.com/irc, instructors can easily register to gain access to a variety of instructor resources available with this text in downloadable format. If assistance is needed, a dedicated technical support team is ready to help with the media supplements that accompany this text. Visit <http://247.pearsoned.com> for answers to frequently asked questions and toll-free user support phone numbers.

The following supplements are available with this text:

- Test Bank
- TestGen[®] Computerized Test Bank
- PowerPoint Presentation

AACSB Learning Standards Tags

What Is the AACSB?

The Association to Advance Collegiate Schools of Business (AACSB) is a nonprofit corporation of educational institutions, corporations, and other organizations devoted to the promotion and improvement of higher education in business administration and accounting. A collegiate institution offering degrees in business administration or accounting may volunteer for AACSB accreditation review. The AACSB makes initial accreditation decisions and conducts periodic reviews to promote continuous quality improvement in management education. Pearson Education is a proud member of the AACSB and is pleased to provide advice to help you apply AACSB Learning Standards.

What Are AACSB Learning Standards?

One of the criteria for AACSB accreditation is the quality of the curricula. Although no specific courses are required, the AACSB expects a curriculum to include learning experiences in such areas as:

- Communication Abilities
- Ethical Understanding and Reasoning Abilities
- Analytic Skills
- Use of Information Technology

- Dynamics of the Global Economy
- Multicultural and Diversity Understanding
- Reflective Thinking Skills

These seven categories are AACSB Learning Standards. Questions that test skills relevant to these standards are tagged with the appropriate standard. For example, a question testing the moral questions associated with externalities would receive the Ethical Understanding tag.

How Can I Use These Tags?

Tagged questions help you measure whether students are grasping the course content that aligns with AACSB guidelines. In addition, the tagged questions may help to identify potential applications of these skills. This, in turn, may suggest enrichment activities or other educational experiences to help students achieve these goals.

Available in MyMISLab

- MIS Video Exercises – Videos illustrating MIS concepts, paired with brief quizzes
- MIS Decision Simulations – interactive exercises allowing students to play the role of a manager and make business decisions
- Auto-Graded writing exercises – taken from the end of chapter
- Assisted-Graded writing exercises – taken from the end of chapter, with a rubric provided
- Chapter Warm Ups, Chapter Quizzes – objective-based quizzing to test knowledge
- Discussion Questions – taken from the end of chapter
- Dynamic Study Modules – on the go adaptive quizzing, also available on a mobile phone
- Learning Catalytics – bring-your-own-device classroom response tools
- Enhanced eText – an accessible, mobile-friendly eText
- Excel & Access Grader Projects – live in the application auto-graded Grader projects provided inside MyMISLab to support classes covering Office tools

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David Kroenke
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1. Ananya Bhattacharya, "Amazon Is Just Beginning to Use Robots in Its Warehouses and They're Already Making a Huge Difference," *QZ.com*, June 17, 2016, accessed June 18, 2016, <http://qz.com/709541/amazon-is-just-beginning-to-use-robots-in-its-warehouses-and-theyre-already-making-a-huge-difference>.
2. Roger Cheng, "Women in Tech: The Numbers Don't Add Up," *CNET*, May 6, 2015, accessed June 17, 2016, www.cnet.com/news/women-in-tech-the-numbers-dont-add-up.
3. Robert B. Reich, *The Work of Nations* (New York: Alfred A. Knopf, 1991), p. 229.
4. Some instructors take the next step and replace their lectures with their own recorded PowerPoints, in what is coming to be known as flipping the classroom. The So What? features, guides, collaboration exercises, and case studies in this text support that approach if you choose it. See the article titled "How the Flipped Classroom Is Radically Transforming Learning" on www.thedailyriff.com for more about this technique.
5. Marilla Svinicki, *Learning and Motivation in the Postsecondary Classroom* (Bolton, MA: Anker Publishing, 2004).

ABOUT THE AUTHORS



David Kroenke has many years of teaching experience at Colorado State University, Seattle University, and the University of Washington. He has led dozens of seminars for college professors on the teaching of information systems and technology; in 1991, the International Association of Information Systems named him Computer Educator of the Year. In 2009, David was named Educator of the Year by the Association of Information Technology Professionals-Education Special Interest Group (AITP-EDSIG).

David worked for the U.S. Air Force and Boeing Computer Services. He was a principal in the startup of three companies, serving as the vice president of product marketing and development for the Microrim Corporation and as chief of database technologies for Wall Data, Inc. He is the father of the semantic object data model. David's consulting clients have included IBM, Microsoft, and Computer Sciences Corporations, as well as numerous smaller companies. Recently, David has focused on using information systems for teaching collaboration and teamwork.

His text *Database Processing* was first published in 1977 and is now in its 14th edition. He has authored and coauthored many other textbooks, including *Database Concepts*, 7th ed. (2015), *Experiencing MIS*, 7th ed. (2017), *SharePoint for Students* (2012), *Office 365 in Business* (2012), and *Processes, Systems, and Information: An Introduction to MIS*, 2nd ed. (2015).



Randall J. Boyle received his Ph.D. in Management Information Systems from Florida State University in 2003. He also has a master's degree in Public Administration and a B.S. in Finance. He has received university teaching awards at Longwood University, the University of Utah, and the University of Alabama in Huntsville. He has taught a wide variety of classes, including Introduction to MIS, Cyber Security, Networking & Servers, System Analysis and Design, Telecommunications, Advanced Cyber Security, Decision Support Systems, and Web Servers.

His research areas include deception detection in computer-mediated environments, secure information systems, the effects of IT on cognitive biases, the effects of IT on knowledge workers, and e-commerce. He has published in several academic journals and has authored several textbooks, including *Experiencing MIS*, 7th ed., *Corporate Computer and Network Security*, 4th ed., *Applied Information Security*, 2nd ed., and *Applied Networking Labs*, 2nd ed.

To C.J., Carter, and Charlotte
—David Kroenke

To Courtney, Noah, Fiona, and Layla
—Randy Boyle

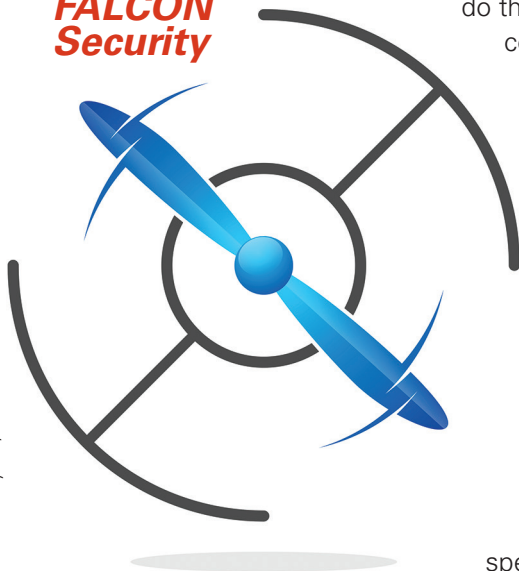
Why MIS?

FALCON Security is a 5-year-old, privately owned company that uses aerial drones to provide surveillance and inspection services for customers. Its customers are large industrial companies that want to reduce their physical security labor costs or need periodic inspection services for industrial sites. Falcon has contracts with several large oil refineries in Texas to provide real-time video surveillance of their sizable industrial facilities. It also does occasional safety inspections on critical infrastructure components (e.g., flare stacks), which would be difficult and dangerous to do in person.

Falcon Security's CEO and cofounder is Mateo Thomas. In the early part of his career Mateo was a major in the United States Army in charge of physical security at a large military base in the Middle East. After retiring from the Army, Mateo went to work as the director of security at a large Texas-based industrial manufacturer. While serving on a security policy steering committee with business unit managers, he met the young and ambitious Joni Campbell. He told Joni the company was paying way too much for physical security. He thought the company could buy a few drones to do the work of several physical security guards at a fraction of the cost. From his time in the military he'd seen how drones could be used successfully to improve security with much less time and effort. The problem was that he didn't know much about actually operating the drones. Neither did Joni.

A week later, Joni was at a friend's wedding and saw a wedding video that included amazing aerial shots of the bride and groom on the beach, driving, and walking in the park. Curious, she approached the photographer, Camillia (Cam) Forset, and asked her how she produced those stunning videos. Turns out that Cam did weddings part-time during the summer months. Her day job, which she didn't especially like, was as a regional sales representative for a drone manufacturer. She experimented with drones at a few photo shoots, and the results were spectacular. Everyone who saw the aerial footage wanted it.

**FALCON
Security**



Source: SkyAce/Fotolia