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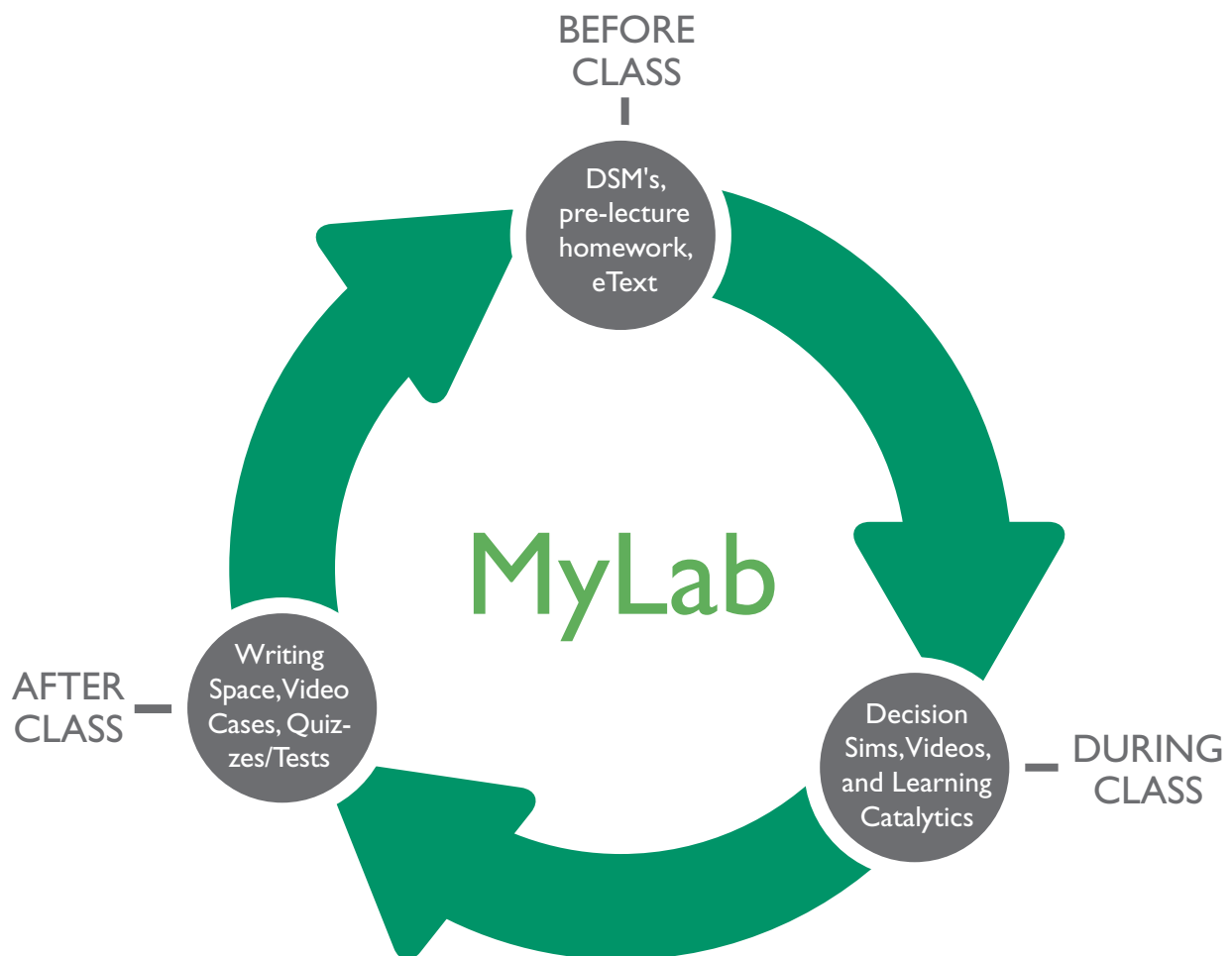
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Using MIS

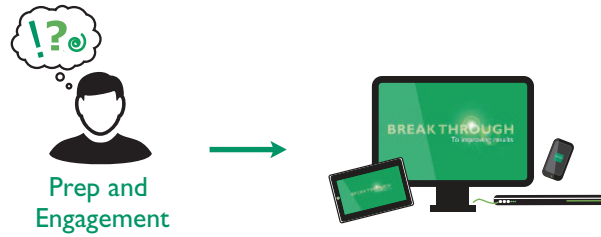
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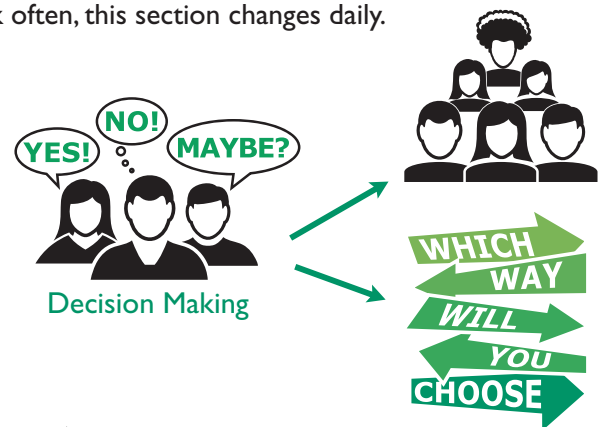


MyMISLab™: Improves Student Engagement Before, During, and After Class



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- **Writing Space** – better writers make great learners—who perform better in their courses. Providing a single location to develop and assess concept mastery and critical thinking, the Writing Space offers automatic graded, assisted graded, and create your own writing assignments, allowing you to exchange personalized feedback with students quickly and easily.

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- **Additional Features** – included with the MyLab are a powerful homework and test manager, robust gradebook tracking, comprehensive online course content, and easily scalable and shareable content.

Dear Student,

College is a fun time in your life. You've experienced the freedom of living on your own, made new friends, and enjoyed once-in-a-lifetime experiences. However, at this point in your college career you've begun to realize that a life transition is on your horizon. You will graduate and you will need to find a career, not just another job. Now is the time for you to start thinking about that career and how to prepare for it.

Most students say they want a successful career. But defining *successful* is different for each person. Most students want an exciting, stable, well-paying job. You owe it to yourself to think about what that job is and how you're going to get it. Which jobs pay the salary you want? Are some jobs more stable than others? What type of work do you want to do for the next 40 years?

This MIS course is important for answering those questions. Over time, technology creates new jobs... examples today are mobile application developers, social media analysts, information security specialists, business intelligence analysts, and data architects, to consider just a few jobs that 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 getting ahead of their effect. 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, non-routine 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.

Using technology in innovative ways enabled superstars like Steve Jobs, Bill Gates, Larry Ellison, Mark Zuckerberg, Larry Page, Sergey Brin, and Jeff Bezos to earn billions and revolutionize commerce. You may not be such a superstar, but you can exceed beyond your expectations by applying the knowledge you learn in this class.

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 addresses the application of the chapter's contents to some other dimension

of business. 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.

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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 other business topics.	Stimulate thought and discussion. Address ethics and security once per chapter. Help develop your problem-solving skills.	Chapter 5, <i>Ethics Guide: Querying Inequality?</i> Chapter 8, Security Guide: Securing Social Recruiting Chapter 9, Guide: Data Mining in the Real World
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: AllRoad Parts, an online vendor of off-road vehicle parts, and PRIDE, a cloud-based, healthcare start-up opportunity.	Understand the relevance of the chapter's content by applying it to a business situation.	Chapter 9, opening vignette: Business Intelligence Systems and PRIDE
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, Q3: How Can You Use the Five Component Model? Chapter 6, Q4: How Do Organizations Use the Cloud?
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 5, So What?: Not What the Data Says...

Resource	Description	Benefit	Example
2025?	Each chapter concludes with a discussion of how the concepts, technology, and systems described in that chapter might change by 2025.	Learn to anticipate changes in technology and recognize how those changes may affect the future business environment.	Chapter 7, 2025?, which 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, which 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, FinQloud 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.	AE10-1, which builds on your knowledge from Chapter 10 by asking you to score the websites you visit using WOT
International Dimension	Module at the end of the text that discusses international aspects of MIS. 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 Q3, How Do Inter-enterprise IS Facilitate Global Supply Chain Management?

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Using MIS

David M. Kroenke

Randall J. Boyle

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

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

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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 mobile device operating systems, mobile UX, 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 *BigData* and describes nonrelational and NoSQL databases.

Explains why the cloud is the future. Describes basic network technology that underlies the cloud, how the cloud works, and how organizations, including AllRoad Parts, can use the cloud. Explains SOA and summarizes fundamental Web services standards.

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 the role of SMIS in the hyper-social organization. Explains the ways organizations 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.

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PREFACE

Chapter 1 claims that MIS is the most important class in the business curriculum. That's a bold statement, and every year I ask whether it remains true. Is there any discipline having a greater impact on contemporary business and government than IS? I 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 otherwise help them accomplish their strategies. In the past year, security problems have come to the forefront. Corporations, individuals, and governments have all endured extensive information systems losses. This need is in addition to normal revisions needed to address emergent technologies such as cloud-based services, sophisticated mobile devices, innovative IS-based business models like that at zulily, changes in organizations' use of social media, and so on.

More sophisticated and demanding users push organizations into a rapidly changing future, one that requires continual adjustments in business planning. To participate, our graduates need to know how to apply emerging technologies to better achieve their organizations' strategies. Knowledge of MIS is critical.

As I wrote in the preface to earlier editions, these developments, and the organizational responses to them, redouble my gratitude to Pearson for publishing this text as an annual edition. And this pace continues to remind me of Carrie Fisher's statement, "The problem with instantaneous gratification is that it's just not fast enough."

Why This Eighth Edition?

The changes in this eighth edition are listed in Table 1. The biggest change concerns security and it runs throughout all the chapters in this revision. As you know, computer crime and related security threats have become major factors in commerce today. Dealing with those threats is an important part of every business professional's education. While I have a great interest in computer security, I do not have deep security expertise. Consequently, I asked Randy Boyle, author of *Corporate Computer Security 4e*, *Applied Information Security 2e*, and *Applied Networking Labs 2e* and a national expert on computer security, to join me as a coauthor on this text. Thankfully, Randy agreed. You will see numerous examples of his expertise throughout this revision, in new and revised security guides and in revisions to Chapter 10 (Chapter 12 in the prior edition).

In addition to new security material, every chapter of this edition includes a new feature called So What? that will ask students to apply what they have learned in the chapter directly to their own interests and prospects. Chapters 7 through 12 begin with a new discussion of PRIDE Systems, a cloud-based virtual exercise competition and healthcare startup. Chapters 1–6 continue to be introduced by AllRoad Parts, an online vendor of off-road parts that is considering 3D printing and ultimately rejects that idea because of the effect it would have on business processes and IS. 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 continues the change from the seventh edition that concerns the teaching of ethics. Every Ethics Guide asks students to apply Immanuel Kant's categorical imperative, utilitarianism, or both to the business situation described in the guide. I hope you find the ethical

TABLE 1 CHANGES IN THE EIGHTH EDITION

Chapter Change

1	New So What? feature: What's Your Number?	8	New collaboration exercise
1	Expanded Security Guide	8	New section on enterprise social networks (ESN)
1	New zulily case study	8	New section on developing an effective social media information systems
2	Updated to SharePoint 2013	8	New discussion of social media revenue models
2	Fixed Google account description to match its current policy	8	Expanded section on social media security concerns
2	Changed SkyDrive to OneDrive	8	Addition of industry statistics throughout the chapter
2	New So What? feature: I Could Work Faster on My Own	9	New PRIDE Systems introduction
2	Updated case study	9	New So What? feature: Data Storytelling
2	New Security Guide: Securing Collaboration	9	Updated case study to use Firefox Lightbeam instead of Collusion
3	New So What? feature: What Strategy Do You Support?		
3	New case study with update of Amazon's FBA rates	10	New PRIDE Systems introduction
4	New Security Guide: Anatomy of a Heartbleed	10	New case on Target data breach
4	New So What? feature: New from CES 2014	10	New industry statistics throughout the chapter
4	New section on hardware innovations including Internet of Things (IoT), self-driving cars, and 3D printing	10	New statistics and chart on the cost of computer crime
4	New industry statistics throughout the chapter	10	New So What? feature: The Latest from Black Hat
4	New 2025 section about how new hardware and software will affect jobs	10	Additional metaphors to explain difficult concepts, risk management, encryption, etc.
5	New So What? feature: Not What the Data Says...	10	Malware content (viruses, payload, Trojan horses, worms, spyware, keylogger, and adware) moved from Chapter 4
5	New Security Guide: Theft by SQL Injection	10	New Security Guide: A Look Through NSA's PRISM
5	New case study	11	New PRIDE Systems introduction
6	New Security Guide: Storm Clouds	11	New So What? feature: Managing IS Department
6	New So What? feature: Unexpected Geotagging	11	New discussion of CSO and CISO in departmental organization
6	New industry statistics throughout the chapter	11	Updated case study with new factors in iOS development
6	New discussion about packets, peering, carriers, and net neutrality		
6	Discussion of Google's Project Loon and Google Fiber		
7	New PRIDE Systems introduction	12	New PRIDE Systems introduction
7	ERP in the cloud added to Q5	12	New case study about failures in development of the Oregon healthcare exchange
7	New So What? feature: Workflow Problems	12	New So What? feature: Systems Development?
7	New case study		
7	Updated Security Guide: One-Stop Shopping	Appl Ex	New data files
8	New PRIDE Systems introduction	Appl Ex	New security exercises discussing the use of HTTPS and WOT
8	New So What? feature: Facebook for Organizations... and Machines		
8	New Security Guide: Securing Social Recruiting	International Dimension	New section on security problems in international IS

considerations richer and deeper with these exercises. The categorical imperative is introduced in the Ethics Guide in Chapter 1 (pages 20–21) and utilitarianism is introduced in the Ethics Guide in Chapter 2 (pages 56–57).

As shown in Table 1, additional changes were made to every chapter, including new cases for Chapters 1, 3, 5, 7, 10, and 12. Other cases have been updated. 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.

To reiterate the preface of earlier editions, I believe it is exceedingly important to make these annual adaptations because the delays associated with a 2-year revision cycle are too long for students' benefit. Text materials that we develop starting 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. Were we to wait 2 years to revise, the materials would be 2 1/2 to 3 years old when studied and 3 to 4 years old by the time students graduate. That is far too long for MIS.

Importance of MIS

As stated, I continue to believe we can enter the classroom with confidence that 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, because of nearly free data storage and data communications, 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 need to not only assess but 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 nearly free data storage and communication will fall prey to the 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 Clinton administration. In *The Work of Nations*,¹ 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, beginning on page 7, I believe the MIS course is the single best course in the curriculum for learning these four key skills.

Today's Role for Professors

When I first began teaching many years ago, I was the possessor of the knowledge, and my goal was to impart my knowledge to my students. I would give detailed, fact-filled, and sometimes long lectures; students would gratefully take notes. Class attendance was high because students needed class notes to succeed. I had no PowerPoints to share and no way to share them if I had. Library resources were limited and woefully dated.

Today, that environment is gone, and thankfully so. But the new environment has, I believe, changed our role with students. 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.

So, what is our role? 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.²

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 that are 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 three guides that describe practical implications of the chapter contents that

¹Robert B. Reich, *The Work of Nations* (New York: Alfred A. Knopf, 1991), p. 229.

²Some 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 www.thedailyriff.com/articles/how-the-flipped-classroom-is-radically-transforming-learning-536.php for more about this technique.

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 37 Office application exercises (see page 519).

Regarding the guides in particular, in this edition every chapter includes an updated Ethics Guide that appears midway through the chapter material. Each chapter also includes a Security Guide that follows the end-of-chapter material. A third guide follows each Security Guide, the nature of which depends on the chapter's contents. By having both ethics and security activities in every chapter, we avoid the "inoculation effect," i.e., "I don't need to do ethics now, I've already had it."

AllRoad and PRIDE Cases

Each part and each chapter opens with a scenario intended to get students involved emotionally, if possible. I 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. My 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, I hope, providing numerous avenues for you to explore such adaptation with your students.

In developing these scenarios, I endeavor to create business situations that are rich enough to realistically carry the discussions of information systems while at the same time being simple enough that students with little business knowledge and even less business experience can understand. I also attempt to create scenarios that will be interesting to teach. This edition continues the AllRoad Parts case and provides an updated (and more realistic) version of the PRIDE Systems case from the seventh edition.

AllRoad Parts

The chapters in Parts 1 and 2 are introduced with dialogue from key players at AllRoad Parts, a small online business that sells parts for trail bikes, dirt bikes (motorcycles), and 4-wheel, off-roading vehicles. I wanted to develop the case around a business with a simpler business model and operations than those of GearUp, used in the fifth and sixth editions. Also, I think it more likely that students will work for a business with online sales than they will for a private auction company like GearUp.

AllRoad is considering strengthening its competitive advantage by using 3D printing to manufacture some of the smaller, less expensive, and seldom-ordered parts. However, were the company to do so, it would be changing its fundamental business model, or at least adding to it, which means that new business processes and IS to support them would need to be developed. 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, AllRoad determines that it does not want to become a manufacturer, but that it wants to support some of its larger customers that likely will want to use 3D printing (larger auto dealerships, large bicycles stores, and so on). To do so, it decides to sell, or perhaps even give away, the part design files needed for 3D printing. This decision illustrates that data, itself, has value. It also sets up the potential need for nonrelational DBMS like MongoDB.

AllRoad is used to motivate the discussion of business intelligence in Chapter 9 as well. There, at least according to its first analysis, AllRoad decides that there may be an insufficient number of qualifying parts to justify selling designs to customers. By the way, the data it used in its analysis is available in the instructor support materials that accompany this text.

Students may object that, in studying AllRoad, they devoted considerable time to an opportunity that ultimately didn't make business sense and was rejected. To me, this outcome is at least as informative as a successful outcome. The example uses knowledge of processes and IS as well as application of business intelligence to avoid making a serious marketing blunder and wasting substantial money. AllRoad Parts didn't have to *implement* 3D printing to find out it would be a mistake. It could *model* and *analyze* to avoid the mistake instead. The very best way to solve a problem is not to have it!

PRIDE Systems

The Performance Recording, Integration, Delivery, and Evaluation (PRIDE) system was first developed for the sixth edition. In that version it was an embryonic, entrepreneurial opportunity that used mobile devices, data-gathering exercise equipment, and the cloud to share integrated data among healthcare providers, heart surgery patients, health clubs, health insurance companies, and employers.

I developed a prototype of PRIDE 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. PRIDE is written in C#, and the code runs against an Azure database in the cloud. As a prototype, I wanted to demonstrate capability quickly, so I used the Windows Phone emulator that is part of Visual Studio to demo the phone interface. The plan was to port the application to iOS and Android devices after demonstrating feasibility and after the club owner obtained financing. For the reasons stated in the annotations for Chapter 7, the sponsor of the project lost interest.

As I reflected on the PRIDE case, I realized that it was unlikely to succeed because, as Zev says in Chapter 7, "Doctors don't care about exercise." 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. All of this is described at the start of Chapter 7 as well as in the annotations for that chapter.

Use of the Categorical Imperative and Utilitarianism in Ethics Guides

In the years since I introduced the Ethics Guides into the first edition of this text, I believe there was 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, when I try to raise interest with them about unethical behavior, I find myself interjecting my own values to the point that I sound like a tent-revival preacher.

As a result, in the seventh edition, I began to use Kant's categorical imperative as well as 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 I 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 Kant's 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.

2025?

Every chapter concludes with a question labeled "2025?" This section presents my guesses about how the subject of that chapter is likely to change between now and 2025. Clearly, if I had a crystal ball that would give good answers to that question, I wouldn't be writing textbooks.

However, I make what I believe is a reasonable stab at an answer. I suspect you will have different ideas, and we can hope that our students will have different ideas as well. The goal is to prompt students to think, wonder, assess, and project about future technology.

Why Might You Want Your Students to Use SharePoint?

When I began to teach collaboration, the first question was 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 that was provided, and how well the work product evolved over time.

My students and I were experimenting with different collaborative tools when I stumbled into an unanticipated benefit: I discovered that Microsoft SharePoint 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. That data made 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, I do not use SharePoint to run my class; I use Blackboard for that purpose. I am, however, requiring my 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 SharePoint Online as well as Lync and hosted Exchange. However, Microsoft's intentions for Office 365 in education are unclear as of September 2014.

Why Are the Chapters Organized by Questions?

The chapters of *Using MIS* are organized by questions. According to Marilla Svinicki,³ 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, I have used it in my class and have found that it works exceedingly well.

³Marilla Svinicki, *Learning and Motivation in the Postsecondary Classroom* (Bolton, MA: Anker Publishing, 2004).

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

In addition to *Using MIS*, I've written an MIS text titled *Experiencing MIS* and a shorter version of that text titled *MIS Essentials* and coauthored with Earl McKinney of Bowling Green State University a fourth MIS text titled *Processes, Systems, and Information: An Introduction to MIS*. These texts provide four different perspectives for teaching this class. I am committed to all four books and plan to revise them all for some time.

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 that a modular text offers. In *Using MIS*, I 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.

Processes, Systems, and Information (PSI) represents a third approach to this class. *PSI* is structured around business processes, 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. My coauthor, Earl, has taught SAP for many years and has extensive experience in teaching others how to use the Global Bikes simulation.

My goal in writing these four books is to offer professors a choice of approach. I 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, our 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:

- Instructor's Resource Manual
- Test Bank
- TestGen[®] Computerized Test Bank
- PowerPoint Presentation

CourseSmart

CourseSmart eTextbooks were developed for students looking to save on required or recommended textbooks. Students simply select their eText by title or author and purchase immediate access to the content for the duration of the course using any major credit card. With a CourseSmart eText, students can search for specific keywords or page numbers, take notes online, print out reading assignments that incorporate lecture notes, and bookmark important passages for later review. For more information or to purchase a CourseSmart eTextbook, visit www.coursesmart.com.

Introduction to the Teaching Guidelines

Teaching Suggestions provide teaching ideas for the introductory scenarios for each chapter and for each of the guides in the chapters. These suggestions are available at the Instructor Resource Center, www.pearsonhighered.com/irc.

We wrote these annotations in the hope that they will provide you with useful background, save you time, and possibly make the class more fun to teach. Consider the annotations as fodder for your class preparation, to be used in any way that meets your needs. You may decide to use them as is, or you might combine them with your own stories, or adapt them to companies in your local area, or use them as examples with which you disagree. Or, if they do not fit your teaching style, just ignore them. The text will work just fine without the annotations.

Notation

The teaching guidelines have two types of information: data for you and data for you to give to your students. Thus, we needed to introduce some notation to separate one category from the other. Thus, we needed to introduce some notation to separate one category from the other. Comments and questions that you can address *directly to students* are typeset in boldface type and appear as follows:

- What are some of the major limitations of data mining?
- If you are interested in learning more about data-mining techniques, you should take the department's database processing class. Drop me an email if you want to know more.

Because these statements are intended for the instructor's use, the "me" in the above statement refers to you, the professor (and not us, the authors). These are just thoughts for statements you might want to make.

General statements and conceptual points *addressed to you*, the instructor, are set in regular type as follows:

We like to start the class even before the class begins. We arrive 5 minutes or so early and talk with students asking their names, where they are from, what their majors are, what they know about computers, and so on, as a way of breaking the ice.

We hope at least some of this will be useful to you. Have fun!

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.

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At Microsoft, I am grateful for the help of Randy Guthrie, who supports MIS professors in many ways, including facilitating use of DreamSpark as well as giving many presentations to students. Also, I thank Rob Howard for conversations and consulting about SharePoint and SharePoint Designer and Steve Fox for helpful conversations about both SharePoint and Microsoft Azure. Regarding our SharePoint program, a very special thanks to David Auer of Western Washington University and Laura Atkins of James Madison University, who serve as the community proctors for our SharePoint MIS community site, which enables dozens of professors and hundreds of students to learn how to use SharePoint. Our SharePoint solution is hosted by NSPI in Atlanta, Georgia.

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No textbook makes its way into the hands of students without the active involvement of a dedicated and professional sales force. I thank the Pearson sales team and especially Anne Fahlgren, the marketing manager for this text.

Like so many authors in college publishing, I owe tremendous thanks to my editor, Bob Horan. Unfortunately for us, Bob retired in the past year. I wish Bob health and great happiness in his retirement years. He is deeply missed. That said, my new editor Nicole Sam has taken over and will guide these texts into the new world of publishing with great success, I'm sure. I look forward to working with her.

David Kroenke

A Note from Randy

I am grateful to be asked to become a coauthor of this quality and successful textbook. I've used David's books in my classes for years, and I've found them enjoyable to teach and my students have found them easy to read. David's writing style is both accessible and conducive to learning. I'm grateful to be part of a team that sincerely cares about student learning.

As David mentioned, security is a major focus of this edition. It's important to understand that because an organization's intellectual property, customer data, communications, and internal systems are critical to an organization's success, they need to be secured from highly motivated hackers with specialized technical skill sets for theft. High-profile data breaches have become commonplace. Students need to learn how to protect themselves and their future employers from these damaging security incidents.

Randy Boyle

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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 13th edition. He has authored and coauthored many other textbooks, including *Database Concepts*, 7th ed. (2015), *Experiencing MIS*, 6th ed. (2016), *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 *Corporate Computer and Network Security*, 4th ed., *Applied Information Security*, 2nd ed., and *Applied Networking Labs*, 2nd ed.

Randy lives in Virginia with his wife and three young children. He currently enjoys T-ball, swimming, and running.

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Why MIS?

AllRoad Parts is a 10-year-old, privately owned company that sells parts for adventure vehicles. Its products include specialized brakes and suspension systems for mountain bikes and suspensions and off-road gear for dirt bikes (motorcycles designed for use in rough terrain), and it has recently started selling bumpers, doors, and soft tops for Jeeps and other off-road, 4-wheel-drive vehicles. Two-thirds of the company's sales are to small businesses like bike shops, motorcycle specialty stores, and off-road customization businesses. The other third are direct sales to consumers.

Jason Green is AllRoad's founder and CEO. Jason always had a strong interest in off-road vehicles; as a teenager he rebuilt a Volkswagen in his parents' garage for off-road use. In college, he started mountain biking and competitively raced cross-country, winning several regional contests and finishing near the top in the world championships in Purgatory, Colorado. He knew that a big part of his success was his innovative, high-quality equipment. In his senior year of college, he started a part-time, profitable eBay business buying and selling hard-to-find mountain bike parts.

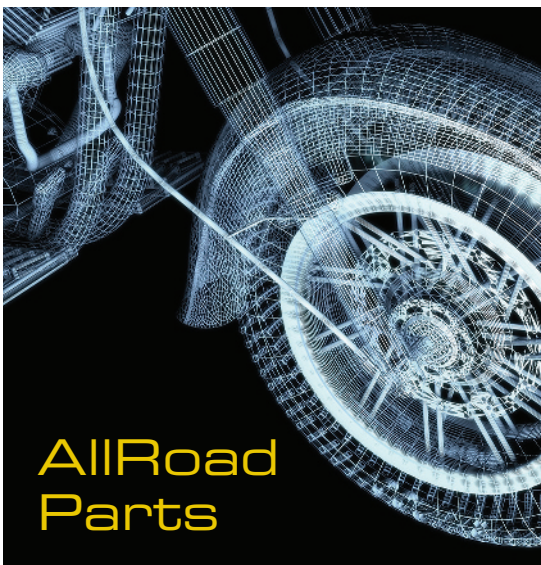
Jason was a strong believer in (and customer of) Fox mountain bike racing parts (www.RideFox.com), and through contacts made at one of the championship events,

he obtained a marketing job at Fox. Part of his job was road testing new equipment, a task he loved. Jason worked at Fox for 5 years, gaining marketing and management experience. However, he never forgot the success he had selling parts himself on eBay and was convinced he could start a parts business on his own. In 2004, he left Fox to start AllRoad Parts.

Today, AllRoad sells nearly \$20 million in bike, motorcycle, and 4-wheel parts for adventure riding. Jason no longer uses eBay, but true to his vision, the bulk of AllRoad's revenue is earned via online sales.

In addition to selling high-end, expensive parts obtained from Fox and other manufacturers, AllRoad also sells a line of specialized, hard-to-find repair parts. These parts have high margins, but those margins

Collaboration



Source: Arsdigital/Fotolia

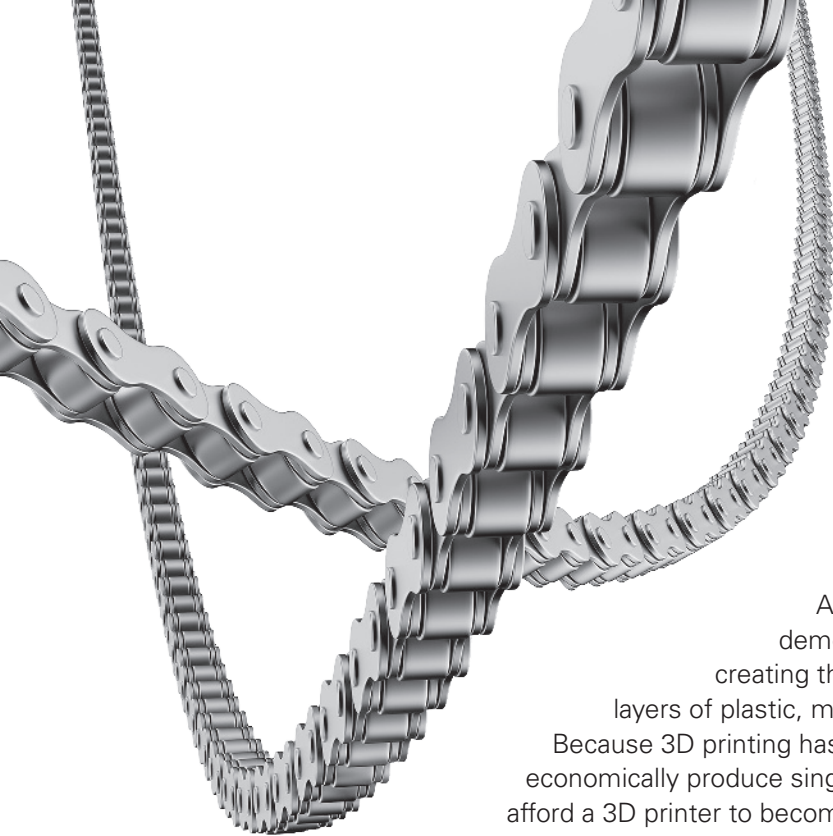
AllRoad
Parts

FBA

Office 365

Jobs!

Google+ vs. Facebook



are reduced by the cost of the large inventory AllRoad must carry. Jason knows his inventory is expensive, but he views having a large selection of repair parts as key to AllRoad's competitive success. "People know they will find that rare, 10 mm stainless steel Nylex cap on our site. Sure, it sells for maybe a dollar, but once we get people on our site, we have a chance to sell them a \$2,000 suspension system as well. We don't sell one every day, but it does happen. Our huge parts selection is strong bait to our customers, and I'm not going to cut back on it."

At a recent manufacturer's trade show, Jason saw a demonstration of 3D printing, which is the process of creating three-dimensional objects by fusing two-dimensional layers of plastic, metal, and other substances on top of one another. Because 3D printing has very small machine setup costs, it can be used to economically produce single-unit quantities. It also enables anyone who can afford a 3D printer to become a manufacturer.¹

Source: Ekostsov/Fotolia

AllRoad hasn't used 3D printing yet, and Jason's not sure that it makes sense for the company. Still, he knows that if AllRoad could manufacture very small quantities, even single units, of some of the more specialized parts, it could substantially reduce inventory costs. But he has so many questions: Is 3D printing technology real? Does it produce quality products? How can past sales be analyzed to determine how much the company might save? Which parts should AllRoad manufacture, and which should it continue to buy? How much will it cost for equipment and information systems to support 3D printing? How can AllRoad integrate in-house manufacturing into its existing purchasing and sales information systems?

Jason doesn't know the answers to these questions, but he doesn't want to wait for AllRoad's competition to show him the way. So, he forms a project team to investigate. He asks Kelly Summers, AllRoad's CFO, to lead a team to assess the opportunity. Kelly asks Lucas Massey, the director of IT services, Drew Mills, the Operations Manager, and Addison Lee, head of Purchasing, to participate. Kelly also includes Jennifer Cooper, a relatively new employee about whom she's received a number of complaints. "I'll work closely with her to learn what she can do," Kelly says to herself.

¹3D printing, also known as **additive manufacturing**, is fascinating. If you haven't yet seen it in action, search the Internet for *3D printing examples*.

The Importance of MIS

CHAPTER

1

“Fired?” You’re firing me?”

“Well, *fired* is a harsh word, but... well, AllRoad has no further need for your services.”

“But, Kelly, I don’t get it. I really don’t. I worked hard, and I did everything you told me to do.”

“Jennifer, that’s just it. You did everything *I* told you to do.”

“I put in so many hours. How could you fire me?”

“Your job was to find ways to reduce our inventory costs using 3D printing.”

“Right! And I did that.”

“No, you didn’t. You followed up on ideas *that I gave you*. But we don’t need someone who can follow up on my plans. We need someone who can figure out what we need to do, create her own plans, and bring them back to me...and others.”

“How could you expect me to do that? I’ve only been here 6 months!”

“It’s called teamwork. Sure, you’re just learning our business, but I made sure all of our senior staff would be available to you...”

“I didn’t want to bother them.”

“Well, you succeeded. I asked Drew what he thought of the plans you’re working on. ‘Who’s Jennifer?’ he asked.”

“But doesn’t he work down at the warehouse?”

“Right. He’s the operations manager...and it would seem to be worth talking to him.”

“I’ll go do that!”

“Jennifer, do you see what just happened? I gave you an idea, and you said you’d do it. That’s not what I need. I need you to find solutions on your own.”

“I worked really hard. I put in a lot of hours. I’ve got all these reports written.”



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Source: Bizoo_n/iStock/Thinkstock/Getty Images

“But today, they’re not enough.”

“Has anyone seen them?”

“I talked to you about some of them. But I was waiting until I was satisfied with them.”

“Right. That’s not how we do things here. We develop ideas and then kick them around with each other. Nobody has all the smarts. Our plans get better when we comment and rework them... I think I told you that.”

“Maybe you did. But I’m just not comfortable with that.”

“Well, it’s a key skill here.”

“I know I can do this job.”

“Jennifer, you’ve been here almost 6 months; you have a degree in business. Several weeks ago, I asked you to conceptualize a way to determine the products for 3D printing. When I asked you how you were doing, do you remember what you said?”

“Yes, I wasn’t sure how to proceed. I didn’t want to just throw something out that might not work.”

“But how would you find out if it would work?”

“I don’t want to waste money...”

“No, you don’t. So, when you didn’t get very far with that task, I backed up and asked you to send me a diagram of our supply chain... how we select the vendors, how we negotiate with them, how we order, receive the goods in our inventory, track sales, and reorder, and so on. Not details, just the overview.”

“Yes, I sent you that diagram.”

“Jennifer, it made no sense. Your diagram had us placing goods in inventory before we’d even ordered them.”

“I know that process, I just couldn’t put it down on paper. But I’ll try again!”

“Well, I appreciate that attitude, but we’re a small company—really, still a startup. Everyone needs to pull more than their own weight here. Maybe if we were a bigger company, I’d be able to find for a spot for you, see if we could bring you along. But we can’t afford to do that now.”

“What about my references?”

“I’ll be happy to tell anyone that you’re reliable, that you work 40 to 45 hours a week, and that you’re honest and have integrity.”

“Those are important!”

“Yes, they are. But today, they’re not enough.”

STUDY QUESTIONS

- Q1** Why is Introduction to MIS the most important class in the business school?
- Q2** What is MIS?
- Q3** How can you use the five-component model?
- Q4** Why is the difference between information technology and information systems important?
- Q5** What is information?
- Q6** What are necessary data characteristics?
- Q7** 2025?

CHAPTER PREVIEW

“But today, they’re not enough.”

Do you find that statement sobering? And if hard work isn’t enough, what is? We’ll begin this book by discussing the key skills that Jennifer (and you) need and explaining why this course is the single best course in all of the business school for teaching you those key skills.

You may find that last statement surprising. If you are like most students, you have no clear idea of what your MIS class will be about. If someone were to ask you, “What do you study in that class?” you might respond that the class has something to do with computers and maybe computer programming. Beyond that, you might be hard-pressed to say more. You might add, “Well, it has something to do with computers in business,” or maybe, “We are going to learn to solve business problems with computers using spreadsheets and other programs.” So, how could this course be the most important one in the business school?

We begin with that question. After you understand how important this class will be to your career, we will discuss fundamental concepts. We’ll wrap up with some practice on one of the key skills you need to learn.

Q1 Why Is Introduction to MIS the Most Important Class in the Business School?

Introduction to MIS is the most important class in the business school. That statement was not true in 2005, and it may not be true in 2025. But it is true in 2015.

Why?

The ultimate reason lies in a principle known as **Moore’s Law**. In 1965, Gordon Moore, cofounder of Intel Corporation, stated that because of technology improvements in electronic chip design and manufacturing, “The number of transistors per square inch on an integrated chip doubles every 18 months.” His statement has been commonly misunderstood to be “The speed of a computer doubles every 18 months,” which is incorrect but captures the sense of his principle.

Because of Moore’s Law, the ratio of price to performance of computers has fallen from something like \$4,000 for a standard computing device to a fraction of a penny for that same computing device.² See Figure 1-1.

As a future business professional, however, you needn’t care how fast of a computer your company can buy for \$100. That’s not the point. Here’s the point:

Because of Moore’s Law, the cost of data processing, communications, and storage is essentially zero.

²These figures represent the cost of 100,000 transistors, which can roughly be translated into a unit of a computing device. If you doubt any of this, just look at your \$199 Kindle Fire and realize that you pay nothing for its wireless access. Geoff Colvin claims the cost of 125,000 transistors is less than the cost of a grain of rice. See: <http://chowtimes.com/2010/09/11/food-for-thought/food-for-thought/>.

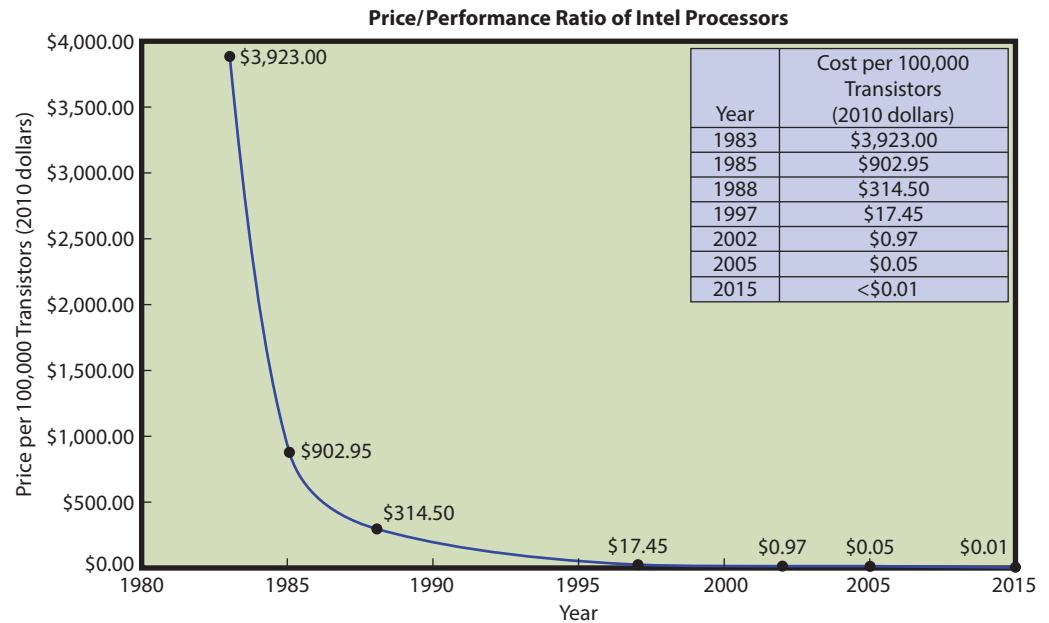


Figure 1-1
Computer Price/Performance Ratio Decreases

Think about that statement before you hurry to the next paragraph. What happens when those costs are essentially zero? Here are some consequences:

- Google+
- Vine
- Pandora
- LinkedIn
- Pinterest
- zulily
- Twitter
- Tableau

None of these companies was prominent in 2010, and, in fact, most didn't exist in 2010.

What Are Cost-Effective Business Applications of Facebook or Twitter or Whatever Else Will Soon Appear?

Social networking is the rage. Go to any retail Web page and you'll find Facebook, Twitter, YouTube, Pinterest, and other buttons. The question is, are the activities needed to support these links cost-effective? Do they generate revenue worth their time and expense? Someone needs to be examining that question, and that person works in marketing... not in a technical field. We'll examine this question in more depth in Chapter 8. For now, think about the first businesses that saw the potential of Facebook and Twitter. They gained a competitive advantage by being ahead of the crowd in adopting these new technologies.

It's not over. Facebook and Twitter are not the end. Right now, many companies are employing new processing capabilities called *the cloud* in innovative ways. Case Study 1, page 31, describes zulily, a mother's shopping site that uses technology to make clothes shopping entertaining. Founded in 2009, zulily's current revenue exceeds \$350 million. All of this leads us to the first reason Introduction to MIS is the most important course in the business school today:

Future business professionals need to be able to assess, evaluate, and apply emerging information technology to business.

You need the knowledge of this course to attain that skill.

How Can I Attain Job Security?

Many years ago I had a wise and experienced mentor. One day I asked him about job security, and he told me that the only job security that exists is "a marketable skill and the courage to use it." He continued, "There is no security in our company, there is no security in any government

program, there is no security in your investments, and there is no security in Social Security.” Alas, how right he turned out to be.

So, what is a marketable skill? It used to be that one could name particular skills, such as computer programming, tax accounting, or marketing. But today, because of Moore’s Law, because the cost of data processing, storage, and communications is essentially zero, any routine skill can and will be outsourced to the lowest bidder. And if you live in the United States, Canada, Australia, Europe, or another advanced economy, that is unlikely to be you.

Numerous organizations and experts have studied the question of what skills will be marketable during your career. Consider two of them. First, the RAND Corporation, a think tank located in Santa Monica, California, has published innovative and groundbreaking ideas for more than 60 years, including the initial design for the Internet. In 2004, RAND published a description of the skills that workers in the 21st century will need:

Rapid technological change and increased international competition place the spotlight on the skills and preparation of the workforce, particularly the ability to adapt to changing technology and shifting demand. Shifts in the nature of organizations . . . favor strong nonroutine cognitive skills.³

Whether you’re majoring in accounting, marketing, finance, or information systems, you need to develop strong nonroutine cognitive skills.

What are such skills? Robert Reich, former Secretary of Labor, enumerates four:⁴

- Abstract reasoning
- Systems thinking
- Collaboration
- Ability to experiment

Figure 1-2 shows an example of each. Reread the AllRoad Parts case that started this chapter, and you’ll see that Jennifer lost her job because of her inability to practice these key skills.

How Can Intro to MIS Help You Learn Nonroutine Skills?

Introduction to MIS is the best course in the business school for learning these four key skills because every topic will require you to apply and practice them. Here’s how.

Skill	Example	Jennifer’s Problem at AllRoad Parts
Abstract reasoning	Construct a model or representation.	Hesitancy and uncertainty when conceptualizing a method for identifying parts for 3D printing.
Systems thinking	Model system components and show how components’ inputs and outputs relate to one another.	Inability to model AllRoad Parts’ supply chain.
Collaboration	Develop ideas and plans with others. Provide and receive critical feedback.	Unwilling to work with others on work-in-progress.
Ability to experiment	Create and test promising new alternatives, consistent with available resources.	Fear of failure prohibited discussion of new ideas.

Figure 1-2
Examples of Critical Skills for
Nonroutine Cognition

³Lynn A. Kaoly and Constantijn W. A. Panis, *The 21st Century at Work* (Santa Monica, CA: RAND Corporation, 2004), p. xiv.

⁴Robert B. Reich, *The Work of Nations* (New York: Alfred A. Knopf, 1991), p. 229.

Abstract Reasoning

Abstract reasoning is the ability to make and manipulate models. You will work with one or more models in every course topic and book chapter. For example, later in this chapter you will learn about a *model* of the five components of an information system. This chapter will describe how to use this model to assess the scope of any new information system project; other chapters will build upon this model.

In this course, you will not just manipulate models that we have developed, you will also be asked to construct models of your own. In Chapter 5, for example, you'll learn how to create data models, and in Chapter 12 you'll learn to make process models.

Systems Thinking

Can you go down to a grocery store, look at a can of green beans, and connect that can to U.S. immigration policy? Can you watch tractors dig up a forest of pulpwood trees and connect that woody trash to Moore's Law? Do you know why Cisco Systems is one of the major beneficiaries of YouTube? Answers to all of these questions require systems thinking. **Systems thinking** is the ability to model the components of the system to connect the inputs and outputs among those components into a sensible whole that reflects the structure and dynamics of the phenomenon observed.

As you are about to learn, this class is about information *systems*. We will discuss and illustrate systems; you will be asked to critique systems; you will be asked to compare alternative systems; you will be asked to apply different systems to different situations. All of those tasks will prepare you for systems thinking as a professional.

Collaboration

Collaboration is the activity of two or more people working together to achieve a common goal, result, or work product. Chapter 2 will teach you collaboration skills and illustrate several sample collaboration information systems. Every chapter of this book includes collaboration exercises that you may be assigned in class or as homework.

Here's a fact that surprises many students: Effective collaboration isn't about being nice. In fact, surveys indicate the single most important skill for effective collaboration is to give and receive critical feedback. Advance a proposal in business that challenges the cherished program of the VP of marketing, and you'll quickly learn that effective collaboration skills differ from party manners at the neighborhood barbeque. So, how do you advance your idea in the face of the VP's resistance? And without losing your job? In this course, you can learn both skills and information systems for such collaboration. Even better, you will have many opportunities to practice them.

Ability to Experiment

"I've never done this before."

"I don't know how to do it."

"But will it work?"

"Is it too weird for the market?"

Fear of failure: the fear that paralyzes so many good people and so many good ideas. In the days when business was stable, when new ideas were just different verses of the same song, professionals could allow themselves to be limited by fear of failure.

Let's take an example of the application of social networking to the oil change business. Is there a legitimate application of social networking there? If so, has anyone ever done it? Is there anyone in the world who can tell you what to do? How to proceed? No. As Reich says, professionals in the 21st century need to be able to experiment.

Successful experimentation is not throwing buckets of money at every crazy idea that enters your head. Instead, **experimentation** is making a reasoned analysis of an opportunity,

envisioning potential solutions, evaluating those possibilities, and developing the most promising ones, consistent with the resources you have.

In this course, you will be asked to use products with which you have no familiarity. Those products might be Microsoft Excel or Access, or they might be features and functions of Blackboard that you've not used. Or you may be asked to collaborate using OneDrive or SharePoint or Google Drive. Will your instructor explain and show every feature of those products that you'll need? You should hope not. You should hope your instructor will leave it up to you to experiment, to envision new possibilities on your own, and to experiment with those possibilities, consistent with the time you have available.

Jobs

Employment is another factor that makes the Introduction to MIS course vitally important to you. Accenture, a technology consulting and outsourcing company, conducted a survey of college graduates in 2013. It found that only 16 percent of 2013 graduates had jobs by April 1, 2013. Further, 41 percent of recent graduates were working in jobs that did not require their degree or were otherwise underemployed.⁵ But this is not the case in job categories that are related to information systems.

Spence and Hlatshwayo studied employment in the United States from 1990 to 2008.⁶ They defined a *tradable job* as one that was not dependent on a particular location; this distinction is important because such jobs can be outsourced overseas. As shown in Figure 1-3, Computer Systems Design and Related Services had the strongest growth of any job type in that category. The number of jobs dipped substantially after the dot-com bust in 2000; since 2003, however, job growth has not only recovered but accelerated dramatically. While this category includes technical positions such as computer programmer and database administrator, it includes nontechnical sales, support, and business management jobs as well. By the way, because Figure 1-3 shows tradable jobs, it puts an end to the myth that all the good computer jobs have gone overseas. According to their data analysis, sourced from the U.S. Bureau of Labor Statistics, that simply has not happened.

The data in Figure 1-3 stops at 2009 and, unfortunately, Spence and Hlatshwayo have not updated their study. However, the Bureau of Labor Statistics recently stated that the job outlook for Computer Systems Analysts will exceed 25 percent for the years 2012 to 2022. That job title is a good surrogate for nontechnical IS-related jobs.⁷

Information systems and computer technology provide job and wage benefits beyond just IS professionals. Acemoglu and Autor published an impressive empirical study of jobs and wages in the United States and parts of Europe from the 1960s to 2010. They found that early in this period, education and industry were the strongest determinants of employment and salary. However, since 1990, the most significant determinant of employment and salary is the nature of work performed. In short, as the price of computer technology plummets, the value of jobs that benefit from it increases dramatically.⁸ For example, plentiful, high-paying jobs are available to business professionals who know how to use information systems to improve business process quality, or those who know how to interpret data mining results for improved marketing, or those who know how to use emerging technology like 3D printing to create new products and address new markets. See the Guide on pages 26–27 for more thoughts on how you might consider an IS-related job.

⁵Accenture, "Accenture 2013 College Graduate Employment Survey," last modified April 29, 2013, www.accenture.com/us-en/Pages/insight-2013-accenture-college-graduate-employment-survey.aspx.

⁶Michael Spence and Sandile Hlatshwayo, *The Evolving Structure of the American Economy and the Employment Challenge* (New York: Council on Foreign Relations, 2011).

⁷Bureau of Labor Statistics, "Computer Systems Analysts," *Occupational Outlook Handbook*, last modified January 8, 2014, www.bls.gov/ooh/computer-and-information-technology/computer-systems-analysts.htm.

⁸Daron Acemoglu and David Autor, "Skills, Tasks, and Technologies: Implications for Employment and Earnings" (working paper, National Bureau of Economic Research, June 2010), www.nber.org/papers/w16082.