David M. **Kroenke** | Randall J. **Boyle** | Andrew **Gemino** | Peter **Tingling**

EXPERIENCING MIS

FIFTH CANADIAN EDITION

Updated to align with the new CPA Canada IT Knowledge Supplement

EXPERIENCING MIS

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FIFTH CANADIAN EDITION

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Pearson

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

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

This book is dedicated to my wife Kathy, my children Christina and Matthew, and all of the students, teachers, reviewers, and colleagues who helped make this a better book.
—Andrew Gemino

This book is dedicated to those who continue to teach me great things. I am the fortunate recipient of knowledge from my partner Susanne, our children, my parents, my colleagues, and, of course, my students, who never fail to astound and inspire me.
—Peter Tingling

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Preface

We undertook the development of the fifth Canadian edition of *Experiencing MIS* because we believe that the skills inherent in the study of information systems are important to the innovation and productivity of every Canadian industry. We are not alone in this belief. The Canadian Coalition for Tomorrow's ICT Skills (www.ccict.ca), a collection of companies and educational institutions, has recognized the growing innovation gap and the challenge of developing the skills for tomorrow's workplace in students today. The foundations for these skills are firmly rooted in studies of both information technology and business. We view this course as a gateway to these topics for many students. Our hope in developing this edition is to interest students in furthering their knowledge in the combined study of business and technology.

In the coming years, technologies will radically change how people relate to one another. Organizations will become more virtual, and people will work with clients and colleagues they may never meet face to face. Many jobs that are here today will be eliminated, and new jobs will take their place. Change will be driven by people who are familiar with business and technology. So, start your MIS experience today!

KEY UPDATES TO THIS EDITION

The fifth Canadian edition is updated to closely align to the new CPA Canada IT Knowledge Supplement.

We have revised this edition of *Experiencing MIS* to include the latest innovations in the field of information systems. We have also added unique new features and application information to help students interact with and apply the material. Key updates to the fifth Canadian edition include the following:

- New and updated material on Database Design
- New thorough coverage on how to use Microsoft Access 2016
- New useful information covering an Introduction to Microsoft Excel 2016 including Pivot Tables and sensitivity analysis
- New discussion regarding *Big Data* and the controversies about this new term
- Expanded coverage of ereaders and tablets and their influence on information sharing
- Expanded and up-to-date discussion on cloud computing

In addition, for those instructors looking for a more detailed discussion of enterprise systems, we have coordinated the material in this fifth Canadian edition to fit neatly with Chapters 7 and 8 from the book *Processes, Systems and Information: An Introduction to MIS*. These additional resources focus on procurement (Chapter 7) and sales (Chapter 8) as detailed in SAP enterprise application. These chapters are available on the MyLab platform.

The features in this book are designed to encourage students to take an active role in developing their own understanding of MIS and how it relates to their business careers. We believe that when we experience MIS from our own personal perspective, we realize the important role that information systems play in our lives now and in our future careers.

FEATURES

Experiencing MIS is the theme of this book and student engagement is the ultimate objective. We have designed the book to engage students through a variety of features and to provide opportunities for students to ground their knowledge in practical exercises and real-life examples.

Running Cases

The book has four parts with each part containing three chapters. It begins with a running case introduction to help introduce students to Part 1. Following this running case introduction, Chapter 1 opens with an additional running case. Chapter 2 and Chapter 3 also begin with a running case. The remaining parts and chapters have a similar format. The running cases in the text include rich examples and thought provoking insights. These cases can be used in class as a platform for relatable discussions.

Chapter Study Questions

We made a choice to organize all of our content around questions. Each chapter typically focuses on approximately five to eight questions that guide students through the content. Using questions helps engage students in a search for relevant knowledge and challenges students to think about the material rather than memorize sections and lists.

Active Review

The chapter study questions are supported by Active Review questions near the end of each chapter. These questions are more detailed and offer an opportunity for students to see how much they have learned. If students are unable to answer the Active Review questions, they can turn back and review the appropriate section earlier in the chapter. This reinforces learning and provides feedback to students so they can better target their study.

MIS in Use and Case Studies

Each chapter includes an MIS in Use mini-case that provides a real-life example of the questions discussed in the chapter. Each MIS in Use mini-case also comes with a set of questions that can be used in the lecture or as assignments. The mini-cases and their questions provide an additional opportunity to highlight important issues and create student engagement with the material. A Case Study at the end of most chapters provide additional real-world examples. We have worked to provide a wide range of case studies so that students are aware of the differences in MIS across organizations.

Using Your Knowledge

At the end of each chapter, we have included a number of Using Your Knowledge questions. These questions provide opportunities for written assignments or discussions that often integrate the various issues raised in the chapter. The Using Your Knowledge questions provide another mechanism for engaging students in developing their own ideas about what MIS means to them.

What Do You Think?

These exercises are a unique feature of *Experiencing MIS* because they are designed to encourage students to develop their personal perspectives about issues in MIS. Several of the exercises (Chapters 3, 8, 9, and 10) focus on ethical issues. In addition, a variety of interesting topics and conundrums are introduced. These exercises can be used in class for discussion or outside the classroom as personal assignments. The answers to these exercises are not hard and fast—they require students to develop their own opinions. This forging of opinions creates further engagement with the material. We encourage instructors to find ways to incorporate these exercises in their classes so that students can experience MIS in a personal way.

Collaborative Exercises

Students often comment that they learn from group experiences. The Collaborative Exercises at the end of each chapter provide opportunities for students to interact and discuss topics related to chapter content. These assignments allow students to engage with the material in a group format designed to stimulate discussion and feedback that supports individual learning.

Application-specific Knowledge Extensions

We have included five Knowledge Extensions that focus on practical introductory skills for MS Visio, MS Excel, Database Design, MS Access, and MS Project. The Knowledge Extensions on MS Excel and MS Project reflect the personal productivity skills that are now expected of graduating students in any business career.

Additional Chapters on SAP Enterprise Systems

Through Pearson Canada, we have the unique opportunity to coordinate the material in this fifth Canadian edition to fit neatly with Chapters 7 and 8 from the book *Processes, Systems, and Information: An Introduction to MIS* by Kroenke and McKinney. Instructors who would like to provide students with more in-depth knowledge of how SAP treats the procurement and sales processes are encouraged to consider these additional resources. We have adjusted Chapters 1 through 7 in the Canadian edition so that the definitions and business process approach provide a seamless transition to these additional resources. These additional chapters are available on MyLab.

We believe that the key to creating an effective experience for students in this course is to provide opportunities for them to engage with the material and to develop their own personal perspective on MIS. The features provided in this book are designed to support this development, while providing a stimulating introduction to the world of MIS. We believe this book effectively presents information that students will need to be successful in their careers. We trust that this book demonstrates that the field of MIS remains as important today as it was in the past and that our success in developing students with knowledge of MIS will play a critical role in our future economic development.

SUPPLEMENTS

The fifth Canadian edition of *Experiencing MIS* is accompanied by a range of supplementary material available to both instructors and students.

These instructor supplements are available for download from a password-protected section of Pearson Canada's online catalogue (www.pearsoncanada.ca/highered). Navigate to your book's catalogue page to view a list of available supplements. Speak to your local Pearson sales representative for details and access.

Instructor's Manual

This valuable resource features numerous teaching tools to help instructors make the most of the textbook in the classroom. Chapter objectives, chapter outlines, and answers to questions posed in the text are provided for each chapter.

PowerPoint® Presentations

These presentations combine lecture notes with images from the textbook. The lecture presentations for each chapter can be viewed electronically in the classroom or printed as black-and-white transparency masters.

Image Library

This library contains .gif or .jpg versions of figures from the textbook.

Computerized Test Bank

Pearson's computerized test banks allow instructors to filter and select questions to create quizzes, tests, or homework. Instructors can revise questions or add their own, and may be able to choose print or online options. These questions are also available in Microsoft Word format.

Learning Solutions Managers

Pearson's Learning Solutions Managers work with faculty and campus course designers to ensure that Pearson technology products, assessment tools, and online course materials are tailored to meet your specific needs. This highly qualified team is dedicated to helping schools take full advantage of a wide range of educational resources, by assisting in the integration of a variety of instructional materials and media formats. Your local Pearson Canada sales representative can provide you with more details on this service program.

MyLab

MyLab MIS

MyLab MIS for Kroenke/Boyle/Gemino/Tingling's *Experiencing MIS*, Fifth Canadian Edition, is a state-of-the-art learning management system complete with diagnostic tests, customized study plans, student remediation, and media resources such as simulations, videos, and an eText. MyLab is the most effective way to manage and deliver your course and help your students master the material.

MyLab delivers proven results in helping individual students succeed. It provides engaging experiences that personalize, stimulate, and measure learning for each student. And, it comes from a trusted partner with educational expertise and an eye on the future. MyLab can be used independently or linked to other types of management learning systems. To learn more about how MyLab combines proven learning applications with powerful assessment, visit www.pearson.com/mylab.

Acknowledgments

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We would like to acknowledge the input from colleagues from other Canadian schools, who provided their comments and ideas while the book was being developed. These include Anita Beecroft, Ed Bosman, John Bryant, Richard Crothers, Nelson Eng, Debbie Gorval, David Horspool, Jai-Yeol Son, Peter Thesiger, Robert Wood, and Jock Wylie.

We express our appreciation to the following reviewers of the previous edition, whose comments on various chapters and aspects of the entire project helped us understand the needs of both instructors and students and improve the book.

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Most importantly, we would like to thank our families for providing us with the love, patience, and time necessary to create this fifth Canadian edition.

Andrew Gemino
Peter Tingling

Letter to Students

Dear Student:

Regardless of whether or not you have chosen to concentrate in management information systems (MIS) or are reading this book because it is the required text for a mandatory course, there is no denying the impact that information systems have and will have on you as an individual and on society in general.

Much of the popular discussion about information technology is centred on a few companies (Apple, Facebook, Amazon.com, Netflix, and Google) and a handful of contemporary technologists, entrepreneurs, and scientists (Gates, Jobs, Zuckerberg, Paige, Brin, Bezos, and Berners-Lee). The reality is that information systems have a much wider range than this narrow media focus provides. It is a complex ecosystem where the only certainty is continuous change. Ignoring the importance of information systems invites ignorance about important technological disruptions that change the way people live and work around the globe. As a student, you must realize that your attitude towards technology and how it is used will have an impact on organizations you work in. We encourage you to invest in increasing your knowledge about information systems.

The overall purpose of this book is to help you understand and adapt to the rapid and disruptive changes that technology brings and to help you prepare for management success. While you could argue that technical disruption is nothing new (your grandparents adapted to the introduction of both automobiles and flight), we think that this time is different. Unlike manufacturing which tends, historically at least, to require physically unmovable assets and require a large number of co-located employees, information based systems are location and distance independent. In many ways, it makes little difference where Netflix or Amazon.com's data centres are located. Accordingly, in today's business environment, success will most likely come through your resilience, flexibility, and ability to innovate with technology. Canadian businesses face increasing pressure to improve the effectiveness and efficiency with which products and services are delivered to global customers. This innovation will require a workforce with new skills and an improved understanding of the role of information systems in business. In writing the book, we kept in mind three goals:

1. To explain the impact of information systems on organizational issues and how you can apply it to address problems and make better decisions in business
2. To show you how to increase your unique value (and marketability) in business by applying knowledge of information systems

3. To describe, in the context of management information systems (MIS), how you can become a better business professional

Note that the emphasis is on you. It is up to you to prepare yourself. No particular book, no course, no professor, and no teaching assistant can do it for you. However, many people have worked hard to structure this book, so you can maximize the benefit from your study time.

To help you achieve your goals, we have updated the content to ensure that it is as current as possible. Beyond the new sections added to the fifth edition (User Generated Content, Crowdsourcing Social Media, etc.), we have updated specific technologies such as cloud computing, social trends including showrooming, and the accelerating business environment.

We have completely changed the running cases in the book. In addition, each chapter includes questions to promote analysis of the running case and collaborative questions that can be used to solidify your understanding of the running case and the material presented in each chapter.

We have retained and updated the five Application-specific Knowledge Extensions, one for database design and one each on MS Excel, MS Access, MS Visio, and MS Project. We believe that these knowledge extensions provide some basic skills for personal productivity software that will be important for future business professionals. The introduction that each of these knowledge extensions provides is intended to make you aware of the capabilities of each application and enable you to explore the further power these applications offer.

In addition to content changes, the book contains four unique features that provide interesting opportunities for learning. First, we have organized the material in every chapter around a set of questions. Use these questions to manage your study time. Read until you can answer the questions.

Second, Collaborative Exercises have been included at the end of every chapter. These new assignments are designed to be accomplished in groups and are meant to help strengthen your teamwork skills and provide an opportunity for developing your interpersonal communication skills. These skills are critical for business professionals.

Third, short MIS in Use cases are included in each chapter, and we have added a number of new cases to this edition. These cases provide real-life examples of how organizations deal with information systems issues. You will also find a Case Study near the end of each chapter for additional insight.

Finally, the "What Do You Think?" feature found at the end of each chapter provides stimulating ideas for class discussion and individual thinking. The exercises often include ethical issues and ask you to develop opinions about important concerns related to information systems. If possible, discuss these questions with other people. Such discussions will give you a chance to develop your own opinions about important topics in information systems.

Like all worthwhile endeavours, this course takes work. That is just the way it is. A sustainable competitive advantage and success in business is rarely achieved without focus, determination, desire, effort, and hard work. It will not always be easy, and it will not always be fun. However, you will learn concepts, skills, and behaviours that will serve you well throughout your business career.

We wish you, as an emerging business professional, the very best success!

Sincerely,

David Kroenke
Randy Boyle
Andrew Gemino
Peter Tingling

PART 1

Why MIS?

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KNOWLEDGE EXTENSION 1 Collaboration Information Systems for Decision Making, Problem Solving, and Project Management available in the MyLab MIS

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MIS in Action

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 Alberta 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 captain in the Canadian Armed forces in charge of physical security at a military base in the Middle East. After retiring from the military, Mateo went to work as the director of security at a large Calgary-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 that 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 had seen how drones could be used successfully to improve security with much less time and effort than regular pilot operated helicopters. 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. She was the only photographer in the metro area who could produce

aerial video, and her business thrived. However, weddings were mostly seasonal or sporadic, and she still needed her day job to pay the bills. Joni knew she had found the drone expert she needed and invited Cam to have lunch with her and Mateo the following Saturday.

After hearing Cam talk about all the things commercial drones could do, Mateo and Joni realized that using drones for corporate security was a much bigger opportunity than they had initially imagined. Mateo and Joni founded Falcon Security and subsequently hired Cam. Five years later, Falcon Security has 15 large industrial clients that pay for daily security surveillance and dozens of industrial clients that contract for aerial safety inspections. It also recently contracted with a few clients requesting one-time aerial land survey, videography (commercials, real estate, etc.), and agricultural monitoring.

Falcon Security has revenues of about $14M a year, most of which comes from providing physical security to its large industrial clients. Mateo wants to grow Falcon Security nationally. He knows there are plenty of industrial clients outside of Alberta that would pay for Falcon's services, and envisions a possible lucrative contract with the federal government. Joni is worried that Falcon is not ready. It has been a bumpy ride. Buying fleets of drones (planes and helicopters) has been expensive and, at times, frustrating. People have to be trained to operate the drones, the drones seem to break frequently, and newer models are always coming out. Then there is the hugely expensive systems development project that is currently underway to automate the collection, storage, and analysis of the data from the drones.

Mateo has also been exploring 3D printing as a way to reduce the costs of the drones. Cam's team was able to rapidly create an innovative prototype of a new passive recharging platform using a 3D printer. Now Falcon's drones can land, charge, and take off again without any human intervention. This has saved countless hours managing the drones and has increased the overall effective range of the drones. Fleets of autonomous drones can now be deployed across long distances by stopping every 10 to 15 miles at a recharging station.

Mateo hopes the company can have the same success in making its own drones. However, he is not sure he wants to manufacture drones. How many new employees will he need to hire and train? How much will it cost to buy additional equipment and information systems to support the manufacturing process? Will these new drones be compatible with their existing data collection and processing system? Mateo asks Joni and Cam to figure out if manufacturing drones is the right move for Falcon Security.

CHAPTER 1
The Importance of MIS

STUDY QUESTIONS

Q1-1 WHAT IS AN INFORMATION SYSTEM?

Q1-2 WHAT IS MIS?

Q1-3 HOW DOES AN IS DIFFER FROM IT?

Q1-4 HOW IMPORTANT ARE INFORMATION SYSTEMS TO OUR ECONOMY?

Q1-5 HOW DO SUCCESSFUL BUSINESS PROFESSIONALS USE INFORMATION SYSTEMS?

Q1-6 WHAT IS THE SHAPE OF THINGS TO COME?

Q1-7 WHAT IS THIS COURSE ABOUT?

MIS in Action

"Fired? You're firing me?"

"Well, *fired* is a harsh word, but…well, Falcon Security has no further need for your services."

"But, Joni, 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 fleet 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 six months!"

"It's called initiative and 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."

KE **Chapter 1 optional knowledge extension is**

Knowledge Extension 1: Collaboration Information Systems for Decision Making, Problem Solving, and Project Management available in the MyLab MIS

"Well, you succeeded. I asked Cam what she thought of the plans you're working on. 'Who's Jennifer?' she asked."

"But doesn't she work down at the hangar?"

"Right. She's the operations manager … and it would probably be worthwhile talking to her."

"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."

"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 six months; you have a degree in business. Several weeks ago, I asked you for your first idea for a process that would identify potential drones, or drone parts, that could be 3D-printed. 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 list of parts that could be printed based on our existing drones, a list of replacement repair parts we buy on a regular basis, the specifications for future drones that we might buy, and a description of how existing 3D-printed drones are made. Not details, just an overview."

"Yes, I sent you those part lists and specifications."

"Jennifer, they made no sense. Your lists included parts that can't be 3D-printed, and your list of potential future drones included models that can't even carry cameras."

"I know which parts can be printed, I just wasn't sure which ones to include. But I'll try again!"

"Well, I appreciate that attitude, but we're a small company, really still a startup in many ways. Everyone needs to pull more than their own weight here. Maybe if we were a bigger company, I'd be able to find 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."

For many, the concept of an information system can be difficult to define and understand. Despite the fact that information systems underlie some of the most popular services available (such as Facebook, Amazon, Netflix, and Google (four companies often referred to as the "Fang economy") or Twitter, Uber, Instagram, and Snapchat), for most people the overwhelming majority of our interactions with such systems involve only the "front end" or "user interface" with little thought to what is actually occurring on the "back end" or behind the scenes. In much the same way that it is possible to cook with a microwave oven while knowing only how to set the power level and time controls rather than understanding how a magnetron functions or the physics of microwaves, information systems often operate like an invisible but powerful magic box.

The effect of information systems however has been far from invisible. In fact the effects of information systems have been so large and so widespread that it is difficult to imagine an industry or organization that has not been affected. Whether we consider the largest for-profit corporations, the smallest sole proprietorship business, any level of government, or nonprofit agencies, the accelerating rate of technology adoption has enabled changes that are difficult to believe. Entire industries, such as publishing and distribution, photography, music, and news, have either fallen or been radically restructured, and newer organizations, such as Google, Airbnb, Uber, Pinterest, and Facebook, have displaced giants in relatively short time periods.

With this in mind, we can say with some certainty that having a foundational understanding of management information systems (MIS) and the key concepts of information technology is essential not only for a career in business but also to be an informed and knowledgeable member of society. Regardless of whether you plan to be involved in accounting, finance, marketing, human resources, or international business, and irrespective of whether your personal goal is to create significant wealth or make a positive impact on society (or perhaps both), the purpose of Part 1 of this textbook is to demonstrate why a basic understanding of MIS and technology are important to every professional today.

Q1-1 WHAT IS AN INFORMATION SYSTEM?

A *system* is a group of components that interact to achieve some purpose. As you might guess, an **information system (IS)** is a group of components that interact to produce information. However, while true, this definition raises two questions: Do all information systems involve technology, and what are the interacting components? As it turns out, these seemingly simple questions remain uncomplicated if we only have common or conversational definitions for *information* and *technology*. For now, if we consider that most people think of technology as involving computers (at least when thinking about information systems and information technology) and consider information as something that reduces uncertainty, then we can confidently say that not all information systems require computerization. For example, a public library organized with the Dewey Decimal System or a calendar posted outside a conference room that is used to organize bookings can both be considered information systems, even though they may not be computerized.

Later we will provide much clearer definitions for *information* and a structure in which to discuss technology. But for now, if we accept the common definitions, we can then describe a computerized information system (which we will now simply call an *Information System*, since that is the focus of this course) as illustrated in Figure 1-1. In this figure,

Figure 1-1 Five Components of an Information System

we show that all information systems, from the simple (someone using a smartphone to find out when the next bus arrives) through to the most complicated (a high-technology Customer Relationship Management (CRM) system that uses algorithms and databases to predict customer behaviours), comprise a **five-component framework** of **computer hardware**, **software**, **data**, **procedures**, and **people**.

These five components are often linked through networks that leverage the power of connectivity to tie software, hardware, and data together to make information more accessible and powerful. Social networks, such as Facebook and LinkedIn, and systems, such as Alibaba and Uber, use the Internet to eliminate the effects of distance and to allow people to remain connected and interact in new ways.

You may already be familiar with the term *hardware*. Hardware has sometimes been used erroneously to refer to all the tangible or physical aspects of a computer system. More correctly, hardware refers to the electronic components and associated gadgetry that constitute a computer system. CDs, for example, do not technically qualify as hardware. *Software*, which has occasionally been used to refer to all the intangible or non-hardware components of a system, is nowadays more correctly used to refer only to programs (or **applications**) that run, or operate, on computer systems. The correct use of these terms is maintained throughout this book. *Data* are the basic building blocks of information, such as facts and observations. *Procedures* are the instructions or processes that you follow to achieve your desired objective; these can be formal and documented policies that are extensive and written down or less detailed, informal instructions. *People* are the actors who want to achieve a particular outcome by interacting with the system.

Let us look at what is hopefully a familiar example—the support system that your university or college uses to provide active learning (perhaps even in this course), such as Moodle, Canvas, or Desire2Learn. Like all systems, it has all five components illustrated in Figure 1-1, and, like many, it makes extensive use of networking technology. The *hardware* of the system includes the electronic devices used to access the system, such as tablets, computers, or smartphones. It is important to note that although most modern computer systems are designed to be used by multiple types of devices, there are still cases where specific types of hardware are required. The *software* of the system includes the stored set of instructions that run on your device, as well as the specific program that your university or college has licensed to provide the service. *Data* for the system may be stored on specialized computers called *servers*, which, through the power of networking, can be located almost anywhere in the world. Data for this system include such things as student identification numbers, enrollment dates, and answers to test questions. The system *procedures* are the steps that you follow to achieve your goal and include how you log on to, or access, the system and how you save or submit your work. You are one of the *people* in this system, but so are the IS professionals who built and maintain the site. Information systems are not just computers and data. An important point to learn in this course is that people are often the most critical part of an information system. Although we have not yet covered the communications aspects of modern information systems, in many cases, not only must systems be available to thousands, if not millions, of people at all hours of the day, but also they may use varying devices and be located in different places. Tying them all together is a network infrastructure.

Q1-2 WHAT IS MIS?

Management information systems (MIS) comprise the development and use of information systems that help organizations achieve their goals and objectives. The definition of MIS has three key elements: *development and use*, *information systems*, and *goals and objectives*. We have just discussed information systems. Now, let us consider development and use, followed by goals and objectives.

Development and Use of Information Systems

Information systems do not magically appear. Instead, they are designed and created by business analysts and systems designers at the request of senior managers or entrepreneurs in order to solve a particular problem or meet a perceived need. With this in mind, you might be thinking, "Wait a minute. I am a finance (or accounting, or marketing) major, not an information systems major. I do not need to know how to put together information systems" or (as we have been told by students in our classes), "I know what I want, I can get my staff to do it."

This could be a sign that you are headed for trouble. Consider, for example, that you are driving to work and you hear a strange noise from your car or you remember that it is due for some maintenance work. Imagine how an unscrupulous or perhaps mistaken person could talk you into a major engine repair, even if all you needed was air in your tires or to replace an inexpensive part. Think about how knowing even just a little about the basic operation of the car would enable you to have a much more insightful discussion with your mechanic, get better performance, and avoid being overcharged. A lack of easily obtainable knowledge could be quite detrimental to your wallet. Throughout your career, in whatever field you choose, you will need new information systems. To have an information system that meets your requirements, you should take an *active role* in that system's development. Without active involvement on your part, only good luck can enable the new system to meet your needs.

Throughout this book we will discuss your role in acquiring information systems (Chapter 10 is specifically focused on this important topic). As you read this book (perhaps electronically) and think about information systems, you will learn how to ask critical questions, such as "Where did that information come from?" "What new information or opportunities are enabled by technology?" "How was that system constructed?" and "What roles did the actual people who will use it play in its development?" Important consequences could depend on your answers so, if you start thinking about these questions now, you will be better prepared to address them later.

In addition to helping choose and implement information systems, you will have important roles to play in the *use* of information systems. Of course, you will need to learn how to employ the system to accomplish your goals. But you will also have other important functions. For example, when using corporate information systems, you may be responsible for protecting the security of the system and its data. When managing your own computer and system usage, you may need to back up data to protect yourself from losing important information. If the system fails (and most do at some point), you may have tasks to perform while the system is down to help restore the system quickly and correctly.

Achieving Business Goals and Objectives

The last part of the definition of MIS is that information systems exist to help organizations achieve their *goals* and *objectives*. This statement has many important implications. First, because all businesses are organizations but not all organizations are businesses, information systems are found in almost every type of enterprise, social, and nonprofit organization, as well as all levels of government. Indeed, we believe it is easier to find an organization without a marketing system than to find one without an information system. (Consider, for example, the justice system. Although prisons do not generally run advertising campaigns, they still have computerized systems for keeping track of prisoners.) More importantly, you are probably aware that organizations at a conceptual level do not really *do* anything. Although corporations are legally considered to have many of the characteristics of humans, they are not truly living beings and, thus, need people to think and act on their behalf. It is the people within an organization or business who sell, buy, design, produce, finance, market, account, and manage. Information systems exist to help organizational actors achieve the goals and objectives of that organization.

MIS in Use | Social Media: Changing the Relationship Between Customers and Business

Social media connect people, and when people connect, they talk, share, and let others know what they think about the world. When instant messaging (IM), web logs (blogs), wikis, video logs, podcasts, and an additional assortment of **social networking (SN)** sites first became popular, many business organizations responded by simply ignoring them. From a pure financial perspective, many SN sites did not, and may never, make positive cash flows; as a result, it seemed that there were few good business reasons to consider using social media. Some organizations, therefore, allowed only limited access to IM and SN sites because they did not want their employees wasting time on these sites while at work. Some organizations even created policies that restrained employees from responding to blogs about the company.

Companies rapidly learned that ignoring social media could be bad for business. For example, video recording of passenger David Dao being physically removed from an overbooked United Airlines flight was shared millions of times and resulted in a 4% drop (more than a billion dollars) in the United stock price. United Airlines, of course, is not alone (and this was not their first negative experience with social media). Governments, large organizations, and even individuals have had to learn to deal with the influence that connectedness can bring to bear on social issues (including the Arab Spring and HeforShe, movements that advocate for government change and to reduce gender inequality).

Some Examples of Using Social Media

As social media mature, organizations are formulating strategies that incorporate blogs, wikis, and SN sites into their business practices. For example, SCENE cards offered by Scotiabank and Cineplex have been used by Facebook (www.facebook.com/SCENE) to provide special offers and events that support the use of the cards. Another example is Deloitte Pixel (https://www2.deloitte.com/us/en/pages/operations/solutions/enterprise-crowdsourcing-solution-pixel.html), which provides a platform to organizations to crowdsource various aspects of idea generation, selection or execution using best practices rather than individually building their own mechanisms. Combining machine learning and adapted for multiple devices (including mobile) this website showcases various approaches and use cases. Similarly, the Big Wild (www.thebigwild.org) was founded by the Canadian Parks and Wilderness Society (CPAWS) and Mountain Equipment Co-op to allow people to share pictures and videos of wild spaces and to connect with others who are interested in preserving these areas.

What About Small Business?

The examples above are all large organizations, but perhaps the most exciting thing about social media has been its impact on small businesses. Mabel's Labels, a company based in Hamilton, Ontario, is a great example of how a small company can effectively use social media. Mabel's Labels has a blog called The Mabelhood (www.blog.mabel.ca), a podcast series on parenting, a Facebook fan page, a Twitter account (twitter.com/mabelhood), a photostream on Flickr, and a YouTube account. All these social media channels help Mabel's Labels connect with customers and increase the size of the network familiar with their products. Social media are changing the way small businesses connect with their customers, and this is a message that entrepreneurs everywhere are listening to.

QUESTIONS

1. **Are the social media sites that Mabel's Labels uses information systems?**
2. **What are the benefits and costs of Mabel's Labels' participation in various social media sites?**
3. **Can larger companies do the same social media marketing and promotion that Mabel's Labels does? Do small businesses have an advantage in social media over larger organizations? Justify your answers.**
4. **What risks does Mabel's Labels face in its social networking strategy? That is, what are the downsides of using social media for small businesses?**
5. **Not all social media sites make money or make a direct and measurable financial contribution to organizations' bottom lines. Will this always be the case, and how will this fact affect management in planning social media initiatives?**

In most cases, information systems are not developed for the sheer joy of exploring technology. They are not created to make the company more modern or so the company can claim to be part of the "new-economy." They are not created because the information systems department thinks they need to be created or because an executive thinks the company is "falling behind the technology curve."

This may seem so obvious that you wonder why we mention it, but every day organizations acquire and develop information systems for the wrong reasons. Right now, somewhere in the world, a company is probably creating a website simply because they think