RAINER • PRINCE • WATSON

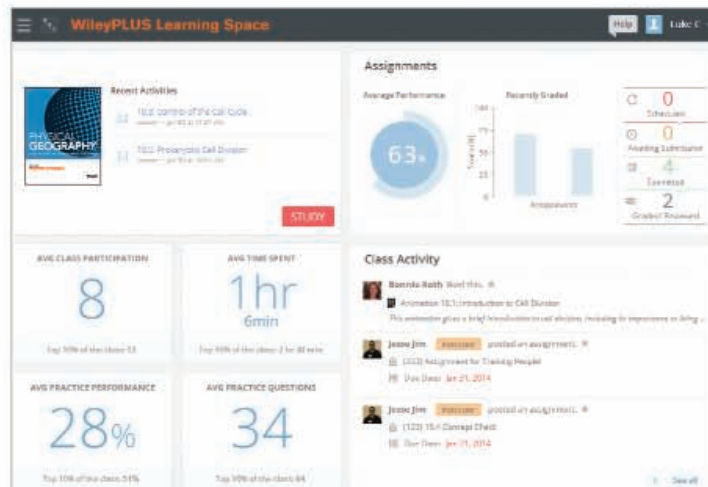# MANAGEMENT INFORMATION SYSTEMS

3rd EDITION

Moving Business Forward

WILEY

WileyPLUS Learning Space

An easy way to help your students **learn**, **collaborate**, and **grow**.

Personalized Experience

Students create their own study guide while they interact with course content and work on learning activities.

Flexible Course Design

Educators can quickly organize learning activities, manage student collaboration, and customize their course—giving them full control over content as well as the amount of interactivity between students.

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- Set up and monitor collaborative learning groups
- Assess learner engagement
- Gain immediate insights to help inform teaching

Student Benefits

- Instantly know what you need to work on
- Create a personal study plan
- Assess progress along the way
- Participate in class discussions
- Remember what you have learned because you have made deeper connections to the content

We are dedicated to supporting you from idea to outcome.

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Using **WileyPLUS** with this book?
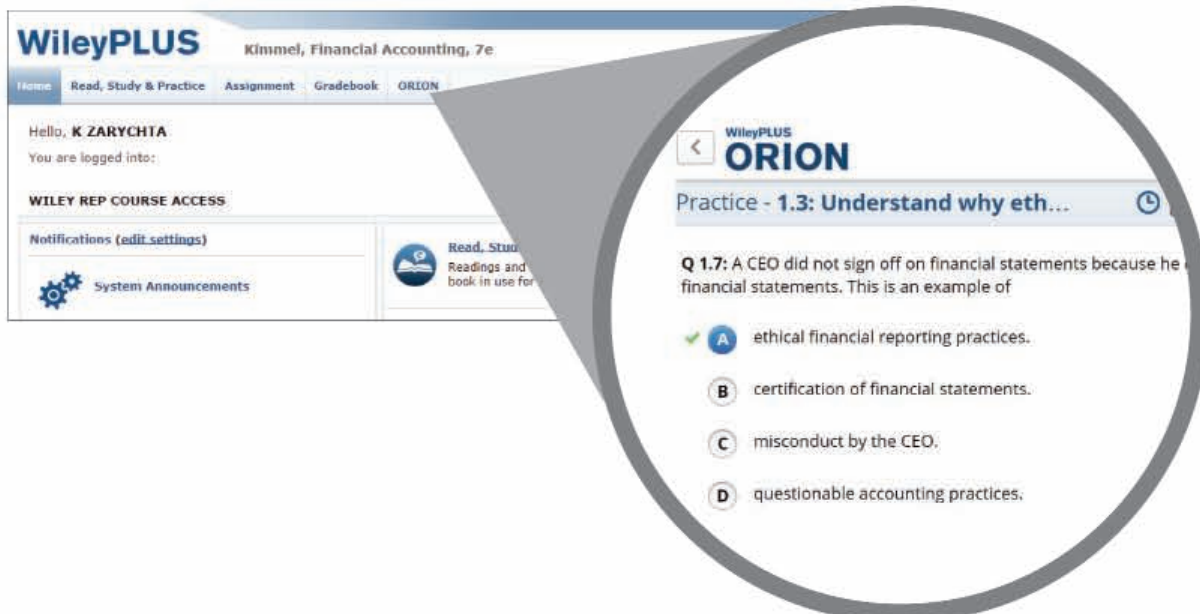# Check out **ORION**.

Whether you want to check your understanding of the material you just read or need to prepare for a test, ORION will help you use your study time most effectively.

Helping you learn by learning about you.™

Step 1 - Begin

Making it easy to figure out where to start!

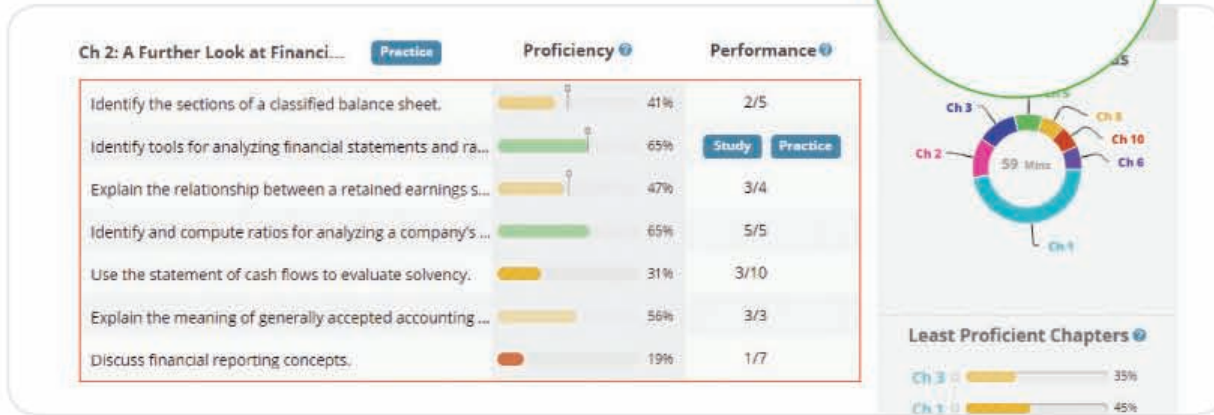**First, try a few questions to get an idea of where you stand.**

WileyPLUS — Kimmel, Financial Accounting, 7e

Home | Read, Study & Practice | Assignment | Gradebook | ORION

Hello, **K ZARYCHTA**
You are logged into:

WILEY REP COURSE ACCESS

Notifications (edit settings)

System Announcements

Read, Stud
Readings and
book in use for

WileyPLUS
ORION

Practice - **1.3: Understand why eth...**

Q 1.7: A CEO did not sign off on financial statements because he financial statements. This is an example of

✓ **A** ethical financial reporting practices.

B certification of financial statements.

C misconduct by the CEO.

D questionable accounting practices.

Step 2 - Practice

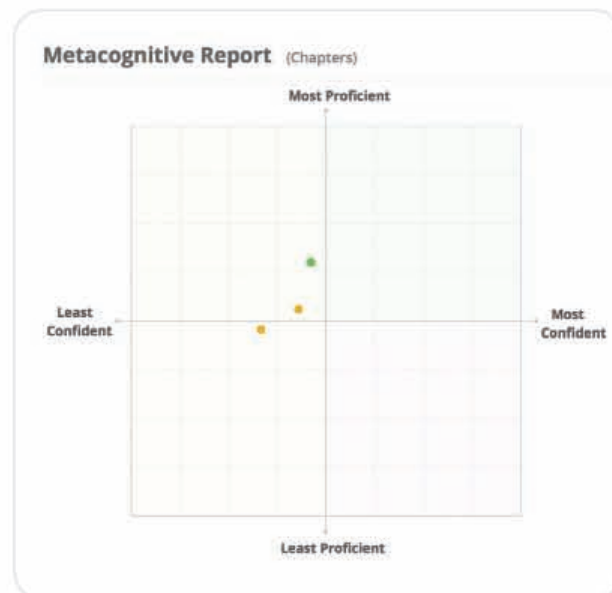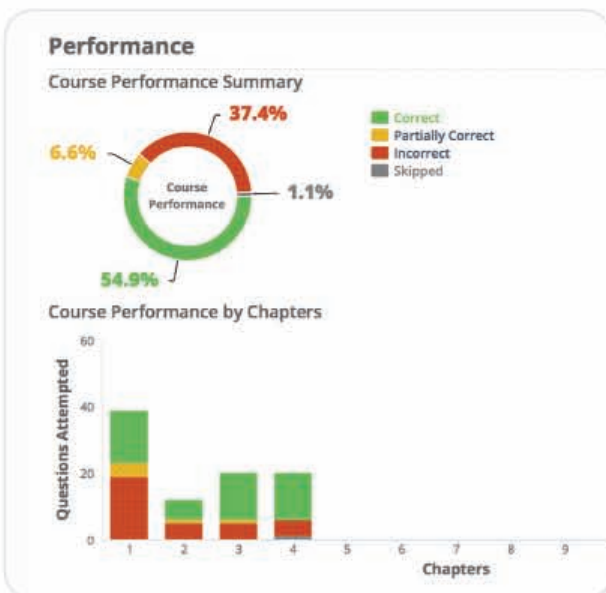## Making it easy to learn new things!

ORION gives you feedback on your performance, and you pick where to practice or study.

Ch 2: A Further Look at Financi...	Practice	Proficiency	Performance
Identify the sections of a classified balance sheet.		41%	2/5
Identify tools for analyzing financial statements and ra...		65%	Study Practice
Explain the relationship between a retained earnings s...		47%	3/4
Identify and compute ratios for analyzing a company's ...		65%	5/5
Use the statement of cash flows to evaluate solvency.		31%	3/10
Explain the meaning of generally accepted accounting ...		56%	3/3
Discuss financial reporting concepts.		19%	1/7

Study   Practice

Least Proficient Chapters
- Ch 3 — 35%
- Ch 1 — 45%

Step 3 - Maintain

Making it easy to remember everything you learn!

ORION provides a number of views into your overall proficiency so you can quickly review the things you might have forgotten before a quiz or exam.

Performance

Course Performance Summary

- 37.4%
- 6.6%
- 1.1%
- 54.9%

Legend:
- Correct
- Partially Correct
- Incorrect
- Skipped

Course Performance by Chapters

Questions Attempted / Chapters

Metacognitive Report (Chapters)

Most Proficient

Least Confident — Most Confident

Least Proficient

MANAGEMENT INFORMATION SYSTEMS

Moving Business Forward

Third Edition

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Kelly Rainer
Brad Prince
Hugh Watson

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To The Student

Dear Student,

Why are you here? We are not asking you a philosophical question—that is a different course. We are asking, "Why are you about to spend an entire term learning about information systems? Why are you—an accounting major, or a marketing or management major—being required to study this topic?" You may be asking, "What's in IT for me?" The short answer is that "IT's About Business," and the longer answer is the goal of this book.

Information systems are making the world a very small place and are contributing to rapidly increasing global competition. As a result, organizations are constantly trying to find ways to gain a competitive advantage—by achieving operational excellence, developing new products and services, developing new business models, providing superb customer service, improving decision making, and so on. It should be obvious, then, that an introductory course in information systems is critically important for success in your chosen career.

Rapid advances in information systems mean that, as business students, change will be the only constant you will encounter in today's dynamic digital business environment. We wrote this book for business students of all majors who will soon become business professionals. We have three goals in mind:

1. To help you be immediately successful when you join your organization
2. To help you understand the importance of information systems for individuals, organizations, and society as a whole
3. To enable you to become informed users of your organization's information systems

To accomplish these goals, we have tried to provide the essential, relevant knowledge that you need to understand to effectively use information systems in your careers.

The way we propose to do this is by keeping you *actively involved* in the material. Every section of the chapters has an activity that asks you to do something beyond just reading the textbook that will help you see why the content is useful for your future business career.

We hope you will enjoy this active approach and successfully complete the course with a richer understanding of what's in IT for you.

Kelly Rainer, Brad Prince, and Hugh Watson

To The Instructor

Dear Instructor,

We are like you. All of us who teach the introductory course in information systems realize that it is difficult for students to understand the importance and relevance of the topics in the course. As a result, students often memorize the content just before the exam, and then forget it as soon as the exam is over. We all want to engage students at a much deeper level. We know that the best way to accomplish this objective is through *hands-on active learning,* leading to *increased student engagement* in our course content.

Accordingly, active learning and student engagement are key principles of our new book. We recognize the need to actively involve students in problem solving, creative thinking, and capitalizing on opportunities. Every section of every chapter includes extensive hands-on exercises, activities, and mini-cases. End-of-chapter material also includes exercises that require students to use software application tools. Through these activities, we enable students to understand how to *do* something with the concepts they learn, such as meet business goals using information systems, configure products, and use spreadsheets and databases to facilitate problem solving.

The preface on the next page further outlines the goals, features, and support material provided with our new text. We hope you will enjoy teaching with this approach!

Kelly Rainer, Brad Prince, and Hugh Watson

Preface

Chapter Organization

Each chapter contains the following elements:

- **Chapter Outline:** Lists the major concepts covered in each chapter.

- **Learning Objectives:** Provide an overview of the key learning goals that students should achieve after reading the chapter.

- **Chapter-Opening Case:** A short case that focuses on a small or start-up company that is using information systems to solve a business problem. Cases in introductory information systems textbooks typically involve very large organizations. In contrast, our chapter-opening cases demonstrate that small and start-up companies also have business problems that they address using information systems. Students will see that small firms usually have to be quite creative in building and implementing IS solutions, because they do not have MIS departments or large budgets. These small-business cases also add an entrepreneurial flavor to each chapter for students who are planning to start their own businesses.

- **Apply the Concept Activities:** This book's unique pedagogical structure is designed to keep students actively engaged with the course material. Reading material in each chapter subsection is immediately followed by an "Apply the Concept" activity that is directly related to a chapter objective. These activities include links to online videos and articles and other hands-on activities that require students to immediately apply what they have learned. Via WileyPLUS, instructors can assign a section of text along with an Apply the Concept activity. Each Apply the Concept has the following elements:

    > Background (places the activity in the context of relevant reading material)
    > Activity (a hands-on activity that students carry out)
    > Deliverable (various tasks for students to complete as they perform the activity)

- **IT's About Business:** Short cases that demonstrate real-world applications of IT to business. Each case is accompanied by questions relating the case to concepts covered in the chapter. Icons relate these boxes to the specific functional areas.

- **IT's Personal:** Sprinkled throughout the chapters, these short vignettes explain the relevance of MIS concepts to students' daily lives.

- **Before You Go On:** End-of-section reviews prompt students to pause and test their understanding of concepts before moving on to the next section.

- **Examples:** Interspersed throughout the text, these highlight the use (and misuse) of information systems by real-world organizations, thereby illustrating the concepts discussed in the chapter.

- **What's in IT for Me?:** A unique end-of-chapter summary that demonstrates the relevance of each key chapter topic to different functional areas, including accounting, finance, marketing, production/operations management, human resources management, and management information systems. This cross-functional focus makes the book accessible for students from any major.

- **Summary:** Keyed to the Learning Objectives listed at the beginning of the chapter, the summary enables students to review major concepts covered.

- **Discussion Questions and Problem-Solving Activities:** Provide practice through active learning. These exercises are hands-on opportunities to apply the concepts discussed in the chapter.

- **Collaboration Exercises:** Team exercises that require students to take on different functional roles and collaborate to solve business problems using Google Drive. These exercises allow students to get first-hand experience solving business problems using Cloud-based tools while also experiencing an authentic business team dynamic.

- **Closing Cases:** Each chapter concludes with two cases about business problems faced by actual companies and how they used IS to solve those issues. The cases are broken down into four parts: a description of the problem, an overview of the IS solution implemented, a presentation of the results of the implementation, and an analysis of key takeaways from the case. Each case is followed by discussion questions, so that students can further explore the concepts presented in the case.

- **Spreadsheet Activity:** Every chapter includes a hands-on spreadsheet project that requires students to practice their Excel skills within the context of the chapter material. WileyPLUS Learning Space includes an Excel Lab Manual for students who need introductory coverage or review.

- **Database Activity:** Every chapter includes a hands-on database project that requires students to practice their Access skills while using concepts learned in the chapter. WileyPLUS Learning Space includes an Access Lab Manual for students who need introductory coverage or review.

- **Internship Activity:** Every chapter includes an Internship Activity which presents a business problem found in one of four recurring industries (healthcare, banking, manufacturing, and retail.) Students are directed to various software demos that provide useful tools for addressing the business problem. Then the students must act as interns and apply the concepts they learned in the chapter to provide a solution to the business problem.

- **Glossary:** A study tool that highlights vocabulary within the chapters and facilitates studying.

Key Features

Student Engagement

As discussed in the note addressed to instructors at the beginning of this preface, one of the chief goals of this text is to engage students at a level beyond recognition of key terms. We believe the best way to achieve this goal is through hands-on, active learning that will lead to increased student engagement with the course and its content.

Accordingly, every section of every chapter provides resources that actively involve students in problem solving, creative thinking, and capitalizing on opportunities. Every chapter includes extensive hands-on exercises, activities, and mini-cases, including exercises that require students to solve business problems using Excel and Access.

Cross-Functional Approach

We emphasize the importance of information systems by calling attention in every chapter to how that chapter's topic relates to each business major. Icons guide students to relevant issues for their specific functional area—accounting (ACC), finance (FIN), marketing (MKT), operations management (OM), human resources management (HRM), and management information systems (MIS). Chapters conclude with a detailed summary (entitled 'What's in IT for Me?') of how key concepts in the chapter relate to each functional area.

Diversified and Unique Examples from Different Industries

Extensive use of vivid examples from large corporations, small businesses, and government and not-for-profit organizations enlivens the concepts from the chapter. The examples illustrate everything from the capabilities of information systems, to their cost and

justification and the innovative ways that corporations are using IS in their operations. Small businesses have been included in recognition of the fact that many students will work for small-to mid-sized companies, and some will even start their own small business. In fact, some students may already be working at local businesses, and the concepts they are learning in class can be readily observed or put into practice in their part-time jobs. Each chapter constantly highlights the integral connection between business and IS. This connection is especially evident in the chapter-opening and closing cases, the "IT's About Business" boxes, and the highlighted examples.

Successes and Failures

Many textbooks present examples of the successful implementation of information systems, and our book is no exception. However, we go one step beyond by also providing numerous examples of IS failures, in the context of lessons that can be learned from such failures. Misuse of information systems can be very expensive.

Global Focus

An understanding of global competition, partnerships, and trading is essential to success in a modern business environment. Therefore, we provide a broad selection of international cases and examples. We discuss the role of information systems in facilitating export and import, the management of international companies, and electronic trading around the globe. These global examples are highlighted with the global icon.

Innovation and Creativity

In today's rapidly changing business environment, creativity and innovation are necessary for a business to operate effectively and profitably. Throughout our book, we demonstrate how information systems facilitate these processes.

Focus on Ethics

With corporate scandals appearing in the headlines almost daily, ethics and ethical questions have come to the forefront of business people's minds. In addition to devoting an entire chapter to ethics and privacy (Chapter 6), we have included examples and cases throughout the text that focus on business ethics. These examples are highlighted with the ethics icon.

What's New in the Third Edition?

- Content changes include:
  - A new section on Big Data in Chapter 3
  - Technical database material moved from Chapter 3 and expanded into new Plug IT In 3.
  - Expanded coverage of Business Processes in Chapter 2
  - A new section on Enterprise Resource Planning in Chapter 11
  - Thoroughly updated and expanded coverage of Social Computing in Chapter 8
  - All new or updated IT's About Business, chapter-opening and closing cases.
- Pedagogical changes include:
  - Revised and streamlined "Apply the Concept" activities now relate directly to chapter objectives.
  - New "Internship Activities" replace the Ruby's Club activities from previous editions. Each Internship Activity includes a software demo that requires students to apply new tools to business problems.
  - Revised "Collaboration Exercises" now each require use of Google Drive.

◦ Revised and streamlined database and spreadsheet exercises for every chapter. These include references to lessons in the WileyPLUS lab manual for students who need instruction or review.
- Complete update of cases and examples including all new or updated chapter opening and closing cases and all new or updated "IT's About Business" boxes.

Online Resources

www.wiley.com/college/rainer

Our book also facilitates the teaching of an Introduction to Information Systems course by providing extensive support materials for instructors and students. Visit www.wiley.com/college/rainer to access the Student and Instructor Companion Sites.

Instructor's Manual

The *Instructor's Manual* includes a chapter overview, teaching tips and strategies, answers to all end-of-chapter questions, supplemental mini-cases with essay questions and answers, and experiential exercises that relate to particular topics. It also includes answers and solutions to all spreadsheet and database activities, along with a guide to teaching these exercises, and links to the separate Excel and Access starter and solutions files.

Test Bank

The test bank is a comprehensive resource for test questions. Each chapter contains multiple choice, true/false, short answer, and essay questions. In addition, each chapter includes "Apply Your Knowledge" questions that require more creative thought to answer. Each multiple choice and true/false question is labeled to indicate its level of difficulty: easy, medium, or hard.

The test bank is available for use in Respondus' easy-to-use software. Respondus® is a powerful tool for creating and managing exams that can be printed or published directly to Blackboard, WebCT, Desire2Learn, eCollege, ANGEL, and other learning systems. For more information on Respondus® and the Respondus Test Bank Network, please visit www.respondus.com.

Reading Quizzes

These multiple choice conceptual questions can be used by instructors to evaluate a student's understanding of the reading. They are available in Respondus, the WileyPLUS course, and the Book Companion Site.

PowerPoint Presentations

The *PowerPoint Presentations* consist of a series of slides for each chapter. The slides are designed around each chapter's content, incorporating key points from the chapter and chapter illustrations as appropriate, as well as real-life examples from the Web.

Image Library

All textbook figures are available for download from the Web site. These figures can easily be added to PowerPoint presentations.

Weekly Updates

(http://wileyinformationsystemsupdates.com)

Weekly updates, harvested from around the Internet by David Firth of the University of Montana, provide you with the latest IT news and issues. These are posted every Monday morning throughout the year at http://wileyinformationsystemsupdates.com/. They include links to current articles and videos as well as discussion questions to assign or use in class.

OfficeGrader

Office Grader™ is an Access-Based VBA Macro that enables automatic grading of Office assignments. The macros compare Office files and grade them against a master file. OfficeGrader™ is available for Word, Access, Excel, and PowerPoint for Office 2010 and 2013. For more information, contact your Wiley sales representative or visit http://www.wiley.com/college/sc/office2013/officegrader.html.

WileyPLUS Learning Space

WileyPLUS Learning Space is an easy way for students to learn, collaborate, and grow. With WileyPLUS Learning Space, students create a personalized study plan, assess progress along the way, and make deeper connections as they interact with the course material and each other. Through a combination of dynamic course materials and visual reports, this collaborative learning environment gives you and your students immediate insight into strengths and problem areas in order to act on what's most important.

- This online teaching and learning environment integrates the entire digital textbook with the most effective instructor and student resources to accommodate every learning style.
- Students achieve concept mastery in a rich, structured environment that is available 24/7.
- Instructors personalize and manage their course more effectively with assessment, assignments, grade tracking, and more. You can even add your own materials to your WileyPLUS course
- With WileyPLUS Learning Space you can identify students who are falling behind and intervene accordingly, without having to wait for them to come to office hours.
- WileyPLUS Learning Space can complement the textbook or replace the printed textbook altogether.

WileyPLUS Learning Space for Rainer MIS 3e includes the following resources to support teaching and learning:

- New author lecture videos for every section of every chapter will facilitate switch to "flipped classrooms" and/or will provide additional learning support for students.
- Orion, an adaptive, personal learning experience that helps students highlight their strengths and problems areas and navigate through their studies to get optimal results in the most efficient amount of time. (See more information below.).
- Group chat function facilitates student discussion about activities and cases.
- Complete eText allows searching across all chapters, note-taking, highlighting, and the ability to copy and paste or print key sections.
- Lab Manual for Microsoft Office 2010 and Office 2013.
- Automatically graded practice questions
- Vocabulary flash cards and quizzes
- Library of additional "IT's About Business" cases.

For more information and a demo, visit here: http://www.wiley.com/college/sc/wpls/

ORION

Included in WileyPLUS Learning Space, ORION helps gauge students' strengths and weaknesses so that instructors can tailor instruction accordingly. Instructor reports track aggregate and individual student proficiency at the objective or chapter level, to show exactly where students excel as well as the areas that need reinforcement.

Based on cognitive science, WileyPLUS with ORION is a personalized, adaptive learning experience that helps students build proficiency on topics while using their study time most effectively.

For more information and a demo, visit here: http://www.wiley.com/college/sc/oriondemo/.

WILEY Flex

In addition to WileyPLUS Learning Space, Wiley provides a wide variety of printed and electronic formats that provide many choices to your students at a wide range of price points. Contact your Wiley sales representative for more details on any of the below.

Wiley E-Text Powered by VitalSource

Wiley E-Texts are complete digital versions of the text that help students study more efficiently. Students can access content online and offline on their desktops, laptops, and mobile devices; search across the entire book content, take notes and highlight, and copy and paste or print key sections.

Wiley Binder Version

A three-hole-punched, loose-leaf version allows students to carry only the content they need, insert class notes and hand-outs, and keep all materials in one place.

Wiley Custom

This group's services allows you to adapt existing Wiley content and combine text materials, incorporate and publish your own materials, and collaborate with Wiley's team to ensure your satisfaction.

Wiley Custom Select

Wiley Custom Select allows you to build your own course materials using selected chapters of any Wiley text and your own material if desired. For more information, visit http://customselect.wiley.com.

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		Darlene de Vida	*Lower Columbia College*
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Brief Contents

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MANAGEMENT INFORMATION SYSTEMS

Moving Business Forward

Third Edition

Introduction to Information Systems

LEARNING OBJECTIVES >>>

1.1 Identify the reasons why being an informed user of information systems is important in today's world.

1.2 Describe the various types of computer-based information systems in an organization.

1.3 Discuss ways in which information technology can affect managers and nonmanagerial workers.

1.4 Identify positive and negative societal effects of the increased use of information technology.

OPENING **CASE** > AngelList Helps Entrepreneurs Build Companies

Fundraising is a difficult and time-consuming process that diverts entrepreneurs from building their companies. For decades, entrepreneurs trying to obtain funding from Silicon Valley's small, wealthy group of angel investors found the process similar to breaking into an exclusive club. They had to work with their personal networks to set up meetings with financiers and then negotiate privately, with little awareness of fair market value or better opportunities elsewhere.

To assist these individuals, AngelList (https://angel.co), founded in 2010 in San Francisco, has created an online forum where founders of early-stage companies — called *startups* — post their ideas and meet investors who fund these often risky ventures. AngelList's mission is to make startup investing transparent and efficient.

How does AngelList work? Basically, startups access the site and create profiles that list information such as their previous financial backers (if any) and the amount of capital they have already raised. They then utilize those profiles to make their "pitch" to hundreds of certified investors – financial firms as well as wealthy individuals and companies. To avoid fraud, AngelList vets its investors by requiring them to provide a track record of their prior investments.

MKT

At the same time, it thoroughly researches any startups that they list on their Web site.

AngelList restricts its services to startups that are trying to obtain funding for the first time. For example, the company handles the regulatory paperwork to help startups complete the relevant forms. One feature on the Web site, called "Syndicates," lets investors pool their money under the direction of a single, wealthy investor known as a "lead." Then, whenever the lead decides to back a startup, so do the other investors, or "backers." Leads set their own terms. For example, one lead investor collects a 15 percent "carry" fee from his backers, plus a portion of any positive return they receive if the startup is acquired or goes public. AngelList takes a 5 percent cut on any such paydays.

Startups such as the private taxi service Uber (www.uber.com) and babysitting-jobs Web site Urbansitter (www.urbansitter.com) have used AngelList to meet new investors and quickly finalize their funding deals. In another example, Sprig (www.eatsprig.com), a San Francisco-based dinner delivery

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service, raised most of the money it needed for a new kitchen in a single day on AngelList.

At the end of 2013, AngelList added startup job listings to its Web site. In addition, it was lobbying the U.S. government to further relax fundraising restrictions contained in the JOBS Act, the 2012 Federal law that lowered regulatory requirements for startups. The company's goal is for the public — rather than simply accredited investors — to use the site to provide funding for promising startups.

And the bottom line? By mid-2014, AngelList featured more than 42,000 businesses, and it had provided entrepreneurs with more than 28,000 introductions to potential investors.

Sources: Compiled from B. Stone, "The Social Network for Startups," *Bloomberg BusinessWeek*, January 20-26, 2014; F. Lardinois, "OnTheGo Raises $700K Seed Round From Foundry Group's AngelList Syndicate and Others to Improve Smart Glasses," *TechCrunch*, January 6, 2014;

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Questions

1. What are the advantages offered by AngelList to entrepreneurs?

2. What are potential disadvantages that entrepreneurs might encounter by using AngelList? (*Hint:* What if you listed your company profile on AngelList and no investor provided funding?)

Introduction

Before we proceed, we need to define information technology and information systems. **Information technology (IT)** refers to any computer-based tool that people use to work with information and to support the information and information-processing needs of an organization. An **information system (IS)** collects, processes, stores, analyzes, and disseminates information for a specific purpose.

IT has far-reaching effects on individuals, organizations, and our planet. Although this text is largely devoted to the many ways in which IT has transformed modern organizations, you will also learn about the significant impacts of IT on individuals and societies, the global economy, and our physical environment. In addition, IT is making our world smaller, enabling more and more people to communicate, collaborate, and compete, thereby leveling the digital playing field.

When you graduate, you either will start your own business or you will work for an organization, whether it is public sector, private sector, for-profit, or not-for-profit. Your organization will have to survive and compete in an environment that has been radically transformed by information technology. This environment is global, massively interconnected, intensely competitive, 24/7/365, real-time, rapidly changing, and information-intensive. To compete successfully, your organization must use IT effectively.

As you read this chapter and this text, keep in mind that the information technologies you will learn about are important to businesses of all sizes. No matter what area of business you major in, what industry you work for, or the size of your company, you will benefit from learning about IT. Who knows? Maybe you will use the tools you learn about in this class to make your great idea a reality by becoming an entrepreneur and starting your own business! In fact, as you see in the chapter opening case, you can use information technology (in the form of AngelList.com) to help you raise the necessary funds to successfully grow your business.

The modern environment is intensely competitive not only for your organization, but for you as well. You must compete with human talent from around the world. Therefore, you will also have to make effective use of IT.

Accordingly, this chapter begins with a discussion of why you should become knowledgeable about IT. It also distinguishes among data, information, and knowledge, and it differentiates computer-based information systems from application programs. Finally, it considers the impacts of information systems on organizations and on society in general.

1.1 Why Should I Study Information Systems?

You are part of the most connected generation in history: You have grown up online; you are, quite literally, never out of touch; you use more information technologies (in the form of digital devices), for more tasks, and are bombarded with more information, than any generation in history. The MIT Technology Review refers to you as *Homo conexus*. Information technologies are so deeply embedded in your lives that your daily routines would be almost unrecognizable to a college student just 20 years ago.

Essentially, you practice continuous computing, surrounded by a movable information network. This network is created by constant cooperation between the digital devices you carry (for example, laptops, tablets, and smartphones); the wired and wireless networks that you access as you move about; and Web-based tools for finding information and communicating and collaborating with other people. Your network enables you to pull information about virtually anything from anywhere, at any time, and to push your own ideas back to the Web, from wherever you are, via a mobile device. Think of everything you do online, often with your smart phone: register for classes; take classes (and not just at your university); access class syllabi, information, PowerPoints, and lectures; research class papers and presentations; conduct banking; pay your bills; research, shop, and buy products from companies or other people; sell your "stuff"; search for, and apply for, jobs; make your travel reservations (hotel, airline, rental car); create your own blog and post your own podcasts and videocasts to it; design your own page on Facebook; make and upload videos to YouTube; take, edit, and print your own digital photographs; "burn" your own custom-music CDs and DVDs; use RSS feeds to create your personal electronic newspaper; text and tweet your friends and family throughout your day; send Snaps; and many other activities. (Note: If any of these terms are unfamiliar to you, don't worry. You will learn about everything mentioned here in detail later in this text.)

The Informed User—You!

So, the question is: Why you should learn about information systems and information technologies? After all, you can comfortably use a computer (or other electronic devices) to perform many activities, you have been surfing the Web for years, and you feel confident that you can manage any IT application that your organization's MIS department installs.

The answer lies in your becoming an **informed user**; that is, a person knowledgeable about information systems and information technology. There are several reasons why you should be an informed user.

Media Bakery

Students today are connected by many devices—almost all are wireless.

In general, informed users tend to get more value from whatever technologies they use. You will enjoy many benefits from being an informed user of IT.

- First, you will benefit more from your organization's IT applications because you will understand what is "behind" those applications (see FIGURE 1.1). That is, what you see on your computer screen is brought to you by your MIS department, who are operating "behind" your screen.

- Second, you will be in a position to enhance the quality of your organization's IT applications with your input.

- Third, even as a new graduate, you will quickly be in a position to recommend—and perhaps help select— the IT applications that your organization will use.

- Fourth, being an informed user will keep you abreast of both new information technologies and rapid developments in existing technologies. Remaining "on top of things" will help you to anticipate the impacts that "new and improved" technologies will have on your organization and to make recommendations on the adoption and use of these technologies.

- Fifth, you will understand how using IT can improve your organization's performance and teamwork as well as your own productivity.
- Finally, if you have ideas of becoming an entrepreneur, then being an informed user will help you use IT when you start your own business.

Going further, managing the IS function within an organization is no longer the exclusive responsibility of the IS department. Rather, users now play key roles in every step of this process. The overall objective in this text is to provide you with the necessary information to contribute immediately to managing the IS function in your organization. In short, the goal is to help you become a very informed user!

USERS   MIS

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Figure 1.1 IT skills open many doors because IT is so widely used.

IT Offers Career Opportunities

Because information technology is vital to the operation of modern businesses, it offers many employment opportunities. The demand for traditional IT staff—programmers, business analysts, systems analysts, and designers—is substantial. In addition, many well-paid jobs exist in areas such as the Internet and electronic commerce (e-commerce), mobile commerce (m-commerce), network security, telecommunications, and multimedia design.

The information systems field includes the people in various organizations who design and build information systems, the people who use those systems, and the people responsible for managing those systems. At the top of the list is the chief information officer (CIO).

The CIO is the executive who is in charge of the IS function. In most modern organizations, the CIO works with the chief executive officer (CEO), the chief financial officer (CFO), and other senior executives. Therefore, he or she actively participates in the organization's strategic planning process. In today's digital environment, the IS function has become increasingly strategic within organizations. As a result, although most CIOs still rise from the IS department, a growing number are coming up through the ranks in the business units (e.g., marketing, finance, etc.). So, regardless of your major, you could become the CIO of your organization one day. This is another reason to be an informed user of information systems!

Table 1.1 provides a list of IT jobs, along with a description of each one. For further details about careers in IT, see www.computerworld.com/careertopics/careers and www.monster.com.

Career opportunities in IS are strong and are projected to remain strong over the next ten years. In fact, the *U.S. News & World Report and Money* listed their "100 top jobs" for 2013, and *Forbes* listed its "10 top jobs" for 2013. Let's take a look at these rankings. (Note that the rankings differ because the magazines used different criteria in their research.) As you can see, jobs suited for MIS majors rank extremely high in all three lists. The magazines with their job rankings are as follows:

Forbes

#1 Software developer

#4 Systems analyst

#6 Network and systems administrator

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It's not just students. Today's professionals must be able to use computing technologies to do their job.

TABLE 1.1 Information
Technology Jobs

Position	Job Description
Chief Information Officer	Highest-ranking IS manager; is responsible for all strategic planning in the organization
IS Director	Manages all systems throughout the organization and the day-to-day operations of the entire IS organization
Information Center Manager	Manages IS services such as help desks, hot lines, training, and consulting
Applications Development Manager	Coordinates and manages new systems development projects
Project Manager	Manages a particular new systems development project
Systems Manager	Manages a particular existing system
Operations Manager	Supervises the day-to-day operations of the data and/ or computer center
Programming Manager	Coordinates all applications programming efforts
Systems Analyst	Interfaces between users and programmers; determines information requirements and technical specifications for new applications
Business Analyst	Focuses on designing solutions for business problems; interfaces closely with users to demonstrate how IT can be used innovatively
Systems Programmer	Creates the computer code for developing new systems software or maintaining existing systems software
Applications Programmer	Creates the computer code for developing new applications or maintaining existing applications
Emerging Technologies Manager	Forecasts technology trends; evaluates and experiments with new technologies
Network Manager	Coordinates and manages the organization's voice and data networks
Database Administrator	Manages the organization's databases and oversees the use of database-management software
Auditing or Computer Security Manager	Oversees the ethical and legal use of information systems
Webmaster	Manages the organization's World Wide Web site
Web Designer	Creates World Wide Web sites and pages

U.S. News & World Report
#4 Computer systems analyst
#6 Database administrator
#7 Software developer
#9 Web developer
#20 IT manager

Money
#3 Software architect
#5 Database administrator
#9 Software developer

#13 IT consultant

#21 Systems administrator

#28 IT business analyst

Going further, when *Forbes* identified its "15 most valuable college majors" in 2012, the list included two business majors: Management Information Systems at #8 and Finance at #14.

Not only do IS careers offer strong job growth, but the pay is excellent as well. The Bureau of Labor Statistics, an agency within the Department of Labor that is responsible for tracking and analyzing trends relating to the labor market, notes that the median salary in 2013 for "computer and information systems managers" is approximately $115,000.

Managing Information Resources

Managing information systems in modern organizations is a difficult, complex task. Several factors contribute to this complexity. First, information systems have enormous strategic value to organizations. Firms rely on them so heavily that, in some cases, when these systems are not working (even for a short time), the firm cannot function. (This situation is called "being hostage to information systems.") Second, information systems are very expensive to acquire, operate, and maintain.

A third factor contributing to the difficulty in managing information systems is the evolution of the management information systems (MIS) function within the organization. When businesses first began to use computers in the early 1950s, the MIS department "owned" the only computing resource in the organization, the mainframe. At that time, end users did not interact directly with the mainframe.

In contrast, in the modern organization, computers are located in all departments, and almost all employees use computers in their work. This situation, known as *end user computing*, has led to a partnership between the MIS department and the end users. The MIS department now acts as more of a consultant to end users, viewing them as customers. In fact, the main function of the MIS department is to use IT to solve end users' business problems.

As a result of these developments, the responsibility for managing information resources is now divided between the MIS department and the users. This arrangement raises several important questions: Which resources are managed by whom? What is the role of the MIS department, its structure, and its place within the organization? What is the appropriate relationship between the MIS department and the end users? Regardless of who is doing what, it is essential that the MIS department and the end users work in close cooperation.

MIS

There is no standard way to divide responsibility for developing and maintaining information resources between the MIS department and the end users. Instead, that division depends on several factors: the size and nature of the organization, the amount and type of IT resources, the organization's attitudes toward computing, the attitudes of top management toward computing, the maturity level of the technology, the amount and nature of outsourced IT work, and even the countries in which the company operates. Generally speaking, the MIS department is responsible for corporate-level and shared resources, and the end users are responsible for departmental resources. Table 1.2 identifies both the traditional functions and various new, consultative functions of the MIS department.

TABLE 1.2 The Changing Role of the Information Systems Department

Traditional Functions of the MIS Department
• Managing systems development and systems project management
◦ As an end user, you will have critical input into the systems development process. You will learn about systems development in Chapter 14.
• Managing computer operations, including the computer center
• Staffing, training, and developing IS skills
• Providing technical services
• Infrastructure planning, development, and control
◦ As an end user, you will provide critical input about the IS infrastructure needs of your department.

New (Consultative) Functions of the MIS Department

- Initiating and designing specific strategic information systems
  - As an end user, your information needs will often mandate the development of new strategic information systems.
    You will decide which strategic systems you need (because you know your business needs better than the MIS department does), and you will provide input into developing these systems.

- Incorporating the Internet and electronic commerce into the business
  - As an end user, you will be primarily responsible for effectively using the Internet and electronic commerce in your business. You will work with the MIS department to accomplish this task.

- Managing system integration including the Internet, intranets, and extranets
  - As an end user, your business needs will determine how you want to use the Internet, your corporate intranets, and extranets to accomplish your goals. You will be primarily responsible for advising the MIS department on the most effective use of the Internet, your corporate intranets, and extranets.

- Educating the non-MIS managers about IT
  - Your department will be primarily responsible for advising the MIS department on how best to educate and train your employees about IT.

- Educating the MIS staff about the business
  - Communication between the MIS department and the business units is a two-way street. You will be responsible for educating the MIS staff on your business, its needs, and its goals.

- Partnering with business-unit executives
  - Essentially, you will be in a partnership with the MIS department. You will be responsible for seeing that this partnership is one "between equals" and ensuring its success.

- Managing outsourcing
  - Outsourcing is driven by business needs. Therefore, the outsourcing decision resides largely with the business units (i.e., with you). The MIS department, working closely with you, will advise you on technical issues such as communications bandwidth, security, etc.

- Proactively using business and technical knowledge to seed innovative ideas about IT
  - Your business needs often will drive innovative ideas about how to effectively use information systems to accomplish your goals. The best way to bring these innovative uses of IS to life is to partner closely with your MIS department. Such close partnerships have amazing synergies!

- Creating business alliances with business partners
  - The needs of your business unit will drive these alliances, typically along your supply chain. Again, your MIS department will act as your advisor on various issues, including hardware and software compatibility, implementing extranets, communications, and security.

So, where do the end users come in? Take a close look at Table 1.2. Under the traditional MIS functions, you will see two functions for which you provide vital input: managing systems development, and infrastructure planning. Under the consultative MIS functions, in contrast, you exercise the primary responsibility for each function, while the MIS department acts as your advisor. IT's About Business 1.1 illustrates how the University System of Georgia manages its IT resources across its 31 member higher-education institutions.

IT'S ABOUT BUSINESS 1.1

Information Technology Supports Students in Georgia

There are two major drivers for change in higher education: lowering costs and improving performance. Lowering costs is necessary because higher education costs have been rapidly increasing for many years, leading to concerns that higher education is out of reach for low-income families. Improving performance is necessary because there is pressure on universities to graduate more students while at the same time maintaining a high-quality educational experience. In essence, colleges and universities are under increasing pressure to accomplish more with less.

The University System of Georgia (USG; www.usg.edu) has employed cutting-edge information technologies to achieve these seemingly contradictory goals. USG is the organizational body that includes 31 public institutions of higher learning in the state of Georgia. The system, which is governed by the Georgia Board of Regents, establishes goals and dictates general policy to its member institutions.

MIS These policies require universities to deliver learning using new technologies (for example, delivering lectures via video) to stay current. In addition, university IT organizations must devise innovative strategies to reduce costs and increase efficiencies both within and among universities. This requirement has become vital as state funding shrinks and students struggle under the escalating costs of higher education. To accomplish these tasks, university IT departments have to be flexible and entrepreneurial.

The individual who bears the major responsibility for implementing these policies is Board of Regents Vice Chancellor and CIO Curtis Carver. Significantly, Carver has to collaborate with 31 independent-minded university CIOs. This position requires him to sell services. USG institutions can pursue technology contracts on their own. So, Carver looks for scenarios where 3 to 5 universities are planning to buy the same product and can consolidate their buying or centralize the service. That approach not only reduces costs, but it also helps alleviate staff shortages in some areas, such as database administration and analytics. The central IT organization's vision statement asserts, "If our customers can choose anyone to provide them IT services, they would choose us." Let's take a look at a specific example of how Carver utilized his strategy to resolve a problem.

The problem involves situations where a class is overbooked at one member university while the same class at other schools has empty seats. To manage such situations, the universities offered a number of such classes across institutions via videoconferencing, but the registration process posed a serious problem for students.

In addition to constituting a major inconvenience, overbooked classes and waiting lists can cause students to take longer to graduate, adding to their loan debt and delaying their entry into the workforce. Although a few vendors sell software to facilitate cross-institution registration, Carver considered those products too complex and costly. As an alternative, USG system developers wrote custom computer code to handle cross-registration. This software integrated student information systems to create a total headcount of registrants in each course across all USG universities. The system provides an interface for each student that exactly resembles the user interface at his or her home institution. Therefore, if a student at Coastal Georgia University registers for a course at the University of Georgia, the system looks exactly like the Coastal Georgia system, with no need to register or pay fees to another university. Thousands of students now sign up for courses through this cross-registration system, known as the Intra-Georgia Registration Sharing System, or Ingress (not to be confused with the open-source Ingres database).

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After the developers had created Ingress, Carver had to convince member universities that this system was really the way to go. University CIOs often have the option to use or not to use a shared service. As of this writing, 22 of the 31 USG universities use or are implementing Ingress. Carver takes the same approach with shared data center services, which the central group offers via a private cloud. The USG also has centralized the operation of its Desire2Learn learning management system, used by 300,000 students state-wide. Finally, Carver is exploring whether the USG can sell Ingress to other institutions.

Sources: Compiled from C. Murphy, "Chiefs of the Year," *InformationWeek*, December 16, 2013; K. Flinders, "Universities Investing in Back-Office IT Systems," *Computer Weekly*, March 2, 2012; "University IT Departments Can Drive Efficiencies and Modernisation," *The Guardian*, June, 2011; "Information Technology in Higher Education: Survey of Chief Information Officers," *The Chronicle of Higher Education*, 2010; www.usg.edu, accessed January 25, 2014.

Questions

1. Describe how the University System of Georgia manages its information resources vis-à-vis the individual universities in the system.

2. What are the advantages of central management of information systems in the University System of Georgia?

3. What are the disadvantages of central management of information systems in the University System of Georgia?