



Business Driven **TECHNOLOGY**

8e

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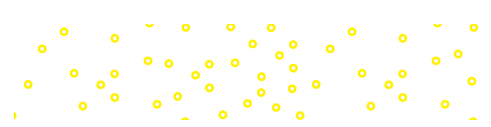
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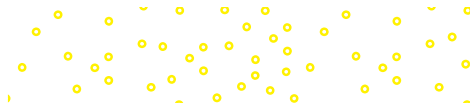
EIGHTH EDITION

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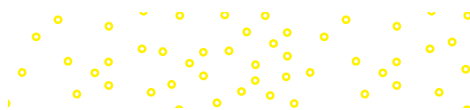
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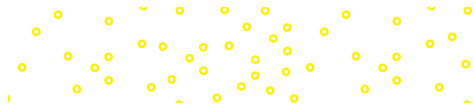
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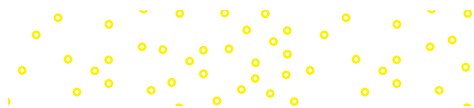




DEDICATION

In memory of Allan R. Biggs, my father, my mentor,
and my inspiration.

Paige



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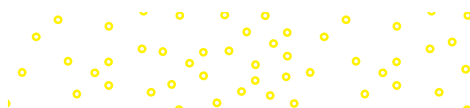
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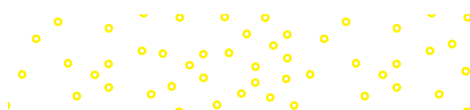
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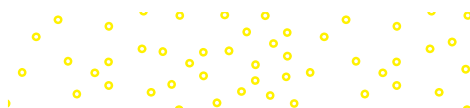
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ABOUT THE AUTHOR

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Paige Baltzan is an Assistant Teaching Professor in the department of Business Information and Analytics at the Daniels College of Business at the University of Denver. She holds a BSBA specializing in Accounting/MIS from Bowling Green State University and an MBA specializing in MIS from the University of Denver. She is a coauthor of several books, including *Business Driven Information Systems*, *Essentials of Business Driven Information Systems*, and *I-Series*, and is a contributor to *Management Information Systems for the Information Age*.

Before joining the Daniels College faculty in 1999, Paige spent several years working for a large telecommunications company and an international consulting firm where she participated in client engagements in the United States as well as South America and Europe. Paige lives in Lakewood, Colorado, with her husband, Tony, and daughters, Hannah and Sophie.

The overall goal of the Technology Plug-Ins is to provide additional information not covered in the text such as personal productivity using information technology, problem solving using Excel, and decision making using Access. These plug-ins also offer an all-in-one text to faculty, avoiding their having to purchase an extra book to support Microsoft Office. These plug-ins offer integration with the core chapters and provide critical knowledge using essential business applications, such as Microsoft Excel, Microsoft Access, and Microsoft Project with hands-on tutorials for comprehension and mastery. Plug-Ins T1 to T12 are located in McGraw-Hill Connect at <http://connect.mheducation.com>.

Plug-In	Description
T1. Personal Productivity Using IT	<p>This plug-in covers a number of things to do to keep a personal computer running effectively and efficiently. The topics covered in this plug-in are:</p> <ul style="list-style-type: none"> ■ Creating strong passwords. ■ Performing good file management. ■ Implementing effective backup and recovery strategies. ■ Using Zip files. ■ Writing professional emails. ■ Stopping spam. ■ Preventing phishing. ■ Detecting spyware. ■ Threads to instant messaging. ■ Increasing PC performance. ■ Using antivirus software. ■ Installing a personal firewall.
T2. Basic Skills Using Excel	<p>This plug-in introduces the basics of using Microsoft Excel, a spreadsheet program for data analysis, along with a few fancy features. The topics covered in this plug-in are:</p> <ul style="list-style-type: none"> ■ Workbooks and worksheets. ■ Working with cells and cell data. ■ Printing worksheets. ■ Formatting worksheets. ■ Formulas. ■ Working with charts and graphics.
T3. Problem Solving Using Excel	<p>This plug-in provides a comprehensive tutorial on how to use a variety of Microsoft Excel functions and features for problem solving. The areas covered in this plug-in are:</p> <ul style="list-style-type: none"> ■ Lists ■ Conditional Formatting ■ AutoFilter ■ Subtotals ■ PivotTables
T4. Decision Making Using Excel	<p>This plug-in examines a few of the advanced business analysis tools used in Microsoft Excel that have the capability to identify patterns, trends, and rules, and create “what-if” models. The four topics covered in this plug-in are:</p> <ul style="list-style-type: none"> ■ IF ■ Lookup ■ Goal Seek ■ Solver ■ Scenario Manager
T5. Designing Database Applications	<p>This plug-in provides specific details on how to design relational database applications. One of the most efficient and powerful information management computer-based applications is the relational database. The topics covered in this plug-in are:</p> <ul style="list-style-type: none"> ■ Entities and data relationships. ■ Documenting logical data relationships. ■ The relational data model. ■ Normalization.

Plug-in	Description
T6. Basic Skills Using Access	<p>This plug-in focuses on creating a Microsoft Access database file. One of the most efficient information management computer-based applications is Microsoft Access. Access provides a powerful set of tools for creating and maintaining a relational database. The topics covered in this plug-in are:</p> <ul style="list-style-type: none"> ■ Create a new database file. ■ Create and modify tables.
T7. Problem Solving Using Access	<p>This plug-in provides a comprehensive tutorial on how to query a database in Microsoft Access. Queries are essential for problem solving, allowing a user to sort information, summarize data (display totals, averages, counts, and so on), display the results of calculations on data, and choose exactly which fields are shown. The topics in this plug-in are:</p> <ul style="list-style-type: none"> ■ Create simple queries using the simple query wizard. ■ Create advanced queries using calculated fields. ■ Format results displayed in calculated fields.
T8. Decision Making Using Access	<p>This plug-in provides a comprehensive tutorial on entering data in a well-designed form and creating functional reports using Microsoft Access. A form is essential to use for data entry and a report is an effective way to present data in a printed format. The topics in this plug-in are:</p> <ul style="list-style-type: none"> ■ Creating, modifying, and running forms. ■ Creating, modifying, and running reports.
T9. Designing Web Pages	<p>This plug-in provides a comprehensive assessment into the functional aspects of web design. Websites are beginning to look more alike and to employ the same metaphors and conventions. The web has now become an everyday thing whose design should not make users think. The topics in this plug-in are:</p> <ul style="list-style-type: none"> ■ The World Wide Web. ■ Designing for the unknown(s). ■ The process of web design. ■ HTML basics. ■ Web fonts. ■ Web graphics.
T10. Creating Web Pages Using HTML	<p>This plug-in provides an overview of creating web pages using the HTML language. HTML is a system of codes that you use to create interactive web pages. It provides a means to describe the structure of text-based information in a document—by denoting certain text as headings, paragraphs, lists, and so on. The topics in this plug-in are:</p> <ul style="list-style-type: none"> ■ An introduction to HTML. ■ HTML tools. ■ Creating, saving, and viewing HTML documents. ■ Apply style tags and attributes. ■ Using fancy formatting. ■ Creating hyperlinks. ■ Displaying graphics.
T11. Creating Gantt Charts with Excel and Microsoft Project	<p>This plug-in offers a quick and efficient way to manage projects. Excel and Microsoft Project are great for managing all phases of a project, creating templates, collaborating on planning processes, tracking project progress, and sharing information with all interested parties. The two topics in this plug-in are:</p> <ul style="list-style-type: none"> ■ Creating Gantt Charts with Excel. ■ Creating Gantt Charts with Microsoft Project.

PREFACE

Unlike any other MIS text, *Business Driven Technology, 8e*, discusses various business initiatives first and how technology supports those initiatives second. The premise for this unique approach is that business initiatives should drive technology choices. Every discussion in the text first addresses the business needs and then addresses the technology that supports those needs.

Business Driven Technology offers you the flexibility to customize courses according to your needs and the needs of your students by covering only essential concepts and topics in the five core units, while providing additional in-depth coverage in the business and technology plug-ins.

Business Driven Technology contains 19 chapters (organized into five units), 12 business plug-ins, and 11 technology plug-ins offering you the ultimate flexibility in tailoring content to the exact needs of your MIS course. The unique construction of this text allows you to cover essential concepts and topics in the five core units while providing you with the ability to customize a course and explore certain topics in greater detail with the business and technology plug-ins.

Plug-ins are fully developed modules of text that include student learning outcomes, case studies, business vignettes, and end-of-chapter material such as key terms, individual and group questions and projects, and case study exercises.

We realize that instructors today require the ability to cover a blended mix of topics in their courses. While some instructors like to focus on networks and infrastructure throughout their course, others choose to focus on ethics and security. *Business Driven Technology* was developed to easily adapt to your needs. Each chapter and plug-in is independent so you can:

- Cover any or all of the *chapters* as they suit your purpose.
- Cover any or all of the *business plug-ins* as they suit your purpose.
- Cover any or all of the *technology plug-ins* as they suit your purpose.
- Cover the plug-ins in any order you wish.



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Connect MIS offers a number of powerful tools and features to make managing assignments easier, so faculty can spend more time teaching. With *Connect MIS*, students can engage with their coursework anytime and anywhere, making the learning process more accessible and efficient. *Connect MIS* offers you the features described next.

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- Go paperless with the eBook and online submission and grading of student assignments.

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The *Connect MIS* Instructor Library is your repository for additional resources to improve student engagement in and out of class. You can select and use any asset that enhances your lecture. The *Connect MIS* Instructor Library includes:

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 - Classroom openers and exercises for each chapter.
 - Case discussion points and solutions.
 - Answers to all chapter questions and cases.
 - Video guides—discussion points, questions and answers.
- PowerPoint Presentations with detail lecture notes.
- Solution files to all Apply Your Knowledge problems.

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- The *Connect MIS* Student Study Center is the place for students to access additional data files, student versions of the PowerPoint slides and more.

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Connect MIS keeps instructors informed about how each student, section, and class is performing, allowing for more productive use of lecture and office hours. The progress-tracking function enables you to:

- View scored work immediately and track individual or group performance with assignment and grade reports.
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- Record and index PowerPoint presentations and anything shown on your computer so it is easily searchable, frame by frame.

- Offer access to lectures anytime and anywhere by computer, iPod, or mobile device.
- Increase intent listening and class participation by easing students' concerns about note taking. Lecture Capture will make it more likely you will see students' faces, not the tops of their heads.

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- A powerful search function to pinpoint and connect key concepts in a snap.

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Assurance of Learning Ready

Many educational institutions today are focused on the notion of *assurance of learning*, an important element of some accreditation standards. *Business Driven Technology, 7e*, is designed specifically to support your assurance of learning initiatives with a simple yet powerful solution.

Each test bank question for *Business Driven Technology* maps to a specific chapter learning outcome/objective listed in the text. You can use our test bank software, EZ Test, or in *Connect MIS* to easily query for learning outcomes/objectives that directly relate to the learning objectives for your course. You can then use the reporting features of EZ Test to aggregate student results in similar fashion, making the collection and presentation of assurance of learning data simple and easy.

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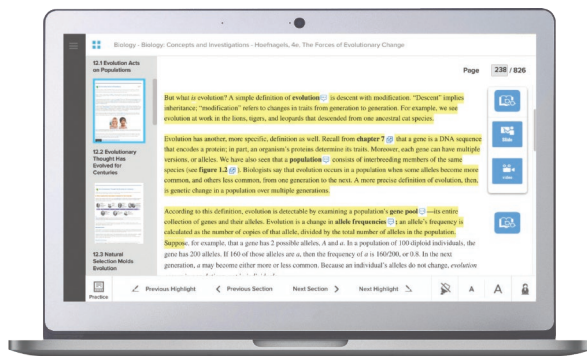
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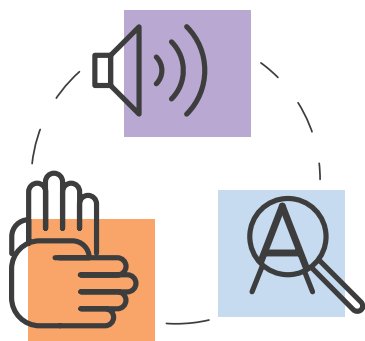
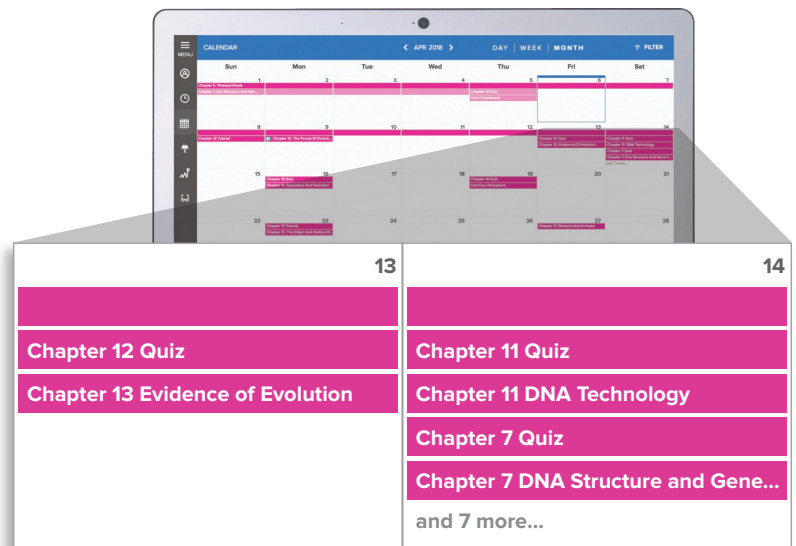
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Walkthrough

This text is organized around the traditional sequence of topics and concepts in information technology; however, the presentation of this material is nontraditional. That is to say, the text is divided into four major sections: (1) units, (2) chapters, (3) business plug-ins, and (4) technology plug-ins. This represents a substantial departure from existing traditional texts. The goal is to provide both students and faculty with only the most essential concepts and topical coverage in the text, while allowing faculty to customize a course by choosing from among a set of plug-ins that explore topics in more detail. All of the topics that form the core of the discipline are covered, including CRM, SCM, Porter’s Five Forces Model, value chain analysis, competitive advantage, information security, and ethics.

Business Driven Technology

includes four major components:

- 5 Core Units
- 19 Chapters
- 12 Business Plug-Ins
- 11 Technology Plug-Ins

UNITS

1. Achieving Business Success

- Chapter 1: Business Driven Technology
- Chapter 2: Identifying Competitive Advantages
- Chapter 3: Strategic Initiatives for Implementing Competitive Advantages
- Chapter 4: Measuring the Success of Strategic Initiatives
- Chapter 5: Organizational Structures That Support Strategic Initiatives

2. Exploring Business Intelligence

- Chapter 6: Valuing and Storing Organizational Information—Databases
- Chapter 7: Accessing Organizational Information—Data Warehouses
- Chapter 8: Understanding Big Data and Its Impact on Business

3. Streamlining Business Operations

- Chapter 9: Enabling the Organization—Decision Making
- Chapter 10: Extending the Organization—Supply Chain Management
- Chapter 11: Building a Customer-Centric Organization—Customer Relationship Management
- Chapter 12: Integrating the Organization from End to End—Enterprise Resource Planning

4. Building Innovation

- Chapter 13: Creating Innovative Organizations
- Chapter 14: Ebusiness
- Chapter 15: Creating Collaborative Partnerships
- Chapter 16: Integrating Wireless Technology in Business

5. Transforming Organizations

- Chapter 17: Developing Software to Streamline Operations
- Chapter 18: Methodologies for Supporting Agile Organizations
- Chapter 19: Managing Organizational Projects

BUSINESS PLUG-INS

B1 Business Basics	B7 Ethics
B2 Business Process	B8 Operations Management
B3 Hardware and Software Basics	B9 Sustainable MIS Infrastructures
B4 MIS Infrastructures	B10 Business Intelligence
B5 Networks and Telecommunications	B11 Global Information Systems
B6 Information Security	B12 Global Trends

TECHNOLOGY PLUG-INS (CONNECT ONLY)

T1 Personal Productivity Using IT	T7 Problem Solving Using Access
T2 Basic Skills Using Excel	T8 Decision Making Using Access
T3 Problem Solving Using Excel	T9 Designing Web Pages
T4 Decision Making Using Excel	T10 Creating Web Pages Using HTML
T5 Designing Database Applications	T11 Creating Gantt Charts with Excel and Microsoft Project
T6 Basic Skills Using Access	
Apply Your Knowledge Projects	Glossary
Notes	Index

Format, Features, and Highlights

Business Driven Technology, 8e, is state of the art in its discussions, presents concepts in an easy-to-understand format, and allows students to be active participants in learning. The dynamic nature of information technology requires all students, more specifically business students, to be aware of both current and emerging technologies. Students are facing complex subjects and need a clear, concise explanation to be able to understand and use the concepts throughout their careers. By engaging students with numerous case studies, exercises, projects, and questions that enforce concepts, *Business Driven Technology* creates a unique learning experience for both faculty and students.

- **Logical Layout.** Students and faculty will find the text well organized with the topics flowing logically from one unit to the next and from one chapter to the next. The definition of each term is provided before it is covered in the chapter and an extensive glossary is included at the back of the text. Each core unit offers a comprehensive opening case study, introduction, learning outcomes, unit summary, closing case studies, key terms, and making business decision questions. The plug-ins follow the same pedagogical elements with the exception of the exclusion of opening case and closing case studies in the technology plug-ins.
- **Thorough Explanations.** Complete coverage is provided for each topic that is introduced. Explanations are written so that students can understand the ideas presented and relate them to other concepts presented in the core units and plug-ins.
- **Solid Theoretical Base.** The text relies on current theory and practice of information systems as they relate to the business environment. Current academic and professional journals and websites upon which the text is based are found in the References at the end of the book—a road map for additional, pertinent readings that can be the basis for learning beyond the scope of the unit, chapter, or plug-in.
- **Material to Encourage Discussion.** All units contain a diverse selection of case studies and individual and group problem-solving activities as they relate to the use of information technology in business. Two comprehensive cases at the end of each unit reflect the concepts from the chapters. These cases encourage students to consider what concepts have been presented and then apply those concepts to a situation they might find in an organization. Different people in an organization can view the same facts from different points of view and the cases will force students to consider some of those views.
- **Flexibility in Teaching and Learning.** While most textbooks that are “text only” leave faculty on their own when it comes to choosing cases, *Business Driven Technology* goes much further. Several options are provided to faculty with case selections from a variety of sources including *CIO*, *Harvard Business Journal*, *Wired*, *Forbes*, and *Time*, to name just a few. Therefore, faculty can use the text alone, the text and a complete selection of cases, or anything in between.
- **Integrative Themes.** Several themes recur throughout the text, which adds integration to the material. Among these themes are value-added techniques and methodologies, ethics and social responsibility, globalization, and gaining a competitive advantage. Such topics are essential to gaining a full understanding of the strategies that a business must recognize, formulate, and in turn implement. In addition to addressing these in the chapter material, many illustrations are provided for their relevance to business practice. These include brief examples in the text as well as more detail presented in the corresponding plug-in(s) (business or technical).

Visual Content Map

Visual Content Map

Located at the beginning of the text and serving as a logical outline, the visual content map illustrates the relationship between each unit and its associated plug-ins.

Introduction

Information is everywhere. Most organizations value information as a strategic asset. Organizational success depends heavily on the ability to gather and analyze information about operations, suppliers, customers, and markets. Information can answer such questions as who are your best and worst customers? How much inventory do you need to meet demand? Where can you source the cheapest raw materials? How can you increase sales or reduce costs? Answering these questions incorrectly can lead directly to business failure. Estimating too many buyers will lead to an excess of inventory; estimating too few buyers will potentially lead to lost sales due to lack of product (resulting in even more lost revenues).

Understanding the direct impact information has on an organization's bottom line is crucial to running a successful business. This text focuses on information, business, technology, and the integrated set of activities used to run most organizations. Many of these activities are the hallmarks of business today—supply chain management, customer relationship management, enterprise resource planning, outsourcing, integration, ebusiness, and others. The five core units of this text cover these important activities in detail. Each unit is divided into chapters that provide individual learning outcomes and case studies. In addition to the five core units, there are technology and business “plug-ins” (see Figure Unit 1.1) that further explore topics presented in the five core units.

The chapters in Unit 1 are:

- Chapter 1—Business Driven Technology.
- Chapter 2—Identifying Competitive Advantages.
- Chapter 3—Strategic Initiatives for Implementing Competitive Advantages.
- Chapter 4—Measuring the Success of Strategic Initiatives.
- Chapter 5—Organizational Structures That Support Strategic Initiatives.

Introduction and Learning Outcomes

Introduction. Located after the Unit Opening Case, the introduction familiarizes students with the overall tone of the chapters. Thematic concepts are also broadly defined.

Learning Outcomes. These outcomes focus on what students should learn and be able to answer upon completion of the chapter or plug-in.

Introduction

Decision making and problem solving in today's electronic world encompass large-scale, opportunity-oriented, strategically focused solutions. The traditional "cookbook" approach to decisions simply will not work in the ebusiness world. Decision-making and problem-solving abilities are now the most sought-after traits in up-and-coming executives. To put it mildly, decision makers and problem solvers have limitless career potential.

Ebusiness is the conducting of business on the Internet, not only buying and selling, but also serving customers and collaborating with business partners. (Unit 4 discusses ebusiness in detail.) With the fast growth of information technology and the accelerated use of the Internet, ebusiness is quickly becoming standard. This unit focuses on technology to help make decisions, solve problems, and find new innovative opportunities. The unit highlights how to bring people together with the best IT processes and tools in complete, flexible solutions that can seize business opportunities (see Figure Unit 3.3). The chapters in Unit 3 are:

- **Chapter 9**—Enabling the Organization—Decision Making.
- **Chapter 10**—Extending the Organization—Supply Chain Management.
- **Chapter 11**—Building a Customer-centric Organization—Customer Relationship Management.
- **Chapter 12**—Integrating the Organization from End to End—Enterprise Resource Planning.

LEARNING OUTCOMES

- 9.1.** Explain the importance of decision making for managers at each of the three primary organization levels along with the associated decision characteristics.
- 9.2.** Classify the different operational support systems, managerial support systems, and strategic support

systems, and explain how managers can use these systems to make decisions and gain competitive advantages.

- 9.3.** Describe artificial intelligence, and identify its five main types.

Unit Opening Case and Opening Case Study Questions

Unit Opening Case. To enhance student interest, each unit begins with an opening case study that highlights an organization that has been time-tested and value-proven in the business world. This feature serves to fortify concepts with relevant examples of outstanding companies. Discussion of the case is threaded throughout the chapters in each unit.

Opening Case Study Questions. Located at the end of each chapter, pertinent questions connect the Unit Opening Case with important chapter concepts.

UNIT ONE OPENING CASE

Big Data, Big Analytics

Imagine working 10 years to become the lead marketing executive at a large retail organization only to find that your competitor is invading your market share by 20 percent each year. You quickly decided to launch several online marketing promotions while improving your products, only to find your efforts are fruitless as your competitor continues to steal your customers, destroying your profits while raising its own.

As you begin to analyze your competitor's business strategy, you find that while you were focused on sales reports, product inventory analysis, and other traditional marketing efforts, your competitor was making a massive investment in upgrading all of its management information systems. This included systems capable of collecting, storing, and analyzing data from every store, product, and sales representative in the market. In fact, your competitor now knows more about your products and sales cycles than you do. The new systems not only collect data throughout its company, but also from a group of suppliers, retailers, and distributors around the globe. These new systems provide your competitor with the ability to adjust prices instantly based on daily customer traffic patterns, reorder automatically from every entity in the supply chains, and even move items within a store or between stores for maximum selling efficiencies.

Your competitor has won and not because it had a higher-quality product or better sales and marketing strategies, but because it identified the value of management information systems coupled with the ability to instantly access big data within and beyond the organization. You quickly realize that your competitor's agility simply cannot be mimicked, offering it a huge competitive advantage. You sigh as you realize your company is in big trouble because it did not understand the dynamics of the big data age.

We are all familiar with the information age and the improvements made to organizations around the world as they are able to better manage employees, track sales information, and

OPENING CASE STUDY QUESTIONS

1. You have landed your dream job working for Steve Evert. Unfortunately, Steve does not understand the difference between efficiency MIS metrics and effectiveness MIS metrics. Provide Steve with an overview of the importance of metrics and the difference between efficiency MIS metrics and effectiveness MIS metrics.

Projects and Case Studies

Case Studies. This text is packed with case studies illustrating how a variety of prominent organizations and businesses have successfully implemented many of this text's concepts. All cases promote critical thinking. Company profiles are especially appealing and relevant to your students, helping to stir classroom discussion and interest.

* APPLY YOUR KNOWLEDGE

1. Mining the Data Warehouse

Alana Smith is a senior buyer for a large wholesaler that sells different types of arts and crafts to greeting card stores such as Hallmark. Alana's latest marketing strategy is to send all of her customers a new line of hand-made picture frames from Russia. Alana's data support her decision for the new line. Her analysis predicts that the frames should sell an average of 10 to 15 per store, per day. Alana is excited about the new line and is positive it will be a success.

One month later Alana learns that the frames are selling 50 percent below expectations and averaging between five and eight frames sold daily in each store. Alana decides to access the company's data warehouse to determine why sales are below expectations. Identify several different dimensions of data that Alana will want to analyze to help her decide what is causing the problems with the picture frame sales.

2. Cleansing Information

You are working for BI, a start-up business intelligence consulting company. You have a new client that is interested in hiring BI to clean up its information. To determine how good your work is, the client would like your analysis of the spreadsheet in Figure AYK.1.

3. Different Dimensions

The focus of data warehousing is to extend the transformation of data into information. Data warehouses offer strategic-level, external, integrated, and historical information so businesses can make projections, identify trends, and make key business decisions. The data warehouse collects and stores integrated sets of historical information from multiple operational systems and feeds them to one or more data marts. It may also provide end-user access to support enterprisewide views of information.

Project Focus

You are currently working on a marketing team for a large corporation that sells jewelry around the world. Your boss has asked you to look at the following dimensions of data to determine which ones you want in your data mart for performing sales and market analysis (see Figure AYK.2). As a team, categorize the different dimensions, ranking them from 1 to 5, with 1 indicating that the dimension offers the highest value and must be in your data mart and 5 indicating that the dimension offers the lowest value and does not need to be in your data mart.

Chapter Four Case: Manipulating the Data to Find of the Truth

How can global warming be real when there is so much snow and cold weather? That's what people wondered after a couple of massive snowstorms buried Washington, DC, and East Coast. Politicians across the capital made jokes and built igloos as they disputed the of climate change. Some concluded the planet simply could not be warming with all that the ground.

These comments frustrated Joseph Romm, a physicist and climate expert with the American Progress. He spent weeks turning data into information and graphs to educate who would listen as to why this reasoning was incorrect. Climate change is all about analyzing and turning it into information to detect trends. You cannot observe climate change by looking window; you have to review decades of weather data with advanced tools to really understand trends.

Increasingly, we see politicians, economists, and newscasters taking tough issues and turning them down to simplistic arguments over what the data mean, each interpreting the data to support their views and agendas. You need to understand the data and turn it into useful information or else you will not understand when someone is telling the truth and are being lied to.⁹

Questions

1. Brainstorm two or three types of data economists use to measure the economy.
2. How do they turn the data into information?
3. What issues do they encounter when attempting to measure the economy?
4. As a manager, what do you need to understand when reading or listening to economic reports?

Source: Clive Thompson, "Do You Speak Statistics?" *Wired*, May 2010, p. 36.

Apply Your Knowledge. At the end of this text is a set of 33 projects aimed at reinforcing the business initiatives explored in the text. These projects help to develop the application and problem-solving skills of your students through challenging and creative business-driven scenarios.

Making Business Decisions

Making Business Decisions.

Small scenario-driven projects help students focus on decision making as they relate to the topical elements in the chapters and plug-ins.

* MAKING BUSINESS DECISIONS

1. Who Really Won the Winter Olympics?

If you were watching the 2014 Winter Olympics, I bet you were excited to see your country and its amazing athletes compete. As you were following the Olympics day by day, you were probably checking different websites to see how your country ranked. And depending on the website you visited, you could get a very different answer to this seemingly easy question. On the NBC and ESPN networks, the United States ranked second, and on the official Sochi Olympic website, the United States ranked fourth. The simple question of who won the 2014 Winter Olympics changes significantly, depending on whom you asked.

In a group, take a look at the following two charts and brainstorm the reasons each internationally recognized source has a different listing for the top five winners. What measurement is each chart using to determine the winner? Who do you believe is the winner? As a manager, what do you need to understand when reading or listening to business forecasts and reports?

Winter Olympics 2014 Medal Ranking According to NBC News					
Rank	Country	Gold	Silver	Bronze	Total
1	Russian Fed.	13	11	9	33
2	United States	9	7	12	28
3	Norway	11	5	10	26
4	Canada	10	10	5	25
5	Netherlands	8	7	9	24

Winter Olympics 2014 Medal Ranking According to Official Sochi Olympic Website					
Rank	Country	Gold	Silver	Bronze	Total
1	Russian Fed.	13	11	9	33
2	Norway	11	5	10	26
3	Canada	10	10	5	25
4	United States	9	7	12	28
5	Netherlands	8	7	9	24

2. Starting Your Own Business

Josh James recently sold his web analytics company, Omniture, to Adobe for \$1.8 billion. Yes,

End-of-Unit Elements

* UNIT CLOSING CASE TWO

Disrupting the Taxi: Uber

Ray Markovich started driving a taxi in Chicago three years ago after shutting his struggling wireless phone store. Driving a cab wasn't particularly gratifying or lucrative—he had to pay \$400 a week just to lease his white 2011 Ford Escape. It was predictable if monotonous work. Well, there's nothing monotonous about it now. In June, Markovich, a thin, well-dressed man with short brown hair and spots of gray in his mustache and goatee, walked into the local office of Uber, the San Francisco-based taxi technology start-up. Uber put him through an hour of orientation, gave him a free iPhone that carries its car dispatch app and some gear to mount it on the windshield, and sent him on his way.

Since then, Markovich has had to dodge ~~flak from traditional cabbies who complain that they can~~ no longer pick up riders in the city's tonier neighborhoods. Uber has also sent him a series of emails from Uber itself, offering steep discounts. At the same time, he has increased his earnings along with his customers. "No one under the age of 30 can get a taxi anymore," says Markovich. "I say if you can't get a taxi, you can't get a reservation."

A battle for the future of transportation is being fought between a growing collection of well-funded start-ups, like Uber, and traditional cabbies who complain that they can't get a taxi as easy as booking a reservation.

* MAKING BUSINESS DECISIONS

1. Who Really Won the Winter Olympics?

If you were watching the 2014 Winter Olympics, I bet you were excited to see your country and its amazing athletes compete. As you were following the Olympics day by day, you were probably checking different websites to see how your country ranked. And depending on the website you visited, you could get a very different answer to this seemingly easy question. On the NBC and ESPN networks, the United States ranked second, and on the official Sochi Olympic website, the United States ranked fourth. The same question has different answers, depending on whom you ask.

In a group, take a look at the following table. The source that is the most commonly recognized source has a different answer. Use a bar chart using to determine the winner. What information do you need to understand when reading a bar chart?

Winter Olympics 2014	
Rank	Country
1	USA
2	Canada
3	China
4	South Korea

* KEY TERMS

Adware 78	competitive advantage 23
Analytics 12	Competitive intelligence 24
balanced scorecard 65	confidentiality 72
benchmark 62	Copyright 72
Benchmarking 62	Core processes 40
Best practices 61	Counterfeit software 72
Big data 9	Critical success factors (CSFs) 59
bug bounty program 76	CRM analysis technologies 48
Business-facing processes 42	CRM predicting technologies 48
Business analytics 12	CRM reporting technologies 48
Business intelligence (BI) 11	Customer-facing processes 40
business process 30	Customer analytics 48
business process 38	Customer relationship management (CRM) 46
Business process reengineering (BPR) 43	Data 8

Each unit contains complete pedagogical support in the form of:

- **Unit Summary.** Revisiting the unit highlights in summary format.
- **Key Terms.** With page numbers referencing where they are discussed in the text.
- **Two Closing Case Studies.** Reinforcing important concepts with prominent examples from businesses and organizations. Discussion questions follow each case study.
- **Apply Your Knowledge.** In-depth projects that help students focus on applying the skills and concepts they have learned throughout the unit.
- **Apply Your Knowledge Application Projects.** Highlights the different AYK projects available at the end of the text that takes the MIS concepts and challenges the students to apply them using Excel, Access, and other tools.

The plug-ins are designed to allow faculty to customize their course and cover selected topics in more detail. Students will read core material related to all of the plug-ins in the five units.

As an example, students will learn about various facets of customer relationship management (CRM) most notably in Chapter 11. However, customer relationship management has its own business plug-in. The CRM business plug-in gives both faculty and students the ability to cover CRM in more detail if desired. Likewise, students will receive an introduction to decision making in Unit 3. The Excel technology plug-ins allow coverage of decision-making tools such as PivotTables, Goal Seek, and Scenario Manager.

About the Plug-Ins

PLUG-IN B1 Business Basics

LEARNING OUTCOMES

1. Define the three common business forms.
2. List and describe the seven departments commonly found in most organizations.

Introduction

LO 1 Define the three common business forms.

A sign posted beside a road in Colorado states, "Failing to plan is planning to fail." Playnix Toys posted the sign after successfully completing its 20th year in the toy business in Colorado. The company's mission is to provide a superior selection of high-end toys for children of all ages. When the company began, it generated interest by using unique marketing strategies and promotions. The toy business has a lot of tough competition. Large chain stores such as Walmart and Target offer toys at deep discount prices. Finding the right strategy to remain competitive is difficult in this industry, as FAO Schwarz discovered when it filed for bankruptcy after 143 years in the toy business.

Management Focus. By focusing on the business plug-ins, your course will take on a managerial approach to MIS.

PLUG-IN T7 Problem Solving Using Access 2017

LEARNING OUTCOMES

1. Describe the process of using the Query Wizard using Access.
2. Describe the process of using the Design view for creating a query using Access.
3. Describe the process of adding a calculated field to a query using Access.
4. Describe the process of using aggregate functions to calculate totals in queries using Access.
5. Describe how to format results displayed in calculated fields using Access.

Introduction

A query is a tool for extracting, combining, and displaying data from one or more tables, according to criteria you specify. For example, in a book inventory database, you could create a query to view a list of all hardcover books with more than 500 pages that you purchased in the past five months. In a query, you can sort information, summarize data (display totals, averages, counts, and so on), display the

Technical Focus. If hands-on, technical skills are more important, include technical plug-ins in your MIS course.

End-of-Plug-In Elements

Each business plug-in contains complete pedagogical support in the form of:

- **Plug-in Summary.** Revisiting the plug-in highlights in summary format.
- **Key Terms.** With page numbers referencing where they are discussed in the text.
- **Making Business Decisions.** Small scenario-driven projects that help students focus individually on decision making as they relate to the topical elements in the chapters.

✱
PLUG-IN SUMMARY

The study of business begins with understanding the different types of businesses including a sole proprietorship, partnership, or a corporation. Figure B1.15 highlights seven departments found in a typical business.

All of these departments must be able to execute activities specific to their business function and also be able to work with the other departments to create synergies throughout the entire business.

- **Accounting** provides quantitative information about the finances of the business including recording, measuring, and describing financial information.
- **Finance** deals with the strategic financial issues associated with increasing the value of the business, while observing applicable laws and social responsibilities.
- **Human resources** manages employees (human resources).
- **Sales** is the function that increases company sales.
- **Marketing** is the department that supports the sales department.
- **Operations management** manages the processes that create the products and services.
- **Management information systems** manages the information systems that support the business.

✱
KEY TERMS

Accounting 355	For profit corporations 353	Operations management 363
accounting department 355	Human resources (HR) 358	Owner's equity 356
asset 356	income statement 356	partnership agreement 353
balance sheet 356	liability 356	Partnerships 353
Bookkeeping 355	Limited liability 353	product life cycle 363
break-even point 358	limited liability corporation (LLC) 354	profit 352
Capital 353		
corporation (also called		
organization, enterprise,		
or business) 353		
Dividends 356		
Expenses 356		
Finance 357		
Financial accounting 355		
financial quarter 357		
Financial statements 356		

✱
MAKING BUSINESS DECISIONS

1. **Setting Up a Business**

Your friend, Olivia Graves, is going to start her own chocolate shop, called Chocolate-By-Design. Olivia is an expert candy maker and one of the city's top pastry chefs. Olivia has come to you for advice on what type of business Chocolate-By-Design should be—a sole proprietorship, partnership, or corporation. Create a report comparing the three different types of businesses, along with your recommendation for Chocolate-By-Design's business structure.
2. **Guest Lecturing on Business**

As a recent college graduate, your favorite professor, Dr. Henning, has asked you to come back and guest lecture at his introduction to business course. Create a presentation defining the different departments in a typical business, what roles each play, and why it is important that they all work together.

Supplements:

- Business Driven Teaching Notes
- Instructor Resource Library in McGraw-Hill Connect
- Instructor's Manual and Video Case Guide
- PowerPoint Presentations
- Classroom Exercises
- Project Files

Support and Supplemental Material

All of the supplemental material supporting *Business Driven Technology* was developed by the author to ensure you receive accurate, high-quality, and in-depth content. Included are a complete set of materials that will assist students and faculty in accomplishing course objectives.

Video Exercises. Many of the videos that accompany the text are supported by detailed teaching notes on how to turn the videos into classroom exercises where your students can apply the knowledge they are learning after watching the videos.

Test Bank. This computerized package allows instructors to custom design, save, and generate tests. The test program permits instructors to edit, add, or delete questions from the test banks; analyze test results; and organize a database of tests and student results.

- **Instructor's Manual (IM).** The IM, written by the author, includes suggestions for designing the course and presenting the material. Each chapter is supported by answers to end-of-chapter questions and problems and suggestions concerning the discussion topics and cases.

- **PowerPoint Presentations.** A set of PowerPoint slides, created by the author, accompanies each chapter that features bulleted items that provide a lecture outline, plus key figures and tables from the text, and detailed teaching notes on each slide.

- **Classroom Exercises.** Choose from over 30 detailed classroom exercises that engage and challenge students. For example, if you are teaching systems development, start the class with the "Skyscraper Activity" where the students build a prototype that takes them through each phase of the systems development life cycle. All classroom exercises can be found in the IM.

- **Project Files.** The author has provided files for all projects that need further support, such as data files.

- **Cohesion Case.** Now assignable through Connect, The Broadway Cafe is a running case instructors can use to reinforce core material such as customer relationship management, supply chain management, business intelligence, and decision making. The case has 15 sections that challenge students to develop and expand their grandfather's coffee shop. Students receive hands-on experience in business and learn technology's true value of enabling business. Please note that the Cohesion Case is not a McGraw-Hill product but a Baltzan direct product.

- **Video Content.** More than 20 videos accompany this text and cover topics from entrepreneurship to disaster recovery. Video IMs are also available so you can turn the videos into engaging classroom activities.

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Business Driven Technology



Achieving Business Success

What's in IT for Me?

This unit sets the stage for diving into *Business Driven Technology*. It starts from the ground floor by providing a clear description of what information technology is and how IT fits into business strategies and organizational activities. It then provides an overview of how organizations operate in competitive environments and must continually define and redefine their business strategies to create competitive advantages. Doing so allows organizations to not only survive, but also thrive. Individuals who understand and can access and analyze the many different enterprisewide information systems dramatically improve their decision-making and problem-solving abilities. Most importantly, information technology is shown as a key enabler to help organizations operate successfully in highly competitive environments.

You, as a business student, must recognize the tight correlation between business and technology. You must first understand information technology's role in daily business activities, and then understand information technology's role in supporting and implementing enterprisewide initiatives and global business strategies. After reading this unit, you should have acquired a solid grasp of business driven information systems, technology fundamentals, and business strategies. You should also have gained an appreciation of the various kinds of information systems employed by organizations and how you can use them to help make strategically informed decisions. All leaders must appreciate the numerous ethical and security concerns voiced by customers today. These concerns directly influence a customer's likelihood to embrace electronic technologies and conduct business over the web. In this sense, these concerns affect a company's bottom line. You can find evidence in recent news reports about how the stock price of organizations dramatically falls when information privacy and security breaches are publicized. Further, organizations face potential litigation if they fail to meet their ethical, privacy, and security obligations concerning the handling of information in their companies.

Big Data, Big Analytics

Imagine working 10 years to become the lead marketing executive at a large retail organization only to find that your competitor is invading your market share by 20 percent each year. You quickly decided to launch several online marketing promotions while improving your products, only to find your efforts are fruitless as your competitor continues to steal your customers, destroying your profits while raising its own.

As you begin to analyze your competitor's business strategy, you find that while you were focused on sales reports, product inventory analysis, and other traditional marketing efforts, your competitor was making a massive investment in upgrading all of its management information systems. This included systems capable of collecting, storing, and analyzing data from every store, product, and sales representative in the market. In fact, your competitor now knows more about your products and sales cycles than you do. The new systems not only collect data throughout its company, but also from a group of suppliers, retailers, and distributors around the globe. These new systems provide your competitor with the ability to adjust prices instantly based on daily customer traffic patterns, reorder automatically from every entity in the supply chains, and even move items within a store or between stores for maximum selling efficiencies.

Your competitor has won and not because it had a higher-quality product or better sales and marketing strategies, but because it identified the value of management information systems coupled with the ability to instantly access big data within and beyond the organization. You quickly realize that your competitor's agility simply cannot be mimicked, offering it a huge competitive advantage. You sigh as you realize your company is in big trouble because it did not understand the dynamics of the big data age.

We are all familiar with the information age and the improvements made to organizations around the world as they are able to better manage employees, track sales information, and analyze customer purchasing patterns. However, this scenario is an example of the game-changing impact of big data, the massive amounts of data being collected by humans and machines over the last few years. Companies are now capturing hundreds of terabytes of data on everything from operations and finances to weather patterns and stock market trends. Sensors are now embedded in everything from products and machines to store floors, collecting real-time data on operations and customers. Radical customization, continuous experimentation, and information-driven business models are the new trademarks of competition



as organizations analyze massive volumes of data. Data volumes are exploding, and more data has been created in the past 2 years than in the entire previous history of the human race. Here are the top 20 facts every manager should know about big data, according to *Forbes* magazine.¹

- Data is growing faster than ever before, and by the year 2020, about 1.7 megabytes of new information will be created every second for every human being on the planet.
- By 2020, our accumulated digital universe of data will grow from 4.4 zettabytes today to around 44 zettabytes, or 44 trillion gigabytes.
- Every second we create new data. For example, we perform 40,000 search queries every second on Google alone, which amounts to 3.5 searches per day and 1.2 trillion searches per year.
- In 2015, over 1 billion people used Facebook each day.
- Facebook users send on average 31.25 million messages and view 2.77 million videos every minute.
- Every minute up to 300 hours of video are uploaded to YouTube alone.
- In 2015, a staggering 1 trillion photos will be taken, and billions of them will be shared online. By 2017, nearly 80 percent of photos will be taken on smart phones.
- This year, over 1.4 billion smart phones will be shipped—all packed with sensors capable of collecting all kinds of data, not to mention the data the users create themselves.
- By 2020, we will have over 6.1 billion smart phone users globally (overtaking basic fixed phone subscriptions).
- Within 5 years, there will be over 50 billion smart connected devices in the world, all developed to collect, analyze, and share data.
- By 2020, at least a third of all data will pass through the cloud (a network of servers connected over the Internet).
- Distributed computing (performing computing tasks using a network of computers in the cloud) is very real. Google uses it every day to involve about 1,000 computers in answering a single search query, which takes no more than a second to complete.
- The market for Hadoop (open source software for distributed computing) is forecast to grow at a compound annual growth rate of 58 percent, surpassing \$1 billion by 2020.
- Estimates suggest that by better integrating big data, healthcare could save as much as \$300 billion a year—that's equal to reducing costs by \$1,000 a year for every man, woman, and child.

- The White House has already invested more than \$200 million in big data projects.
- For a typical Fortune 1000 company, just a 10 percent increase in data accessibility will result in more than \$65 million additional net income.
- Retailers who leverage the full power of big data could increase their operating margins by as much as 60 percent.
- Almost 80 percent of organizations have already invested or plan to invest in big data.
- At the moment, less than 0.5 percent of all data is ever analyzed or used.

Introduction

Information is everywhere. Most organizations value information as a strategic asset. Organizational success depends heavily on the ability to gather and analyze information about operations, suppliers, customers, and markets. Information can answers such questions as who are your best and worst customers? How much inventory do you need to meet demand? Where can you source the cheapest raw materials? How can you increase sales or reduce costs? Answering these questions incorrectly can lead directly to business failure. Estimating too many buyers will lead to an excess of inventory; estimating too few buyers will potentially lead to lost sales due to lack of product (resulting in even more lost revenues).

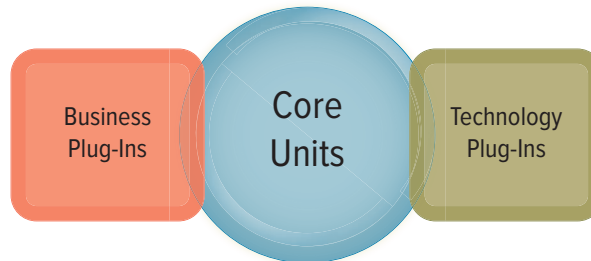
Understanding the direct impact information has on an organization's bottom line is crucial to running a successful business. This text focuses on information, business, technology, and the integrated set of activities used to run most organizations. Many of these activities are the hallmarks of business today—supply chain management, customer relationship management, enterprise resource planning, outsourcing, integration, ebusiness, and others. The five core units of this text cover these important activities in detail. Each unit is divided into chapters that provide individual learning outcomes and case studies. In addition to the five core units, there are technology and business “plug-ins” (see Figure Unit 1.1) that further explore topics presented in the five core units.

The chapters in Unit 1 are:

- Chapter 1—Business Driven Technology.
- Chapter 2—Identifying Competitive Advantages.
- Chapter 3—Strategic Initiatives for Implementing Competitive Advantages.
- Chapter 4—Measuring the Success of Strategic Initiatives.
- Chapter 5—Organizational Structures That Support Strategic Initiatives.

FIGURE UNIT 1.1

The Format and Approach of This Text.



LEARNING OUTCOMES

1.1. Describe the information age and the differences among data, information, business intelligence, and knowledge.

1.2. Explain systems thinking and how management information systems enable business communications.

Competing in the Information Age

Did you know that . . .

- The movie *Avatar* took more than four years to create and cost \$450 million.
- Lady Gaga's real name is Stefani Joanne Angelina Germanotta.
- Customers pay \$2.6 million for a 30-second advertising time slot during the Super Bowl.²

A *fact* is the confirmation or validation of an event or object. In the past, people primarily learned facts from books. Today, by simply pushing a button people can find out anything, from anywhere, at any time. We live in the *information age*, when infinite quantities of facts are widely available to anyone who can use a computer. The impact of information technology on the global business environment is equivalent to the printing press's impact on publishing and electricity's impact on productivity. College student startups were mostly unheard of before the information age. Now, it's not at all unusual to read about a business student starting a multimillion-dollar company from his or her dorm room. Think of Mark Zuckerberg, who started Facebook from his dorm, or Michael Dell (Dell Computers) and Bill Gates (Microsoft), who both founded their legendary companies as college students.

You may think only students well versed in advanced technology can compete in the information age. This is simply not true. Many business leaders have created exceptional opportunities by coupling the power of the information age with traditional business methods. Here are just a few examples:

- Amazon is not a technology company; its original business focus was to sell books, and it now sells nearly everything including technology services.
- Netflix is not a technology company; its primary business focus is to rent videos.
- Zappos is not a technology company; its primary business focus is to sell shoes, bags, clothing, and accessories.

Amazon's founder, Jeff Bezos, at first saw an opportunity to change the way people purchase books. Using the power of the information age to tailor offerings to each customer and speed the payment process, he in effect opened millions of tiny virtual bookstores, each with a vastly larger selection and far cheaper product than traditional bookstores. The success of his original business model led him to expand Amazon to carry many other types of products.

LO 1.1 Describe the information age and the differences among data, information, business intelligence, and knowledge.

The founders of Netflix and Zappos have done the same thing for videos and shoes. All these entrepreneurs were business professionals, not technology experts. However, they understood enough about the information age to apply it to a particular business, creating innovative companies that now lead entire industries.

Over 20 years ago a few professors at MIT began describing the *Internet of Things (IoT)* a world where interconnected Internet-enabled devices or “things” have the ability to collect and share data without human intervention. Another term commonly associated with The Internet of Things is *machine-to-machine (M2M)*, which refers to devices that connect directly to other devices. With advanced technologies devices are connecting in ways not previously thought possible and researchers predict that over 50 billion IoT devices will be communicating by 2020. Kevin Ashton, cofounder and executive director of the Auto-ID Center at MIT, first mentioned the Internet of Things in a presentation he made to Procter & Gamble. Here’s Ashton explanation of the Internet of Things:

“Today computers—and, therefore, the Internet—are almost wholly dependent on human beings for information. Nearly all of the roughly 50 petabytes (a petabyte is 1,024 terabytes) of data available on the Internet were first captured and created by human beings by typing, pressing a record button, taking a digital picture or scanning a bar code.

The problem is, people have limited time, attention and accuracy—all of which means they are not very good at capturing data about things in the real world. If we had computers that knew everything there was to know about things—using data they gathered without any help from us—we would be able to track and count everything and greatly reduce waste, loss and cost. We would know when things needed replacing, repairing or recalling and whether they were fresh or past their best.”³

IoT is transforming our world into a living information system as we control our intelligent lighting from our smart phone to a daily health check from our smart toothbrush. Of course with all great technological advances come unexpected risks and you have to be prepared to encounter various security issues with IoT. Just imagine if your devices are hacked by someone who now has the ability to shut off your water, take control of your car, or unlock the doors of your home from thousands of miles away. We are just beginning to understand the security issues associated with IoT and M2M and you can be sure that sensitive data leakage from your IoT device is something you will most likely encounter in your life.

Students who understand business along with the power associated with the information age will create their own opportunities and perhaps even new industries. Realizing the value of obtaining real-time data from connected “things” will allow you to make more informed decisions, identify new opportunities, and analyze customer patterns to predict new behaviors. Our primary goal in this course is to arm you with the knowledge you need to compete in the information age. The core drivers of the information age include:

- Data
- Information
- Business intelligence
- Knowledge (see Figure 1.1)

DATA

Data are raw facts that describe the characteristics of an event or object. Before the information age, managers manually collected and analyzed data, a time-consuming and complicated task without which they would have little insight into how to run their business. **Structured data** has a defined length, type, and format and includes numbers, dates, or strings such as Customer Address. Structured data is typically stored in a traditional system such as a relational database or spreadsheet and accounts for about 20 percent of the data that surrounds us. The sources of structured data include:

- **Machine-generated data** is created by a machine without human intervention. Machine-generated structured data includes sensor data, point-of-sale data, and web log data.
- **Human-generated data** is data that humans, in interaction with computers, generate. Human-generated structured data includes input data, click-stream data, or gaming data.

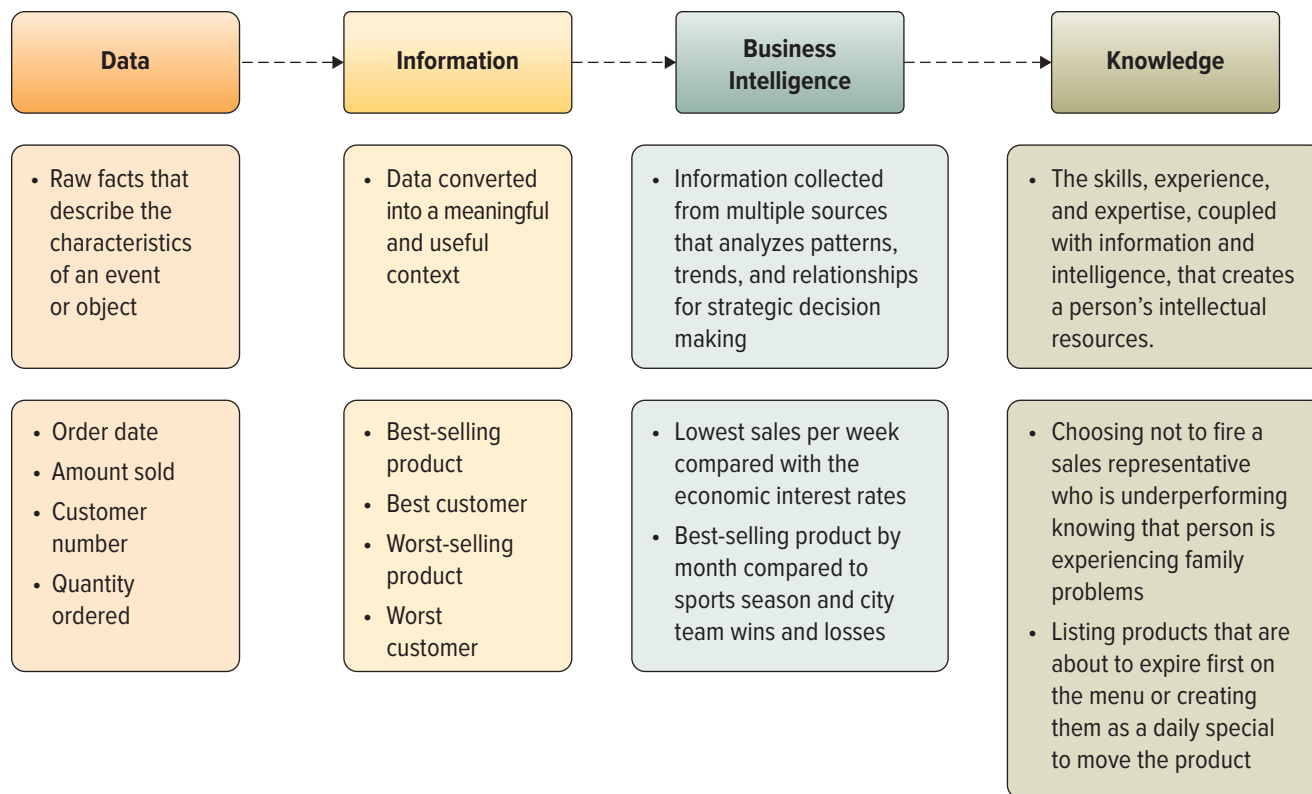


FIGURE 1.1
The Differences among Data, Information, Business Intelligence, and Knowledge.

Unstructured data is not defined and does not follow a specified format and is typically free-form text such as emails, Twitter tweets, and text messages. Unstructured data accounts for about 80 percent of the data that surrounds us. The sources of unstructured data include:

- Machine-generated unstructured data includes satellite images, scientific atmosphere data, and radar data.
- Human-generated unstructured data includes text messages, social media data, and emails.

Big data is a collection of large complex data sets, including structured and unstructured data, which cannot be analyzed using traditional database methods and tools. Lacking data, managers often found themselves making business decisions about how many products to make, how much material to order, or how many employees to hire based on intuition or gut feelings. In the information age, successful managers compile, analyze, and comprehend massive amounts of data daily, which helps them make more successful business decisions.

A **snapshot** is a view of data at a particular moment in time. Figure 1.2 provides a snapshot of sales data for Tony's Wholesale Company, a fictitious business that supplies snacks to stores. The data highlight characteristics such as order date, customer, sales representative, product, quantity, and profit. The second line in Figure 1.2, for instance, shows that Roberta Cross sold 90 boxes of Ruffles to Walmart for \$1,350, resulting in a profit of \$450 (note that Profit = Sales - Costs). These data are useful for understanding individual sales; however, they do not provide us much insight into how Tony's business is performing as a whole. Tony needs to answer questions that will help him manage his day-to-day operations such as:

- Who are my best customers?
- Who are my least-profitable customers?
- What is my best-selling product?
- What is my slowest-selling product?
- Who is my strongest sales representative?
- Who is my weakest sales representative?

What Tony needs, in other words, is not data but *information*.