

SIXTH EDITION

Business Driven Technology

Paige Baltzan

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Paige Baltzan

Daniels College of Business
University of Denver

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BUSINESS DRIVEN TECHNOLOGY, SIXTH EDITION

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

Paige

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Paige Baltzan

Paige Baltzan teaches in the department of Business Information and Analytics at the Daniels College of Business at the University of Denver. She holds a BS/BA 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, 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 on this textbook’s website at www.mhhe.com/baltzan.

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 12 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 six 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 five 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 ■ 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 four 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 two 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 three 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 two 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 six 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 seven 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 Web Pages Using Dreamweaver	<p>This plug-in provides a tour of using Dreamweaver to create web pages. Dreamweaver allows anyone with limited web page design experience to create, modify, and maintain full-featured, professional-looking pages without having to learn how to code all the functions and features from scratch. The five topics in this plug-in are:</p> <ul style="list-style-type: none"> ■ Navigation in Dreamweaver. ■ Adding content. ■ Formatting content. ■ Using cascading style sheets. ■ Creating tables.
T12. 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* 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, 6e, contains 20 chapters (organized into five units), 12 business plug-ins, and 12 technology plug-ins offering you the ultimate flexibility in tailoring content to the exact needs of your MIS or IT 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.



LESS MANAGING. MORE TEACHING. GREATER LEARNING.



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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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Instructor library

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
- Animated step-by-step solutions to the Apply Your Knowledge problems, narrated by the author
- Instructor Course Guide—a topical organization of all the instructor content, material and resources available

Student study center

- 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.
- Access an instant view of student or class performance relative to learning objectives.
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Increase the attention paid to lecture discussion by decreasing the attention paid to note taking. For an additional charge Lecture Capture offers new ways for students to focus on the in-class discussion, knowing they can revisit important topics later. Lecture Capture enables you to:

- Record and distribute your lecture with a click of button.
- 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.

McGraw-Hill *Connect Plus MIS*

McGraw-Hill reinvents the textbook learning experience for the modern student with *Connect Plus MIS*. A seamless integration of an eBook and *Connect MIS*, *Connect Plus MIS* provides all of the *Connect MIS* features plus the following:

- An integrated eBook, allowing for anytime, anywhere access to the textbook.
- A powerful search function to pinpoint and connect key concepts in a snap.

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Tegrity Campus: Lectures 24/7



Tegrity Campus is a service that makes class time available 24/7 by automatically capturing every lecture in a searchable format for students to review when they study and complete assignments. With a simple one-click start-and-stop process, you capture all computer screens and corresponding audio. Students can replay any part of any class with easy-to-use browser-based viewing on a PC or Mac.

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You can learn more about Tegrity by watching a 2-minute Flash demo at <http://tegritycampus.mhhe.com>.

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*, 6e, 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 and EZ Test Online, 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.

AACSB Statement

The McGraw-Hill Companies is a proud corporate member of AACSB International. Understanding the importance and value of AACSB accreditation, *Business Driven Technology*, 6e, recognizes the curricula guidelines detailed in the AACSB standards for business accreditation by connecting selected questions in the text and/or the test bank to the six general knowledge and skill guidelines in the AACSB standards.

The statements contained in *Business Driven Technology*, 6e, are provided only as a guide for the users of this textbook. The AACSB leaves content coverage and assessment within the purview of individual schools, the mission of the school, and the faculty. While *Business Driven Technology*, 6e, and the teaching package make no claim of any specific AACSB qualification or evaluation, we have within *Business Driven Technology*, 6e, labeled selected questions according to the six general knowledge and skills areas.

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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
- 20 Chapters
- 12 Business Plug-Ins
- 12 Technology Plug-Ins

UNITS

Unit One: Achieving Business Success

Chapter One: Business Driven Technology
Chapter Two: Identifying Competitive Advantages
Chapter Three: Strategic Initiatives for Implementing Competitive Advantages
Chapter Four: Measuring the Success of Strategic Initiatives
Chapter Five: Organizational Structures That Support Strategic Initiatives

Unit Two: Exploring Business Intelligence

Chapter Six: Valuing Organizational Information
Chapter Seven: Storing Organizational Information—Databases
Chapter Eight: Accessing Organizational Information—Data Warehouse

Unit Three: Streamlining Business Operations

Chapter Nine: Enabling the Organization—Decision Making
Chapter Ten: Extending the Organization—Supply Chain Management
Chapter Eleven: Building a Customer-centric Organization—Customer Relationship Management
Chapter Twelve: Integrating the Organization from End to End—Enterprise Resource Planning

Unit Four: Building Innovation

Chapter Thirteen: Creating Innovative Organizations
Chapter Fourteen: Ebusiness
Chapter Fifteen: Creating Collaborative Partnerships
Chapter Sixteen: Integrating Wireless Technology in Business

Unit Five: Transforming Organizations

Chapter Seventeen: Developing Software to Streamline Operations
Chapter Eighteen: Methodologies for Supporting Agile Organizations
Chapter Nineteen: Managing Organizational Projects
Chapter Twenty: Developing a 21st-Century Organization

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

T1 Personal Productivity Using IT (<i>on OLC</i>)	T8 Decision Making Using Access (<i>on OLC</i>)
T2 Basic Skills Using Excel (<i>on OLC</i>)	T9 Designing Web Pages (<i>on OLC</i>)
T3 Problem Solving Using Excel (<i>on OLC</i>)	T10 Creating Web Pages Using HTML (<i>on OLC</i>)
T4 Decision Making Using Excel (<i>on OLC</i>)	T11 Creating Web Pages Using Dreamweaver (<i>on OLC</i>)
T5 Designing Database Applications (<i>on OLC</i>)	T12 Creating Gantt Charts with Excel and Microsoft Project (<i>on OLC</i>)
T6 Basic Skills Using Access (<i>on OLC</i>)	
T7 Problem Solving Using Access (<i>on OLC</i>)	

Apply Your Knowledge Projects
Glossary
Notes

Illustration Credits
Index

Format, Features, and Highlights

Business Driven Technology, 6e, 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. Consider Apple and its iPod, iPod accessories, and iTunes Music Store. Apple's success depends heavily on information about its customers, suppliers, markets, and operations for each of these product lines. For example, Apple must be able to predict the number of people who will purchase an iPod to help estimate iPod accessory and iTunes sales within the next year. Estimating too many buyers will lead Apple to produce an excess of inventory; estimating too few buyers will potentially mean 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 One**—Business Driven Technology.
- **Chapter Two**—Identifying Competitive Advantages.
- **Chapter Three**—Strategic Initiatives for Implementing Competitive Advantages.
- **Chapter Four**—Measuring the Success of Strategic Initiatives.
- **Chapter Five**—Organizational Structures That Support Strategic Initiatives.

Learning Outcomes and Introduction

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 Four 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 3.1). The chapters in Unit 3 are:

- **Chapter Nine**—Enabling the Organization—Decision Making.
- **Chapter Ten**—Extending the Organization—Supply Chain Management.
- **Chapter Eleven**—Building a Customer-centric Organization—Customer Relationship Management.
- **Chapter Twelve**—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



Apple—Merging Technology, Business, and Entertainment

This might sound hard to believe, but a bit more than a decade ago, Apple was on the brink of bankruptcy. Apple Inc., now back from near oblivion, is blazing a trail through the digital world with innovation and creativity that has been missing from the company for the past 20 years. The unique feature of Apple's competitive advantages is that they come from customers and users, not Apple employees. That's right; the company welcomes products created by consumers to sell to consumers, a trend new to business.

Capitalizing on the iPod

With millions of iPods in the hands of consumers, many people are finding ways to capitalize on the product. John Lin created a prototype of a remote control for the iPod and took his prototype to *Macworld*, where he found success. A few months later, Lin's company had Apple's blessing and a commitment for shelf space in its retail stores. "This is how Apple supports the iPod economy," Lin said.

In the iPod-dominated market, hundreds of companies have been inspired to develop more

OPENING CASE STUDY QUESTIONS

1. Explain how Apple achieved business success through the use of information, information technology, and people.
2. Describe the types of information employees at an Apple store require and compare it to the types of information the executives at Apple's corporate headquarters require. Are there any links between these two types of information?

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

Apply Your Knowledge Project Overview

Project Number	Project Name	Project Type	Plug-In	Focus Area	Project Level	Skill Set	Page Number
1	Financial Destiny	Excel	T2	Personal Budget	Introductory	Formulas	AYK.4
2	Cash Flow	Excel	T2	Cash Flow	Introductory	Formulas	AYK.4
3	Technology Budget	Excel	T1, T2	Hardware and Software	Introductory	Formulas	AYK.4
4	Tracking Donations	Excel	T2	Employee Relationships	Introductory	Formulas	AYK.4
5	Convert Currency	Excel	T2	Global Commerce	Introductory	Formulas	AYK.5
6	Cost Comparison	Excel	T2	Total Cost of Ownership	Introductory	Formulas	AYK.5
7	Time Management	Excel or Project	T12	Project Management	Introductory	Gantt Charts	AYK.6
8	Maximize Profit	Excel	T2, T4	Strategic Analysis	Intermediate	Formulas or Solver	AYK.6
9	Security Analysis	Excel	T3	Filtering Data	Intermediate	Conditional Formatting, Autofilter, Subtotal	AYK.7
10	Gathering Data	Excel	T3	Data Analysis	Intermediate	Conditional Formatting	AYK.8

Chapter One Case: The World Is Flat—Thomas Friedman

In his book *The World Is Flat*, Thomas Friedman describes the unplanned cascade of technological and social shifts that effectively leveled the economic world and “accidentally made Beijing, Bangalore, and Bethesda next-door neighbors.” Chances are good that Bhavya in Bangalore will read your next X-ray, or as Friedman learned firsthand, “Grandma Betty in her bathrobe” will make your JetBlue plane reservation from her Salt Lake City home.

Friedman believes this is Globalization 3.0. “In Globalization 1.0, which began around 1492, the world went from size large to size medium. In Globalization 2.0, the era that introduced us to multinational companies, it went from size medium to size small. And then around 2000 came Globalization 3.0, in which the world went from being small to tiny. There is a difference between being able to make long-distance phone calls cheaper on the Internet and walking around Riyadh with a PDA where you can have all of Google in your pocket. It is a difference in degree that’s so enormous it becomes a difference in kind,” Friedman states. Figure 1.10 displays Friedman’s list of “flatteners.”

FIGURE 1.10
Thomas Friedman’s 10 Forces That Flattened the World

1. Fall of the Berlin Wall	The events of November 9, 1989, tilted the worldwide balance of power toward democracies and free markets.
2. Netscape IPO	The August 9, 1995, offering sparked massive investment in fiber-optic cables.
3. Work flow software	The rise of applications from PayPal to VPNs enabled faster, closer coordination among far-flung employees.
4. Open-sourcing	Self-organizing communities, such as Linux, launched a collaborative revolution.
5. Outsourcing	Migrating business functions to India saved money and a Third World economy.
6. Offshoring	Contract manufacturing elevated China to economic prominence.
7. Supply-chaining	Robust networks of suppliers, retailers, and customers increased business efficiency.
8. In sourcing	Logistics giants took control of customer supply chains, helping mom-and-pop shops go global.
9. Informing	Power searching allowed everyone to use the Internet as a “personal supply chain of knowledge.”
10. Wireless	Wireless technologies pumped up collaboration, making it mobile and personal.

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. Improving Information Quality

HangUps Corporation designs and distributes closet organization structures. The company operates five different systems: order entry, sales, inventory management, shipping, and billing. The company has severe information quality issues including missing, inaccurate, redundant, and incomplete information. The company wants to implement a data warehouse containing information from the five different systems to help maintain a single customer view, drive business decisions, and perform multidimensional analysis. Identify how the organization can improve its information quality when it begins designing and building its data warehouse.

2. Information Timeliness

Information timeliness is a major consideration for all organizations. Organizations need to decide the frequency of backups and the frequency of updates to a data warehouse. In a team, describe the timeliness requirements for backups and updates to a data warehouse for

- Weather tracking systems.
- Car dealership inventories.
- Vehicle tire sales forecasts.
- Interest rates.
- Restaurant inventories.
- Grocery store inventories.

3. Entities and Attributes

Martex Inc. is a manufacturer of athletic equipment and its primary lines of business include running, tennis, golf, swimming, basketball, and aerobics equipment. Martex currently supplies four primary vendors including Sam's Sports, Total Effort, The Underline, and Maximum Workout. Martex wants to build a database to help it organize its products. In a group, identify the different types of entity classes and the related attributes that Martex will want to consider when designing the database.

4. Integrating Information

End-of-Unit Elements

* UNIT CLOSING CASE TWO



Zillow

Zillow.com is an online marketplace for renters, real estate agents, and homebuyers to find and share information.



* MAKING BUSINESS DECISIONS

1. Improving Information Quality

HangUps Corporation designs and distributes closet organization structures. The company operates five different systems: order entry, sales, inventory management, shipping, and billing. The company has severe information quality issues including missing, redundant, and inconsistent data. The company is considering a new software house containing information from multiple sources. The company wants to drive business from a customer view, drive business from a customer view, drive business from its data warehouse.

2. Information Timeliness

Information timeline

* KEY TERMS

Analytical information, 86	Data-mining tools, 107
Attribute, 93	Data visualization, 112
Backward integration, 100	Data visualization tools, 112
Business intelligence dashboard, 112	Data warehouse, 105
Business-critical integrity constraint, 97	Dynamic catalog, 98
Business rule, 97	Dynamic information, 98
Content creator, 98	Entity, 93
Cube, 106	Extraction, transformation, and loading (ETL), 105
Content editor, 98	Foreign key, 94
Database, 92	Forward integration, 100
Database management system (DBMS), 92	Informing, 111
	Information cleansing or scrubbing, 108

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.
- **Critical Business Thinking.** Small scenario-driven projects that help students focus individually on decision making as they relate to the topical elements in the chapters.
- **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.
- **Entrepreneurial Challenge:** This section offers an exciting running case that tasks the students with applying the MIS concepts to their own start-up business.

About the Plug-Ins

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.

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.

LO 1. Define the three common business forms.

Introduction

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

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 2010

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 results of calculations on data, and choose exactly which fields are shown. You can view the results of a query in a tabular format, or you can view the query's data through a form or on a report (which is covered in Plug-In T8, "Decision Making Using Access 2010"). In this plug-in, you will learn how to use the Query Wizard and Query-By-Example (QBE) tool to solve problems using

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.
- **Two Closing Case Studies.** Reinforcing important concepts with prominent examples from businesses and organizations. Discussion questions follow each case study.
- **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 business 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 (HR)** includes the policies, plans, and procedures for the effective management of employees (human resources).
- **Sales** is the function of selling a good or service and focuses on increasing customer sales, which in
- **Marketing** is the function of identifying, selecting, and promoting the goods and services that the company offers to its target market.
- **Operational process** is the function of producing goods and services.
- **Management** is the function of planning, organizing, leading, and controlling the organization's resources to achieve its purpose.

*** KEY TERMS**

Accounting, 325	report, operating statement, and profit-and-loss (P&L) statement), 326	Operations management (also called production management), 334
Accounting department, 325	Liability, 326	Owner's equity, 326
Asset, 326	Limited liability, 323	Partnership, 323
Bookkeeping, 325	Limited liability corporation (LLC), 324	Partnership agreement, 323
Break-even point, 328	Limited liability corporation (LLC), 324	Product life cycle, 333
Business process, XXX	Loss, 326	
Capital, 323	Management, 323	
Corporation (also called, organization, enterprise, or business), 323	Marketing, 323	
Dividend, 327	Marketing, 323	
Expense, 326	Marketing, 323	
Finance, 327	Marketing, 323	

*** CLOSING CASE ONE**

Battle of the Toys—FAO Schwarz Is Back!

German immigrant Frederick Schwarz established FAO Schwarz, a premier seller of fine toys, in 1862. After moving between several store locations in Manhattan, the growing company settled at 745 Fifth Avenue in 1931. FAO Schwarz soon became a toy institution, despite the impending Depression.

Unfortunately, the New York institution closed its doors in 2004 after its owner, FAO Inc., filed for bankruptcy twice in 2003. The company ran into trouble because it could not compete with the deep discounts offered on toys at chain stores like Walmart and Target. All the stores in the FAO chain were closed.

Some people believe that FAO Schwarz was its own worst enemy. The company sold Sesame Street figures for \$9 while the same figure at a discount store went for less than \$3.

In 2004, the New York investment firm D. E. Shaw & Co. bought the rights to the FAO Schwarz name and reopened the Manhattan and Las Vegas stores. The grand reopening of the New York store occurred on November 25, 2004, during the Macy's Thanksgiving Day parade. It appears that the company has learned from its previous mistakes and is moving forward with a new business strategy of offering high-end, hard-to-find toys and products along with outstanding customer service.

Jerry Welch, FAO chief executive officer, states the company based its new business strategy on offering customers—local, visitors, and Internet—a unique shopping experience in which they can spend thousands of dollars or just twenty, but still purchase an exclusive item.

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.

Online Learning Center (www.mhhe.com/baltzan) The McGraw-Hill website for *Business Driven Technology* includes support for students and faculty. All supplements will be available exclusively on the OLC. This will allow the author to continually update and add to the instructor support materials. The following materials will be available on the OLC:

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 students 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.

■ **Sample Syllabi.** Several syllabi have been developed according to different course lengths—quarters and semesters, as well as different course concentrations such as a business emphasis or a technology focus.

■ **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.

■ **Image Library.** Text figures and tables, as permission allows, are provided in a format by which they can be imported into PowerPoint for class lectures.

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

■ **Cohesion Case.** 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

Supplements:

- Business Driven Teaching Notes
- Online Learning Center
- Instructor's Manual
- PowerPoint Presentations.
- Sample Syllabi
- Classroom Exercises
- Image Library
- Project Files
- Internet Links
- Captivate Files
- Cohesion 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. The case can be found at www.cohesioncase.com.

- **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.

UNIT ONE OPENING CASE



Apple—Merging Technology, Business, and Entertainment

This might sound hard to believe, but a bit more than a decade ago, Apple was on the brink of bankruptcy. Apple Inc., now back from near oblivion, is blazing a trail through the digital world with innovation and creativity that has been missing from the company for the past 20 years. The unique feature of Apple's competitive advantages is that they come from customers and users, not Apple employees. That's right; the company welcomes products created by consumers to sell to consumers, a trend new to business.

Capitalizing on the iPod

With millions of iPods in the hands of consumers, many people are finding ways to capitalize on the product. John Lin created a prototype of a remote control for the iPod and took his prototype to *Macworld*, where he found success. A few months later, Lin's company had Apple's blessing and a commitment for shelf space in its retail stores. "This is how Apple supports the iPod economy," Lin said.

In the iPod-dominated market, hundreds of companies have been inspired to develop more than 500 accessories—everything from rechargers for the car to \$1,500 Fendi bags. Eric Tong, vice president at Belkin, a cable and peripheral manufacturer, believes that 75 percent of all iPod owners purchase at least one accessory—selling over 30 million accessories to date. With most of the products priced between \$10 and \$200, that puts the iPod economy well over \$300 million and perhaps as high as \$6 billion. Popular iPod accessories include:

- Altec Lansing Technologies—iPod speakers and recharger dock (\$150).
- Belkin—TuneCast mobile FM transmitter (\$40).
- Etymotic Research—high-end earphones (\$150).
- Griffin Technology—iTrip FM transmitter (\$35).



- Kate Spade—Geneva faux-croc mini iPod holder (\$55).
- Apple—socks set in six colors: green, purple, blue, orange, pink, and gray (\$29).
- Apple—digital camera connector (\$29).

Capitalizing on the iPhone

Looking at someone using an iPhone is an interesting experience because there is a good chance they are not making a phone call. They could be doing a number of things from playing a game to trading stocks, watching a TV show, or even conducting business with a mobile version of salesforce.com's customer-management software. In a brilliant strategic move, Apple let outsiders offer software for the iPhone and in less than six months, more than 10,000 applications had been created. In fact, more than 15,000 applications are available at its app store section of iTunes, and they have been downloaded a total of 500 million times. Now, many of the iPhone apps are available for the iPad.

The iPhone and iPad app store market is getting so huge relative to other smart-phone markets that some developers argue there is little point adapting applications for Google's Android or any other iPhone competitor. According to Jeff Holden, CEO of Pelago Inc., when he created his social networking company he fully intended to follow the conventional wisdom for how to build a sizable, fast-growing software company: Get your programs on as many platforms and devices as possible. But when he crunched the numbers he came to an interesting business conclusion: The 13 million iPhone owners had already downloaded more applications than the 1.1 billion other cell phone owners! To entrepreneurs, developing a program for the iPhone automatically provides a significantly larger market—almost 94 times larger than its competitors. "Why would I ever build for anything but the iPhone?" Holden asked.

Capitalizing on the iPad

Apple's latest release, the iPad, is a lightweight, portable, tablet computer, similar to the iPhone, that allows customers to download applications, check email, and play music all at the touch of a button. Both the iPhone and the iPad can multitask, allowing customers to read a web page while downloading email in the background over wireless networks. The arrival of the iPad brought a simultaneous expansion of the network of accessories. Because the iPad was designed with an exposed screen and without a camera, separate keyboard, memory card slots, or expansion ports, one might say it was specifically built for accessories. Many owners will modify it in some way, whether for mere decoration or hard-core protection. A few of the new accessories include:

- iPad Clear Armor screen protector—\$35.
- iPad Antique book case cover—\$40.
- iPad wireless keyboard—\$99.

- iPad overcoat sleeve—\$35.
- iPad Joule luxury stand—\$130.

Apple has consistently outperformed its key rivals through the development of its MP3 player, the iPod, and continues to make its products smaller and less expensive, while providing complementary features such as games and applications. For the iPhone, Apple developed a unique application called Siri, a voice-activation system that is capable of recognizing voice commands. Siri can perform all kinds of functions from dialing a contact and creating an email to location services such as “Find my Phone,” ensuring lost phones are found quickly.

Apple’s latest offering is a new service called the iCloud. The iCloud has the ability to collect all of the content, including videos, photos, songs, books, etc., from customer devices such as iPods, iPads, and iPhones in one secure location in “the cloud.” Apple customers no longer have to worry about backing up their applications or data because everything is automatically uploaded and stored in the iCloud when using an Apple device. In a fast-paced, technology-driven sector, with competitors quickly following suit, Apple is constantly pressured to develop new products and product extensions. Luckily Apple stays ahead of the pack by focusing on the following key competitive advantages:

- **Customer focus:** Apple is driven by customer satisfaction and ensures customers are deeply involved in product development and application development.
- **Resources and capabilities:** Apple continues to invest heavily in research and development to take advantage of new technologies, improved facilities, and cloud infrastructures.
- **Strategic vision:** Apple has a clear alignment of its vision, mission, and business leadership and goals.
- **Branding:** Apple is the leader in brand loyalty as it has achieved cult status with its authentic product image.
- **Quality focus:** Apple has an outstanding commitment to quality.¹



Introduction

Information is everywhere. Most organizations value information as a strategic asset. Consider Apple and its iPod, iPod accessories, and iTunes Music Store. Apple's success depends heavily on information about its customers, suppliers, markets, and operations for each of these product lines. For example, Apple must be able to predict the number of people who will purchase an iPod to help estimate iPod accessory and iTunes sales within the next year. Estimating too many buyers will lead Apple to produce an excess of inventory; estimating too few buyers will potentially mean lost sales due to lack of product (resulting in even more lost revenues).

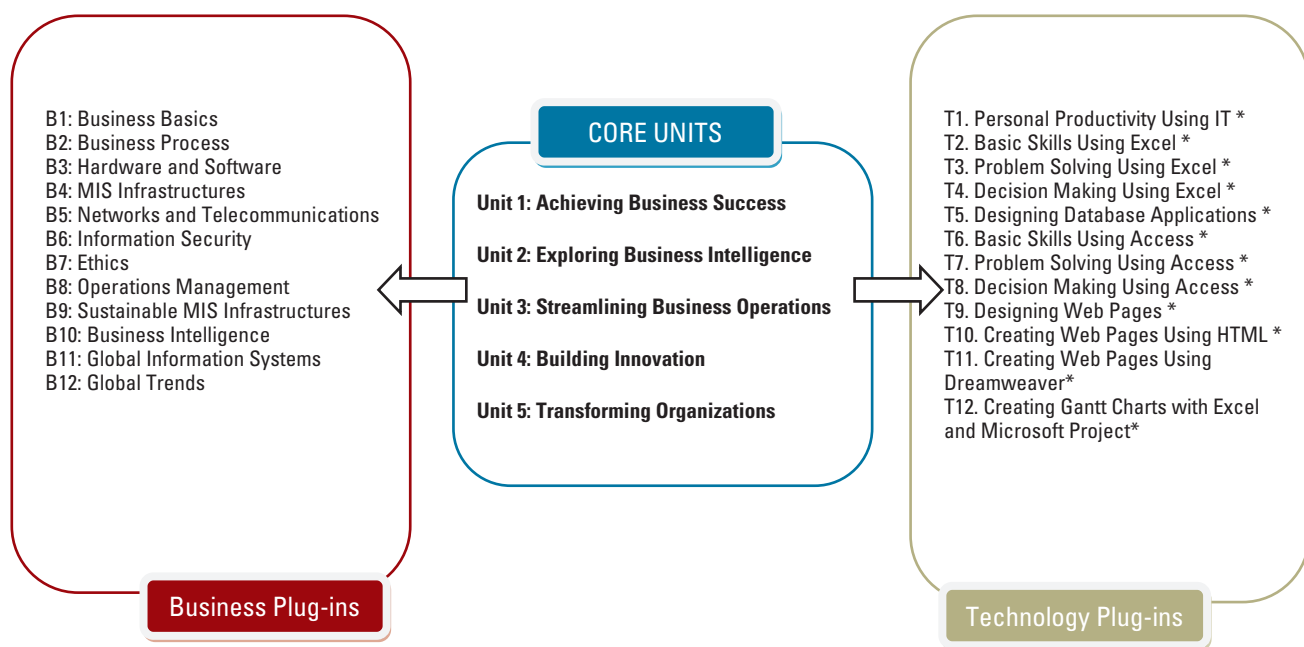
Understanding the direct impact information has on an organization's bottom line is crucial to running a successful business. This text focuses on information, business, technology, and the integrated set of activities used to run most organizations. Many of these activities are the hallmarks of business 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 One**—Business Driven Technology.
- **Chapter Two**—Identifying Competitive Advantages.
- **Chapter Three**—Strategic Initiatives for Implementing Competitive Advantages.
- **Chapter Four**—Measuring the Success of Strategic Initiatives.
- **Chapter Five**—Organizational Structures That Support Strategic Initiatives.

FIGURE UNIT 1.1

The Format and Approach of This Text



* Plug-In is Located on www.mhhe.com/baltzan

LEARNING OUTCOMES

- 1.1. Describe the information age and the differences among data, information, business intelligence, and knowledge.
- 1.2. Identify the different departments in a company and why they must work together to achieve success.
- 1.3. 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.
- 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

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

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. 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.

Students who understand business along with the power associated with the information age will create their own opportunities and perhaps even new industries, as co-founders Chris DeWolfe and Tom Anderson did with Myspace and Mark Zuckerberg did with Facebook. 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 are:

- 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. 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.

FIGURE 1.1

The Differences among Data, Information, Business Intelligence, and Knowledge

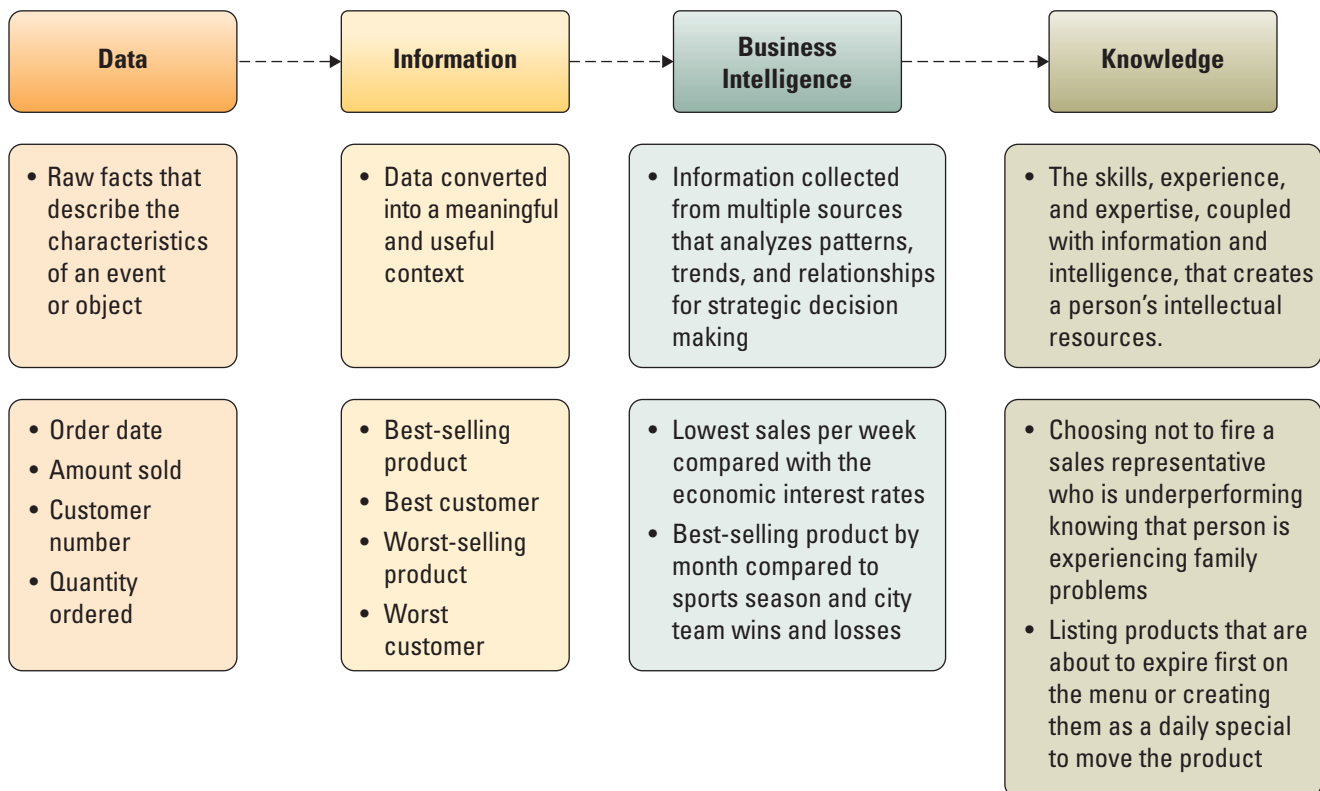


Figure 1.2 shows sales data for Tony’s Wholesale Company, a fictitious business that supplies snacks to stores. The data highlight characteristics such as order date, customer, sales representative, product, quantity, and profit. The second line in Figure 1.2, for instance, shows that Roberta Cross sold 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*.

INFORMATION

Information is data converted into a meaningful and useful context. Having the right information at the right moment in time can be worth a fortune. Having the wrong information at the right moment; or the right information at the wrong moment can be disastrous. The truth about information is that its value is only as good as the people who use it. People using the same information can make different decisions depending on how they interpret or analyze the information. Thus information has value only insofar as the people using it do as well.

Tony can analyze his sales data and turn them into information to answer all the above questions and understand how his business is operating. Figures 1.3 and 1.4, for instance, show us that Walmart is Roberta Cross’s best customer, and that Ruffles is Tony’s best product measured in terms of total sales. Armed with this information, Tony can identify and then address such issues as weak products and underperforming sales representatives.

A **variable** is a data characteristic that stands for a value that changes or varies over time. For example, in Tony’s data, price and quantity ordered can vary. Changing variables allows managers to create hypothetical scenarios to study future possibilities.

Order Date	Customer	Sales Representative	Product	Qty	Unit Price	Total Sales	Unit Cost	Total Cost	Profit
4-Jan	Walmart	PJ Helgoth	Doritos	41	\$24	\$ 984	\$18	\$738	\$246
4-Jan	Walmart	Roberta Cross	Ruffles	90	\$15	\$1,350	\$10	\$900	\$450
5-Jan	Safeway	Craig Schultz	Ruffles	27	\$15	\$ 405	\$10	\$270	\$135
6-Jan	Walmart	Roberta Cross	Ruffles	67	\$15	\$1,005	\$10	\$670	\$335
7-Jan	7-Eleven	Craig Schultz	Pringles	79	\$12	\$ 948	\$ 6	\$474	\$474
7-Jan	Walmart	Roberta Cross	Ruffles	52	\$15	\$ 780	\$10	\$520	\$260
8-Jan	Kroger	Craig Schultz	Ruffles	39	\$15	\$ 585	\$10	\$390	\$195
9-Jan	Walmart	Craig Schultz	Ruffles	66	\$15	\$ 990	\$10	\$660	\$330
10-Jan	Target	Craig Schultz	Ruffles	40	\$15	\$ 600	\$10	\$400	\$200
11-Jan	Walmart	Craig Schultz	Ruffles	71	\$15	\$1,065	\$10	\$710	\$355

FIGURE 1.2
Tony’s Snack Company
Data