

EFRAIM TURBAN

CAROL POLLARD

GREGORY WOOD

INFORMATION TECHNOLOGY FOR MANAGEMENT

On-Demand Strategies for Performance, Growth and Sustainability

11th Edition

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Information Technology for Management

On-Demand Strategies for Performance,
Growth and Sustainability

Eleventh Edition

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Growth and Sustainability

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EFRAIM TURBAN

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Information Technology for Management discusses a variety of business strategies and explains how they rely on data, digital technology, and mobile devices to support them in the on-demand economy. Our goal is to provide students from any business discipline with a strong foundation for understanding the critical role that digital technology plays in enhancing business sustainability, profitability, and growth and excel in their careers. Enabling technologies discussed in this textbook include the following:

- **Performance** Combining the latest capabilities in big data analytics, reporting, collaboration, search, and digital communication helps enterprises be more agile and cuts costs to optimize business performance and profitability.
- **Growth** Strategic technologies enable business to create new core competencies, expand their markets, and move into new markets to experience exponential growth in the on-demand economy.
- **Sustainability** Cloud services are fundamental to sustaining business profitability and growth in today's on-demand economy. They play a critical role in managing projects and sourcing agreements, respecting personal privacy, encouraging social responsibility, and attracting and engaging customers across multimedia channels to promote sustainable business performance and growth.

In this 11th edition, students learn, explore, and understand the importance of IT's role in supporting the three essential components of business performance improvement: *technology*, *business processes*, and *people*.

What's New in the 11th Edition?

In the 11th edition of *IT for Management*, we present and discuss concepts in a comprehensive yet easy-to-understand format by actively engaging students through a wide selection of case studies, interactive figures, video animations, tech notes, concept check questions, online and interactive exercises, and critical thinking questions. We have enhanced the 11th edition in the following ways:

New Author Dr. Carol Pollard, Professor of Computer Information Systems at the Walker College of Business and former Executive Director of the Center for Applied Research in Emerging Technologies (CARET) at Appalachian State University in North Carolina, has taken the helm for the 11th edition. Carol

has applied her innovative teaching and learning techniques to create a stronger pedagogical focus and more engaging format for the text.

Diverse Audience *IT for Management* is directed toward undergraduate, introductory MBA courses, and Executive Education courses in Management Information Systems and General Business programs. Concepts are explained in a straightforward way, and interactive elements, tools, and techniques provide tangible resources that appeal to all levels of students.

Strong Pedagogical Approach To encourage improved learning outcomes, we employed a blended learning approach, in which different types of delivery and learning methods, enabled and supported by technology, are blended with traditional learning methods. For example, case study and theoretical content are presented visually, textually, and/or interactively to enable different groups of students to use different learning strategies in different combinations to fit their individual learning style and enhance their learning. Throughout the book, content has been reorganized to improve development of the topics and improve understanding and readability. A large number of images that did not enhance understanding have been removed and replaced with informative and interactive figures and tables that better convey critical concepts.

Leading-Edge Content Prior to and during the writing process, we consulted with a number of vendors, IT professionals, and managers who are hands-on users of leading technologies, to learn about their IT/business successes, challenges, experiences, and recommendations. To integrate the feedback of these business and IT professionals, new or updated chapter opening and closing cases have been added to many of the chapters along with the addition of relevant, leading-edge content in the body of the chapters.

New Technologies and Expanded Topics New to this edition are the IT framework, business process reengineering, geocoding, systems developments methodologies, including Waterfall, object-oriented analysis, Agile and DevOps, advances in Search Technology, the growth of Mobile Commerce and Mobile Payment Systems, the Always-On Supply Chain, and the Project Management framework. In addition, with more purchases and transactions starting online and attention being a scarce resource, students learn how search, semantic, and recommendation technologies function to improve revenue. **Table P-1** provides a detailed list of new and expanded topics.

Useful Tools and Techniques New to this edition is a feature we call the "IT Toolbox." This involves the provision of a set of useful tools or techniques relevant to chapter content. Collectively, these tools and techniques equip readers with a suite of IT tools that will be useful in their university classes, workplace, and personal life.

Engaging Students to Assure Learning

The 11th edition of *Information Technology for Management* engages students with up-to-date coverage of the most important IT trends today. Over the years, this IT textbook has distinguished itself with an emphasis on illustrating the use of cutting-edge business technologies for supporting and achieving managerial goals and objectives. The 11th edition continues this tradition with more interactive activities and analyses.

Real-World Case Studies Each chapter contains numerous real-world examples illustrating how businesses use IT to increase productivity, improve efficiency, enhance communication and collaboration, and gain a competitive edge. Faculty will appreciate a variety of options for reinforcing student learning that include three different types of **Case Studies** (opening case, video case, and business case), along with interactive figures and whiteboard animations that provide a multimedia overview of each chapter.

Interactive Figures and Whiteboard Animations The unique presentation of interactive figures and whiteboard animations facilitates reflection on the textual content of the book and provides a clear path to understanding key concepts. The whiteboard animations fit particularly well with the “flipping the classroom” model and complement additional functionality and assets offered throughout the 11th edition. The interactive figures actively engage the students in their own learning to effectively reinforce concepts.

Learning Aids Each chapter contains various learning aids, which include the following:

- **Learning Objectives** are listed at the beginning of each chapter to help students focus their efforts and alert them to the important concepts that will be discussed.

- **IT at Work** boxes spotlight real-world cases and innovative uses of IT.
- Definitions of **Key Terms** appear in the margins throughout the book.
- **Tech Note** boxes explore topics such as “Key Performance Indicators” and “Six Basic Systems Development Guidelines.”
- **Career Insight** boxes highlight different jobs in the IT for management field.

End-of-Chapter Activities At the end of each chapter, features designed to assure student learning include the following:

- **Critical Thinking Questions** are designed to facilitate student discussion.
- **Online and Interactive Exercises** encourage students to explore additional topics.
- **Analyze and Decide** questions help students apply IT concepts to business decisions.
- **Concept Questions** test students’ comprehension of each learning objective at the end of each chapter to ensure that the students are clear on the concepts. Students are provided with immediate feedback on their performance.

Details of New and Enhanced Features of the 11th Edition

The textbook consists of 14 chapters organized into four modules. All chapters have new or updated sections, as shown in Table P-1.

TABLE P-1 Overview of New and Expanded Topics and Innovative Enterprises Discussed in the Chapters

Chapter	New and Expanded IT and Business Topics	Innovative Enterprises
1. Disruptive IT Impacts Companies, Competition, and Careers	<ul style="list-style-type: none"> • IT’s role in the on-demand economy • Business process improvement • Business process re-engineering • SMAC model • Nature of on-demand work • Becoming an informed IT user • Technology mega trends 	<ul style="list-style-type: none"> • Uber • Airbnb • FitBit • NFL • Teradata
2. Information Systems, IT Architecture, Data Governance, and Cloud Computing	<ul style="list-style-type: none"> • IS concepts and framework • Information, knowledge, wisdom model • Software-defined data center 	<ul style="list-style-type: none"> • Mediatra • National Climatic Data center • U.S. National Security Agency • Apple • Uber • WhatsApp • Slack • Vanderbilt University Medical Center • Coca-Cola

TABLE P-1 Overview of New and Expanded Topics and Innovative Enterprises Discussed in the Chapters *(continued)*

Chapter	New and Expanded IT and Business Topics	Innovative Enterprises
3. Data Management, Data Analytics, and Business Intelligence	<ul style="list-style-type: none"> • Dirty data costs and consequences • Data life cycle • Genomics and big data • Aligning business intelligence with business strategy 	<ul style="list-style-type: none"> • Coca-Cola • Capitol One • Travelocity • First Wind • Argo Corporation • Walmart • Infinity Insurance • DoD and Homeland Security • CarMax • McDonald's • Verizon
4. Networks, Collaborative Technology, and the Internet of Things	<ul style="list-style-type: none"> • IPv6 protocol • Types of networks • Network terminology • Quality of service • Net neutrality • Mobile networks and near-field communication • Internet of Things 	<ul style="list-style-type: none"> • Sony • AT & T • Time-Warner • Amazon • Warner Music • Proctor & Gamble • Walmart • Ford • Asda • Unilever • Caterpillar • Santander • Google • Isle of Man
5. Cybersecurity and Risk Management Technology	<ul style="list-style-type: none"> • Data breaches • Major sources of cyberthreats • Classes of hackers • Spear phishing • Crimeware categories • Denial of service • KPMG data loss barometer • Enterprise risk management framework 	<ul style="list-style-type: none"> • Yahoo • Global Payments, Inc. • Government of China • Google • U.S. Chamber of Commerce • Brookings Institution • LinkedIn • Damballa
6. Search, Semantic, and Recommendation Technology	<ul style="list-style-type: none"> • Social search technologies • Personal assistant and voice search • Mobile search and mobile SEO • On-page and off-page SEO factors • Updates to Google's ranking algorithm • Semantic search technologies 	<ul style="list-style-type: none"> • Mint.com • Google • Microsoft • Yahoo • Netflix • Apple • Amazon • Diigo • World Wide Web Consortium (W3C)

(continued)

TABLE P-1 Overview of New and Expanded Topics and Innovative Enterprises Discussed in the Chapters (continued)

Chapter	New and Expanded IT and Business Topics	Innovative Enterprises
7. Web 2.0 and Social Technology	<ul style="list-style-type: none"> • Snapchat, the #2 social platform • Social bookmarking • Social customer service moves from optional to essential • Role of APIs in development of new Web applications and functionality • The dominance of Facebook and the demise of Google+ • Emerging virtual-world technology 	<ul style="list-style-type: none"> • KLM Royal Dutch Airlines • Facebook, Inc. • Myntra • Snap, Inc. • Kickstarter.com • GoFundMe.com • Oculus VR • High Fidelity • Twitter • Social Mention • Diigo • Clipix • Dropbox
8. Retail, E-commerce, and Mobile Commerce Technology	<ul style="list-style-type: none"> • Direct and marketplace B2B ecommerce • In-store retail technology • Omni-channel retailing • Growth of mobile commerce • Growth of the mobile gaming market • Mobile payment methods • Mobile visual search 	<ul style="list-style-type: none"> • Macys Department Stores • Amazon.com • Ally Bank • LinkedIn.com • Alibaba.com • Dell, Inc. • The Walt Disney Company • PayPal, Inc. • Chegg.com
9. Functional Business Systems	<ul style="list-style-type: none"> • Business management systems • Cross-functional coordination and integration of systems • Systems that support supply-chain management • Social customer service • eXtensible Business Reporting Language (XBRL) 	<ul style="list-style-type: none"> • Ducati Motor Holding S.p.A. • Office Depot • Schurman Fine Papers • BAE Systems • Adweek • Salesforce.com • LinkedIn • HSBC Bank • United Rentals
10. Enterprise Systems	<ul style="list-style-type: none"> • 3D printing impact on supply chain • Selecting an ERP vendor • Factors for ERP success • Order fulfillment • Always-on supply chain • Enterprise social platforms 	<ul style="list-style-type: none"> • Organovo • Ferrari • GE • Siemens • Organic Valley Family of Farms • Boers & Co. • Peters Ice Cream • ScanSource • Avande • Dillard's • FoxMeyer Drugs • Joint Munitions Command • Flower.com • Red Robin • Lowe's • Procter & Gamble

TABLE P-1 Overview of New and Expanded Topics and Innovative Enterprises Discussed in the Chapters *(continued)*

Chapter	New and Expanded IT and Business Topics	Innovative Enterprises
11. Data Visualization and Geographic Information Systems	<ul style="list-style-type: none"> Increasing reliance on data discovery Data visualization tools Enterprise data mashups Geocoding 	<ul style="list-style-type: none"> Safeway PepsiCo IBM ADP Corp. Department of Veterans Affairs General Motors
12. IT Strategy, Sourcing, and Strategic Technology Trends	<ul style="list-style-type: none"> Business–IT alignment IT strategic planning Porter’s competitive forces model Porter’s value chain model Five-phase outsourcing life cycle IT sourcing strategies Strategic technology trends Technology scanning 	<ul style="list-style-type: none"> Intel Nestle Nespresso LinkedIn ESSA Academy Cisco Citigroup
13. Systems Development and Project Management	<ul style="list-style-type: none"> SDLC stages Systems development methodologies DevOps Project management framework PM core and support knowledge areas Responsibility matrix 	<ul style="list-style-type: none"> Denver International Airport U.S. Census Bureau Apple Mavenlink
14. IT Ethics, Privacy, and Sustainability	<ul style="list-style-type: none"> Ethical vs. unethical behavior Privacy paradox Climate change Technology addiction “People-first” approach to technology Disruptive technologies 	<ul style="list-style-type: none"> Google Target Facebook SnapChat NASA Apple

Supplemental Materials

An extensive package of instructional materials is available to support this 11th edition. These materials are accessible from the book companion website at www.wiley.com/college/turban.

- Instructor’s Manual** The Instructor’s Manual presents objectives from the text with additional information to make them more appropriate and useful for the instructor. The manual also includes practical applications of concepts, case-study elaboration, answers to end-of-chapter questions, questions for review, questions for discussion, and Internet exercises.
- Test Bank** The test bank contains over 1,000 questions and problems (about 75 per chapter) consisting of multiple-choice, short answer, fill-ins, and critical thinking/essay questions.
- PowerPoint Presentation** A series of slides designed around the content of the text incorporates key points from the text and illustrations where appropriate.
- Chapter Summary Whiteboard Animations** A series of video animations that summarize the content of each chapter in an entertaining way to engage the students in grasping the subject matter.

Acknowledgments

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Finally, we dedicate the 11th edition of *Information Technology for Management* to the Memory of Dr. Linda Volonino, the driving force behind editions 7 through 10 of *IT for Management*. Thank you Linda, for all your hard work in providing the foundation for this latest edition of the textbook.

**CAROL POLLARD
 GREGORY WOOD**

Disruptive IT Impacts Companies, Competition, and Careers

CHAPTER OUTLINE

LEARNING OBJECTIVES

Case 1.1 Opening Case: Uber, Airbnb, and the On-Demand Economy

1.1 Doing Business in the On-Demand Economy

1.1 Describe how the on-demand economy is changing the way that business is conducted.

1.2 Business Process Improvement and Competitive Advantage

1.2 Explain the role of IT in business process improvement. Understand the concepts of business process reengineering and competitive advantage.

1.3 IT Innovation and Disruption

1.3 Describe innovating technologies and explain how they are disrupting enterprises.

1.4 IT and You

1.4 Understand the value of being an “informed user” of IT and the ways in which IT can add value to your career path and performance in the on-demand economy.

Case 1.2 Business Case: The Internet of Things Comes to the NFL

Case 1.3 Video Case: What Is the Value of Knowing More and Doing More?

Introduction

The more digital technology advances, the more it is almost instantly integrated into our daily lives. Many managers and entrepreneurs recognize the need to integrate digital technology into their products and services. For example, it has been estimated that 78% of business

leaders expect their organizations to be a digital business by 2020. Outdated and complex application architectures with a mix of interfaces can delay or prevent the release of new products and services, and maintaining these obsolete systems absorbs large portions of the information technology (IT) budget.

Companies such as Uber, Airbnb, Shyp, TaskRabbit, and other participants in the on-demand economy are leveraging IT to create exciting new business models and revolutionize the way workers, businesses, and customers interact and compete. Peter Hinssen, a well-known business author, university lecturer, and digital consultant, described the change in digital technology as follows:

Technology used to be nice. It used to be about making things a little bit better, a little bit more efficient. But, technology stopped being nice: it's disruptive. It's changing our business models, our consumer markets, our organizations. (Maclver, 2015)

As businesses continue to join the on-demand economy, IT professionals must constantly scan for innovative new technologies to provide business value and help shape the future of the business. For example, smart devices, mobile apps, sensors, and technology platforms—along with increased customer demand for digital interactions and on-demand services—have moved commerce in fresh new directions. We've all heard the phrase “there's an app for that” and that kind of consumer thinking is what drives the on-demand economy.

Business leaders today need to know what steps to take to get the most out of mobile, social, cloud, big data, analytics, visualization technologies, and the Internet of Things (IoT) to move their business forward and enable new on-demand business models. Faced with opportunities and challenges, managers need to know how to leverage IT earlier and more efficiently than their competitors.

A goal of this book is to empower you to improve your use and management of IT at work by raising your understanding of IT terminology, practices, and tools and developing your IT skills to transform you into an informed IT user. Throughout this book, you will learn how digital technology is transforming business and society in the on-demand economy as the IT function takes on key strategic and operational roles that determine an enterprise's success or failure. You will also be provided with an in-depth look at IT trends that have immediate and future capacity to influence products, services competition, and business relationships. Along the way, we'll describe many different ways in which IT is being used and can be used in business and provide you with the some of the terminology, techniques and tools that enable organizations to leverage IT to improve growth, performance, and sustainability.

In this opening chapter, you will learn about the powerful impacts of digital technology on people, business, government, entertainment, and society that are occurring in today's on-demand economy. You will also discover how leading companies are deploying digital technology and changing their business models, business processes, customer experiences, and ways of working. We will present examples of innovative products, services, and distribution channels to help you understand the digital revolution that is currently shaping the future of business, the economy and society and changing management careers. And, we'll explain why IT is important to you and how becoming an “informed user” of IT will add significant value to your career and overall quality of life.

Case 1.1 Opening Case



NICOLAS MAETERLINCK / Stringer / Getty Images

THE ON-DEMAND BUSINESS FRAMEWORK



Uber and Airbnb Revolutionize Business Models in the On-Demand Economy

If you've used Uber or Airbnb, then you have participated in the on-demand economy where speed, convenience, and simplicity are key factors in consumer behavior and purchasing decisions. Michael Boland, author of *What's Driving the Local On-Demand Economy*, explains that as consumers, "We're being conditioned to expect everything on-demand as the mobile device increasingly becomes the *remote control for the physical world*" (Boland, 2015). For example, the majority of consumers who tap an Uber app to get a ride would not consider dialing an 800 number for a taxi. With all transactions performed by apps and automated processes, the entire process from hailing to paying for a ride is slick, quick, and easy, without cash or credit cards.

Tech Platforms Enabled On-Demand Services to Take Off

Decades of technological innovation have given us smartphone apps, mobile payment platforms, GPS and map technology, and social authentication. These technologies are being used to build the infrastructure needed for **on-demand services**. This infrastructure—also referred to as a **technology platform** or **technology stack**—supports the exchange and coordination of staggering amounts of data. The term technology stack reflects the fact that the platform is made up of multiple layers (stacks) of hardware, software, network connectivity, and **data analytics** capabilities.

In many consumer markets today, companies that do not have iPhone or Android apps or technology platforms that support the exchange of goods and services—no matter how useful their website—may find themselves losing their competitive edge.

On-Demand Economy Requires a New Business Model

Uber and Airbnb are popular examples of companies that developed on-demand business models to transform slow-to-innovate industries. A simple definition of **business model** is the way a company generates revenue and makes a profit. On-demand business models provide real-time fulfillment of goods and services, which have attracted millions of users worldwide. This model fits best when speed and convenience matter the most. The ground transportation, grocery, and restaurant industries are examples of hyper-growth

categories in the on-demand world. Forward-thinking companies are reshaping these industries.

Uber Business Model

Uber disrupted the taxi industry with a workforce that is essentially any person with a smartphone and a car. Location-aware smartphone apps bring drivers and passengers together, while in-app accounts make the cashless payment process effortless. By simply opening the Uber app and pressing the middle button for several seconds (a long press), customers can order a ride to their current location, selecting the kind of car they want. Payment is automatically charged to the credit card on file with receipts via email.

The Uber concept developed in response to taxi scarcities. It started on a snowy Paris night in 2008 when the two founders could not get a cab. They wanted a dead-simple app that could get them a car with a tap. On June 1, 2015, the entrepreneurs celebrated Uber fifth anniversary and announced that the company had grown into a transportation network covering 311 cities in 58 countries in North and South Americas, Europe, Africa, Asia Pacific, and the Middle East.

Uber has invested in new and developing technologies and partnerships. The company partnered with Carnegie Mellon University to build robotic cars and new mapping software. In March 2015, Uber purchased deCarta, a 40-person mapping start-up to reduce its dependence on Google maps.

Airbnb Business Model

Another disruption to a traditional industry occurred when Airbnb blindsided the hotel industry. Airbnb allows anyone with a spare apartment or room—even if only for a day—to run their own bed and breakfast by giving them a technology platform to market themselves to a global market. By 2016, the Airbnb site had over 1.5 million listings in 190 countries and 34,000 cities. Over 40 million guests have used Airbnb worldwide. For comparison, Hilton, InterContinental, and Marriott, the largest hotel chains in the world, have less than 1 million rooms each.

Uber and Airbnb do not own inventory. Instead, they scale up (expand) by improving their ability to acquire and match customers and service providers.

Business Success in Terms of Company Growth and Valuation

The ride-hailing app Uber and the housing rental app Airbnb are two of the most valuable start-ups, as displayed in **Figure 1.1**. Valuation of a company at its early stages is based heavily on its growth potential and future value. In contrast, the valuation of an established company is based on its present value, which is calculated using traditional financial ratios and techniques related to revenues or other assets.

Uber's massive market value—estimated at \$60 billion—is greater than 80% of all Standard & Poor (S&P) 500 companies, many of which have been around for 25, 50, or 100 years. Investors valued Airbnb at \$24 billion—higher than the value of the hotel giant Marriott

International. These companies would never have been able to grow in the old way as a traditional organization, with their own inventory of products, services, and workforce and traditional forms of technology.

Questions

1. In what ways are the Uber and Airbnb business similar or different?
2. How did Uber achieve its new business model?
3. To what extent do you think changing their business models contributed to the success of Uber and Airbnb?

Sources: Compiled from Primack (2015), Storbaek (2015), Winkler and MacMillan (2015), Jaconi (2014), *Uber.com* (2017), *Airbnb.com* (2017).

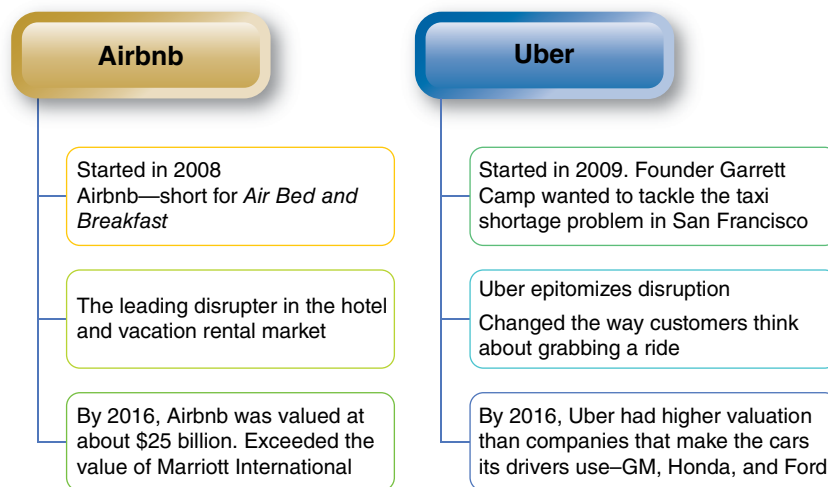


FIGURE 1.1 On-demand business models of Airbnb and Uber have been extremely successful.

1.1 Doing Business in the On-Demand Economy

The on-demand economy is revolutionizing commercial activities in businesses around the world. The businesses in this new economy are fueled by years of technology innovation and a radical change in consumer behavior. As companies become more highly digitized, it becomes more and more apparent that what companies can do depends on what their IT and data management systems can do. For over a decade, powerful new digital approaches to doing business have emerged. And there is sufficient proof to expect even more rapid and dramatic changes due to IT breakthroughs and advances.

In market segment after market segment, mobile communications and technology stacks make it financially feasible for companies to bring together consumers and providers of products and services. These capabilities have created the **on-demand economy**. As Ev Williams, cofounder of Twitter says,

On-demand economy is the economic activity created by technology companies that fulfill consumer demand through the immediate provisioning of products and services.

The internet makes human desires more easily attainable. In other words, it offers convenience. Convenience on the internet is basically achieved by two things: speed, and cognitive ease. If you study what the really big things on the internet are, you realize they are masters at making things fast and not making people think.

The proliferation of smartphone-connected consumers, simple and secure purchase flows, and location-based services are a few of the market conditions and technological innovations that are propelling the explosion of on-demand services.

Just as the rapid growth of online-only Amazon and eBay transformed retail, the even faster growth of app-driven companies, like Uber, Airbnb, and Grubhub, has disrupted the taxi, hotel, and restaurant markets. As you read in the opening case, in six short years, Uber changed the taxi industry as it rose from start-up to the world's most valuable private technology company, and Airbnb tackled the fiercely competitive hotel market and attracted more than 60 million customers to become the third most valuable venture-capital-backed company in the world. Another example is Grubhub who became No. 1 in online food ordering, controlling over 20% of that \$9 billion market. What today's successful technology businesses have in common are platform-based business models. Platforms consist of hardware, software, and networks that provide the connectivity for diverse transactions, such as ordering, tracking, user authentication, and payments. These business models are designed to serve today's on-demand economy, which is all about time (on-demand), convenience (tap an app), and personalized service (my way). For example, millennials want the ease of online payment over cash and insist on efficiency for all aspects of their lives, including shopping, delivery, and travel.

Key strategic and tactical questions that determine an organization's profitability and management performance are shown in **Figure 1.2**. Answers to each question require an understanding of the capabilities of mundane to complex IT, which ones to implement and how to manage them.

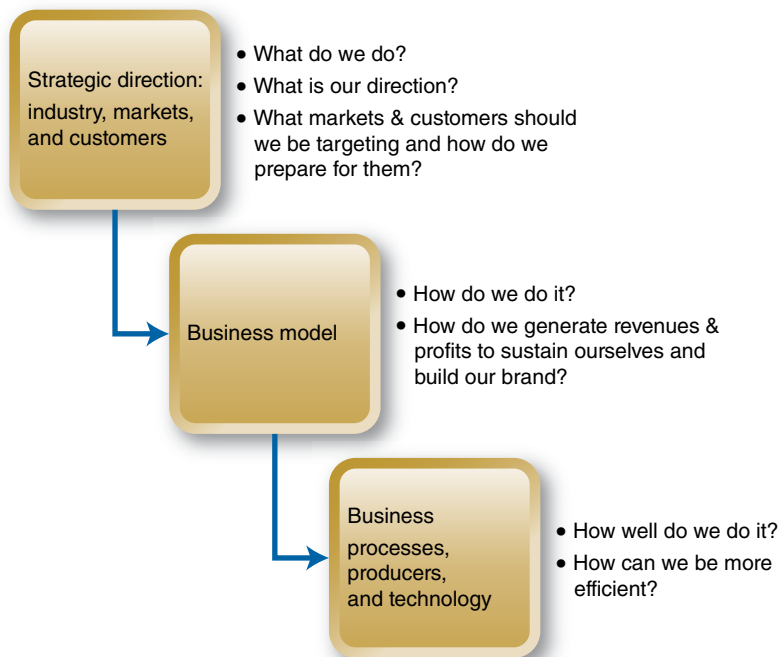


FIGURE 1.2 Key strategic and tactical questions.

Growth of the On-Demand Economy

Whether it is ease of scheduled deliveries or the corresponding time savings, the growth of the on-demand economy is a product of its alignment with consumers' growing appetite for greater convenience, speed, and simplicity. A recent survey reported that 86.5 million Americans have used the services of at least one on-demand start-up company (Chriss, 2016).

The growth of the on-demand economy demonstrates the high level of interest consumers have in on-demand services from dog walking to laundry services, short-term home rentals, massages, and truck hauling. Although just applying a mobile app to an existing service will not ensure a company's success, IT is a vital and integral part of the all businesses that are part of the on-demand economy.

Low Cost of Entry One of the reasons that the on-demand economy has taken off is that it is easier than ever to become an on-demand business. Companies like Dispatch, a software as-a-service company, allow entrepreneurs to move into the on-demand world quickly and inexpensively. For example, Aatlantic Fitness, a fitness equipment repair service company, moved into the on-demand economy using Dispatch, and Handyman Connection, a 20-year-old home repair service company, is using Dispatch's platform to compete with Handy, an on-demand service for house cleaning that has raised \$60 million in venture capital.

Digital Business Models

The on-demand economy is driving the transformation of traditional business models to digital business models to serve customers what they want and where they want it.

Business models are the ways enterprises generate revenue or sustain themselves. Digital business models define how businesses make money via digital technology. Companies that adopt digital business models are better positioned to take advantage of business opportunities and survive, according to the Accenture *Technology Vision* 2013 report (Accenture, 2013). **Figure 1.3** contains examples of new technologies that destroyed old business models and created new ones.

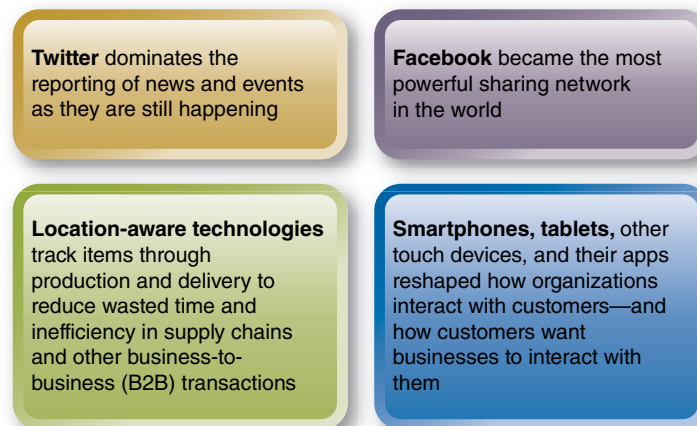


FIGURE 1.3 Digital business models refer to how companies engage their customers digitally to create value via websites, social channels, and mobile devices.

The ways in which market leaders are transitioning to digital business models include the following:

- **NBA talent scouts rely on sports analytics and advanced scouting systems** NBA talent scouts used to crunch players' stats, watch live player performances, and review hours of tapes to create player profiles. Now software that tracks players' performance has changed how basketball and soccer players are evaluated. For example, STATS' SportVU technology is revolutionizing the way sports contests are viewed, understood, played, and enjoyed. SportVU uses six palm-sized digital cameras that track the movement of every player on the court, record ball movement 25 times per second, and convert movements into statistics. SportVU produces real-time and highly complex statistics to complement the traditional play-by-play. Predictive sport analytics can provide a 360-degree view of a player's performance and help teams make trading decisions. Sports analytics bring about small competitive advantages that can shift games and even playoff series.
- **Dashboards keep casino floor staff informed of player demand** Competition in the gaming industry is fierce, particularly during bad economic conditions. The use of manual spreadsheets and gut-feeling decisions did not lead to optimal results. Casino operators facing pressure to increase their bottom line have invested in analytic tools, such as

Tangam's Yield Management solution (TYM). TYM is used to increase the yield (profitability) of blackjack, craps, and other table games. The analysis and insights from real-time apps are used to improve the gaming experience and comfort of players.

Today, a top concern of well-established corporations, global financial institutions, born-on-the-Web retailers, and government agencies is how to design their **digital business models** in order to

- Deliver an incredible customer experience
- Turn a profit
- Increase market share
- Engage their employees

In the digital (online) space, the **customer experience** must measure up to the very best the Web has to offer. Stakes are high for those who get it right—or get it wrong. Forrester research repeatedly confirms there is a strong relationship between the quality of a firm's customer experience and loyalty, which, in turn, increases revenue (Schmidt-Subramanian et al., 2013).

IT's Role in the On-Demand Economy

According to the 2016 survey conducted by the Society of Information Management (SIM), 1,213 IT leaders (including 490 chief information officers (CIOs)) from 801 companies reported companies that are more highly digitized and tightly connected are putting a greater emphasis on the strategic use of IT to enhance growth and improve performance. As a result, IT priorities and spending are changing (Kappelman et al., 2017).

A review of the top 10 IT management priorities reported in the survey results is shown in **Table 1.1**. Along with business-IT alignment and security, Table 1.1 clearly demonstrates a need for companies to focus on strategic and organizational priorities such as innovation, IT and business agility, speed of IT delivery, and business **productivity** and efficiency.

TABLE 1.1 10 Top IT Management Priorities

IT Management Issues	
1	Technology Alignment with the Business
2	Security, Cybersecurity & Privacy
3	Innovation
4	IT Agility & Flexibility
5	Business Agility & Flexibility
6	Business Cost Reduction & Controls
7	IT Cost Reduction & Controls
8	Speed of IT Delivery & IT Time to Market
9	Business Strategic Planning
10	Business Productivity & Efficiency

Adapted from Kappelman et al. (2017).

To address these issues, IT leaders said they need to focus on relationships, meet more frequently with top management, and spend significant amounts of time with functional leaders, customers, and suppliers. Companies also need to emphasize finding, keeping, and developing IT talent and on improving IT to improve business performance. These findings point to one clear message—IT in the on-demand economy is about meeting customer needs.

IT Business Objectives

Now, more than ever, IT must be responsive to the needs of consumers who are demanding a radical overhaul of business processes in companies across diverse industry sectors. Intuitive interfaces, around-the-clock availability, real-time fulfillment, personalized treatment, global consistency, and zero errors—this is the world to which customers have become increasingly accustomed. And, it's not just about providing a superior user or customer experience—when companies get it right, they can also offer more competitive prices because of lower costs, better operational controls, and open themselves up to less risk.

According to Chirantan Basu of Chron (Basu, 2017), to stay abreast of the ever-changing business landscape and customer needs, IT today must concentrate on the following six business objectives:

1. **Product development** From innovations in microprocessors to efficient drug-delivery systems, IT helps businesses respond quickly to changing customer demands.
2. **Stakeholder integration** Companies use their investor relations websites to communicate with shareholders, research analysts, and others in the market.
3. **Process improvement** An ERP system replaces dozens of legacy systems for finance, human resources, and other functional areas, to increase efficiency and cost-effectiveness of internal business processes.
4. **Cost efficiencies** IT allows companies to reduce transaction and implementation costs, such as costs of duplication and postage of email versus snail mail.
5. **Competitive advantage** Companies can use agile development, prototyping, and other systems methodologies to bring a product to market cost-effectively and quickly.
6. **Globalization** Companies can outsource most of their noncore functions, such as HR and finance, to offshore companies and use ICT to stay in contact with its global employees, customers, and suppliers 24/7.

Every technology innovation triggers opportunities and threats to business models and strategies. With rare exceptions, every business model depends on a mix of IT, knowledge of its potential, the requirements for success, and, equally important, its limitations.

Questions

1. What precipitated the on-demand economy?
2. How is IT contributing to the success of the on-demand economy?
3. List the six IT business objectives.
4. What are the key strategic and tactical questions that determine an organization's profitability and management performance?
5. What is a business model?
6. What is a digital business model?
7. Give two examples of how companies are transitioning to digital business models.
8. What factors are driving the move to digital business models?

1.2 Business Process Improvement and Competitive Advantage

Given that a company's success depends on the efficiency of its business processes, even small improvements in key processes can have significant payoff. All functions and departments in the enterprise have tasks they need to complete to produce outputs, or deliverables, in order to meet their **objectives**.

Before you can begin to improve something, you have to understand what it is you are improving. We'll start by defining a business process, looking at its characteristics, and then exploring ways in which a business process can be improved either incrementally or radically through Business Process Reengineering.

What Is a Business Process?

Business processes are series of steps by which organizations coordinate and organize tasks to get work done. In the simplest terms, a **process** consists of activities that convert inputs into outputs by doing work.

Examples of common business processes are as follows:

- **Accounting** Invoicing; reconciling accounts; auditing
- **Finance** Credit card or loan approval; estimating credit risk and financing terms
- **Human resources (HR)** Recruiting and hiring; assessing compliance with regulations; evaluating job performance
- **IT or information systems** Generating and distributing reports and data visualizations; data analytics; data archiving
- **Marketing** Sales; product promotion; design and implementation of sales campaigns; qualifying a lead
- **Production and operations** Shipping; receiving; quality control; inventory management
- **Cross-functional business processes** Involving two or more functions, for example, order fulfillment and product development

Three Components of a Business Process Business processes have the three basic components shown in **Figure 1.4**. They involve inputs, activities, and deliverables.

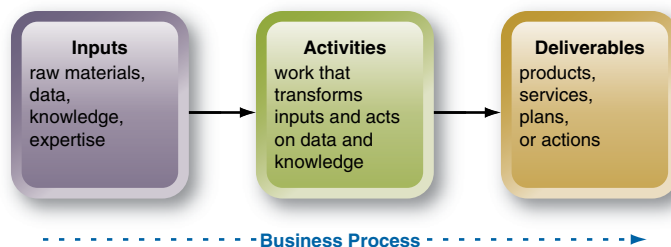


FIGURE 1.4 Three components of a business process.

Processes can be formal or informal. **Formal processes** are documented and have well-established steps. Order taking and credit approval processes are examples. Routine formal processes are referred to as **standard operating procedures (SOPs)**. An SOP is a well-defined and documented way of doing something. An effective SOP documents who will perform the tasks; what materials to use; and where, how, and when the tasks are to be performed. SOPs are needed for the handling of food, hazardous materials, or situations involving safety, security, or compliance. In contrast, **informal processes** are typically undocumented, have inputs that may not yet been identified, and are knowledge-intensive. Although enterprises would prefer to formalize their informal processes in order to better understand, share, and optimize them, in many situations process knowledge remains in people's heads.

Processes range from slow, rigid to fast-moving, adaptive. Rigid processes can be structured to be resistant to change, such as those that enforce security or compliance regulations. Adaptive processes are designed to respond to change or emerging conditions, particularly in marketing and IT.

Improving Business Processes

Designing an effective process can be complex because you need a deep understanding of the inputs and outputs (also known as **deliverables**), how things can go wrong, and how to prevent

Deliverables are the outputs or tangible things that are produced by a business process. Common deliverables are products, services, actions, plans, or decisions, such as to approve or deny a credit application. Deliverables are produced in order to achieve specific objectives.

things from going wrong. For example, Dell had implemented a new process to reduce the time that tech support spent handling customer service calls. In an effort to minimize the length of the call, tech support's quality dropped so much that customers had to call multiple times to solve their problems. The new process had backfired—increasing the time to resolve computer problems and aggravating Dell customers.

The importance of efficient business processes and continuous process improvement cannot be overemphasized. Why? Because 100% of an enterprise's performance is the result of its processes. Maximizing the use of inputs in order to carry out similar activities better than one's competitors is a **critical success factor (CSF)**. Poorly designed, flawed, or outdated business processes waste resources, increase costs, cause delays, and aggravate customers. For example, when customers' orders are not filled on time or correctly, customer loyalty suffers, returns increase, and reshipping increases costs. The blame may not be employee incompetence, but a flawed order fulfillment process.

Don't Automate, Obliterate!

In today's on-demand economy, incrementally improving a business process isn't always sufficient to create the type of change required. Instead, radical changes need to occur to meet higher customer expectations. To do this, companies have to go beyond simply automating an existing process. They must reinvent the entire business process, including reducing the number of steps required, eliminating documents, developing automated decision-making, and dealing with regulatory and fraud issues. Operating models, skills, organizational structures, and roles need to be redesigned to match the reinvented processes. Data models should be adjusted and rebuilt to enable better decision-making, performance tracking, and customer insights.

Leading organizations have come to recognize that it can take a long time to see the benefits of traditional large-scale projects that migrate all current processes to digital and sometimes they don't work. Instead, successful companies are reinventing processes, challenging everything related to an existing process and rebuilding it using cutting-edge digital technology. For example, rather than creating technology tools to help back-office employees type customer complaints into their systems, leading organizations create self-serve options for customers to type in their own complaints.

Business Process Reengineering (BPR) The process by which these types of radical process change can be achieved is referred to as **business process reengineering (BPR)**, its slogan is "Don't automate, obliterate!" (Hammer and Champy, 2006). Consisting of eight stages, shown in **Figure 1.5**, BPR proposes that simply applying IT to a manual or outdated process does not always optimize it. Instead, processes need to be examined to determine whether they are still necessary. After unnecessary processes are identified and eliminated, the remaining ones are redesigned (or reengineered) in order to automate or streamline them. Next, the new process is implemented and put into operation and its performance is evaluated. Finally, the process is reassessed over time to continually improve it.

The goal of BPR is to eliminate unnecessary, non-value-added processes, and simplify and automate the remaining processes to significantly reduce cycle time, labor, and costs. For example, reengineering the credit approval process cuts time from several days or hours to minutes or less. Simplifying processes naturally reduces the time needed to complete the process, which also cuts down on errors.

After eliminating waste, technology can enhance processes by (1) automating existing manual processes; (2) expanding the data flows to reach more functions in order to make it possible for sequential activities to occur in parallel; and (3) creating innovative business processes that, in turn, create new business models. For instance, consumers can scan an image of a product and land on an e-commerce site, such as Amazon.com, selling that product. This process flips the traditional selling process by making it customer-centric.

You will read more about optimizing business processes and role of business process management (BPM) role in the alignment of IT and business strategy in Chapter 13.