CHAPTER 1

Digital Transformation Disrupts Companies, Competition, and Careers Locally and Globally

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Case 1.1 Opening Case

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Uber and Airbnb Innovative Digital Business Models Facilitate Global Expansion and Operational Resilience During the COVID-19 Pandemic

Almost every new startup wants to disrupt some traditional industry with a digital solution. Two of the most ingenious and most-valuable startups to achieve this goal are Uber and Airbnb. For example, most consumers who tap an Uber app to get a ride would never 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 and eliminates the use of cash or credit cards at the time of service. Similarly, Airbnb provides an easy-to-use digital platform to offer accommodations, dining, and leisure activities to guests worldwide with the click of a couple of buttons.

New Economies and COVID-19 Require New Digital Business Models

Uber and Airbnb are popular examples of companies that developed new digital business models to transform slow-to-innovative industries. A simple definition of a business model is the way a company generates revenue and makes a profit. On-demand and sharing (access-over-ownership) business models provide real-time fulfillment of goods and services, which have attracted millions of users worldwide. These models fit best when speed and/or convenience matter the most. The ground transportation, grocery, and restaurant industries are examples of hyper-growth categories in the on-demand world. The home-based accommodation and bicycle/scooter rental industries are good examples of high-growth categories in the sharing economy. Currently, forward-thinking companies that have reaped the benefits of rethinking their business models by applying digital solutions to reshape their industries are now adapting their business models by utilizing technology in even more new and creative ways to meet the demands and uncertainties of the COVID-19 pandemic. The sharing economy has been severely impacted by COVID-19 causing companies like Uber and Airbnb to make creative adjustments and develop new strategies to ensure their customers feel safe and how they will need to operate in the 'new normal.'

Uber On-Demand 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 e-mail.

The Uber concept developed in response to scarcity of taxies. It started on a snowy Paris night in 2008 when the two founders could not get a cab. They wanted a simple app that could get them a car with a tap. On June 1, 2015, the entrepreneurs celebrated Uber's 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. By mid-2018, their global presence had grown tremendously over the past few years, and to achieve this phenomenal growth Uber has invested in new and developing technologies and partnerships. For example, the company partnered with Carnegie Mellon University to build robotic cars and purchased deCarta, a 40-person mapping start-up to reduce its dependence on Google Maps.

Airbnb Access-over-Ownership Business Model

Another disruption to a traditional industry occurred when Airbnb blindsided the hotel industry. Airbnb—probably the most global of the new startups—allows anyone with a spare apartment or room to run their own bed and breakfast by giving them a technology platform to market themselves to a global market. Just click a few buttons on Airbnb's website and type up a brief description of your property and its amenities, and your spare room can become a new source of income! By 2016, Airbnb hosts had accommodated 40 million guests in its 1.5 million listings in 34,000 cities in 190 countries. In mid-2018, Airbnb had accommodated over a whopping 150 million guests in 4 million listings—including 1,400 castles—in 65,000 cities and 191 countries around the globe. In comparison, Hilton, InterContinental, and Marriott, the largest hotel chains in the world, have less than one million rooms each.

Business Success of Uber and Airbnb in terms of Company Valuation, Growth, and Globalization

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.

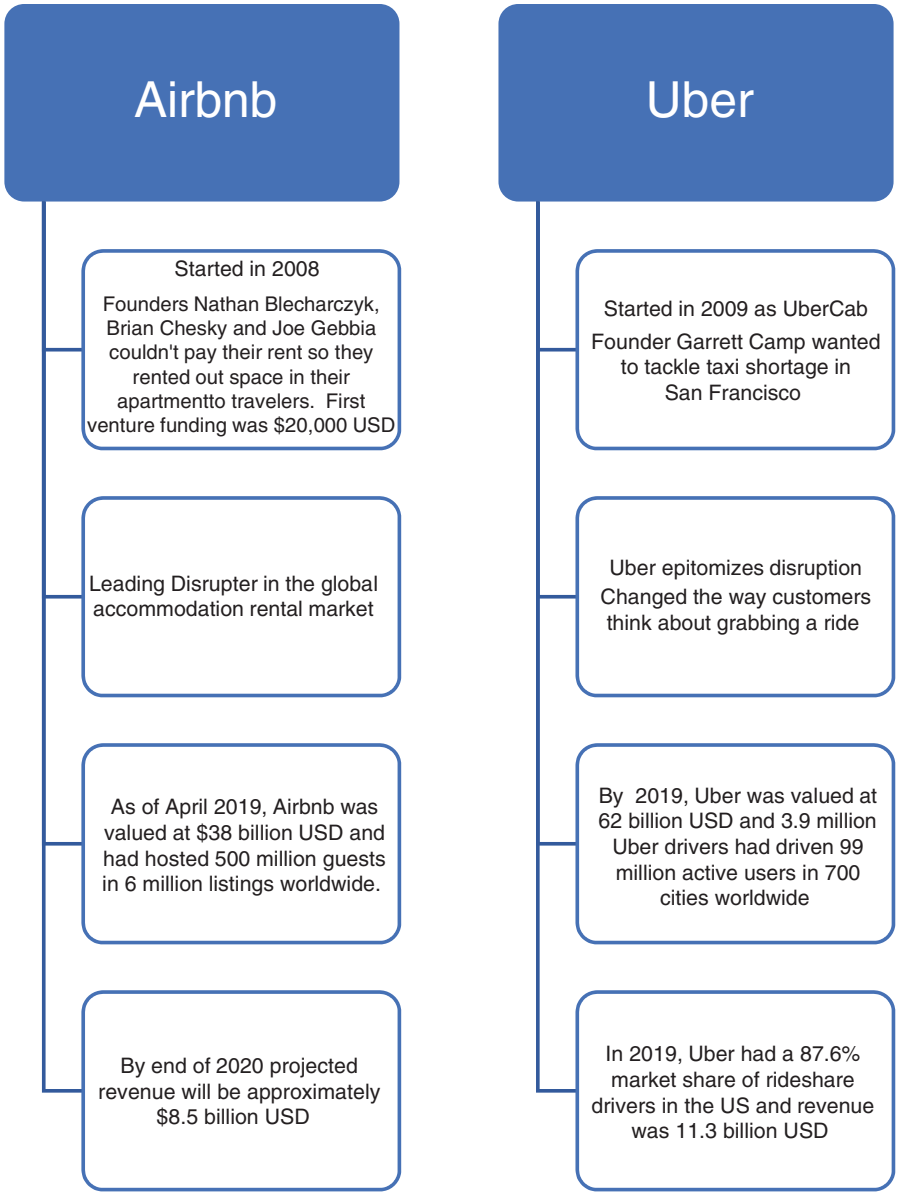

FIGURE 1.1 Innovative business models of Airbnb and Uber have been extremely successful.

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. Currently, investors value Airbnb at $31 billion—rivaling that of hotel giant Marriott International.

To achieve their phenomenal local and global growth, both Uber and Airbnb have used some interesting technology-enabled strategies. For example, Uber has been aggressive in going global. It uses "Ambassadors" who are paid to recruit new drivers from its competitor Lyft using an automated hiring, recruitment, and onboarding system that is far more efficient than the process used by traditional taxi companies. Ambassadors also offer free rides to new customers to advertise Uber by word of mouth in new cities, and drones are used to recruit new drivers and customers around the globe! Once a customer base has been established, Uber founder, Travis Kalanick, then actively lobbies governors worldwide to write new laws that favor Uber's business model.

However, globalization hasn't all been plain sailing for Uber. Since 2011, when Uber first expanded its services outside of the United States, Uber has encountered resistance in several countries such as China, Russia, and Southeast Asia. Despite setbacks, it has been able to salvage market share in these countries by retaining a substantial share in joint ventures with local rivals such as Yandex.Taxi (https://taxi.yandex.ru) and Grab (https://www.grab.com/sg). More recently, Uber has shifted its focus to countries where it is convinced it can win, including India, Middle East, and North Africa, and has a particular interest in Saudi Arabia where Uber is focusing on recruiting female drivers who have only recently been allowed to drive there. Despite its optimism that its business model will be successful in these parts of the world, local competitors there also present undisputed barriers to Uber's ultimate success. For example, Uber sold its Chinese business to Didi Chuxing in 2016, putting an end to its very expensive, high-stakes battle over the lucrative Chinese market.

On the other hand, Airbnb growth strategies include developing new services to enhance their guests' travel experience, such as creating "Airbnb Plus - a listing of homes verified for quality and comfort" and identifying "Superhosts" who have consistently been rated highly by previous guests. They have also added "Travel Experiences"

to allow their guests insider access to unexpected places together with a list of restaurants that have been recommended by many of their guests. But, Airbnb's most effective growth strategy has been increasing the number of countries where its services are offered. For example, since Airbnb unveiled its French platform in 2012, it has gone from strength to strength with a staggering 8.5 million French people using Airbnb properties between June 1 and August 31, 2019.

This strategy, however, has presented Airbnb organizers with some very interesting challenges that include handling a total of 65 different currencies, translating host listings between countries, dealing with foreign law agencies, and offering country-specific sign-up methods. For example, although Facebook or Google accounts work in the United States, these are not the best sign-up methods in other parts of the world, and just by allowing travelers to use Weibo (https://www.weibo.com/us) and WeChat (https://www.wechat.com/en), Airbnb is able to grow its customer base in China by 700%.

Uber and Airbnb Retool their Digital Business Models to Build Resilience during the COVID-19 Pandemic

While globalization has presented highly valued start-ups like Uber and Airbnb with huge opportunities for growth, the COVID-19 pandemic presented them with some daunting business challenges as people around the globe were told to stay home. In the early days of the pandemic, both Uber and Airbnb were faced with a significant downturn in demand as far fewer people took rides or sought accommodations for vacation or business, during COVD-19 lockdowns and Airbnb's plans to file a request to 'go public' were waylaid by pandemic-related turmoil in the stock market. This initial reaction has been followed by ongoing government and customer concerns about general health and safety issues associated with the pandemic. As a result, on-demand and sharing economy companies have been forced to make significant adjustments in response to unforeseen events and recent data show that their businesses are growing again thanks to agile thinking and creative adjustments they have made to their business models. For example, Airbnb made efforts to increase the variety of the accommodations they offer and use technology to broadcast their new offerings. In June 2020 Airbnb reported that bookings for entire homes and cabins and cottages in secluded areas increased significantly causing their gross booking value to grow for the first time since February 2020 and on August 19, 2020 it filed with the Security Exchange Commission (SEC) to 'go public'. In another creative move, Uber transformed itself from a solely ridesharing venture to a food delivery service. Consequently, their new mobile app 'Uber Eats' has become their key revenue generator amidst COVID-19. In creating Uber Eats, Uber offered restaurants a new way to connect with their customers and inject a modicum of positivity among the bad news plaguing the world during and after COVID-19. In quickly reacting to the unforeseen events of COVID-19, Uber and Airbnb have demonstrated the power of on-demand and sharing economy companies to make swift and significant adjustments to their business models by digitally transforming themselves.

At the end of the day, it is clear that technology plays a huge part in both enabling innovative products and services to facilitate local and global success by allowing gig workers and consumers in the on-demand and sharing economies to seamlessly connect with business services 24 hours a day, 365 days a year despite important cultural differences and the challenges of COVID-19.

Questions

1. In what ways are the Uber and Airbnb business models similar and different?
2. What challenges did Uber and Airbnb face when they went "global"?
3. What growth strategies are benefiting the global success of Uber and Airbnb? How do they differ?
4. How has technology helped or hindered Uber and Airbnb in the growth of their global business?
5. In what ways has the COVID-19 pandemic impacted Uber and Airbnb?

Sources: Compiled from Solomon (2016), Hawkins (2017), Henshall (2017), Domat (2018), Ledsom (2019), Airbnb.com, and Uber.com, Overstreet (2020).

DID YOU KNOW?

*That **gig economy** is a new buzzword that refers to the rise in contracted work—or "gigs"—that aren't traditional jobs. Examples of these are ridesharing, home and apartment rentals, and food delivery and are made possible using apps and mobile devices. As many as one in every five jobs are currently contracted and it is estimated that over half of the U.S. workforce could find themselves doing contract or freelance work over the next decade. An example of "gig" work and how it affects the economy was offered in our opening case.*

IT architectures guide the process of planning, acquiring, building, modifying, and interfacing with deployed IT resources in a single department within an organization.

Legacy systems are older information systems that have been maintained over several decades because they fulfill critical needs.

Introduction

Many forward-thinking managers and entrepreneurs are digitally transforming their existing business models and reinventing their businesses. In a recent industry study, 87% of senior business leaders said digital transformation is a company priority and 79% of corporate strategists said they are reinventing their business and creating new revenue streams in new ways (Gartner, 2019). By no longer operating and maintaining outdated and complex **IT architectures** with a mix of **legacy systems** that can delay or prevent the release of innovative new products and

services and absorb large portions of the information technology (IT) budget, companies can add value, increase their customer base, expand their business capabilities, and increase profits.

Companies such as Uber (https://www.uber.com), Airbnb (https://www.airbnb.com) Shyp (http://shyp.com), TaskRabbit (https://www.taskrabbit.com), and Lyft (https://www.lyft.com) 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. (MacIver, 2015)*

As businesses continue to change their business models to accommodate the needs of the on-demand and sharing economies, IT professionals must constantly scan for innovative new technologies to provide business value, help shape the future of the business, and facilitate performance and growth in local and global markets. For example, smart devices, mobile apps, sensors, and technology platforms—along with increased customer demand for digital interactions and on-demand and shared 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 drives the on-demand and sharing economies.

Business leaders today need to know what steps to take to get the most out of mobile, social, cloud, big data, analytics, visualization technologies, artificial intelligence and the Internet of Things (IoT) to move their business forward and enable new on-demand and sharing 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 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 at all levels as the IT function takes on a key strategic role that determines 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 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 their 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 today. 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, 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.

1.1 Doing Business in the On-Demand and Sharing Economies

LO1.1 Define *the differences between the on-demand and sharing economies and the six business objectives IT should focus on to enhance organizational performance, growth, and sustainability*.

The on-demand and sharing economies are revolutionizing commercial activities in businesses around the world. The businesses in these new economies 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.

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

Sharing economy is an economic system in which goods or services are shared between private individuals, either free or for a fee, typically arranged through an online company or organization.

In market segment after market segment, mobile communications and technology stacks make it financially feasible for companies to bring together consumers and providers to purchase or share products and services. These capabilities have created the **on-demand economy** and the **sharing economy**. As Ev Williams, cofounder of Twitter (https://twitter.com/home) says,

> *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 and shared services.

Just as the rapid growth of online-only Amazon (https://www.amazon.com) and eBay transformed retail, the even faster growth of app-driven companies, such as Uber, Airbnb, and Grubhub (https://www.grubhub.com), 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.

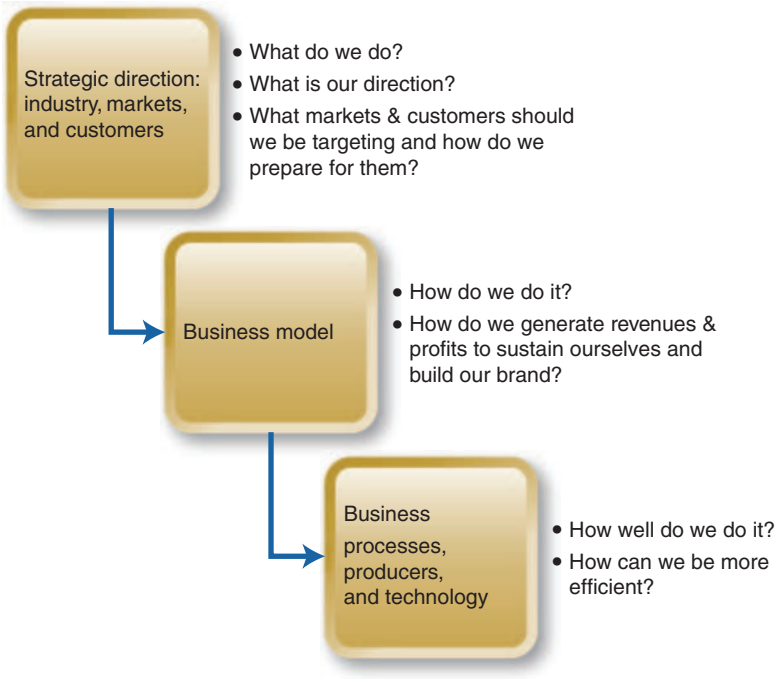

FIGURE 1.2 Key strategic and tactical questions.

Disruptive Digital Business Models

Digital transformation drives radical changes in **business models** to enable organizations to provide goods and services to customers in the way they want them delivered, when they want them, and where they want to have access to them.

Companies that adopt **digital business models** are better positioned to take advantage of business opportunities and survive. **Figure 1.3** describes seven highly disruptive business models and some of the companies that use them to differentiate their products and services.

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 model to

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

Business model is a company's core strategy for making a profit. It defines the products and/or services it will sell, its target market, costs associated with doing business, and the company's ongoing plans for achieving its goals.

Digital business model prescribes how businesses make money and meet their goals using digital technology, such as websites, social media, and mobile devices.

Business Model	• Description/Examples
Subscription	• Customer pays monthly payment for continued access to a specific product/service • *Netflix* • *Apple Music*
Freemium	• Customer gets 'basic' or free version of a product/service or a free trial. Has option to upgrade to a paid version of the product/service • *Linkedin* • *Dropbox*
Free	• Customer is the "product". Customer data is the most valuable part of the business along with his/her attention for advertisiing purposes • *Google* • *Facebook*
Access-over-Ownership	• Customer pays for temporary access to the product/service, but does not own it • *Zipcar* • *AirBnb*
Experience	• Customer is given a unique experience for which they are willing to pay a high price • *Tesla* • *Apple*
On-Demand	• Customer pays for a service they don't have time to do themselves, but is fulfilled by people with time, but short on money • *Uber* • *Taskrabbit*
Ecosystem	• Customer is sold an interdependent suite of products/services that when purchased, increase in value based on how many are owned • *Apple* • *Google*

FIGURE 1.3 Disruptive digital business models enable companies to engage customers to create value via websites, social channels, and mobile devices.

Customer experience describes the cumulative impact of multiple interactions over the course of a customer's contact with an organization.

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 wrong. There is a strong relationship between the quality of a firm's customer experience and loyalty, which, in turn, increases revenue. As a result, a firm's IT business objectives should be carefully and clearly defined.

IT's Role in the On-Demand and Sharing Economies

The 2018 IT Trends survey conducted by the Society of Information Management (SIM) reflects that the current state of IT management remains stable despite the massive changes present in the IT world today. Responses were analyzed from IT leaders in 793 highly digitized and tightly connected organizations. Results showed that companies are investing heavily in analytics, cybersecurity, cloud, application software development and maintenance, enterprise resource planning (ERP), and customer relationship management (CRM). These levels of investment are consistent with the top ten IT management concerns shown in **Table 1.1**, which clearly demonstrate a need for companies to continue to focus on strategic and organizational priorities such as cybersecurity, business–IT alignment, and **data analytics**.

Data analytics is the process of examining data sets to draw conclusions about the information they contain, usually with the aid of specialized information systems.

TABLE 1.1 Top Ten IT Management Issues

	IT Management Issues
1	Security, Cybersecurity and Privacy
2	Technology Alignment with the Business
3	Data Analytics
4	Compliance and Regulations
5	IT Cost Reduction & Controls
6	Business Cost Reduction & Controls
7	Innovation
8	Digital Transformation
9	Business Agility and Flexibility
10	IT Agility and Flexibility

Source: Adapted from Kappelman et al. (2019).

Respondents also indicated that in addition to cybersecurity, their most worrisome personal IT concerns centered around the skills shortage that has led to difficulties in finding and retaining highly skilled IT talent, the credibility of IT, and perception of IT leadership within an organization. On the business side, they listed alignment of business goals with IT goals, business continuity, and compliance/regulations as areas of concern. Once again, these findings point to one clear message—IT in the on-demand and sharing economies is all about safeguarding data and identifying and meeting customer needs. Each of these concerns will be addressed throughout the following chapters to help you understand how IT is managed to ensure corporate performance, growth, and sustainability goals are met.

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 to enhance an organization's performance, growth, and sustainability:

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 e-mail 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 Information Communication Technology (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, requirements for success, and, equally important, its limitations.

Decades of technological innovation have given us smartphone apps, mobile payment platforms, GPS and map technology, and social authentication. These technologies are needed to build the infrastructure needed for on-demand services and sharing services.

This infrastructure—also referred to as a **technology platform** or **technology stack**—supports the exchange and coordination of staggering amounts of data.

Technology platform is the operating system and computer hardware used as a base upon which other applications, processes, or technologies are developed.

Technology stack is the multiple layers of hardware, software, network connectivity, and data analytics capability that comprise a technology platform.

In many consumer markets today, companies that do not have these mobile apps (Apple or Android) or other technology platforms that support the exchange of goods and services—no matter how useful their website—may find themselves losing their competitive edge. This often leads to customer dissatisfaction, which results in a considerably smaller customer base and inevitably leads to an inability to sustain performance and growth followed by decline and, in extreme cases, extinction.

These and many other technologies and their impact on how companies operate and compete will be discussed in the following chapters to enable you to understand the importance of IT for management and become a more informed user of IT.

IT at Work 1.1

Digital Transformation Drives Kroger's Mission to Improve Customer Satisfaction

Grocery store Kroger has long been a leader in customer satisfaction by creating unique, personalized shopping experiences that drive customer loyalty. Every year, they deliver more than 3 billion personalized recommendations to shoppers through their customer insights team and through their *Restock Kroger* project; they have created a seamless digital shopping experience for their customers to access anything, anywhere, anytime.

Promoting an omnichannel approach, Kroger offers its customers in-store and online experiences they don't distinguish between. Its goal is to deliver customers' needs at any point in time. Digital shelving, driverless grocery delivery, automated warehouse operations, on-demand delivery, and mini-grocery store setups in Walgreen's brick-and-mortar-pharmacies are just a few ways that Kroger is meeting customer needs through digital transformation.

Kroger CIO, Chris Hjelm, is proud of Kroger's commitment to data, innovation, and tech savvy initiatives that he has promoted during his time with the company. Some of the other innovative digital solutions already in place or being pilot tested at Kroger include the following:

- **Enhanced display for grocery environment (EDGE)** that displays prices, nutrition and allergy information along with videos and images on shelf-edge high-resolution screens to boost sales
- **Scan, Bag, Go** technology that allows shoppers to scan products using a provided handheld scanner or the Kroger mobile app
- **ClickList** online ordering services that offer targeted, personalized offers to shoppers
- **QueVision** that has lowered checkout times from an average of 4 minutes to less than 30 seconds and improved foot traffic management in stores by combining infrared sensors, predictive analytics, and management tools
- **Food at Safe Temperature (FAST) Alerts** that monitor temperature trends and alert store managers and facilities engineers of negative temperature trends before food safety issues arise

In his role as CIO of Kroger's $115 billion operation, Hjelm sees his key roles as twofold. He must "keep the trains running on time" and "create a sustainable competitive advantage by working on things that aren't being done elsewhere."

Sources: Compiled from The Kroger Co. (2018), Kroger 2019 Sustainability Report, and Zappa (2019).

Questions

1. Name four disruptive business models and describe what they offer to their customers.
2. How is IT contributing to the success of the on-demand and shared economies?
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 Competition

LO1.2 Explain *the role of IT in improving business processes. Understand the concepts of business process reengineering and competitive advantage*.

One way that a company can gain a **competitive advantage** over its competitors is by improving business processes. 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.

Competitive advantage is when an organization differentiates itself by charging less and creating and delivering better quality products or services than its competitors.

Deliverables are tangible or intangible goods or services produced in a project and intended to be delivered to a customer.

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 (BPR).

What Is a Business Process?

In the simplest terms, a **business process** consists of activities that convert inputs into outputs by doing work.

Business process is a series of steps by which organizations coordinate and organize tasks to get work done within and across their different business functions.

Table 1.2 shows some examples of common business processes and the business units where they are used. In addition to business processes that are used within a business unit, some business processes can be **cross-functional** and involve two or more functions, for example, order fulfillment and product development, which is used in both sales and production/operations management.

Cross-functional business process involves two or more business functions.

TABLE 1.2 Examples of Business Processes in Business Units

Business Unit	Business Processes in Use
Accounting	Invoicing, reconciling accounts, auditing
Finance	Credit card or loan approval, estimating credit risk and financing terms
Human resources (HR)	Recruiting, hiring, assessing compliance with regulations, evaluating job performance
Information systems (IS/IT)	Generating and distributing reports, data visualizations, data analytics, data archiving
Marketing	Sales, product promotion, design and implementation of sales campaigns, qualifying a lead
Production and operations (POM)	Shipping, receiving, quality control, inventory management

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

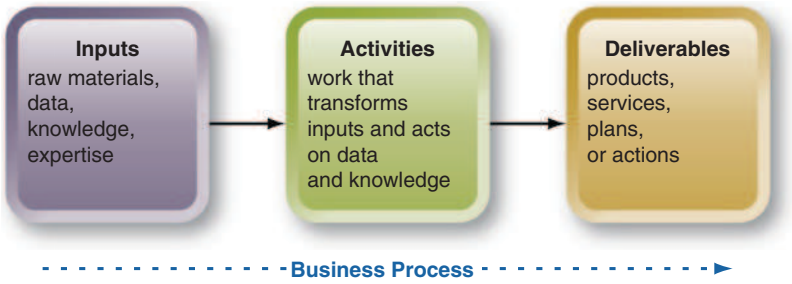

FIGURE 1.4 Three components of a business process.

Formal process is a process that has documented and well-established steps. For example, order taking and credit approval processes.

Informal process is a process that is typically undocumented, has inputs that may not yet been identified, and are knowledge-intensive.

Processes can be **formal** or **informal**. Routine formal processes are typically referred to as **standard operating procedures (SOPs)**. 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 and is difficult to formalize.

Standard operating procedures (SOP) is a well-defined and documented way of doing something. An effective SOP states 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.

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 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.

Critical success factor (CSF) is an element that is necessary to ensure the success of an organization or project, that is, access to adequate financial resources, clear definition of goals, realistic calendar of tasks and activities.

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. The process by which these types of radical process change can be achieved to improve productivity, **cycle time**, and quality is referred to as **business process reengineering (BPR)**. Its slogan is "Don't automate, obliterate!" (Hammer and Champy, 2006).

Cycle time is the period to complete one cycle of an operation or to complete a function, job, or task from start to finish.

Business process reengineering (BPR) is the radial redesign of core business processes to achieve a dramatic improvement in productivity, cycle times, and quality.

Consisting of the 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.

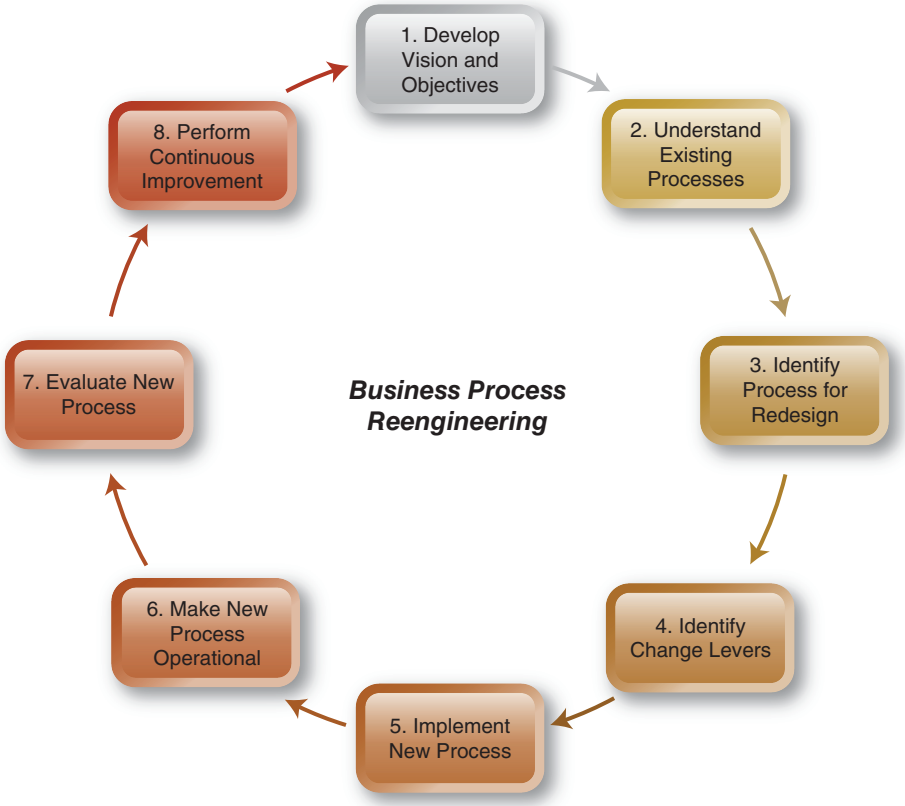

FIGURE 1.5 Eight phases of BPR.

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, IT can enhance business 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.

With the help of **business process management (BPM)** software, business processes performed either by computers or manually can be mapped and new ones designed. The software includes built-in templates showing workflows and rules for various functions, such as rules for credit approval. These templates and rules provide consistency and high-quality outcomes. For example, Oracle's WebLogic Server Process Edition includes server software and process integration tools for automating complex business processes, such as handling an insurance claim.

Business process management (BPM) consists of the methods, tools, and technology to support and continuously improve business processes.

However, BPM initiatives can be extremely challenging, and in order to be successful, BPM requires buy-in from a broad cross section of the business, the right technology selection, and highly effective change management processes. You will read more about optimizing business processes and role of BPM in the alignment of IT and business strategy in Chapter 13.

Competition

Understanding trends that affect new ways of doing business and getting ahead of those trends by adding, deleting, and changing existing business processes gives organizations an important advantage over their competitors. Basically, this requires radically improving business processes to offer unique products or services or convince customers your business is a more

attractive alternative to your competitors. Helping a company gain, maintain, and sustain a competitive advantage in the market is a very important function of IT, which will be discussed in detail in Chapter 12.

Influential industry leaders cite "new competition" as their biggest business challenge. Once an enterprise has learned to compete well in the market, it can only continue to excel by continually improving its business processes. Maintaining a competitive advantage requires forecasting market trends, staying abreast of industry changes, and developing innovative strategies to stay ahead of the competition. It also demands continuously tracking competitors and monitoring their future plans and promptly taking corrective action to outmaneuver them. To achieve this, an organization must have an IT function that is agile, flexible, and responsive (discussed in Chapter 12). IT agility, flexibility, and mobility are tightly interrelated and fully dependent on an organization's IT infrastructure and architecture, which are discussed in Chapter 2. **IT at Work 1.2** demonstrates how Coca-Cola transformed Costa Coffee by radically improving its business processes and completely replacing its IT architecture to meet and beat the competition.

IT at Work 1.2

Coca-Cola Gives Costa Coffee a Greenfield IT Opportunity to Ramp Up Global Retail Operations

Coca-Cola recently acquired 4,000-store Costa Coffee chain from Whitbread, a British Hospitality group, for $4.9 billion USD. The acquisition is part of Coca-Cola's strategy to build a coffee brand that will rival Starbucks in a global coffee shop market that is currently valued at $165 billion USD. The acquisition expands the existing Coca-Cola coffee lineup that already includes the market-leading Georgia brand in Japan, plus coffee products in many other countries.

In setting up Costa Coffee as a distinct entity, Coca-Cola also invested in a new foundation of digital platforms to fuel its ambitions of competing with Starbucks on a global scale. The acquisition gives Coca-Cola a strong, global coffee platform with a presence in more than 30 countries in Europe, Asia Pacific, the Middle East, and Africa and the potential for additional expansion. Founded in London, in 1971, Costa Coffee has become a major coffee brand across the world with nearly 4,000 retail outlets with highly trained baristas, a coffee vending operation, for-home coffee formats, and Costa's state-of-the-art Roastery.

Not many companies can create their IT organization from scratch, but with their acquisition by Coca-Cola, Costa Coffee was handed the golden opportunity to swap out its old legacy IT for new platforms, applications, and a ramped-up talent base. For Phil Scully, Costa's CIO, it was a dream come true. "It's as close to a greenfield IT opportunity as you'll ever get," he exuded, and "a rare opportunity that I'm hugely privileged to be able to take."

Usually, when companies are acquired, they must integrate their IT operations and services with those of the company acquiring them. In the Coca-Cola–Costa Coffee acquisition, that was not the case. Instead, Costa Coffee was offered the opportunity to build a brand-new IT function to connect to Coca-Cola's IT systems. To achieve this, Costa Coffee will have to work through a digital transformation to transition from the system it shares with its former parent, Whitbread, under a series of technology service agreements (TSAs) for Human Resources, Entity Resource Planning, CRM, Supply Chain, and other core systems.

Scully took over as Costa Coffee CIO in 2017 and since then he has taken huge strides in digital transformation, most of which has focused on enhancing customer and in-store capabilities. As Costa Coffee takes hold of its own IT destiny, the pressure will be on to build an advanced digital capability that will drive Coca-Cola's and Costa Coffee's goals. Cloud IT will be critical to their plan. Scully aims to move from a completely physical data center to the cloud to unlock opportunities such as fully upgrading its ERP systems to become a cloud-only business. The shift to the cloud is designed to provide IT, systems, and data management that is as consistent, repeatable, and high quality as its coffee is at its thousands of outlets around the world.

The transformation also demands a rapid ramp-up of talent. Scully is recruiting about 50% more IT professionals from around the world to create a blend of 130 to 140 permanent, contract, and outsourced IT staff to help him achieve his vision.

Sources: Compiled from Caballero (2018), Wood and Sweney (2018), MacIver (2019), and https://www.coca-colacompany.com.

Questions

1. What is a business process? Give three examples.
2. What is the difference between business deliverables and objectives?
3. List and give examples of the three components of a business process.
4. Explain the differences between formal and informal processes.
5. What is an SOP?
6. What is the purpose of BPM?

1.3 IT Innovation and Disruption

LO1.3 Describe *how IT is disrupting the way that companies operate, the IT megatrends that are driving organizational performance, growth, and sustainability and how COVID-19 is accelerating digital transformation*.

Digital technology creates new markets, businesses, products, and careers. As digital technology changes the way consumers and retailers buy and sell products, companies must adapt and innovate to ensure their product offerings, platforms, technologies, and search options cater to these changing needs.

To qualify as a digital disruption, it must

1. Be a threat to personal or business goals in the short or long term
2. Must be digital, for example, related to the IoT, a mobile app, a new technology, or anything related to the digital evolution

Social–Mobile–Analytics–Cloud (SMAC) Model

We are in the era of **social–mobile–analytics–cloud (SMAC)** computing that is reshaping business strategies and day-to-day operations (**Figure 1.6**).

Social–mobile–analytics–cloud (SMAC) is the concept that the convergence of four technologies is currently driving business innovation and digital transformation.

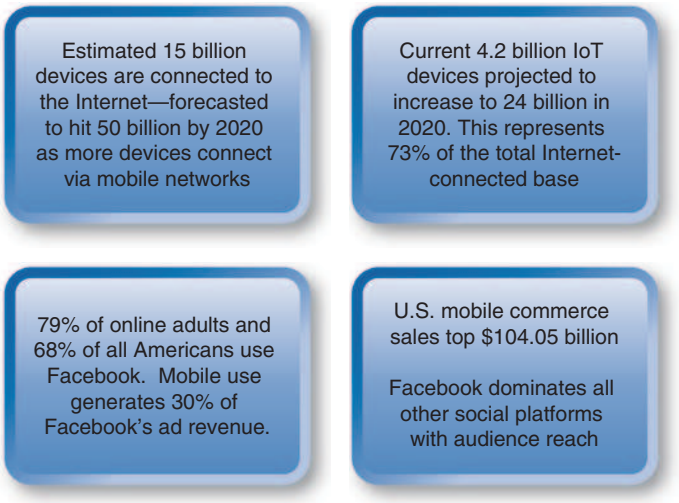

FIGURE 1.6 SMAC reshapes business strategies and day-to-day operations.

The cloud consists of huge data centers accessible via the Internet and forms the core by providing 24/7 access to storage, applications, and services. Handhelds and wearables, such as FitBit, Pebble, and Apple Watch, and their users form the edge. Social channels connect the core and edge. The SMAC integration creates the technical and services infrastructure needed for digital business. This infrastructure makes it possible to meet the expectations of employees, customers, and business partners given that almost everyone is connected (social), everywhere they go (mobile), gets the information they need (analytics), and has 24/7 access to products and services (cloud).

Here are three examples of SMAC's influence:

1. **Powerful social influences impact advertising and marketing** Connections and feedback via social networks have changed the balance of influence. Consumers are more likely to trust tweets from ordinary people than recommendations made by celebrity endorsements. And, negative sentiments posted or tweeted can damage brands.
2. **Consumer devices go digital and offer new services** The Nike+ FuelBand wristband helps customers track their exercise activities and calories burned. The device links to a mobile app that lets users post their progress on Facebook.

3. **eBay's move to cloud technology improves sellers' and buyers' experiences** The world's largest online marketplace, eBay, moved its IT infrastructure to the cloud. With cloud computing, eBay is able to introduce new types of landing pages and customer experiences without the delay associated with having to buy additional computing resources.

The balance of power has shifted as business is increasingly driven by individuals for whom mobiles are an extension of their body and mind. They expect to use location-aware services, apps, alerts, social networks, and the latest digital capabilities at work and outside work. To a growing extent, customer loyalty and revenue growth depend on a business's ability to offer unique customer experiences that wow customers more than competitors can.

Technology Mega Trends

For 21st-century enterprises, connectivity, big data and analytics, artificial intelligence, and **digitization** are technology **mega trends** that cannot be ignored. Business breakthroughs and innovation would be impossible without them. They also mark the difference between outdated 20th-century business models and practices and those of today's on-demand economy.

The most influential IT mega trends driving digital transformation of companies in the on-demand economy are discussed next.

Digitization is the process of transforming any kind of activity or information into a digital format that can be collected, stored, searched, and analyzed electronically and efficiently.

Mega trends are forces that shape or create the future of business, the economy, and society.

Cloud computing is an Internet-based computing system consisting of many computers and other devices where computer infrastructure, access to applications, software, processing power, and so on are shared.

Big data is a process that is used when traditional data mining and handling techniques cannot uncover the insights and meaning of the underlying data that are usually unstructured (text), time sensitive, or extremely large.

Unstructured data is data that either does not have a predefined format or is not organized in a predefined manner. Unstructured data is typically text, although it may also contain some dates and numbers.

Connectivity.

Companies need to connect with consumers and business partners across multiple channels and devices using digital platforms that consist of hardware, software (mobile apps), networks (social media), (embedded sensors), and **cloud computing**.

For example, rather than run applications or programs from software stored on a computer or server owned by the company, cloud computing allows companies to access the same kinds of applications through the Internet. Major business cloud computing providers include Amazon Web Services (AWS), Cisco Powered, Dell Cloud Solutions, Google Cloud, IBM Cloud Solutions, and Teradata Cloud. One of the many benefits of cloud is that it provides the flexibility to acquire or expand connectivity and computing power as needed for operations, business transactions, and communication.

Expanded connectivity supports smart products, which can sense, process, report, and take corrective action, such as smart clothing, watches, phones, to smart buildings and smart cities. This IoT is becoming a driving force in the on-demand and sharing economies

Connectivity pushes other sub trends, like **big data**, to create market opportunities for new products and services, such as social sentiment analysis, open innovation, new insurance business models, and micro personalized marketing and medicines.

Big Data and Data Analytics.

There is no question that the increasing volume of data can be valuable, but only if they are processed and available when and where they are needed. The problem is that the amount, variety, structure, and speed of data being generated or collected by enterprises differ significantly from traditional data. Big data stream in from multiple channels and sources, including the following:

- Mobile devices and machine-to-machine sensors embedded in everything from airport runways to casino chips (Later in this chapter, you will read more about the IoT.)
- Social content from texts, tweets, posts, blogs
- Clickstream data from the Web and Internet searches
- Video data and photos from retail and user-generated content
- Financial, medical, research, customer, and business-to-business transactions

Big data are 80% to 90% unstructured. **Unstructured data** do not have a predictable format like a credit card application form but may instead consist of large volumes of text. Huge volumes of unstructured data flooding into an enterprise are too much for traditional technology to process and analyze quickly. Big data tend to be more time sensitive than traditional (or small) data. Data collected from social, mobile, and other channels are

analyzed to gain insights and make smart decisions that drive up the bottom line. Machine-generated data from sensors and social media texts are main sources of big data.

Big data has been one of the most disruptive forces businesses have seen in a long time and impacts people, processes, and profits. When an enterprise harnesses its data and can act on analytic insights, it can turn the challenges into opportunities.

Artificial Intelligence and Robotics. To improve their ability to meet evolving customer expectations in a timely manner, digital innovators use technology to automate, streamline, or eliminate their processes. An example of this is robotic process automation that uses software and artificial intelligence to accelerate administrative activities. One bank saw its mortgage application time drop from 20 to 2 days after implementing technology to automate the document-intensive application process. It is estimated that by 2022, artificial intelligence and machine-learning systems will handle most customer interactions. These systems will be highly attuned to individual customer preferences and will tailor each engagement according to a customer's context and current need. Consequently, customers will quickly become accustomed to this level of valet service and won't stay with companies that do not anticipate their needs.

Digitization. Across industries, companies are attempting to transform their disconnected or disjointed approaches to customers, products, services, and operating models to an always-on, real-time, and information-rich marketplace. Some leaders are redesigning their capabilities and operating models to take full advantage of digital technologies to keep step with the "connected" consumer and attract talent. Others are creating qualitatively new business models—and tremendous value—around disruptive digital opportunities. In doing so, these companies secure not only continued relevance but also superior returns.

Digitization often requires that old wisdom be combined with new skills, for example, by training a merchandising manager to program a pricing algorithm and creating new roles, such as user-experience designer. The benefits of digitizing processes, through BPR, are huge. By digitizing information-intensive processes, costs can be cut by up to 90% and turnaround times improved by several orders of magnitude.

Examples span multiple industries. For example, one bank digitized its mortgage application and decision process, cutting the cost per new mortgage by 70% and slashing time to preliminary approval from several days to just one minute. A telecommunications company created a self-serve, prepaid service where customers could order and activate phones without back-office involvement. A shoe retailer built a system to manage its in-store inventory that enabled it to know immediately whether a shoe and size was in stock—saving time for customers and sales staff. An insurance company built a digital process to automatically adjudicate a large share of its simple claims.

In addition, replacing paper and manual processes with software allows businesses to automatically collect data that can be mined to better understand process performance, cost drivers, and causes of risk. Real-time reports and **dashboards** on digital-process performance enable managers to address problems before they get out of control. For example, quality issues in a company's supply chain can be identified and remedied more rapidly by monitoring customer buying behavior and feedback in digital channels.

Dashboards is an easy-to-read, often single-page, real-time user interface, showing a graphical presentation of the current status and historical trends of an organization's key performance indicators to enable instantaneous and informed decisions to be made.

Machine-to-Machine Technology. Sensors can be embedded in most products. Objects that connect themselves to the Internet include cars, heart monitors, stoplights, and appliances. Sensors are designed to detect and react, such as Ford's rain-sensing front wipers that use an advanced optical sensor to detect the intensity of rain or snowfall and adjust wiper speed accordingly. **Machine-to-machine (M2M) technology** and the **Internet of Things (IoT)** are widely used to automate business processes in industries ranging from transportation to health care. By adding sensors to trucks, turbines, roadways, utility meters, heart monitors, vending machines, and other equipment they sell, companies can track and manage their products remotely.

Machine-to-machine (M2M) technology enables sensor-embedded products to share reliable real-time data via radio signals.

Internet of Things (IoT) refers to a set of capabilities enabled when physical things are connected to the Internet via sensors.

When devices or products are embedded with sensors, companies can track their movements or monitor interactions with them. Business models can be adjusted to take advantage of what is learned from this behavioral data. For example, an insurance company

offers to install location sensors in customers' cars. By doing so, the company develops the ability to price the drivers' policies on how a car is driven and where it travels. Pricing is customized to match the actual risks of operating a vehicle rather than based on general proxies—driver's age, gender, or location of residence. **Table 1.3** lists several opportunities for improvement through the application of embedded physical things.

TABLE 1.3 Improvement Opportunities for Embedded Sensors

Industry Sector	Application	Payoff
Oil and gas	Exploration and development rely on extensive sensor networks placed in the earth's crust. Sensors can produce accurate readings of the location, structure, and dimensions of potential fields	Lower development costs and improved oil flows
Health care	Sensors and data links can monitor patients' behavior and symptoms in real time and at low cost, allowing physicians to more precisely diagnose disease and prescribe treatment regimens	Reduce hospitalization and treatment costs by $1 billion per year in the United States
Retail	Sensors can capture shoppers' profile data stored in their membership cards to help close purchases	Additional information and discounts at point of sale
Farming	Ground sensors can take into account crop and field conditions and adjust the amount of fertilizer that is spread on areas that need more nutrients	Reduction in time and cost
Advertising	Billboards can scan people passing by, assessing how they fit consumer profiles, and instantly change displayed messages based on those assessments	Better targeted marketing campaigns; flexibility; increased revenues
Automotive	Systems can detect imminent collisions and take evasive action, such as automatic braking systems	Potential accident reduction savings of more than $100 billion annually

COVID-19 Accelerates Digital Transformation

Recent developments surrounding the COVID-19 global pandemic have had a far-reaching effect on the global economy and the professional and personal lives of individuals. Consequently, companies in all industry sectors have had to act much more quickly to create new business models that address the regulatory requirements of COVID-19 lockdowns along with ensuing health and safety concerns and new purchasing habits of consumers, vendors and partners. Most companies have achieved this goal primarily by integrating new innovative information and communication technologies into their business models to increase personal engagement with consumers, vendors and partners, maintain a competitive advantage in the market and develop the operational resilience needed to safeguard their sustainability. As a result, the rate of digital transformation around the globe has increased significantly.

This accelerated digital transformation has not been limited to on-demand and sharing companies like Uber and Airbnb as described in our opening case. The unexpected events of COVID-19 have forced the pace of digital transformation to increase in all companies – large and small – and in all industry sectors as many struggle not only to compete, but also survive within uncertain times. In a recent survey of 2,500 enterprises across many different industry sectors the *COVID-19 Digital Engagement Report* shows that 97% of enterprise decision makers believed that the pandemic has accelerated companies' digital communications strategies by an average of six years; 95% are seeking new ways to engage customers, and 92% feel that transforming digital communications must be a priority in addressing current business challenges (Sil, 2020).

When people were asked to stay home and social distancing was shown to be the most effective way to slow the spread of the virus many companies saw their sales rapidly decrease, were unable to resume production and lost face-to-face contact with their customers. Small companies that were using limited technology prior to the pandemic have been particularly vulnerable to the impact of the pandemic. The mandated lockdowns and restricted activity caused their customers to engage in fewer activities outside of their own homes and began to replace face-to-face purchases of food, medications and clothing at 'bricks and mortar' establishments with e-commerce transactions for the first time. As a result, small firms have had to change their mindset and business models to include new and innovative technologies to

sustain them. In addition, companies of all sizes have begun to rely heavily on Chatbots and other omni-channel technologies to provide online interactive customer service to consumers. To ensure continuity many companies have also relaxed their policies to allow employees to work from home using information communication technology (ICT) apps like WhatsApp, Skype and Zoom while securing their expanded networks with cloud security tools such as Data Network Solutions (DNS), DHCP, and IP Address Management. Interactions with vendors and partners have followed a similar pattern as sales meetings, stockholder meetings and industry conferences have necessarily evolved into virtual events.

The impact of COVID-19 has not been limited to private sector companies. Education, healthcare, and law enforcement and government agencies around the globe are also responding to the need to more rapidly digitally transform themselves. For example, schools at all levels from elementary to university are training teachers to use the same digital tools that private companies are using to enable an effective and secure virtual learning experience for their students. This transition has not come without issues. For example, one South Carolina county recently had to suspend its entire virtual learning program because of a ransomware attack.

In healthcare more and more patients are being offered 'tele-health' visits and IBM is exploring how artificial intelligence and robotics can be used to drastically speed up timelines to develop drugs and therapies to lessen the severity of COVID-19 when contracted by those in high risk groups.

In law enforcement, agencies are employing innovative technologies to deploy contactless crime investigation techniques. For example, agencies around the globe are intensifying their use of aerial drones to identify and eradicate illegal drug crop production, illegal fishing, contraband smuggling and human trafficking, and in some countries robots and drones are even being used to identify people who are not wearing masks in public places.

Government agencies at all levels have closed their doors and are relying heavily on maintaining virtual communications with their constituents. In many cases this has made the decision process for creating and enforcing public policies more widely available and transparent to constituents with both positive and negative consequences. These and other innovative technologies are discussed in detail in subsequent chapters.

Lessons Learned

Those companies that have adapted quickly to change by exploiting digital technology and software are outperforming their peers. Companies that change the way they view and use technology from being a cost center and operational function to be a genuine competitive differentiator will reap the benefits. The five factors companies attribute these benefits to can be summed up in the following Lessons Learned:

1. **Exploit the power of software** Become "app-centric" and extend core business functions to include software development.
2. **Develop, deliver, disrupt—quickly!** Embrace agile development techniques and broadly implement DevOps.
3. **Boost speed and efficiency with automated programming interfaces (APIs)** Take a managed approach to use APIs for building full-function Web applications (particularly mobile apps) and for integrating back-office systems.
4. **Leverage third-party innovation** Take a more managed approach to use APIs for integrating third-party services into applications and enable external develop access to systems and data.
5. **Maximize returns with smarter IT investments** Get smarter at assessing and prioritizing IT investments to maximize return on investment and put portfolio management in place to prioritize and track IT programs.

Business opportunities presented by today's technology innovations are being realized on an unprecedented scale. **Cloud services**, big data, mobility, digitization, and the IoT are just a few of the emerging technologies that will build operational resilience, disrupt many industries and shake up competitive positions.

Cloud services is any computing resource that is provided over the Internet on demand.

In the pandemic and post-pandemic era, innovation through disruptive technology is necessary for any company to thrive in an on-demand and sharing economy where increased competition, expanded global markets and empowered customers define success. **IT at Work 1.3** demonstrates how one company successfully triumphed over its competition by using disruptive technology to disrupt itself!

IT at Work 1.3

Netflix Digitally Disrupts Itself!

In its first incarnation, Netflix simply provided a better way to rent DVDs. Going head to head with the then giant Blockbuster Video, a company that charged high late fees for DVD returns, Netflix allowed its customers to rent DVDs by mail with no late fees! Although the Netflix model didn't offer the instant gratification of taking home a DVD from a local store, it was simpler to rent from Netflix, and customers preferred the affordability Netflix offered. In this way, Netflix had seriously disrupted Blockbuster's business.

The subsequent introduction of Netflix's subscription streaming service also seriously disrupted major television networks such as ABC, CBS, and NBC. Until a few years ago, viewers could only watch TV shows on their television sets. As a result, TV moguls ABC, CBS, and NBC were able to charge high advertisement rates and high subscription rates. When Netflix came on the scene, traditional TV broadcasting companies had to completely reshape how they delivered their offerings. In doing so, their business operations were significantly disrupted. They no longer had the bulk of the market, their advertisement revenues dropped substantially, and their costs have increased to provide Webcasting services such as video-on-demand and Web delivery of content. However, Netflix didn't stop at disrupting other competitors—it went on to disrupt itself!

With the entry of more and more digital Webcast services such as HULU, ROKU, Sling TV, Amazon Prime Video and Netflix were facing increasingly stiff competition. To survive and prosper, Netflix separated its first-run movie rental offerings from its Web streaming services and runs two business models simultaneously. In its latest incarnation, Netflix is focusing on edging out its competition with original programming. At the 2018 Emmy Awards, Netflix had more Emmy nominations than premium cable giant HBO and took home 23 prestigious awards! In creating a new market, Netflix has avoided being displaced by its competitors and is one of the rare companies that has successfully disrupted itself.

Sources: Compiled from Muck (2017), Romero (2019), and netflix.com.

Questions

1. What are the benefits of cloud computing?
2. What is M2M technology? Give an example of a business process that could be automated with M2M.
3. Describe the relationships in the SMAC model.
4. What impacts does the SMAC model have on business?
5. Why have mobile devices given consumers more power in the marketplace?
6. Explain why connectivity is important in today's on-demand economy.
7. In what ways is IT disrupting business?
8. In what ways has COVID-19 accelerated digital transformation?

1.4 IT and You

LO1.4 Discuss *what it means to be an "informed user" of IT and the ways in which IT can add value to your career path and job performance*.

Today, IT and information systems touch nearly all aspects of our lives. IT is a part of our social life, our work, and every business process, and it is no longer the sole responsibility of the IT department. Just think about much of your day you spend interacting with technology—your iPad, PC, and smartphone. The 2018 Global Mobile Consumer Survey reported that American consumers check their smartphones an average of 52 times each day (Spangler, 2018). Aggregated across the estimated 270 million American smartphone users, that's 12.69 billion "looks" per day!