

Business Strategy: Innovation and Entrepreneurship

Chapter Outline

- 7.1 Competition Driven by Innovation
The Innovation Process
- 7.2 Strategic and Social Entrepreneurship
- 7.3 Innovation and the Industry Life Cycle
Introduction Stage
Growth Stage
Shakeout Stage
Maturity Stage
Decline Stage
Crossing the Chasm
- 7.4 Types of Innovation
Incremental vs. Radical Innovation
Architectural vs. Disruptive Innovation
Open Innovation
- 7.5 Implications for the Strategist

Learning Objectives

- LO 7.1 Outline the four-step innovation process from idea to imitation.
- LO 7.2 Apply strategic management concepts to entrepreneurship and innovation.
- LO 7.3 Describe the competitive implications of different stages in the industry life cycle.
- LO 7.4 Derive strategic implications of the crossing-the-chasm framework.
- LO 7.5 Categorize different types of innovations in the markets-and-technology framework.
- LO 7.6 Compare and contrast closed and open innovation.

Netflix: Disrupting the TV Industry

Just like cable providers disrupted the early broadcast model of television in a wave of innovation, companies streaming video represents the most recent wave of innovation reshaping the television industry.

The disruptive impact of cable played out in the 1980s and 1990s, upsetting a handful of broadcast networks with dozens and then hundreds of channels. The current wave of disruption started in the 2000s and may be reaching its peak. Now, with basically every device from a TV to a PC or laptop and smartphones turning into a TV screen, demand for online streaming is exploding. And Netflix is riding atop the crest of this wave to industry leadership and competitive advantage. During peak hours, Netflix now accounts for more than one-third of all downstream Internet traffic in the United States!

How did Netflix turn from an obscure online rental shop for DVDs sent via postal mail to the dominant content provider of on-demand streaming? After being annoyed at having to pay more than \$40 in late fees for a Blockbuster video, Reed Hastings started Netflix in 1997 to offer online rentals of DVDs. At the time, the commercial Internet was in its infancy; Amazon had just made its IPO in the same year. Streaming content was only a distant dream in the era of dial-up Internet. Selling products online seemed rather straightforward, but how could a business rent DVDs through the web? In 1999 Netflix rolled out a monthly subscription model, with unlimited rentals for a single monthly rate (and no late fees!). Rental

DVDs were sent in distinctive red envelopes, with pre-printed return envelopes. New rentals would not be sent until the current rental was returned.

Despite an innovative business model, Netflix got off to a slow start. By 2000, it had only about 300,000 subscribers and was losing money. Hastings approached Blockbuster, at the time the largest brick-and-mortar video rental chain with almost 8,000 stores in the United

States. He proposed selling Blockbuster 49 percent of Netflix and rebranding it as Blockbuster.com. Basically the idea was that Netflix would become the online presence for the huge national chain. The dot.com bubble had just burst, and Blockbuster didn't see value in having a presence online. Blockbuster turned Netflix down cold. Netflix, however, survived the dot.com bust, and by 2002, the company was profitable and went public. Blockbuster began online rentals in 2004, but by this time, Netflix had built a subscriber base of almost 4 million and a strong brand identity.

Blockbuster lost 75 percent of its market value between 2003 and 2005. From there it went from bad to worse. In 2010, the once mighty Blockbuster filed for bankruptcy.

So Netflix was at the forefront of the current wave of disruption in the TV industry as it began streaming content over the Internet in 2007. And it stayed at the forefront. It adjusted quickly to the new options consumers had to receive content, making streaming available on a large number of devices including mobile phones, tablets, game consoles, and new devices dedicated to Internet content streaming such as Roku, Apple TV, and Google Chromecast. At the same time the market for Internet-connected,



House of Cards, a Netflix original series, starring Kevin Spacey and Robin Wright.
© A-Pix Entertainment/Photofest

large, high-definition flat-screen TVs began to take off. Within just two years, Netflix subscriptions (then priced at \$7.99 per month) jumped to 12 million. Despite the impending wave of disruption, old-line media executives continued to dismiss Netflix as a threat. In 2010, Time Warner CEO Jeff Bewkes snubbed Netflix by saying, “It’s a little bit like, is the Albanian army going to take over the world? I don’t think so.”¹

Even Reed Hastings called what Netflix provided “rerun TV.” But behind their bravado, the broadcast networks were awaking to the threat Netflix posed. They stopped distributing content to Netflix and instead made it available through Hulu.com, an online content website that is jointly owned by several of the major networks. In 2011, Hulu began offering original content that was not available on broadcast or cable television. The lower-cost structure afforded by Hulu’s streaming model meant that the networks saw Hulu as a place to test new series ideas with minimal financial risk. In response, Netflix announced a move to create and stream original content online.

Since content streaming was Netflix’s main business, it devoted significant resources to produce high-quality content. In 2013, Netflix first released the political drama *House of Cards*, followed by the comedy-drama *Orange Is the New Black*. Both of these shows proved tremendous hits, and both have received many awards including Emmys and Golden Globes.

In 2015, Netflix had more than 60 million subscribers worldwide, with 50 million in the United States. Its revenues were \$6 billion, and its market cap was \$38 billion. Indeed, over the past decade, Netflix’s stock appreciated by over 4,100 percentage points, while the tech-heavy NASDAQ 100 index grew by “only” 193 percentage points over the same period. By innovating on many different dimensions, Netflix was able to not only disrupt the TV industry, but also to gain a competitive advantage.²

You will learn more about Netflix by reading the chapter-related questions appear on page 242.

INNOVATION—the successful introduction of a new product, process, or business model—is a powerful driver in the competitive process. The ChapterCase provides an example of how innovations in technology and business models can make existing competitors obsolete, and how they allowed Netflix to gain a competitive advantage.

Continued innovation forms the bedrock of Netflix’s business strategy. Using big data analytics, in particular, Netflix introduced a number of early innovations in the video rental business. One of the more ingenious moves by Netflix was to have each user build a queue of movies he or she wanted to watch next. This allowed Netflix to predict future demand for specific movies fairly accurately. Another innovation was to create a “personalized recommendation engine” for each user that would predict what each subscriber might want to watch next based not only on a quick rating survey and the subscriber’s viewing history, but also what movies users with a similar profile had watched and enjoyed. Based on Netflix’s proprietary learning algorithm, the recommendations would improve over time as the user’s preferences become more clear. This also allowed Netflix to steer users away from hit movies (where wait times for DVD rentals were long because the company only had a limited number in its library) to lesser-known titles in its catalog. The ability to bring in the “long tail”³ of demand delighted not only viewers, as they enjoyed lesser-known, but often critically acclaimed films, but also movie studios, which could now make additional money on movies that would otherwise not be in demand. Moreover, in contrast to other players in the media industry, Netflix was fast to catch the wave of content streaming via the Internet.

Innovation allows firms to redefine the marketplace in their favor and achieve a competitive advantage.⁴ That’s why we focus on innovation and the related topic of entrepreneurship in this chapter—to celebrate innovation as a powerful competitive weapon for business strategy formulation. We begin this chapter by detailing how competition is a process driven by continuous innovation. Next we discuss strategic and social

entrepreneurship. We then take a deep dive into the industry life cycle. This helps us to formulate a more dynamic business strategy as the industry changes over time. We also introduce the crossing-the-chasm framework, highlighting the difficulties in transitioning through different stages of the industry life cycle. We then move into a detailed discussion of different types of innovation using the markets-and-technology framework. We also present different ways to organize for innovation. As with every chapter, we conclude with practice-oriented “Implications for the Strategist.”

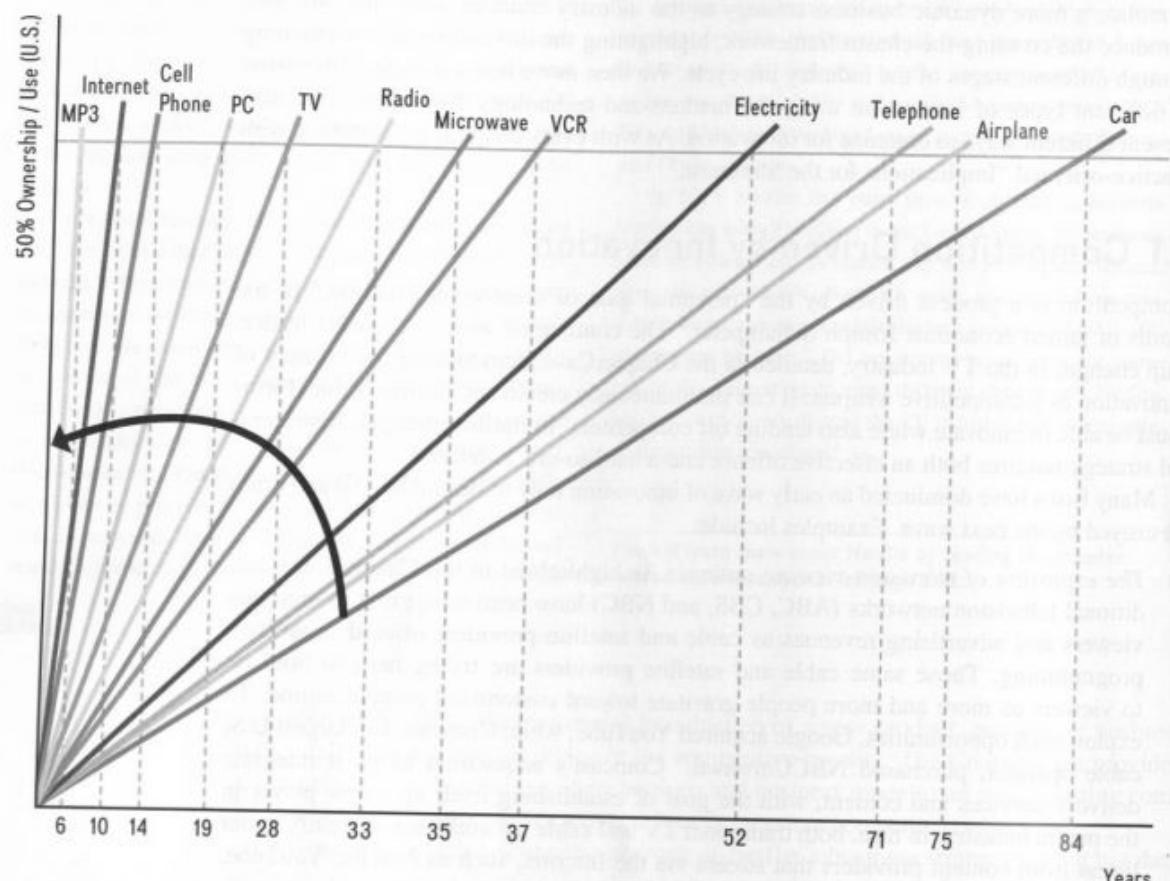
7.1 Competition Driven by Innovation

Competition is a process driven by the “perennial gale of creative destruction,” in the words of famed economist Joseph Schumpeter.⁵ The continuous waves of market leadership changes in the TV industry, detailed in the ChapterCase, demonstrate the potency of innovation as a competitive weapon: It can simultaneously create and destroy value. Firms must be able to innovate while also fending off competitors’ imitation attempts. A successful strategy requires both an effective offense and a hard-to-crack defense.

Many firms have dominated an early wave of innovation only to be challenged and often destroyed by the next wave. Examples include:

- *The explosion of television-viewing options:* As highlighted in the ChapterCase, traditional television networks (ABC, CBS, and NBC) have been struggling to maintain viewers and advertising revenues as cable and satellite providers offered innovative programming. Those same cable and satellite providers are trying hard to hold on to viewers as more and more people gravitate toward customized content online. To exploit such opportunities, Google acquired YouTube, while Comcast, the largest U.S. cable operator, purchased NBCUniversal.⁶ Comcast’s acquisition helps it integrate delivery services and content, with the goal of establishing itself as a new player in the media industry. In turn, both traditional TV and cable networks are currently under threat from content providers that stream via the Internet, such as Netflix, YouTube, and Amazon.
- *The move from typewriters to PCs to mobile devices:* Wang Laboratories, a computer company that led the market for word-processing machines, destroyed typewriter companies such as Smith Corona and Underwood. It then was undone by computer makers such as IBM and Compaq. Today, IBM has exited the personal computer market, selling its PC division to the Chinese technology company Lenovo, and Compaq has been acquired by HP. The computer industry, however, has not been standing still either. Once-successful PC makers such as HP and Dell are now under threat by companies that are innovating in the mobile device space, such as Apple, Samsung, Google, and the Chinese start-up Xiaomi.

As the adage goes, change is the only constant—and the rate of technological change has accelerated dramatically over the past hundred years. Changing technologies spawn new industries, while others die. This makes innovation a powerful strategic weapon in order to gain and sustain competitive advantage. Exhibit 7.1 shows how many years it took for different technological innovations to reach 50 percent of the U.S. population (either through ownership or usage). As an example, it took 84 years for half of the U.S. population to own a car, but only 28 years for half the population to own a TV. The pace of the adoption rate of recent innovations continues to accelerate. It took 19 years for the PC to reach 50 percent ownership, but only 6 years for MP3 players to accomplish the same diffusion rate.

EXHIBIT 7.1 Accelerating Speed of Technological Change


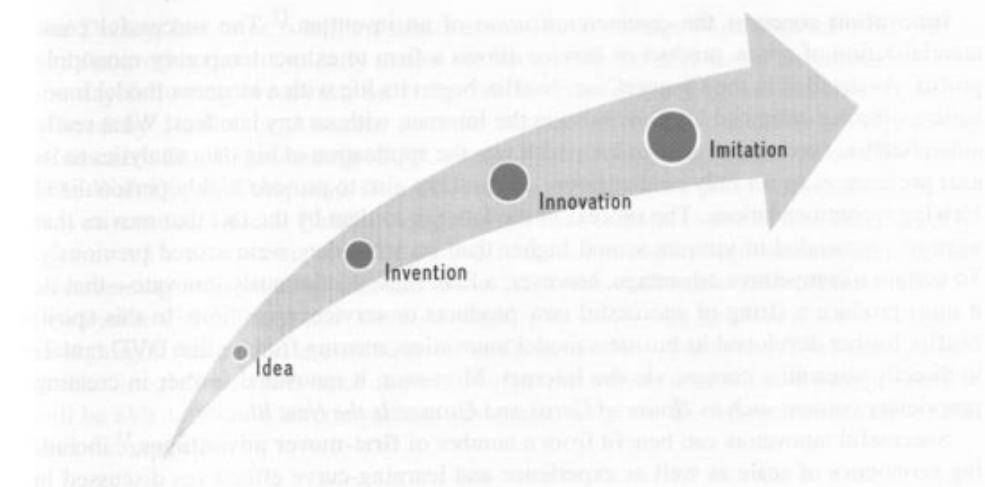
Source: Depiction of data from the U.S. Census Bureau, the Consumer Electronics Association, Forbes, and the National Cable and Telecommunications Association.

What factors explain increasingly rapid technological diffusion and adoption? One determinant is that initial innovations such as the car, airplane, telephone, and the use of electricity provided the necessary infrastructure for newer innovations to diffuse more rapidly. Another reason is the emergence of new business models that make innovations more accessible. For example, Dell's direct-to-consumer distribution system improved access to low-cost PCs, and Walmart's low-price, high-volume model used its sophisticated IT logistics system to fuel explosive growth. In addition, satellite and cable distribution systems facilitated the ability of mass media such as radio and TV to deliver advertising and information to a wider audience. The speed of technology diffusion has accelerated further with the emergence of the Internet, social networking sites, and viral messaging. The accelerating speed of technological changes has significant implications for the competitive process and firm strategy. We will now take a close look at the innovation process unleashed by technological changes.

LO 7-1
THE INNOVATION PROCESS

Outline the four-step innovation process from idea to imitation.

Broadly viewed, innovation describes the discovery, development, and transformation of new knowledge in a four-step process captured in the *four I's: Idea, Invention, Innovation, and Imitation* (see Exhibit 7.2).⁷


EXHIBIT 7.2

The Four I's: Idea, Invention, Innovation, and Imitation

The innovation process begins with an **idea**. The idea is often presented in terms of abstract concepts or as findings derived from basic research. Basic research is conducted to discover new knowledge and is often published in academic journals. This may be done to enhance the fundamental understanding of nature, without any commercial application or benefit in mind. In the long run, however, basic research is often transformed into applied research with commercial applications. For example, wireless communication technology today is built upon the fundamental science breakthroughs Albert Einstein accomplished over 100 years ago in his research on the nature of light.⁸

In a next step, **invention** describes the transformation of an idea into a new product or process, or the modification and recombination of existing ones. The practical application of basic knowledge in a particular area frequently results in new technology. If an invention is *useful, novel, and non-obvious* as assessed by the U.S. Patent and Trademark Office, it can be patented.⁹ A **patent** is a form of *intellectual property*, and gives the inventor exclusive rights to benefit from commercializing a technology for a specified time period in exchange for public disclosure of the underlying idea (see also the discussion on *isolating mechanisms* in Chapter 4). In the United States, the time period for the right to exclude others from the use of the technology is 20 years from the filing date of a patent application. Exclusive rights often translate into a *temporary monopoly position* until the patent expires. For instance, many pharmaceutical drugs are patent protected.

Strategically, however, patents are a *double-edged sword*. On the one hand, patents provide a temporary monopoly as they bestow exclusive rights on the patent owner to use a novel technology for a specific time period. Thus, patents may form the basis for a competitive advantage. Because patents require full disclosure of the underlying technology and know-how so that others can use it freely once the patent protection has expired, however, many firms find it strategically beneficial *not* to patent their technology. Instead they use **trade secrets**, defined as valuable proprietary information that is not in the public domain and where the firm makes every effort to maintain its secrecy. The most famous example of a trade secret is the Coca-Cola recipe, which has been protected for over a century.¹⁰ The same goes for Ferrero's Nutella, whose secret recipe is said to be known by even fewer than the handful of people who have access to the Coca-Cola recipe.¹¹

Avoiding public disclosure and thus making its underlying technology widely known is precisely the reason Netflix does not patent its recommendation algorithm or Google its PageRank algorithm. Netflix has an advantage over competitors because its recommendation algorithm works best; the same goes for Google—its search algorithm is the best available. Disclosing the information how exactly these algorithms work would nullify their advantage.

invention
The transformation of an idea into a new product or process, or the modification and recombination of existing ones.

patent
A form of *intellectual property* that gives the inventor exclusive rights to benefit from commercializing a technology for a specified time period in exchange for public disclosure of the underlying idea.

trade secret
Valuable proprietary information that is not in the public domain and where the firm makes every effort to maintain its secrecy.

innovation
The commercialization of any new product or process, or the modification and recombination of existing ones.

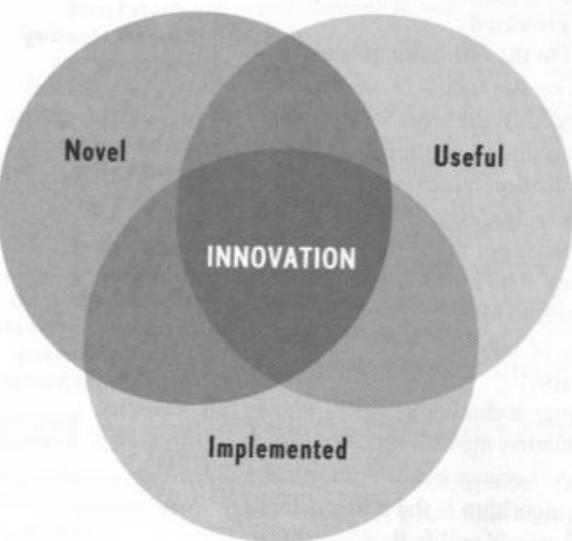
first-mover advantages
Competitive benefits that accrue to the successful innovator.

Innovation concerns the *commercialization* of an invention.¹² The successful commercialization of a new product or service allows a firm to extract temporary monopoly profits. As detailed in the ChapterCase, Netflix began its life with a business model innovation, offering unlimited DVD rentals via the Internet, without any late fees. What really aided Netflix, however, to gain an early lead was the application of big data analytics to its user preferences to not only predict future demand but also to provide highly personalized viewing recommendations. The success of the latter is evident by the fact that movies that were recommended to viewers scored higher than on what they were scored previously. To sustain a competitive advantage, however, a firm must continuously innovate—that is, it must produce a string of successful new products or services over time. In this spirit, Netflix further developed its business model innovation, moving from online DVD rentals to directly streaming content via the Internet. Moreover, it innovated further in creating proprietary content such as *House of Cards* and *Orange Is the New Black*.

Successful innovators can benefit from a number of **first-mover advantages**,¹³ including economies of scale as well as experience and learning-curve effects (as discussed in Chapter 6). First movers may also benefit from *network effects* (see discussion of Apple in discussion of the Introduction Stage later in this chapter). Moreover, first movers may hold important intellectual property such as critical patents. They may also be able to lock in key suppliers as well as customers through increasing switching costs. For example, users of Microsoft Word might find the switching costs entailed in moving to a different word-processing software prohibitive. Not only would they need to spend many hours learning the new software, but collaborators would also need to have compatible software installed and be familiar with the program to open and revise shared documents.

Google (by offering Google Docs, a free web-based suite of application software such as word-processing, spreadsheet, and presentation programs) is attempting to minimize switching costs by leveraging *cloud computing*—a real-time network of shared computing resources via the Internet (Google Drive). Rather than requiring each user to have the appropriate software installed on his or her personal computer, the software is maintained and updated in the cloud. Files are also saved in the cloud, which allows collaboration in real time globally wherever one can access an Internet connection.

EXHIBIT 7.3 / Innovation: A Novel and Useful Idea That Is Successfully Implemented



Innovation need not be high-tech in order to be a potent competitive weapon, as P&G's history of innovative new product launches such as the Swiffer line of cleaning products shows. P&G uses the *razor-razorblade business model* (introduced in Chapter 5), where the consumer purchases the handle at a low price, but must pay a premium for replacement refills and pads over time. As shown in Exhibit 7.3, an innovation needs to be novel, useful, and successfully implemented in order to help firms gain and sustain a competitive advantage.

The innovation process ends with *imitation*. If an innovation is successful in the marketplace, competitors will attempt to imitate it. Although Netflix has some 50 million U.S. subscribers, imitators are set to compete its advantage away. Amazon offers its Instant Video service to its estimated 50 million Prime subscribers (\$99 a year or \$8.25 a month), with selected titles free. In addition, Prime members receive free two-day shipping on Amazon purchases. Hulu Plus (\$7.99 a month), a video-on-demand service jointly owned by NBC, Fox,

and Disney, has some 6 million subscribers. One advantage Hulu Plus has over Netflix and Amazon is that it typically makes the latest episodes of popular TV shows available the day following broadcast, on Hulu, while often delayed by several months before offered by Netflix or Amazon. A joint venture of NBCUniversal Television Group (Comcast), Fox Broadcasting (21st Century Fox) and Disney—ABC Television Group (The Walt Disney Company), Hulu Plus uses advertisements along with its subscription fees as revenue sources. Finally, Google's YouTube with its over 1 billion users is evolving into a TV ecosystem, benefiting not only from free content uploaded by its users but also creating original programming. As of 2015, the most subscribed channels were by PewDiePie (36 million) and YouTube Spotlight, its official channel (23 million) used to highlight videos and events such as YouTube Music Awards and YouTube Comedy Week. Google's business is, of course, ad supported. Only time will tell whether Netflix will be able to sustain its competitive advantage given the imitation attempts by a number of competitors.

7.2 Strategic and Social Entrepreneurship

Entrepreneurship describes the process by which change agents (entrepreneurs) undertake economic risk to innovate—to create new products, processes, and sometimes new organizations.¹⁴ Entrepreneurs innovate by commercializing ideas and inventions.¹⁵ They seek out or create new business opportunities and then assemble the resources necessary to exploit them.¹⁶ If successful, entrepreneurship not only drives the competitive process, but it also creates value for the individual entrepreneurs and society at large.

Although many new ventures fail, some achieve spectacular success. Examples of successful entrepreneurs are:

- **Reed Hastings**, founder of Netflix featured in the ChapterCase. Hastings grew up in Cambridge, Massachusetts. He obtained an undergraduate degree in math from Bowdoin College, a small liberal arts college. Hastings then volunteered for the Peace Corps for two years, teaching high school math in Swaziland (Africa). Next, he enrolled at Stanford University to pursue a master's degree in computer science, which brought him to Silicon Valley. Reed Hastings declared his love affair with writing computer code, but emphasized, "The big thing that Stanford did for me was to turn me on to the entrepreneurial model."¹⁷ His net worth today is an estimated \$1 billion.
- **Jeff Bezos**, the founder of Amazon.com (featured in ChapterCase 8), the world's largest online retailer. The stepson of a Cuban immigrant, Bezos graduated from Princeton and then worked as a financial analyst on Wall Street. In 1994, after reading that the Internet was growing by 2,000 percent a month, he set out to leverage the Internet as a new distribution channel. Listing products that could be sold online, he finally settled on books because that retail market was fairly fragmented, with huge inefficiencies in its distribution system. Perhaps even more important, books represent a perfect commodity, because they are identical regardless of where a consumer buys them. This reduced uncertainty when introducing online shopping to consumers. In a comprehensive research study that evaluated the long-term performance of CEOs globally, Jeff Bezos was ranked number two, just behind the late Steve Jobs (Apple), but ahead of Yun Jong-Yong (Samsung).¹⁸
- **Oprah Winfrey**, best-known for her self-titled TV talk show, and founder and CEO of Harpo Productions, a multimedia company. Some of Harpo's well-known products include *The Oprah Winfrey Show*, *Dr. Phil*, *The Rachael Ray Show*, *The Dr. Oz Show*,

LO 7-2

Apply strategic management concepts to entrepreneurship and innovation.

entrepreneurship
The process by which people undertake economic risk to innovate—to create new products, processes, and sometimes new organizations.



Oprah Winfrey, a highly successful entrepreneur and business person in many areas including as talk show host, actress, producer, media proprietor, and philanthropist.
© Randall Michelson/WireImage/Getty Images

entrepreneurs
The agents that introduce change into the competitive system.

strategic entrepreneurship
The pursuit of innovation using tools and concepts from strategic management.

Oprah.com, O, The Oprah Magazine, and O at Home. In 2011, she launched a new cable TV channel jointly with Discovery Communications: OWN, The Oprah Winfrey Network.¹⁹ A graduate of Tennessee State University, Winfrey used her entrepreneurial talents to rise from poverty and an abusive childhood to become one of the most successful entrepreneurs in the multimedia business, with a net worth of over \$2 billion.²⁰ Also in 2011, Winfrey ended her record-setting talk show to devote her entrepreneurial talents to OWN. To make OWN more successful, she took over the position as CEO in addition to chief creative officer. OWN is now available to some 82 million pay television households in the United States (70 percent of households).

■ **Elon Musk**, an engineer and serial entrepreneur with a deep passion to “solve environmental, social, and economic challenges.”²¹ We featured him in his role as leader of Tesla Motors in ChapterCase 3. Musk left his native South Africa at age 17. He went to Canada and then to the United States, where he completed a bachelor’s degree in economics and physics at the University of Pennsylvania. After only two days in a PhD program in applied physics and material sciences at Stanford University, Musk left graduate school to found Zip2, an online provider of content publishing software for news organizations. Four years later, in 1999, computer maker Compaq acquired Zip2 for \$341 million (and was in turn acquired by HP in 2002). Elon Musk moved on to co-found PayPal, an online payment processor. When eBay acquired PayPal for \$1.5 billion in 2002, Musk had the financial resources to pursue his passion to use science and engineering to solve social and economic challenges. He is leading three new ventures simultaneously: electric cars with Tesla Motors, renewable energy with SolarCity, and space exploration with SpaceX.²²

Entrepreneurs are the agents who introduce change into the competitive system. They do this not only by figuring out how to use inventions, but also by introducing new products or services, new production processes, and new forms of organization. Entrepreneurs can introduce change by starting new ventures, such as Reed Hastings with Netflix or Mark Zuckerberg with Facebook. Or they can be found within existing firms, such as A.G. Lafley at Procter & Gamble (P&G), who implemented an *open-innovation model* (which we’ll discuss later). When innovating within existing companies, change agents are often called *intrapreneurs*: those pursuing *corporate entrepreneurship*.²³

Entrepreneurs who drive innovation need just as much skill, commitment, and daring as the inventors who are responsible for the process of invention.²⁴ As an example, the engineer Nikola Tesla invented the alternating-current (AC) electric motor and was granted a patent in 1888 by the U.S. Patent and Trademark Office.²⁵ Because this breakthrough technology was neglected for much of the 20th century and Tesla did not receive the recognition he deserved in his lifetime, the entrepreneur Elon Musk is not just commercializing Tesla’s invention but also honoring Tesla with the name of his company, Tesla Motors, a new venture formed to design and manufacture all-electric automobiles. Tesla Motors launched several all-electric vehicles based on Tesla’s original invention.

Strategic entrepreneurship describes the pursuit of innovation using tools and concepts from strategic management.²⁶ We can leverage innovation for competitive advantage by applying a strategic management lens to entrepreneurship. The fundamental question of strategic entrepreneurship, therefore, is how to combine entrepreneurial actions, creating new opportunities or exploiting existing ones with strategic actions taken in the pursuit of competitive advantage.²⁷ This can take place within new ventures such as Tesla Motors or within established firms such as Apple. Apple’s continued innovation in mobile

devices is an example of strategic entrepreneurship: Apple’s managers use strategic analysis, formulation, and implementation when deciding which new type of mobile device to research and develop, when to launch it, and how to implement the necessary organizational changes to support the new product launch. Each new release is an innovation; each is therefore an act of entrepreneurship—planned and executed using strategic management concepts. In 2015, for example, Apple entered the market for computer wearables by introducing the Apple Watch.

Social entrepreneurship describes the pursuit of social goals while creating profitable businesses. Social entrepreneurs evaluate the performance of their ventures not only by financial metrics but also by ecological and social contribution (*profits, planet, and people*). They use a *triple-bottom-line* approach to assess performance (discussed in Chapter 5). Examples of social entrepreneurship ventures include Teach For America (see MiniCase 2), TOMS Shoes (which gives a pair of shoes to an economically disadvantaged child for every pair of shoes it sells), Better World Books (an online bookstore that “harnesses the power of capitalism to bring literacy and opportunity to people around the world”),²⁸ and Wikipedia (see following and MiniCase 17).

The founder of Wikipedia, Jimmy Wales, typifies social entrepreneurship.²⁹ Raised in Alabama, Wales was educated by his mother and grandmother who ran a nontraditional school. In 1994, he dropped out of a doctoral program in economics at Indiana University to take a job at a stock brokerage firm in Chicago. In the evenings he wrote computer code for fun and built a web browser. During the late 1990s’ Internet boom, Wales was one of the first to grasp the power of an open-source method to provide knowledge on a very large scale. What differentiates Wales from other web entrepreneurs is his idealism: Wikipedia is free for the end user and supports itself solely by donations and not, for example, by online advertising. Wikipedia has 35 million articles in 288 languages, including some 5 million items in English. About 500 million people use Wikipedia each month. Wales’ idealism is a form of social entrepreneurship: His vision is to make the entire repository of human knowledge available to anyone anywhere for free.

Since entrepreneurs and the innovations they unleash frequently create entire new industries, we now turn to a discussion of the industry life cycle to derive implications for competitive strategy.

7.3 Innovation and the Industry Life Cycle

social entrepreneurship
The pursuit of social goals while creating a profitable business.

LO 7-3
Describe the competitive implications of different stages in the industry life cycle.

Innovations frequently lead to the birth of new industries. Innovative advances in IT and logistics facilitated the creation of the overnight express delivery industry by FedEx and that of big-box retailing by Walmart. The Internet set online retailing in motion, with new companies such as Amazon and eBay taking the lead, and it revolutionized the advertising industry first through Yahoo, and later Google and Facebook. Advances in nanotechnology are revolutionizing many different industries, ranging from medical diagnostics and surgery to lighter and stronger airplane components.³⁰

Industries tend to follow a predictable **industry life cycle**: As an industry evolves over time, we can identify five distinct stages: *introduction, growth, shakeout, maturity, and decline*.³¹ We will illustrate how the type of innovation and resulting strategic implications change at each stage of the life cycle as well as how innovation can initiate and drive a new life cycle.

The number and size of competitors change as the industry life cycle unfolds, and different types of consumers enter the market at each stage. That is, both the supply and demand sides of the market change as the industry ages. Each stage of the industry life cycle requires different competencies for the firm to perform well and to satisfy that stage’s

industry life cycle
The five different stages—introduction, growth, shakeout, maturity, and decline—that occur in the evolution of an industry over time.

unique customer group. We first introduce the life cycle model before discussing different customer groups in more depth when introducing the crossing-the-chasm concept later in this chapter.³²

Exhibit 7.4 depicts a typical industry life cycle, focusing on the smartphone industry in emerging and developed economies. In a stylized industry life cycle model, the horizontal axis shows time (in years) and the vertical axis market size. In Exhibit 7.4, however, we are taking a snapshot of the global smartphone industry in the year 2016. This implies that we are joining two different life cycles (one for emerging economies and one for developed economies) in the same exhibit at one point in time.

The development of most industries follows an S-curve. Initial demand for a new product or service is often slow to take off, then accelerates, before decelerating, and eventually turning to zero, and even becoming negative as a market contracts.

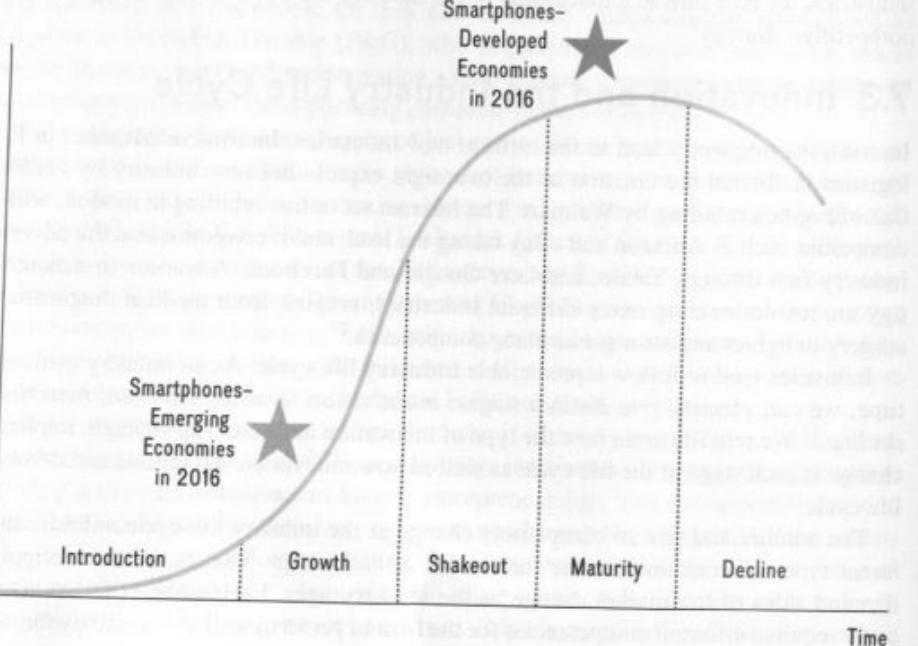
As shown in Exhibit 7.4, in emerging economies such as Argentina, Brazil, China, India, Indonesia, Mexico, and Russia, the smartphone industry is in the growth stage (in 2016). The market for smartphones in these countries is expected to grow rapidly over the next few years. More and more of the consumers in these countries with very large populations are expected to upgrade from a simple mobile phone to a smartphone such as the Apple iPhone, Samsung Galaxy, or Xiaomi's popular Mi2S phone.

In contrast, the market for smartphones is in the maturity stage in 2016 in developed economies such as Australia, Canada, Germany, Japan, South Korea, the United Kingdom, and the United States. This implies that developed economies moved through the prior three stages of the industry life cycle (introductory, growth, and shakeout) some years earlier. Because the smartphone industry is mature in these markets, little or no growth in market size is expected over the next few years because most consumers own smartphones. This implies that any market share gain by one firm comes at the expense of others, as users replace older smartphones with newer models. Competitive intensity is expected to be high.

Each stage of the industry life cycle—introduction, growth, shakeout, maturity, and decline—has different strategic implications for competing firms. We now discuss each stage in detail.

EXHIBIT 7.4 /

Industry Life Cycle:
The Smartphone
Industry in Emerging
and Developed
Economies



INTRODUCTION STAGE

When an individual inventor or company launches a successful innovation, a new industry may emerge. In this introductory stage, the innovator's core competency is R&D, which is necessary to creating a new product category that will attract customers. This is a capital-intensive process, in which the innovator is investing in designing a unique product, trying new ideas to attract customers, and producing small quantities—all of which contribute to a high price when the product is launched. The initial market size is small, and growth is slow.

In this introductory stage, when barriers to entry tend to be high, generally only a few firms are active in the market. In their competitive struggle for market share, they emphasize unique product features and performance rather than price.

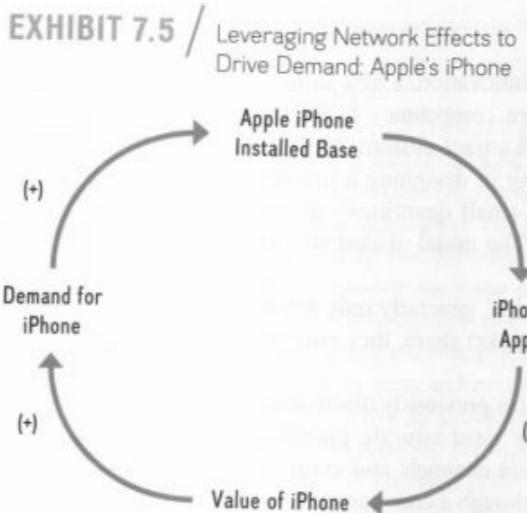
Although there are some benefits to being early in the market (as previously discussed), innovators also may encounter *first-mover disadvantages*. They must educate potential customers about the product's intended benefits, find distribution channels and complementary assets, and continue to perfect the fledgling product. Although a core competency in R&D is necessary to create or enter an industry in the introductory stage, some competency in marketing also is helpful in achieving a successful product launch and market acceptance. Competition can be intense, and early winners are well-positioned to stake out a strong position for the future. As one of the main innovators in software for mobile devices, Google's Android operating system for smartphones is enjoying a strong market position and substantial lead over competitors.

The strategic objective during the introductory stage is to achieve market acceptance and seed future growth. One way to accomplish these objectives is to initiate and leverage **network effects**,³³ the positive effect that one user of a product or service has on the value of that product for other users. Network effects occur when the value of a product or service increases, often exponentially, with the number of users. If successful, network effects propel the industry to the next stage of the life cycle, the growth stage (which we discuss next).

Apple effectively leveraged the network effects generated by numerous complementary software applications (apps) available via iTunes to create a tightly integrated ecosystem of hardware, software, and services, which competitors find hard to crack. The consequence has been a competitive advantage for over a decade, beginning with the introduction of the iPod in 2001 and iTunes in 2003. Apple launched its enormously successful iPhone in the summer of 2007. A year later, it followed up with the Apple App Store, which boasts, for almost anything you might need, “there’s an app for that.” Apps are small software programs developed to provide mobile users with inexpensive business and personal services wherever they may be. Popular apps allow iPhone users to access their business contacts via LinkedIn, hail a ride via Uber, call colleagues overseas via Skype, check delivery of their Zappos packages shipped via UPS, get the latest news on Twitter, and engage in customer relationship management using Salesforce.com. You can stream music via Pandora, post photos using Instagram, watch Netflix, access Facebook to check on your friends, or video message using Snapchat.

Even more important is the effect that apps have on the value of an iPhone. Arguably, the explosive growth of the iPhone is due to the fact that the Apple App Store offers the largest selection of apps to its users. The 1.5 million apps available were downloaded 75 billion times as of spring 2015. Moreover, Apple argues that users have a better experience because the apps take advantage of the tight integration of hardware and software provided by the iPhone. The availability of apps, in turn, leads to network effects that increase the value of the iPhone for its users. Exhibit 7.5 shows how. Increased value creation, as we know from Chapter 6, is positively related to demand, which in turn

network effects
The positive effect (externality) that one user of a product or service has on the value of that product for other users.

EXHIBIT 7.5

increases the installed base, meaning the number of people using an iPhone. As of the spring of 2015, Apple had sold more than 75 million iPhone 6 models, introduced just six months prior. As the installed base of iPhone users further increases, this incentivizes software developers to write even more apps. Making apps widely available strengthened Apple's position in the smartphone industry. Based on positive feedback loops, a virtuous cycle emerges where one factor positively reinforces another. Apple's ecosystem based on integrated hardware, software, and services providing a superior user experience is hard to crack for competitors. Apple now hopes that its vast App Store in combination with a seamless user experience will now also ignite a virtuous cycle of continuous demand based on network effects for its Apple Watch, introduced in early 2015.³⁴

GROWTH STAGE

Market growth accelerates in the growth stage of the industry life cycle (see Exhibit 7.4). After the initial innovation has gained some market acceptance, demand increases rapidly as first-time buyers rush to enter the market, convinced by the proof of concept demonstrated in the introductory stage.

As the size of the market expands, a **standard** signals the market's agreement on a common set of engineering features and design choices.³⁵ Standards can emerge bottom-up through competition in the marketplace or be imposed top-down by government or other standard-setting agencies such as the Institute of Electrical and Electronics Engineers (IEEE) that develops and sets industrial standards in a broad range of industries, including energy, electric power, biomedical and health care technology, IT, telecommunications, consumer electronics, aerospace, and nanotechnology.

An agreed-upon standard, such as the IBM PC, ensures that all components of the system work well together, regardless of who developed them. It also helps legitimize the new technology by reducing uncertainty and confusion. A standard tends to capture a larger market share and can persist for a long time.

In the 1980s, the Wintel standard (a portmanteau of Windows and Intel) marked the beginning of exponential growth in the personal computer industry; it still holds some 90 percent of market share in personal computers. In the 2000s we saw a standards war between the HD-DVD format and the higher-definition rival, the Blu-ray Disc (BD). Blu-ray, backed by an association of electronics companies including Sony, Panasonic, and others, bested the HD-DVD format backed by Toshiba. Some argue that Sony's PlayStation 3 acted as a catalyst for adopting the Blu-ray format. A tipping point in favor of the Blu-ray format may have been the decision in 2008 by Warner Bros. to release discs only in Blu-ray format. Leading retailers such as Walmart and Best Buy began carrying DVDs in Blu-ray format and did not stock as large a selection in the HD-DVD format; Netflix and Blockbuster also fell in line. As a consequence, many companies stopped making HD-DVD players. Barriers to entry fell as technological uncertainties were overcome, and many new and established firms rushed to participate in the growth opportunity. As a side note, Sony and others never reaped the full rewards of this victory. Today the HD-DVD format still prevails, and wars on media formats have been overshadowed by delivery through video on demand (VOD) and streaming.

standard
An agreed-upon solution about a common set of engineering features and design choices.

Government bodies or industry associations can also set standards by making top-down decisions. The European Union determined in the 1980s that GSM (Global System for Mobile Communications) should be the standard for cell phones in Europe. The United States relied instead on a market-based approach, and CDMA (Code Division Multiple Access), a proprietary standard developed by Qualcomm, emerged as an early leader. While North American manufacturers and service providers such as AT&T, Verizon, Motorola, and others were fighting a format war, Scandinavian companies such as Nokia and Ericsson faced no such uncertainty, and they leveraged their early lead into a temporary competitive advantage. Today, about 80 percent of the global mobile market uses the GSM standard.

Since demand is strong during the growth phase, both efficient and inefficient firms thrive; the rising tide lifts all boats. Moreover, prices begin to fall, often rapidly, as standard business processes are put in place and firms begin to reap economies of scale and learning. Distribution channels are expanded, and complementary assets in the form of products and services become widely available.³⁶

After a standard is established in an industry, the basis of competition tends to move away from product innovations toward process innovations.³⁷ **Product innovations**, as the name suggests, are new or recombined knowledge embodied in new products—the jet airplane, electric vehicle, smartphones, and wearable computers. **Process innovations** are new ways to produce existing products or to deliver existing services. Process innovations are made possible through advances such as the Internet, lean manufacturing, Six Sigma, biotechnology, nanotechnology, and so on.

Process innovation must not be high-tech to be impactful, however. The invention of the standardized shipping container, for instance, has transformed global trade.³⁸ By loading goods into uniform containers that could easily be moved between trucks, rail, and ships, significant savings in cost and time were accomplished. Before containerization was invented some 60 years ago, it cost almost \$6 to load a ton of (loose) cargo, and theft was rampant. After containerization, the cost for loading a ton of cargo had plummeted to \$0.16 and theft all but disappeared (because containers are sealed at the departing factory). Efficiency gains in terms of labor and time were even more impressive. Before containerization, dock labor could move 1.7 tons per hour onto a cargo ship. After containerization, this had jumped to 30 tons per hour. Ports are now able to accommodate much larger ships, and travel time across the oceans has fallen in half. As a consequence, costs for shipping goods across the globe have fallen rapidly. Moreover, containerization enabled optimization of global supply chains and set the stage for subsequent process innovations such as *just-in-time (JIT) operations management*. Taken together, a set of research studies estimated that containerization alone more than tripled international trade within five years of adopting this critical process innovation.³⁹

Exhibit 7.6 shows the level of product and process innovation throughout the entire life cycle.⁴⁰ In the introductory stage, the level of *product innovation* is at a maximum because new features increasing perceived consumer value are critical to gaining traction in the market. In contrast, process innovation is at a minimum in the introductory stage because companies produce only a small number of products, often just prototypes or beta versions. The main concern is to commercialize the invention—that is, to demonstrate that the product works and that a market exists.

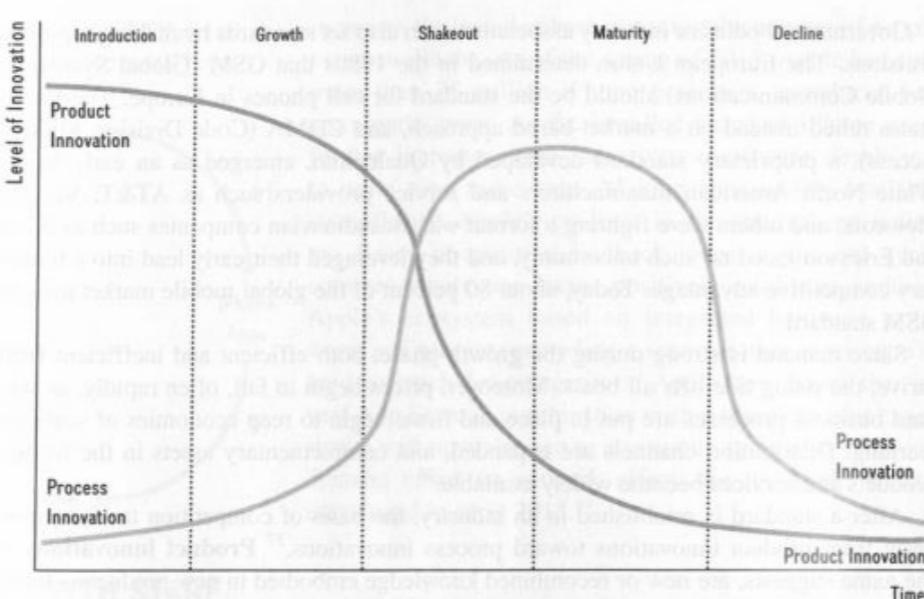
The relative importance, however, reverses over time. Frequently, a standard emerges during the growth stage of the industry life cycle (see the second column, "Growth," in Exhibit 7.6). At that point, most of the technological and commercial uncertainties about the new product are gone. After the market accepts a new product, and a standard for the new technology has emerged, *process innovation* rapidly becomes more important than

product innovation
New or recombined knowledge embodied in new products.

process innovation
New ways to produce existing products or deliver existing services.

EXHIBIT 7.6 /

Product and Process Innovation throughout an Industry Life Cycle



product innovation. As market demand increases, economies of scale kick in: Firms establish and optimize standard business processes through applications of lean manufacturing, Six Sigma, and so on. As a consequence, product improvements become incremental, while the level of process innovation rises rapidly.

During the growth stage, process innovation ramps up (at increasing marginal returns) as firms attempt to keep up with rapidly rising demand while attempting to bring down costs at the same time. The core competencies for competitive advantage in the growth stage tend to shift toward manufacturing and marketing capabilities. At the same time, the R&D emphasis tends to shift to process innovation for improved efficiency. Competitive rivalry is somewhat muted because the market is growing fast.

Since market demand is robust in this stage and more competitors have entered the market, there tends to be more strategic variety: Some competitors will continue to follow a *differentiation strategy*, emphasizing unique features, product functionality, and reliability. Other firms employ a *cost-leadership strategy* in order to offer an acceptable level of value but lower prices to consumers. They realize that lower cost is likely a key success factor in the future, because this will allow the firm to lower prices and attract more consumers into the market. When introduced in the spring of 2010, for example, Apple's first-generation iPad was priced at \$829 for 64GB with a 3G Wi-Fi connection.⁴¹ Just three years later, in spring 2013, the same model was priced at only one-third of the original price, or \$275.⁴² Access to efficient and large-scale manufacturing operations (such as those offered by Foxconn in China, the company that assembles most of Apple's products) and effective supply chain capabilities are key success factors when market demand increases rapidly. By 2015, Gazelle, an ecommerce company that allows people to sell their electronic devices and to buy pre-certified used ones, offered \$30 for a "flawless" first-generation iPad.

The key objective for firms during the growth phase is to stake out a strong strategic position not easily imitated by rivals. In the fast-growing shapewear industry, startup company Spanx has staked out a strong position. In 1998, Florida State University graduate Sara Blakely decided to cut the feet off her pantyhose to enhance her looks when wearing pants.⁴³ Soon after she obtained a patent for her bodyshaping undergarments, and

Spanx began production and retailing of its shapewear in 2000. Sales grew exponentially after Blakely appeared on *The Oprah Winfrey Show*. By 2015, Spanx had grown to 150 employees and sold millions of Spanx "power panties," with revenues exceeding \$250 million. To stake out a strong position and to preempt competitors, Spanx now offers over 200 products ranging from slimming apparel and swimsuits to bras and activewear. Moreover, it now designs and manufactures bodyshaping undergarments for men ("Spanx for Men—Manx"). Spanx products are now available in over 50 countries globally via the Internet. Moreover, to strengthen its strategic position and brand image in the United States, Spanx is opening retail stores across the country.

The shapewear industry's explosive growth has attracted several other players: Flexees by Maidenform, BodyWrap, and Miraclesuit, to name a few. They are all attempting to carve out positions in the new industry. Given Spanx's ability to stake out a strong position during the growth stage of the industry life cycle and the fact that it continues to be a moving target, it might be difficult for competitors to dislodge the company.

Taking the risk paid off for Spanx's founder: After investing an initial \$5,000 into her startup, Blakely became the world's youngest self-made female billionaire. Blakely was also listed in the Time 100, the annual list of the most influential people in the world.

SHAKEOUT STAGE

Rapid industry growth and expansion cannot go on indefinitely. As the industry moves into the next stage of the industry life cycle, the rate of growth declines (see Exhibit 7.4). Firms begin to compete directly against one another for market share, rather than trying to capture a share of an increasing pie. As competitive intensity increases, the weaker firms are forced out of the industry. This is the reason this phase of the industry life cycle is called the shakeout stage: Only the strongest competitors survive increasing rivalry as firms begin to cut prices and offer more services, all in an attempt to gain more of a market that grows slowly, if at all. This type of cut-throat competition erodes profitability of all but the most efficient firms in the industry. As a consequence, the industry often consolidates, as the weakest competitors either are acquired by stronger firms or exit through bankruptcy.

The winners in this increasingly competitive environment are often firms that stake out a strong position as cost leaders. Key success factors at this stage are the manufacturing and process engineering capabilities that can be used to drive costs down. The importance of process innovation further increases (albeit at diminishing marginal returns), while the importance of product innovation further declines.

Assuming an acceptable value proposition, price becomes a more important competitive weapon in the shakeout stage, because product features and performance requirements tend to be well-established. A few firms may be able to implement a blue ocean strategy, combining differentiation and low cost, but given the intensity of competition, many weaker firms are forced to exit. Any firm that does not have a clear strategic profile is likely to not survive the shakeout phase.



Sara Blakely, founder and long-time CEO of Spanx. World's youngest female billionaire.
© Zuma Press, Inc/Alamy

MATURITY STAGE

After the shakeout is completed and a few firms remain, the industry enters the maturity stage. During the fourth stage of the industry life cycle, the industry structure morphs into an oligopoly with only a few large firms. Most of the demand was largely satisfied in the prior shakeout stage. Any additional market demand in the maturity stage is limited. Demand now consists of replacement or repeat purchases. The market has reached its maximum size, and industry growth is likely to be zero or even negative going forward. This decrease in market demand increases competitive intensity within the industry. In the maturity stage, the level of process innovation reaches its maximum as firms attempt to lower cost as much as possible, while the level of incremental product innovation sinks to its minimum (see Exhibit 7.6).

Generally, the firms that survive the shakeout stage tend to be larger and enjoy economies of scale, as the industry consolidated and most excess capacity was removed. As shown in Exhibit 7.4, the smartphone industry in the United States and other developed economies is in the maturity stage. Competitive intensity is likely to increase even further going forward.

The domestic airline industry has been in the maturity stage for a long time. The large number of bankruptcies as well as the wave of mega-mergers, such as those of Delta and Northwest, United and Continental, and American Airlines and US Airways, are a consequence of low or zero growth in a mature market characterized by significant excess capacity.

DECLINE STAGE

Changes in the external environment (such as those discussed in Chapter 3 when presenting the PESTEL framework) often take industries from maturity to decline. In this final stage of the industry life cycle, the size of the market contracts further as demand falls, often rapidly. At this final phase of the industry life cycle, innovation efforts along both product and process dimensions cease (see Exhibit 7.6). If a technological or business model breakthrough emerges that opens up a *new* industry, however, then this dynamic interplay between product and process innovation starts anew.

If there is any remaining excess industry capacity in the decline stage, this puts strong pressure on prices and can further increase competitive intensity, especially if the industry has high exit barriers. At this final stage of the industry life cycle, managers generally have four strategic options: *exit*, *harvest*, *maintain*, or *consolidate*.⁴⁴

- **Exit.** Some firms are forced to *exit* the industry by bankruptcy or liquidation. The U.S. textile industry has experienced a large number of exits over the last few decades, mainly due to low-cost foreign competition.
- **Harvest.** In pursuing a *harvest strategy*, the firm reduces investments in product support and allocates only a minimum of human and other resources. While several companies such as IBM, Brother, Olivetti, and Nakajima still offer typewriters, they don't invest much in future innovation. Instead, they are maximizing cash flow from their existing typewriter product line.
- **Maintain.** Philip Morris, on the other hand, is following a *Maintain strategy* with its Marlboro brand, continuing to support marketing efforts at a given level despite the fact that U.S. cigarette consumption has been declining.
- **Consolidate.** Although market size shrinks in a declining industry, some firms may choose to *consolidate* the industry by buying rivals. This allows the consolidating firm to stake out a strong position—possibly approaching monopolistic market power, albeit in a declining industry.

Although chewing tobacco is a declining industry, Swedish Match has pursued a number of acquisitions to consolidate its strategic position in the industry. It acquired, among other firms, the Pinkerton Tobacco Company of Owensboro, Kentucky, maker of the Red Man brand. Red Man is the leading chewing tobacco brand in the United States. Red Man has carved out a strong strategic position built on a superior reputation for a quality product and by past endorsements of Major League Baseball players since 1904. Despite gory product warnings detailing the health risk of chewing tobacco and a federally mandated prohibition on marketing, the Red Man brand has remained not only popular, but also profitable.

CROSSING THE CHASM

The industry life cycle model assumes a more or less smooth transition from one stage to another. This holds true for most continuous innovations that require little or no change in consumer behavior. But not all innovations enjoy such continuity.

In the influential bestseller *Crossing the Chasm*⁴⁵ Geoffrey Moore documented that many innovators were unable to successfully transition from one stage of the industry life cycle to the next. Based on empirical observations, Moore's core argument is that *each stage of the industry life cycle is dominated by a different customer group*. Different customer groups with distinctly different preferences enter the industry at each stage of the industry life cycle. Each customer group responds differently to a technological innovation. This is due to differences in the psychological, demographic, and social attributes observed in each unique customer segment. Moore's main contribution is that the significant differences between the *early* customer groups—who enter during the introductory stage of the industry life cycle—and *later* customers—who enter during the growth stage—can make for a difficult transition between the different parts of the industry life cycle. Such differences between customer groups lead to a big gulf or *chasm* into which companies and their innovations frequently fall. Only companies that recognize these differences and are able to apply the appropriate competencies at each stage of the industry life cycle will have a chance to transition successfully from stage to stage.

Exhibit 7.7 shows the **crossing-the-chasm framework** and the different customer segments. The industry life cycle model (shown in Exhibit 7.4) follows an S-curve leading up to 100 percent total market potential that can be reached during the maturity

LO 7.4

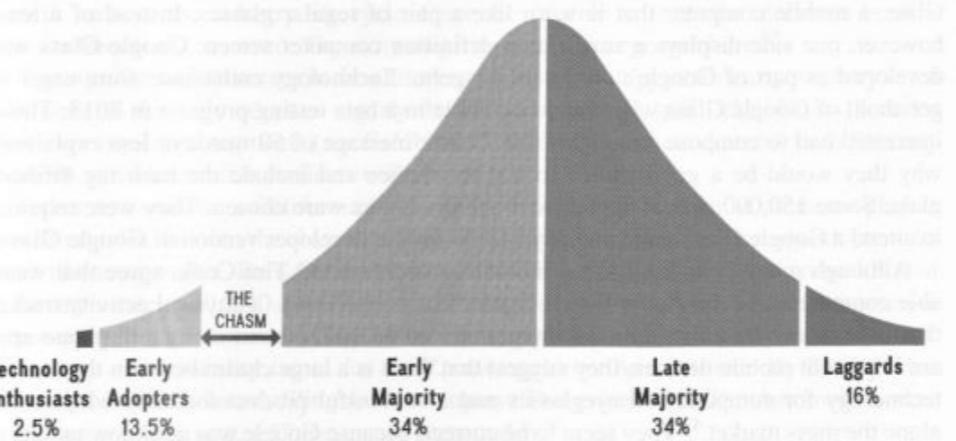
Derive strategic implications of the crossing-the-chasm framework.

crossing-the-chasm framework
Conceptual model that shows how each stage of the industry life cycle is dominated by a different customer group.

EXHIBIT 7.7 /

The Crossing-the-Chasm Framework

Source: Adapted from G.A. Moore (1991), *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers* (New York: HarperCollins), p. 17.



stage. In contrast, the *chasm framework* breaks down the 100 percent market potential into different customer segments, highlighting the *incremental* contribution each specific segment can bring into the market. This results in the familiar bell curve. Note the big gulf, or *chasm*, separating the early adopters from the early and late majority that make up the mass market. Social network sites have followed a pattern similar to that illustrated in Exhibit 7.7. Friendster was unable to cross the big chasm. MySpace was successful with the early majority, but only Facebook went on to succeed with the late majority and laggards. Each stage customer segment, moreover, is also separated by smaller chasms. Both the large competitive chasm and the smaller ones have strategic implications.

Both new technology ventures and innovations introduced by established firms have a high failure rate. This can be explained as a failure to successfully cross the chasm from the early users to the mass market because the firm does not recognize that the business strategy needs to be fine-tuned for each customer segment. Formulating a business strategy for each segment guided by the *who, what, why, and how* questions of competition (Who to serve? What needs to satisfy? Why and how to satisfy them?), introduced in Chapter 6, the firm will find that the core competencies to satisfy each of the different customer segments are quite different. If not recognized and addressed, this will lead to the demise of the innovation as it crashes into the chasm between life cycle stages.

We first introduce each customer group and map it to the respective stage of the industry life cycle. To illustrate, we then apply the chasm framework to an analysis of the mobile phone industry.

TECHNOLOGY ENTHUSIASTS. The customer segment in the introductory stage of the industry life cycle is called *technology enthusiasts*.⁴⁶ The smallest market segment, it makes up some 2.5 percent of total market potential. Technology enthusiasts often have an engineering mind-set and pursue new technology proactively. They frequently seek out new products before the products are officially introduced into the market. Technology enthusiasts enjoy using beta versions of products, tinkering with the product's imperfections and providing (free) feedback and suggestions to companies. For example, many software companies such as Google and Microsoft launch beta versions to accumulate customer feedback to work out bugs before the official launch. Moreover, technology enthusiasts will often pay a premium price to have the latest gadget. The endorsement by technology enthusiasts validates the fact that the new product does in fact work.

A recent example of an innovation that appeals to technology enthusiasts is Google Glass, a mobile computer that is worn like a pair of regular glasses. Instead of a lens, however, one side displays a small, high-definition computer screen. Google Glass was developed as part of Google's wild-card program. Technology enthusiasts were eager to get ahold of Google Glass when made available in a beta testing program in 2013. Those interested had to compose a Google+ or Twitter message of 50 words or less explaining why they would be a good choice to test the device and include the hash tag #ifihadglass. Some 150,000 people applied and 8,000 winners were chosen. They were required to attend a Google Glass event and pay \$1,500 for the developer version of Google Glass.

Although many industry leaders, including Apple's CEO Tim Cook, agree that wearable computers like the Apple Watch or the Nike + FuelBand (a physical activity tracker that is worn on the wrist; data are integrated into an online community and phone app) are important mobile devices, they suggest that there is a large chasm between the current technology for computerized eyeglasses and a successful product for early adopters let alone the mass market.⁴⁷ They seem to be correct, because Google was until now unable to

cross the chasm between technology enthusiasts and early adopters, even after spending \$10 billion on R&D per year.⁴⁸

EARLY ADOPTERS. The customers entering the market in the growth stage are *early adopters*. They make up roughly 13.5 percent of the total market potential. Early adopters, as the name suggests, are eager to buy early into a new technology or product concept. Unlike technology enthusiasts, however, their demand is driven by their imagination and creativity rather than by the technology per se. They recognize and appreciate the possibilities the new technology can afford them in their professional and personal lives. Early adopters' demand is fueled more by intuition and vision rather than technology concerns. These are the people that lined up at Apple Stores in the spring of 2015 when it introduced Apple Watch. Since early adopters are not influenced by standard technological performance metrics but by intuition and imagination (What can this new product do for me or my business?), the firm needs to communicate the product's potential applications in a more direct way than when it attracted the initial technology enthusiasts. Attracting the early adopters to the new offering is critical to opening any new high-tech market segment.

EARLY MAJORITY. The customers coming into the market in the shakeout stage are called *early majority*. Their main consideration in deciding whether or not to adopt a new technological innovation is a strong sense of practicality. They are pragmatists and are most concerned with the question of what the new technology can do for them. Before adopting a new product or service, they weigh the benefits and costs carefully. Customers in the early majority are aware that many hyped new product introductions will fade away, so they prefer to wait and see how things shake out. They like to observe how early adopters are using the product. Early majority customers rely on endorsements by others. They seek out reputable references such as reviews in prominent trade journals or in magazines such as *Consumer Reports*.

Because the early majority makes up roughly one-third of the entire market potential, winning them over is critical to the commercial success of the innovation. They are on the cusp of the mass market. Bringing the early majority on board is the key to catching the growth wave of the industry life cycle. Once they decide to enter the market, a *herding effect* is frequently observed: The early majority enters in large numbers.⁴⁹

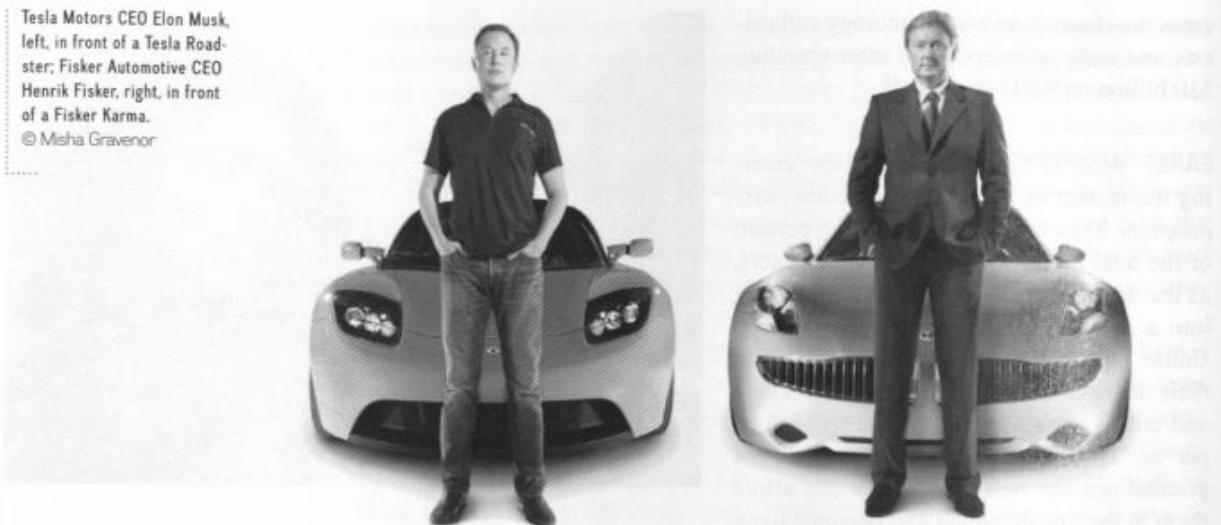
The significant differences in the attitudes toward technology of the early majority when compared to the early adopters signify the wide competitive gulf—the *chasm*—between these two consumer segments (see Exhibit 7.7). Without adequate demand from the early majority, most innovative products wither away.

Fisker Automotive, a California-based designer and manufacturer of premium plug-in hybrid vehicles, fell into the chasm because it was unable to transition to early adopters, let alone the mass market. Between its founding in 2007 and 2012, Fisker sold some 1,800 of its Karma model, a \$100K sports car, to technology enthusiasts. It was unable, however, to follow up with a lower-cost model to attract the early adopters into the market. In addition, technology and reliability issues for the Karma could not be overcome. By 2013, Fisker had crashed into a chasm, filing for bankruptcy. The assets of Fisker Automotive were purchased by Wanxiang, a Chinese auto parts maker.⁵⁰



Google Glass allows the wearer to use the Internet and smartphone-like applications via voice commands (e.g., conduct online search, stream video, and so on).
© AP Photo/Google/Rex Features

Tesla Motors CEO Elon Musk, left, in front of a Tesla Roadster; Fisker Automotive CEO Henrik Fisker, right, in front of a Fisker Karma.
© Misha Gravenor



In contrast, Tesla Motors, the maker of all-electric vehicles introduced in Chapter Case 3, and a fierce rival of Fisker at one time, was able to overcome some of the early chasms. The Tesla Roadster was a proof-of-concept car that demonstrated that electric vehicles could achieve an equal or better performance than the very best gasoline-engine sports cars. The 2,400 Roadsters that Tesla built between 2008 and 2012 were purchased by technology enthusiasts. Next, Tesla successfully launched the Model S, a family sedan, sold to early adopters. The Tesla Model S received a strong endorsement as the 2013 *Motor-Trend* Car of the Year and the highest test scores ever awarded by *Consumer Reports*. This may help in crossing the chasm to the early majority, because consumers would now feel more comfortable in considering and purchasing a Tesla vehicle. Tesla is hoping to cross the large competitive chasm between early adopters and early majority with its Model X (a minivan, SUV crossover) and its new, lower-priced Model 3, coming out in 2017.

LATE MAJORITY. The next wave of growth comes from buyers in the *late majority* entering the market in the maturity stage. Like the early majority, they are a large customer segment, making up approximately 34 percent of the total market potential. Combined, the early adopters and early majority make up the lion's share of the market potential. Demand coming from just two groups—early and late majority—drives most industry growth and firm profitability.

Members of the early and late majority are also quite similar in their attitudes toward new technology. The late majority shares all the concerns of the early majority. But there are important differences. Although members of the early majority are confident in their ability to master the new technology, the late majority is not. They prefer to wait until standards have emerged and are firmly entrenched, so that uncertainty is much reduced. The late majority also prefers to buy from well-established firms with a strong brand image rather than from unknown new ventures.

LAGGARDS. Finally, *laggards* are the last consumer segment to come into the market, entering in the declining stage of the industry life cycle. These are customers who adopt a new product only if it is absolutely necessary, such as first-time cell phone adopters in the United States today. These customers generally don't want new technology, either for personal or economic reasons. Given their reluctance to adopt new technology, they are generally not considered worth pursuing. Laggards make up no more than 16 percent of

the total market potential. Their demand is far too small to compensate for reduced demand from the early and late majority (jointly almost 70 percent of total market demand), who are moving on to different products and services.

CROSSING THE CHASM: APPLICATION TO THE MOBILE PHONE INDUSTRY. Let's apply the crossing-the-chasm framework to one specific industry. In this model, the transition from stage to stage in the industry life cycle is characterized by different competitive chasms that open up because of important differences between customer groups. Although the large chasm between early adopters and the early majority is the main cause of demise for technological innovations, other smaller mini-chasms open between each stage.

Exhibit 7.8 shows the application of the chasm model to the mobile phone industry. The first victim was Motorola's Iridium, an ill-fated satellite-based telephone system.⁵¹ Development began in 1992 after the spouse of a Motorola engineer complained about being unable to get any data or voice access to check on clients while vacationing on a remote island. Motorola's solution was to launch 66 satellites into low orbit to provide global voice and data coverage. In late 1998, Motorola began offering its satellite phone service, charging \$5,000 per handset (which was almost too heavy to carry around) and up to \$14 per minute for calls.⁵² Problems in consumer adoption beyond the few technology enthusiasts became rapidly apparent. The Iridium phone could not be used inside buildings or in cars. Rather, to receive a satellite signal, the phone needed an unobstructed line of sight to a satellite. Iridium crashed into the first chasm, never moving beyond technology enthusiasts (see Exhibit 7.8). For Motorola, it was a billion-dollar blunder. Iridium was soon displaced by cell phones that relied on Earth-based networks of radio towers. The global satellite telephone industry never moved beyond the introductory stage of the industry life cycle.

The first Treo, a fully functioning smartphone combining voice and data capabilities, was released in 2002 by Handspring. The Treo fell into the main chasm that arises between early adopters and the early majority (see Exhibit 7.8). Technical problems, combined with a lack of apps and an overly rigid contract with Sprint as its sole service provider, prevented the Treo from gaining traction in the market beyond early adopters. For these reasons, the Treo was not an attractive product for the early majority, who rejected it. This caused the Treo to plunge into the chasm. Just a year later, Handspring was folded into Palm, which in turn was acquired by HP for \$1 billion in 2010.⁵³ HP shut down Palm in 2011 and wrote off the acquisition.⁵⁴

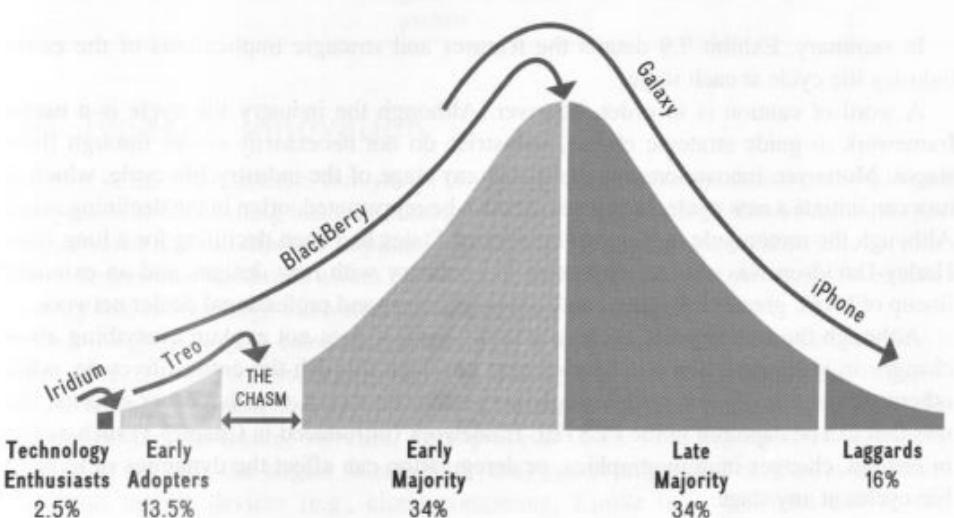


EXHIBIT 7.8 /

Crossing the Chasm:
The Mobile Phone
Industry

Research in Motion (RIM)⁵⁵ introduced its first fully functioning BlackBerry smartphone in 2000. It was a huge success—especially with two key consumer segments. First, corporate IT managers were early adopters. They became product champions for the BlackBerry because of its encrypted security software and its reliability in always staying connected to a company's network. This allowed users to receive e-mail and other data in real time, anywhere in the world where wireless service was provided. Second, corporate executives were the early majority pulling the BlackBerry over the chasm because it allowed 24/7 access to data and voice. RIM was able to create a beachhead to cross the chasm between the technology enthusiasts and early adopters on one side and the early majority on the other.⁵⁶ RIM's managers identified the needs of not only early adopters (e.g., IT managers) but also the early majority (e.g., executives), who pulled the BlackBerry over the chasm. By 2005, the BlackBerry had become a corporate executive status symbol. As a consequence of capturing the first three stages of the industry life cycle, between 2002 and 2007, RIM enjoyed no less than 30 percent year-over-year revenue growth as well as double-digit growth in other financial performance metrics such as return on equity. RIM enjoyed a temporary competitive advantage.

In 2007, RIM's dominance over the smartphone market began to erode quickly. The main reason was Apple's introduction of the iPhone. Although technology enthusiasts and early adopters argue that the iPhone is an inferior product to the BlackBerry based on technological criteria, the iPhone enticed not only the early majority, but also the late majority to enter the market. For the late majority, encrypted software security was much less important than having fun with a device that allowed users to surf the web, take pictures, play games, and send and receive e-mail. Moreover, the Apple iTunes Store soon provided thousands of apps for basically any kind of service. While the BlackBerry couldn't cross the gulf between the early and the late majority, Apple's iPhone captured the mass market rapidly. Moreover, consumers began to bring their personal iPhone to work, which forced corporate IT departments to expand their services beyond the BlackBerry. Apple rode the wave of this success to capture each market segment. Likewise, Samsung with its Galaxy line of phones, having successfully imitated the look-and-feel of an iPhone (as discussed in Chapter 4), is enjoying similar success across the different market segments.

This brief application of the chasm framework to the mobile phone industry shows its usefulness. It provides insightful explanations of why some companies failed, while others succeeded—and thus goes at the core of strategy management.

In summary, Exhibit 7.9 details the features and strategic implications of the entire industry life cycle at each stage.

A word of caution is in order, however: Although the industry life cycle is a useful framework to guide strategic choice, industries do not *necessarily evolve* through these stages. Moreover, innovations can emerge at any stage of the industry life cycle, which in turn can initiate a new cycle. Industries can also be rejuvenated, often in the declining stage. Although the motorcycle industry in the United States had been declining for a long time, Harley-Davidson was able to rejuvenate the industry with new designs and an extended lineup of bikes, greater reliability, and a more efficient and professional dealer network.

Although the industry life cycle is a useful tool, it does not explain everything about changes in industries. Some industries may never go through the entire life cycle, while others are continually renewed through innovation. Be aware, too, that other external factors that can be captured in the PESTEL framework (introduced in Chapter 3) such as fads in fashion, changes in demographics, or deregulation can affect the dynamics of industry life cycles at any stage.

EXHIBIT 7.9 / Features and Strategic Implications of the Industry Life Cycle

	Life Cycle Stages				
	Introduction	Growth	Shakeout	Maturity	Decline
Core Competency	R&D, some marketing	R&D, some manufacturing, marketing	Manufacturing, process engineering	Manufacturing, process engineering, marketing	Manufacturing, process engineering, marketing, service
Type and Level of Innovation	Product innovation at a maximum; process innovation at a minimum	Product innovation decreasing; process innovation increasing	After emergence of standard: product innovation decreasing rapidly; process innovation increasing rapidly	Product innovation at a minimum; process innovation at a maximum	Product and process innovation ceased
Market Growth	Slow	High	Moderate and slowing down	None to moderate	Negative
Market Size	Small	Moderate	Large	Largest	Small to moderate
Price	High	Falling	Moderate	Low	Low to high
Number of Competitors	Few, if any	Many	Fewer	Moderate, but large	Few, if any
Mode of Competition	Non-price competition	Non-price competition	Shifting from non-price to price competition	Price	Price or non-price competition
Customer	Technology enthusiasts	Early adopters	Early majority	Late majority	Laggards
Business-Level Strategy	Differentiation	Differentiation	Differentiation or blue ocean	Cost-leadership or blue ocean	Cost-leadership, differentiation, or blue ocean
Strategic Objective	Achieving market acceptance	Staking out a strong strategic position; generating "deep pockets"	Surviving by drawing on "deep pockets"	Maintaining strong strategic position	Exit, harvest, maintain, or consolidate

7.4 Types of Innovation

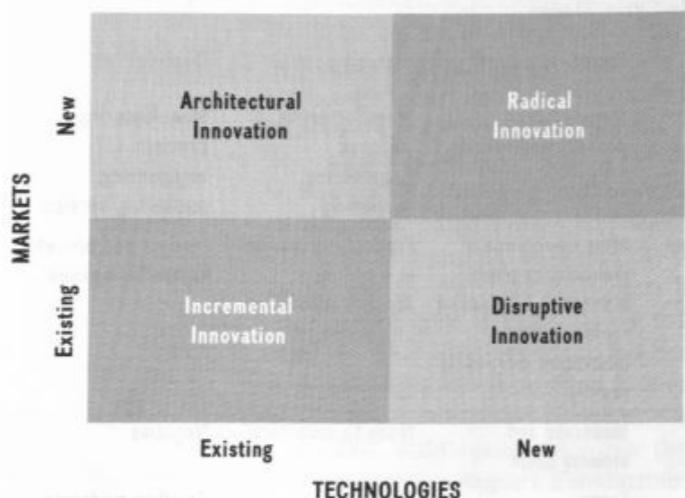
Because of the importance of innovation in shaping competitive dynamics and as a critical component in formulating business strategy, we now turn to a discussion of different types of innovation and the strategic implications of each. We need to know, in particular, along which dimensions we should assess innovations. This will allow us to formulate a business strategy that can leverage innovation for competitive advantage.

One insightful way to categorize innovations is to measure their degree of newness in terms of *technology* and *markets*.⁵⁷ Here, *technology* refers to the methods and materials used to achieve a commercial objective.⁵⁸ For example, Amazon integrates different types of technologies (hardware, software, microprocessors, the Internet, logistics, and so on) to provide not only the largest selection of retail goods online, but also an array of services and mobile devices (e.g., cloud computing, Kindle tablets, Prime, and so on).

LO 7-5

Categorize different types of innovations in the markets-and-technology framework.

EXHIBIT 7.10 / Types of Innovation: Combining Markets and Technologies



We also want to understand the *market* for an innovation—e.g., whether an innovation is introduced into a new or an existing market—because an invention turns into an innovation only when it is successfully commercialized.⁵⁹ Measuring an innovation along these dimensions gives us the **markets-and-technology framework** depicted in Exhibit 7.10. Along the horizontal axis, we ask whether the innovation builds on existing technologies or creates a new one. On the vertical axis, we ask whether the innovation is targeted toward existing or new markets. Four types of innovations emerge: incremental, radical, architectural, and disruptive innovations. As indicated by the color coding in Exhibit 7.10, each diagonal forms a pair: incremental versus radical innovation and architectural versus disruptive innovation.

INCREMENTAL VS. RADICAL INNOVATION

Although radical breakthroughs such as smartphones and magnetic resonance imaging (MRI) radiology capture most of our attention, the vast majority of innovations are actually incremental ones. An **incremental innovation** squarely builds on an established knowledge base and steadily improves an existing product or service offering.⁶⁰ It targets existing markets using existing technology.

On the other hand, **radical innovation** draws on novel methods or materials, is derived either from an entirely different knowledge base or from a recombination of existing knowledge bases with a new stream of knowledge. It targets new markets by using new technologies.⁶¹ Well-known examples of radical innovations include the introduction of the mass-produced automobile (the Ford Model T), the X-ray, the airplane, and more recently biotechnology breakthroughs such as genetic engineering and the decoding of the human genome.

Many firms get their start by successfully commercializing radical innovations, some of which, such as the jet-powered airplane, even give birth to new industries. Although the British firm de Havilland first commercialized the jet-powered passenger airplane, Boeing was the company that rode this radical innovation to industry dominance. More recently, Boeing's leadership has been contested by Airbus; each company has approximately half the market. This stalemate is now being challenged by aircraft manufacturers such as Bombardier of Canada and Embraer of Brazil, which are moving up-market by building larger luxury jets that are competing with some of the smaller airplane models offered by Boeing and Airbus.

markets-and-technology framework
A conceptual model to categorize innovations along the market (existing/new) and technology (existing/new) dimensions.

incremental innovation
An innovation that squarely builds on an established knowledge base and steadily improves an existing product or service.

radical innovation
An innovation that draws on novel methods or materials, is derived either from an entirely different knowledge base or from a recombination of the existing knowledge bases with a new stream of knowledge.

A predictable pattern of innovation is that firms (often new ventures) use radical innovation to create a temporary competitive advantage. They then follow up with a string of incremental innovations to sustain that initial lead. Gillette is a prime example for this pattern of strategic innovation. In 1903, entrepreneur King C. Gillette invented and began selling the safety razor with a disposable blade. This *radical innovation* launched the Gillette Company (now a brand of Procter & Gamble). To sustain its competitive advantage, Gillette not only made sure that its razors were inexpensive and widely available by introducing the “razor and razorblade” business model, but also continually improved its blades. In a classic example of a string of *incremental innovations*, Gillette kept adding an additional blade with each new version of its razor until the number had gone from one to six! Though this innovation strategy seems predictable, it worked. Gillette holds some 80 percent of the \$15 billion market for razors and blades globally. Gillette's newest razor, the Fusion ProGlide with Flexball technology, a razor handle that features a swiveling ball hinge, costs \$11.49 (and \$12.59 for a battery-operated one) *per razor*.⁶²

The example shows how radical innovation created a competitive advantage that the company sustained through follow-up incremental innovation. Such an outcome is not a foregone conclusion, though. In some instances, the innovator is outcompeted by second movers that quickly introduce a similar incremental innovation to continuously improve their own offering. For example, although CNN was the pioneer in 24-hour cable news, today Fox News is the most watched cable news network in the United States (although the entire industry is in decline as viewers now stream much more content directly via mobile devices, as discussed in the Netflix ChapterCase). Once firms have achieved market acceptance of a breakthrough innovation, they tend to follow up with incremental rather than radical innovations. Over time, these companies morph into industry incumbents. Future radical innovations are generally introduced by new entrepreneurial ventures. Why is this so? The reasons concern *economic incentives*, *organizational inertia*, and the firm's embeddedness in an *innovation ecosystem*.⁶³

ECONOMIC INCENTIVES. Economists highlight the role of *incentives* in strategic choice. Once an innovator has become an established incumbent firm (such as Google has today), it has strong incentives to defend its strategic position and market power. An emphasis on incremental innovations strengthens the incumbent firm's position and thus maintains high entry barriers. A focus on incremental innovation is particularly attractive once an industry standard has emerged and technological uncertainty is reduced. Moreover, many markets where network effects are important (such as online search), turn into **winner-take-all markets**, where the market leader captures almost all of the market share. As a near monopolist, the winner in these types of markets is able to extract a significant amount of the value created. In the United States, Google handles some 65 percent of all online queries, while it handles more than 90 percent in Europe. As a result, the incumbent firm uses incremental innovation to extend the time it can extract profits based on a favorable industry structure (see the discussion in Chapter 3). Any potential radical innovation threatens the incumbent firm's dominant position.

The incentives for entrepreneurial ventures, however, are just the opposite. Successfully commercializing a radical innovation is frequently the only option to enter an industry protected by high entry barriers. One of the first biotech firms, Amgen, used newly discovered drugs based on genetic engineering to overcome entry barriers to the pharmaceutical industry, in which incumbents had enjoyed notoriously high profits for several decades. Because of differential economic incentives, incumbents often push forward with incremental innovations, while new entrants focus on radical innovations.

winner-take-all markets
Markets where the market leader captures almost all of the market share and is able to extract a significant amount of the value created.

ORGANIZATIONAL INERTIA. From an organizational perspective, as firms become established and grow, they rely more heavily on formalized business processes and structures. In some cases, the firm may experience *organizational inertia*—resistance to changes in the status quo. Incumbent firms, therefore, tend to favor incremental innovations that reinforce the existing organizational structure and power distribution while avoiding radical innovation that could disturb the existing power distribution. Take, for instance, power distribution between different functional areas, such as R&D and marketing. New entrants, however, do not have formal organizational structures and processes, giving them more freedom to launch an initial breakthrough. We discuss the link between organizational structure and firm strategy in depth in Chapter 11.

innovation ecosystem
A firm's embeddedness in a complex network of suppliers, buyers, and complementors, which requires interdependent strategic decision making.

INNOVATION ECOSYSTEM. A final reason incumbent firms tend to be a source of incremental rather than radical innovations is that they become embedded in an **innovation ecosystem**: a network of suppliers, buyers, complementors, and so on.⁶⁴ They no longer make independent decisions but must consider the ramifications on other parties in their innovation ecosystem. Continuous incremental innovations reinforce this network and keep all its members happy, while radical innovations disrupt it. Again, new entrants don't have to worry about preexisting innovation ecosystems, since they will be building theirs around the radical innovation they are bringing to a new market.

ARCHITECTURAL VS. DISRUPTIVE INNOVATION

Firms can also innovate by leveraging *existing technologies* into *new markets*. Doing so generally requires them to reconfigure the components of a technology, meaning they alter the overall *architecture* of the product.⁶⁵ An **architectural innovation**, therefore, is a new product in which known components, based on existing technologies, are reconfigured in a novel way to create new markets.

As a radical innovator commercializing the xerography invention, Xerox was long the most dominant copier company worldwide.⁶⁶ It produced high-volume, high-quality, and high-priced copying machines that it leased to its customers through a service agreement. Although these machines were ideal for the high end of the market such as Fortune 100 companies, Xerox ignored small and medium-sized businesses. By applying an architectural innovation, the Japanese entry Canon was able to redesign the copier so that it didn't need professional service—reliability was built directly into the machine, and the user could replace parts such as the cartridge. This allowed Canon to apply the *razor-razorblade business model* (introduced in Chapter 5), charging relatively low prices for its copiers but adding a steep markup to its cartridges. Xerox had not envisioned the possibility that the components of the copying machine could be put together in an altogether different way that was more user-friendly. More importantly, Canon addressed a need in a specific consumer segment—small and medium-sized businesses and individual departments or offices in large companies—that Xerox neglected.

Finally, a **disruptive innovation** leverages *new technologies* to attack *existing markets*. It invades an existing market from the bottom up, as shown in Exhibit 7.11.⁶⁷ The dashed blue lines represent different market segments, from Segment 1 at the low end to Segment 4 at the high end. Low-end market segments are generally associated with low profit margins, while high-end market segments often have high profit margins. As first demonstrated by Clayton Christensen, the dynamic process of disruptive innovation begins when a firm, frequently a startup, introduces a new product or process based on a new technology to meet existing customer needs. To be a disruptive force, however, this new technology has to have additional characteristics:

architectural innovation
A new product in which known components, based on existing technologies, are reconfigured in a novel way to attack new markets.

disruptive innovation
An innovation that leverages new technologies to attack existing markets from the bottom up.

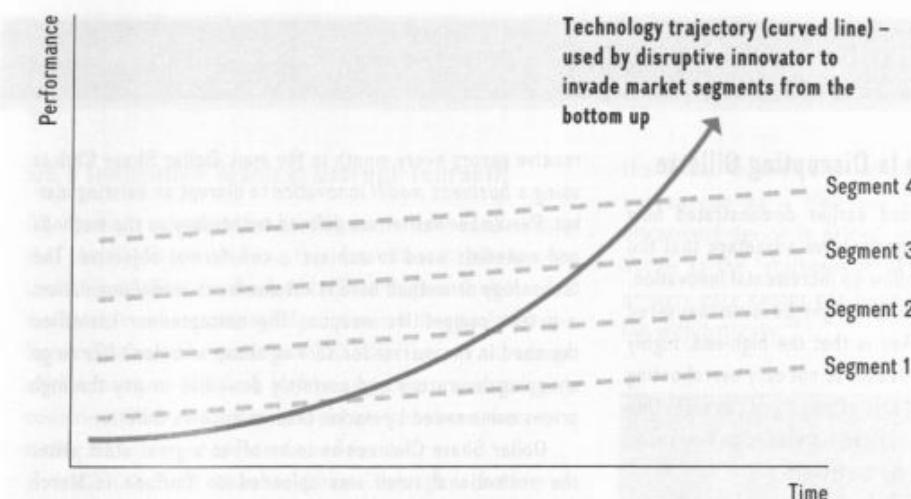


EXHIBIT 7.11

Disruptive Innovation: Riding the Technology Trajectory to Invade Different Market Segments from the Bottom Up

1. It begins as a low-cost solution to an existing problem.
2. Initially, its performance is inferior to the existing technology, but its rate of technological improvement over time is faster than the rate of performance increases required by different market segments. In Exhibit 7.11, the solid curved upward line captures the new technology's trajectory, or rate of improvement over time.

The following examples illustrate disruptive innovations:

- Japanese carmakers successfully followed a strategy of disruptive innovation by first introducing small fuel-efficient cars and then leveraging their low-cost and high-quality advantages into high-end luxury segments, captured by brands such as Lexus, Infiniti, and Acura. More recently, the South Korean carmakers Kia and Hyundai have followed a similar strategy.
- Digital photography improved enough over time to provide higher-definition pictures. As a result, it has been able to replace film photography, even in most professional applications.
- Laptop computers disrupted desktop computers; now tablets and larger-screen smartphones are disrupting laptops.
- Educational organizations such as Coursera and Udacity are disrupting traditional universities by offering *massive open online courses* (MOOCs), using the web to provide large-scale, interactive online courses with open access.

One factor favoring the success of disruptive innovation is that it relies on a stealth attack: It invades the market from the bottom up, by first capturing the low end. Many times, incumbent firms fail to defend (and sometimes are even happy to cede) the low end of the market, because it is frequently a low-margin business. Google, for example, is using its mobile operating system, Android, as a beachhead to challenge Microsoft's dominance in the personal computer industry, where 90 percent of machines run Windows.⁶⁸ Google's Android, in contrast, is optimized to run on mobile devices, the fastest-growing segment in computing. To appeal to users who spend most of their time on the web accessing e-mail and other online applications, for instance, it is designed to start up in a few seconds. Moreover, Google provides Android free of charge.⁶⁹ In contrast to Microsoft's proprietary Windows operating system, Android is open-source software, accessible to

Strategy Highlight 7.1

How Dollar Shave Club Is Disrupting Gillette

The Gillette example discussed earlier demonstrated how radical innovation created a competitive advantage that the company sustained through follow-up incremental innovation. In some instances, the innovator might be outmaneuvered by low-cost disruption. One key is that the high-end, highly priced offering of the market leader is not only overshooting what the market demands, but also often priced too high. One wonders if a person really does need six blades on one razor, or wants to pay over \$10 for one cartridge!

Seeing this opening provided by Gillette's focus on the high-end, high-margin business of the market, Dollar Shave Club is attempting to establish a low-cost alternative to invade Gillette's market from the bottom up (see Exhibit 7.11). With an \$8,000 budget and the help of a hilarious promotional video that went viral with over 20 million views,⁷⁰ the entrepreneur Michael Dubin launched Dollar Shave Club, an ecommerce startup that delivers razors by mail. It uses a subscription-based business model.⁷¹ As the company's name suggests, its entry-level membership plan delivers a razor and five cartridges a month for just \$1 (plus \$2 shipping). The member selects an appropriate plan, pays a monthly fee, and will

receive razors every month in the mail. Dollar Shave Club is using a *business model innovation* to disrupt an existing market. Remember earlier, we defined *technology* as the methods and materials used to achieve a commercial objective. The technology or method here is the *business model innovation*, a potent competitive weapon. The entrepreneur identified the need in the market for serving those who don't like to go shopping for razors and certainly don't like to pay the high prices commanded by market leaders such as Gillette.

Dollar Shave Club seems to be off to a great start. After the promotional video was uploaded on YouTube in March 2012, some 12,000 people signed up for Dollar Shave membership within the first 48 hours. It also raised over \$20 million in venture capital funding from prominent firms such as Kleiner Perkins Caufield & Byers and Andreessen Horowitz, among others. Dollar Shave Club has also begun advertising on regular television in addition to its online campaigns and has expanded its product lines by the introduction of additional personal grooming products. It remains to be seen, however, if Dollar Shave Club can disrupt the \$15 billion wet-shaving industry where Procter & Gamble's subsidiary Gillette holds 80 percent of the world market.

anyone for further development and refinement. In this sense, Google is leveraging *crowdsourcing* in its new product development, just as Threadless uses crowdsourcing to design and market T-shirts, and Wikipedia uses the wisdom of the crowds to collectively edit encyclopedia entries. Google's Android holds an 85 percent market share in mobile operating systems, while Apple's iOS has 12 percent, and the remaining 3 percent is held by Microsoft's Windows.⁷²

Strategy Highlight 7.1 shows how the upstart Dollar Shave Club is attempting to disrupt the market leader Gillette in the wet-shaving industry.

Another factor favoring the success of disruptive innovation is that incumbent firms often are slow to change. Incumbent firms tend to listen closely to their current customers and respond by continuing to invest in the existing technology and in incremental changes to the existing products. When a newer technology matures and proves to be a better solution, those same customers will switch. At that time, however, the incumbent firm does not yet have a competitive product ready that is based on the disruptive technology. Although customer-oriented visions are more likely to guard against firm obsolescence than product-oriented ones (see Chapter 2), they are no guarantee that a firm can hold out in the face of disruptive innovation. One of the counterintuitive findings that Clayton Christensen unearthed in his studies is that it can hurt incumbents to listen too closely to their existing customers. Apple is famous for not soliciting customer feedback because it believes it knows what customers need before they even realize it.

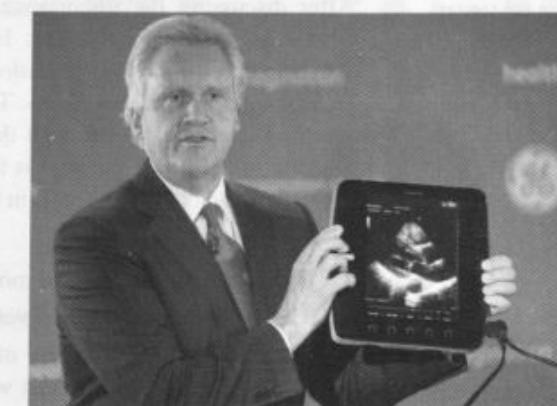
Strategy Highlight 7.2

GE's Innovation Mantra: Disrupt Yourself!

GE Healthcare is a leader in diagnostic devices. Realizing that the likelihood of disruptive innovation increases over time, GE decided to disrupt itself. A high-end ultrasound machine found in cutting-edge research hospitals in the United States or Europe costs \$250,000. There is not a large market for these high-end, high-price products in developing countries. Given their large populations, however, there is a strong medical need for ultrasound devices.

In 2002, a GE team in China, through a bottom-up strategic initiative, developed an inexpensive, portable ultrasound device, combining laptop technology with a probe and sophisticated imaging software. This lightweight device (11 pounds) was first used in rural China. In spring 2009, GE unveiled the new medical device under the name Venue 40 in the United States, at a price of less than \$30,000. There was also high demand from many American general practitioners, who could not otherwise afford the quarter of a million dollars needed to procure a high-end machine (that weighed about 400 pounds). In the fall of 2009, GE Chairman and CEO Jeff Immelt unveiled

the Vscan, an even smaller device that looks like a cross between an early iPod and a flip phone. This wireless ultrasound device is priced around \$5,000. GE views the Vscan as the "stethoscope of the 21st century," which a primary care doctor can hang around her neck when visiting with patients.⁷³



Jeffrey Immelt, GE CEO and chairman, unveils the Vscan.
© Saul Loeb/AFP/Getty Images

HOW TO RESPOND TO DISRUPTIVE INNOVATION? Although these examples show that disruptive innovations are a serious threat for incumbent firms, some have devised strategic initiatives to counter them:

1. *Continue to innovate in order to stay ahead of the competition.* A moving target is much harder to hit than one that is standing still and resting on existing (innovation) laurels. Apple has done this well, beginning with the iPod in 2001, followed by the iPhone and iPad and more recently the Apple Watch in 2015. Amazon is another example of a company that has continuously morphed through innovation,⁷⁴ from a simple online book retailer to the largest ecommerce company. It also offers consumer electronics (Kindle tablets), cloud computing, and content streaming, among other offerings.
2. *Guard against disruptive innovation by protecting the low end of the market* (Segment 1 in Exhibit 7.11) by introducing low-cost innovations to preempt stealth competitors. Intel introduced the Celeron chip, a stripped-down, budget version of its Pentium chip, to prevent low-cost entry into its market space. More recently, Intel followed up with the Atom chip, a new processor that is inexpensive and consumes little battery power, to power low-cost mobile devices.⁷⁵ Nonetheless, Intel also listened too closely to its existing personal computer customers such as Dell, HP, Lenovo, and so on, and allowed ARM Holdings, a British semiconductor design company (that supplies its technology to Apple, Samsung, HTC, and others) to take the lead in providing high-performing, low-power-consuming processors for smartphones and other mobile devices.

reverse innovation
An innovation that was developed for emerging economies before being introduced in developed economies. Sometimes also called *frugal innovation*.

3. *Disrupt yourself, rather than wait for others to disrupt you.* A firm may develop products specifically for emerging markets such as China and India, and then introduce these innovations into developed markets such as the United States, Japan, or the European Union. This process is called **reverse innovation**,⁷⁶ and allows a firm to disrupt itself. Strategy Highlight 7.2 describes how GE Healthcare invented and commercialized a disruptive innovation in China that is now entering the U.S. market, riding the steep technology trajectory of disruptive innovation shown in Exhibit 7.11.

OPEN INNOVATION

After discussing the importance of innovation to gaining and sustaining competitive advantage, the question arises: How should firms organize for innovation? During the 20th century, the *closed innovation* approach was the dominant research and development (R&D) approach for most firms: They tended to discover, develop, and commercialize new products internally.⁷⁷ Although this approach was costly and time-consuming, it allowed firms to fully capture the returns to their own innovations.

Several factors led to a shift in the knowledge landscape from closed innovation to open innovation. They include:

- The increasing supply and mobility of skilled workers.
- The exponential growth of venture capital.
- The increasing availability of external options (such as spinning out new ventures) to commercialize ideas that were previously shelved or insource promising ideas and inventions.
- The increasing capability of external suppliers globally.

Taken together, these factors have led more and more companies to adopt an open innovation approach to research and development. **Open innovation** is a framework for R&D that proposes permeable firm boundaries to allow a firm to benefit not only from internal ideas and inventions, but also from ideas and innovation from external sources. External sources of knowledge can be customers, suppliers, universities, start-up companies, and even competitors.⁷⁸ The sharing goes both ways: Some external R&D is insourced (and further developed in-house) while the firm may spin out internal R&D that does not fit its strategy to allow others to commercialize it. Even the largest companies, such as AT&T, IBM, and GE, are shifting their innovation strategy toward a model that blends internal with external knowledge sourcing via licensing agreements, strategic alliances, joint ventures, and acquisitions.⁷⁹

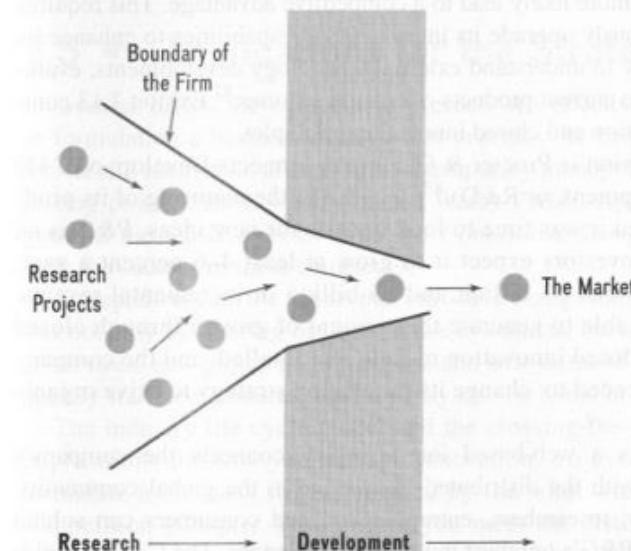
Exhibit 7.12 depicts the closed and open innovation models. In the closed innovation model (Panel A), the firm is conducting all research and development in-house, using a traditional funnel approach. The boundaries of the firm are impenetrable. Outside ideas and projects cannot enter, nor does the firm allow its own research ideas and development projects to leave the firm. Firms in the closed innovation model are extremely protective of their intellectual property. This not only allows the firm to capture all the benefits from its own R&D, but also prevents competitors from benefiting from it. The mind-set of firms in the closed innovation model is that to profit from R&D, the firm must come up with its own discoveries, develop them on its own, and control the distribution channels. Strength in R&D is equated with a high likelihood of benefiting from first-mover advantages. Firms following the closed innovation model,

LO 7.6
Compare and contrast closed and open innovation.

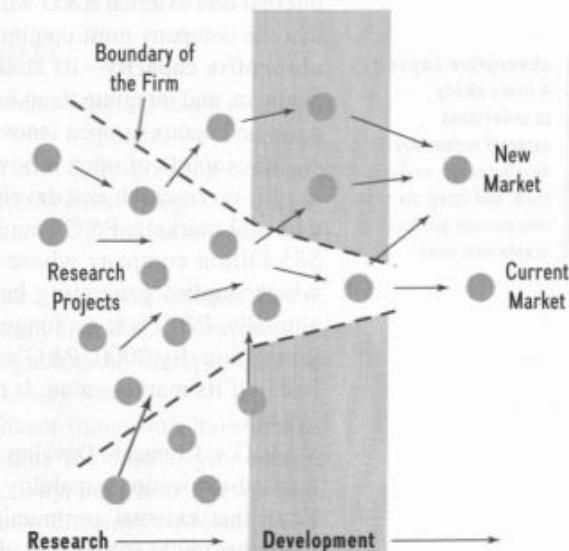
open innovation
A framework for R&D that proposes permeable firm boundaries to allow a firm to benefit not only from internal ideas and inventions, but also from external ones. The sharing goes both ways: some external ideas and inventions are insourced while others are spun out.

EXHIBIT 7.12 / Closed Innovation vs. Open Innovation

Panel A: Closed Innovation



Panel B: Open Innovation



Source: Adapted from H. Chesbrough (2003), "The area of open innovation," *MIT Sloan Management Review*, Spring, 35–41.

however, are much more likely to fall prone to the *not-invented-here syndrome*.⁸⁰ "If the R&D leading to a discovery and a new development project was not conducted in-house, it cannot be good."

As documented, the pharmaceutical company Merck suffers from the *not-invented-here syndrome*.⁸¹ That is, if a product was not created and developed at Merck, it could not be good enough. Merck's culture and organizational systems perpetuate this logic, which assumes that since the company hired the best people, the smartest people in the industry must work for Merck, and so the best discoveries must be made at Merck. The company leads the industry in terms of R&D spending, because Merck believes that if it is the first to discover and develop a new drug, it would be the first to market. Merck is one of the most successful companies by total number of active R&D projects. Perhaps even more important, Merck's researchers had been awarded several Nobel Prizes for their breakthrough research, a considerable point of pride for Merck's personnel.

In the open innovation model, in contrast, a company attempts to commercialize both its own ideas and research from other firms. It also finds external alternatives such as spin-out ventures or strategic alliances to commercialize its internally developed R&D. The boundary of the firm has become porous (as represented by the dashed lines in the Panel B in Exhibit 7.12), allowing the firm to spin out some R&D projects while insourcing other promising projects. Companies using an open innovation approach realize that great ideas can come from both inside and outside the company. Significant value can be had by commercializing external R&D and letting others commercialize internal R&D that does not fit with the firm's strategy. The focus is on building a more effective

business model to commercialize both internal *and* external R&D, rather than focusing on being first to market.

One key assumption underlying the open innovation model is that combining the best of internal *and* external R&D will more likely lead to a competitive advantage. This requires that the company must continuously upgrade its internal R&D capabilities to enhance its **absorptive capacity**—its ability to understand external technology developments, evaluate them, and integrate them into current products or create new ones.⁸² Exhibit 7.13 compares and contrasts open innovation and closed innovation principles.

absorptive capacity
A firm's ability
to understand
external technology
developments, evaluate
them, and integrate them
into current products or
create new ones.

An example of open innovation is Procter & Gamble's Connect+Develop, or C+D (a play on research and development, or R&D).⁸³ Because of the maturing of its products and markets, P&G decided it was time to look outside for new ideas. P&G is an \$85 billion company whose investors expect it to grow at least 4–6 percent a year, which implies generating between \$3 billion and \$5 billion in incremental revenue annually. P&G was no longer able to generate this amount of growth through closed innovation. By 2000, P&G's closed innovation machine had stalled, and the company lost half its market value. It needed to change its innovation strategy to drive organic growth.

P&G's Connect+Develop is a web-based interface that connects the company's internal-innovation capability with the distributed knowledge in the global community. From that external community, researchers, entrepreneurs, and consumers can submit ideas that might solve some of P&G's toughest innovation challenges. The C+D model is based on the realization that innovation was increasingly coming from small entrepreneurial ventures and even from individuals. Universities also became much more proactive in commercializing their inventions. The Internet now enables access to widely distributed knowledge from around the globe.

External collaborations fostered through the worldwide Connect+Develop network now play a role in roughly 50 percent of P&G's new products, up from about 15 percent

EXHIBIT 7.13 / Contrasting Principles of Closed and Open Innovation

Closed Innovation Principles	Open Innovation Principles
The smart people in our field work for us.	Not all the smart people work for us. We need to work with smart people inside <i>and</i> outside our company.
To profit from R&D, we must discover it, develop it, and ship it ourselves.	External R&D can create significant value; internal R&D is needed to claim (absorb) some portion of that value.
If we discover it ourselves, we will get it to market first.	We don't have to originate the research to profit from it; we can still be first if we successfully commercialize new research.
The company that gets an innovation to market first will win.	Building a better business model is often more important than getting to market first.
If we create the most and best ideas in the industry, we will win.	If we make the best use of internal <i>and</i> external ideas, we will win.
We should control our intellectual property (IP), so that our competitors don't profit from it.	We should profit from others' use of our IP, and we should buy others' IP whenever it advances our own business model.

Source: Adapted from H.W. Chesbrough (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Boston: Harvard Business School Press).

in 2000. Successful product innovations that resulted from P&G's open innovation model include Pringles meets Print (sold for \$1.5 billion in 2011), Mr. Clean Magic Eraser, Swiffer Dusters, Crest SpinBrush, and Olay Regenerist.

7.5 ► Implications for the Strategist

Innovation drives the competitive process. An effective innovation strategy is critical in formulating a business strategy that provides the firm with a competitive advantage. Successful innovation affords firms a temporary monopoly, with corresponding monopoly pricing power. *Fast Company* named Warby Parker, Apple, Alibaba, Google, and Instagram as the top five on its *2015 Most Innovative Companies*.⁸⁴ Continuous innovation fuels the success of these companies.

Entrepreneurs are the agents that introduce change into the competitive system. They do this not only by figuring out how to use inventions, but also by introducing new products or services, new production processes, and new forms of organization. Entrepreneurs frequently start new ventures, but they may also be found in existing firms.

The industry life cycle model and the crossing-the-chasm framework have critical implications for how you manage innovation. To overcome the chasm, you need to formulate a business strategy guided by the who, what, why, and, how questions of competition (Chapter 6) to ensure you meet the distinctly different customer needs inherent along the industry life cycle. You also must be mindful that to do so, you need to bring different competencies and capabilities to bear at different stages of the industry life cycle.

Many of the more successful companies have either adopted or are moving toward an open innovation model. As a strategist, you must actively manage a firm's internal and external innovation activities. Internally, you can *induce innovation* through a top-down process or motivate innovation through *autonomous behavior*, a bottom-up process.⁸⁵ In induced innovation, you need to put a structure and system in place to foster innovation. Consider 3M: "A core belief of 3M is that creativity needs freedom. That's why . . . we've encouraged our employees to spend 15 percent of their working time on their own projects. To take our resources, to build up a unique team, and to follow their own insights in pursuit of problem-solving."⁸⁶ We discussed *autonomous behavior* in detail in Chapter 2. To not only motivate innovations through autonomous behavior, but also ensure their possible success, *internal champions* need to be willing to support promising projects. In Strategy Highlight 2.2, we detailed how Howard Behar, at that time a senior executive at Starbucks, was willing to support the bottom-up idea of Frappuccino, which turned out to be a multi-billion-dollar business.

Externally, you must manage innovation through cooperative strategies such as licensing, strategic alliances, joint ventures, and acquisitions. These are the vehicles of *corporate strategy* discussed in the next two chapters.

In conclusion, in this and the previous chapter, we discussed how firms can use *business-level strategy*—differentiation, cost leadership, blue ocean, and innovation—to gain and sustain competitive advantage. We now turn our attention to *corporate-level strategy* to help us understand how executives make decisions about *where to compete* (in terms of industries, value chains, and geography) and how to execute it through strategic alliances as well as mergers and acquisitions. A thorough understanding of business and corporate strategy is necessary to formulate and sustain a winning strategy.

CHAPTERCASE 7 / Consider This...

The impact of Netflix's mega success *House of Cards* in reshaping the TV industry cannot be underestimated. The American political TV drama starring Kevin Spacey and Robin Wright was an innovation that fundamentally changed the existing business model of TV viewing on three fronts.

1. **Delivery.** *House of Cards* was the first time that a major TV drama was streamed online and thus bypassed the established ecosystem of networks and cable operators.
2. **Access.** *House of Cards* created the phenomenon of binge watching because it allowed Netflix subscribers to view many or all episodes in one sitting, without any advertising interruptions. As of 2015, spending an estimated \$200 million, Netflix produced three seasons for a total of 39 episodes each roughly 45 to 60 minutes long.
3. **Management.** *House of Cards* was the first time original programming had been developed based on Netflix's proprietary data algorithms and not by more traditional methods. When executive producer David Fincher and actor Kevin Spacey brought the proposed show to Netflix, the company approved the project without a pilot or any test-marketing. "Netflix was the only network that said, 'We believe in you,' recalls Spacey. We've run our data and it tells us that our audience would watch this series. We don't need you to do a pilot. How many [episodes] do you wanna do?"⁸⁷

The success of *House of Cards* created a huge buzz, attracted millions of new subscribers to Netflix, and helped its stock climb to new highs.

The power of directly streaming content to users, so that they can watch whenever they want, how much they want to watch at a time, and on whatever Internet-connected device, was also demonstrated in Netflix's reruns of *Breaking Bad*. Netflix streamed the 62-episode crime drama in ultra HD, and it scored much higher than on its previous run on the cable channel AMC. Indeed, the season finale of *Breaking Bad* on Netflix attracted almost 6 million viewers. This is even more impressive given the

fact that *Breaking Bad* was a TV rerun.

Despite riding high, there are some serious challenges for Reed Hastings and Netflix on the horizon. First is the issue of how to ensure that Netflix users' have a seamless, uninterrupted viewing experience, without buffering (and seeing the "spinning wheels"). Recall that Netflix is responsible for more than one-third of all downstream Internet traffic in the United States during peak hours. For a long time, Netflix has been a strong support of *net neutrality*, with the goal of preventing broadband operators such as Comcast from slowing content or blocking access to certain websites. Conceivably, Comcast may have an incentive to slow down Netflix's content and favor its own NBC content. This is the reason Netflix—after refusing to do so for a long time—has begun to pay Comcast directly to ensure a smoother streaming experience for its users. Rather than going through the public Internet, in exchange for payment, Netflix will be able to hook up its servers directly to Comcast's broadband network. This so-called *peering* (creating dedicated and direct connections) between a content provider and a broadband provider is the first in the industry. Given its precedent, Netflix is likely to strike similar deals with other broadband providers, such as AT&T, Verizon, and Time Warner, that control access to Netflix customers.

The second issue for Hastings is how to create sustained future growth. The domestic market seems to be maturing, so growth has to come from international expansion. Problems with a lack of available titles and few places with broadband Internet connections hamper its growth. In 2010, Canadian expansion was off to a slow start because of a small number of titles in the Netflix library because of differences in distribution deals. Of the 10 million international users of Netflix (in 2015), 6 million are in Canada. Although the Latin American market has some 600 million people, roughly twice the population of the United States, because of the *digital divide* (inequality in access to and speed of the Internet) in many Latin American countries, most Internet



connections are slow dial-up, which prohibits effective streaming of content. In 2015, Netflix began negotiations to offer its services in China. One of the issues Netflix will face is potential censoring of its content; *House of Cards* has not only explicit content in terms of nudity and violence, but also features a corrupt Chinese businessman meddling in U.S. politics.

Questions

1. Netflix started to pay one broadband provider (Comcast) to ensure fast and seamless access to its end users. As hinted, other broadband providers (AT&T, Verizon, and Time Warner) will want to extract a similar kind of "toll" from Netflix.
 - a. Does this violate net neutrality (the rule Internet service providers should treat all data equally, and not charge differentially by user, content, site, etc.)? Why or why not?
 - b. Do you favor net neutrality? Explain why.
2. Netflix growth in the United States seems to be maturing. What other services can Netflix offer that might further demand in the United States?
3. International expansion appears to be a major growth opportunity for Netflix. Elaborate on the challenges Netflix faces going beyond the U.S. market. What can Netflix do to address some of the challenges encountered when going internationally?

TAKE-AWAY CONCEPTS

This chapter discussed various aspects of innovation and entrepreneurship as a business-level strategy, as summarized by the following learning objectives and related take-away concepts.

LO 7-1 / Outline the four-step innovation process from idea to imitation.

- Innovation describes the discovery and development of new knowledge in a four-step process captured in the Four I's: *idea, invention, innovation, and imitation*.
- The innovation process begins with an idea.
- An invention describes the transformation of an idea into a new product or process, or the modification and recombination of existing ones.
- Innovation concerns the commercialization of an invention by entrepreneurs (within existing companies or new ventures).
- If an innovation is successful in the marketplace, competitors will attempt to imitate it.

LO 7-2 / Apply strategic management concepts to entrepreneurship and innovation.

- Entrepreneurship describes the process by which change agents undertake economic risk to innovate—to create new products, processes, and sometimes new organizations.
- Strategic entrepreneurship describes the pursuit of innovation using tools and concepts from strategic management.
- Social entrepreneurship describes the pursuit of social goals by using entrepreneurship. Social entrepreneurs use a triple-bottom-line approach to assess performance.

LO 7-3 / Describe the competitive implications of different stages in the industry life cycle.

- Innovations frequently lead to the birth of new industries.
- Industries generally follow a predictable industry life cycle, with five distinct stages: introduction, growth, shakeout, maturity, and decline.