

Chapter 1

Setting the Stage: Technology and the Modern Enterprise

Chapter Introduction

This chapter provides a general overview of the different ways in which technology has changed the business landscape. It provides information on the young technology entrepreneurs who have started some of the world's most successful technology firms. The chapter also highlights the impact technology has had on various managerial disciplines and provides an overview of the various career opportunities in the field of technology. Lastly, a synopsis is provided of the rest of the material covered in the textbook.

1. Tech's Tectonic Shift: Radically Changing Business Landscapes

- Appreciate how in recent years, technology has helped bring about radical changes across industries and throughout societies.
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Section Outline

- While technology is fundamentally transforming business environments, a report in Forbes suggests 72 percent of firms are failing at digital transformation.
- At the start of the prior decade, Google barely existed and well-known strategists dismissed Internet advertising models.

- Today billions in advertising dollars are pouring into digital efforts.
- Prior to the introduction of the iPod, Apple was widely considered a tech industry has-been.
 - Within ten years Apple had grown to be the most valuable firm in the United States, selling more music and generating more profits from mobile device sales than any firm in the world.
 - Apple's app sales through iTunes, alone, are larger than the revenues of more than half of the companies ranked in the *Fortune* 500.
- Social Media barely warranted a mention a decade ago, but today, Facebook's user base is larger than any nation in the world.
 - Firms are harnessing social media for new product ideas and for millions in sales.
 - Social media has also emerged as a catalyst for global change, with Facebook and Twitter playing key organizing roles in uprisings worldwide.
- Moore's Law and other factors that make technology faster and cheaper have thrust computing and telecommunications into the hands of billions in ways that are both empowering the poor and poisoning the planet.
- China started the prior decade largely as a nation unplugged and offline.
 - Today, China has more Internet users than any other country and has spectacularly launched several publicly traded Internet firms that now have market caps and profits to match their US rivals, including Baidu, Tencent, and Alibaba.
 - China has emerged as a clear leader in smartphone payments—four of the ten most downloaded apps were Chinese. In the first ten months of 2017, Chinese consumers spent \$12.8 trillion through mobile payments vs. an only \$50 billion full-year total in the U.S.
- The world's second most populous nation, India, has ridden technology to become a global IT powerhouse.
 - In two decades, India's tech sector has grown from "almost nothing" to a \$120 billion industry, expanding even during the recent global recession.
 - India's TCS (Tata Consulting Services) is the world's number two technology solutions firm, second in size only to IBM.
 - India has half a billion mobile Internet users.
 - India's e-commerce sector is growing so quickly that Walmart recently won a high-stakes bidding war against Amazon, paying \$16 billion for a 77 percent stake in India's FlipKart, a leader in S. Asian online shopping and payments.
- Even in the far reaches of nations in sub-Saharan Africa, fast/cheap tech is becoming an economic lubricant.
 - Seventy percent of the region's population lives within range of mobile phone coverage, a greater percentage than those who have access to reliable and safe

- water or electricity.
 - Mobile phones using Ghana's Esoko empower the agrarian poor with farming info and commodity pricing, raising incomes and lowering the chance of exploitation by unscrupulous middlemen.
 - Kenya's M-PESA and Somaliland's Zaad use text messages to replace cash, bringing the safety and speed of electronic payment and funds transfer to the unbanked and leveraging mobile money at rates that far outstrip any nation in the West.
 - Tech giants including Google, IBM, and Microsoft now run R&D centers and significant operations in several African nations, many of which now rank among the world's fastest growing economies.
- Fast and cheap computing is also helping create the multibillion dollar **Internet of Things (IoT)**.
 - Cheap processors and software smarts are also powering the drone revolution with far-reaching impact.
 - Farmers use drones to regularly survey crops at closer distances and with greater regularity than satellite or plane flight could ever match.
 - Soon drones will be able to deliver medical supplies to remote regions of the world to support humanitarian efforts.
 - The way people conceive of software and the software industry is also changing radically.
 - Apple, Facebook, Google, IBM, Netflix, and Oracle are among the firms that collectively pay thousands of programmers to write code that is then given away for free.
 - The rise of open source software has rewritten the revenue models for the computing industry and lowered computing costs for startups to blue chips worldwide.
 - Cloud computing and software as a service are turning sophisticated, high-powered computing into a utility available to even the smallest businesses and nonprofits.
 - Many organizations today collect and seek insights from massive datasets, which are often referred to as "Big Data."
 - Data analytics and business intelligence are driving discovery and innovation, redefining modern marketing, and creating a shifting knife-edge of privacy concerns that can shred corporate reputations if mishandled.
 - The pervasiveness of computing has created a set of security and espionage threats unimaginable to the prior generation.

Questions and Exercises

1. Search online and compare profits from Google, Apple, and other leading tech firms with those of major media firms and other nontech industry leaders. How have profits

at firms such as Google and Apple changed over the past few years? What do you think is behind such trends? How do these compare with changes in the nontech firms that you chose?

Answer: Students' answers will vary. This could be a group assignment. Divide the class into groups of three and ask them to compare profits from Google, Apple, and other leading tech firms with those of major media firms and nontech industry leaders of their choice. Ask groups to share their findings with the rest of the class.

2. How do recent changes in computing impact consumers? Are these changes good or bad? Explain. How do they impact businesses?

Answer: Some of the recent changes in computing include the growth of open source software, cloud computing, and software as a service (SaaS). All of these changes have their own advantages and disadvantages for businesses and consumers. Cloud computing and SaaS reduce computing costs and provide greater access to sophisticated high-powered computing, however both have increased security and privacy concerns. Open source software also reduces costs and allows for greater collaboration among programmers but may have quality issues.

3. Serial entrepreneur and venture capitalist Marc Andreessen has written that "software is eating the world," suggesting that software and computing are transforming entire industries and creating disruptive new upstarts. Come to class with examples of firms and industries that have been completely transformed through the use of software.

Answer: Students' answers will vary. Examples might include Comcast, Spectrum, Disney, Walmart and many more. Andreessen's article can be found at <http://www.wsj.com/articles/SB10001424053111903480904576512250915629460>. He also proposed that the next industries to be transformed by software will include education and health care.

4. Venture capitalist Ben Evans, who works with Andreessen, has said "mobile is eating the world." Give examples of how mobile has built billion dollar industries that wouldn't exist without handheld computing power. How should today's managers be thinking about mobile as an opportunity and threat?

Answer: Students' answers may vary. Examples include the growth and success of companies like Facebook; China's Baidu, Tencent, Alibaba; India's Micromax; and Africa's Esoko, Sproxil, M-PESA, and Zaad. Mobile can serve as an opportunity for managers via its ability to increase sales and vet and build trust with customers. However, it can also act as a threat due to the way mobile phones and cameras, YouTube, Facebook, Instagram, and Twitter can now so easily reveal ethical lapses and customer service flaws.

5. How is social media impacting firms, individuals, and society?

Answer: Students' answers may vary. Social media (Facebook, Twitter, etc.) is changing the way individuals communicate with one another as well as the way in which customers and companies communicate. Customers are using social media to broadcast their views on products and services. Firms are harnessing social media for

new product ideas and for millions in sales. Social media is also changing the way society, as a whole, interacts. Social media has emerged as a catalyst for global change, with Facebook and Twitter playing key organizing roles in uprisings worldwide. While a status update alone won't depose a dictator, technology can capture injustice, broadcast it to the world, disseminate ideas, and rally the far-reaching.

6. What kinds of skills do today's managers need that weren't required a decade ago?

Answer: Students' answers may vary. Answers should reflect the impact of technology on the manager's skill set. Possible answers might include basic computer skills, project management skills, use of spreadsheets, word processing skills, knowledge of presentation programs, communication tools such as e-mail and instant messaging, conducting teleconferences, social networking, etc. Managers must have a general awareness of technology to be effective consumers of technology.

7. Investigate the role of technology in emerging markets. Come to class with examples to share on how technology is helping fuel economic growth and provide economic opportunity and public good to consumers outside of North America, Europe, and Asia's wealthier nations.

Answer: Students' answers will vary. Although China started the prior decade largely as a nation unplugged and offline, the nation now has more Internet users than any other country and has spectacularly launched several publicly traded Internet firms including Baidu, Tencent, and Alibaba. Also, India, the world's second most populous nation, has ridden technology to become a global IT powerhouse. India's tech sector has grown from "almost nothing" to a \$120 billion industry, expanding even during the recent global recession. Technology has enabled the once almost-exclusively-agrarian nation to become a go-to destination for R&D and engineering across sectors as far-flung as aircraft engine design, medical devices, telecom equipment, and microprocessors. Even in the far reaches of nations in sub-Saharan Africa, fast/cheap tech is becoming an economic lubricant, where the agrarian poor are now empowered with farming info and commodity pricing, raising incomes and lowering the chance of exploitation by unscrupulous middlemen.

8. Work with your instructor to identify and implement ways in which your class can leverage social media. For example, you might create a Facebook group where you can share ideas with your classmates, join Twitter and create a hash tag for your class, leverage Google Hangouts and other tools on Google+, or create a course wiki. (See Chapter 8 "Social Media, Peer Production, and Web 2.0" for more on these and other services).

Answer: This can be an in-class activity. Divide the class to into different groups and ask each group to come up with at least three ways in which the class, as a whole, can use social media. After every group has presented their ideas, allow students to vote on the idea they like the best and then ask them to actually implement it.

9. Watch the video below, produced by the World Economic Forum. Is Artificial Intelligence (AI) really intelligence? What makes AI "smarter"? Which nations lead in AI and why? What advantages does each have? What sort of balance can be struck between fearing AI, regulating AI, and harnessing AI? Give examples of how AI can be

used in business. (View the video online at:
http://www.youtube.com/embed/Ls1_tqlpMww?rel=0.)

Answer:

- What makes AI “smarter”?
 - Data, so firms with more data have an advantage, nations with more data, as well.
- Which nations lead in AI and why? What advantages does each have?
 - China: Baidu, Tencent, Alibaba. The Chinese government is backing an effort to achieve AI leadership.
 - U.S.: Google, FB, Amazon MS. Leads in investment.
 - Kaifu Li ranks these four nations according to number of "leadership" Top AI People:
 - U.S.: 80
 - UK: 15
 - Canada: 15
 - China: 2
 - China has an emerging entrepreneurial culture and an education system that embraces engineering.
 - Chinese firms have more data.
 - Government is putting money behind initiatives.
 - U.S. has advanced research with longer-term horizon.
- What sort of balance can be struck between fearing AI, regulating AI, and harnessing AI?
 - Students' answers will vary.
 - AI using biased data sets can be "unethical" systems.
- Give examples of how AI can be used in business.
 - Medicine
 - Law enforcement
 - Service robots
 - Many other examples exist; students' answers will vary.

10. Watch this video on how 3D printing is spurring advances in manufacturing. How are technologies like this poised to influence the economy, society, and the jobs of the future? Work with classmates to brainstorm on ways in which 3D printing can benefit society. View the video online at: <http://www.youtube.com/embed/Adl1Sn86ojs?rel=0>.

Answer:

- How are technologies like this poised to influence the economy, society, and the jobs of the future?
 - Lower transportation costs
 - The NASA 3D-printed wrench is a good example of "no transport costs" if the 3D printing raw material is on-site.
 - Reduce/eliminate inventory
 - Custom parts can be produced far faster than via conventional methods that may require special tools and machines. This could reduce the number of manufacturing jobs
 - Other ideas (student responses will vary):

- Never be "out of a part" for certain parts that can be printed
- Work with classmates to brainstorm on ways in which 3D printing can benefit society.
 - Student responses will vary but might include:
 - Objects are created using AI in ways they could not have been made with conventional techniques.
 - New parts designed by AI may be better than a human could create.

Additional Exercise

1. Use the Internet to identify the future trends in information technology that could be of strategic importance for businesses. Ask students to submit a 3-page report of their findings.

2. It's Your Revolution

- Name firms across hardware, software, and Internet businesses that were founded by people in their twenties (or younger).

Section Outline

- Many of the world's most successful technology firms—organizations that have had tremendous impact on consumers and businesses across industries—were created by young people. The following few can be considered:
 - Bill Gates was an undergraduate when he left college to found Microsoft—a firm that would eventually become the world's largest software firm and catapult Gates to the top of the *Forbes* list of world's wealthiest people (enabling him to also become the most generous philanthropist of our time).
 - Michael Dell was just a sophomore when he began building computers in his dorm room at the University of Texas.
 - Mark Zuckerberg founded Facebook as a nineteen-year-old college sophomore.
 - Steve Jobs was just twenty-one when he founded Apple.
 - Tony Hsieh proved his entrepreneurial chops when, at twenty-four, he sold LinkExchange to Microsoft for over a quarter of a billion dollars.
 - He'd later serve as CEO of Zappos, eventually selling it to Amazon for \$900 million.
 - Sergey Brin and Larry Page were both twenty-something doctoral students at Stanford University when they founded Google, so were Jerry Yang and David

- Filo of Yahoo!
- Kevin Systrom was 26 when he founded the photo-sharing service Instagram.
 - Palmer Lucky was 21 when he sold Oculus VR to Facebook for \$2 billion before the virtual reality firm even shipped its first consumer product.
 - Steve Chen and Chad Hurley of YouTube were in their late twenties when they launched their firms.
 - Jeff Bezos hadn't yet reached thirty when he began working on what would eventually become Amazon.
 - Jenn Hyman and Jenny Fleiss, founders of Rent the Runway, were in their twenties in grad school when they launched the firm that is recasting how millions of consumers engage with high-end designer apparel and accessories.
 - Payal Kadakai launched ClassPass, a service allowing customers to take fitness classes from multiple providers, just a few years out of undergrad.
 - David Karp of Tumblr was another early bloomer.
 - Shawn Fanning's Napster, widely criticized as a piracy playground, was written when he was just nineteen.
 - Finland's Linus Torvalds wrote the first version of the Linux operating system when he was just twenty-one.
- *Tech Crunch* crows that Internet entrepreneurs are like pro athletes—"they peak around the age of 25."
 - *BusinessWeek* regularly runs a list of America's Best Young Entrepreneurs—the top twenty-five aged twenty-five and under.
 - *Inc.* magazine's list of the Coolest Young Entrepreneurs is subtitled the "30 under 30."
 - Whenever someone sees young people on the cover of a business magazine, it's almost certainly because they've done something groundbreaking with technology.
 - The generals and foot soldiers of the technology revolution are filled with the ranks of the young.

Questions and Exercises

1. Look online for lists of young entrepreneurs. How many of these firms are tech firms or heavily rely on technology? Are there any sectors more heavily represented than tech?

Answer: Students' answers will vary. This can be a group activity. The following article contains a list of young entrepreneurs: The Rich List (<http://www.retireat21.com/top-young-entrepreneurs>). Ask groups to present their findings with the class.

2. Have you ever thought of starting your own tech-enabled business? Brainstorm with some friends. What kinds of ideas do you think might make a good business?

Answer: This can be a group activity. Students' responses will vary. The first and most important aspect to realizing a good business idea is to have a vision to take the idea forward through to realization. In order to materialize, adequate funding and capital is also required. Ideas need to be contemporary, novel, and should add value to a customer's expectations.

3. How have the costs of entrepreneurship changed over the past decade? What forces are behind these changes? What does this mean for the future of entrepreneurship?

Answer: This could be an excellent topic for a group discussion. Possible points of discussion: decline of entry barriers, brick-and-mortar versus online storefronts, impact of open source software on startup costs, opportunity costs of entrepreneurship, failure rates of new businesses, exponential growth of some small-time technology companies. Students could then debate whether such trends are likely to strengthen or weaken in the future.

4. Many universities and regions have competitions for entrepreneurs (e.g., business plan competitions, elevator pitch competitions). Does your school have such a program? What are the criteria for participation? If your school doesn't have one, consider forming such a program.

Answer: Criteria for participation in entrepreneurship competitions usually consist of the following:

- Participants' qualifications
- Team size and composition
- Nature of ventures (for profit versus not for profit)
- Location of the proposed business
- Stage of business
- Faculty sponsor/advisor
- Non-violation of any intellectual property rights
- Eligibility of teams that have already received some form of venture capital financing

Students' answers will vary. This can also be an in-class activity. Divide the class into groups of three and ask them to create a competition for entrepreneurs. A general outline of the competition could include eligibility criteria, judging/assessment criteria, competition procedures (phases, structure of business plan, structure of presentations, etc.), schedule of key dates, and prizes.

5. Research business accelerator programs such as Y-Combinator, TechStars, and DreamIt. Do you have a program like this in your area? What do entrepreneurs get from participating in these programs? What do they give up? Do you think these programs are worth it? Why or why not? Have you ever used a product or service from a firm that has participated in one of these programs?

Answer: Students' answers will vary. This can be a group activity. Divide the class into groups of three and ask them to find out about business accelerator programs. Ask students to present their findings. Conduct a question and answer session at the end of every presentation. Possible questions could include:

- What do entrepreneurs get from participating in these programs? What do they give up?
- Do you think these programs are worth it? Why or why not?
- Have you ever used a product or service from a firm that has participated in one of these programs?

Participation in these programs would not only keep students informed about the practicality of their ideas, but would also give them a fresh insight as to where they stand among others in the same category. Whether such programs are worth attending will depend upon individual perspectives.

6. Explore online for lists of resources for entrepreneurship. Use social media to share these resources with your class.

Answer: A simple search engine query should throw up a huge list of resources. Entrepreneurship resources can be found at:

- Kissmetrics' Entrepreneur's Handbook (<http://www.lifehack.org/articles/lifehack/20-great-resources-on-entrepreneurship.html>)
- Stanford University's Entrepreneurship Corner (<http://ecorner.stanford.edu/>)
- Entrepreneur (<http://www.entrepreneur.com/>)

7. Why are we in the 'golden age' of technology entrepreneurship? What factors are helping entrepreneurs more rapidly achieve their vision, and with a lower cost?

Answer: Students' answers will vary.

8. Have any alumni from your institution founded technology firms or risen to positions of prominence in tech-focused careers? If so, work with your professor to invite them to come speak to your class or to student groups on campus. Your career services, university advancement (alumni giving and fundraising), alumni association, and LinkedIn searches may be able to help uncover potential speakers.

Answer: This can be a group activity. Divide the class into small groups and ask them to identify alumni who have founded technology firms or risen to positions of prominence in tech-focused careers. Each group can be asked to conduct a telephonic or e-mail based interview of the alumni member, and then share the experience in a classroom discussion. Students can take the help of the faculty or alumni association to arrange a talk or seminar.

Additional Exercise

1. What is meant by 'social entrepreneurship'? Are social enterprises sustainable? Conduct an Internet search to find out and write a 2-page report on your findings.

3. Geek Up—Tech Is Everywhere and You'll Need It to Thrive

- Appreciate the degree to which technology has permeated every management discipline.
- See that tech careers are varied, richly rewarding, and poised for continued growth.

Section Outline

- Shortly after the start of the prior decade, there was a lot of concern that tech jobs would be outsourced, leading many to conclude that tech skills carried less value and that workers with tech backgrounds had little to offer; this turned out to be stunningly wrong.
 - Tech jobs boomed, and as technology pervades all other management disciplines, tech skills are becoming more important, not less.
 - Today, tech-knowledge can be a key differentiator for the job seeker.
- A principle called Moore's Law is behind fast, cheap computing.
 - As computing gets both faster and cheaper, it gets "baked into" all sorts of products and shows up everywhere.
 - Example can include the radio frequency identification (RFID) tags that track luggage at the airport.
- As technology becomes faster and cheaper and developments like open source software, cloud computing, software as a service (SaaS), and outsourcing push technology costs even lower, tech skills are being embedded inside more and more job functions.
 - There isn't a single modern managerial discipline that isn't being deeply and profoundly impacted by tech.

Finance

- Many business school students who study finance aspire to careers in investment banking.
 - Many i-bankers will work on **IPOs** (initial public stock offerings), in effect helping value companies the first time these firms wish to sell their stock on the public markets.
 - IPO markets need new firms, and the tech industry is a fertile ground that continually sprouts new businesses like no other.
 - Other i-bankers will be involved in valuing merger and acquisition (M&A) deals, and tech firms are active in this space, too.
 - The technology sector has become a major driver of global M&A activity, and there were 3,389 deals in the TMT sector in 2017, totaling US \$498.2 billion.
 - Leading tech firms are flush with cash and constantly on the hunt for new firms to acquire.
- Trader beware—software might take your job. Researchers in the US and China have

shown an AI approach that beat major trading indices as well as traditional investment portfolio allocation strategies.

- Even in nontech industries, technology impacts nearly every endeavor as an opportunity catalyst or a disruptive wealth destroyer.
 - The aspiring investment banker who doesn't understand the role of technology in firms and industries can't possibly provide an accurate guess at how much a company is worth.
 - Those in other finance careers will be lending to tech firms and evaluating the role of technology in firms in an investment portfolio.
 - Modern finance simply wouldn't exist without tech.
 - Tech isn't a commodity for finance—it's the discipline's lifeblood.
- Refer to Table 1.1 for the value of tech deals by sector in the year 2017.

Accounting

- The numbers used by accountants are all recorded, stored, and reported by information systems, and the reliability of any audit is inherently tied to the reliability of the underlying technology.
- Increased regulation, such as the heavy executive penalties tied to the **Sarbanes-Oxley Act** in the United States, have ratcheted up the importance of making sure accountants (and executives) get their numbers right.
 - Negligence could mean jail time.
 - The link between accounting and tech has never been tighter, and the stakes for ensuring systems accuracy have never been higher.
- Many of the careers at accounting firms are highly tech-centric.
- Every major accounting firm has spawned a tech-focused consulting practice, and in many cases, these firms have grown to be larger than the accounting services functions from which they sprang.
 - Today, Deloitte's tech-centric consulting division is larger than the firm's audit, tax, and risk practices.
 - At the time of its spin-off, Accenture was larger than the accounting practice at former parent Arthur Andersen.
- Many firms that had previously spun off technology practices are once again building up these functions, finding strong similarities between the skills of an auditor and skills needed in emerging disciplines such as information security and privacy.

Marketing

- Technology has thrown a grenade onto the marketing landscape, and as a result, the skill set needed by today's marketers is radically different from what was leveraged by the prior generation.

- Online channels have provided a way to track and monitor consumer activities, and, firms are leveraging this insight to understand how to get the right product to the right customer, through the right channel, with the right message, at the right price, at the right time.
- The success or failure of a campaign can often be immediately assessed based on online activity such as website visit patterns and whether a campaign results in an online purchase.
- The ability to track customers, analyze campaign results, and modify tactics has amped up the return on investment of marketing dollars, with firms increasingly shifting spending from tough-to-track media such as print, radio, and television to the Web.
 - New channels continue to emerge: smartphone, tablet, smart TV, smart watch and other wearables, smart auto, and more.
- The rise of social media is also part of the blown-apart marketing landscape.
 - Now all customers can leverage an enduring and permanent voice, capable of broadcasting word-of-mouth influence in ways that can benefit and harm a firm.
 - Savvy firms are using social media to generate sales, improve their reputations, better serve customers, and innovate.
 - Those who don't understand this landscape risk being embarrassed, blindsided, and out of touch with their customers.
- Central components of the new marketing toolkit include:
 - Search engine marketing (SEM)
 - Search engine optimization (SEO)
 - Customer relationship management (CRM)
 - Personalization systems
 - Sensitivity to managing the delicate balance between gathering and leveraging data and respecting consumer privacy
- Tech's role in marketing will only grow in prominence.

Operations

- A firm's operations management function is focused on producing goods and services.
- Quality programs, process redesign, supply chain management, factory automation, and service operations are all tech-centric.

Human Resources

- Technology helps firms harness the untapped power of employees.
- Knowledge management systems are morphing into social media technologies—social networks, wikis, and Twitter-style messaging systems that can accelerate the ability of a firm to quickly organize and leverage teams of experts.
- Crowdsourcing tools and question-and-answer sites like Quora and Stack Overflow allow firms to reach out for expertise beyond their organizations.

- Human resources (HR) directors are using technology for employee training, screening, and evaluation.
- The accessibility of end-user technology means that every employee can reach the public, creating an imperative for firms to:
 - Set policy on issues such as firm representation and disclosure.
 - Continually monitor and enforce policies
 - Capture and push out best practices.
- The hiring and retention practices of the prior generation are also in flux.
 - Recruiting is now grounded in information systems that scour databases for specific skill sets, allowing recruiters to cast a wider talent net than ever before.
 - Job seekers are writing resumes with keywords in mind, aware that the first cut is likely made by a database search program, not a human being.
 - The rise of professional social networks also puts added pressure on employee satisfaction and retention.
- While many students have been wisely warned that inappropriate social posts can ruin their job candidacy, the inverse is also true.
 - In many ways social media is 'the new résumé.'

The Law

- Many of the hottest areas in corporate law involve technology.
- In recent years, activity has dramatically escalated in a variety of areas, such as:
 - Intellectual property
 - Patents
 - Piracy
 - Privacy
- The number of U.S. patent applications waiting approval has tripled in the past decade, while China saw a threefold increase in patent applications in just five years.
- Firms planning to leverage new inventions and business methods need legal teams with the skills to:
 - Sleuth out whether or not a firm can legally do what it plans
 - Help them protect proprietary methods and content
 - Help enforce claims in the home country and abroad

Information Systems Careers

- Recent surveys have shown there to be more IT openings than in any field except health care.
 - Tech jobs make up two of the top three “Best Jobs” on the *US News* list.
 - Technology careers have ranked among the safest careers to have during the most recent downturn.
- Students studying technology can leverage skills in ways that range from the highly technical to those that emphasize a tech-centric use of other skills.
 - Resources like Coursera, iTunes U., CodeAcademy, Udemy, edX, YouTube, and others provide a smorgasbord of learning where the smart and motivated can geek up.
- The high demand for scarce technical talent has also led many tech firms to offer six-figure starting salaries to graduating seniors from top universities.

- Opportunities for programmers abound, particularly for those versed in new technologies.
 - By some estimates there will be three times the number of new US programming jobs created than there are the number of new programmers graduating from US colleges.
 - There are also non-programming roles for experts in areas such as:
 - User-interface design (who work to make sure systems are easy to use)
 - Process design (who leverage technology to make firms more efficient)
 - Strategy (who specialize in technology for competitive advantage)
- Career paths allow for developing expertise in a particular technology (e.g., business intelligence analyst, database administrator, social media manager), while project management careers leverage skills in taking projects from idea through deployment.
- Opportunities for programmers abound, particularly for those versed in new technologies. But there are also non-programming roles for experts in areas such as user-interface design (who work to make sure systems are easy to use), process design (who leverage technology to make firms more efficient), and strategy (who specialize in technology for competitive advantage).
- In consulting firms, careers range from hard-core programmers who “build stuff” to analysts who do no programming but might work identifying problems and developing a solutions blueprint that is then turned over to another team to code.
- Careers that involve consulting and field engineering are often particularly attractive for those who are effective communicators, and who enjoy working:
 - With an ever-changing list of clients and problems.
 - Across various industries and in many different geographies.
- Upper-level career opportunities are also increasingly diverse.
 - Consultants can become partners who work with the most senior executives of client firms, helping identify opportunities for those organizations to become more effective.
 - Technology specialists can rise to be chief information officer or chief technology officer—positions focused on overseeing a firm’s information systems development and deployment.
- Many firms are developing so-called *C-level* specialties in emerging areas with a technology focus, such as:
 - Chief information security officer (CISO)
 - Chief privacy officer (CPO)
 - Senior technology positions may also be a ticket to the chief executive’s suite.

Your Future

- With tech at the center of so much change, people may well be preparing for careers that do not yet exist.
 - By studying the intersection of business and technology today, people develop a base to build upon and critical thinking skills that will help evaluate new, emerging technologies.
- While a focus solely on technology is a recipe for disaster, a business perspective that

lacks an appreciation for tech's role is also likely to be doomed.

- Technology and business are inexorably linked, and those not trained to evaluate and make decisions in this ever-shifting space risk irrelevance, marginalization, and failure.

Questions and Exercises

1. Look at *Fortune's* "Best Companies to Work For" list. How many of these firms are technology firms? Which firm would you like to work for? Are they represented on this list?

Answer: Students' answers will vary. This could be an in-class activity. The instructor could also first ask students to identify a company they would like to work for. The instructor could then present *Fortune's* "Best Companies to Work For" list and ask students to identify if their preferred company is listed. The class should identify the sector (technology, manufacturing, healthcare, retailing, etc.) which contains the most number of best companies to work for.

2. Look at *BusinessWeek's* "Best Places to Start Your Career" list. Is the firm you mentioned above also on this list?

Answer: Students' answers will vary. As an additional exercise, students could be asked to choose a firm from the list that they would like to work for and to justify their answers.

3. What are you considering studying? What are your short-term and long-term job goals? What role will technology play in that career path? What should you be doing to ensure that you have the skills needed to compete?

Answer: Students' answers will vary. This could also be an in-class activity. The class could also be divided based on the careers students choose with each student presenting a new idea. To realize a career path, a student needs to understand the meaning of and effort that goes in to pursuing the career in question. The student needs to have a clear thought process and adequate information to decide on his or her career path.

4. Which jobs that exist today likely won't exist at the start of the next decade? Based on your best guess on how technology will develop, can you think of jobs and skill sets that will likely emerge as critical five and ten years from now?

Answer: Students' answers will vary. This can be an in-class activity. Divide the class into groups of three and ask them to think of jobs that won't exist at the start of the next decade and jobs and skill sets that will. Examples: The jobs of drivers of public transport like trains and subways might not exist in the future owing to the development of GPS technology. Robotics might replace several assembly line jobs as well as basic customer facing roles such as those of bank tellers. Genetic engineering, aerospace engineering, and nanotechnology could be some of the jobs of the future.

5. Explore online resources to learn technology on your own, and search for programs that encourage college students. If you are from a group underrepresented in technology (i.e. a woman or minority), search out programs that provide learning and opportunity for those seeking tech careers. Share your resources with your professor, via a class wiki, or other mechanism so that you create a common resource everyone can use to #geekup. And tweet what you create using that hashtag!

Answer: Students' answers will vary. This can also be an in-class activity. Start by asking the class to find others whom they feel may be underrepresented in technology, and to spend a little time searching the Internet to find out what programs are available. Create a class wiki where students can post their findings, and propose they tweet their findings as well.

Additional Exercise

1. Using the case study resource "The Convince & Convert Blog!" (<http://www.convinceandconvert.com/category/social-media-case-studies/>). Divide the class into ten groups and ask each group to make a detailed presentation on one of the cases listed in the article.

4. The Pages Ahead

- Understand the structure of this text, the issues and examples that will be introduced, and why they are important.

Section Outline

- Today's winners have no guarantee of sustained dominance.
- What students should acquire in the pages that follow are a fourfold set of benefits:
 - Provide a description of what's happening in industry today,
 - Offer an introduction to key business and technology concepts,
 - Offer a durable set of concepts and frameworks that can be applied even as technologies and industries change
 - Develop critical thinking that will serve you well throughout your career as a manager
- Chapter 2 focuses on building big-picture skills to think about how to leverage technology for competitive advantage.
- Chapter 3 illustrates how a tech-fed value chain helped Spanish clothing giant Zara craft a counterintuitive model that seems to defy all conventional wisdom in the fashion industry.
- Chapter 4 studies Netflix in two parts: the first half of the chapter tramples the notion that dot-com startup firms can't compete against large, established rivals; the second part of the chapter covers Netflix's uncertain future, where we present how the shift

from atoms (physical discs) to bits (streaming and downloads) creates additional challenges.

- Chapter 5 focuses on understanding the implications of technology change for firms and society.
- Chapter 6 introduces the concept of disruptive innovation to help managers understand why so many large incumbents are beat by new entrants.
- Chapter 7 explores one of the most disruptive firms of the post-Internet era, Amazon.
- In Chapter 8, discusses how technologies, services, and platforms can create nearly insurmountable advantages.
- Chapter 9 students learn about various technologies used in social media and peer production, including blogs, wikis, social networking, Twitter, and more.
- Chapter 10 expands on peer production concepts to explore the so-called “Sharing Economy” and “Collaborative Consumption.”
- Chapter 11 will allow students to study success and failure in IS design and deployment by examining one of the Web’s hottest firms, Facebook.
- Chapter 12 provides a fascinating look at how two young women entrepreneurs have crafted a business that has attracted millions of customers and recast how women relate to designer fashion.
- Chapter 13 offers a primer to help managers better understand what software is all about.
- Chapter 14 deals with open source software, software as a service, hardware clouds, app software, and virtualization; the issues that are front and center for any firm making technology decisions.
- In Chapter 15 students will study data, which is often an organization’s most critical asset.
- Chapter 16 unmask the mystery of the Internet—it shows how the Internet works and why a manager should care about IP addresses, IP networking, the DNS, peering, and packet versus circuit switching.
- Chapter 17 helps managers understand attacks and vulnerabilities and how to keep end users and organizations more secure.
- Chapter 18 discusses one of the most influential and far-reaching firms in today’s business environment, Google.

Questions and Exercises

1. Which firms do you most admire today? How do these firms use technology? Do you think technology gives them an advantage over rivals? Why or why not?

Answer: Students’ answers will vary. This is a good question to bring in the idea of a sustainable competitive advantage. Google is one firm people admire the most. Google has leveraged technology in a way no other competitor has. By harnessing the power of technology, they have reached a level where they earn as much as all their competitors put together.

2. What areas covered in this book are most exciting? Most intimidating? Which do you think will be most useful?

Answer: This could be an in-class activity. Ask students to vote on the various chapters

of the text they consider to be 'most exciting', 'most intimidating' and 'most useful.' Are there any chapters that are common in two or more categories? If so, discuss why. Students could also have a discussion on the chapters that rank the lowest in the three categories.

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Chapter 2

Strategy and Technology: Concepts and Frameworks for Achieving Success

Chapter Introduction

This chapter describes competitive advantage and explains how IT acts as an enabler of competitive advantage. It describes the limitations of technology-based competition and emphasizes the need for sustainable competitive advantage. The chapter discusses the value chain and the role of brand, scale, data and switching cost assets, differentiation, network effects, and distribution channels. It attempts to describe the relationship between timing, technology, and the creation of resources for competitive advantage. The chapter also covers the five forces of competitive advantage.

1. Introduction

- Define operational effectiveness and understand the limitations of technology-based competition leveraging this principle.
- Define strategic positioning and the importance of grounding competitive advantage in this concept.
- Understand the resource-based view of competitive advantage.
- List the four characteristics of a resource that might possibly yield sustainable

competitive advantage.

Section Outline

- Management theorists, consultants, and practitioners often vehemently disagree on how firms should craft tech-enabled strategy, and many widely read articles contradict one another.
- As a manager, the ability to size up a firm's strategic position and understand its likelihood of sustainability is one of the most valuable and yet most difficult skills to master.

The Danger of Relying on Technology

- Firms strive for **sustainable competitive advantage**, financial performance that consistently outperforms their industry peers.
- It is difficult to compete when everyone can copy technology and the competition is just a click away.
- Consistent winners are empowered through their use of technology.
- According to Michael Porter, a professor at the Harvard Business School and father of the *value chain* and the *five forces* concepts, the reason so many firms suffer aggressive, margin-eroding competition is because they've defined themselves according to operational effectiveness rather than strategic positioning.
 - **Operational effectiveness** refers to performing the same tasks better than rivals perform them.
 - Everyone wants to be better, but the danger in operational effectiveness is "sameness."
 - When offerings are roughly the same, they are more **commodity** than differentiated. Competition will focus on offering the lowest price, and this can pull down profits.
 - The **fast follower problem** exists when rivals watch a pioneer's efforts, learn from their successes and missteps, then enter the market quickly with a comparable or superior product at a lower cost.
 - Over 175 mattress firms operate in a crowded space made popular with disruptive models by Casper, Purple, Leesa, Tuft & Needle, among others. CNBC states "you can't tell them apart."
 - Snapchat is considered the pioneer of many photo and video sharing features, such as "Stories," location stickers, and **augmented-reality** "selfie filters," but Facebook properties including Instagram, WhatsApp, Messenger, and the flagship Facebook app routinely mimic Snap features, implementing some in as little as four months after their appearance in Snapchat.
 - Snapchat's growth tumbled 82 percent after Instagram Stories launched, and the firm posted a \$2.2 billion loss in its first quarter as a public company.

- Operational effectiveness is critical, but for the most part, these efforts can be matched.
- **Strategic positioning** refers to performing different activities from those of rivals, or the same activities in a different way.
- Technology itself is often very easy to replicate, and those assuming advantage lies in technology alone may find themselves in a profit-eroding arms race with rivals able to match their moves step by step.

Different Is Good: FreshDirect Redefines the Grocery Landscape in New York City and Beyond

- FreshDirect, the New York City-based grocery firm, focused on the two most pressing problems for Big Apple shoppers—selection is limited and prices are high.
- The firm's "storefront" is a website offering a product mix heavy on fresh produce, as well as one-click menus and semiprepared specials like "meals in four minutes."
- Deliveries set out from a 400,000 square foot facility alongside corporate offices and R&D labs in the South Bronx.
 - This kind of size allows FreshDirect to offer a fresh goods selection that's over five times larger than local supermarkets.
- The FreshDirect model crushes costs that plague traditional grocers.
 - Worker shifts are highly efficient, avoiding the downtime lulls and busy rush hour spikes of storefronts and resulting in labor costs that are 60 percent lower than at traditional grocers.
 - FreshDirect buys and prepares what it sells, leading to less waste, an advantage that the firm claims.
 - Higher **inventory turns** mean the firm is selling product faster, so it collects money quicker than its rivals do—FreshDirect's overall perishable inventory turns 197 times a year versus 40 times a year at traditional grocers.
 - FreshDirect's super-fast "farm-to-fork" supply chain also allows food to be harvested for optimal freshness, yielding taste that far outpaces the competition.
 - Artificial intelligence software, coupled with some seven miles of fiber-optic cables linking systems and sensors, supports everything from baking the perfect baguette to verifying orders with 99.9 percent accuracy.
 - Since it lacks the money-sucking open-air refrigerators of the competition, the firm even saves big on energy (instead, staff bundle up for shifts in climate-controlled cold rooms tailored to the specific needs of dairy, deli, and produce).
 - The firm also uses recycled biodiesel fuel to cut down on delivery costs.
 - FreshDirect buys directly from suppliers, eliminating middlemen wherever possible.
- The firm offers suppliers several benefits beyond traditional grocers, all in exchange for more. These include:
 - Offering to carry a greater selection of supplier products while eliminating the "slotting fees" (payments by suppliers for prime shelf space) common in traditional retail
 - Cobranding products to help establish and strengthen supplier brand

- Paying partners in days rather than weeks
- Sharing data to help improve supplier sales and operations
- FreshDirect does it all with margins in the range of 20 percent (to as high as 45 percent on many semi-prepared meals), easily dwarfing the razor-thin 1 percent margins earned by traditional grocers.
- Traditional grocers can't fully copy the firm's delivery business because this would leave them **straddling** two markets (low-margin storefront and high-margin delivery), unable to gain optimal benefits from either.
- Entry costs for would-be competitors are also high, and the firm's complex and highly customized software, which handles everything from delivery scheduling to orchestrating the preparation of thousands of recipes, continues to be refined and improved each year.
- On top of all this comes years of relationship building with suppliers, as well as customer data used to further refine processes, speed reorders, and make helpful recommendations.

SIDEBAR: Better than Grocers, but Other Rivals?

- The FreshDirect model is superior to conventional grocery stores in just about every way, and the firm has devastated the competition while delivering on quality, selection, and value.
- However, one threat successful firms face is the potential entry of even better-funded, growth-seeking rivals to try to squeeze them out of the current market.
 - Amazon has recently shown up in FreshDirect's backyard, buying a massive Northern New Jersey distribution center formerly owned by grocer PathMark.
 - Estimates suggest the facility may be able to move ten times the dollar volume of FreshDirect's new Bronx distribution center. Many delivery items are cheaper from AmazonFresh than from FreshDirect.
 - Other players in the market include Walmart and Kroger as well as Uber-style contract food delivery services like Instacart, Google Express, and meal-kit delivery firms like Blue Apron.
 - Although AmazonFresh garnered negative early reviews for a poor online shopping experience and an uneven selection, these are problems a well-funded and patient giant may be able to iron out over time.

But What Kinds of Differences?

- The **resource-based view of competitive advantage** approach's idea is that if a firm is to maintain sustainable competitive advantage, a firm must control a set of exploitable resources that have four critical characteristics—valuable, rare, imperfectly imitable, and nonsubstitutable.
- Resource-based thinking can help firms avoid the trap of carelessly entering markets simply because growth is spotted.
 - The telecommunications industry learned this lesson in a very hard and painful way.
 - Most of what travels over the Internet is transferred over long-haul fiber-optic

cables, so telecom firms began digging up the ground and laying webs of fiberglass to meet the growing demand.

- On top of that, a technology called **dense wave division multiplexing (DWDM)** enabled existing fiber to carry more transmissions than ever before.

Questions and Exercises

1. What is operational effectiveness?

Answer: Operational effectiveness refers to performing the same tasks better than rivals perform them.

2. What is strategic positioning?

Answer: Strategic positioning refers to performing different activities from those of rivals, or the same activities in a different way.

3. Is a firm that competes based on the features of technology engaged in operational effectiveness or strategic positioning? Give an example to back up your claim.

Answer: Assuming that the features can be replicated, firms competing based on features alone are likely to be engaged in operational effectiveness. The automotive industry is an example of an industry that relies heavily on operational effectiveness because features such as power steering, antilock brakes, tire pressure sensors, and the like can be easily duplicated.

4. What are the dangers of competing on operational effectiveness? Are firms more likely to be considered commodities or differentiated offerings? How would you describe the basis for consumer decision-making when evaluating products that are highly similar?

Answer: The danger of competing on operational effectiveness is that it leads to “sameness.” It is usually not sufficient enough to yield sustainable dominance over the competition. As a result, firms become more likely to be considered commodities. Consumers likely base their decision on the strategic differences between firms.

5. What is the “resource-based” view of competitive advantage? What are the characteristics of resources that may yield sustainable competitive advantage?

Answer: The resource-based view of competitive advantage can help recognize whether a firm's differences are special enough to yield sustainable competitive advantage. The idea here is that if a firm is to maintain sustainable competitive advantage, it must control a set of exploitable resources that have four critical characteristics. These resources must be:

- Valuable
- Rare
- Imperfectly imitable (tough to imitate)
- Non-substitutable

Having all four characteristics is the key.

6. Examine the FreshDirect business model and list reasons for its competitive advantage. Would a similar business work in your neighborhood? Why or why not?

Answer: The following are reasons for FreshDirect's competitive advantage:

- It offers a good selection at lower prices.
- Labor costs are 60 percent lower than conventional grocery stores due to highly efficient worker shifts.
- The firm has a higher inventory turn.
- Artificial intelligence software is used to support everything.
- The firm saves energy costs through several energy-efficient practices.
- FreshDirect is able to cut costs by negotiating favorable terms with suppliers.

Depending on the market conditions, a business similar to FreshDirect's may or may not work in students' neighborhood. If real estate is not prohibitive, which promotes lower prices and wider selection, and lifestyles are not frenetic, their model might not gain traction. In some areas, grocery shopping is a social experience.

7. What effect did FreshDirect have on traditional grocers operating in New York City? Why?

Answer: FreshDirect drove one-third of New York City grocers out of business within five years of launch by undercutting competition by as much as 35 percent. The reason for this was that FreshDirect was operating on a large scale and they offered more choices to customers at lower prices. Many of the other grocers could not match this.

8. Choose a technology-based company. Discuss its competitive advantage based on the resources it controls.

Answer: Students may choose any company whose core competence is dependent on technology solutions. They should explain the competitive advantage based on the resources the firm controls using technology. Companies such as HP obtain significant operational control through the use of supply chain systems and VMI systems.

9. Use the resource-based view of competitive advantage to explain the collapse of many telecommunications firms in the period following the burst of the dot-com bubble.

Answer: Most of what travels over the Internet is transferred over long-haul fiber-optic cables, so telecom firms began laying webs of fiberglass to meet the growing demand. Eventually, rivals and new upstart firms started doing the exact same thing. On top of that, a technology called dense wave division multiplexing (DWDM) enabled existing fiber to carry more transmissions than ever before. The end result—these new assets weren't rare and each day they seemed to be less valuable. For some firms, the transmission prices they charged on newly laid cable collapsed by over 90 percent. Established firms struggled, upstarts went under, and the impact was felt throughout all industries that supplied the telecom industry. These were the reasons for the collapse of many telecommunications firms in the period following the burst of the dot-com bubble.

10. Consider the examples of Barnes & Noble competing with Amazon, and Apple offering iTunes. Are either (or both) of these efforts straddling? Why or why not?

Answer: When a firm attempts to match the benefits of a successful position while maintaining its existing position, it is referred to as straddling. When competing with Barnes and Noble, Amazon is not straddling since it doesn't include brick and mortar stores as part of its model. Barnes & Noble is straddling because it operates both virtual and brick and mortar stores. Apple's offering of iTunes is not straddling because Apple doesn't sell CDs.

Additional Exercises

1. Provide a real-life example of the fast follower problem.
2. Provide an example of a successful firm and any of its key resources that have all the four critical characteristics discussed in the resource-based view of competitive advantage.
3. Discuss the reasons for the failure and subsequent decline of Dense Wave Division Multiplexing (DWDM) based optic fiber cables.

2. Powerful Resources

- Understand that technology is often critical to enabling competitive advantage, and provide examples of firms that have used technology to organize for sustained competitive advantage.
- Understand the value chain concept, and be able to examine and compare how various firms organize to bring products and services to market.
- Recognize the role technology can play in crafting an imitation-resistant value chain, as well as when technology choice may render potentially strategic assets less effective.
- Define the following concepts: brand, scale, data and switching cost assets, differentiation, network effects, and distribution channels.
- Understand and provide examples of how technology can be used to create or strengthen the resources mentioned above.

Section Outline

- Recognizing a resource doesn't mean a firm will be able to acquire it or exploit it forever.
- But being aware of major sources of competitive advantage can help managers recognize an organization's opportunities and vulnerabilities, and can help them

brainstorm winning strategies.

Imitation-Resistant Value Chains

- Firms that craft an **imitation-resistant value chain** have developed a way of doing business that others will struggle to replicate, and in nearly every successful effort of this kind, technology plays a key enabling role.
- The **value chain** is the set of interrelated activities that bring products or services to market.

SIDEBAR: Key Framework: The Value Chain

- The value chain is the “set of activities through which a product or service is created and delivered to customers.” There are five primary components and four supporting components.
 - The primary components are:
 - Inbound logistics
 - Operations
 - Outbound logistics
 - Marketing and sales
 - Support
 - The secondary components are:
 - Firm infrastructure
 - Human resource management
 - Technology/research and development
 - Procurement

SIDEBAR: Dell's Struggles: Nothing Lasts Forever

- For years Dell's superefficient, vertically integrated manufacturing and direct-to-consumer sales combined to help the firm earn seven times more profit on its own systems when compared with comparably configured rival PCs.
- While Dell sold direct to consumers, rivals had to share a cut of sales with the less efficient retail chains responsible for the majority of their sales.
- But then Dell's killer model, one that had become a staple case study in business schools worldwide, began to lose steam.
 - Nearly two decades of observing Dell had allowed the contract manufacturers serving Dell's rivals to improve manufacturing efficiency.
- As the cost of computing fell, the price advantage Dell enjoyed over rivals also shrank in absolute terms.
- The direct-to-consumer model also suffered when sales of notebook PCs outpaced the more commoditized desktop market.
- Customers often want to compare products in person before making a purchase

decision.

- The firm has fallen on such hard times that management has “taken the firm **private**,” a plan that would allow a turn-around team to buy up all of Dell’s publicly-traded stock.
- Dell’s struggles as computers, customers, and the product mix changed all underscore the importance of continually assessing a firm’s strategic position among changing market conditions—there is no guarantee that today’s winning strategy will dominate forever, with a reminder that the advantages that were sustainable for years in earlier competition might not line up with market realities and the competitive environment going forward.

Brand

- A firm’s **brand** is the symbolic embodiment of all the information connected with a product or service, and a strong brand can also be an exceptionally powerful resource for competitive advantage.
- Consumers use brands to *lower search costs*, so having a strong brand is particularly vital for firms hoping to be the first online stop for consumers.
- A strong brand *proxies quality* and *inspires trust*, so if consumers can’t rely on a firm to deliver as promised, they’ll go elsewhere.
- As an upside, tech can play a critical role in rapidly and cost-effectively strengthening a brand.
- If a firm performs well, consumers can often be enlisted to promote a product or service (so-called **viral marketing**).
- With the rise of social media, services like Facebook and Twitter have become viral marketing machines.
- Early customer accolades for a novel service often mean that positive press (a kind of free advertising) will also likely follow.
 - But if a firm shows up late, it may end up paying much more to counter an incumbent’s place in the consumer psyche.

Scale

- Advantages related to a firm’s size are referred to as **scale advantages**.
- Businesses benefit from **economies of scale** when the cost of an investment can be spread across increasing units of production or in serving a growing customer base.
 - Firms that benefit from scale economies as they grow are sometimes referred to as being *scalable*.
 - The Internet firm Blue Nile sold as many diamond rings with just 115 employees and one website as a traditional jewelry retailer would sell through 116 stores. With lower operating costs, Blue Nile can sell at prices that brick-and-mortar stores can’t match, attracting even more customers and further fueling its advantages in economies of scale. Profit margins improve as the cost to run the firm’s single website and operate its one warehouse are spread across increasing jewelry sales.

- A growing firm may also gain *bargaining power with its suppliers or buyers*.
- The scale of technology investment required to run a business can also act as a barrier to entry, discouraging new, smaller competitors.
- Intel's size allows the firm to pioneer cutting-edge manufacturing techniques and invest \$7 billion on next-generation plants. Rivals such as AMD and IBM once made their own chips, but sold off manufacturing when their smaller market shares couldn't justify the Intel-sized multi-billion dollar table stakes needed to stay in the game.

Switching Costs and Data

- **Switching costs** exist when consumers incur an expense to move from one product or service to another.
- Tech firms often benefit from strong switching costs that cement customers to their firms.
- Similarly, firms that seem dominant but that don't have high switching costs can be rapidly trumped by strong rivals.
- It is critical for challengers to realize that in order to win customers away from a rival, a new entrant must not only demonstrate to consumers that an offering provides more value than the incumbent, they have to ensure that their value added exceeds the incumbent's value plus any perceived customer switching costs.
- *Data* can be a particularly strong switching cost for firms leveraging technology.
- Fueled by scale over time, firms that have more customers and have been in business longer can gather more data, and many can use this data to improve their value chain by offering more accurate demand forecasting or product recommendations.

SIDEBAR: Sources of Switching Costs

- Learning costs
- Information and data
- Financial commitment
- Contractual commitments
- Search costs
- Loyalty programs

Differentiation

- *Commodities* are products or services that are nearly identically offered from multiple vendors.
- Consumers buying commodities are highly price-focused since they have so many similar choices.
- In order to break the commodity trap, many firms leverage technology to *differentiate* their goods and services.
- Data is not only a switching cost, it also plays a critical role in differentiation.
 - Each time a visitor returns to Amazon, the firm uses browsing records, purchase patterns, and product ratings to present a custom home page featuring products that the firm hopes the visitor will like.
- Apple is another firm that has distinguished itself through differentiation.

- Unlike rival offerings from Microsoft and Google, Apple mobile and computer operating systems only run on Apple hardware. This allows the firm to tightly integrate the experiences across Apple products.
- While Apple's market share in computer operating systems is less than Microsoft Windows, and Apple's worldwide smartphone market share is less than Google's Android, Apple's differentiation (and the ability to avoid price-eroding, commodity-based competition of other hardware rivals) has helped make Tim Cook's firm the most profitable company in the United States.

Network Effects

- **Network effects** (sometimes called *network externalities* or *Metcalfe's Law*) exist when a product or service becomes more valuable as more people use it.
- A firm with a big network of users might also see value added by third parties.
- Switching costs also play a role in determining the strength of network effects.
- Because no one wants to be stranded with an abandoned product and lose this additional investment, users may choose a technically inferior product simply because the product has a larger user base and is perceived as having a greater chance of being offered in the future.

SIDEBAR: Open Table: Network Effects That Fill Restaurants' Seats

- By getting in between restaurants and their customers, and adding value along the way, OpenTable has built the world's largest online restaurant reservation system, one so dominant it is effectively a monopoly.
- OpenTable can get you a reservation at over 32,000 restaurants worldwide (as recently as 2013, its largest US rival had only 1,000).
- The system delivers high value by exposing inventory, lowering search costs and reducing frustration.

Distribution Channels

- **Distribution channels**—the path through which products or services get to customers—can be critical to a firm's success.
- Firms offering highly differentiated offerings may face difficulty convincing potential customers of a product's unfamiliar benefits.
- Apple gear at a Best Buy might face price or simple feature checklist comparisons. However, Apple products offered at the Apple store give firm-trained employees an opportunity to present advantages of the company's unique products, how they work together, and offer free on-site customer support.
- More recently, Apple has leveraged its iTunes platform as a distribution channel to launch a new subscription service. Just nine months after launching the Apple Music, the firm had attracted over 13 million paying subscribers to its streaming service.
- Today, Apple has over 60 million subscribers worldwide, and while Spotify has more subscribers overall, Apple Music has overtaken its Swedish rival in the United States.
- Many firms offer **APIs** (application programming interfaces), essentially programming

hooks that allow other firms to tap into their services. By publishing APIs, Uber has managed to add its service to apps and websites provided by United Airlines, OpenTable, and TripAdvisor.

- Users can be recruited to create new distribution channels for a firm's products and services.
 - Amazon now has over 1 million of these "associates" (the term the firm uses for its **affiliates**), yet it only pays them if a promotion gains a sale.
 - Google similarly receives some 30 percent of its ad revenue not from search ads, but from advertisements distributed within third-party sites ranging from lowly blogs to the *New York Times*.
- Being dependent on distribution channels provided by other firms can present challenges if distribution partners suddenly decide to cut you off.
- The ability to distribute products by bundling them with existing offerings can be a key advantage.

What about Patents?

- In the United States, technology and even business models can be patented, typically for periods of twenty years from the date of patent application.
- Firms that receive patents have some degree of protection from copycats that try to identically mimic their products and methods.
- The patent system is often considered to be unfairly stacked against startups.
- Large firms can also be victims. **Non-Practicing Entities (NPEs)**, more commonly known as *patent trolls*, hold intellectual property not with the goal of bringing novel innovations to market but instead in hopes that they can sue or extort large settlements from others.
- Litigation threats are pushing rivals to cooperate in patent portfolio acquisition.
- Even if an innovation is patentable, that doesn't mean that a firm has bulletproof protection.
 - Some patents have been nullified by the courts upon later review.
- Software patents are also widely granted, but notoriously difficult to defend.
 - In many cases, coders at competing firms can write substitute algorithms that aren't the same, but accomplish similar tasks.

Questions and Exercises

1. Define and diagram the value chain.

Answer: The value chain is the set of interrelated activities that bring products or services to market. Refer to Figure 2.2 for a diagram of the value chain.

2. Discuss the elements of FreshDirect's value chain and the technologies that FreshDirect

uses to give the firm a competitive advantage. Why is FreshDirect resistant to imitation from incumbent firms? What advantages does FreshDirect have that insulate the firm from serious competition from startups copying its model?

Answer: The following are reasons for FreshDirect's competitive advantage:

- It offers a good selection at lower prices.
- Labor costs are 60 percent lower than conventional grocery stores due to highly efficient worker shifts.
- The firm has a higher inventory turn.
- Artificial intelligence software is used to support everything.
- The firm saves energy costs through several energy-efficient practices.
- FreshDirect is able to cut costs by negotiating favorable terms with suppliers.

FreshDirect is resistant to imitation by incumbent firms because copying the firm's business model would leave a competitor straddling two markets (low-margin storefront and high-margin delivery), and unable to gain optimum benefit from either. Entry costs for would-be competitors are also high spent over \$75 million (the firm building infrastructure before it could serve a single customer).

3. Identify two firms in the same industry that have different value chains. Why do you think these firms have different value chains? What role do you think technology plays in the way that each firm competes? Do these differences enable strategic positioning? Why or why not?

Answer: Apple and Dell compete in the same (personal computer) industry but with significantly different value chains. Apple's value chain emphasizes branding, innovation, customer loyalty based on a differentiated product, and a retail strategy. Dell's value chain emphasizes low cost based on manufacturing efficiencies, a huge selection of choice based on customer configuration, and direct sales. Dell uses technology to compete on price, delivery time, and choice; whereas Apple uses technology to foster uniqueness (easy-to-use, hardware and software integrated machines.) Each of these approaches allows the firm to strategically position itself for a different and unique customer base.

4. How can information technology help a firm build a brand inexpensively?

Answer: If a brand is recognized positively, information technology can be used to inexpensively promote the product or service. If a firm performs well, consumers can often be enlisted to promote a product or service (viral marketing).

5. Describe Blue Nile's advantages over a traditional jewelry chain. Can conventional jewelers successfully copy Blue Nile? Why or why not?

Answer: Blue Nile's advantage over traditional jewelry chains are based on scale. It sold as many diamond rings with just 115 employees and one website as a traditional jewelry retailer would sell through 116 stores. This leads to lower prices, attracts more customers, and increases scale advantages even more. In turn, higher profit margins are the result.

Conventional jewelers cannot copy Blue Nile because of two reasons:

- Conventional retailers cannot match the scale at which Blue Nile is operating and hence they cannot provide the products at the same price.
- If a conventional retailer adopts the model, it will leave him straddling in two markets.

6. What are switching costs? What role does technology play in strengthening a firm's switching costs?

Answer: Switching costs occur when consumers incur an expense to move from one product or service to another. There are several sources of switching costs including, learning costs, information and data, financial commitment, contractual commitment, search costs, and loyalty programs. Tech firms often benefit from switching costs because users invest time learning a product, entering data, creating files, etc. Data can be a particularly strong switching cost for firms that leverage technology. There is a cost associated with switching (data) from Facebook, Netflix, or FreshDirect to a competitor's system.

7. What are network effects? Name a product or service that has been able to leverage network effects to its advantage.

Answer: Network effects exist when the value of a product or service increases as more people use it. eBay benefits from network effects as it increases its customer base, because future customers see it as way to maximize exposure. Each additional person that lists an item makes eBay more valuable.

8. What role did network effects play in your choice of an operating system, a social network, a word processor, or a mobile phone?

Answer: Network effects play a role in the choice of an operating system because a widely used OS is more likely to be compatible with other systems or networks, less likely to be abandoned, more likely to benefit from third-party add-ons like training, and have more available skilled support. Similarly, a widely used word processor is also less likely to be abandoned and is more likely to benefit from third-party add-ons. The choice of a mobile phone is also influenced by the reasons mentioned above.

9. How can technology be a distribution channel? Name a firm that has tried to leverage its technology as a distribution channel.

Answer: Technologies such as the Internet and cell phones act as channels to sell products. Users can be induced (for a cut of the take) to create additional distribution channels for a firm. Websites such as Amazon use the Internet to sell books and use affiliates to attract people to the distribution channel.

10. How does Apple compete with rivals? What competitive assets does the firm leverage when competing against Google, Microsoft, and others?

Answer: Apple competes with rivals through differentiation. User experience across products is seamless. Apple systems also consistently receive high customer

satisfaction ratings, are considered easier to use, are more secure, and have fewer privacy issues.

11. Do you think it is possible to use information technology to achieve competitive advantage? If so, how? If not, why not?

Answer: Used in isolation, information technology can't build a sustainable competitive advantage. If used to build a value chain or brand, create scale economies and distribution channels, take advantage of switching costs, data and network effects, and achieve differentiation, information technology can be used to create a competitive advantage. IT is commonly used as an enabler of competitive advantage.

12. What are the potential sources of switching costs if you decide to switch cell phone service providers? Cell phones? Operating systems? PayTV service?

Answer: The potential sources of switching costs are listed below:

Product or Service	Switching Cost
Cell Phone Service Providers	Contractual commitment, change in number, search costs, and loyalty programs
Cell Phones	Learning costs, information and data cost
Operating Systems	Learning costs, information and data, and search costs
Pay TV Service	Information and data, contractual commitment, search costs, and loyalty programs

13. Why is an innovation based on technology alone often subjected to intense competition?

Answer: Innovation based on technology alone is often subject to intense competition because technology, in many cases (and despite patent protection) can be easily duplicated or copied.

14. Can you think of firms that have successfully created competitive advantage even though other firms provide essentially the same thing? What factors enable this success?

Answer: Netflix and Blockbuster both provide movies on rental CDs. Through brand, scale, switching costs, and data advantages, Netflix was able to craft a significant competitive advantage over Blockbuster.

15. What can a firm do to prepare for the inevitable expiration of a patent (patents typically expire after twenty years)? Think in terms of the utilization of other assets and the

development of advantages through employment of technology.

Answer: A firm can prepare for the inevitability of patent expirations by continually developing new patentable products. Better yet, they can use the time to develop sustainable competitive advantage by building imitation-resistant value chains and brand, developing scale economies, differentiating their products and services, building in switching costs, and developing new and different distribution channels.

16. Walmart has purchased Jet.com and is going after Amazon's business and is invading FreshDirect's NYC grocery market. Survey the class—has anyone used Jet.com? How was their use compared with their Amazon purchases? What factors explain Jet's performance? Do you think it was wise for Walmart to buy Jet? Why or why not? What will Jet need to do in order to catch up with Amazon and to displace FreshDirect? Do you think it will be able to do this?

Answer: Answers will vary between students but should include analysis of the firms' assets at work.

Additional Exercises

1. The Internet can be used even by small players to sell their products. Do you think scale is important for a firm that sells its products online?
2. Price is the only factor that determines demand in a transparent market like the Internet. Do you agree with this statement? What other factors, if any, affect demand in an Internet market?

3. Barriers to Entry, Technology, and Timing

- Understand the relationship between timing, technology, and the creation of resources for competitive advantage.
- Argue effectively when faced with broad generalizations about the importance (or lack of importance) of technology and timing to competitive advantage.
- Recognize the difference between low barriers to entry and the prospects for the sustainability of new entrant's efforts.

Section Outline

- Some have correctly argued that the barriers to entry for many tech-centric businesses are low.

- Today's Internet giants are winners because in most cases, they were the first to move with a profitable model and they were able to quickly establish resources for competitive advantage.
 - In a year in which Netflix profits were up sevenfold, Blockbuster lost more than \$1 billion, and today Blockbuster is bankrupt.
 - By 2018, Netflix briefly surpassed Disney in market capitalization.
 - In the first three months of 2018, eBay made nearly half a billion dollars in profits, while Sotheby's lost \$6.5 million and has since been taken private.
 - In 2018, Amazon's profits totaled over \$11.2 billion, while Barnes & Noble lost over \$152 million and is now no longer a publicly traded company.
- Timing and technology alone will not yield sustainable competitive advantage.
 - Yet both of these can be enablers for competitive advantage.
- True strategic positioning means that a firm has created differences that cannot be easily matched by rivals.
- Moving first pays off when the time lead is used to create critical resources that are valuable, rare, tough to imitate, and lack substitutes.

SIDEBAR: But Google Arrived Late! Why Incumbents Must Constantly Consider Rivals

- Yahoo! and Hotmail were able to hold onto their lead in e-mail market share for several years after Gmail's introduction, likely because these firms quickly matched and nullified Gmail's most significant tech-based innovation (more free storage) before Google could inflict real damage.
- Yahoo! (and many Wall Street analysts) saw search as a commodity—a service the firm had subcontracted out to other firms including Alta Vista and Inktomi.
- As Google's innovations in technology and interface remained unmatched over time, this allowed the firm to build its brand, scale, and advertising network (distribution channel) that grew from network effects because content providers and advertisers attract one another.
- Now Google (and Apple, too) are once again running from this playbook—turning the smartphone software market into what increasingly looks like a two-horse race.
- Google's ability to succeed after being late to the search and mobile isn't a sign of the power of the late mover; it's a story about the failure of incumbents to monitor their competitive landscape, recognize new rivals, and react to challenging offerings.
- Firms that quickly get to market with the "right" model can dominate, but it's equally critical for leading firms to pay close attention to competition and innovate in ways that customers value.

Questions and Exercises

1. Does technology lower barriers to entry or raise them? Do low entry barriers necessarily mean that a firm is threatened?

Answer: Barriers to entry for many tech-centric businesses are low. Technology lowers the barriers to entry as technology can be duplicated easily. This argument is particularly true for the Internet where rivals can put up a competing website seemingly overnight. Low entry barriers do not always provide a threat to companies that have built a sustainable competitive advantage based on critical resources that are rare, valuable, and tough to imitate, and lack substitutes. However, low entry barriers will attract more competitors and may become a serious threat if the firm does not possess sustainable competitive advantage.

2. Is there such a thing as the first-mover advantage? Why or why not?

Answer: There is a “first-mover advantage” provided the early entrant uses the time-lead to create critical resources that are rare, valuable, tough to imitate, and lack substitutes. Timing and technology alone will not produce a sustainable competitive advantage; however, both can be significant enablers for competitive advantage.

3. Why did Google beat Yahoo! in search?

Answer: Google's success after being a late entrant in search is attributable to the fact that Yahoo! failed to monitor the competitive landscape and recognize and react aggressively to Google's threat. In fact, Yahoo! saw no problem with providing startup funding to Google, and even used Google to provide search results. Yahoo! saw search as a commodity, a service the firm had subcontracted out to other firms including Alta Vista and Inktomi.

4. A former editor of the *Harvard Business Review*, Nick Carr, once published an article in that same magazine with the title “IT Doesn't Matter.” In the article he also offered firms the advice: “Follow, Don't Lead.” What would you tell Carr to help him improve the way he thinks about the relationship between time, technology, and competitive advantage?

Answer: Timing or technology alone will not produce a sustainable competitive advantage by itself; however, both can be significant enablers for competitive advantage. Moving first can pay off when the time lead is used to create critical resources that are rare, valuable, and tough to imitate, and lack substitutes. Technology provides advantage if it is aligned with business objectives.

5. Name an early mover that has successfully defended its position. Name another that had been superseded by the competition. What factors contributed to its success or failure?

Answer: Netflix is a first mover that has successfully defended its position by using time to build a sustainable competitive advantage based on brand, scale, data assets, switching costs, and differentiation. Atari is a first mover that succumbed to “fast follower” Nintendo. Nintendo used a combination of technology, brand, and scale to deny Atari access to retail distribution. The students may provide similar examples that are consistent with the concept.

6. You have just written a word processing package far superior in features to Microsoft Word. You now wish to form a company to market it. List and discuss the barriers your

startup faces.

Answer: A startup software company offering a word processor in competition with Microsoft Word faces huge barriers. In addition to any software patent protection they might have, Microsoft enjoys huge advantages in scale and brand recognition. In addition, Microsoft has a considerable advantage because of network effects (learn MS Word; everyone else in the corporate world is using it), switching costs (we just paid a fortune for all of these seat licenses and training), and distribution (it comes bundled with and is compatible with MS Office). Microsoft might also have a data advantage over other products.

7. What kinds of strategic assets are Google's Android and Apple's iOS seeking to create and exploit? Do you think these firms will be more successful than rivals? Why or why not?

Answer: Google's Android and Apple's iOS are seeking to create assets that exploit the network effects, which exist when a product or service becomes more valuable as more people use it. These firms will be more successful than rivals such as Microsoft and HP because Apple and Google have a much larger network as well as a greater number of apps that run on and enhance their devices, most of which are provided by third parties. Third-party add-on products, books, magazines, or even skilled labor are all attracted to networks of the largest number of users, making Apple's iOS devices and Google's Android even more valuable.

Additional Exercise

1. When do you think being a first mover will be at a disadvantage? Provide two examples.

4. Key Framework: The Five Forces of Industry Competitive Advantage

- Diagram the five forces of competitive advantage.
- Apply the framework to an industry, assessing the competitive landscape and the role of technology in influencing the relative power of buyers, suppliers, competitors, and alternatives.

Section Outline

- Strategic frameworks help managers describe the competitive environment a firm is

facing.

- Frameworks can also be used as brainstorming tools to generate new ideas for responding to industry competition.
- One of the most popular frameworks for examining a firm's competitive environment is **Porter's five forces**, also known as the *Industry and Competitive Analysis*. The five forces this framework considers are:
 - The intensity of rivalry among existing competitors
 - The threat of new entrants
 - The threat of substitute goods or services
 - The bargaining power of buyers
 - The bargaining power of suppliers
- Consider how the rise of the Internet has impacted the five forces for music retailers.
 - Traditional music retailers scrambled to invest in selling music online out of what is perceived to be a necessity.
 - Their *intensity of rivalry* increases because they not only compete based on the geography of where brick-and-mortar stores are physically located, they now compete online as well.
 - Investments online are expensive and uncertain, prompting some firms to partner with *new entrants* such as Amazon.
 - Customers can hear samples of almost all tracks, selection is seemingly limitless (the *long tail* phenomenon), and data is leveraged using *collaborative filtering* software to make product recommendations and assist in music discovery.
 - The process of buying a plastic disc now faces *substitutes* as digital music files become available on commercial music sites.
 - From a sound quality perspective, the *substitute good* of digital tracks purchased online is almost always inferior to their CD counterparts.
 - Consumers (buyers) have *bargaining power*.
 - They demand cheaper prices and greater convenience.
 - The Internet can also create models that strengthen the *bargaining power of suppliers*. Consider the rise of taxi services such as Uber.
- While it can be useful to look at changes in one industry as a model for potential change in another, it's important to realize that the changes that impact one industry do not necessarily impact other industries in the same way.
- It is often suggested that the Internet increases bargaining power of buyers and lowers the bargaining power of suppliers.
 - This suggestion is true for some industries like auto sales and jewelry where the products are commodities and the **price transparency** of the Internet counteracts a previous **information asymmetry** where customers often didn't know enough information about a product to bargain effectively.
 - But it's not true across the board.

- In cases where network effects are strong or a seller's goods are highly differentiated, the Internet can strengthen supplier bargaining power.
- Switching costs weaken buyer bargaining power.
 - Switching costs help cement customers to the company even when rivals offer more compelling rates or services.
- Tech plays a significant role in shaping and reshaping the five forces, but it's not the only significant force that can create an industry shock.
- Government deregulation or intervention, political shock, and social and demographic changes can all play a role in altering the competitive landscape.

Questions and Exercises

1. What are Porter's "five forces"?

Answer: The five forces Potter's framework considers are:

- The intensity of rivalry among existing competitors
 - The threat of new entrants
 - The threat of substitute goods or services
 - The bargaining power of buyers
 - The bargaining power of suppliers
2. Use the five forces model to illustrate competition in the newspaper industry. Are some competitors better positioned to withstand this environment than others? Why or why not? What role do technology and resources for competitive advantage play in shaping industry competition?

Answer: The newspaper industry is threatened by substitute products such as cable television, satellite television, leisure activities that can be performed instead of reading a newspaper, and the Internet in the form of blogs and e-newspapers. As a result of this, competition is high. The threat of new entrants, with the exception of Internet rivals, is low. Individual buyer power is increasing with the increase in the number of substitutes. Supplier bargaining power, primarily for paper and inks, in the traditional newspaper model, is diminishing as print runs decline. Some competitors, like the Wall Street Journal, have a presence in both the traditional newspaper industry, and through their subscription website, the Internet news industry as well. Because of its subscription-based Internet newspaper, its specialized (financial) products and services, its reputation, and the synergy between its online and print products, the Wall Street Journal is in a relatively better position than its competitors. The WSJ has leveraged Internet technology by taking advantage of its existing print brand, thereby significantly reducing promotion costs for its Internet brand. On the other hand, the Internet version promotes the print version on its home page.

3. What is price transparency? What is information asymmetry? How does the Internet relate to these two concepts? How does the Internet shift bargaining power among the five forces?

Answer: Price discrimination exists when sales of identical goods or services are transacted at different prices from the same provider. Information, or price transparency, is a condition where buyers know what products are being offered and at what prices throughout the entire market. The Internet fosters price transparency, and reduces price discrimination, by making information to counteract information asymmetry readily available. In certain cases this serves to enhance the power of buyers and reduce seller power.

4. How has the rise of the Internet impacted each of the five forces for music retailers?

Answer: Owing to the rise of the Internet, the intensity of rivalry has increased as retailers compete globally. The Internet has made it easy for new entrants like Amazon and Apple iTunes to establish themselves. Substitutes in the form of digital music files emerge. Buyer bargaining power, resulting in lower prices, in turn results from all of this increased choice. The bargaining power of suppliers (music labels and artists) also increases as labels find ways around the sales restrictions imposed by retailers, and bands find innovative ways to bypass labels.

5. In what ways is the online music buying experience superior to that of buying in stores?

Answer: The online music buying experience benefits from the availability of music "samples," seemingly limitless selection, and data leveraged via collaborative filtering software to make product recommendations.

6. What is the *substitute* for music CDs? What is the comparative sound quality of the substitute? Why would a listener accept an inferior product?

Answer: Digital music files are the substitutes for music CDs. The lower quality sound of digital music files compared to CDs is trumped by the convenience of carrying thousands of songs on a portable device. The digital music is also cheaper to obtain.

7. Based on Porter's five forces, is this a good time to enter the retail music industry? Why or why not?

Answer: Due to the intensity of the rivalry among existing competitors, the bargaining power of buyers and suppliers is more. Hence, this may not be the right time to enter the retail music industry.

8. What is the cost to the music industry of music theft? Cite your source.

Answer: This question is designed to encourage students to research on the Internet and student answers might have slight variations depending on the sources they use. According to the Recording Industry Association of America, a credible study by the Institute for Policy Innovation pegs the ANNUAL harm at \$12.5 billion in losses to the U.S. economy as well as more than 70,000 lost jobs and \$2 billion in lost wages to American workers. Source: <http://www.riaa.com/>.

9. Discuss the concepts of price transparency and information asymmetry as they apply to the diamond industry as a result of the entry of Blue Nile. Name another industry where the Internet has had a similar impact.

Answer: As a result of the entry of Blue Nile into the diamond industry via their online store, price transparency has increased and information asymmetry has decreased. Blue Niles's website serves as a sort of basis for determining low price. eBay also serves as a price benchmark for a variety of goods, including new goods in the second tier markets.

10. Under what conditions can the Internet strengthen supplier bargaining power? Give an example.

Answer: When network effects are strong and/or a seller's goods are highly differentiated, the Internet can strengthen supplier bargaining power. This is due to the presence of only a few suppliers and the creation of a market with many buyers through Internet exposure. Consulting and recruiting firms with an online presence benefited from the demand for programming experts in certain legacy languages during the Y2K run-up.

11. What is the effect of switching costs on buyer bargaining power? Give an example.

Answer: Switching costs can weaken buyer bargaining power. In cases where network effects are strong or a seller's goods are highly differentiated, the Internet can strengthen supplier bargaining power and lower that of the buyer.

Wells Fargo has found that customers who use online bill payment (where switching costs are high) are 70 percent less likely to leave the bank than those who don't use it. This shows that switching costs help cement customers to the company even when rivals offer more compelling rates or services.

12. How does the Internet impact bargaining power for providers of rare or highly differentiated goods? Why?

Answer: When network effects are strong and/or a seller's goods are highly differentiated, the Internet can strengthen supplier bargaining power. For instance, an antique dealer with a rare and valuable piece, can expand the number of potential customers available, and bid up the price via a service like eBay. The buyer obtains bargaining power because he has access to more potential buyers.

Additional Exercises

1. Analyze the banking industry in the United States with reference to Porter's five forces and determine if it is the right time for a company to enter the banking business in United States.
2. Consider an industry with very few rivals and list a few substitutes for that industry.

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Chapter 3

Zara: Fast Fashion from Savvy Systems

Chapter Introduction

Zara is the game-changing crown jewel in the multibrand empire of Inditex Corporation, the world's largest pure-play fashion retailer and a firm that's bigger than Gap, H&M, Topshop, and anyone else in the space. The firm's supremacy is plotted and executed from "The Cube," the gleaming, futuristic headquarters located in La Coruña's Arteixo industrial area.

This chapter discussed the blend of technology-enabled strategy used by Zara, which seems to break all of the rules in the fashion industry. These counterintuitive moves are part of a recipe for success that's beating the pants off the competition and has catapulted Ortega to become the world's second richest man, ahead of Warren Buffet.

1. Introduction

- Understand how Zara's parent company Inditex leveraged a technology-enabled strategy to become the world's largest fashion retailer.
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Section Outline

- The blend of technology-enabled strategy that Zara has unleashed deviates widely from what otherwise looks like the standard fashion retail playbook.
 - The firm shuns advertising and rarely runs sales.
 - In an industry where nearly every major player outsources manufacturing to low-cost countries, Zara is highly vertically integrated, keeping huge swaths of its production process in-house.
 - Zara's model continues to be locally focused, but it is also evolving to support e-commerce, including deploying fifty-two special e-commerce stockrooms globally, each capable of delivery to stores or customer homes.
- In August 2008, sales edged ahead of Gap, making Inditex the world's largest fashion retailer.

Why Study Zara?

- While competitors falter, Zara is undergoing one of the fastest global expansions the fashion world has ever seen, opening one store per day and entering new markets worldwide—ninety-six markets so far.
- The chain's profitability is among the highest in the industry.
- Zara's duds look like high fashion but are comparatively inexpensive.
- It is important to understand how counterintuitive and successful Zara's strategy is, and how technology makes all of this possible.
- In order to understand and appreciate just how successful Zara's strategy is, it's important to first examine the conventional wisdom in apparel retail.

Gap: An Icon in Crisis

- In retail in general and fashion in particular, having too much unwanted product on hand will force a firm to mark down or write off items, killing profits.
- For years, Gap sold most of what it carried in stores.
- Gap had spot-on tastes throughout the 1990s, but when sales declined in the early part of the following decade, it filled its stores with miniskirts, low-rise jeans, and even a much-ridiculed line of purple leather pants.
- The throngs of teenagers the firm sought to attract never showed up, and the shift in offerings sent Gap's mainstay customers to retailers that easily copied the styles that Gap had made classic.
- Gap's same-store sales declined for twenty-nine months straight and profits vanished.

SIDEBAR: Contract Manufacturing: Lower Costs at What Cost?

- Conventional wisdom suggests that leveraging cheap **contract manufacturing** in developing countries can keep the cost of goods low.
- But many firms have also experienced the ugly downside to this practice.
 - Global competition among contract firms has led to race-to-the-bottom cost-cutting measures.
 - Too often, this means that in order to have the low-cost bid, contract firms skimp on safety, ignore environmental concerns, employ child labor, and engage in other ghastly practices.
- The apparel industry in particular has been plagued by accusations of sweatshop labor and unsafe working conditions.

- Incidents such as the Spring 2013 Bangladesh Rana Plaza disaster, which killed more than 1,100 people in the collapse of an illegally constructed eight-story building housing multiple contract garment factories, underscore the human toll of unacceptable contract manufacturing practices.
 - While Gap was not implicated in the Rana Plaza incident, the firm was singled out as a protest target because it is one of the largest importers of clothing from Bangladesh, and it refused to sign a safety accord backed by H&M and Zara, among others.
- Big firms are big targets, and those that fail to adequately ensure their products are made under acceptable labor conditions risk a brand-damaging backlash that may turn off customers, repel new hires, and leave current staff feeling betrayed.
 - Today's manager needs to think deeply not only about their own firm's ethical practices, but also those of all of their suppliers and partners.

SIDEBAR: Tech for Good: The Fair Factories Clearinghouse

- The problem of sweatshop labor and dismal industry practices has plagued the clothing industry for years.
 - Even well-meaning firms can find themselves stung by corner-cutting partners that hide practices from auditors or truck products in from unmonitored off-site locations.
- Reebok invested millions in developing an in-house information system to track audits of its suppliers along dimensions such as labor, safety, and environmental practices.
 - Reebok went on to donate this system and provided critical backing to help create the nonprofit organization Fair Factories Clearinghouse.
- With management that included former lawyers for Amnesty International, Fair Factories (FairFactories.org) provides systems where apparel and other industries can share audit information on contract manufacturers.
- Suppliers across industries now recognize that if they behave irresponsibly the Fair Factories system will carry a record of their misdeeds, notifying all members to avoid the firm.

Questions and Exercises

1. Has anyone shopped at Zara? If so, be prepared to share your experiences and observations with your class. What did you like about the store? What didn't you like? How does Zara differ from other clothing retailers in roughly the same price range? If you've visited Zara locations in different countries, what differences did you notice in terms of offerings, price, or other factors?

Answer: This is an activity designed to promote classroom discussion. The students who have visited the store may share their experiences about shopping at Zara. Factors such as customer service, price, fashion, variety, etc. can be discussed. Due to the nature of this question, student answers will vary.

2. What is the "conventional wisdom" of the fashion industry with respect to design, manufacturing, and advertising?

Answer: The conventional fashion industry business model is based on long lead times, contract manufacturing, and large advertising budgets.

3. What do you suppose are the factors that helped Gap to at one point rise to be first in sales in the fashion industry? Why do you suppose Gap profits collapsed?

Answer: Gap's targeting was appropriate in the earlier years and its fashion predictions were always spot-on. This led to increased sales; Gap sold most of what it carried in stores. Gap's CEO turned Gap's button-down shirts and khakis into America's business casual uniform. This kind of innovation and operational efficiency led Gap to the top spot in the United States.

As sales declined, Gap decided to chase the youth market and filled stores with miniskirts, low-rise jeans, and even a much-ridiculed line of purple leather pants. The throngs of teenagers Gap sought to attract never showed up, and the shift in offerings sent Gap's mainstay customers to retailers that easily copied the styles that Gap had made classic. Gap's same-store sales declined for twenty-nine months straight and profits vanished.

4. Where do Gap clothes come from? Who makes them? Why? Are there risks in this approach?

Answer: Gap clothes are contract-manufactured by offshore companies in developing nations. The rationale for this practice is that lower labor costs lead to lower prices, increased volumes, and higher profit margins. The risk to this approach is that the firm will be criticized for low pay, use of child labor, and unsafe working conditions. Environmental disregard prevalent among contract manufacturers will be discovered by watchdog groups, the media, and customers. This type of negative exposure can severely impact a firm's fortunes.

5. Describe the downside of working with a supplier exposed as having used unethical practices. How does this potentially damage a firm? How can technology play a role in helping a firm become more socially responsible with its supply sourcing?

Answer: A firm that works with a supplier exposed as having used unethical practices can be taken to task by watchdog groups, the media, and its consumers. This can trigger a brand-damaging backlash that may reduce sales, lower employee morale, and decrease the company's appeal among prospective employees. A firm can use in-house information systems or shared databases such as the Fair Factories system to track audit information on contract manufacturers along dimensions such as labor, safety, and environmental practices.

6. Describe the Fair Factories Clearinghouse. Which firm thought of this effort? Why did they give the effort away? Think in terms of strategic resources: what happens as more firms join this effort and share their data?

Answer: The Fair Factories Clearinghouse is a nonprofit organization formed to collect and share audit information on contract manufacturers. This effort was initiated by Reebok to monitor the activities of their own suppliers. Reebok donated their internal system and helped create Fair Factories Clearinghouse because they realized an

industry-wide system would be more effective. As more firms join the system the database becomes broader and more valuable.

Additional Exercises

1. Zara shuns advertising and rarely runs sales. Do you think this is an appropriate strategy? Explain your answer.
2. What actions would you take if you were appointed as the CEO of Gap? Justify your answer.

2. Don't Guess, Gather Data—Make Small Batches of What Customers Want & Ship Fast!

- Contrast Zara's approach with the conventional wisdom in fashion retail, examining how the firm's strategic use of information technology influences design and product offerings, manufacturing, inventory, logistics, marketing, and ultimately profitability.

Section Outline

- Stores can make sure that they are carrying the kinds of things customers want to buy by asking them.
- Zara's store managers lead the intelligence-gathering effort that heavily influences the products that the firm produces.
 - Armed with custom apps on mobile devices (initially Windows **PDA**s, now touch screen iPods) staff regularly chat up customers to gain insight on what patrons would like to see on store racks and shelves.
 - As much as 70 percent of salaries can come from store sale performance.
 - The staff then turns into a sort of investigation unit in the forensics of trendspotting, looking for evidence in the piles of unsold items that customers tried on but didn't buy.
 - Information on what's selling is also tallied via the store's **point-of-sale (POS) system** the cash registers that ring up sales and deduct sold items from inventory.
- All the valuable data allows the firm to plan new styles and issue rebuy orders based on feedback rather than hunches and guesswork.
 - The goal is to improve the frequency and quality of decisions made by the design and planning teams.

Design

- Rather than create trends by pushing new lines via catwalk fashion shows, Zara designs follow evidence of customer demand.
- Instead of designing a collection before the season, Zara tries to understand what the customers like, and then they design and produce it.
- Data on what sells and what customers want to see goes directly to the designers who crank out an astonishing thirty thousand items a year versus two to four thousand items offered up at big chains like H&M and Gap.
- The Zara design staff relies heavily on young and fresh graduates from design school.
 - Teams are regularly rotated to cross-pollinate experience and encourage innovation.
 - Design staff regularly reach out to store managers electronically and via phone, and even sometimes fly managers back to headquarters in Spain to view mockups and consult on design.
- The idea is that those closest to customers are better equipped than the corner office VP at knowing what customers want.

Manufacturing and Logistics

- Getting locally targeted designs quickly onto store shelves is where Zara really excels.
 - The average time for a Zara concept to go from idea to appearance in store is fifteen days versus their rivals who receive new styles once or twice a season.
- The firm is able to be responsive through a competitor-crushing combination of **vertical integration** and technology-orchestrated coordination of suppliers, just-in-time manufacturing, and finely tuned logistics.
 - Vertical integration is when a single firm owns several layers in its **value chain**.
 - Profits from this clothing retailer come from blending math with a data-driven fashion sense.
 - Inventory optimization models help the firm determine how many of which items in which sizes should be delivered to each specific store during twice-weekly shipments, ensuring that each store is stocked with just what it needs.
 - Outside the distribution center in La Coruña, fabric is cut and dyed by robots in twenty-three highly automated factories.
 - After cutting and dyeing, many items are stitched together through a network of local cooperatives that have worked with Inditex so long they don't even operate with written contracts.
 - All of the items the firm sells end up in a five-million-square-foot distribution center in La Coruña, or a similar facility in Zaragoza in the northeast of Spain.
 - Clothes are ironed in advance and packed on hangers, with security and price tags affixed.
- Zara inventory is smart. Security tags are custom made to also include RFID-technology. **RFID (radio frequency identification)** tags wirelessly emit a unique identifying code for the individual item.
 - RFID lets Zara know where products are, so if a customer asks for an item in a store (perhaps in a different size or color), staff using custom apps on an iPod Touch can immediately tell if a product is in store, in a nearby store, or if it can be ordered from the distribution center or Zara.com.

- Firms from Walmart to JCPenny have struggled to effectively implement RFID, but Zara's vertical integration is an advantage here, as well.
 - The entire supply chain is under Zara control and all items flow through one of two warehouses, Zara can affix tags to all products before sending them out to stores (a challenge for other retailers that have third-party suppliers ship to multiple warehouses or directly to stores).
- Stores then send tags back to Zara warehouses for reuse (reassigning a tag's unique identification number to a new clothing item).
- Zara is also a pioneer in going green, with an environmental strategy that includes the use of renewable energy systems at **logistics** centers and biodiesel for the firm's trucking fleet.

Stores

- Most products are manufactured for a limited production run.
 - Limited runs allow the firm to cultivate the exclusivity of its offerings.
 - Each Zara store is stocked with items tailored to the tastes of its local clientele.
 - Limited runs encourage customers to buy right away and at full price.
 - The constant parade of new, limited-run items also encourages customers to visit often.
 - Limited production runs allow the firm to reduce to a minimum the risk of making a mistake.
- While stores provide valuable frontline data, headquarters plays a major role in directing in-store operations.
 - Software is used to schedule staff based on each store's forecasted sales volume, with locations staffing up at peak times such as lunch or early evening.
- The store displays are directed centrally.

Integrating E-Commerce: Omnichannel = More Sales + Better Customer Experience

- Zara sees e-commerce as a critical part of the firm's **omnichannel** strategy, which blends online and offline sales in ways that best benefit the customer.
- The company sees the link between online and offline sales as being so fluid, it doesn't even breakout online sales as a separate category.
- A review of fashion e-commerce apps rated Zara's offering as best-in-class, and there is no evidence that online shopping is cannibalizing in-store sales.
- E-commerce makes up ten percent of Zara's sales and grew twenty-three percent in 2018.

SIDEBAR: Technology ≠ Systems. Just Ask Prada.

- Zara's IT expenditure is less than one-fourth the fashion industry average.
- Zara excels by targeting technology investment at the points in its value chain where it will have the most significant impact, making sure that every dollar spent on tech has a payoff.
- This is in contrast with high-end fashion house Prada's efforts at its flagship Manhattan