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Technology Is Eating the World

The Dizzying Nature of Today's Existence

The future ain't what it used to be.

—Yogi Berra

Let's say that you're curious about Twitter, and one day you decide to take the plunge. You compose 140 characters or fewer and tweet.

You wait—and then wait some more.

Nothing happens. No retweets (RTs). No modified tweets (MTs). Just crickets.

You start to wonder if you have used Twitter correctly. Aren't tweets supposed to start conversations? Isn't that what social media experts[*] promise?

Don't worry. It's *not* your fault. The majority of tweets are ignored. Some estimates put that number at greater than 70 percent,[†] and I would suspect that that number is much higher for first-time users who are not named Tim Cook.[‡] On the other end of the spectrum, some are heard around the world. Let me tell you about one of them.

Whoops

Up until December 20, 2013, relatively few people had heard of a 30-something PR exec named Justine Sacco. That all changed at 10:19 a.m. on that now-infamous Friday morning. The senior director of corporate communications for Internet conglomerate Inter-Active Corp (IAC) boarded an 11-hour flight from London to Cape Town, South Africa. Right before takeoff, Sacco thought it either wise, funny, or both to tweet the following (see Figure 1.1):

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[*] I don't like the term, but maybe I qualify as one. See http://tinyurl.com/ps-sm-exp.
[†] See http://tinyurl.com/q9zzq8y.
[‡] Cook, the CEO of Apple, signed up on September 20, 2013. Within days, he had amassed millions of followers.

Justine Sacco
@JustineSacco

Going to Africa. Hope I don't get
AIDS. Just kidding. I'm white!

12/20/13, 10:19 AM from Hillingdon, London

Figure 1.1   Justine Sacco's Infamous Tweet
Source: Twitter, December 20, 2013

Almost immediately after taking off on her Wi-Fi-free plane, Sacco's highly offensive tweet went viral. #HasJustineLandedYet soon started trending worldwide on Twitter. News reporters camped out at the Cape Town airport hoping to interview her.

Once Sacco landed, turned on her phone, and connected to the Internet, she realized the gravity of her joke gone bad. She deleted the offending tweet, along with her Twitter account. She issued a public apology. In her words, she was sorry "for being insensitive to this crisis—which does not discriminate by race, gender, or sexual orientation, but which terrifies us all uniformly—and to the millions of people living with the virus, I am ashamed."[*]

By that point, however, none of those actions mattered. No one could put that genie back in the bottle. The Twitter mob wanted blood. As the story developed, more disturbing details emerged. Twitter is public by default, and subsequent investigation of her activity on the social network revealed a pattern of insensitive and politically incorrect tweets. For instance, in February 2012, Sacco tweeted, "I had a sex dream about an autistic kid last night."[†]

Now, IAC is no mom-and-pop operation. Run by legendary media mogul Barry Diller, the corporation owns valuable online properties such as Match.com, OkCupid, The Daily Beast, Tinder, Dictionary.com, and Vimeo. No doubt that many of its millions of social-media-savvy customers quickly took to Twitter and other sites to express their outrage at the views of one of its most senior PR employees. IAC initially responded by condemning Sacco before doing the inevitable on December 22, 2013: terminating her employment amid the maelstrom.

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[*] See www.cnn.com/2013/12/22/world/sacco-offensive-tweet.

[†] For some other doozies, see http://tinyurl.com/oh-justine.

Now, make no mistake: People who should know better have been making insensitive, racial, and misogynistic comments and jokes for a very long time—centuries before the advents of the Web and social media. Consider Donald Sterling, the octogenarian ex-owner of the Los Angeles Clippers of the National Basketball Association (NBA). Sterling wouldn't know Twitter if it bit him, yet he has a long history of controversial remarks and employment practices. In 2014, during the NBA playoffs, Sterling caused quite the stir after making what he thought were private remarks about African Americans to his mistress, V. Stiviano, a woman nearly 50 years his junior. (For whatever reason, Stiviano recorded Sterling. Maybe it was a sting operation.) Sterling's racist comments represented social dynamite, especially in a league comprising nearly 80 percent black players. New NBA commissioner Adam Silver promptly banned Sterling for life and forced him to sell the team. (Ironically, Steve Ballmer ponied up more than a record $2 billion for the franchise.)

So, what was different about Justine Sacco? Ten or 20 years ago, it was impossible to go from nearly anonymous to nearly ubiquitous in a few minutes. And Sacco didn't publish a lengthy, hate-filled screed. Her crime could be represented in fewer than 140 ill-advised characters. The kerfuffle illustrates not only the pervasive nature of technology today, but also how choosing the wrong communications medium can result in adverse consequences. (I certainly don't endorse Sacco's views, but she could have chosen a more private way to express them—one that wouldn't have resulted in her termination and permanently sullied her professional image.)

You may think that this was the only occurrence of an employee using technology and social media to cause major headaches for a prominent public company. Not even close. It happens almost every day. For instance, in January 2013, an employee from British electronics retailer HMV who had access to its social media channels "live tweeted" the company's layoffs.[*] A few months later, in August 2013, AOL CEO Tim Armstrong abruptly fired Patch creative director Abel Lenz on a call in front of 1,000 coworkers. Lenz's crime was taking a photo during a meeting, the details of which almost immediately went viral, including the actual recording of the call.[†] Armstrong issued an apology soon afterward.

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[*] For more, see http://tinyurl.com/k6xjnx2.

[†] Listen to the call at http://tinyurl.com/patch-call-aol.

I could go on, but you get my point. Yogi Berra's quote at the beginning of this chapter has never been more apropos. We are living in a time of extraordinary technological and social change. Simply put, technology is everywhere now—or soon will be.

This chapter describes some of the key technological trends affecting not only every workplace on the globe, but just about every area of society. In so doing, it lays the groundwork for Part II of this book.

Accelerating Technological Change

Do you think that things happen faster these days than, say, 10 years ago? If so, you're not alone. More than ever, it seems like time flies. You may not be aware, though, that people have felt this way since the Industrial Revolution. *Speed dating* may be a relatively new term, but the notion that the pace of life is expediting is actually old hat. The dictionary company Merriam-Webster formally recognized the term *fast food* more than six decades ago.

The French cultural theorist and urbanist Paul Virilio has written extensively about emerging technology, speed, and power. Virilio contends that speed serves as the very foundation of technological society. Further, the velocity at which something happens often changes its very essence.* Moreover, Virilio states "that which moves with speed quickly comes to dominate that which is slower."[1] In two words, speed kills.

Virilio is no iconoclast. A gaggle of prominent academics and researchers has studied whether we are living in an era of accelerated technological change and concluded in the affirmative. Hermann Lübbe, Hartmut Rosa, Reinhart Koselleck, and many others have done extensive work to further our understanding of how rapid technological advances and our preoccupation with speed are collectively changing society. In his 2000 book *Faster: The Acceleration of Just About Everything,* James Gleick argues that this trend is only going to intensify in the coming years.

Research by the Federal Communications Commission (FCC) confirms that people are adopting technology more quickly than ever. Figure 1.2 shows the time that it has taken for inventions such as electricity, the VCR, and the telephone to reach one-quarter of the U.S. population.

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* To this end, in 1997 Virilio posited the theory of *dromology* to explain the importance of speed in warfare and communication.
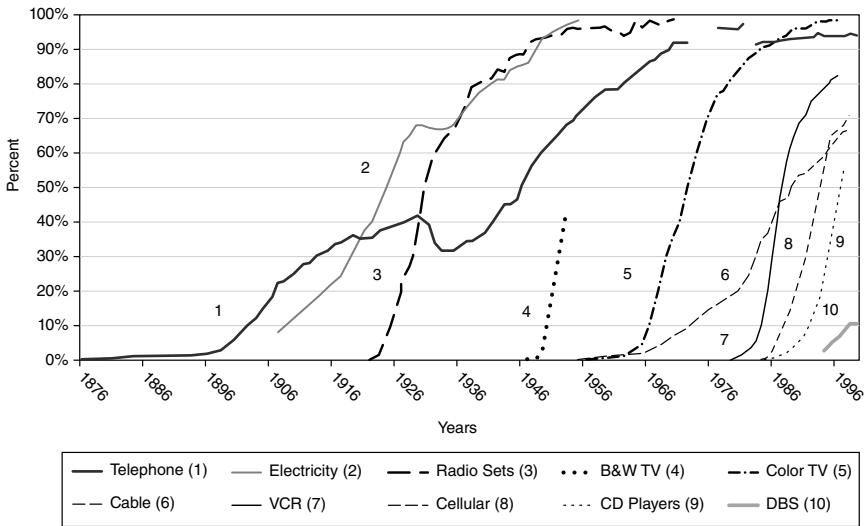
Figure 1.2   Penetration Rates of Consumer Technologies (1876–Present)
Source: FCC[2]

March 11, 2014, marked the 25th birthday of the World Wide Web. In honor of this historic event, several important technology media outlets released insightful research reflecting not only the development of the Internet, but also what's likely to happen in the coming years. Many media outlets, including *The Economist*, featured stories.[*] After all, it made for good fodder. Figure 1.3 presents the aforementioned FCC data.

On that same day, the Pew Research Center released a report called "The Future of the Internet."[†] The far-reaching analysis examined 15 theses about the digital future. At a high level, it surmised how trends like Big Data, mobility, and the Internet of Things will impact our lives by 2025. The Pew report peers into the future and offers some predictions that may or may not ultimately come true. Your guess is probably just as good as mine. Less uncertain, though, is the increasing rate at which we are adopting new technologies. As Pew's Drew Desilver wrote about the report:

> Using data from the website (of course) for futurist Ray Kurzweil's 2005 book *The Singularity Is Near, The Economist*'s chart not only

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[*] Read the whole article at http://tinyurl.com/kvbre4v.
[†] Access the entire report at http://tinyurl.com/pew5555.

depicts just how quickly the Web caught on, *but also shows a larger trend of ever-more-rapid adoption of new technologies over the past century and a half.* [Emphasis mine]
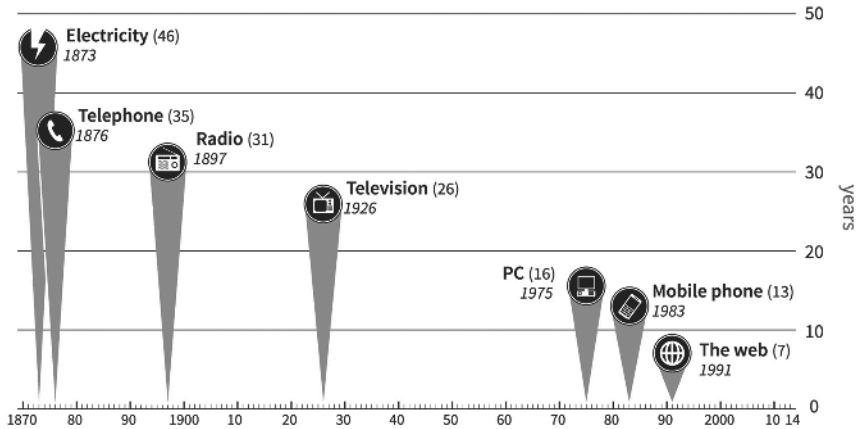
Figure 1.3   Technology Adoption: Years Until Used by One-Quarter of American Population
Source: FCC

Desilver cites the work of Ray Kurzweil, hands down the most prominent spokesperson on these types of subjects over the last several decades. The renowned inventor, author, and futurist has been banging the drums of technology, increasingly rapid change, and exponential growth for decades. In 2000 he wrote *The Age of Spiritual Machines: When Computers Exceed Human Intelligence.* Of note here is his Law of Accelerating Returns:

> As order exponentially increases, time exponentially speeds up (that is, the time interval between salient events grows shorter as time passes).
> The Law of Accelerating Returns (to distinguish it from a better-known law in which returns diminish) applies specifically to evolutionary processes. In an evolutionary process, it is order—the opposite of chaos—this is increasing. And, as we have seen, time speeds up.

Accelerating change goes hand in hand with automation, something that is also increasing faster than ever.

The Rise of the Machines

For a long time now, companies have been replacing humans with technology. Not that long ago, we needed to interact with another person at a bank to deposit checks and to withdraw cash. Not anymore. ATMs have us covered.

Automation is encroaching on our lives faster than ever, a point that Erik Brynjolfsson and Andrew McAfee of MIT make in their 2012 book *Race Against the Machine*. Research conducted at its Center for Digital Business proves that the digital revolution is accelerating. One of its principal effects is that computers are now capable of doing things that only humans used to be able to do.

Kurzweil has extrapolated current trends and arrived at an astonishing conclusion: Sometime around 2045, human and machine intelligence will merge. In his words, "the knowledge and skills embedded in our brains will be combined with the vastly greater capacity, speed, and knowledge-sharing ability of our own creations." Yes, man will be immortal.

Kurzweil has made many bold predictions such as these throughout the years. Unlike many experts, however, his prophecies have a remarkable knack of coming true—nearly five in six by his own estimation. For instance, in his 1990 book *The Age of Intelligent Machines*, he accurately prognosticated the fall of the Soviet Union as a result of "new technologies such as cellular phones and fax machines disempowering authoritarian governments by removing state control over the flow of information." In the same book, Kurzweil extrapolated the progress of chess software. Many laughed when he predicted that a computer would beat the world's best player by 2000. Kurzweil was actually too conservative. It happened even *earlier* than he predicted. In May 1997, the IBM supercomputer Deep Blue defeated world chess champion Garry Kasparov in a highly publicized tournament.

To be fair, Kurzweil is considered a controversial figure in many circles.[*] Many people find him and his views objectionable, although I am not one of them. I have enjoyed his writings and, based on my brief personal interaction with him, he is quite affable. In 2013, I had the pleasure of seeing him speak at the University of Nevada, Las Vegas. I was even able to ask him a question: Why did you decide to work at Google and do you like it? He answered that the com-

[*] Check out the 2009 documentary *Transcendent Man*, a fascinating look at the man.

pany's vast human and financial resources let him do things that he could not otherwise do. And, yes, he likes having a "real job."

The Deep Blue example is both instructive and endemic of a much more significant trend: Technology is capable of doing things that were once considered unthinkable or possible only on *Star Trek* episodes. Companies such as Tesla are changing the very nature of what automobiles can do. For its part, Google is wisely preparing for the inevitable twin declines in ad revenue and profits. The company's secret GoogleX division spends untold billions on "moonshot" projects. To this end, it hired Sebastian Thrun, at the time a professor of computer science and director of the Artificial Intelligence Laboratory at Stanford University. Thrun pioneered the company's foray into self-driving cars, making remarkable progress in just over three years. Note, however, that we are still a long ways away from seeing them on public highways and streets.

Things that we once thought unfathomable have started to become realities, as a few more examples will demonstrate. In 2011, IBM's Watson bested two of the greatest *Jeopardy!* champions in the show's history: Brad Rutter and Ken Jennings. After "reading" Wikipedia, the supercomputer soundly defeated its human competition. What's more, speech and voice recognition have made major strides. Apple's Siri might not be perfect, but it's getting better—and fast. Ditto for Microsoft's Cortana. Google Translate lets users effortlessly move between more than 80 languages from Afrikaans to Zulu—and usually very well.[*]

Forget robots on factory floors taking jobs from blue-collar workers. Technology is starting to eliminate the need for certain types of white-collar jobs, too. More than three years ago, Steve Lohr wrote in the *New York Times* about the ability of computers to mimic human reasoning. Companies like Narrative Science are using computers to generate passable news articles. As Lohr writes, its software:

> takes data, like that from sports statistics, company financial reports and housing starts and sales, and turns it into articles. For years, programmers have experimented with software that wrote such articles, typically for sports events, but these efforts had a formulaic, fill-in-the-blank style. They read as if a machine wrote them.[3]

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[*] Try it yourself at https://translate.google.com.

Fewer jobs will remain immune from a greater level of automation and routinization.

Trailing the Goldfish: Our Declining Attention Spans

Perhaps you've heard of Herbert Simon (no relation to me, although he did teach at my *alma mater*). The man was a true polymath. Throughout his lengthy and legendary career, he did extensive research in a range of variegated fields, including cognitive psychology, computer science, public administration, economics, management, and sociology.

Simon is perhaps best known for coining the phrase *bounded rationality* in 1955.[*] This is the notion that, in decision making, the rationality of individuals is limited by:

- The information they have
- The cognitive limitations of their minds
- The finite amount of time they have to make decisions

Simon understood full well that *homo economicus* was a myth. Classic economic theory had it all wrong; most of the time, we cannot and do not make completely rational decisions. We do the best with what we have. Not only are we wholly inconsistent, but we are also easily manipulated in all sorts of ways. As a result, the field of *behavioral economics* has become downright chic, with authors like Dan Ariely extending Simon's work.

"In an information-rich world, the wealth of information means a dearth of something else," Simon wrote in 1970. If the world was replete with information more than 40 years ago, what would you call it *now*? And what are we lacking today?

For starters, how about the ability to pay attention for more than 15 seconds at a time? The number of distractions is orders of magnitude greater now than it was back then. The National Center for Biotechnology Information reported in 2014 that American "attention spans have been decreasing over the past decade with the increase in external stimulation."[†] How much? Look at the jarring data in Table 1.1.

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[*] For more on this, see http://tinyurl.com/aclnans.
[†] See http://tinyurl.com/a7kmuce.

Table 1.1   Average Attention Spans

Attention Spans	Seconds
Average American in 2000	12
Average American in 2013	8
Goldfish in 2013	9

Source: National Center for Biotechnology Information (January 1, 2014)

You read that right: A garden-variety goldfish routinely pays attention for longer periods than the average American does these days. It's a good bet that the rise in the number of messages we regularly receive is at least partly responsible for our frighteningly short attention spans.

A Communications Revolution

On February 19, 2014, Facebook announced its acquisition of piping-hot mobile-messaging app WhatsApp for $19 billion, including $4 billion in cash. A few weeks earlier, Snapchat spurned a reported $3 billion offer from Mark Zuckerberg. Many pundits thought that Evan Spiegel and Bobby Murphy, the company's two 20-something founders, had lost their marbles.

The risky gambit seems to have paid off. In October 2014, *The Wall Street Journal* reported that Snapchat was in discussions with Yahoo. The latter would invest in the former at a $10-billion valuation.[4]

These numbers seem like Monopoly money and suggest that we have entered a new tech bubble. Whether these gargantuan rolls of the dice pay off for Facebook and Yahoo is anyone's guess. That aside, these loft valuations reflect the fact that we are in the middle of a veritable communications revolution.

Task-specific communications applications are immensely popular in the consumer world. Forget about social networks like Twitter, Facebook, and LinkedIn. Temporal message like Snapchat and WhatsApp, photo-sharing vehicles like Instagram and Pinterest, and video-sharing apps like Vine are fundamentally changing the way that consumers communicate with brands, not to mention with each other. Even the absurdly simple, oft-criticized Yo app served an indispensable

communications function. In August 2014, Israeli citizens used it extensively to alert others of impending missile attacks.[*]

Those of us who want to stay in touch with each other are no longer restricted to the phone and e-mail. We've never had more communication options available to us—*at least outside of work.*

The Age of the Entrepreneur

During the dot-com bubble, overhyped companies like Pets.com, Webvan, eToys, and Kozmo quickly rocketed to unprecedented valuations—only to quickly and spectacularly crash. For every Amazon, eBay, Google, and other iconic company to emerge from that era, thousands more are historical footnotes. Back then, starting a tech company was a Herculean task. For instance, early Web magazine Salon.com reportedly needed to raise and spend an eye-popping $100 million to serve its first customer.

There's arguably even greater hype around the current batch of disruptive start-ups: Uber, Lyft, Pinterest, and Airbnb. On many levels, though, today's environment could not be more different from the late 1990s. Infrastructure costs have plummeted by orders of magnitude. Cloud computing has become an incredibly affordable and viable tool for myriad entrepreneurs who don't know if their ideas will thrive or fail. Why even buy software at all? The rise of software as a service (SaaS) has been meteoric, as the successes of Salesforce.com, Workday, and others have shown. Why buy when you can rent? And open-source software has continued to gain popularity, power, and mainstream acceptance. There has never been a greater variety of legally downloadable, free[†] applications available to anyone with an Internet connection. Sites like GitHub serve as central and robust code repositories.

As I write in *The Age of the Platform*, the prevalence of application programming interfaces (APIs) and software development kits (SDKs) has been a boon to developers and companies like Apple, Facebook, Google, LinkedIn, WordPress, and Twitter. Microsoft (via Nokia), Amazon, and BlackBerry may make quality smartphones, but each company has struggled with selling them. Developers are

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[*] See http://time.com/2983226/yo-app-israel-missile.
[†] It's critical to remember that open-source software is much more like free speech than free beer.

choosing to concentrate their efforts on Android and iOS. Consumers have spoken loudly: They are loath to buy a phone that offers a relatively paltry selection of apps.

One of the most important effects of vastly more powerful and affordable technology is the ease of starting a company. It's no accident that Eric Ries's 2011 book *The Lean Startup* became a *New York Times* best-seller. Reis helped popularize the concept of a minimum viable product (MVP), a "version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort."[5] Untold numbers of start-ups across the world are building their companies on top of Amazon Web services (AWS) and similar offerings from Microsoft, IBM, and Google. They are developing MVPs, collecting data via A/B testing, refining their products, and failing fast. (Beyond start-ups, some very prominent conglomerates have embraced lean methods. For instance, General Electric has trained more than 40,000 of its employees in the lean methodology.[6]) Reis has become a bona fide rock star.

Those lacking sufficient funds to bootstrap their own big ideas have plenty of alternatives. First, crowdfunding sites like Kickstarter are more popular than ever. Next, they can apply to popular start-up incubators like Y Combinator, TechStars, Seedcamp, and others. In return for relatively small ownership stakes, these accelerators provide their residents with seed money, advice, adult supervision, and connections. (Lest I overstate things, admission to A-list incubators is fiercely competitive; they reject the vast majority of applicants.) Failing that, ambitious founders and entrepreneurs can approach angel investors and venture capital (VC) firms.

No Shame: Entrepreneurialism, Failure, and American Risk Taking

Tech start-ups and mobile apps may be relatively recent advents, but they reflect the same American entrepreneurial ethos we've seen since the nineteenth century California Gold Rush. In the United States, there has never been shame in starting a company that eventually goes under. This is not true across the globe. For example, in many Asian countries such as Japan, failure is still widely stigmatized. In *Forbes*, Kevin Ready writes about the Japanese start-up gap. "Japan, as all modern societies, has benefited greatly from the innovation and value creation of entrepreneurship, yet has a culture that is highly resistant against, if not openly hostile to startups."[7]

(Continued)

(*Continued*)

It would be difficult to imagine Peter Theil of PayPal fame hatching his fellowship program in China. For the last four years, the billionaire entrepreneur and investor has paid 20 teenagers $100,000 each *not* to attend college. He believes that college debt is oppressive and that Theil Fellows will benefit more from the experience they gather even if their start-ups fail.

Theil is hardly the only American tech titan espousing the virtues of new, disruptive technologies like Bitcoin. Marc Andreessen is best known as coauthor of Mosaic, the first widely used Web browser. He cofounded Netscape Communications and currently serves as the general partner of the highly influential and successful venture capital firm Andreessen Horowitz, a firm that has perhaps the most impressive investment portfolio in the world.[*] As Andreessen famously remarked, "Software is eating the world." In his view, the American entrepreneurial ethos—and Silicon Valley in particular—drives a great deal of the world's innovation. Other countries cannot innovate as quickly as the United States does because they lack corresponding growth engines. This is very true, but deep cultural mores encourage Americans to start their own companies. In other cultures, the same societal forces strongly discourage their citizens from doing the same.

Disruption Is Cool

Because language is at the heart of this book, I would be remiss not to mention the metamorphosis of the word *disrupt* over the past decade. Consider its current *Oxford English Dictionary* definition:

- (v) Interrupt (an event, activity, or process) by causing a disturbance or problem;
- (v) Drastically alter or destroy the structure of (something)

Up until recently, the word's connotation was decidedly negative. As a kid, my parents sometimes told me that I was being *disruptive.* Why would anyone intentionally disrupt something or someone? The old notion of *disruption* has been, well, disrupted.

On a macroeconomic level, capitalism and disruption have always gone hand in hand. (The next chapter begins with one of my favorite related stories.) The Austrian economist Joseph Schumpeter popularized the notion of *creative destruction* in the early twentieth

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[*] See it at http://a16z.com/portfolio.

century. Although it has long been an economic fact of life in capitalist societies, relatively few people have so outwardly *aspired* to actively disrupt entire industries.

My, how times have changed. Disruption is very much in vogue. TechCrunch runs trendy Disrupt conferences. Start-ups like Lyft, Uber, Airbnb, and countless others blatantly flout their goals of disrupting established industries. Behemoths like Google and Facebook are spending billions of dollars to effectively disrupt their own business models, the necessity of which Steve Jobs understood all too well. The mad genius once famously said, "If you don't cannibalize yourself, someone else will."

SEO and the *Really* Long Tail

If you're reading this book, it's safe to say that you sometimes search the Web for pictures, general information, videos, music (legal or otherwise), gifts to buy, and myriad other things. Whether you use Google, Yahoo, Bing, DuckDuckGo, or an alternative search engine, odds are that you rarely or never look at the second page of those search engines' results.[*]

Consider the following data from Chitika, an online ad network that delivers more than 4 billion strategically targeted ads each month to a network of more than 250,000 websites. In June 2013, the company released a study demonstrating what many marketers and technologists already knew: There's tremendous power in occupying the top spot in Google's organic search results.[†] Figure 1.4 displays some of the study's compelling data in a graphical format.
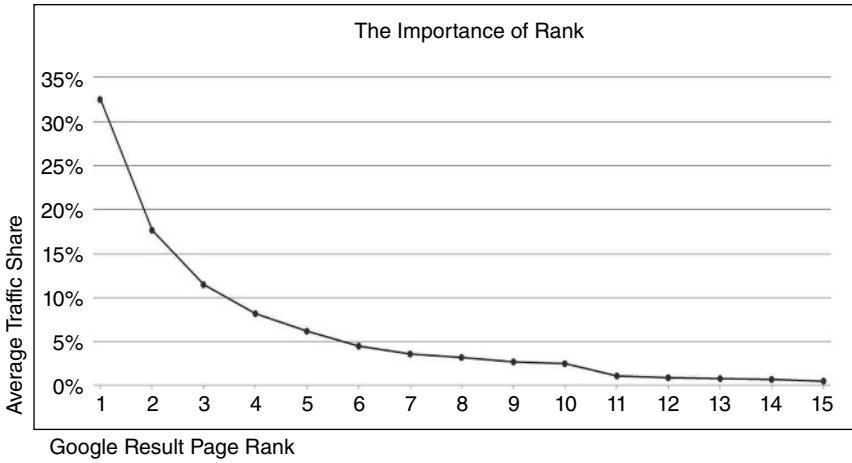
Other fascinating tidbits from the Chitika study include the following:

- Google's first page (read: the top 10 results) drives nearly 92 percent of all search traffic.
- The second page (read: results 11 through 20, inclusive) drives another 4.8 percent.
- Collectively, all of the remaining results drive less than 4 percent of Google search traffic.

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[*] I'll further assume that, like most people, you have not adjusted your search settings from the default of 10. In case you didn't know, you can change that very easily. I set my default Google results to 100 per page.

[†] Read the entire study at http://tinyurl.com/rptChitika.

The Importance of Rank

Average Traffic Share vs *Google Result Page Rank*

Figure 1.4   Traffic as a Function of Google Search Result Rank

Source: Data from Chitika

Figure 1.5 shows that people rarely go search beyond those first 10 to 15 results.

The Cumulative Importance of Rank

Average Traffic Share vs *Google Result Page Rank*
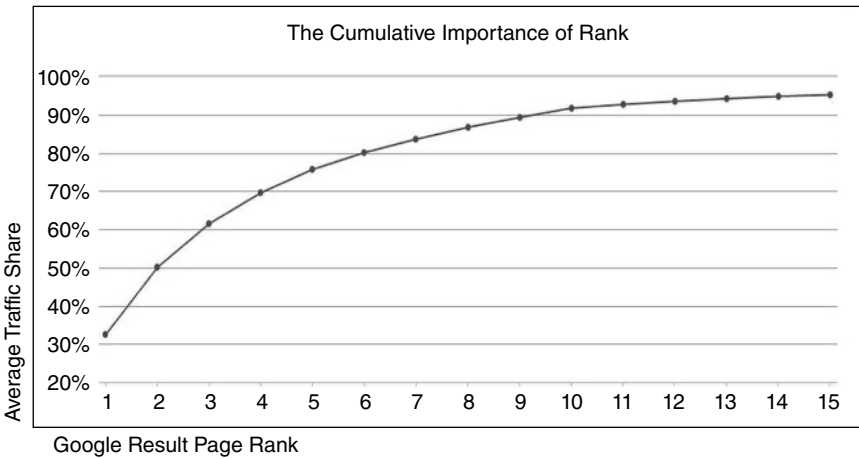
Figure 1.5   Cumulative Traffic as a Function of Google Search Result Rank

Source: Chitika

The Sliding Scale of Search

I am reminded here of the infamous quote by Alec Baldwin's character Blake in the movie *Glengarry Glen Ross*: "Second prize is a set of steak knives." Humor aside, statistics like these establish why search engine optimization (SEO) is essential today—and has been for more than 15 years. (SEO is "the process of getting traffic from the free, organic, editorial, or natural search results on search engines."[*]) Corporations often employ pricey SEO specialists whose sole jobs involve increasing their employers' organic ranking on search engines. These people study changes in the Google algorithm; the goal is to maintain and improve their organizations' existing site rankings. Companies without the budgets to hire SEO gurus often contract boutique SEO firms to accomplish the same goal.

A few more concrete examples are in order here. I've always loved French toast. Every month, roughly 8 million Google users type in "how to make French toast" or some similar variation.[†] Google handles so many searches that its software can almost always autocorrect user typos and even predict what they *really* want based on their initial keystrokes.

Now imagine that you run Instructables, a site that "lets you explore, document, and share your creations." When Google users search for "French toast recipes," a page from Instructables shows up at the top. Because of that key enviable placement, Instructables can expect to garner roughly one-third of all Google searches based on that query. (See Figure 1.4.) Note that that number is an aggregate one; it does not apply evenly across all searches. (The history of search is fascinating. John Battelle's *The Search: How Google and Its Rivals Rewrote the Rules of Business and Transformed Our Culture* is the best book I've read on the subject.)

Let's move to another example. You own Italianissimo, an upscale Italian restaurant in West Caldwell, New Jersey, not far from where I used to live. As the proprietor, you're curious about where Google organically ranks your establishment. You type in "best Italian restaurants in northern New Jersey" and find that Italianissimo shows up

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[*] For more, see http://searchengineland.com/guide/what-is-seo.

[†] Through its AdWords product, Google lets anyone determine approximate search traffic. Just type in the word or phrase and hit "enter." For more, see http://tinyurl .com/google-toast.

on the fifth page of Google's results. As a result, it will receive only a tiny fraction of the traffic—and, more important, *the business*—than it would if Google had placed it at the top of page one. And, if your restaurant shows up on page 50 or 500, then it might as well be invisible to the average Googler.

A few disclaimers are in order here. First, you can buy your way to the top of the rankings via Google AdWords, but that can get very expensive very quickly. Second, although it is the dominant search engine in the United States, Google is hardly the only site by which people find restaurants. Bing, Yahoo, DuckDuckGo, and other search engines collectively account for the other one-third of U.S. searches. Beyond search engines, every day millions of people use sites like Facebook, OpenTable,[*] GrubHub, Yelp, Groupon, and others in deciding where to dine. And good old-fashioned word of mouth still matters. Third, users can opt to receive personalized results from Google, thus affecting the placement of any given website, business, and the like. Brass tacks: Your search results may not equate to mine, even if we enter precisely the same terms.

In the infamous words of the science-fiction writer William Gibson, "The future is already here–it's just not evenly distributed." The same applies with regard to Google's search results on any given topic. The highest-ranked result is orders of magnitude more valuable than the hundredth, never mind the thousandth, millionth, and so on. In this way, search is fairly pedestrian. It is just another example of a *power law.* (This is alternatively known as *the Pareto principle, the 80–20 rule, and the law of the vital few.*) For many events, roughly 80 percent of the effects stem from only 20 percent of its causes.

It's important to point out the sheer number of searches that take place every minute online. The site Internet Live Stats[†] reveals that Google alone handles more than a mind-blowing 2.4 million searches per minute per day—a number that has grown every year since the company's inception. As more and more people gain access to the Web, we can expect that number to keep rising. For the foreseeable future, the traditional index search business will not be disrupted.

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[*] Acquired by Priceline for $2.6 billion on June 13, 2014.
[†] See http://tinyurl.com/lf8tjqk.

Let's go back to 1995, the nascent, pre-Google days of the Web. Assume for a moment that only 1 million or 10 million searches took place every day. Was there still value in being listed on the 6th or 26th page on Yahoo or Lycos? Sure, but not nearly as much as there is today. Now more than ever, even long-tail traffic can result in additional, business, revenue, and profits.

Search is certainly not an all-or-nothing game. For any given search query, Google's PageRank (named for Larry Page, the company's eponymous cofounder and current CEO) typically returns a very large set of results presented in descending order of importance—at least as its algorithm sees it.

In other words, "the head" (read: the top five or ten results) attracts most of the traffic and value in search. At the same time, though, there's still enormous *potential* value in the rest of the results (i.e., *the tail*). This is the thesis behind Chris Anderson's 2006 business text *The Long Tail.* Although few learned business folks dispute its existence, recent research suggests that the long tail is much thinner than Anderson had originally conceived.

Anita Elberse makes this case in her eye-opening 2013 book *Blockbusters: Hit-making, Risk-taking, and the Big Business of Entertainment.* She points to data on the music industry from Nielsen, a global information services firm. In her words:

> [O]f the eight million unique digital tracks sold in 2011 (the large majority for $0.99 or $1.29 through the iTunes Store), 94 percent—7.5 million tracks—sold fewer than one copy. Yes, that's right: of all of the tracks that sold at least one copy, about a third sold *exactly* one copy. (One has to wonder how many of those songs were purchased by the artists themselves, just to test the technology, or perhaps their moms out of a sense of loyalty.) And the trend is the opposite of what Anderson predicted: the recorded-music tail is getting thinner and thinner over time. Two years earlier, in 2009, 6.4 million unique tracks were sold; of those, 93 percent sold fewer than one hundred copies and 72 percent sold only one copy.

Elberse describes how the "head" of the tail is expanding—that is, fewer and fewer hits in the music, movie, book, and sports businesses are driving greater percentages of profits. She calls the levels of concentration in these markets "astonishing."

Google and the Never-Ending Jargon Train

Few learned folks doubt Google's immense power today. Consider this striking testament to its clout: As I write these words, European governments are working with the search giant to comply with new legislation on "the right to be forgotten." Its service is *too* good, *too* accurate.

The pressure to define and "own" a business and technology term has become more intense as our world has become noisier. For this very reason, software vendors and advisory firms such as CSC (mentioned in the Preface) coin and heavily promote their own terms.

Research firm Gartner defines *search-based data discovery tools* as "those that enable users to develop and refine views and analyses of structured and unstructured data using search terms."[*] IBM as of late has been marketing the concept of *cognitive computing*. As the company describes on its website,[†] cognitive computing represents systems that "learn and interact naturally with people to extend what either humans or machine could do on their own. They help human experts make better decisions by penetrating the complexity of Big Data." On an individual level, prominent thought leaders like Tom Davenport, a professor of management and information technology at Babson College, espouse newfangled terms like *Analytics 3.0.*[‡]

Now, businesses have been pushing their own wares for decades, and there's nothing unethical about this practice. Each company is understandably trying to market its own products and services. If Gartner promulgates a term like *search-based data discovery tools*, you can bet that competitors such as International Data Group (IDC), Forrester Research, and AMR Research will soon follow with their own facsimilies.

Let's look at a timely example of this type of term inflation. In my fifth book, *Too Big to Ignore*, I wrote the following about Big Data:

> Douglas Laney (then with the META group, now with Gartner) fired the first shot in late 2001. Laney wrote about the growth challenges and opportunities facing organizations with respect to increasing amounts of data. Years before the term Big Data was

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[*] For more, see http://tinyurl.com/gartner-SBDT.
[†] See http://tinyurl.com/ibmccog.
[‡] See http://hbr.org/2013/12/analytics-30/ar/1.

de rigueur, Laney defined three primary dimensions of the Data Deluge as the increasing amount of data (volume), the increasing range of data types and sources (variety), and the increasing speed of data (velocity).

Laney's three *v's* stuck, and today most people familiar with Big Data have heard of them. That's a far cry from saying, however, that everyone agrees on the proper definition of Big Data. Just about every major tech vendor and consulting firm has a vested interest in pushing its own agenda. To this end, many companies and thought leaders have developed their own definitions of Big Data. A few have even tried to introduce additional *v's* like veracity (from IBM) and variability (from Forrester Research). Among the technorati, arguments abound, and it often gets pretty catty.

Once Big Data became a *thing*, it didn't take long for other large software vendors and consulting firms to piggyback on Laney's oft-quoted work. Surely, there had to be more *v's*! It didn't take long for the herd to start zealously promoting variability, viability, veracity, validity, and value.

In reality, these extra *v's* don't alleviate the general sense of confusion about the topic, a point echoed by text analytics and data expert Seth Grimes. In a piece for *InformationWeek*, Grimes correctly notes that Laney's three terms more than adequately define *Big Data*. He further cautions readers and professionals to be wary of "wanna-*v's*" such as those previously mentioned.[8]

Marketing Madness

The precipitous drop in start-up costs discussed earlier has enabled anyone with an app or business idea to launch it. Of course, many concepts are terrible and destined for the morgue. When anyone can do something, just about everyone does. Thanks to rapid technological advances, creative endeavors such as starting a company or blog, writing and publishing a book, releasing an album, or shooting a movie have never been easier. Arguably, the principal downside of this trend is that it's never been tougher to get noticed. Beyond that, Andrew Keen contends in *The Cult of the Amateur* that the lack of proper gatekeepers has eliminated quality control. As a result, it is difficult to separate the wheat from the chaff. All of this noise means

that relying only on organic traffic is unlikely to move the needle. (See "SEO, Google, and the *Really* Long Tail" earlier in this chapter.)

Google cofounder Sergey Brin once allegedly said, "Marketing is the cost you pay for lousy products." Brin is one of the smartest men on the planet, but he is dead wrong here. By way of background, search in 1998 was generally unreliable and ineffective. From the beginning, Google built a better mousetrap without the help of any formal marketing and advertising, relying instead on good old-fashioned word-of-mouth. Douglas Edwards makes this point in his excellent 2012 book *I'm Feeling Lucky: The Confessions of Google Employee Number 59.* The buzz around Google grew organically, as did its entrance into truly rarefied air, the marketing Holy Grail: the widespread adoption of "Google" as a verb.[*]

Although these stories are interesting and even inspirational, for the average company they are increasingly far-fetched. Google was the exception that proves the rule: More than ever, marketing matters. Sure, on rare occasions, YouTube videos, apps, songs, blog posts, photos, memes, and tweets go viral. (Justine Sacco, mentioned at the start of this chapter, is perhaps the best example of the latter.[†]) Foolish is the start-up founder, author, musician, or executive who dismisses the importance of marketing. In the words of Q Manning, CEO and founder of mobile-app firm Rocksauce Studios:

> All businesses require marketing. Digital products are no different. In our very first conversation with a prospective client, we emphasize the absolute necessity of marketing. We perform days of research to make sure we're building a beautiful product with the right features. We strongly advise them to make room in their budget for a solid marketing campaign.
>
> Of course we want our clients to be successful. That's not going to happen, however, if no one knows that the app exists.[9]

Manning is absolutely right. The vast majority of sales happen with the aid of some type of advertising and/or marketing. More broadly, marketing, disruption, and technology have always been inextricably linked. Think about it. Most industries and professions fall into one of two categories:

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[*] *The Oxford English* Dictionary formally recognized it in 2006.

[†] Don't mistake good viral for bad viral.

1. *Those that have already been changed or obliterated by technology.* When was the last time you saw a Tower Records, Block-buster, Fotomat,* or travel agency?
2. *Those that are being disrupted by technology—or soon will be.* Taxi-cabs and hotels are at the top of the list. Lyft, Uber, and Airbnb show no signs of backing down.

For a long time now, marketing and advertising budgets have been shifting from traditional print media, radio, and television to the online sources such as display ads, social media, content marketing, and search engines. Budgets tightened during the financial crisis, but they appear to have returned with a vengeance. Two statistics here are particularly instructive. Marketing expenditures on mobile paid search grew 98 percent globally in 2014 compared to 2013.[10] In June 2014, the Interactive Advertising Bureau (IAB) reported that:

> Internet advertising revenues in the U.S. reached $11.6 billion for the first quarter of 2014, marking a 19 percent increase over the same period in 2013, according to the latest [Internet] Advertising Revenue Report figures released today by the IAB and PwC US.[11]

Compared to its 1998 or even 2009 counterparts, marketing in a field in 2014 may be barely recognizable. Although the changes may be dramatic, the function is alive and well because it is a necessary evil. Companies that ignore marketing do so at their own peril; the alternative these days is virtual anonymity.

Marketing seems synonymous with noise today because it's 24/7. That is, people in industrialized societies are carrying more devices and almost constantly staring at screens. As a result, they are seeing more advertisements and marketing messages than ever. Jay Walker-Smith of Yankelovich Consumer Research estimates that American consumers have seen a ten-fold increase in marketing messages in the last 40 years. In his words, "We've gone from being exposed to about 500 ads a day back in the 1970s to as many as 5,000 a day today." This is a ten-fold increase over the past four decades.

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* I'm dating myself here. Fotomat was an American-based retail chain of photo development drive-through kiosks located in shopping center parking lots.

Consider this amazing statistic: In their 2012 book, *The Human Face of Big Data*, Rick Smolan and Jennifer Erwitt write that today the average man is exposed to more data in a single day than his fifteenth century counterpart was *in his entire lifetime*.

Mobile Mania

Since the late 1990s, Mary Meeker of the VC firm Kleiner Perkins Caufield & Byers has published and presented her highly anticipated Internet Trends report. It scores oodles of press coverage. In May 2013, she was at it again.[*] Over the past few years, Meeker's research has emphasized both the increasing importance and usage of smartphones. She noted that people touch them an astonishing 150 times every day. Twenty-three of those times involved checking messages alone. All signs point to these numbers increasing.

That same year, IDC largely echoed Meeker's smartphone research. It found that 79 percent of people ages 18 to 44 keep their smartphones with them 22 hours per day.[†] (Yes, many people sleep next to them.) A full one-quarter of respondents couldn't remember a single time during the day in which they were not in the same room as their phones. Four out of five smartphone users check their phones within the first 15 minutes of waking up each morning. (I certainly do.) Nearly 80 percent of those people say that it's the first thing they do each morning after opening their eyes.

These statistics speak volumes about the adoption of smartphones. Most folks, though, don't need to see this type of data to grasp the profound influence that iPhones and Droids have had on our lives. Just watch people at your local supermarket, Target, and health club. Take a look at what just about everyone does once an air plane lands: Like trained rats, we immediately pick up our phones as soon as the wheels touch the ground, present company included.

BYOD

Back in the late 1990s, it was relatively easy for IT departments to block access to forbidden sites and other content that management deemed *NSFW*.[‡] Services such as WebSense theoretically forbade

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[*] Read her 2013 report at www.kpcb.com/insights/2013-internet-trends.
[†] To learn more about the report, see http://www.mediabistro.com/alltwitter/smartphones_b39001.
[‡] Shorthand for "not suitable/safe for work."

employees from wasting time, at least while using a company computer. IT maintained site blacklists, easily blocking Hotmail, AOL, Gmail, porn sites, and other time-wasting online destinations.

IT is now almost completey ineffectual as this type of gatekeeper. Most employees take their own smartphones with them to work, a movement termed *bring your own device* (BYOD). This renders services like WebSense largely moot. Want to tweet or check Facebook at the office? Just whip out your smartphone. There's not much that IT can do to stop you or anyone else for that matter. If you connect via an AT&T, Verizon, or T-Mobile network (and not your organization's Wi-Fi), Big Brother will never know what you've been doing.

Security experts advise that the biggest threats lie *inside* of organizations' walls, not from outside hackers. Yes, recent high-profile data breaches have received plenty of publicity. Examples include LinkedIn, eBay, SONY, Michael's, Neiman Marcus, and JP Morgan Chase. Most CIOs know full well, however, that there's a much bigger risk: Employees, independent contractors, consultants, and freelancers could easily walk out with highly sensitive corporate information on a tablet, smartphone, or USB drive.[*]

The Rise of the Tech Celebrity

Many aspiring entrepreneurs fancy themselves the next Steve Jobs, the iconic leader who pioneered so many game-changing products. It's fair to call Jobs the first modern-day rock-star CEO, not to mention the inspiration for most of today's young, über-wealthy tech leaders. Facebook founder Mark Zuckerberg, Twitter cofounder and current Square CEO Jack Dorsey, and Tesla and SpaceX head honcho Elon Musk are bona fide celebrities. When they visit countries and appear at events, they evoke memories of the Beatles arriving in America for the first time in 1964. Outside of the United States, Jobs's influence is felt in places as far away as China. Lei Jun, the CEO of Beijing-based electronics behemoth Xiaomi, often dons the Jobsian uniform of a black shirt and jeans.

The sports and entertainment worlds have also caught technology fever. Cats and dogs are living together. High school jocks aren't afraid to hang out with geeks anymore. Luminaries such as LeBron James, Ashton Kutcher, and Leonardo DiCaprio are investing in tech

[*]For more of my thoughts on BYOD and security, see http://tinyurl.com/philbyod.

companies. In 2013, BlackBerry hired R&B singer, producer, and actress, Alicia Keys as its creative director. (Not long after, the company parted ways with her. The metadata from one of her tweets revealed that she had been using an iPhone.[*]) The company's new CEO John Chen is desperately trying to right the ship, but the trend is unmistakable: Marriages between celebrities and tech companies are on the uptick. As Julianne Pepitone writes on CNN, "Lately it's become popular for tech companies to sign on celebrities as 'creative directors,' which some see as glorified spokespeople. As of this writing, Lady Gaga holds the position at Polaroid, while rapper will.i.am does the same at Intel."[12] Apple paid $3 billion for headphone and streaming-music company Beats Music in May 2014. This was by far the most expensive acquisition in Apple's history. It's tough to see CEO Tim Cook making that unprecedented purchase had it not been for the star power of Beats's cofounders: rapper Dr. Dre and record and film producer Jimmy Iovine.

Want more proof that technology and pop culture have never been more intertwined? HBO's 2014 comedy *Silicon Valley* about a fictitious start-up has been hailed as a "hilarious critical and commercial darling."[13] The hit show tells the story of a bunch of geeks working on a file-compression algorithm, most certainly a sign of the times. Thomas Middleditch plays Richard Hendriks, the show's protagonist, a reclusive programmer who could easily be mistaken for an early Mark Zuckerberg in both appearance and disposition. Mike Judge's show perfectly captures the start-up zeitgeist, much like his cult classic *Office Space* did with Corporate America.

A New Body Politic

Beyond Hollywood, there's a growing sense that even governments are finally ending their sloth-like ways. The public sector is starting to recognize the importance of technology, especially as it pertains to future job growth. Soon after moving into the White House in 2009, President Obama issued a memorandum advocating a more open government. In his words, "Executive departments and agencies should harness new technologies to put information about their operations and decisions online and readily available to the public."

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[*]For more on the hidden technology behind Twitter, see http://tinyurl.com/ke9a9sa.

More recently, Obama has asked Americans to learn computer science—and effected policies to that end.[*] Nonprofits such as Code for America are encouraging us to embrace our inner geek. At the city level, Thomas Menino of Boston, Edwin M. Lee of San Francisco, Rahm Emanuel of Chicago, Mike Bloomberg of New York, and other progressive mayors have been walking the walk. They have gone far beyond merely stating obvious yet vacuous platitudes about our technology-centered future. For instance, at the NY Tech Meetup in October 2011, Bloomberg said:

> Technology is going to define the twenty-first century economy, and I want to make sure those jobs are created in New York City. . . . The BigApps competition is just one of the ways we're making sure that's still true for today's entrepreneurs and for the visionaries of the future.[†]

Bloomberg entered office in 2002 resolute that technology could make New York City government more efficient, responsive, and transparent. Over the course of his three terms, he enacted many tech-friendly policies. (The Wikipedia entry for them runs a robust 500 words.) Although many politicians still struggle with turning on their smartphones, an increasing number understand the critical role that technology is playing in the world. Other prominent thought leaders include California Lt. Governor Gavin Newsom, author of *Citizenville: How to Take the Town Square Digital and Reinvent Government*, and Tim O'Reilly, founder of O'Reilly Media. Both have written and spoken extensively about promulgating a more open, more interactive government—one based on new technologies, greater citizen participation, and platform thinking. The popular and influential author Stephen B. Johnson echoes similar progressive sentiments in *Future Perfect: The Case for Progress in a Networked Age.*

Other Trends

I would be remiss if I didn't mention several other important technological trends that are changing our lives. Although the number of Facebook users seems to have plateaued at about 1.3 billion, social

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[*] Watch him here on YouTube: www.youtube.com/watch?v=6XvmhE1J9PY.
[†] Watch him here on YouTube: www.youtube.com/watch?v=z6A6R7hI70o#t=93.

media has remained a major societal and business force. As I write these words, Facebook, Twitter, and LinkedIn have just reported strong or record earnings, and their stock prices have jumped considerably.

Wearable technology has arrived in earnest. The number of smartwatches continues to rise. Jawbone, the Apple Watch, and FitBit have arrived. Google has suspended development of its Glass product, but similar devices are coming soon. Scores of other potentially life-changing products will be released and improved in the next three to five years. Both Google and Apple announced plans at their annual 2014 development conferences to let users closely monitor their lives and health via future versions of their operating systems.

Long considered a pipe dream, virtual reality is very close to finally arriving. Led by a homeschooled 21-year-old named Palmer Luckey, Oculus Rift finally cracked the elusive VR code in 2013. The company's flagship headset was leaps and bounds better than competing products, so much so that in March 2014, Facebook plunked down more than $2 billion to acquire it.

Massive changes are coming in the form of personalized medicine, mobile payments, 3D printing, augmented reality, and the long-awaited arrival of the smart home via the Internet of Things. These advances—and many others—will affect just about every aspect of our lives. Pick an area or field. It's not a matter of *if* it will change, but *when.*

Next

This chapter has covered key technological trends affecting our personal and professional lives in profound ways. As it relates to business communication, the most important consequence of these trends is that they are collectively overwhelming us at work.

Let that serve as the starting point for Chapter 2.

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