given time. Here we can bring back our handy threshold tool and ask: what's the absolute minimum amount of performance equipment you would need in order to leave the house, or in order to have company over? What's the maximum amount of performance equipment you're willing to put on, your peak of extravagance, above which point you would feel too ostentatious and have to tone it down?

Then there are the cultural factors that affect status value, and to understand these we'll need to incorporate a few more lenses, which we'll come to later on. Much like the paradox of the toga in ancient Rome, some objects can connote high status in one culture and low status in another. A suntan on someone who lives in London or New York is a sign to others that that person can afford leisure time, perhaps a tropical vacation, or at least a trip to the tanning salon. On the other hand, a tan in China or Thailand is a mark of peasants who toil in the fields, and the bourgeois are inclined toward whiter skin. Thus on the shelves of pharmacies in Bangkok you'll find dozens of skin products with whitening ingredients; in the United States, expensive moisturizers are tinted. Does this mean that the people who use these products are all that different from one another?

Erving Goffman surely would have agreed with Shakespeare that men and women are merely players who each play many parts in life—only the world is not *a* stage but rather millions of stages, with billions or perhaps trillions of props and costumes. The parts we play, the dialogues we speak, and the gestures we make are only as convincing as their juxtaposition with the scenery on the stages we tread. But the right props and costumes can make us look, and even feel, at home on any given stage.

Chapter 3

Riding the Waves of the Past, Present, and Future

Tokyo's Shinjuku Station during Friday morning rush hour is one of the wonders of the modern world, with heaving swells of suited commuters gliding through lines of ticket barriers, joining a current of suits that takes them out to buses and walkways and on to their offices in government and corporate Japan. Of the 35 million residents of the greater Tokyo metropolitan area, 3.64 million pass through this station, the busiest in the world, every day. It is a sight to behold.

From a vantage point at the edge of the throng (and ideally nursing a decent freshly brewed cup of coffee) you can bear witness to the finessed urban choreography. As they pass through ticket gates, few commuters break stride, reaching forward and placing their bag, wallet, or phone on a pad, letting the object linger just long enough to receive a beep of confirmation as the gates open. Look carefully and you'll see that only a few people this morning are still inserting physical paper tickets, those edifices to a mechanical era. With the vast majority of traffic being

daily commuters, most have invested in the digital alternative, the prepaid commuter card, or its mobile equivalent built into the phone.*

The uninterrupted pace is testament to the human ingenuity behind such a system, the ability and desire among commuters to learn and refine an oft-repeated task, and the adaptability of humans willing to try new ways of doing things. Fifteen years ago, all traffic through these gates was either processed mechanically or by a member of the station staff. When you consider the lines at the paper ticket machine and the risk of loss or damage to that small, tearable, crumple-able stub, it should be no surprise that people have invested the time and energy in the digital equivalent.

For the latter part of the twentieth century and the beginning of the twenty-first, Japan has offered a window into global leading-edge behaviors. That unique combination of infrastructure investment and technological ecosystem provides a feast that proves difficult to replicate elsewhere. Japan boasts a tightly integrated high-tech manufacturing base and, perhaps more important, established relationships between people and companies that allow even further integration. The underlying technologies that enable those commuters to pass through ticket gates without breaking step can also be used to buy from vending machines and

* Super Urban Intelligent Card (it also sounds like *suika*—or watermelon in Japanese), Suica or Mobile Suica. A few very early adopters also ran experiments with the Suica cards, shaving down their cards' edges and taping them to the inside covers of mobile phones, creating a "mobile ticketing application" before it was truly integrated into the phone.

convenience stores, pick up advertising information,* open keyless lockers in many of Tokyo's stations, pay for taxi rides, and, for a while, shop online via integrated laptops. In a paradoxical clash of old and new, it can also be used to pay for a physical copy of the morning news out of a newspaper box.

In most countries, electronic payment and ticketing systems are primarily sold to consumers on the promise of convenience to oneself, to shave time off the transaction process and to juggle fewer things. In Japan, the benefits of adoption are promoted through another message: that you are less likely to inconvenience others. Consideration for the group over the individual is far more part of the Japanese psyche than in societies such as the United States or Germany, where people generally care less about those around them. (One of the strongest visual reminders of Japanese courtesy comes in winter: in other countries people wear masks to protect themselves from the germs of others; in Japan a sick person wears a mask to protect others from his own germs.)† In this equation, using paper tickets at the ticket gate (or coins at the convenience store checkout) comes with a perceptual risk of being slightly slower and holding everyone else up. As with any other adoption decision that people make for themselves, they do so for personal gain—but as individuals

* Suica posters, or SuiPo, are posters that use Suica technology to allow passersby to interact with posters via their Suica cards, in much the same way that people now use QR codes.

† One could argue that not turning up to work in the first place is the greater appreciation for others, but it is certainly less visible reconfirmation of the group. It might apply for heavy colds but less so for something mild.

whose reputations depend on their compliance with social norms, they also do it for the greater good. At the heart of every social pressure is a prod that pushes individuals to do better, do more, or act differently, and perhaps try something new.

For companies looking to bring new products and services to market, understanding the push and pull of adoption—where personal motivations, context, and cultural norms collide—is critical to success. What drives some to adopt early, some late, and some to reject a technology altogether? And how can we use our understanding of this adoption curve to develop, target, and message services in ways that give them the greatest chance of success?

A Breakthrough in the Fields

When we think of the cutting edge, the latest and greatest innovations on the market, our thoughts don't typically turn to corn, that eternal staple of the American heartland. And yet it was from the cornfields of Iowa that our modern concept of how people adopt new offerings and ideas emerged.

In a series of investigations in the 1940s, sociologists Bryce Ryan and Neal Gross of Iowa State University went into two farming communities to study the adoption of hybrid seed corn (cross-pollinated strains of corn intended to produce higher crop yields)—how, when, why, and by whom. From that research, economist Joe Bohlen and sociologist George Beal, both also of Iowa State, crafted a model that has, since its publication in 1957, itself been adopted by countless researchers, analysts, strategists, and academics, well beyond the realm of agriculture.

This model, which Beal and Bohlen called the "diffusion

process," breaks down into five discrete stages that an individual goes through on the path to adoption. First is the awareness stage: the individual learns that the new thing exists, but he may not necessarily know what it is, what it does, and how it works. The awareness stage is then followed by the interest stage: the individual may still not know much about the thing, but he has heard enough to get a sense that it might be useful, and is worth checking out. After interest comes evaluation, a sort of mental test run where the individual imagines the new thing in his life. This is followed by the trial stage, an actual test run.

Finally comes adoption, which Beal and Bohlen defined as "large-scale, continued use of the idea" but more important as "satisfaction with the idea." The distinction is a noteworthy one, because it's easy to get caught in the trap of directly equating adoption with use. It's a fallacy on two fronts: for one, someone may buy a fancy new camera and after a couple of weeks decide to leave it at home and use the camera on her phone instead, yet this doesn't necessarily mean she has given up on the fancy camera (she may simply limit its use to her home and special occasions); and second, for cost-sensitive consumers, there often comes a point where they are no longer satisfied with the idea of the thing they own, like an old flip phone, and have already become satisfied with the idea of something, say an iPhone, that they don't own *yet* but are saving up to buy. If they've already evaluated the iPhone, tested it out, and decided they want it, wouldn't you say they've already adopted the iPhone? At the very least I'd say they've quasi-adopted it.

However, what was most striking about Beal and Bohlen's model, and what has certainly had the most lasting impact, was

their breakdown of the "adoption curve": who adopts first, last, and in between. At the forefront are the innovators, who are typically well respected in their communities and have connections outside of their communities that give them exposure to new ideas. Fundamentally, innovators possess a large amount of risk capital—they can afford to try out new things without worrying too much about losing money or prestige if they fail. Innovators are followed by early adopters, who are often younger, well educated, active in the community, and avid media consumers. One of the key drivers for innovators and early adopters is their inherent inquisitiveness, the desire to constantly try new things and experiences. That inquisitiveness can make them wide-ranging dilettantes, or it can lead them to invest large amounts of time in a particular domain and become experts in it. Either way it positions them strategically within subcommunities (networks of video gamers, photographers, etc.), on one hand as people who can introduce new ideas that emerge from other communities, or on the other as the leaders who are the first to know about any new developments in their area of expertise.

If the innovators and early adopters have found clear benefits beyond newness and shininess, the early majority will start to pick up on it. They're often a bit older, perhaps a bit less educated and informed, but typically people with respected opinions. That last point is a tricky one: the early majority can be highly influential, but if their good taste is their only source of cachet, they don't want to risk losing it by adopting a dud, so they wait to see how things pan out for the innovators and early adopters. The late majority, who are often older and not in step with emerging trends, may not gain awareness of new ideas until

they've reached the early majority, but they will typically follow. Lastly, there are the laggards, who may be stubbornly averse to change and only adopt with great reluctance, or who may be detached from society to a degree and thus lacking exposure even to firmly established technologies.

There's one other group, though: non-adopters, who I'd argue could be subdivided into "recusers" and "rejecters." Recusers don't adopt a particular product or technology because they don't feel they need it, or can just as well get by without it. Rejecters may share that sentiment but moreover find the technology to repulse some element of their worldview, and treat their non-adoption as an active protest. For instance, if you ask certain young American urbanites for their opinions on a TV show, a recuser might say, "I haven't seen it" or "I haven't had time to watch it," whereas a rejecter would be more likely to proclaim, with great pride, "I haven't owned a TV for fifteen years."

Non-adopters aren't cave dwellers—they're aware of new technologies, they may even go through the interest and evaluation stages of pre-adoption, but at some point, and it could be anywhere along the adoption curve timeline, they decide that the thing is just not for them. They could be early-stage recusers who give the thing a try and find it falls below their standards, or they could be majority-stage rejecters who see others adopting it and deem it too trendy for their individualistic proclivities. In a way, such rejecters treat rejection as a matter of prestige much like the early adopters value their adoption; the rejecters are simply as bearish on the thing as the adopters are bullish. The crass ones may put a bumper sticker on their car with an image of Calvin from *Calvin and Hobbes* urinating on a Ford logo; the

slightly subtler ones might wear a T-shirt with an Apple logo inside a red circle with a diagonal slash across it.

When Beal and Bohlen published their hybrid corn seed adoption studies, they claimed they were only focused on two main ideas that were more or less obvious: that adoption is not a spontaneous decision but rather occurs in stages; and that not everyone adopts at once. In explaining that second idea, they showed how adopters generally share certain characteristics with others who adopt around the same time, and in hindsight this seems to be the actual crux of their report. This is why we study the adoption process: because it's a very organic form of market segmentation. Savvy designers and marketers do well to tailor their offerings as they traverse the adoption curve.

As a researcher, I find that adoption behaviors offer a wonderful lens into the tensions and pressures that people—and societies—face when confronted with something new. For my clients, this lens can also highlight who their next customers could be, how those people will (or won't) make room in their lives for that next thing, and how that thing will reflect on its first owners, its subsequent ones, and even the people who vow never to own it. For all the effort we put into getting an offering out to market, once it hits the shelves, its use, consumption, rejection, or otherwise shapes what it is, what it can be, and ultimately us as well.

Technologies change our bodies: the use of video games and mobile phones have even evolved users' thumbs, and what were once simply handy appendages for holding objects are now the most dexterous digits some people possess. Technologies also change our minds, and what we decide to hold in them: consider

the last time you committed a phone number to memory, or did long division. In a paper called "Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips," researchers from Columbia, Harvard, and the University of Wisconsin–Madison found that the presence of Internet access lowered people's ability to recall specific information from memory, but increased their ability to recall how and where to access it online. In summing up this so-called Google effect, they suggested that "we have become dependent on [gadgets] to the same degree we are dependent on all the knowledge we gain from our friends and coworkers—and lose if they are out of touch. The experience of losing our Internet connection becomes more and more like losing a friend. We must remain plugged in to know what Google knows," simply because the tools and information for convenience demand it.

These changes are also happening faster than ever before, not necessarily because technology is changing faster, but because our use of it is. The mainstream has quickened its pace of adoption, and abandonment, of today's tools. Increased connectivity—people-to-people, people-to-things, and things-to-things—means that the question of whether to opt into a new technology is increasingly becoming one of whether to opt into or out of the network it occupies, and in the broadest sense, it's a matter of opting into or out of society.

Much as we might imagine our designs in the hands of customers and constituents as ready to be touched and molded to the unique circumstances of their context, they arrive with a set of assumptions of use and acceptable boundaries of use. When technology amplifies existing behaviors, it can be enabling us to

remember more, shout farther, or run faster, but we can't assume that the social values surrounding those behaviors will readily change to accommodate the adoption of new technology.

What Beal and Bohlen only hinted at, and what I believe qualitative, in-context research can fundamentally tap into, are the social pressures that contribute to that segmentation, and how those pressures cascade along the curve as adopters exert their influence on those who have yet to adopt. The above paragraph can give you some sense of this cascade, and how both reflective and behavioral design play into its social mechanics, but now let's look a little deeper and see what happens when social pressures grow so strong as to actually change the shape of the adoption curve.

A High-(Peer-)Pressure System on the Horizon

As we saw in the last chapter, the desire to project social status and affirm peer group affiliation can skew behavior in any context, for example, deciding which parts of our conversations we allow others to overhear, or changing one's style of footwear to fit a social group's tastes. But let's examine how it changes the adoption curve in one of the most social-pressure-packed environments: high school.

In 2011 I ran a study in Nigeria, which among many other things is the most populous country in Africa and a rich, if complex, prize for the company that can build market share there. Nigeria, like many countries in Africa, has a relatively young population, with a median age often half that of European or

North American countries,* and technology adoption there reflects both a young and relatively price-sensitive demographic.

Social networks are an inherent part of teenage life the world over, and in Africa arguably even more so because of the young, socially active demographic. When hiring our local team members, we could tell from their profiles that they had a sufficient presence on Facebook. The buzz on the ground in Nigeria around Facebook was palpable, with the cropped, white *F* in a blue box omnipresent in newspaper articles and advertising for the local operators and mobile phone companies. Being the obvious foreigner in any locale tends to attract some kind of request to connect, and in Nigeria, rightly or wrongly you're perceived as implicitly interesting, wealthy, or a possible business or social connection who may help a person find a better life (the study focused on poorer communities, in which these requests were more prevalent). It used to be that partway through a social exchange a team member was asked for his phone number or email address, but already in Nigeria this had switched to "What's your Facebook?" (The way it was asked, and by whom, suggested that sometimes the asker knew enough to know it was the question to ask, but didn't necessarily have a Facebook account or know enough about the service to sign up and send out friend requests.)

If I asked you for your contact information, what information would you give me? Home or work mailing address? Post office

* For example, estimated 2012 figures for median age in years for Egypt (24.9 years), Nigeria (18.4 years), Uganda (15.2), compared with the United Kingdom (41.2), Canada (42.4), or the United States (38.5).

box? One of your email addresses? IM address? Skype? Landline? Mobile phone number? Twitter handle? The answer is dependent in part on why the question is being asked, but all of us have an ever-evolving sense of the connotations that come with each medium: its novelty or its played-outness, its ubiquity or exclusivity, its ease or difficulty of use, and its functional advantages and disadvantages. When someone asks for or offers a point of contact outside your expected worldview, it jars on an emotional level, partly because it suggests that you go out of your way to learn a new process rather than use a known one, and partly because it implies that the world has moved on while you've stayed behind. If at this point you're a Facebook native with a wry smile, be forewarned: your time will come sooner than you think.

That "future shock," as futurist Alvin Toffler once called the psychological effect of "too much change in too short a period of time," is a phenomenon that has existed throughout the lifetime of every living person on earth today, but the dynamics of how this plays out, the speed at which it occurs, and the consequences of adopting or not adopting in the face of it are constantly changing.

Around the same time as I was in Nigeria, I heard a South African parent talk about how over the summer, kids in his son's class switched from Nokia to BlackBerry devices, primarily because of the BlackBerry Messenger (BBM) application, a proprietary instant messaging service available exclusively to BlackBerry users. In a class of thirty students, if the eight most socially active kids are communicating via BBM, do the other twenty-two really have the option of not adopting it? If they didn't have BBM, which conversations would they be part of, which would they miss, and how would their experiences be

fundamentally different from their classmates'? What if it's not the eight most influential kids using BBM, but only two? And what if it's only one? At what point does the conversation become confined to that communication channel, and at what point does the decision to opt out of, or reject, that channel become a decision to opt out of a key part of society?

These questions reminded me of the adoption dynamics for mobile phones that I witnessed over the previous decade and a half, where mainstream adopters were pressuring laggards to get their own phones. One such way that pressure played out was that mobile users developed the expectation that they could reach their contacts quickly and at any time of day, wherever they were, and became frustrated when landline-only users couldn't meet that expectation. At a certain point, adult users began buying phones for (typically older) relatives, because the cost of a new phone outweighed the inconvenience of being unable to reach those relatives in any way short of tracking them down in the streets. And all along there were businesses furnishing employees with phones, whether those employees wanted them or not. Regardless of how laggards come to adopt mobile phones or any technology, whenever the pressure builds to the point where laggards are essentially coerced into adoption, it's generally a sign that social norms have shifted and the use of that technology is not just standard but expected.

Yet well before the adoption curve reaches the point where the majority starts to coerce the laggards, social influence plays a significant role in adoption. That influence can come from mass media, but most often it comes from peers. To borrow the old adage about politics, all adoption is local. Well, almost all.

Thomas Valente, currently the director of the University of Southern California's master of public health program, has spent a good portion of his career analyzing social networks and their impact on the diffusion of innovation. In his *Network Models of the Diffusion of Innovations*, he theorized that adoption behavior could be predicted using a threshold model (sound familiar?) of networks. The key factor in adoption, he argued, is the number of one's peers who adopt an innovation; when that number reaches the individual's threshold, that individual will in turn adopt the innovation.

Valente analyzed data from studies on the adoption of the antibiotic tetracycline among American doctors in the 1950s; hybrid corn among Brazilian farmers in the 1960s; and family planning services among married women in South Korea in the 1970s. The data was consistent with Beal and Bohlen's observations that the earliest adopters, the innovators, were the most affected by influences in the greater social system and far less affected by influences within their personal networks. An innovator thus has a very low network threshold, perhaps as low as zero, meaning they may adopt even when none of their peers have done so.

However, beyond the innovators, Valente found that thresholds varied within each adoption category. An early adopter with a high threshold could be exposed to an innovation very early on but wait to adopt until many peers have done so; by contrast, someone else who adopts at the same time, and thus by the classical definition is also considered an early adopter, might find out about the innovation much later but adopt it quickly due to a low threshold. Similarly, a laggard with a low threshold might be what Valente calls an "isolate," someone who simply

isn't exposed to the innovation until very late on, while a high-threshold laggard might actually be averse to adoption for a long time, until enough peers have embraced the innovation that the laggard caves in and adopts.

The Valente study provides three important lessons: one, that the adoption curve timeline only tells part of the story, and people who adopt at the same time are not necessarily influenced in the same way; two, that some people, regardless of whether they're early adopters, in the majority, or laggards, are immediately influenced by their peers while others will monitor their peers' behavior for some time before making a decision; and three, that people who may be considered laggards relative to the greater social system could be early adopters within their own personal networks, or vice versa, depending on how their networks are externally connected to the social system. That is to say, you may think your own mom a Luddite, but her friends may look up to her as *très chic*.

So how do these factors play out in the modern age of online social networking? We see that there are fewer isolates: people in Nigeria with Internet connectivity can access roughly the same information about new technologies and trends as people in the United States (although typically at a lower speed), so laggardism tends to be the result of high network thresholds rather than the consequence of living under a rock. (Remember that economic factors limiting consumption are not the same as social factors limiting adoption, at least within the Beal and Bohlen definition as "satisfaction with an idea.")

We also see that the more level informational playing field puts added pressure on the people with low thresholds who want

the prestige of being the first among their friends to adopt. They have to adopt increasingly early in order to be the first, but that also means taking risks on innovations that haven't been vetted for usefulness, and sticking with them longer so as not to lose the prestige of being an influencer by backing the wrong horse, hyping it, and then abandoning it. And because more of the innovations being adopted are either connected to online social networks, touted through those networks, or simply are the networks themselves, it's easier to tell who's a laggard, who's a forward-thinking influencer, and who's simply adopting early for early-adoption's sake. Some people will inevitably create new accounts regardless of whether or not they plan to use the service, in order to take (some would say squat) their preferred username, both out of convenience (and inherently inconvenience to others) and because of the assumption that that service will reflect in some way who joined when. When all that activity leaves a digital footprint, the insiders and outsiders, influencers and influencees, become transparent to the whole network.

The Big Picture and the Dirty Little Secret

So far, we've been looking at adoption behaviors on the micro scale: understanding when individuals adopt, what motivates them, how their peers influence them, and how they try to exert influence on their peers. Now let's take this lens and zoom out to the macro level: how a culture can promote or repress adoption; where to look for early adoption on a mass scale to get a sense of how a newer technology might affect an ecosystem; and what challenges innovation faces when attempting to overcome old

obstacles. Whenever I'm in the field and want to get some sense of this big picture, I start by looking in a rather unlikely area—the local porn marketplace.

Many people think about sex quite often; some people obsess about it. Reflect for a moment on your own thoughts over the course of today, the people you've met and where you've let your eyes and mind wander. It's no surprise that pornography is a massive industry, estimated at around $14 billion in annual revenue in the United States alone, or about one-third of its bigger and more reputable entertainment-industry brother in Hollywood. Porn is interesting to me in my work because it's what's called "compelling content," in that the demand for it is sufficiently strong to drive the means to consume it. Or to put it another way: porn has the power to drive technology adoption.

There are plenty of other types of compelling content that vary from place to place and person to person—sports scores, weather reports, lifesaving medical information, etc.—and these are all interesting, too, but in my mind they lack the one feature that makes porn compelling to research: it's taboo. The social stigma around porn highlights the concept of "reflective appeal"—just as people are drawn to products that help them show off positive personal traits, they also look for products that can conceal negatively perceived traits. For taboo content such as porn, this tends to force inventive workarounds. This means porn consumers are constantly looking for new, less obvious, and consequently less antisocial ways to consume it. A porn retailer (more often than not set up in an informal market stall) is a good benchmark of the current local standards for content consumption, from Blu-ray to VCD (Video CD, popular in India

and parts of Asia) to VHS. The marketplace for porn reveals one culture's connection to others: whether they're importing their porn from the United States, Europe, or Asia, or producing it themselves. It's also worth a look because, frankly, it's much easier to get a sense of consumption there than to strike up a conversation on the street about porn. At least, that's usually the case.

On one of my trips through Old Delhi with a fellow researcher, Younghee Jung, we were invited, as is typical when wandering around markets in India, by a shopkeeper to sit and have a chai. When we got onto the subject of mobile phones, the shopkeeper took out his phone (which happened to be a Nokia, though he didn't know that was the company we worked for) and showed us what was at the time one of the hottest viral videos in India, featuring two seventeen-year-old public school students engaged in oral sex. We were a bit surprised that the shopkeeper would show us the clip, which despite its popularity was still considered quite scandalous (as well as illegal to distribute under Indian law), but even more surprising was the fact that he had the video on his phone despite being relatively tech-illiterate. He explained to us that he had never used Bluetooth before, but he went to the effort of learning how to use the feature specifically in order to get the video onto his phone. He also offered to send the video to us via Bluetooth, if we wanted it, further demonstrating his literacy and his desired standing as an earlier adopter in the network. You're probably familiar with this kind of viral mechanism as it occurs through web-based sharing, but it's important to remember that the spread of technology and media is also constantly playing out offline.

The presence of porn out in public can also reveal broader shifts in cultural norms. On my visit to Kabul in 2008, the DVD stalls on Flower Street were selling Bollywood movies, warlord videos, and the odd action flick. A year later, they were openly selling porn, marking a dramatic shift from the days when the Taliban was so intent on removing the female form from public view that shampoo packaging had female faces scratched out, lest the imagery drive hot-blooded males to distraction. The emergence of an open marketplace for imported pirated porn DVDs could be taken as a sign of a more sexually open mainstream society, and would likely be used by the mullahs as an example of Western decadence. There was no indication of a homegrown porn industry, locally produced content going overseas, or a market for female-consumed or gay and lesbian targeted porn, but such things would be considered even greater indications of permissiveness, as would a shift from an ad hoc marketplace to more established infrastructure, in this case a fixed-location sex shop.*

Checking out the porn market is just one quick-and-dirty way to gauge cultural norms as they relate to the adoption of new technologies and new ideas, and it works well as a supplement to, but not a substitute for, more traditional ethnographic methods. Just as the drivers for porn consumption are universal,

* The shift from sex-toy prudence to far more mainstream availability is probably starkest in China, where a decade ago they were out of sight, but today almost every neighborhood has a shop openly selling sex toys and libido enhancers, and penetrative vibrators are sold at the point of sale in convenience stores.

so too are marketplaces for porn. Social norms in countries like Ethiopia or India may push the market out of sight or underground, but they simply force suppliers to find more inventive ways to meet consumer demand. In China, where porn is illegal, some sellers found a subtly ingenious, although admittedly imperfect, way of signaling that their product was for sale: a woman standing at the edge of the market holding a baby wrapped in swaddling. The baby, which was occasionally fake, provided a socially acceptable excuse to stand and talk to the woman, and the porn CDs or DVDs could be hidden in the folds of the cloth.

The lesson from all this is not just that people the world over love porn and are willing to go to great lengths (such as adopting new technologies or pretending to coo over fake babies) to get it. The lesson is that moral codes have a great bearing on adoption, and that you can only understand adoption insofar as you understand the boundaries of moral restrictions, and the choices people make to honor or disobey those boundaries.

Take, for instance, the Amish. The common assumption is that they're rejecters of most forms of technology, because their religious views condemn it, and recusers in other areas where they simply don't need certain technologies in their simple, farm-dwelling lives. However, as Kevin Kelly, who is two steps ahead of most other technology writers and spent time traveling through Amish communities around the United States, and studying their adoption behaviors, reports in his book *What Technology Wants*, "Amish lives are anything but anti-technological. . . . I have found them to be ingenious hackers and tinkers, the ultimate makers and do-it-yourselfers and surprisingly pro technology." Many Amish use power tools in their carpentry work,

often excising electric motors and retrofitting the machines to run pneumatically, using diesel generators to power compressed air tanks. Kelly writes that, while every Amish community has its own set of rules, the prevailing attitude toward technology is that it's okay if it helps strengthen the community. But because their traditional ways teach them to remain separate from the rest of society, they thus have to stay off the electricity grid. "The Amish noticed that when their homes were electrified with wires from a generator in town, they became more tied to the rhythms, policies, and concerns of the town. Amish religious belief is founded on the principle that they should remain 'in the world, not of it' and so they should remain separate in as many ways as possible."

The Amish are certainly an outlier among cultures, but the point is that one wrong assumption—that they're hostile toward technology, when really they're just very selective about the technologies they allow into their lifestyle—can completely change outsiders' perceptions of how they really live. The best way to understand how a culture adopts (or doesn't adopt) an innovation is to go there and see it for yourself. In person, you can gain insight into the social barriers unique to a culture, and whether adoption is purely driven by reflective appeal (status), behavioral appeal (usefulness), or the relative importance of one over the other. If you do the research right, it will allow you to tap into the sentiment of adoption, which you'll never get from looking at quantified data.

However, when it comes to cutting-edge technologies that haven't yet been implemented in the community or country you're interested in, it helps to go elsewhere, to the early-adopter places.

They aren't always the most tech-savvy cultures, just the ones that took a particular step first. For next-generation display technologies, Seoul is the place to look. For mobile money services, Kenya provides the dominant model. Tokyo, as discussed at the top of this chapter, is good for looking at highly integrated services across ticketing, noncash payments, and location-based services. "Cutting-edge" can mean many different things when it comes to mobile phone use, and San Francisco, Tokyo, Afghanistan, Ghana, Kenya, and India are all worth a visit to understand their mobile ecosystems. Each provides a sufficient density of people exploring a unique combination of technology and culture in idiosyncratic contexts. Even when the technology stays the same from place to place, the unique nuances of a given location will reveal insights about adoption as you examine how technology has become woven into the fabric of everyday life there.

Of course, by the time you read this, there will be new technologies emerging in unexpected places. The places that are for now ahead of the curve may see the rest of the world catch up to them quickly. As innovations are becoming more and more connected, we are increasingly aware of what people are adopting in other communities. Even the notion of community and human ecosystem is evolving, becoming more social and less tangible, and blurring borders between countries, cultures, and languages.

New Possibilities, New Consequences

Any forward-thinking discussion about the adoption of new technology is bound to be clouded by the natural hopes and fears for an uncertain future. Kevin Kelly adeptly stirred up both

ends of that emotional spectrum in *What Technology Wants*, in which he theorized that innovation has an unconscious manifest destiny, a trajectory that we can't control for better and/or for worse. In the context of our recurring theme—technology amplifies existing behavior—the only thing we can truly anticipate is that, eventually, a piece of technology will be adopted by those people who can use it to amplify their behavior the most.

The opportunities, risks, and consequences of adoption greatly depend on the context in which we imagine them playing out. From the modern metropolises of New York and Tokyo to countries with a very different level of risk, such as Afghanistan, I've been exploring how the world will behave when everyone is inherently "known."

What will everyday interactions look like when technology allows you to connect a person standing in front of you to their online profile? There are various ways to do this already: identifying someone by their travel card as they pass through a ticket gate; being tagged by friends in their just-uploaded photos; or a geosocial check-in via Facebook, Foursquare, or some other similar service. At the infrastructural level, personal-data-sharing technologies are already here, but (as of this writing) they have yet to become mainstream through mobile devices, where their impact will be greatest and most visible.

If it all sounds Big Brotherish to you, then good, because by most of today's metrics it is. But it also highlights the privacy tradeoffs we make when we post more of our selves online, driven by a desire to communicate and share our social connections and experiences. While you're worried about what companies and governments are doing with your personal data, you're

also propagating that data with ever more detailed tools in the name of socializing or consuming. Keep an eye on Big Brother, but don't forget your socially connected little sister.

One technology already making waves, but for which the biggest disruption is yet to come, is near-time facial recognition: the ability to capture someone's face and accurately match it to their online identity (and everything attached to it), all within the time it takes to say "hi." The technologies required to make this happen are already here but tend to require a big infrastructure—think airports or customs controls. Still, it's only a matter of time before it's available through your mobile phone.

On the streets of Tokyo, advertisers are already using high-tech, camera-equipped billboards that can scan the faces of pedestrians passing by to track their (presumed) gender and age, and use that data to present tailored content. Some might see this as invasive marketing becoming more invasive; others might see it as informational promotion becoming more informative. Either way it's a matter of amplification.

At some point, smartphone users will have access to the same technology. Google has already developed it and decided to withhold it because of privacy concerns, but eventually a developer with a compelling consumer proposition and a different set of ethics will put it out there. While the argument around privacy evokes strong emotions—as it should—recent history suggests that consumers are willing to make privacy tradeoffs for something of value, given the frequency with which smartphone users let companies track their location in return for a blue dot on a map and the lowdown on, say, the nearest four-star pizza

parlor. Whether consumers truly understand the long-term impact of those tradeoffs is another thing. I'm sure that there will be compelling facial-recognition applications and services that drive adoption, whether they help people get laid, gossip, or reveal their place in the socioeconomic strata.* People looking to make friends or find mates will have a new resource at their disposal, but so too will those with more nefarious intent.

In 2010 I was running a study in Afghanistan to explore the adoption of M-Paisa, a local mobile money transfer service. The research included a side trip to Jalalabad, on the Pakistan border, which happened to come on the day the U.S. military announced its Iraq exit strategy. In another part of the city, street demonstrations were under way to protest that coalition forces had yet to declare any plans to leave Afghanistan. In any study it's necessary to read the streets, and I know how important it is to let people on the streets read me as well, so I want them to see a friendly guy with a camera casually chatting up the locals. But, hypothetically, if they had had real-time facial recognition at their disposal in that situation, they could have snapped my photo with their phones and instantly seen who I was, where I came from, and whom I worked for.

Want to know whether someone is worth kidnapping? Someday soon, there will be an app for that. On one hand, it's comforting to think they'd have a tool to sniff me out and discover my intent; on the other hand, if they were the type to be

* Either through some form of extrapolation of public records—Sweden, Finland, and Norway post this online—or through matching data from salary services with job titles.

suspicious of any foreigner with a corporate background, I wouldn't be able to conceal that connection from them.

This is the paradox of technological evolution: just as it can help us become who we want to be, it can also allow others to expose us for who we really are, for better or for worse.

A Footnote to the Future

There's one last thing to keep in mind when considering how people and societies will adopt the next wave of technologies and the waves to come. When a new innovation enters our consciousness, it's natural to get excited and focus on the uptake of the new—who will adopt, when, and why—and ignore the inevitable slough of the old. But just as all things have an adoption curve, they also have an abandonment curve. There will always be reasons for moving on, and it's simply a matter of when or how they become more compelling than the reasons for staying put: when newer technology makes older ones, such as the phone kiosk, typewriter, and hand-powered drill, effectively obsolete; when society and the nature of work shift, and leave behind things like servants' bells and sword scabbards; or simply because the novelty effect wears off, and Pet Rocks just don't seem as cool anymore. Hints to behaviors past lie all around us: people holding up virtual lighters on their phone screens at concerts; nomenclature like *glove compartment*, *pen pal*, and *disc jockey*; and even the iconography on our computers that points back to the physical objects we've since abandoned in favor of the applications those icons represent—notepads, envelopes, paper clips, and fountain pens. This list may at some point include

physical banknotes and coins, physical tickets of any form, metal keys, and the rearview mirror. Just as self-image, relationship networks, social mores, and risk factors all influence the shape and magnitude of adoption curves, so too do they impact abandonment curves. Every wave comes in with the tide, and every tide recedes.

On the flip side of the innovators, early adopters, early majority, late majority, laggards, rejecters, and recusers, there are the dabblers, early abandoners, an early exodus, a late exodus, die-hards, and lifers. Every piece of technology is like a hermit crab's shell, and its users choose to occupy it because it meets their needs at the time they move into it. And just as hermit crabs change shells, people will invariably move on when their needs change or they find something that better suits them.