

"Born Digital"  
by PalFREY and Gassae

## INTRODUCTION

**Y**OU SEE THEM EVERYWHERE. THE TEENAGE GIRL WITH THE IPOD, SITTING across from you on the subway, frenetically typing messages into her cell phone. The whiz kid summer intern in your office who knows what to do when your e-mail client crashes. The eight-year-old who can beat you at any video game on the market—and types faster than you do, too. Even your niece's newborn baby in London, whom you've never met, but with whom you have bonded nonetheless, owing to the new batch of baby photos that arrive each week.

All of them are "Digital Natives." They were all born after 1980, when social digital technologies, such as Usenet and bulletin board systems, came online. They all have access to networked digital technologies. And they all have the skills to use those technologies. (Except for the baby—but she'll learn soon enough.)

Chances are, you've been impressed with some of the skills these Digital Natives possess. Maybe your young assistant has shown you a hilarious political satire online that you never would have found on your own, or made presentation materials for you that make your own PowerPoint slides seem medieval by comparison. Maybe your son has Photoshopped a cloud

out of a family vacation photo and turned it into the perfect Christmas card. Maybe that eight-year-old made a funny video on her own that tens of thousands of people watched on YouTube.

But there's also a good chance that a Digital Native has annoyed you. That same assistant, perhaps, writes inappropriately casual e-mails to your clients—and somehow still doesn't know how to put together an actual *printed* letter. Or maybe your daughter never comes down for dinner on time because she's always busy online, chatting with her friends. And when she does come down to dinner, she won't stop texting those same friends under the table.

Maybe you're even a bit frightened by these Digital Natives. Your son has told you, perhaps, that a boy in his ninth-grade class is putting up scary, violent messages on his Web page. Or you heard about that ring of college kids who hacked into a company website and stole 487 credit-card numbers before getting caught by police.

There is one thing you know for sure: These kids are different. They study, work, write, and interact with each other in ways that are very different from the ways that you did growing up. They read blogs rather than newspapers. They often meet each other online before they meet in person. They probably don't even know what a library card looks like, much less have one; and if they do, they've probably never used it. They get their music online—often for free, illegally—rather than buying it in record stores. They're more likely to send an instant message (IM) than to pick up the telephone to arrange a date later in the afternoon. They adopt and pal around with virtual Neopets online instead of pound puppies. And they're connected to one another by a common culture. Major aspects of their lives—social interactions, friendships, civic activities—are mediated by digital technologies. And they've never known any other way of life.

**B**eginning in the late 1970s, the world began to change—and fast. The first online bulletin board system (or “BBS,” for short) let people with clunky computer equipment and access to telephone lines swap documents, read news online, and send one another messages. Usenet groups,

organized around topics of interest to communities of users, became popular in the early 1980s. E-mail began to enter popular usage later in the 1980s. The World Wide Web made its debut in 1991, with easy-to-use browsers widely accessible a few years later. Search engines, portals, and e-commerce sites hit the scene in the late 1990s. By the turn of the millennium, the first social networks and blogs cropped up online. In 2001, Polaroid declared bankruptcy, just as sales of digital cameras started to take off. In 2006, Tower Records liquidated its stores; by 2008, iTunes had become the largest music retailer in the United States. Today, most young people in many societies around the world carry mobile devices—cell phones, Sidekicks, iPhones—at all times, and these devices don't just make phone calls; they also send text messages, surf the Internet, and download music.

This is the most rapid period of technological transformation ever, at least when it comes to information. The Chinese invented the printing press several *centuries* before Johannes Gutenberg developed the European printing press in the mid-1400s and churned out his first Bibles. Few people could afford the printed books made possible by presses for another several centuries. By contrast, the invention and adoption of digital technologies by more than a billion people worldwide has occurred over the span of a few decades. Despite the saturation of digital technologies in many cultures, no generation has yet lived from cradle to grave in the digital era.

No major aspect of modern life is untouched by the way many of us now use information technologies. Business, for instance, can be done more quickly and over greater distances, often with much less capital required to get up and running. Politicians e-mail their constituents, offer video introductions to their campaigns on their websites, and provide volunteers with sophisticated digital tools to organize events on their own. Even religion is being transformed: Priests and pastors, imams, rabbis, gurus, and even Buddhist monks have begun to reach their faithful through their weblogs.

Most notable, however, is the way the digital era has transformed how people live their lives and relate to one another and to the world around them. Some older people were there at the start, and these “Digital

Settlers”—though not native to the digital environment, because they grew up in an analog-only world—have helped to shape its contours. These older people are online, too, and often quite sophisticated in their use of these technologies, but they also continue to rely heavily on traditional, analog forms of interaction. Others less familiar with this environment, “Digital Immigrants,” learned how to e-mail and use social networks late in life. You know them by the lame jokes and warnings about urban myths that they still forward to large cc: lists. Those who were born digital don’t remember a world in which letters were printed and sent, much less handwritten, or where people met up at formal dances rather than on Facebook. The changing nature of human relationships is second nature to some, and learned behavior to others.

This narrative is about those who wear the earbuds of an iPod on the subway to their first job, not those of us who still remember how to operate a Sony Walkman or remember buying LPs or eight-track tapes. Much is changing beyond just how much young people pay (or don’t pay) for their music. The young people becoming university students and new entrants in the workforce, while living much of their lives online, are different from us along many dimensions. Unlike those of us just a shade older, this new generation didn’t have to relearn anything to live lives of digital immersion. They learned in digital the first time around; they only know a world that is digital.

Unlike most Digital Immigrants, Digital Natives live much of their lives online, without distinguishing between the online and the offline. Instead of thinking of their digital identity and their real-space identity as separate things, they just have an identity (with representations in two, or three, or more different spaces). They are joined by a set of common practices, including the amount of time they spend using digital technologies, their tendency to multitask, their tendency to express themselves and relate to one another in ways mediated by digital technologies, and their pattern of using the technologies to access and use information and create new knowledge and art forms. For these young people, new digital technologies—computers, cell phones, Sidekicks—are primary mediators of human-to-human connections. They have created a 24/7 network that blends the human with the technical to a degree we haven’t experienced before, and

it is transforming human relationships in fundamental ways. They feel as comfortable in online spaces as they do in offline ones. They don’t think of their hybrid lives as anything remarkable. Digital Natives haven’t known anything but a life connected to one another, and to the world of bits, in this manner.

Digital Natives are constantly connected. They have plenty of friends, in real space and in the virtual worlds—indeed, a growing collection of friends they keep a count of, often for the rest of the world to see, in their online social network sites.<sup>1</sup> Even as they sleep, connections are made online, in the background; they wake up to find them each day. Sometimes, these connections are to people the Digital Native would never have had a chance to meet in the offline world. Through social network sites, Digital Natives connect with and IM and share photos with friends all over the world. They may also collaborate creatively or politically in ways that would have been impossible thirty years ago. But in the course of this relentless connectivity, the very nature of relationships—even what it means to “befriend” someone—is changing. Online friendships are based on many of the same things as traditional friendships—shared interests, frequent interaction—but they nonetheless have a very different tenor: They are often fleeting; they are easy to enter into and easy to leave, without so much as a goodbye; and they are also perhaps enduring in ways we have yet to understand.

Digital Natives don’t just experience friendship differently from their parents; they also relate to information differently. Consider the way Digital Natives experience music. Not so long ago, teenagers would go to a friend’s house to listen to a new record. Or music could signal a shared intimacy: A teenage girl would give her new boyfriend a mixed tape, with song names carefully written onto the cassette lining, to signal her growing affection. Not everything has changed: Digital Natives still listen to copious amounts of music. And they still share lots of music. But the experience is far less likely than before to take place in physical space, with friends hanging out together to listen to a stereo system. The network lets them share music that they each, then, can hear through headphones, walking down the street or in their dorm rooms, mediated by an iPod or the iTunes Music System on their hard drive. The mixed tape has given

way to the playlist, shared with friends and strangers alike through social networks online. A generation has come to expect music to be digitally formatted, often free for the taking, and endlessly shareable and portable.

Digital Natives are tremendously creative. It is impossible to say whether they are more or less creative than prior generations, but one thing is certain: They express themselves creatively in ways that are very different from the ways their parents did at their age. Many Digital Natives perceive information to be malleable; it is something they can control and reshape in new and interesting ways. That might mean editing a profile on MySpace or encyclopedia entries on Wikipedia, making a movie or online video, or downloading a hot music track—whether lawfully or not. Whether or not they realize it, they have come to have a degree of control over their cultural environment that is unprecedented. Digital Natives can learn how to use a new software program in a snap. They seemingly can take, upload, and edit pictures to share with friends online in their sleep. Digital Natives, at their most creative, are creating parallel worlds on sites like Second Life. And after they do, they record parts of that world and post a video of it on YouTube (if they live in California) or Daily Motion (if they live in Cannes) in a new art form called “machinima.” Digital Natives can rework media, using off-the-shelf computer programs, in ways that would have seemed impossible a few short decades ago.

Digital Natives are coming to rely upon this connected space for virtually all of the information they need to live their lives. Research once meant a trip to a library to paw through a musty card catalog and puzzle over the Dewey Decimal System to find a book to pull off the shelves. Now, research means a Google search—and, for most, a visit to Wikipedia before diving deeper into a topic. They simply open a browser, punch in a search term, and dive away until they find what they want—or what they thought they wanted. Most Digital Natives don’t buy the newspaper—ever. It’s not that they don’t read the news, it’s just that they get it in new ways and in a wide variety of formats. And they have little use for those big maps you have to fold on the creases, or for TV listings, travel guides, or pamphlets of any sort; the print versions are not obsolete, but they do strike Digital

Natives as rather quaint. These changes, to be sure, are not all good, but they will be enduring.

Indeed, many aspects of the way in which Digital Natives lead their lives are cause for concern. Digital Natives’ ideas about privacy, for instance, are different from those of their parents and grandparents. In the process of spending so much time in this digitally connected environment, Digital Natives are leaving more traces of themselves in public places online. At their best, they show off who they aspire to be and put their most creative selves before the world. At their worst, they put information online that may put them in danger, or that could humiliate them in years to come. With every hour they log online, they are leaving more tracks for marketers—and pedophiles, for that matter—to follow. There’s more about them for admissions officers and potential employers—and potential dates—to find. The repercussions of these changes, in the decades to come, will be profound for all of us. But those who are growing up as Digital Natives are on track to pay the highest price.

Digital Natives will move markets and transform industries, education, and global politics. The changes they bring about as they move into the workforce could have an immensely positive effect on the world we live in. By and large, the digital revolution has already made this world a better place. And Digital Natives have every chance of propelling society further forward in myriad ways—if we let them.

But make no mistake: We are at a crossroads. There are two possible paths before us—one in which we destroy what is great about the Internet and about how young people use it, and one in which we make smart choices and head toward a bright future in a digital age. The stakes of our actions today are very high. The choices that we are making now will govern how our children and grandchildren live their lives in many important ways: how they shape their identities, protect their privacy, and keep themselves safe; how they create, understand, and shape the information that underlies the decision-making of their generation; and how they learn, innovate, and take responsibility as citizens. On one of these paths, we seek to constrain their creativity, self-expression, and innovation in public and

private spheres; on the other, we embrace these things while minimizing the dangers that come with the new era.

Fear is the single biggest obstacle to getting started on that second path, the one where we realize the potential of digital technology and the way that Digital Natives are using it. Parents, educators, and psychologists all have legitimate reasons to worry about the digital environment in which young people are spending so much of their time. So do corporations, who see their revenues at risk in industry after industry—recorded entertainment, telephony, newspapers, and on and on. Lawmakers, responding to this sense of crisis, fear that they will pay a high price if they fail to act in the traditional manner to right these wrongs.

The media feeds this fear. News coverage is saturated with frightening stories of cyberbullying, online predators, Internet addiction, and online pornography. Of course parents worry. Parents worry most that their digitally connected kids are at risk of abduction when they spend hours a day in an uncontrolled digital environment where few things are precisely as they seem at first glance. They worry, too, about bullying that their children may encounter online, addiction to violent video games, and access to pornographic and hateful images.

Parents aren't the only ones who fear the impact of the Internet on young people. Teachers worry that they are out of step with the Digital Natives they are teaching, that the skills they have imparted over time are becoming either lost or obsolete, and that the pedagogy of our educational system cannot keep up with the changes in the digital landscape. Librarians, too, are reimagining their role: Instead of primarily organizing book titles in musty card catalogs and shelving the books in the stacks, they serve as guides to an increasingly variegated information environment. Companies in the entertainment industry worry that they'll lose their profits to piracy, and newspaper execs fear their readers are turning to Drudge, Google, blogs, or worse for their news.

As parents of Digital Natives, we take both the challenges and the opportunities of digital culture seriously. We share the concerns of many parents about the threats to the privacy of our children, to their safety, and to their education. We worry about the crush of too much information and the impact of violent games and images online. But as a culture of fear emerges

around the online environment, we must put these real threats into perspective; our children and future generations have tremendous opportunities in store for them, not in spite of the digital age, but because of it.

We see promise in the way that Digital Natives are interacting with digital information, expressing themselves in social environments, creating new art forms, dreaming up new business models, and starting new activist ventures. The purpose of this book is to separate what we need to worry about from what's not so scary, what we ought to resist from what we ought to embrace.

There is a huge risk that we, as a society, will fail to harness the good that can come from these opportunities as we seek to head off the worst of the problems. Fear, in many cases, is leading to overreaction, which in turn could give rise to greater problems as young people take detours around the roadblocks we think we are erecting. Instead of emphasizing education and giving young people the tools and skills they need to keep themselves safe, our lawmakers talk about banning certain websites or keeping kids under eighteen out of social networks. Instead of trying to figure out what's going on with kids and digital media, the entertainment industry has gone to war against them, suing its young customers by the tens of thousands. Instead of preparing kids to manage a complex and exploding information environment, governments around the world are passing laws against certain kinds of publications, making the banning of books look like a quaint, harmless activity. At the same time, we do next to nothing in terms of taking the kinds of steps that need to be taken if we are to address the real concerns facing kids.

Our goal in this book is to present the good and the bad in context and to suggest things that all of us—parents, teachers, leaders of companies, and lawmakers—can do to manage this extraordinary transition to a globally connected society without shutting the whole thing down.

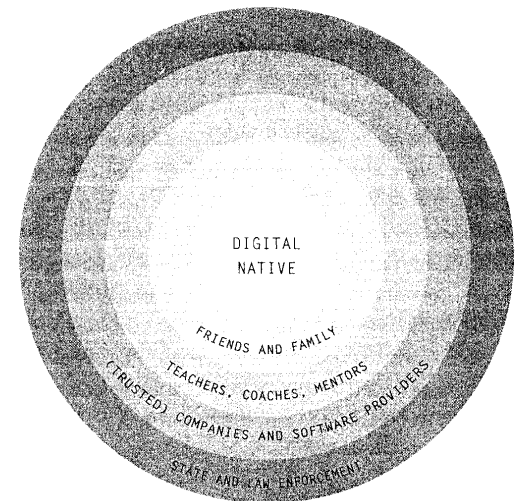
The hard problem at the core of this book is how to balance caution with encouragement: How do we take effective steps to protect our children, as well as the interests of others, while allowing those same kids enough room to figure things out on their own? If we can find this balance, in the process we will allow thousands of flowers to bloom online and empower our children

to handle problems that will no doubt arise in their future. The solutions that will work are complicated ones. They will involve lots of different groups, including parents and educators as well as technology firms and lawmakers—and, critically, Digital Natives themselves.

In shaping solutions to the problems that arise, we need not think in radically new paradigms. Often, the old-fashioned solutions that have solved similar problems in the past will work in the digital age, too. Those solutions are engaged parenting, a good education, and common sense. A lot of the things we're worried about—bullying, stalking, copyright violations, and so forth—are things we've handled for decades, if not centuries. We can, as a society, handle them in the digital age, too, without the hysteria that has surrounded them. We too often overestimate the ways in which the online environment is different from real space, to our detriment.

Parents and teachers are on the front lines. They have the biggest responsibility and the most important role to play. But too often, parents and teachers aren't even involved in the decisions that young people are making. They cut themselves off from their Digital Native children because the language and cultural barriers are too great. What we hope parents and teachers will begin to understand as they read this book is that the traditional values and common sense that have served them well in the past will be relevant in this new world, too. Rather than banning the technologies or leaving kids to use them on their own in their bedrooms—two of the most common approaches—parents and teachers need to let Digital Natives be their guides into this new, connected way of living. Then the conversation can begin. To many of the questions that arise, common sense is a surprisingly good answer. For the others, we'll need to work together on creative solutions.

That said, parents and teachers need not, and should not, go it alone. As mentioned earlier, Digital Natives, their peers, technology companies, and lawmakers each have a role to play in solving these problems. Imagine a series of concentric circles, with the Digital Native at the center (see Figure 1). In many cases, the Digital Natives themselves are the ones who are best positioned to solve the problems that arise from their digital lives. Of course, it's not always realistic to put Digital Natives in charge, but it's important to start there all the same. One circle out, the family and close



friends of a Digital Native can have an impact, whether through guidance (in the case of Internet safety, for instance) or through collaborative development of social norms (in the case of intellectual property). The third circle includes teachers and mentors, who often can have a big impact on how Digital Natives navigate these environments. Fourth, we look to the technology companies that build software and offer services, which can also make a big difference in how these issues play out—and which must act accountably if that difference is going to be for the good. Fifth, we turn to the law and to law enforcement, often powerful instruments but usually blunt ones—and properly seen as a last resort.

We are not indifferent to the outcome of the many legal, political, and moral debates that this material engages. For one thing, we are both parents of Digital Natives. We care deeply about the world in which they are growing up, about the friendships they will make, about their safety, and about how they learn and engage with society at large. We are eager for them to become active, caring, global citizens.

For another thing, we are lawyers. We love the law. We believe strongly that the law is an essential part of organizing our democratic societies in a constructive way. The law is a crucial means to solving many social problems. But we are also lawyers who believe that the limits of law are sharply apparent in the context of many of the problems we are studying here. Despite the uncertainty inherent in predicting the future, now is the time to look ahead, whether as parents, as teachers, or as policy-makers, technologists, or Digital Natives, and to shape—without doing harm—the regulatory framework for the emerging digital space in ways that advance the public interest. In some cases, like the surge in online creativity, these trends point to opportunities we should harness. In others, such as the privacy problem or the cyberbullying problem, substantial dangers lurk in the digital future that we ought to head off at the pass. The law is rarely the right answer, but we should not hesitate to use it when it could do more good than harm. Technology companies can be encouraged to do the right thing on their own, especially when they know that future regulation is a possibility if they do not. And it's always important to have law enforcement as a backstop for the worst cases.

**I**n writing this book, we've been trying to capture a picture of something that is already kaleidoscopic in its complexity, and that changes substantially every few months. By the time this book is printed, it will already be starting to go out of date. It will still provide an introduction to the most serious issues of the digital explosion and how they affect our children, as well as a context in which to think about solutions, and these matters will be pertinent for a long time to come. But we did not want to stop there. Therefore, much of our work is online, so that we can update it over time. It's in the form of a wiki—at <http://www.digitalnative.org/>—and uses the same technology that powers Wikipedia, the extraordinary online encyclopedia and one of the subjects of this book. It is a technology that allows anyone who wants to participate in updating our work to do so.

Our methodology involved a combination of approaches. We learned a great deal from the best research done by others in the field: social sci-

tists, psychologists, neuroscientists, developmental pediatricians, and librarians. We also conducted original research of our own. In order to understand more clearly the issues facing Digital Natives, we conducted a series of focus groups and interviews of young people. Our goal was not to undertake a comprehensive study, but rather to take an in-depth look at the way young people relate to information and one another.

We spoke in detail to young people from around the world about the technologies they use, how they express their identities online, and what they think about privacy and safety. We asked them what they create in digital formats, what they know about intellectual property, how they research new topics and keep tabs on news about the world, and how they interact with one another. In all, we held about 100 conversations with young people in these formal settings. You will hear their voices, though without their names attached, throughout this book. Our research is also grounded in conversations that we held with about 150 additional informants, including other young people, their teachers, librarians, psychologists, and those who study them.

This culture is global in scope and nature. Whether physically based in Rio de Janeiro, Shanghai, Boston, Oslo, or Cape Town, Digital Natives—often young elites—form part of a global culture of their peers. They are connected to each other in terms of how they relate to information, how they relate to new technologies, and how they relate to one another. When they chat with each other, broadcast their latest videos, post messages on their blogs and social network profiles, or share the latest tunes over P2P networks, they do so across states, national boundaries, and continents. Parallel to their digital universe, Digital Natives are embedded in regional and local customs, habits, and values. These factors, among others—together with the social and economic context and the local laws—are likely to shape the ways in which Digital Natives use digital technology, how they can realize its opportunities, and how they will address the challenges it poses.

While researching and writing this book, we sought to identify both the common threads of the emerging global culture and to take into account regional and local differences. We have each logged hundreds of thousands of miles over the past few years, visiting dozens of countries and hundreds

of places to speak with Digital Natives, their parents and teachers, representatives of software companies, and in several cases government officials. We interviewed them about the topics we're addressing in this book. We learned a lot from these conversations, and we hope that the insights that we brought back—from Eastern Europe, the Middle East, Asia, and Africa, among other destinations—are faithfully reflected in this book in one way or another.

As expensively educated academics in highly connected, wealthy societies, we come from places of great privilege. Both the opportunities and the problems outlined in this book take on different contours from perspectives other than our own. And there are many such other perspectives. Rather than calling Digital Natives a *generation*—an overstatement, especially in light of the fact that only 1 billion of the 6 billion people in the world even have access to digital technologies—we prefer to think of them as a *population*.

One of the most worrying things of all about digital culture is the huge divide it's opening up between the haves and have nots. This divide is regional: Wealthy countries like the United States and Switzerland have high levels of broadband access, high rates of literacy, and educational systems that (often) emphasize critical thinking. As a result, many kids in wealthy countries are Digital Natives. In the developing world, the technology is less prevalent, electricity often scarce, and literacy rates low, and the number of teachers who know how to instruct kids in the use of technologies is in short supply. There's a divide even within rich countries. In the United States, most kids can access the technology itself, but there are huge divides between those children who have the skills to use it effectively and those who do not.

The vast majority of young people born in the world today are not growing up as Digital Natives. There is a yawning participation gap between those who are Digital Natives and those who are the same age, but who are not learning about digital technologies and living their lives in the same way.<sup>2</sup> For billions of people around the world, the problems facing Digital Natives are mere abstractions.

The biggest concern that we highlight in this book is the impact of the participation gap. The digital world offers new opportunities to those who know how to avail themselves of them. These opportunities make possible new forms of creativity, learning, entrepreneurship, and innovation. In the past, many have worried about the “digital divide,” the separation between those with access to the network and those without access. This is a persistent problem, but it's not the whole problem. The harder issue arises when you realize that access to the technologies is not enough. Young people need to learn digital literacy—the skills to navigate this complicated, hybrid world that their peers are growing up in. This type of inequality must be overcome. The costs of leaving the participation gap unaddressed over time will be higher than we should be willing to bear.

This story is breaking all around us, around the world, at unprecedented speed. The bad news is that there are no easy answers to the puzzles that Digital Natives encounter as they navigate their digitally mediated lives or to the problem of the participation gap. The good news is that there is a lot that we can do as our children grow up, with them and for them. We each have a role to play in solving these problems. Most important of all, we need to prepare our Digital Natives and other young people to lead the way themselves toward a bright future in the digital age.