
Digital Nation at a Crossroads

Sigmund Freud recognized three primary sources of discontent in the human condition: our struggle with nature; the deterioration of the body; and social conflict.¹ Most scientific progress and technological innovation can be explained in relation to the alleviation of one of these three problems. To ameliorate the effects of the natural world, one of the world's fastest supercomputers, operating in Yokohama, Japan, crunches teraflops of information per second in order to predict earthquakes and weather activity. Thwarting disease, extending life span, and remaking the self are key drivers of modern biotechnology research and enhancement technologies.² Portable, high-speed telecommunications tools are being harnessed to help monitor and regulate the body, promising to increase both access to and the quality of health services. Reducing conflict and advancing democracy have been closely aligned with improvements in communications technologies; the Internet is the latest tool to augur more harmonious relations among peoples.

The drive to stem disease and build protective shields against natural and humanmade disasters will only accelerate as new breakthroughs occur. The products of the incipient communications and biotechnology revolutions will alter our lives immeasurably in the years to come. We can only glimpse the shape of the future from our vantage point at this dawning age of instant, networked communications and the demystification of the genetic code. If the past reveals anything, it is that technological advancement will yield new conveniences and opportunities for social and political empowerment while at the same time harboring unforeseen challenges to humanity and the environment. The movement of digital bits and the harnessing of new energy sources promise cleaner transactions and processes than those of the industrial age, and the portability of intelligent devices to

regulate the body and to expand communications will spread new modes of well-being and enlightenment. While it may appear that we are prevailing in the struggle against nature and ourselves and forging a healthier society, a great deal of concerted attention and action will be needed to safeguard this enterprise, particularly in democratizing access to and effective use of the critical means of communications in society.

For some, including Freud himself, the prospects for humanity's overriding its destructive penchant are grim. The decline of the nation-state, weapons proliferation, and the rise of informal terror and paramilitary networks in our time indicate that the progeny of science and invention will be uncontrollable or will control us. The mass media are full of speculations about the spread of scourges made possible by the mapping of the genetic code, or warfare against computer networks that could destabilize economies—scenarios that dim our hopes for the potential of science and technology, appropriately applied, to improve the human condition.³ These sentiments are not unique to our age, but the tools have become so powerful as to kindle terrifying awe. The prospects for emerging technology and media to play a pivotal role in revitalizing the economy and democracy are tempered by these realities. Yet vigilant action by a broad cross-section of stakeholders could yield significant improvements in the future quality of life. Fast-forwarding to 2010 or 2020, we might be confronted by a growing surveillance society or a powder keg of global inequalities; or we might be buoyed by breakthroughs and inventions opening windows to new opportunities for civilization to flower. Which of these scenarios better approximates the society of the future will depend upon choices we make today and the degree to which citizens become engaged and voice their concerns. This book develops a case for how we might better tap the potential of information and communications technologies as drivers to expand opportunity and inclusion, a proposal to help decision makers and concerned citizens usher in a more productive and democratic society in the years to come.

We can only begin to catalog the myriad examples of the salutary uses of information and communications technologies, when organizations and individuals possess the capacity and facility to use them meaningfully and productively. Increasingly, pathways to human development intersect with technology, and examples are plentiful of individuals and organizations globally, many in dire circumstances, using a windup radio, a refurbished

computer, or a mobile telephone to improve their lives in some way. In today's labor market, possessing technical skills is crucial for the job hunter to enhance the odds of finding gainful employment. Experiments with e-health show that specialists can be virtually transported to remote locations, expanding accessibility to health services while decreasing cost. And intelligent transportation and telecommuting may help untangle snarled freeways, helping commuters make up for lost productivity. A significant investment in technology-enhanced programs for health, transportation, and labor alone could save billions of dollars annually. Prudent policy-making would ensure that these efficiencies improve rather than worsen the prospects of the underclass. My checking myself out at a grocery store register or doing my banking online signals the downside of automation: redundancy. So, smarter deployment and use of these tools needs to invite not just better practice—faster, easier, more efficient—but more comprehensive and inclusive approaches to improving key areas of human life.

Investing in new technologies is no recipe for success. Simply having the tools, as is already the case in most wealthy nations, does not guarantee performance. By themselves, information and communications technologies will not bring about results; however, not possessing them in many cases will probably slow down the diffusion of innovation in the long run. Anyone who has stepped into a school knows that plowing billions of dollars into classroom educational technologies has done little on the whole to transform these efficient yet ineffective institutions. Access is necessary but not sufficient to enhance performance. Schools are often uninventive in how instruction is delivered such that technology adoption has largely hewn to established practice.⁴ The tools have conformed to an outworn pedagogy in which “the filling of a pail” takes precedence over “the lighting of a fire” in the hearts and minds of learners.⁵ The current mandates for high-stakes testing, for example, might mean that computers are used to drill students on multiple-choice tests, a misuse of a tool promising so much more in sparking curiosity and an appetite for learning. Educational institutions are not alone in underutilizing these tools. The productivity paradox in some businesses speaks to the misuse of information and communications technologies where organizational investments in infrastructure, if not properly orchestrated, can actually impair performance.

Training a spotlight on schools reveals that cultural norms often shape how technology is used, a reality working against the grain of the demands

of the emerging society. The *modus vivendi* for this post-Enlightenment society is a new relationship to information and knowledge. Merely reciting facts, answering questions, following orders, and consuming media are insufficient skills to thrive in a fluid social environment. We can no longer afford to receive information and knowledge, comfortable and resigned, like the heirs of a substantial inheritance; rather, we must construct our relationship to knowledge, provisionally and tenuously, to meet human purposes. The key attributes of knowledge work and of distributed learning—teamwork, critical thinking, and adaptability—shatter the shibboleths of Enlightenment epistemology, based on the centralization of information and knowledge for individuals, institutions, and society. The acquisition of knowledge is not merely a process of collecting facts but a lifelong struggle to adapt to a mercurial and complex external world.

That technology and media are increasingly distributed and interactive puts an enormous obligation on society and individuals to navigate, adjust, adapt, and prosper in this environment. Distributed systems push information to the periphery, placing a premium on cognitive and communicative skills, such as problem solving, critical thinking, and teamwork. In manufacturing, for example, savings are realized not just in back-office, information-intensive transactions but also in reorganizing activities to make them work better. The valued employee may no longer be the one who stands on an assembly line, following orders and beating the clock, but the one who participates on a dynamic, asynchronous team contributing to a complex built-to-order production process. Interactivity also challenges individuals and organizations to be responsive and flexible, unlike the one-to-many communications approaches of the past. Peer-to-peer exchanges increase control over the communications process by sender and receiver, potentially cutting out the information broker. In El Salvador, an initiative to operate dozens of telecenters (*infocentros*) across the country allows poor businesspeople to negotiate crop prices using the Internet and peer-to-peer interactions to leverage their power over wholesalers.⁶

This book suggests a plan to harness the potential of information and communications technologies to achieve a more productive and inclusive society, a Digital Nation. Without a more robust, forward-looking national approach to weaving information and communications tools intentionally and democratically into the economic and social agenda, the nation's future is jeopardized. A Digital Nation privileges bold new experimentation

to improve citizen access and effective use of new technologies while using innovative approaches to address long-standing social problems. In the health care arena, for example, a Digital Nation will optimize the use of information and communications tools to reduce the soaring costs of health services, expand access to services in remote communities, and improve the quality of diagnosis, treatment, and recovery. A Digital Nation will harness information and communications technologies to lift all boats and will not forsake populations facing serious obstacles to the realization of their life pursuits, such as immigrants, single parents, the disabled, and the incarcerated. Often these communities do not benefit from the fruits of early technology adoption because the market bypasses them. A Digital Nation will offer multiple pathways for everyone to develop the capacity and proficiency to achieve their life goals. And because human potential is often stymied by a dearth of basic literacy, a Digital Nation must customize solutions to remediation while leveraging these newfound skills to enhance communities' ability to participate meaningfully in society. These approaches acknowledge that technology is not a silver bullet; rather, it is a catalyst, driver, and powerful tool in rethinking the educational enterprise, expanding delivery of health and social services, and increasing the productivity and purpose of work. The realization of the Digital Nation, shorthand for a more productive and inclusive society, will require concerted action on the part of many stakeholders, from politicians to parents, lest the inequalities and discriminatory practices that plague the status quo be exacerbated.

Lag time in accessing and effectively using online services can be lethal, economically and socially, for groups already on society's margins. Discriminatory practices, including employment and wage bias as well as digital redlining, are pervasive in the private sphere, and even public institutions are unwittingly creating the very inequalities in opportunity that they are constitutionally beholden to thwart. Electronic government services are rolling out, for example, propelled in part by the low cost of online delivery; yet their potential beneficiaries do not always have the computers or the know-how to profit. This challenge was highlighted recently in Alabama, where a local employment office put up banners in low-income neighborhoods advertising an online job bank and offering a Web address to customers, and community leaders recoiled because the unemployed are among the least likely to have access to computers.⁷ Some consumers comparison-shop

online, moreover, saving money on goods and services and often avoiding sales taxes, while others must transact sales in the less competitive offline world. Using the Internet is second nature for many savvy young people, who rely heavily on the Web to conduct research and complete school admissions applications. Overseen by poorly trained teachers, other students occupy overcrowded classrooms in which computer devices are viewed as tools for geeks and nerds. Given these gaps in motivation, know-how, and technology proficiency, we must set ambitious benchmarks and accelerate the timetable for becoming a true Digital Nation.

A Digital Nation is an ambitious and achievable road map for arriving at a United States in which every resident has nondiscriminatory access to essential communications tools and information services as well as widespread opportunity to cultivate the skills to navigate a post-Enlightenment society. Achieving the vision is within our reach if leaders will focus on this issue and give it the priority it warrants. No national strategy exists to integrate the various goals for a Digital Nation beyond the silos of specific functional arenas, such as education. In the current climate a compelling vision is in abeyance that would build on the nation's proven competitive advantage and nimbleness in experimenting with new tools to enhance productivity and inclusion. Just as the vision to place a person on the moon in the early 1960s was realized as the decade closed, the dawn of a new decade motivates us to set bold goals to be realized by its close: that of universal literacy to advance creativity and unlock human potential. With the United Nations' goal to cut illiteracy in half by 2012, there is an opportunity to use information and communications technologies in an environment where the dearth of trained personnel and the magnitude of the world's illiterate population (almost 1 billion people) call for break-the-mold solutions, first to impart skills and second to translate these skills into productive engagement in the life of the larger community.

This book also articulates measurable benchmarks and timetables so that we can gauge our progress and hold institutions accountable as we journey toward a Digital Nation. The vision is by decade's end for every U.S. resident to leverage learning opportunities to become a full participant in the economic, civic, and educational life of the community. The ultimate goal of a Digital Nation, then, is outcome-driven, not focused on inputs. It is my hunch that many if not most disadvantaged Americans will find their way to the Digital Nation through some interaction with media

and technology as edifying and empowering tools, if more effective and customized public policies are implemented. The drive for more skilled and credentialed workers; the threshold résumé for gainful employment; and the migration of government and educational services online means that basic skills are no longer sufficient to connect to democratic life and commercial activity. Embracing a Digital Nation ensures that no person will be left behind in the old paradigm, unable to migrate to cyberspace. It also soberly acknowledges that many people lack basic skills to participate—they cannot read, they may not speak English, they may be blind or ill—so policymakers and community leaders must be pressed to redouble their efforts to resolve these challenges with the assistance of technology where appropriate.

One of the best examples of the empowering potential of advanced telecommunications and media pertains to transformations within the disability community. Hard-fought legal victories have led to the enforcement of government mandates for organizations to provide functionally equivalent telecommunications services to the 54 million Americans with disabilities. For example, as we transition to a world of digital television, providing better picture quality and new services for consumers, Congress mandated in 1996 that captioning be made available so that everyone would have access to televised information. In the realm of telecommunications, manufacturers and service providers must make their products and services accessible to people with disabilities, if readily available. Anecdotes abound of projects and programs empowering the disabled, shifting them from marginalization to the mainstream. Funded in part by the federal government, a small project in northeast Georgia is using high bandwidth and computers with voice-enabled browsers to deliver instructional and training programs to disabled persons who need life and job skills.⁸ Despite government intervention in funding and enforcement, many disabled persons are still unaffected by these miraculous tools, as are millions of others, because the political will does not exist to enforce nondiscrimination mandates and fully fund effective targeted programs.

Groups with serious challenges to their well-being—including single parents, the incarcerated, and immigrants—stand to benefit enormously from strategic investments in technology. Distance education alone is a revolutionary application for communities unwilling or unable to participate in classroom-based education. Imagine a hypothetical single mother, Maria

Gutiérrez, living in Winston-Salem, North Carolina. She has not completed high school and must juggle community college with her duties as the mother of two young children. Maria had never heard of the Internet before a recent visit to a new government-funded community technology center. She had seen many technology advertisements on Spanish-language television describing how she could save money on long-distance calls, but before a friend recommended she visit the center, she never thought about how the Internet could enable her to improve her skills, locate valuable social service information, and communicate with friends and potential employers. Maria is currently finishing her degree by taking her classes remotely in pursuit of her associate's degree. Learning technical skills and earning a degree will on average greatly enhance Maria's prospects for gainful employment.

A snapshot of the distribution of access and meaningful use of these tools shows a nation with many divisions and, most important, untapped human potential, exacerbated by the uneven deployment and application of communications. The vision of a Digital Nation is not deterministic: it does not foresee building more technology infrastructure and hoping people will come forward to use it. Rather, the vision is tied to technology's role in addressing long-standing social ills, particularly the divide in economic and civic participation, with an eye toward developing people's talents. Communications devices can also be used to tackle basic skills, such as teaching Braille or phonetics, developing building blocks with individualized learning for those who have fallen through the cracks of formal schooling.

Realizing a Digital Nation will involve a renegotiation of the social contract between government and citizens. In the early 1990s the first baby-boomer president and his technology-minded vice president set the nation on a new course, suggesting that the social contract could be better realized by testing the potential of emerging communications technologies and digital media to deliver services and streamline institutions. A policy vision of the e-commons portrayed a society in which no aspect of moribund public institutions would be untouched by technology. Indeed, the premise that these tools could influence our collective destiny in new and profound ways set the tone for the juggernaut decade of the 1990s, in which budget deficits at the beginning of the decade were soon replaced by surpluses and an enduring boom. Since the e-commons is predicated on everyone's having the ability to enter and use virtual spaces for dialogue and the delivery

of services, the government immediately set to the task of building the architecture or scaffolding on which the ensuing information highway would be built. Private and public venture funds became available to seed innovation, spark entrepreneurship, and alleviate looming equity concerns. By 1994 benchmarks were in place to wire every classroom, library, health care clinic, and government agency.

While these actions were laudable, they were focused too much on inputs—in effect, a supply-driven approach to social policy—and insufficiently attuned to outcomes. Illustrated in the federal approach to education policy, the concentration on wiring classrooms took precedence over training teachers and developing content and curricula tied to standards. Rather than training a vanguard cadre of teachers and having them return to their schools to train others, many policymakers harbored a build-it-and-they-will-come mentality. This unbalanced approach is echoed in the current debate over the pace of high-speed telecommunications deployment. Industry has been pushing high-speed services to consumers, who continue to scratch their heads and wonder what qualitative difference these services make in their lives. Clearly, people need to know how to use these tools if they are to interact with them meaningfully. A concern for human-capacity building led to a focus on professional development in the late 1990s, so that teachers would be more comfortable with technology as the government was subsidizing the cost of classroom networks. Also, the notion emerged of a provisional policy solution to the challenge of achieving universal home computer and Internet access: situating government investments in communities. Programs to expand community technology centers and after-school initiatives mushroomed as the decade came to a close. This palliative first addressed the issue of generating demand among householders who otherwise would not perceive the benefits of paying for home-based technology. Second, demand-side solutions recognize that because of gaps in technical and cognitive skills among a significant swath of the underserved population, community solutions are required to exercise remediation and impart marketable skills in a supportive environment.⁹ Developing content, produced in a way that was relevant to diverse communities, was critical, too, and was exemplified in some of the better community-based civic networks and public-interest media efforts. Since commercial providers are unlikely to invest in school-based markets in general, most innovative content and curriculum will be developed from

the bottom up, further necessitating the diffusion of media and technology skills.

So, the nation was set on the right path, poised to develop a more integrated approach in which the transformative potential of information and communications technology would be woven into core functional areas, but it has veered off course and into rough seas. Economic and political realities thwart the realization of a Digital Nation. On the political front, because home Internet penetration is now above 50 percent, some policymakers argue it is time to retrench from government support for community-based technology programs, teacher training, and research and development. And because the Internet is ostensibly a mature industry and government coffers are emptying, some suggest it is time to step away from government-sponsored innovation. This position is at odds with the long-standing approach of policymakers concerning the appropriate role of government in supporting the rollout of information and communications technologies. Targeted subsidies for low-income telephone subscribers continue after several decades, for example, despite the fact that 96 percent of America's households are connected.¹⁰ Additionally, the Telecommunications Act of 1996 mandates that the level of universal service should evolve and may eventually include advanced telecommunications capability, but only *after* service has been subscribed to by a substantial majority of residential customers.¹¹ Policymakers have recognized that intervention becomes more, not less, critical as telecommunications technology reaches a majority of households and take-up by low-income households slows. In terms of ending support for research and innovation, with technology products changing so rapidly the work of demonstrating their innovative uses for community problem solving is a moving target. Given the advent of broadband and Internet 2, along with wireless and handheld devices, next-generation funding remains essential to spur demand and spark innovation. The loss of government venture capital will result in less experimentation and entrepreneurship in harnessing technology to solve community problems and generate wealth.

Regaining momentum in achieving a Digital Nation is a critical national priority, not just a passing fancy, and will constitute a bellwether for America's success in the new century. Appeals to democratize cyberspace and invest substantial financial and human resources in its realization can be justified on economic and social justice grounds. Achieving a Digital Na-

tion is an urgent proposition because so many people are being left out of a whole range of potentially beneficial and empowering services that if implemented effectively could improve the lives of the underclass while in the aggregate increasing productivity and saving money. Having jobs go unfilled costs industry billions of dollars annually, and raising the skills and education levels of the millions of young adults who are out of school and uncredentialed would generate billion of dollars in earnings over the course of their productive lifetimes.¹² One economic justification is that the telecommunications and media sector is one-sixth of the nation's economy and will drive future growth. While it is known that every year of formal education raises earnings by about 10 percent in the United States,¹³ becoming computer- and Internet-literate also yields a wage premium, independent of educational attainment.¹⁴ At the broader level, smart use of information technologies, particularly by business, has led to cost savings annually of \$200 billion in the United States, with 30 percent of all economic growth between 1996 and 2000 attributed to enhanced productivity wrought by the information technology sector.¹⁵ Clearly, there is a compelling national interest in fostering a universal digital literacy, boosting wages and productivity in a competitive global marketplace. The economic argument suggests that smart investment today in technology and training will reap major dividends down the road. Who would argue with the fact that the United States' leadership in the twenty-first century will continue to be predicated on its technology prowess, including the blossoming field of biotechnology? Skill in creating more intelligent machines, increasingly intermixed with biological components, may well be the industry that determines U.S. economic preeminence in future years.

At the other end of the labor market, individuals and entire communities will likely be bypassed by global economic activity if they lack technology fluency. Intellectual capital coupled with technology flows determine in large measure where knowledge work will migrate. Work shortages and unfilled positions in many industries often translate into a gap between the intellectual capital of a given community and the needs of its workforce. In places such as Los Angeles, an oversupply of underskilled, undercredentialed workers exists, creating a misfit with a dynamic economy. Indeed the achievement gap in the United States is large in comparison to those in most other industrialized nations.¹⁶ Rectifying these inequalities and expanding the pool of the next generation of scientists, inventors, and officeholders

will be a telltale for economic competitiveness in the twenty-first century. To stay competitive tomorrow's leaders will need to emerge from communities of color and include more women. When 88 percent of fourth-grade African-American students cannot read at proficiency,¹⁷ often leading to a downward spiral of underachievement, the question of grooming tomorrow's leaders becomes tied to the resolution of systemwide failures, and the destiny of the dominant society becomes tethered to that of the marginalized.

Heirs of the social justice movement argue that human dignity and flourishing depend on everyone's having access to the necessary resources and tools to be self-governing. That telecommunications is essential to improving people's lives and achieving human dignity is captured in a statement by the UN Secretary-General and Nobel laureate Kofi Annan: "People lack many things: jobs, shelter, food, health care, and drinkable water. Today, being cut off from basic telecommunications services is a hardship almost as acute as these other deprivations, and may indeed reduce the chances of finding remedies to them."¹⁸ Annan's statement indicates that communications, literacy, and facility with essential technologies are a set of rights that underwrite what it means to have dignity and autonomy as a human being. These social endowments are essential to exercise freedom in the world. Social advocates depend on the existing legal framework to ensure that exclusion and discrimination are overcome. The power of technology to uplift, extend, and empower has its mirror image in the plight of excluded populations who are further removed from the center of economic and civic life. So, the Constitution has been brought to bear to defend economic opportunity, voting rights, and educational advancement in the digital age. Lawsuits challenging the constitutionality of entire school districts and systems reveal a novel conception of what an adequate, up-to-date education entails, arguing for technology resources and training so that students can compete for gainful employment.

Because so much is riding on the success of the information economy, it is imperative that decision makers in government and the business community use all available levers to ensure ubiquitous access to essential tools as well as develop a variety of pathways to build entrepreneurship and training geared toward the varying needs of diverse communities. The educational and training opportunities appropriate for migrant workers and their families, for example, will be different from those of the learning-

disabled or court-supervised youth, and intelligent interfaces and customized instruction can greatly benefit out-of-school and uncredentialed individuals. Since so many individuals and communities remain on the wrong side of the achievement gap, it is not surprising that social advocates have pressured government and business to step up their efforts to equalize cyberspace in the name of national security, economic prosperity, and social justice. Yet, many Americans are skeptical of spending taxpayer dollars to support what they see as other people's consumer choices. Is not the computer simply another consumer item, like a television or an automobile, whose availability resides in the domain of private choice within the marketplace? Is not the Internet simply a more sophisticated telephone, a tool that has been universally available for decades? Why all the fuss?

Early in his tenure, Federal Communications Commission Chairman Michael Powell gave a speech in which he described his opposition to the use of federal funds to subsidize Internet connectivity.¹⁹ Saying that he, too, would like to own a Mercedes-Benz if it were not so expensive, he argued that government does not have a role in supporting consumer choices for luxury goods, items people could easily live without, such as a high-end automobile. Of course, the analogy is inappropriate; a better comparison would be government support for telecommunications and public transportation. The government may not support one's buying a sports car but it does subsidize considerably both the transportation and telecommunications infrastructures in the United States in order to expand the flow of commerce and ideas. Taxpayers expend billions of dollars annually to construct and maintain roads as well as to support intelligent transportation systems and public transportation for those who are unable or unwilling to use private transport. For all intents and purposes, these costs have become invisible to most taxpayers, who take for granted that the price of gasoline includes, on average, 42 cents per gallon in taxes, to buoy a system in which individuals and commodities can be efficiently transported.

The same is true for telecommunications. The U.S. government for years has subsidized the cost of telephone access for low-income and rural households. Part of the reason the telephone has become so ubiquitous is subsidies to make the service affordable. More recently taxpayers have begun to support the wiring of schools and libraries, so that today few publicly supported learning institutions are unconnected. The rationale is simple: the means of communications, like the means of transport, is a touchstone

of a free society. Without these basic building blocks, the edifice cannot stand and the circulation of ideas is choked.

In order to boost low-income and low-achieving populations, innovative policy solutions are necessary to achieve universal literacy over the next decade. Clearly, leadership is pivotal, and the combination of powerful leadership and mobilization of a robust constituency provides the best chance of applying sufficient pressure to mine public resources in an era of fiscal belt-tightening. With the telecommunications and media sectors worth several trillion dollars, possible revenue streams can be tapped, including taxing the sale and transfer of media properties; spectrum license fees; or a communications tax on consumer purchases of media goods and services. Any or all of these would generate billions of dollars of dedicated funds to usher in the Digital Nation.²⁰

In addition, the job of coordinating and implementing a Digital Nation mandate must be strengthened, both in setting benchmarks and in orchestrating a more robust national strategy that mobilizes the full force of public and private organizations. A high-ranking official to act as liaison among government departments, not just in creating interagency interoperability in the technical sense but in leveraging the substantive benefits of numerous programs across the federal government, could be useful. A national action plan would establish a putting-a-man-on-the-moon-type of goal—universal literacy over the next decade—and be a catalyst in its realization. Benchmarks would include a national plan to connect and modernize telecommunications and technology in public institutions and domiciles, including broadband access for all. It would also establish technology standards for students and teachers, and would create incentives for shifts in the way teachers are trained and where they teach. A Digital Nation plan would strengthen the school-to-work connection and expand workforce development. It would also include a strong communications component, including public service announcements in print and broadcast, to underscore the importance of a new basic literacy, mainstreaming the issue for decision makers and consumers. In 2001 a coalition of organizations, including AOL Time Warner and the American Library Association, developed an ad campaign with the slogan, “Everybody should know the basics, like how to use a computer,” to motivate youths and their caregivers to get connected and sharpen their skills.²¹ Future efforts should be more durable and develop the air of a movement, taking its cue from the

environmental movement, where everyone begins to act in small ways to realize a larger goal, an improved quality of life for all. Transforming institutions and organizations will be pivotal in accruing maximum benefits from information and communications tools.

In any concerted effort to develop a new relationship to knowledge and technology, the needs and interests of youths and young adults in developing the Digital Nation agenda should be paramount. Millennials, those young people born since 1982, have grown up largely in a world where technology is second nature and mobile devices are extensions of their fingertips. Their frame of reference is different, and their creativity will be curtailed if the digital society is driven by a generation whose perspective is outworn. Studies suggest that students often know more than their teachers when it comes to navigating and manipulating digital tools.²² They are often impatient with how digital literacy is taught and rely on each other to advance their skills and interests. In all informal learning environments, such as ThinkQuest and the Computer Clubhouse, children and young adults are put in the first position, and develop and design their own portfolios, with adults operating as facilitators and mentors. The Youth Employment Summit in Alexandria, Egypt, convened young people from around the world who committed themselves to a social order in which the transfer of atoms would give way to the movement of digital bits, as long as this transformation contributed to raising employment and the voice of youths, particularly those marginalized in the developing world. Since over one-half the world's population is under 25, and 80 percent live in poverty, the prospects of a new world order based on the interests of young people must address global inequalities while simultaneously encouraging entrepreneurship and innovation in the world's youth population.

Ultimately, our collective response to information inequality and the literacy gap hinges on our answer to two questions. Are there enduring divides, ones that market forces alone will not combat? And if so, is the Digital Nation such a high-salience policy concern that it warrants sustained public and private support until the vision is achieved? If there is equivocation on the first question, then clearly policymakers will take a wait-and-see approach, marginalizing the Digital Nation to a matter of diffusion curves and market forces. If there is acceptance of the first question but hedging on the second, then the issue is eclipsed by more immediate and fundamental concerns, such as fixing schools, ensuring health coverage for

all, or prosecuting the war on terrorism. Leadership remains fundamental and should be framed as a matter of leveraging and integrating existing public- and private-sector investments as well as tying the discourse of digital literacy and inclusion to everyday issues of common concern. Mainstreaming this issue is key because it is not an abstract idea but a matter of economic viability, political equality, and educational opportunity. Policymakers need to advance the public-interest goals of equity and inclusion in the digital age, increasing annual investments several fold both domestically and in meeting the communications aspirations of culturally rich and economically strapped nations. And a social movement must be fostered, folded into key economic, environmental, and social struggles, where engaged citizens develop the critical mass to influence their representatives to act.