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# Will the Internet Change the World?

THE WORLD OF INFORMATION processing and communications has seen dramatic changes since the mid-1970s. Twenty-five years ago, no one had been saved by using their mobile phone to call for help after a car crash, and no one had been killed in a crash with someone who was talking on the phone rather than thinking about driving. Twenty-five years ago, young cyber-geeks typed out BASIC programs on machines with a whole 1k of memory, no mouse, and no graphical user interface (read: Windows).<sup>1</sup> Only a little before that, the height of interactive gaming was Pong.

Over the intervening years, the cost of voice transmission circuits has dropped by a factor of 10,000, and computing power per dollar invested has risen by a factor of 10,000. The effects of these changes have already begun to work their way into the economy. They have digitized and globalized the world of banking and investment, which sees over 1 trillion electronic financial transactions daily. E-commerce, broadly defined to include proprietary networks such as electronic data interchange (EDI), topped \$1 trillion in the United States in 2000, according to the Census Bureau.<sup>2</sup>

These changes have, with some justification, produced material for countless editorials in the outmoded paper-based press, countless books in the outmoded paper-based publishing world, and countless commentaries on the outmoded analog TV, celebrating the new world in which we will live.

At the extreme, these writings have suggested millenarian change. George Gilder, an author and visionary, wrote in the *Wall Street Journal* on December 31, 1999, that the Internet would be the savior of religion:

Now, at the turn of the new millennium, in a further unfolding of the overthrow of matter, we are moving into an industrial era based on photons, totally massless bearers of electromagnetic energy: light. . . . With any technology

that will change the world so radically as the Internet . . . religious wars are important and inescapable. . . . The twentieth century has been an era when an atheistic belief in the ultimacy of matter and the triviality of man led to the horrors of Nazism, Communism, and an epoch of total war. Now sweeping through the global economy, the overthrow of matter will unleash an under-tow of religious belief that will make the new millennium a time of awakening to the oceanic grandeur and goodness of the universe.<sup>3</sup>

But the idea that the Internet will change the world—developed and developing alike—in truly dramatic ways is not limited to the US religious right. A wide swath of businesspeople, senior officials, and development professionals agree. Commonly, they compare the Internet with the Industrial Revolution. Internet-driven changes “will transform our society over the next century as significantly as the two industrial revolutions”—one of railways and factories, the second of the internal combustion engine, electricity, synthetic chemicals and the automobile—argues Michael Dertouzos in *What Will Be*. The information marketplace, as he termed it, will establish itself “solidly and rightfully as the Third Revolution in modern human history. It is big, exciting and awesome.” Similarly, in March 1999 Jack Welch, at that point the chief executive officer (CEO) of General Electric, also suggested that the arrival of the Internet was “the single most important event in the US economy since the Industrial Revolution,” and Alan Greenspan, chairman of the Federal Reserve, was talking of a revolution that “has altered the structure of the way the American economy works.”<sup>4</sup>

Thomas Friedman, author of *The Lexus and the Olive Tree* and op-ed writer for the *New York Times*, is another firm believer in the global Internet revolution. In the period between January 1999 and June 2001, he published pieces that mentioned the Internet and globalization thirty-four times. His arguments run as follows:

“If you don’t think it’s a new world, think again,” he says. “We are now in a period of radical change, possibly more sweeping and complex than any period since 1776–1789.” Technology, he argues, “is shrinking the world from a size medium to a size small.” Because of the Internet, “you now have to think globally. You have to think about your customers as global, your competitors as global, your readers as global, your suppliers as global and your partners as global”—and that is happening “whether we like it or not.”

At the same time, it “turns out that the real secret of success in the information age is what it always was: fundamentals—reading, writing and arithmetic, church, synagogue and mosque, the rule of law and good governance.” Indeed, these basics have become even more important. “Just when the developing world is coming to really grasp that it has no choice but to get itself ready to climb aboard this train . . . the train is going to get faster—not slower—as the developing world moves toward Internet-based commerce, communication and learning systems. What’s worse, no one can slow the train

down, because the world economy today is just like that Internet: everybody is connected but nobody is in charge.”

One reason that Friedman is such a believer in the Internet is that he argues it “super-empowers” people. He points to an upstart online book retailer challenging Amazon.com that got 142,000 hits after it was mentioned in one of his columns and argues that “with \$100,000, I could start an Amazon.com tomorrow.” At a slightly larger scale, America Online’s (AOL’s) global member services center in the Philippines, which employs 900 people, “is but one example of a simple truth—that the best hope for alleviating poverty around the world is through more globalization, not less.” He notes that Jody Williams organized a global ban on landmines using e-mail. He approvingly quotes a nongovernmental organization (NGO) official who argues that “thanks to globalization and the Internet, power is now much more diffused, global companies are now much more exposed, and organizations like ours much better positioned to offer solutions.”

But a number of countries aren’t reacting well to the process of Internet-catalyzed globalization. “The failure of many nations to master modernity,” Friedman warns, “is producing a lot of unemployed and angry young people in those countries, combined with the spread of new information technologies, which are super-empowering these angry people in ways that not only threaten the stability of the states they live in but also enable them, as individuals, to threaten America.” Friedman cites the Love Bug virus created by two Filipinos that caused \$10 billion in damage. He says that the Love Bug episode is as emblematic of the new world order as the Cuban missile crisis was of the Cold War.

The only way to avoid countries harboring “the rogue unemployed” and posing a threat to the world at large is “nation building—helping others restructure their economies and put in place decent, non-corrupt government,” Friedman argues. Once again, however, the Internet appears to be making this process far easier. In the Middle East, he notes, “the Internet and globalization are acting like nutcrackers to open societies and empower Arab democrats with new tools. . . . In the 20th century, the Arab states thrived by developing oil. In the 21st century they will thrive only if they develop their people, and the only way to do that is by democratizing. The battle is on, and thanks to the Internet and globalization the Arab democrats finally have some artillery.”<sup>5</sup>

So, according to Friedman, the Internet is a huge force for globalization and for development. Countries that get left behind will find themselves in ever-greater trouble. But the Internet is also a huge force for ensuring countries get what they need to stay abreast—reading, writing, and arithmetic; church, synagogue, and mosque; and the rule of law and good governance.

From the academic community, Nicholas Negroponte of the MIT Media Lab broadly agrees with Friedman’s line of argument, suggesting that the Internet will promote rapid convergence of incomes:

Developing nations will leapfrog the telecommunications infrastructures of the First World and become more wired (and wireless). We once moaned about the demographics of the world. But all of a sudden we must ask ourselves: Considering two countries with roughly the same population, Germany and Mexico, is it really so good that less than half of all Germans are under 40 and so bad that more than half of all Mexicans are under 20? Which of those nations will benefit first from “being digital”?<sup>6</sup>

Negroponte also believes that the Internet will foster world peace by breaking down national borders.<sup>7</sup> He suggests that, twenty years from now, children who are used to finding out about other countries through the click of a mouse “are not going to know what nationalism is.”<sup>8</sup>

Belief in the transformative power of the Internet as a force for development is also widespread in industry. On October 16, 2000, a meeting of luminaries from the fields of development and information technology gathered in Seattle to discuss the global digital divide. The gathering was attended by figures such as Jeff Bezos (founder of Amazon), Eric Benhamou (chairman of 3Com), and Vint Cerf (founding father of the Internet).<sup>9</sup>

The group discussed a raft of private and public initiatives to achieve digital development—not least the proposed \$1 billion Hewlett Packard World e-Inclusion program (since scaled back). “Providing the technologies to connect people everywhere is a vital social mission,” said William Plummer, a vice president at Nokia. The sentiment echoed that of an interview given by John Chambers, the CEO of Cisco Systems, a couple of months before. “For the first time, we have the chance to address global poverty,” he argued. “We have the chance to reeducate the majority of the world. If you are in Africa and your teachers are dying of AIDS, there is no way you can educate your population without this [Internet] capability. So it changes everything.”<sup>10</sup>

Meanwhile, the heads of government of the Group of Eight (G8) dedicated their 2000 meeting in Okinawa to the Internet’s role in development.<sup>11</sup> The G8’s Charter on the Global Information Society declared: “Information and Communications Technology (IT) is one of the most potent forces in shaping the twenty-first century. . . . IT is fast becoming a vital engine of growth for the world economy. . . . Enormous opportunities are there to be seized and shared by us all.”<sup>12</sup>

Members of the G8 went on to make dramatic promises of assistance to the cause of the Internet in development (although few were fully funded). Most spectacular was a \$10 billion program announced by the host nation, Japan. At the same time the G8 created the Digital Opportunity Task Force to advise in the process of overcoming the “digital divide.”

Among development officials, Mark Malloch Brown, then head of the United Nations Development Programme (UNDP), suggested in 2000 that “by eliminating space and time [the Internet] gives us an unprecedented means of overcoming two of the root causes of extreme poverty—ignorance and isolation.

... it will for the first time allow many poor and isolated groups to become part of the global community.”<sup>13</sup> As a result of interest from leaders in business, government, and the donor community, capitals from London to Canberra began developing strategies to integrate information and communication technologies (ICTs) into their aid work, while capitals from Brasilia to Ulan Bator developed strategies in part to attract those dollars.

For developing countries, the first stage was frequently an “e-readiness assessment,” in which the country ranked itself according to measures such as the number of phone lines per person, the number of government websites, and the number of information technology (IT) graduates produced each year.<sup>14</sup> Countries were also ranked by others, including the McConnell International survey *Risk E-Business: Seizing the Opportunity of Global E-Readiness*, the Mosaic Group’s *Global Diffusion of the Internet Project*, the World Information Technology and Services Alliance *International Survey of E-Commerce*, the Center for International Development and Conflict Management’s *Negotiating the Net*, the International Telecommunications Union’s *Digital Access Index*, Orbicom’s *Monitoring the Digital Divide and Beyond*, and Ohio State University’s *Cyber-Space and Post-Industrial Transformations: A Cross-National Analysis of Internet Development*.<sup>15</sup> Bridges, a South African think tank, put together a helpful collection of such studies, which noted that fifty-five countries had been ranked by more than five different exercises.<sup>16</sup>

Hitching development to the Internet bandwagon, followed by the creation of numerous e-development assessment methodologies, gave rise to what might be termed the Okinawa consensus. It can be summarized as follows: The Internet and related technologies present a significant opportunity for developing countries to improve their growth prospects. Indeed, the Internet may be a “leapfrog” technology—one that creates an opportunity for developing countries to catch up economically with the industrial world. It is a powerful tool to improve government service delivery, education, and income-earning opportunities even for the world’s poorest people. Given that, poor country governments (in partnership with the private sector and with the help of donors) need to dedicate significant resources to expanding the use of the Internet, especially in government and education and to reach the poor. In addition, Internet industries can be promoted by establishing technology parks, and Internet use can be increased by putting computers in libraries and building stand-alone Internet access points.

This book examines the Okinawa consensus, the policies suggested, the rationale behind them, and which ones might make sense. Suffice it here to say that we were and are acting in a relative vacuum of knowledge regarding those policies. The technology of the Internet is very young and its use in the poorest, or least-developed, countries even more recent. We can have, perforce, very little evidence on the effectiveness of Internet policies or of the Internet in development more generally.

As of December 2005, for example, there had not been survey-based, academically rigorous study of the economic impact of an Internet access program in any developing country. At the macroeconomic level, we have even less empirical knowledge about the impact of the Internet on economic growth than we do about older technologies or policies. For example, the Federal Reserve Bank of Cleveland published a cross-country study that used a novel approach to predict the impact of the Internet on global growth rates. It estimated the impact of cross-country Internet use in 1999 on gross domestic product (GDP) growth between 1974 and 1992, suggesting that 100 percent Internet usage in 1999 would have caused about 4 percent additional economic growth each year in the 1970s and 1980s.<sup>17</sup> Concerns over the direction of causality in this study surely throw some considerable doubt on the Reserve Bank's conclusions. Nonetheless, that such studies are published by the US Federal Reserve system is a sign of the difficulty economists face in this area.

Policy formulation based on anecdote is perhaps the inevitable result of the Internet's novelty. And even though anecdotal experiences are a perfectly valid form of evidence, no worse than the theoretically suspect statistical work based on weak data often presented as the alternative, such an approach to policy formulation needs to be used with caution.

By way of illustration, a recent study of research on the effectiveness of criminal justice measures found that research design had a large impact on the findings obtained.<sup>18</sup> Studies that lacked a well-chosen control group or a temporal sequence between cause and effect, studies that lacked random samples, and particularly studies that used anecdotes (rather than the results of experiments) as evidence all found larger positive and lower negative impacts of the intervention under review than did randomized studies with carefully designed control groups. The authors have little new to say as to why studies in which researchers have a larger degree of freedom as to what counts as evidence tend to be more positive, but one reason comes to mind—researchers with a vested interest (consciously or unconsciously) biasing results to fit their hopes for new programs.

With regard to use of the Internet in developing countries, the dominant source of evidence is preliminary “success stories” involving the use of the Internet for a particular application in a particular milieu, the story often as not told by the person who championed this use in the first place. Competitions such as the much-hyped Stockholm Challenge, which gives out prizes to managers of ICT projects from around the world who write in to describe what their ICT application has achieved, positively encourage this form of evidence creation. Such anecdotal evidence of cases in which the Internet is a cost-effective method of meeting an information need in LDCs is all that can be used to formulate global policy proposals at the macro level calling for widespread subsidies for access and to ICT firms. Yet there are numerous reasons that proponents might quite unintentionally bias their anecdotal reporting in

favor of a positive outcome or generalize from a very particular set of circumstances that led to success.

To take an example of one real success story, Sakshi, an NGO advocating for women's rights in India, has long lobbied for legislation to protect women from sexual harassment. To bolster their efforts, they requested research support over the Internet from international women's groups. With the help of this support, Sakshi succeeded in having landmark sexual harassment legislation passed in India in 1997.<sup>19</sup>

The Internet *can* be a powerful tool to help improve social conditions, then. Yet it is a big step to argue, based on such stories, that the Internet will be a powerful force for growing social inclusion worldwide. To go from anecdote to universal application, we have to ask how replicable the anecdotal situation is—will it be repeated all over the world? In how many cases will the Internet make the difference between social exclusion and inclusion?

It is worth revisiting the Sakshi story in this regard. Knowledge of sexual harassment cases and legal precedents that was collected over the Internet was one element required in order to get the antiharassment laws approved. But a lot else was needed besides: Sakshi staff skilled in legal argument and in drafting writs, a receptive legislature with an institutional setup that allowed for NGO submissions, and an international network of support that provided good advice at low or no cost. At a more basic level, Sakshi needed money to pay staff who were literate, spoke English, and had computer skills; it needed electricity and telephone connections—the list goes on. But it is an important list because many people in the world are not literate, let alone computer-savvy, English-speaking legal experts. Worldwide, most people do not have access to the physical networks required for Internet use or the human networks providing high-quality free advice that is relevant to their concerns. Many people in the world live in countries where the supreme court would not be receptive to NGO interventions and unwilling to pass sexual harassment laws. The Internet was doubtless a useful tool in the fight to pass sexual harassment legislation in India, but it could only be effective in the role of knowledge conduit that led to change if a number of other factors came into play.

In addition to our limited information regarding replicability of success stories because of the context-specific nature of their success, a system that relies on self-reporting of stories and rewards positive results reporting over negative stories inevitably fosters selection bias. For example, a recent survey of garment and horticulture firms in three developing countries found that, of the sample of seventy-seven firms, all with access to the Web, only one trader in one company suggested that his use of the web had “revolutionised” the way he did business.<sup>20</sup> If anyone from the survey was to apply to the Stockholm Challenge or get their story in *Wired*, it would almost inevitably be that one person who had reported revolutionary results.

A focus on self-reported success stories still at the very early stages of development might well allow projects that turn out to be unsustainable to be put forward as models for replication. Take the 2001 Stockholm Challenge award-winning Gyandoot project in the Indian state of Madhya Pradesh, where more than 40 percent of the population live below the poverty line. Gyandoot was designed to bring forty-four e-government services to the people through thirty-nine telecenters connected via an intranet, including information on agricultural prices, a public complaint line regarding government services, and application facilities for various certificates.

The kiosks were set up at an average cost of approximately \$1,500 each, and that expenditure has brought some positive returns. The Stockholm Challenge judges praised it as “a unique government-to-citizen Intranet project . . . with numerous benefits to the region, including a people-based self-reliant sustainable strategy. ‘Gyandoot’ is recognized as a breakthrough in e-government.”<sup>21</sup>

Nonetheless, a 2002 in-depth analysis found significant problems with implementation. A survey of the telecenters found 36 percent closed during the (working hours) survey visit. Of open centers, 35 percent had no electricity at the time of the visit, and 50 percent had no regular intranet connectivity. Average revenues per center per month averaged only \$3—clearly far too low to suggest sustainability. Perhaps most damning, the survey team found an average of just over one user per center to interview, after searching for users both in the centers and in nearby community meeting areas. Survey results suggest an average of perhaps nineteen users per month per center (largely from upper income brackets) for the e-government services offered by the program.<sup>22</sup> It is too early to say that this experiment involving e-government for the poorest was a total failure, but 2001 was far too early to brand it an unqualified success.

Compare our patchy knowledge of the role of the technology of the Internet in development to the large and rich literature on the role of the technology of voice telephony. There again we have numerous anecdotal examples, but also survey-based as well as cross-country studies of the micro- and macro-economic impact of telecommunications rollout. This literature clearly suggests impacts such as improved farm and nonfarm income earning opportunities, reduced prices for purchased goods, and reasonably compelling evidence of some type of link to economic growth.<sup>23</sup> We have had a good deal longer to evaluate the telephone (the technology has been around for a century), but this evaluation, based on surveys and statistics as well as stories, provides a far stronger basis for policy recommendations.

Again, there is a place for self-reported success stories as part of a spectrum of evidence regarding the development effectiveness of the Internet, but there are limits to how far such an approach can take us. The development community has begun to move beyond that approach—a number of careful

studies and independent analyses are under way, and a few are already completed—but most of the existing evidence, I would argue, is still of the “success story” type. Given the problems of relying on anecdote alone, looking at any other sources of evidence that might bring some clarity to the potential role of the Internet in development is important.

First, it might be worth reviewing the theory and evidence regarding the role of other technologies, or technology in general, in promoting economic growth. It appears that there are no general rules on what causes growth when and where—as we have already seen regarding Sakshi, context matters. At the same time, it appears that the role played by technology in economic growth is very large pretty much everywhere. These two statements can both be true at the same time because, as I show in Chapter 2, economists have a very broad definition of technology. It is defined by economists as “total factor productivity,” technology is anything that creates (or destroys) economic value that isn’t capital or labor. It could include a new machine design, new law, or new accounting technique. Chapter 2 goes on to discuss what we know about technology and growth. In short, if technology is important to growth, rich countries must have more of it than poor countries, and given that the world still has a number of poor countries, moving technology around must be difficult. If the Internet resembles the average technology, then, it may have a role in growth (this is especially the case because it is networked and can significantly reduce the unit cost of moving information). But in Chapter 2, I also briefly discuss why the Internet, like most technologies, might do more for the rich world than for the poor world.

Chapter 3 takes the theory presented in the preceding chapter and applies it to the part of the world where the most information has been gathered about the impact of the Internet—the rich country club of the Organization for Economic Cooperation and Development (OECD). Even in these countries, it is difficult to say too much about the Internet per se, so the chapter begins with a discussion of the impact of information and communications technologies (telecommunications, computers, and software) on economic performance. The evidence is that the ICT industry is producing more powerful computers and software for the same amount of money, that companies across the rich world are investing huge amounts in this equipment in ways that increase output per worker, but at the same time, that there is limited evidence of a dramatic “pure technological” impact from use, as would be captured in rising total factor productivity statistics. That might be the case because some investments in ICTs carry very low returns, and I examine why. Looking at the Internet in particular, I conclude that e-commerce appears to have had a fairly marginal impact to date, and I discuss how widespread Internet access on workplace desktops might even be a drain on productivity. I conclude Chapter 3 by looking at what the evidence from OECD countries might mean for countries of the developing

world, with their comparatively small ICT industries and limited institutional and educational capacities to take advantage of the numerous opportunities that ICT investments do provide.

Looking at the more limited evidence from the developing world itself, I suggest in Chapter 4 that the impact of ICT production is and will remain muted, compared to its significant impact in the United States. On the use side, I note the incredibly rapid rollout of ICT in poor countries since the late 1990s—suggesting the significant role that communications can play in fostering development and downplaying fears of a digital divide. At the same time, I note that advanced uses of the Internet, such as e-commerce, remain limited in the developing world, for a range of reasons connected with a generally low level of development. As suggested in Chapter 2, that raises concerns that the Internet could be a force for further divergence of incomes across countries.

Taking up this issue, Chapter 5 examines e-government in developing countries. There are some considerable opportunities for governments even in the poorest countries to improve transparency and efficiency through the Internet. At the same time, IT rollout is costly, and failures are frequent. Calls for widespread Internet access in schools in the developing world in particular appear to be divorced from the reality of education budgets. High costs and low benefits again suggest that government-run public Internet access programs may be a misallocation of scarce resources in the poorest countries.

In Chapters 2 through 5, I show there is strong evidence that businesses in developing countries already exploit the Internet where it has the highest value. Evidence for especially strong total factor productivity impacts is weak, however, and there is considerable support for the proposition that the broader environment in many developing countries may be unsuited to widespread use of advanced Internet applications. This evidence suggests that policies regarding the Internet in developing countries should be based on a “no regrets” strategy, rather than significant government intervention to favor the Internet over other investments. Such a policy is laid out in Chapter 6, which also discusses the role of donor countries. In terms of the impact that rich countries have on poor countries in the area of the Internet and development, aid policies matter less than these countries imagine; a halt to the attempt to strengthen intellectual property rights worldwide, for example, may foster the growth of the Internet in poor countries more than expenditures on unsustainable “pilot” telecenters. Chapter 7 concludes by comparing the social impact of the Internet worldwide to the economic impact discussed in previous chapters, finding there the same picture of mixed and muted effects.

Our past inability to predict the future impact of technologies, and perhaps in particular information and communications technologies, is the stuff of cliché. For example, in 1876, Alexander Graham Bell was touting his new invention (the telephone) throughout the United States and gave a presentation

at the White House. There, President Rutherford Hayes turned to him and said, "That's an amazing invention, but who would ever want to use one?" A little less than 100 years later, Thomas Watson of IBM predicted a world market for five computers. But just as some have underestimated the potential of a technology, with even greater regularity, visionaries have forecast new worlds emerging as the result of a technological advance, forecasts that have proven universally overoptimistic. The death of paper has been predicted at least since a 1975 *Business Week* article, and the death of the pencil was announced by the *New York Times* in 1938.<sup>24</sup>

Looking at this latest information "revolution," Tom Peters, author of the best-selling business book *In Search of Excellence*, argues that today "we are in the opening innings of a world-class, unprecedented mess" created by the Internet, and because of this mess "we'll all get it wrong far more often than we get it right."<sup>25</sup> That seems a plausible line, based on our past record of prediction. It may be that this book will turn out to be excessively pessimistic in its estimates of impact and of potential. But the very fact that we are so bad at prognostication suggests the need for considerable caution. Investing billions of dollars in projects supporting Internet rollout, in environments where dollars are scarce enough that alternate uses with confirmed track records of reducing poverty are going short of funds, may be a high-risk strategy.

## Notes

1. I was one of them.
2. Census Bureau 2003.
3. Some further examples: Freeman Dyson, professor emeritus of physics at the Institute for Advanced Study at Princeton, writes in *The Sun, the Genome and the Internet* that he "dreamed" that "solar energy and genetic engineering and the Internet will work together to create a socially just world, in which every Mexican village becomes as wealthy as Princeton." In *Cyborgs, Simians and Women: The Reinvention of Nature*, feminist Donna Haraway argues that the Internet would also end sexism (quoted in Cassidy 2002). Jeremy Rifkin declares that we are in "the age of access," with a whole new view of moral systems. For the people of the twenty-first century, "personal freedom has less to do with the right of possession and the ability to exclude others and more to do with the right to be included in webs of mutual relationships." That may all be true, but if so, someone had better tell my good friend Leo Moss, because despite being 100 percent twenty-first century (he is four), he nonetheless seems to be developing a strong sense of property rights regarding the sharing of toys with his brother.
4. Lewis 1999. Louis Rossetto, in his first column as editor of *Wired* magazine, upped the ante by suggesting that the Internet was the greatest invention since the discovery of fire (quoted in Cassidy 2002).
5. The Friedman quotes and ideas all come from his columns in the *New York Times*, [www.nytimes.com](http://www.nytimes.com), specifically, the columns printed on July 20, April 16, and

February 13, 2001; December 19, November 20, September 29, August 8, July 25, March 31, February 11, and February 1, 2000; December 8, March 9, February 2, and January 1, 1999.

6. Negroponte 1995.

7. November 25, 1997, on CNN, <http://www.cnn.com/TECH/9711/25/internet.peace.reut/>.

8. Similar hopes were expressed of earlier communications revolutions: the chairman of Cable and Wireless suggested world peace would be brought by the telegraph, and Marshall McLuhan was arguing in 1964 that the computer would usher in “a Pentecostal condition of universal understanding and unity” (quoted in Berman 1988). And Negroponte was hardly alone in his suggestion that national borders would be significantly weakened by the Net (see Franda 2002 for a review).

9. See <http://www.digitaldividend.org/pdf/0501bw01.PDF>. One person attending did raise some doubts about the utility of the Internet for poverty alleviation (see the conclusion of the book), but apart from the Luddite opposition of Bill Gates, the meeting was of the firm opinion that overcoming the digital divide was a global priority (<http://seattlep-i.nwsource.com/business/gate19.shtml>).

10. *Business Week*, August 28, 2000.

11. At the same time, activists on a nearby beach burned a laptop to protest the meeting’s focus on IT rather than debt relief and the environment. The picture was e-mailed to listserves around the world dedicated to debt relief and the environment.

12. G8 2000.

13. Malloch Brown 2000.

14. If those measures did not appeal, they ranked themselves on “e-leadership”—how committed senior government officials were to e-based reform.

15. And, at a lower level of interest (and impact), Charles Kenny’s work “Prioritizing Countries for Assistance to Overcome the Digital Divide” (Kenny 2001).

16. See <http://www.bridges.org/ereadiness/tools.html>. In the end, the main thing we learned from this profusion of studies was that rich countries had more Internet users, more IT graduates, and more government websites than did poor countries, but some poor countries did as well as rich ones on “e-leadership.” A review by Maugis et al. (2003) concluded that “these studies are fraught with uncertainties and ambiguities in both theory and practice and lack robust foundations for empirical analysis. . . . As such, they provide little guidance for business and government.”

17. Altig and Rupert 1999.

18. Weisburd, Lum, and Petrosino 2001.

19. “Sexual Harassment Legislation Victory for Women in India,” available at <http://www.apc.org>.

20. Humphreys et al. 2003.

21. <http://www1.worldbank.org/publicsector/egov/gyandootcs.htm>.

22. Center for Electronic Governance, Indian Institute of Management 2002. See also Cecchini 2002.

23. See Forestier, Grace, and Kenny 2001 for a review.

24. Brown and Duguid 2000: 19. And technologies have been behind more than one attack of “irrational exuberance,” or the madness of stock-buying crowds. The Internet bubble has its antecedents in the railway bubble. John Cassidy, a business journalist, notes that the slew of magazines that were launched to cover the Internet revolution bear uncanny resemblance to titles such as *Railway World*, *Railway Express*, *Railway Examiner*, and *Railway Review*, which were launched in 1840s Britain, only to fail after the financial crash of 1847. See Cassidy 2002.



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25. “Source: 2001: A Business Odyssey with Tom Peters,” *Georgia Tech Alumni Magazine*, Winter 2001. Given the record of the companies selected by Peters for their excellence, modesty in the predictive power of pundits is well taken (within two years of the publication of *Excellence*, the best-selling business book of all time, fourteen of the companies he had selected were floundering, according to *Business Week*). See Sherden 1998 for a discussion.



