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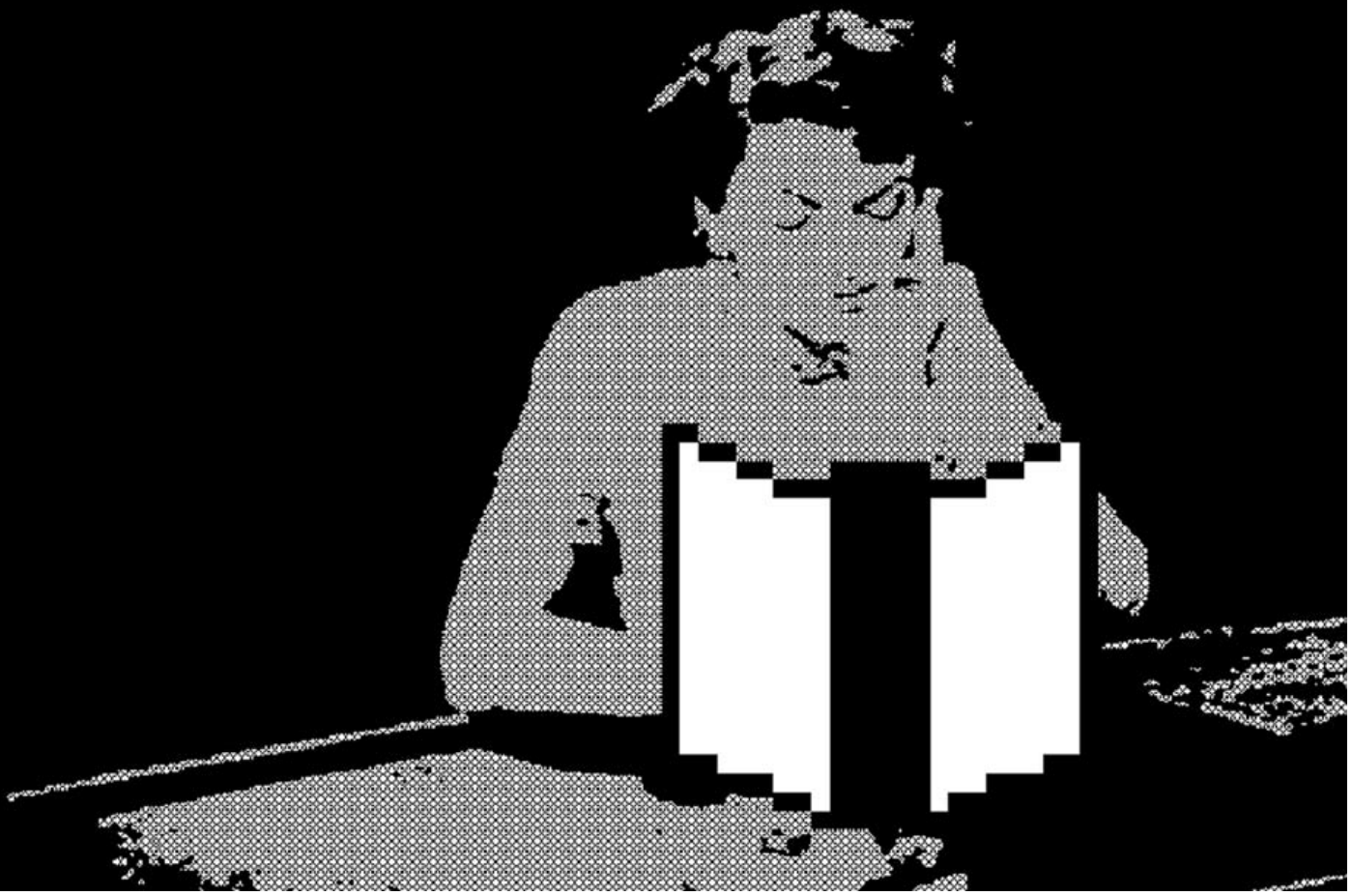

The World Is Flat [Updated and Expanded] A Brief History of the Twenty-first Century

By: Thomas L Friedman
ISBN: 0374292795

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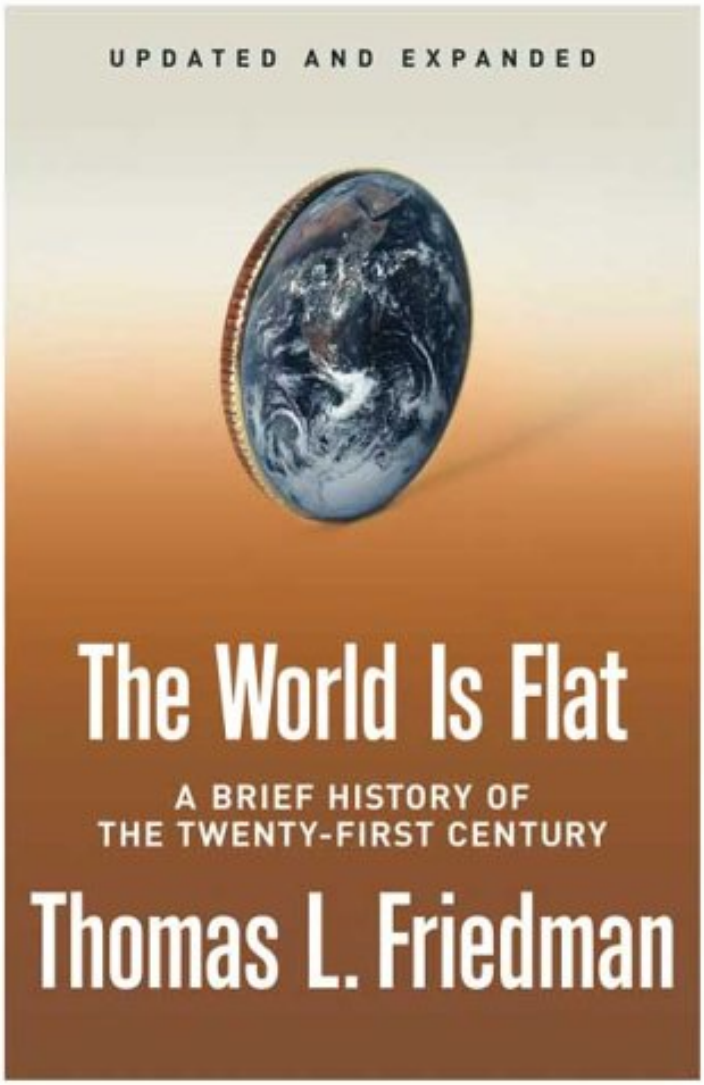

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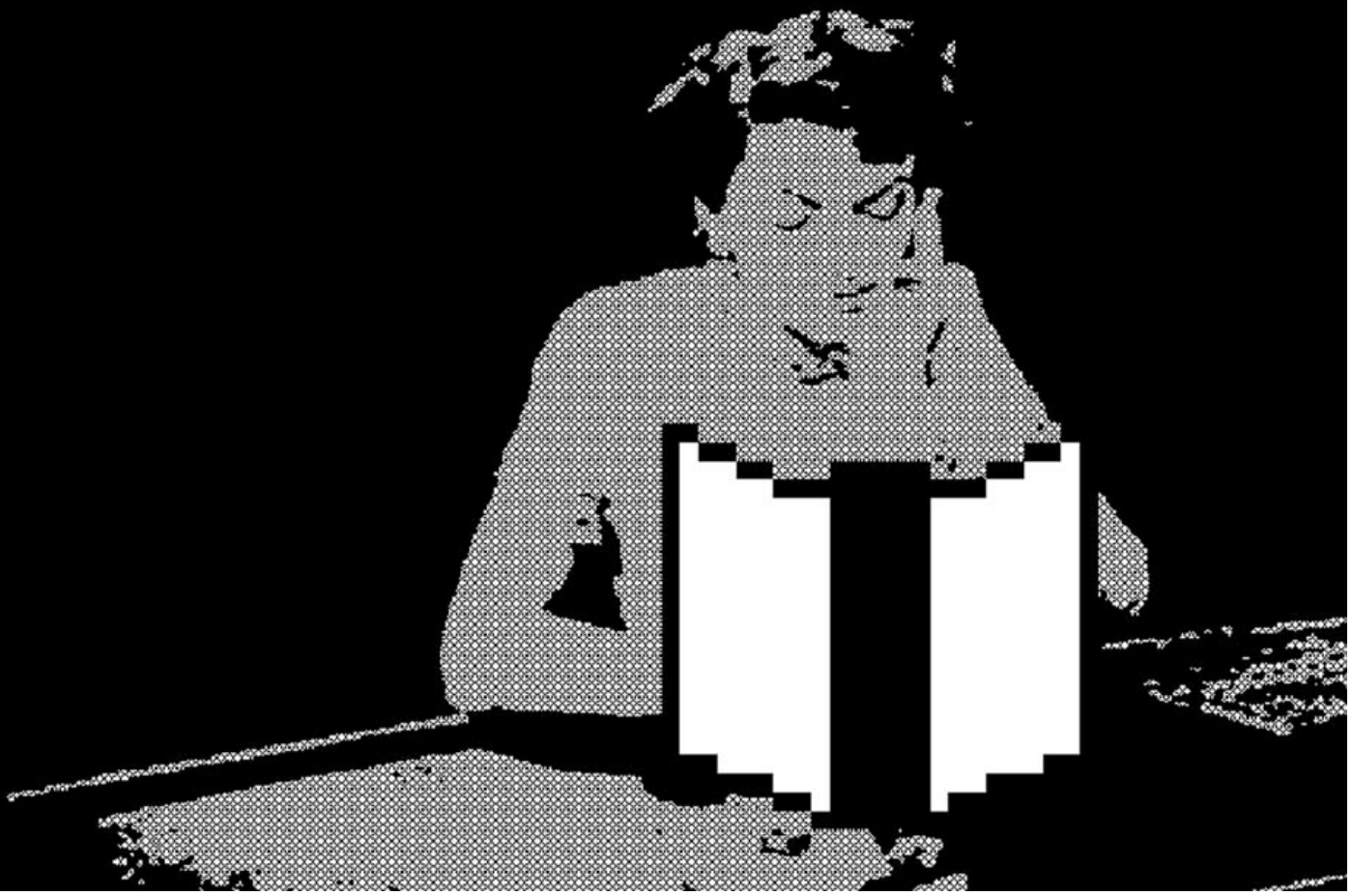

THE NVORL1) 1S F L AT No, this definitely wasn't Kansas. It didn't even seem like India. Was this the New World, the Old World, or the Next World? I had come to Bangalore, India's Silicon Valley, on my own Columbus-like journey of exploration. Columbus sailed with the Niña, the Pinta, and the Santa Maria in an effort to discover a shorter, more direct route to India by heading west, across the Atlantic, on what he presumed to be an open sea route to the East Indies-rather than going south and east around Africa, as Portuguese explorers of his day were trying to do. India and the magical Spice Islands of the East were famed at the time for their gold, pearls, gems, and silk-a source of untold riches. Finding this shortcut by sea to India, at a time when the Muslim powers of the day had blocked the overland routes from Europe, was a way for both Columbus and the Spanish monarchy to become wealthy and powerful. When Columbus set sail, he apparently assumed the Earth was round, which was why he was convinced that he could get to India by going west. He miscalculated the distance, though. He thought the Earth was a smaller sphere than it is. He also did not anticipate running into a landmass before he reached the East Indies. Nevertheless, he called the aboriginal peoples he encountered in the new world "Indians." Returning home, though, Columbus was able to tell his patrons, King Ferdinand and Queen Isabella, that although he never did find India, he could confirm that the world was indeed round. I set out for India by going due east, via Frankfurt. I had Lufthansa business class. I knew exactly which direction I was going thanks to the GPS map displayed on the screen that popped out of the armrest of my airline seat. I landed safely and on schedule. I too encountered people called Indians. I too was searching for the source of India's riches. Columbus was searching for hardware-precious metals, silk, and spices-the source of wealth in his day. I was searching for software, brainpower, complex algorithms, knowledge workers, call centers, transmission protocols , breakthroughs in optical engineering-the sources of wealth in our day. Columbus was happy to make the Indians lie met his slaves, a pool of free manual labor. I just wanted to understand why the Indians I met were taking our work, why they had become such an important pool for the outsourcing

w'HILE I WAS SLEEPING of service and information technology work from America and other industrialized countries. Columbus had more than one hundred men on his three ships; I had a small crew from the Discovery Times channel that fit comfortably into two banged-up vans, with Indian drivers who drove barefoot. When I set sail, so to speak, I too assumed that the world was round, but what I encountered in the real India profoundly shook my faith in that notion. Columbus accidentally ran into America but thought he had discovered part of India. I actually found India and thought many of the people I met there were Americans. Sonic had actually taken American names, and others were doing great imitations of American accents at call centers and American business techniques at software labs. Columbus reported to his king and queen that the world was round, and lie went down in history as the man who first made this discovery. I returned home and shared my discovery only with my wife, and only in a whisper. "Honey," I confided, "I think the world is flat." H ow did I come to this conclusion? I guess you could say it all started in Nandan Nilekani's conference room at Infosys Technologies Limited. Infosys is one of the jewels of the Indian information technology world, and Nilekani, the company's CEO, is one of the most thoughtful and respected captains of Indian industry. I drove with the Discovery "Times crew out to the Infosys campus, about forty minutes from the heart of Bangalore, to tour the facility and interview Nilekani. The Infosvs campus is reached by a pockmarked road, with sacred cows, horse-drawn carts, and motorized rickshaws all jostling alongside our vans. Once you enter the gates of Infosys, though, you are in a different world. A massive resort-size swimming pool nestles amid boulders and manicured lawns, adjacent to a huge putting green. There are multiple restaurants and a fabulous health club. Glass-and-steel buildings seem to sprout up like weeds each week. In some of those buildings, Infosys employees are writing specific software programs for American or European companies; in others, they are running the back rooms of major

... well summed up the Infosys workday: 24/7/365. The clocks were labeled US West, US East, GMT, India, Singapore, Hong Kong, Japan, Australia. "Outsourcing is just one dimension of a much more fundamental thing happening today in the world," Nilekani explained. "What happened over the last [few] years is that there was a massive investment in technology, especially in the bubble era, when hundreds of millions of dollars were invested in putting broadband connectivity around the world, undersea cables, all those things." At the same time, he added, computers became cheaper and dispersed all over the world, and there was an explosion of software-e-mail, search engines like Google, and

Flattened? Flattened? My God, he's telling me the world is flat! Here I was in Bangalore-more than five hundred years after Columbus sailed over the horizon, using the rudimentary navigational technologies of his day, and returned safely to prove definitively that the world was round-and one of India's smartest engineers, trained at his country's top technical institute and backed by the most modern technologies of his day, was essentially telling nee that the world was flat-as flat as that screen on which lie can host a meeting of his whole global supply chain. Even more interesting, he was citing this development as a good thing, as a new milestone in human progress and a great opportunity for India and the world-the fact that we had made our world flat! In the back of that van, I scribbled down four words in my notebook: "The world is flat." As soon as I wrote them, I realized that this was the

S THE WORLI) IS FLAT underlying message of everything that I had seen and heard in Bangalore in two weeks of filming. The global competitive playing field was being leveled. The world was being flattened. As I came to this realization, I was filled with both excitement and dread. The journalist in me was excited at having found a framework to better understand the morning headlines and to explain what was happening in the world today. Clearly, it is now possible for more people than ever to collaborate and compete in real time with more other people on more different kinds of work from more different corners of the planet and on a more equal footing than at any previous time in the history of the world-using computers, e-mail, networks, teleconferencing , and dynamic new software. That is what Nandan was telling nee. That was what I discovered on my journey to India and beyond. And that is what this book is about. When you start to think of the world as flat, a lot of things make sense in ways they did not before. But I was also excited personally, because what the flattening of the world means is that we are now connecting all the knowledge centers on the planet together into a single global network, which -if politics and terrorism do not get in the way-could usher in an amazing era of prosperity and innovation. But contemplating the flat world also left nee filled with dread, professional and personal. My personal dread derived from the obvious fact that it's not only the software writers and computer geeks who get empowered to collaborate on work in a flat world. It's also al-Qaeda and other terrorist networks. The playing field is not being leveled only in ways that draw in and superempower a whole new group of innovators. It's being leveled in a way that draws in and superempowers a whole new group of angry, frustrated, and humiliated men and women. Professionally, the recognition that the world was flat was unnerving because I realized that this flattening had been taking place while I was sleeping, and I had missed it. I wasn't really sleeping, but I was otherwise engaged. Before 9/11, I was focused on tracking globalization and exploring the tension between the "Lexus" forces of economic integration and the "Olive Tree" forces of identity and nationalism-hence my 1999 book, The Lexus and the Olive Tree. But after 9/11, the olive tree wars became all-

the world together, driving global integration. In Globalization 1.0, the primary questions were: Where does my country fit into global competition and opportunities? How can I go global and collaborate with others through my country? The second great era, Globalization 2.0, lasted roughly from 1800 to 2000, interrupted by the Great Depression and World Wars I and II. This era shrank the world from a size medium to a size small. In Globalization 2.0, the key agent of change, the dynamic force driving global integration , was multinational companies. These multinationals went global for markets and labor, spearheaded first by the expansion of the Dutch and English joint-stock companies and the Industrial Revolution. In the first half of this era, global integration was powered by falling transportation costs, thanks to the steam engine and the railroad, and in the second half by falling telecommunication costs-thanks to the diffusion of the telegraph , telephones, the PC, satellites, fiber-optic cable, and the early version of the World Wide Web. It was during this era that we really saw the

THE WORLD IS FLAT birth and maturation of a global economy, in the sense that there was enough movement of goods and information from continent to continent for there to be a global market, with global arbitrage in products and labor. The dynamic forces behind this era of globalization were breakthroughs in hardware-from steamships and railroads in the beginning to telephones and mainframe computers toward the end. And the big questions in this era were: Where does my company fit into the global economy? How does it take advantage of the opportunities? I low can I go global and collaborate with others through my company? The Lexus and the Olive Tree was primarily about the climax of this era, an era when the walls started falling all around the world, and integration, and the backlash to it, went to a whole new level. But even as the walls fell, there were still a lot of barriers to seamless global integration. Remember, when Bill Clinton was elected president in 1992, virtually no one outside of government and the academy had e-mail, and when I was writing The Lexus and the Olive Tree in 1998, the Internet and e-commerce were just taking off. Well, they took off-along with a lot of other things that came together while I was sleeping. And that is why I argue in this book that around the year 2000 we entered a whole new era: Globalization 3.0. Globalization 3.0 is shrinking the world from a size small to a size tiny and flattening the playing field at the same time. And while the dynamic force in Globalization 1.0 was countries globalizing and the dynamic force in Globalization 2.0 was companies globalizing, the dynamic force in Globalization 3.0-the thing that gives it its unique character-is the newfound power for individuals to collaborate and compete globally. And the lever that is enabling individuals and groups to go global so easily and so seamlessly is not horsepower, and not hardware, but software - all sorts of new applications-in conjunction with the creation of a global fiber-optic network that has made its all next-door neighbors. Individuals must, and can, now ask, Where do I fit into the global competition and opportunities of the day, and how can I, on my own, collaborate with others globally? But Globalization 3.0 not only differs from the previous eras in how it is shrinking and flattening the world and in how it is empowering indi-

We take data protection and privacy very seriously. The accountant in India can see the data on his screen, but he cannot take a download of it or print it out-our program does not allow it. The most he could do would be to try to memorize it, if he had some ill intention . The accountants are not allowed to even take a paper and pen into the room when they are working on the returns." I was intrigued at just how advanced this form of service outsourcing had become. "We are doing several thousand returns," said Rao. What's more, "Your CPA in America need not even be in their office. They can be sitting on a beach in California and e-mail us and say, `Jerry, you are really good at doing New York State returns, so you do Tom's returns. And Sonia, you and your team in Delhi do the Washington and Florida

WHILE I WAS SLEEPING 13 returns.' Sonia, by the way, is working out of her house in India, with no overhead [for the company to pay]. `And these others, they are really complicated, so I will do them myself."' In 2003, some 25,000 U.S. tax returns were done in India. In 2004, the number was 100,000. In 2005, it is expected to be 400,000. In a decade, you will assume that your accountant has outsourced the basic preparation of your tax returns -if not more. "How did you get into this?" I asked Rao. "My friend Jeroen Ths, a Dutchman, and I were both working in California for Citigroup," Rao explained. "I was his boss and we were coming back from New York one day together on a flight and I said that I was planning to quit and lie said, `So am I' We both said, `Why don't we start our own business?' So in 1997-98, we put together a business plan to provide high-end Internet solutions for big companies . . . Two years ago, though, I went to a technology convention in Las Vegas and was approached by some medium-size [American] accounting firms, and they said they could not afford to set up big tax outsourcing operations to India, but the big guys could, and [the medium guys] wanted to get ahead of them. So we developed a software product called VTR- Virtual Tax Room-to enable these medium-size accounting firms to easily outsource tax returns." These midsize firms "are getting a more level playing field, which they were denied before," said Jerry. "Suddenly they can get access to the same advantages of scale that the bigger guys always had." Is the message to Americans, "Mama, don't let your kids grow tip to be accountants"? I asked. Not really, said Rao. "What we have done is taken the grunt work. You know what is needed to prepare a tax return? Very little creative work. This is what will move overseas." "What will stay in America?" I asked. "The accountant who wants to stay in business in America will be the one who focuses on designing creative complex strategies, like tax avoidance or tax sheltering, managing customer relationships," he said. "He or she will say to his clients, `I am getting the grunt work done efficiently far away. Now let's talk about how we manage your estate and what you are

The primary reason that the industry has been able to scale up as rapidly as it has over the past three years is due to the investment that these [foreign-based] companies have made in systems, processes and training." There are about seventy, thousand accounting grads in India each year, he added, many of whom go to work for local Indian firms starting at $100 a month. With the help of high-speed cominunications , stringent training, and standardized forms, these young Indians can fairly rapidly be converted into basic Western accountants at a fraction of the cost. Some of the Indian accounting firms even go about marketing themselves to American firms through teleconferencing and skip the travel. Concluded Boomer, "The accounting profession is currently in transformation. Those who get caught in the past and resist change will be forced deeper into commoditization. Those who can create value through leadership, relationships and creativity will transform the industry , as well as strengthen relationships with their existing clients." What you're telling me, I said to Rao, is that no matter what your profession -doctor, lawyer, architect, accountant-if you are an American, you better he good at the touchy-feely service stuff, because anything that can be digitized can be outsourced to either the smartest or the cheapest producer, or both. Rao answered, "Everyone has to focus on what exactly is their value-add." But what if I am just an average accountant? I went to a state university . I had a B+ average. Eventually I got my CPA. I work in a big accounting firm, doing a lot of standard work. I rarely meet with clients.

Any activity where we can digitize and decompose the value chain, and move the work around, will get moved around. Some ONE While I Was Sleeping Your Highnesses, as Catholic Christians, and princes who love and promote the holy Christian faith, and are enemies of the doctrine of Mahomet, and of all idolatry and heresy, determined to send me, Christopher Columbus, to the above-mentioned countries of India, to see the said princes, people, and territories , and to learn their disposition and the proper method of converting them to our holy faith; and furthermore directed that I should not proceed by land to the East, as is customary, but by a Westerly route, in which direction we have hitherto no certain evidence that anyone has gone. -Entry from the journal of Christopher Columbus on his voyage of 1492 N 0 one ever gave ire directions like this on a golf course before: "Aim at either Microsoft or IBM." I was standing on the first tee at the KGA Golf Club in downtown Bangalore, in southern India, when my playing partner pointed at two shiny glass-and-steel buildings off in the distance, just behind the first green. The Goldman Sachs building wasn't done yet; otherwise he could have pointed that out as well and made it a threesome. HP and Texas Instruments had their offices on the back nine, along the tenth hole. That wasn't all. The tee markers were from Epson, the printer company, and one of our caddies was wearing a hat from 3M. Outside, some of the traffic signs were also sponsored by Texas Instruments, and the Pizza Hut billboard on the way over showed a steaming pizza, under the headline "Gigabites of Taste!"

16 'FHF WORLD IS FLAT cane upon a very fascinating situation that I thought might interest you. I have just learned that in many small and some medium- size hospitals in the US, radiologists are outsourcing reading of CAT scans to doctors in India and Australia!!! Most of this evidently occurs at night (and maybe ... a journalist and not an accountant or a radiologist . There will be no outsourcing for me-even if some of my readers wish my column could be shipped off to North Korea. At least that's what I thought. Then I heard about the Reuters operation in India. I didn't have time to visit the Reuters office in Bangalore, but I was able to get hold of Tom Glocer, the CEO of Reuters, to hear what he was doing. Glocer is a pioneer in the outsourcing of elements of the news supply chain. With 2,300 journalists around the world, in 197 bureaus, serving a

%'IIILE I WAS SLEEPING 17 market including investment hankers, derivatives traders, stockbrokers, newspapers, radio, television, and Internet outlets, Reuters has always had a very complex audience to satisfy. After the dot-corn bust, though, when many of its customers became very cost-conscious, Reuters started asking itself, for reasons of both cost and efficiency: Where do we actually need our people to be located to feed our global news supply chain? And can we actually disaggregate the work of a journalist and keep part in London and New York and shift part to India? Glocer started by looking at the most basic bread-and-butter function Reuters provides, which is breaking news about company earnings and related business developments, every second of every day. "Exxon comes out with its earnings and we need to get that as fast possible up on screens around the world: `Exxon earned thirty-nine cents this quarter as opposed to thirty-six cents last quarter.' The core competency there is speed and accuracy," explained Glocer. "You don't need a lot of analysis. We just need to get the basic news up as fast as possible. The flash should be out in seconds after the company releases, and the table [showing the recent history of quarterly earnings] a few seconds later." Those sorts of earnings flashes are to the news business what vanilla is to the ice cream business-a basic commodity that actually can be made anywhere in the flat world. The real value-added knowledge work happens in the next five minutes. That is when you need a real journalist who knows how to get a comment from the company, a comment from the top two analysts in the field, and even some word from competitors to put the earnings report in perspective. "That needs a higher journalistic skill set-someone in the market with contacts, who knows who the best industry analysts are and has taken the right people to lunch," said Glocer. The dot-corn bust and the flattening of the world forced Glocer to rethink how Reuters delivered news-whether it could disaggregate the functions of a journalist and ship the low-value-added functions to India. His primary goal was to reduce the overlap Reuters payroll, while preserving as many good journalism jobs as possible. "So the first thing we did," said Glocer, "was hire six reporters in Bangalore as an experiment.

18 TI IE VORI,1) IS FLAT We said, `Let's let them just do the flash headlines and the tables and whatever else we can get them to (lo in Bangalore.- These new Indian hires had accounting backgrounds and were trained by Reuters, but they were paid standard local wages and vacation and health benefits. "India is an unbelievably rich place for recruiting people, not only with technical skills but also finaflcial skills," said Glocer. When a company puts out its earnings, one of the first things it does is hand it to the wires-Reuters, Dow Jones, and Bloomberg-for distribution. "We will get that raw data," he said, "and then it's a race to see how fast we can turn it around. Bangalore is one of the most wired places in the world, and although there's a slight delay-one second or less-in getting the information over there, it turns out you can just as easily sit in Bangalore and get the electronic version of a press release and turn it into a story as you can in London or New York." The difference, however, is that wages and rents in Bangalore are less than one-fifth what they are in those Western capitals. While economics and the flattening of the world have pushed Reuters down this path, Glocer has tried to make a virtue of necessity. "We think we can off-load commoditized reporting and get that done efficiently somewhere else in the world," he said, and then give the conventional Reuters journalists, whom the company is able to retain, a chance to focus on doing much higher-value-added and personally fulfilling journalism and analysis. "Let's say you were a Reuters Journalist in New York. Do you reach your life's fulfillment by turning press releases into boxes on the screen, or by doing the analysis?" asked Glocer. Obviously, it is the latter. Outsourcing news bulletins to India also allows Reuters to extend the breadth of its reporting to more small-cap companies, companies it was not cost-efficient for Reuters to follow before with higher-paid journalists in New York. But with lower-wage Indian reporters, who can be hired in large numbers for the cost of one reporter in New York, it can now do that from Bangalore. By the summer of 2004, Reuters had grown its Bangalore content operation to three hundred staff, aiming eventually for a total of fifteen hundred. Some of those are Reuters veterans sent out to train the Indian teams, some are reporters filing earnings flashes, but most are journalists doing

WHILE I WAS SLl?I?PING 19 slightly more specialized data analysis-number crunching-for securities offerings. "A lot of our clients are doing the same thing," said Glocer. "Investment research has had to have huge amounts of cost ripped out of it, so a lot of firms are using shift work in Bangalore to do bread-and-butter company analysis." Until recently the big Wall Street firms had conducted investment research by spending millions of dollars on star analysts and then charging part of their salaries to their stockbrokerage departments, which shared the analysis with their best customers, and part to their investment banking business, which sometimes used glowing analyses of a company to lure its banking business. In the wake of New York State Attorney General Eliot Spitzer's investigations into Wall Street practices, following several scandals, investment banking and stockbrokerage have had to be distinctly separated-so that analysts will stop hyping companies in order to get their investment banking. But as a result, the big Wall Street investment firms have had to sharply reduce the cost of their market research, all of which has to be paid for now by their brokerage departments alone. And this created a great incentive for them to outsource some of this analytical work to places like Bangalore. In addition to being able to pay an analyst in Bangalore about $15,000 in total compensation, as opposed to $80,000 in New York or London, Reuters has found that its India employees tend to be financially literate and highly motivated as well. Reuters also recently opened a software development center in Bangkok because it turned out to he a good place to recruit developers who had been overlooked by all the Western companies vying for talent in Bangalore. I find myself torn by this trend. Having started my career as a wire service reporter with United Press International, I have enormous sympathy with wire service reporters and the pressures, both professional and financial , under which they toil. But UPI might still be thriving today as a wire service , which it is not, if it had been able to outsource some of its lower-end business when I started as a reporter in London twenty-five years ago. "It is delicate with the staff," said Glocer, who has cut the entire Reuters staff by roughly a quarter, without deep cuts among the reporters . The Reuters staff, he said, understand that this is being done so

20 THE WORLD IS FLAT that the company can survive and then thrive again. At the same time, said Glocer, "these are sophisticated people out reporting. They see that our clients are doing the exact same things. They get the plot of the story . . . What is vital is to be honest with people about what we are doing and why and not sugarcoat the message. I firmly believe in the lesson of classical economists about moving work to where it can he done best. However, we must not ignore that in some cases, individual workers will not easily find new work. For them, retraining and an adequate social safety net are needed" In an effort to deal straight with the Reuters staff, David Schlesinger, who heads Reuters America, sent all editorial employees a memo, which included the following excerpt: OFF-SHORING WITH OBLIGATION I grew up in New London, Connecticut, which in the 19th century was a major whaling center. In the 1960's and 70's the whales were long gone and the major employers in the region were connected with the military-not a surprise during the Vietnam era. My classmates' parents worked at Electric Boat, the Navy and the Coast Guard. The peace dividend changed the region once again, and now it is best known for the great gambling casinos of Mohcgan Sun and Foxwoods and for the pharmaceutical researchers of Pfizer. Jobs went; jobs were created. Skills went out of use; new skills were required. The region changed; people changed. New London, of course, was not unique. How many mill towns saw their mills close; how many shoe towns saw the shoe industry move elsewhere; how many towns that were once textile powerhouses now buy all their linens from China? Change is hard. Change is hardest on those caught by surprise. Change is hardest on those who have difficulty changing too. But change is natural; change is not new; change is important. The current debate about off-shoring is dangerously hot. But the debate about work going to India, China and Mexico is actually no different from the debate once held about submarine work leaving New

Customer" call center in Bangalore. The call center is a cross between a co-ed college "24/7 Customer" call center in Bangalore. The call center is a cross between a co-ed college frat house and a phone hank raising money for the local public TV station . There are several floors with rooms full of twenty-somethings- some twenty-five hundred in all-working the phones. Some are known as "outbound" operators, selling everything from credit cards to phone minutes. Others deal with "inbound" calls-everything from tracing lost luggage for U.S. and European airline passengers to solving computer problems for confused American consumers. The calls are transferred here by satellite and undersea fiber-optic cable. Each vast floor of a call center consists of clusters of cubicles. The young people work in little

22 THE WORLD IS FLAT teams under the banner of the company whose phone support they are providing. So one corner might he the Dell group, another might he flying the flag of Microsoft. Their working conditions look like those at your average insurance company. Although I am sure that there are call centers (Someone on the other end just slammed down the phone.) Male call center operator: "Merchant services, this is Jerry, may I help you?" (The Indian call center operators adopt Western names of their own choosing. The idea, of course, is to make their American or European customers feel more comfortable. Most of the young Indians I talked to about this were not offended but took it as an opportunity to

WHILE 1 WAS SLEEPING 23 have some fun. While a few just opt for Susan or Bob, some really get creative.) Woman operator in Bangalore speaking to an American: "My name is Ivy Timberwoods and I am calling you ..:' Woman operator in Bangalore getting an American's identity number : "May I have the last four digits of your Social Security?" Woman operator in Bangalore giving directions as though she were in Manhattan and looking out her window: "Yes, we have a branch on Seventy-fourth and Second Avenue, a branch at Fifty-fourth and Lexington ..." Male operator in Bangalore selling a credit card he could never afford himself: "This card comes to you with one of the lowest AYR ..." Woman operator in Bangalore explaining to an American how she screwed up her checking account: "Check number six-six-five for eighty- one dollars and fifty-five cents. You will still be hit by the thirty-dollar charge. Am I clear?" Woman operator in Bangalore after walking an American through a computer glitch: "Not a problem, Mr. Jassup. 'T'hank you for your time. Take care. Bye-bye." Woman operator in Bangalore after someone has just slammed down the phone on her: "Hello? Hello?" Woman operator in Bangalore apologizing for calling someone in America too early: "This is just a courtesy call, I'll call back later in the evening ..." Male operator in Bangalore trying desperately to sell an airline credit card to someone in America who doesn't seem to want one: "Is that because you have too many credit cards, or you don't like flying, Mrs. Bell?" Woman operator in Bangalore trying to talk an American out of her computer crash: "Start switching between memory okay and memory test ..." Male operator in Bangalore doing the same thing: "All right, then, let's just punch in three and press Enter ..." Woman operator in Bangalore trying to help an American who cannot stand being on the help line another second: "Yes, ma'am, I do

Hello?" Same woman operator in Bangalore looking up from her phone: "I definitely have a bad day!" Woman operator in Bangalore trying to help an American woman with a computer problem that she has never heard before: "What is the problem with this machine, ma'am? The monitor is burning?" T here are currently about 245,000 Indians answering phones from all over the world or dialing out to solicit people for credit cards or cell phone bargains or overdue bills. These call center jobs are low- wage, low-prestige jobs in America, but when shifted to India they become high-wage, high-prestige jobs. The esprit de corps at 24/7 and other call centers I visited seemed quite high, and the young people were all eager to share some of the bizarre phone conversations they've had with Americans who dialed 1-800-HELP, thinking they would wind up talking to someone around the block, not around the world. C. M. Meghna, a 24/7 call center female operator, told me, "I've had lots of customers who call in [with questions] not even connected to the product that we're dealing with. They would call in because they had lost their wallet or just to talk to somebody. I'm like, `Okay, all right, maybe you should look under the bed [for your wallet] or where do you normally keep it,' and she's like, `Okay, thank you so much for helping."' Nitu Somaiah: "One of the customers asked me to marry him." Sophie Sunder worked for Delta's lost-baggage department: "I remember this lady called from Texas," she said, "and she was, like, weeping on the phone. She had traveled two connecting flights and she lost her bag and in the hag was her daughter's wedding gown and wedding

WHILH: I WAS SLEEPING 25 ring and I felt so sad for her and there was nothing I could do. I had no information. "Most of the customers were irate," said Sunder. "The first thing they say is, `Where's my bag? I want my bag now!' We were like supposed to say, `Excuse me, can I have your first name and last name?' `But where's my bag!' Some would ask which country am I from? We are supposed to tell the truth, [so] we tell them India. Some thought it was Indiana, not India! Some did not know where India is. I said it is the country next to Pakistan." Although the great majority of the calls are rather routine and dull, competition for these jobs is fierce-not only because they pay well, but because you can work at night and go to school during part of the day, so they are stepping-stones toward a higher standard of living. P. V. Kannan, CEO and cofounder of 24/7, explained to me how it all worked: "Today we have over four thousand associates spread out in Bangalore, Hyderabad, and Chennai. Our associates start out with a take-home pay of roughly $200 a month, which grows to $300 to $400 per month in six months. We also provide transportation, lunch, and dinner at no extra cost. We provide life insurance, medical insurance for the entire family- and other benefits." Therefore, the total cost of each call center operator is actually around $500 per month when they start out and closer to $600 to $700 per month after six months. Everyone is also entitled to performance bonuses that allow them to earn, in certain cases, the equivalent of 100 percent of their base salary. "Around 10 to 20 percent of our associates pursue a degree in business or computer science during the day hours," said Kannan, adding that more than one-third are taking some kind of extra computer or business training, even if it is not toward a degree. "It is quite common in India for people to pursue education through their twenties-self-improvement is a big theme and actively encouraged by parents and companies. We sponsor an MBA program for consistent performers [with] full-day classes over the weekend. Everyone works eight hours a day, five days a week, with two fifteen-minute breaks and an hour off for lunch or dinner." Not surprisingly, the 24/7 customer call center gets about seven hun-

26 TIIF wORLll IS PLAT dred applications a day, but only 6 percent of applicants are hired. Here is a snippet from a recruiting session for call center operators at a women's college in Bangalore: Recruiter 1: "Good morning, girls." Class in unison: "Good morning, ma'am." Recruiter 1: "We have been retained by some of the multinationals here to do the recruitment for them. The primary clients that we are recruiting [for] today are Honeywell. And also for America Online." The young women-dozens of them-then all lined up with their application forms and waited to be interviewed by a recruiter at a wooden table. Here is what some of the interviews sounded like: Recruiter 1: "What kind of job are you looking at?" Applicant 1: "It should be based on accounts, then, where I can grow, I can grow in nay career." Recruiter 1: "You have to be more confident about yourself when you're speaking. You're very nervous. I want you to work a little on that and then get in touch with us." Recruiter 2 to another applicant: "Tell me something about yourself." Applicant 2: "I have passed my SSC with distinction. Second P also with distinction. And I also hold a 70 percent aggregate in previous two years." (This is Indian lingo for their equivalents of GPA and SAh scores.) Recruiter 2: "Go a little slow. Don't be nervous. Be cool." The next step for those applicants who are hired at a call center is the training program, which they are paid to attend. It combines learning how to handle the specific processes for the company whose calls they will be taking or making, and attending something called "accent neutralization class." These are daylong sessions with a language teacher who prepares the new Indian hires to disguise their pronounced Indian accents when speaking English and replace them with American, Canadian, or British ones-depending on which part of the world they will be speaking with. It's pretty bizarre to watch. The class I sat in on was being trained to speak in a neutral middle-American accent. The students were asked to read over and over a single phonetic paragraph designed to teach them how to soften their is and to roll their r's. Their teacher, a charming eight-months-pregnant young woman

WHILE I WAS SLEEPING 27 dressed in a traditional Indian sari, moved seamlessly among British, American, and Canadian accents as she demonstrated reading a paragraph designed to highlight phonetics. She said to the class, "Remember the first day I told you that the Americans flap the 'tuh' sound? You know, it sounds like an almost `duh' sound - not crisp and clear like the British. So I would not say"-here she was crisp and sharp-"Betty bought a bit of better butter' or `Insert a quarter in the meter.' But I would say"-her voice very flat-"`Insert a quarter in the meter' or `Betty bought a bit of better butter.' So I'm just going to read it out for you once, and then we'll read it together. All right? `Thirty little turtles in a bottle of bottled water. A bottle of bottled water held thirty little turtles. It didn't matter that each turtle had to rattle a metal ladle in order to get a little bit of noodles.' "All right, who's going to read first?" the instructor asked. Each member of the class then took a turn trying to say this tongue twister in an American accent. Some of them got it on the first try, and others, well, let's just say that you wouldn't think they were in Kansas City if they answered your call to Delta's lost-luggage number. After listening to them stumble through this phonetics lesson for half an hour, I asked the teacher if she would like me to give them an authentic version -since I'm originally from Minnesota, smack in the Midwest, and still speak like someone out of the movie Fargo. Absolutely, she said. So I read the following paragraph: "A bottle of bottled water held thirty little turtles. It didn't matter ..ERR, COD:3..

my Indian food and I still work for a multinational. Why should I go to America?" The relatively high standard of living that she can now enjoy-enough for a small apartment and car in Bangalore-is good for America as well. When you look around at 24/7's call center, you see that all the computers are running Microsoft Windows. The chips are designed by Intel. The phones are from Lucent. The air-conditioning is by Carrier, and even the bottled water is by Coke. In addition, 90 percent of the shares in 24/7 are owned by U.S. investors. This explains why, although the United States has lost some service jobs to India in recent years, total exports from American- based companies-merchandise and services-to India have grown from

WHILE I WAS SLEEPING 29 $2.5 billion in 1990 to $5 billion in 2003. So even with the outsourcing of some service jobs from the United States to India, India's growing economy is creating a demand for many more American goods and services. What goes around, comes around. me years ago, when Japan was beating America's brains out in the Nauto industry, I wrote a column about playing the computer geography game Where in the World is Carmen Sandiego? with my nine- year-old daughter, Orly. I was trying to help her by giving her a clue suggesting that Carmen had gone to Detroit, so I asked her, "Where are cars made?" And without missing a beat she answered, "Japan." Ouch! Well, I was reminded of that story while visiting Global Edge, an Indian software design firm in Bangalore. The company's marketing manager, Rajesh Rao, told me that he had just made a cold call to the VP for engineering of a U.S. company, trying to drum up business. As soon as Mr. Rao introduced himself as calling from an Indian software firm, the U.S. executive said to him, "Namaste," a common Hindi greeting. Said Mr. Rao, "A few years ago nobody in America wanted to talk to its. Now they are eager." And a few even know how to say hello in proper Hindu fashion. So now I wonder: If I have a granddaughter one day, and I tell her I'm going to India, will she say, "Grandpa, is that where software comes from?" No, not yet, honey. Every new product-from software to widgets- goes through a cycle that begins with basic research, then applied research, then incubation, then development, then testing, then manufacturing , then deployment, then support, then continuation engineering in order to add improvements. Each of these phases is specialized and unique, and neither India nor China nor Russia has a critical mass of talent that can handle the whole product cycle for a big American multinational. But these countries are steadily developing their reseach and development capabilities to handle more and more of these phases. As that continues, we really will see the beginning of what Satyam Cherukuri, of Sarnoff, an American research and development firm, has

30 TH[: WORLD IS FLAT called "the globalization of innovation" and an end to the old model of a single American or European multinational handling all the elements of the development product cycle from its own resources. More and more American and European companies are outsourcing significant research and development tasks to India, Russia, and China. According to the information technology office of the state government in Karnataka, where Bangalore is located, Indian units of Cisco Systems, Intel, IBM, Texas Instruments, and GE have already filed 1,000 patent applications with the U.S. Patent Office. Texas Instruments alone has had 225 U.S. patents awarded to its Indian operation. "The Intel team in Bangalore is developing microprocessor chips for high-speed broadband wireless technology, to be launched in 2006," the Karnataka IT office said, in a statement issued at the end of 2004, and "at GE's John F. Welch Technology Centre in Bangalore, engineers are developing new ideas for aircraft engines, transport systems and plastics." Indeed, GE over the years has frequently transferred Indian engineers who worked for it in the United States back to India to integrate its whole global research effort. GE now even sends non-Indians to Bangalore. Vivek Paul is the president of Wipro Technologies, another of the elite Indian technology companies, but he is based in Silicon Valley to be close to Wipro's American customers. Before coming to Wipro, Pau] managed GE's CT scanner business out of Milwaukee. At the time he had a French colleague who managed GE's power generator business for the scanners out of France. "I ran into him on an airplane recently," said Paul, "and lie told me he had moved to India to head up GE's high-energy research there." I told Vivek that I love hearing an Indian who used to head up GE's CI' business in Milwaukee but now runs Wipro's consulting business in Silicon Valley tell me about his former French colleague who has moved to Bangalore to work for GE. That is a flat world. E very time I think I have found the last, most obscure job that could be outsourced to Bangalore, I discover a new one. My friend Vivek Kulkarni used to head the government office in Bangalore responsible

WHILE I WAS SLEEPING 31 for attracting high technology global investment. After stepping down from that post in 2003, he started a company called B2K, with a division called Brickwork, which offers busy global executives their own personal assistant in India. Say you are running a company and you have been asked to give a speech and a PowerPoint presentation in two days. Your "remote executive assistant" in India, provided by Brickwork, will do all the research for you, create the PowerPoint presentation, and e-mail the whole thing to you overnight so that it is on your desk the clay you have to deliver it. "You can give your personal remote executive assistant their assignment when you are leaving work at the end of the day in New York City, and it will be ready for you the next morning," explained Kulkarni. "Because of the time difference with India, they can work on it while you sleep and have it back in your morning." Kulkarni suggested I hire a remote assistant in India to do all the research for this book. "He or she could also help you keep pace with what you want to read. When you wake up, you will find the completed summary in your in-box." (I told him no one could he better than my longtime assistant, Maya Gorman, who sits ten feet away!) Having your own personal remote executive assistant costs around $1,500 to $2,000 a month, and given the pool of Indian college grads from which Brickwork can recruit, the brainpower you can hire dollar- for-dollar is substantial. As Brickwork's promotional material says, "India's talent pool provides companies access to a broad spectrum of highly qualified people. In addition to fresh graduates, which are around 2.5 million per year, many qualified homemakers are entering the job market ." India's business schools, it adds, produce around eighty-nine thousand MBAs per year. "We've had a wonderful response," said Kulkarni, with clients coming from two main areas. One is American health-care consultants, who often need lots of numbers crunched and PowerPoint presentations drawn up. The other, he said, are American investment banks and financial services companies, which often need to prepare glossy pamphlets with graphs to illustrate the benefits of an IPO or a proposed merger. In the case of a merger, Brickwork will prepare those sections of the report dealing with

32 TILE WORLD IS FLAT general market conditions and trends, where most of the research can be gleaned There is no real end to what can be done by whom." Unlike Columbus, I didn't stop with India. After I got home, I decided to keep exploring the East for more signs that the world was flat. So after India, I was soon off to Tokyo, where I had a chance to interview Kenichi Ohmae, the legendary former McKinsey & Company consultant in Japan. Ohmae has left McKinsey and struck out on his own in business, Ohmae & Associates. And what do they do? Not consulting anymore, explained Ohmae. He is now spearheading a drive to outsource low-end Japanese jobs to Japanese-speaking call centers and service providers in China. "Say what?" I asked. "To China? Didn't the Japanese once colonize China, leaving a very bad taste in the mouths of the Chinese?" Well, yes, said Ohmae, but he explained that the Japanese also left behind a large number of Japanese speakers who have maintained a slice of Japanese culture, from sushi to karaoke, in northeastern China, particularly around the northeastern port city of Dalian. Dalian has become for Japan what Bangalore has become for America and the other English-speaking countries: outsourcing central. The Chinese may never forgive Japan for what it did to China in the last century, but the Chinese are so focused on leading the world in the next century that they are ready to brush up on their Japanese and take all the work Japan can outsource. "The recruiting is quite easy," said Ohmae in early 2004. "About one-

WHILE I WAS SLEEPING 33 third of the people in this region [around Dalian] have taken Japanese as a second language in high school. So all of these Japanese companies are coming in." Ohmae's company is doing primarily data-entry work in China, where Chinese workers take handwritten Japanese documents, which are scanned, faxed, or e-mailed over from Japan to Dalian, and then type them into a digital database in Japanese characters. Ohmae's company has developed a software program that takes the data to be entered and breaks it down into packets. These packets can then be sent around China or Japan for typing, depending on the specialty required, and then reassembled at the company's database in its Tokyo headquarters . "We have the ability to allocate the job to the person I needed to see Dalian, this Bangalore of China, firsthand, so I kept moving around the East. Dalian is impressive not just for a Chinese city. With its wide boulevards, beautiful green spaces, and nexus of universities , technical colleges, and massive software park, Dalian would stand out in Silicon Valley. I had been here in 1998, but there had been so much new building since then that I did not recognize the place. Dalian, which is located about an hour's flight northeast of Beijing, sym-

34 THE WORLD IS FLAT bolizes how rapidly China's most modern cities-and there are still plenty of miserable, backward ones-are grabbing business as knowledge centers, not just as manufacturing hubs. The signs on the buildings tell the whole story: GE, Microsoft, Dell, SAP, HP, Sony, and Accentureto name but a few-all are having backroom work done here to support their Asian operations, as well as new software research and development. Because of its proximity to Japan and Korea, each only about an hour away by air, its large number of Japanese speakers, its abundance of Internet bandwidth, and many parks and a world-class golf course (all of which appeal to knowledge workers), Dalian has become an attractive locus for Japanese outsourcing. Japanese firms can hire three Chinese software engineers for the price of one in Japan and still have change to pay a roomful of call center operators ($90 a month starting salary). No wonder some twenty-eight hundred Japanese companies have set up operations here or teamed up with Chinese partners. "I've taken a lot of American people to Dalian, and they are amazed at how fast the China economy is growing in this high-tech area," said Win Liu, director of U.S./EU projects for DHC, one of Dalian's biggest homegrown software firms, which has expanded from thirty to twelve hundred employees in six years. "Americans don't realize the challenge to the extent that they should." Dalian's dynamic mayor, Xia Deren, forty-nine, is a former college president. (For a Communist authoritarian system, China does a pretty good job of promoting people on merit. The Mandarin meritocratic culture here still runs very deep.) Over a traditional ten-course Chinese dinner at a local hotel, the mayor told one how far Dalian has come and just where he intends to take it. "We have twenty-two universities and colleges with over two hundred thousand students in Dalian," he explained. More than half those students graduate with engineering or science degrees , and even those who don't, those who study history or literature, are still being directed to spend a year studying Japanese or English, plus computer science, so that they will be employable. The mayor estimated that more than half the residents of Dalian had access to the Internet at the office, home, or school.

We are approaching and we are catching up with the Indians. Exports of software products [from Dalian] have been increasing by 50 percent annually. And China is now becoming the country that develops the largest number of university graduates. Though in general our English is not as competent as that of the Indian people, we have a bigger population, [so] we can pick out the most intelligent students who can speak the best English." Are Dalian residents bothered by working for the Japanese, whose government has still never formally apologized for what the wartime Japanese government did to China? "We will never forget that a historical war occurred between the two nations," he answered, "but when it comes to the field of economy, we only focus on the economic problems-especially if we talk about the software outsourcing business. If the U.S. and Japanese companies make their products in our city, we consider that to be a good thing. Our youngsters are trying to learn Japanese, to master this tool so they can compete with their Japanese counterparts to successfully land high- salary positions for themselves in the future." The mayor then added for good measure, "My personal feeling is that Chinese youngsters are more ambitious than Japanese or American youngsters in recent years, but I don't think they are ambitious enough, because they are not as ambitious as my generation. Because our generation , before they got into university and colleges, were sent to distant rural areas and factories and military teams, and went through a very hard time, so in terms of the spirit to overcome and face the hardships, [our generation had to have more ambition] than youngsters nowadays." Mayor Xia had a charmingly direct way of describing the world, and although some of what he had to say gets lost in translation, he gets it- and Americans should too: "The rule of the market economy," this

First we will have our young people employed by the foreigners, and then we will start our own companies. It is like building a building. 'T'oday, the U.S., you are the designers, the architects , and the developing countries are the bricklayers for the buildings. But one day I hope we will be the architects." Just kept exploring-east and west. By the summer of 2004, I was ill I Colorado on vacation. I had heard about this new low-fare airline called JetBlue, which was launched ill 1999. I had no idea where they operated, but I needed to fly between Washington and Atlanta, and couldn't quite get the times I wanted, so I decided to call JetBlue and see where exactly they flew. I confess I did have another motive. I had heard that JetBlue had outsourced its entire reservation system to housewives in Utah, and I wanted to check this out. So I dialed JetBlue reservations and had the following conversation with the agent: "Hello, this is Dolly. Can I help you?" answered a grandmotherly voice. "Yes, I would like to fly from Washington to Atlanta," I said. "Do you fly that route?" "No, I'm sorry we don't. We fly from Washington to Ft. Lauderdale," said Dolly. "How about Washington to New York City?" I asked. "I'm sorry, we don't fly that route. We do fly from Washington to Oakland and Long Beach," said Dolly. "Say, can I ask you something? Are you really at home? I read that JetBlue agents just work at home." "Yes, I am," said Dolly in the most cheerful voice. (I later confirmed with JetBlue that her full name is Dolly Baker.) "I am sitting in my office

WHILI? I WAS SLEEPING 37 upstairs in my house, looking out the window at a beautiful sunny day. Just five minutes ago someone called and asked me that same question and I told them and they said, `Good, I thought you were going to tell me you were in New Delhi."' "Where do you live?" I asked. "Salt Lake City, Utah," said Dolly. "We have a two-story home, and I love working here, especially in the winter when the snow is swirling and I am up here in the office at home." "I low do you get such a job?" I asked. "You know, they don't advertise," said Dolly in the sweetest possible voice. "It's all by word of mouth. I worked for the state government and I retired, and [after a little while] I thought I have to do something else and I just love it." David Neeleman, the founder and CEO of JetBlue Airways Corp., has a name for all this. He calls it "homesourcing" JetBlue now has four hundred reservation agents, like Dolly, working at home in the Salt Lake City area, taking reservations-in between babysitting, exercising, writing novels, and cooking dinner. A few months later I visited Neeleman at JetBlue's headquarters in New York, and he explained to me the virtues of homesourcing, which he actually started at Morris Air, his first venture in the airline business. (It was bought by Southwest.) "We had 250 people in their homes doing reservations at Morris Air," said Neeleman. "They were 30 percent more productive-they take 30 percent more bookings, by just being happier. They were more loyal and there was less attrition. So when I started JetBlue, I said, `We are going to have 100 percent reservation at home."' Neeleman has a personal reason for wanting to do this. He is a Mormon and believes that society will be better off if more mothers are able to stay at home with their young children but are given a chance to be wage earners at the same time. So he based his home reservations system in Salt Lake City, where the vast majority of the women are Mormons and many are stay-at-home mothers. Home reservationists work twenty- five hours a week and have to come into the JetBlue regional office in Salt Lake City for four hours a month to learn new skills and be brought up to date on what is going on inside the company.

[Employers] are more willing to outsource to India than to their own homes, and I can't understand that. Somehow they think that people need to be sitting in front of them or some boss they have designated. The productivity we get here more than makes up for the India [wage] factor." A Los Angeles Times story about JetBlue (May 9, 2004) noted that "in 1997, 11.6 million employees of U.S. companies worked from home at least part of the time. Today, that number has soared to 23.5 million-16% of the American labor force. (Meanwhile, the ranks of the self-employed, who often work from home, have swelled during the same periodto 23.4 million from 18 million.) In some eyes, homesourcing and outsourcing aren't so much competing strategies as they are different manifestations of the same thing: a relentless push by corporate America to lower costs and increase efficiency, wherever that may lead." That is exactly what I was learning on my own travels: Homesourcing to Salt Lake City and outsourcing to Bangalore were just flip sides of the same coin -sourcing. And the new, new thing, I was also learning, is the degree to which it is now possible for companies and individuals to source work anywhere. Just kept moving. In the fall of 2004, I accompanied the chairman of I the Joint Chiefs of Staff, General Richard Myers, on a tour of hot spots in Iraq. We visited Baghdad, the U.S. military headquarters in Fallujah, and the 24th Marine Expeditionary Unit encampment outside Babil, in the heart of Iraq's so-called Sunni Triangle. The makeshift 24th MEU base is a sort of Fort Apache, in the middle of a pretty hostile Iraqi Sunni Muslim population. While General Myers was meeting with officers and enlisted men there, I was free to walk around the base, and eventually I wandered into the command center, where my eye was immediately caught by a large flat-screen TV. On the screen was a live TV feed that looked to be coming from some kind of overhead camera. It showed some people moving around behind a house. Also on the screen, along

WHILE I WAS SLEEPING 39 the right side, was an active instant-messaging chat room, which seemed to be discussing the scene on the TV. "What is that?" I asked the soldier who was carefully monitoring all the images from a laptop. He explained that a U.S. Predator drone-a small pilotless aircraft with a high-power television camera-was flying over an Iraqi village, in the 24th MEU's area of operation, and feeding real-time intelligence images back to his laptop and this flat screen. This drone was actually being "flown" and manipulated by an expert who was sitting back at Nellis Air Force Base in Las Vegas, Nevada. That's right, the drone over Iraq was actually being remotely directed from Las Vegas. Meanwhile, the video images it was beaming back were being watched simultaneously by the 24th MEU, United States Central Command headquarters in Tampa, CentCom regional headquarters in Qatar, in the Pentagon, and probably also at the CIA. The different analysts around the world were conducting an online chat about how to interpret what was going on and what to do about it. It was their conversation that was scrolling down the right side of the screen. Before I could even express my amazement, another officer traveling with us took me aback by saying that this technology had "flattened" the military hierarchy-by giving so much information to the low-level officer, or even enlisted man, who was operating the computer, and emnpowering him to make decisions about the information he was gathering . While I'm sure that no first lieutenant is going to he allowed to start a firefight without consulting superiors, the days when only senior officers had the big picture are over. The military playing field is being leveled. I told this story to my friend Nick Burns, the U.S. ambassador to NATO and a loyal member of the Red Sox Nation. Nick told me he was at CentCom headquarters in Qatar in April 2004, being briefed by General John Ahizaid and his staff. Abizaid's team was seated across the table from Nick with four flat-screen TVs behind them. The first three had overhead images being relayed in real time from different sectors of Iraq by Predator drones. The last one, which Nick was focused on, was showing a Yankees-Red Sox game.

40 TIIF. WORLD IS FLAT On one screen it was Pedro Martinez versus Derek Jeter, and on the other three it was Jihadists versus the First Cavalry. FLATBURGERS AND FRIES I kept moving-all the way back to my home in Bethesda, Maryland. By the time I settled back into my house from this journey to the edges of the earth, my head was spinning. But no sooner was I home than more signs of the flattening came knocking at my door. Some came in the form of headlines that would unnerve any parent concerned about where his college-age children are going to fit in. For instance, Forrester Research, Inc., was projecting that more than 3 million service and professional jobs would move out of the country by 2015. But my jaw really dropped when I read a July 19, 2004, article from the International Herald Tribune headlined: "Want Fries With Outsourcing?" "Pull off U.S. Interstate Highway 55 near Cape Girardeau, Missouri, and into the drive-through lane of a McDonald's next to the highway and you'll get fast, friendly service, even though the person taking your order is not in the restaurant-or even in Missouri," the article said. "The order taker is in a call center in Colorado Springs, more than 900 miles, or 1,450 kilometers, away, connected to the customer and to the workers preparing the food by high-speed data lines. Even some restaurant jobs, it seems, are not immune to outsourcing. `The man who owns the Cape Girardeau restaurant, Shannon Davis, has linked it and three other of his 12 McDonald's franchises to the Colorado call center, which is run by another McDonald's franchisee, Steven Bigari. And he did it for the same reasons that other business owners have embraced call centers: lower costs, greater speed and fewer mistakes. "Cheap, quick and reliable telecommunications lines let the order takers in Colorado Springs converse with customers in Missouri, take an electronic snapshot of them, display their order on a screen to make sure

noted. "Bigari said he had cut order time in Tests conducted by outside companies found that Bigari's drive-throughs now make mistakes on fewer than

42 THE NV0RLD IS FLAP 2 percent of all orders, down from about 4 percent before he started using the call centers, Bigari said." Bigari "is so enthusiastic about the call center idea," the article noted, "that he has expanded it beyond the drive-through window at his seven restaurants that use the system. While he still offers counter service at those restaurants, most customers now order through the call center, using phones with credit card readers on tables in the seating area." S one of the signs of flattening I encountered back hone, though, had nothing to do with economics. On October 3, 2004, I appeared on the CBS News Sunday morning show Face the Nation, hosted by veteran CBS correspondent Bob Schaeffer. CBS had been in the news a lot in previous weeks because of Dan Rather's 60 Minutes report about President George W. Bush's Air National Guard service that turned out to be based on bogus documents. After the show that Sunday, Schieffer mentioned that the oddest thing had happened to him the week before. When he walked out of the CBS studio, a young reporter was waiting for him on the sidewalk. This isn't all that unusual, because as with all the Sunday-morning shows, the major networks-CBS, NBC, ABC, CNN, and Fox-always send crews to one another's studios to grab exit interviews with the guests. But this young man, Schicffer explained, was not from a major network. He politely introduced himself as a reporter for a Web site called InDC Journal and asked whether he could ask Schieffer a few questions. Schaeffer, being a polite fellow, said sure. The young man interviewed him on a device Schieffer did not recognize and then asked if he could take his picture. A picture? Schieffer noticed that the young man had no camera. He didn't need one. He turned his cell phone around and snapped Schieffer's picture. "So I came in the next morning and looked up this Web site and there was my picture and the interview and there were already three hundred comments about it," said Schieffer, who, though keenly aware of online journalism, was nevertheless taken aback at the incredibly fast, low-cost, and solo manner in which this young man had put him up in lights.

Basically, I'd say that the barrier to entry to do journalism that requires portable, ad hoc recording equipment, is [now] about $100-$200 to $300 if you add a camera, $400 to $500 for a pretty nice recorder and a pretty nice camera. [But] $200 is all that you need to get the job done." What prompted him to become his own news network? "Being an independent journalist is a hobby that sprang from my frustration about biased, incomplete, selective, and/or incompetent information gathering by the mainstream media," explained Ardolino, who describes himself as a "center-right libertarian." "Independent journalism and its relative, blogging, are expressions of market forces-a need is not being met by current information sources. I started taking pictures and doing interviews of the antiwar rallies in D.C., because the media was grossly misrepresenting the nature of the groups that were organizing the gatherings-unrepentant Marxists, explicit and implicit supporters of terror, etc. I originally chose to use humor as a device, but I've since branched out. Do I have more power, power to get nay message out, yes. The Schieffer interview actually brought in about twenty-five

in pieces." On any given day one can come across any number of stories, like the encounter between Bob Schieffer and Bill Ardolino, that tell you that old hierarchies are being flattened and the playing field is being leveled. As Micah L. Sifry nicely put it in The Nation magazine (November 22, 2004): "The era of top-down politics-where campaigns, institutions and journalism were cloistered communities powered by hard-to-amass capital -is over. Something wilder, more engaging and infinitely more satisfying to individual participants is arising alongside the old order." I offer the Schieffer-Ardolino encounter as just one example of how the flattening of the world has happened faster and changed rules, roles, and relationships more quickly than we could have imagined. And,

WHILE I WAS SLEEPING 45 though I know it is a cliché, I have to say it nevertheless: You ain't seen nothin' yet. As I detail in the next chapter, we are entering a phase where we are going to see the digitization, virtualization, and automation of almost everything. The gains in productivity will be staggering for those countries, companies, and individuals who can absorb the new technological tools. And we are entering a phase where more people than ever before in the history of the world are going to have access to these tools- as innovators, as collaborators, and, alas, even as terrorists. You say you want a revolution? Well, the real information revolution is about to begin. I call this new phase Globalization 3.0 because it followed Globalization 2.0, but I think this new era of globalization will prove to be such a difference of degree that it will be seen, in time, as a difference in kind. That is why I introduced the idea that the world has gone from round to flat. Everywhere you turn, hierarchies are being challenged from below or transforming themselves from top-down structures into more horizontal and collaborative ones. "Globalization is the word we came up with to describe the changing relationships between governments and big businesses," said David Rothkopf, a former senior Department of Commerce official in the Clinton administration and now a private strategic consultant. "But what is going on today is a much broader, much more profound phenomenon " It is not simply about how governments, business, and people communicate , not just about how organizations interact, but is about the emergence of completely new social, political, and business models. "It is about things that impact some of the deepest, most ingrained aspects of society right clown to the nature of the social contract," added Rothkopf. "What happens if the political entity in which you are located no longer corresponds to a job that takes place in cyberspace, or no longer really encompasses workers collaborating with other workers in different corners of the globe, or no longer really captures products produced in multiple places simultaneously? Who regulates the work? Who taxes it? Who should benefit from those taxes?" If I am right about the flattening of the world, it will be remembered as one of those fundamental changes-like the rise of the nation-state or the Industrial Revolution-each of which, in its clay, noted Rothkopf,

46 THE WORLD IS FLAT produced changes in the role of individuals, the role and form of governments , the way we innovated, the way we conducted business, the role of women, the way we fought wars, the way we educated ourselves, the way religion responded, the way art was expressed, the way science and research were conducted, not to mention the political labels we assigned to ourselves and to our opponents. "There are certain pivot points or watersheds in history that are greater than others because the changes they produced were so sweeping, multifaceted, and hard to predict at the time," Rothkopf said. If the prospect of this flattening-and all of the pressures, dislocations , and opportunities accompanying it-causes you unease about the future, you are neither alone nor wrong. Whenever civilization has gone through one of these disruptive, dislocating technological revolutions- like Gutenberg's introduction of the printing press-the whole world has changed in profound ways. But there is something about the flattening of the world that is going to be qualitatively different from other such profound changes: the speed and breadth with which it is taking hold. The introduction of printing happened over a period of decades and for a long time affected only a relatively small part of the planet. Same with the Industrial Revolution. This flattening process is happening at warp speed and directly or indirectly touching a lot more people on the planet at once. The faster and broader this transition to a new era, the more likely is the potential for disruption, as opposed to an orderly transfer of power from the old winners to the new winners. To put it another way, the experiences of the high-tech companies in the last few decades who failed to navigate the rapid changes brought about in their marketplace by these types of forces may he a warning to all the businesses, institutions, and nation-states that are now facing these inevitable, even predictable, changes but lack the leadership, flexibility, and imagination to adapt-not because they are not smart or aware, but because the speed of change is simply overwhelming them. And that is why the great challenge for our time will be to absorb these changes in ways that do not overwhelm people but also do not leave them behind. None of this will be easy. But this is our task. It

WHILE I WAS SLEEPING 47 is inevitable and unavoidable. It is the ambition of this book to offer a framework for how to think about it and manage it to our maximum benefit. I have shared with you in this chapter how I personally discovered that the world is flat. The next chapter details how it got that way.

TWO The Ten Forces That Flattened the World The Bible tells us that God created the world in six days and on the seventh day he rested. Flattening the world took a little longer. The world has been flattened by the convergence of ten major political events, innovations, and companies. None of us has rested since, or maybe ever will again. This chapter is about the forces that flattened the world and the multiple new forms and tools for collaboration that this flattening has created. FLATTENER #1 1 1 /9/89 When the Walls Came Down and the Windows Went Up T lie first time I saw the Berlin Wall, it already had a hole in it. It was December 1990, and I was traveling to Berlin with the reporters covering Secretary of State James A. Baker III. The Berlin Wall had been breached a year earlier, on November 9, 1989. Yes, in a wonderful kabbalistic accident of dates, the Berlin Wall fell on 11/9. The wall, even in its punctured and broken state, was still an ugly scar across Berlin. Secretary Baker was making his first visit to see this crumbled monument to Soviet communism. I was standing next to him with a small group of reporters. "It was a foggy, overcast day," Baker recalled in

'l'HF: TEN FORCES THAT FLATTENED THE WORLD 49 his memoir, The Politics of Diplomacy, "and in my raincoat, I felt like a character in a John le Carré novel. But as I peered through a crack in the Wall [near the Reichstag] and saw the high-resolution drabness that characterizes East Berlin, I realized that the ordinary men and women of East Germany, peacefully and persistently, had taken matters into their own hands. This was their revolution." After Baker finished looking through the wall and moved along, we reporters took turns peering through the same jagged concrete hole. I brought a couple of chunks of the wall home for my daughters. I remember thinking how unnatural it looked-indeed, what a bizarre thing it was, this cement wall snaking across a modern city for the sole purpose of preventing the people on the other side from enjoying, even glimpsing, freedom. The fall of the Berlin Wall on 11/9/89 unleashed forces that ultimately liberated all the captive peoples of the Soviet Empire. But it actually did so much more. It tipped the balance of power across the world toward those advocating democratic, consensual, free-market-oriented governance, and away from those advocating authoritarian rule with centrally planned economies. The Cold War had been a struggle between two economic systems-capitalism and communism-and with the fall of the wall, there was only one system left and everyone had to orient himself or herself to it one way or another. Henceforth, more and more economies would be governed from the ground up, by the interests , demands, and aspirations of the people, rather than from the top down, by the interests of some narrow ruling clique. Within two years, there was no Soviet Empire to hide behind anymore or to prop up autocratic regimes in Asia, the Middle East, Africa, or Latin America. If you were not a democracy or a democratizing society, if you continued to hold fast to highly regulated or centrally planned economics, you were seen as being on the wrong side of history. For some, particularly among the older generations, this was an unwelcome transformation. Communism was a great system for making people equally poor. In fact, there was no better system in the world for that than communism. Capitalism made people unequally rich, and for some who were used to the plodding, limited, but secure Socialist

50 TIIE WORLD IS FLAT lifestyle-where a job, a house, an education, and a pension were all guaranteed, even if they were meager-the fall of the Berlin Wall was deeply unsettling. But for many others, it was a get-out-of-jail-free card. That is why the fall of the Berlin Wall was felt in so many more places than just Berlin, and why its fall was such a world-flattening event. Indeed, to appreciate the far-reaching flattening effects of the fall of the Berlin Wall, it's always best to talk to non-Germans or non-Russians. Tarun Das was heading the Confederation of Indian Industry when the wall fell in Berlin, and he saw its ripple effect felt all the way to India. "We had this huge mass of regulation and controls and bureaucracy," he recalled. "Nehru had come to power [after the end of British colonial rule] and had a huge country to manage, and no experience of running a country. The U.S. was busy with Europe and Japan and the Marshall Plan. So Nehru looked north, All the years of socialism and controls had taken us downhill to

If I celebrate the fall of the wall, it is because I am convinced of how much we can learn from each other. Most knowledge is learning from the other across the border." Yes, the world became a better place to live in after 11/9, because each outbreak of freedom stimulated another outbreak, and that process in and of itself had a flattening effect across societies, strengthening those below and weakening those above. "Women's freedom," noted Sen, citing just one example, "which promotes women's literacy, tends to reduce fertility and child mortality and increase the employment opportunities for women, which then affects the political dialogue and gives women the opportunity for a greater role in local self-government." Finally, the fall of the wall did not just open the way for more people

52 THE WORLD IS FLAT to tap into one another's knowledge pools. It also paved the way for the adoption of common standards-standards on how economies should be run, on how accounting should be done, on how banking should be conducted, on how PCs should be made, and on how economics papers should be written. I discuss this more later, but suffice it to say here that common standards create a flatter, more level playing field. To put it another way, the fall of the wall enhanced the free movement of best practices. When an economic or technological standard emerged and proved itself on the world stage, it was much more quickly adopted after the wall was out of the way. In Europe alone, the fall of the wall opened the way for the formation of the European Union and its expansion from fifteen to twenty-five countries. That, in combination with the advent of the curo as a common currency, has created a single economic zone out of a region once divided by an Iron Curtain. While the positive effects of the wall coming down were immediately apparent, the cause of the wall's fall was not so clear. There was no single cause. `lb some degree the termites just ate away at the foundations of the Soviet Union, which were already weakened by the system's own internal contradictions and inefficiencies; to some degree the Reagan administration 's military buildup in Europe forced the Kremlin to bankrupt itself paying for warheads; and to some degree Mikhail Gorbachev's hapless efforts to reform something that was unreformable brought communism to an end. But if I had to point to one factor as first among equals, it was the information revolution that began in the early- to mid- 1980s. Totalitarian systems depend on a monopoly of information and force, and too mach information started to slip through the Iron Curtain, thanks to the spread of fax machines, telephones, and other modern tools of communication. A critical mass of IBM PCs, and the Windows operating system that brought them to life, came together in roughly this same time period that the wall fell, and their diffusion put the nail in the coffin of communism, because they vastly improved horizontal communication-to the detriment of the exclusively top-down form that communism was based upon. They also greatly enhanced personal information gathering and personal empowerment. (Each component of this information revoluTHE

TEN FORCES THAT FLATTENED THE WORLD 53 tion was brought about by separate evolutions: The phone network evolved from the desire of people to talk to each other over long distances . The fax machine evolved as a way to transmit written communication over the phone network. The PC was diffused by the original killer apps-spreadsheets and word processing. And Windows evolved out of the need to make all of this usable, and programmable, by the masses.) The first IBM PC hit the markets in 1981. At the same time, many computer scientists around the world had started using these things called the Internet and e-mail. The first version of the Windows operating system shipped in 1985, and the real breakthrough version that made PCs truly user-friendly-Windows 3.0-shipped on May 22, 1990, only six months after the wall went down. In this sane time period, some people other than scientists started to discover that if they bought a PC and a dial-up modem, they could connect their PCs to their telephones and send e-mails through private Internet service providers-like CompuServe and America Online. "The diffusion of personal computers, fax machines, Windows, and dial-up modems connected to a global telephone network all came together in the late 1980s and early 1990s to create the basic platform that started the global information revolution," argued Craig J. Mundie, the chief technology officer for Microsoft. The key was the melding of them all together into a single interoperable system. That happened, said Mundie, once we had in crude form a standardized computing platform -the IBM PC-along with a standardized graphical user interface for word processing and spreadsheets-Windows-along with a standardized tool for communication-dial-up modems and the global phone network. Once we had that basic interoperable platform, then the killer applications drove its diffusion far and wide. "People found that they really liked doing all these things on a computer , and they really improved productivity," said Mundie. "They all had broad individual appeal and made individual people get up and buy a Windows-enabled PC and put it on their desk, and that forced the diffusion of this new platform into the world of corporate computing even more. People said, Wow, there is an asset here, and we should take advantage of it."'

to become familiar with the PC in their own languages." 'T'his was all new and exciting, but we shouldn't forget how constricted this early PC-Windows-modem platform was. "This platform was constrained by too many architectural limits," said Mundie. "There was missing infrastructure." The Internet as we know it today-with seemingly magical transmission protocols that can connect everyone and everything -had not yet emerged. Back then, networks had only very basic protocols for exchanging files and e-mail messages. So people who were using computers with the same type of operating systems and software could exchange documents through e-mail or file transfers, but even doing this was tricky enough that only the computing elite took the trouble. You couldn't just sit down and zap an e-mail or a file to anyone anywhere-especially outside your own company or outside your own Internet service-the way you can today. Yes, AOL users could communicate with CompuServe users, but it was neither simple nor reliable. As a result, said Mundie, a huge amount of data and creativity was accumulating in all those computers , but there was no easy, interoperable way to share it and mold it. People could write new applications that allowed selected systems to work together, but in general this was limited to planned exchanges between PCs within the network of a single company. This period from 11/9 to the mid-1990s still led to a huge advance in personal empowerment, even if networks were limited. It was the age of "Me and my machine can now talk to each other better and faster, so that I personally can do more tasks" and the age of "Me and my machine can now talk to a few friends and ..ERR, COD:3..

THE TEN FORCES THAT FI,A'I'TENED 'l'HE WORLD 55 had ever been - but the age of seamless global communication had not dawned. Though we didn't notice it, there was a discordant note in this exciting new era. It wasn't only Americans and Europeans who joined the people of the Soviet Empire in celebrating the fall of the wall-and claming credit for it. Someone else was raising a glass-not of champagne but of thick 'T'urkish coffee. His name was Osama bin Laden and lie had a different narrative. His view was that it was the jihadi fighters in Afghanistan, of which he was one, who had brought down the Soviet Empire by forcing the Red Army to withdraw from Afghanistan (with some help from U.S. and Pakistani forces). And once that mission had been accomplished- the Soviets completed their pullout from Afghanistan on February 15, 1989, just nine months before the fall of the Berlin Wall-bin Laden looked around and found that the other superpower, the United States, had a huge presence in his own native land, Saudi Arabia, the home of the two holiest cities in Islam. And he did not like it. So, while we were dancing on the wall and opening up our Windows and proclaiming that there was no ideological alternative left to free- market capitalism, bin Laden was turning his All the years of socialism and controls had taken us downhill to

56 THE WORLD IS FLAT FLATTENER #2 8/9/95 When Netscape Went Public B y the mid-1990s, the PC-Windows network revolution had reached its limits. If the world was going to become really interconnected, and really start to flatten out, the revolution needed to go to the next phase. And the next phase, notes Microsoft's Mundie, "was to go from a PC-based computing platfornm to an Internet-based platform." The killer applications that drove this new phase were e-mail and Internet browsing. E-mail was being driven by the rapidly expanding consumer portals like AOL, CompuServe, and eventually MSN. But it was the new killer app, the Web browser-which could retrieve documents or Web pages stored on Internet Web sites and display them on any computer screen - that really captured the imagination. The actual concept of the World Wide Web-a system for creating, organizing, and linking documents so they could be easily browsed -was created by British computer scientist Tim Berners-Lee. He put up the first Web site in 1991, in an effort to foster a computer network that would enable scientists to easily share their research. Other scientists and academics had created a number of browsers to surf this early Web, but the first mainstream browser-and the whole culture of Web browsing for the general public-was created by a tiny start-up company in Mountain View, California, called Netscape. Netscape went public on August 9, 1995, and the world has not been the same since. As John Doerr, the legendary venture capitalist whose firm Kleiner Perkins Caulfield & Byers had backed Netscape, put it, "The Netscape IPO was a clarion call to the world to wake up to the Internet. Until then, it had been the province of the early adopters and geeks." This Netscape-triggered phase drove the flattening process in several key ways: It gave us the first broadly popular commercial browser to surf the Internet. The Netscape browser not only brought the Internet alive but also made the Internet accessible to everyone from five-year-olds to eighty-five-year-olds. The more alive the Internet became, the more consumers wanted to do different things on the Web, so the more they de-

THE TEN FORCES THAT FLATTENED THE WORLD 57 manded computers, software, and telecommunications networks that could easily digitize words, music, data, and photos and transport them on the Internet to anyone else's computer. This demand was satisfied by another catalytic event: the rollout of Windows 95, which shipped the week after Netscape took its stock public. Windows 95 would soon become the operating system used by most people worldwide, and unlike previous versions of Windows, it was equipped with built-in Internet support , so that not just browsers but all PC applications could "know about the Internet" and interact with it. Looking back, what enabled Netscape to take off was the existence, from the earlier phase, of millions of PCs, many already equipped with modems. Those are the shoulders Netscape stood on. What Netscape did was bring a new killer app-the browser-to this installed base of PCs, making the computer and its connectivity inherently more useful for millions of people. This in turn set off an explosion in demand for all things digital and sparked the Internet boom, because every investor looked at the Internet and concluded that if everything was going to be digitized-data, inventories, commerce, books, music, photos, and entertainment -and transported and sold on the Internet, then the demand for Internet-based products and services would be infinite. This led to the dot-corn stock bubble and a massive overinvestment in the fiber-optic cable needed to carry all the new digital information. This development , in turn, wired the whole world together, and, without anyone really planning it, made Bangalore a suburb of Boston. Let's look at each one of these developments. W hen I sat down with Jim Barksdale, the former Netscape CEO, to interview him for this book, I explained to him that one of the early chapters was about the ten innovations, events, and trends that had flattened the world. The first event, I told him, was 11/9, and I explained the significance of that date. Then I said, "Let me see if you can guess the significance of the second date, 8/9." That was all I told him: 8/9. It took Barksdale only a second to ponder that before shooting back with the right answer: "The day Netscape went public!"

58 THE WORLD IS FLAT Few would argue that Barksdale is one of the great American entrepreneurs . He helped Federal Express develop its package tracking and tracing system, then moved over to McCaw Cellular, the mobile phone company, built that up, and oversaw its merger with AT&T in 1994. Just before the sale closed, he was approached by a headhunter to become the CEO of a new company called Mosaic Communications, forged by two now-legendary innovators-Jim Clark and Marc Andreessen. In mid-1994, Clark, the founder of Silicon Graphics, had joined forces with Andreessen to found Mosaic, which would quickly be renamed Netscape Communications. Andreessen, a brilliant young computer scientist, had just spearheaded a small software project at the National Center for Supercomputing Applications (NCSA), based at the University of Illinois, that developed the first really effective Web browser, also called Mosaic. Clark and Andreessen quickly understood the huge potential for Web- browsing software and decided to partner up to commercialize it. As Netscape began to grow, they reached out to Barksdale for guidance and insight into how best to go public. Today we take this browser technology for granted, but it was actually one of the most important inventions in modern history. When Anclreessen was back at the University of Illinois NCSA lab, lie found that he had PCs, workstations, and the basic network connectivity to move files around the Internet, but it was still not very exciting-because there was nothing to browse with, no user interface to pull up and display the contents of other people's Web sites. So Andreessen and his team developed the Mosaic browser, making Web sites viewable for any idiot, scientist, student, or grandma. Marc Andreessen did not invent the Internet, but he did as much as any single person to bring it alive and popularize it. "The Mosaic browser started out in 1993 with twelve users, and I knew all twelve," said Andreessen. There were only about fifty Web sites at the time and they were mostly just single Web pages. "Mosaic," he explained , "was funded by the National Science Foundation. The money wasn't actually allocated to build Mosaic. Our specific group was to build software that would enable scientists to use supercomputers that were in remote locations, and to connect to them by the NSF network. So we built [the first browsers as] software tools to enable researchers to

THE TEN FORCES THAT FLATTENED THE WORLD 59 `browse' each other's research. I looked at it as a positive feedback loop: The more people had the browser, the more people would want to be interconnected , and the more incentive there would be to create content and applications and tools. Once that kind of thing gets started, it just takes off and virtually nothing can stop it. When you are developing it, you are not sure anyone is going to use it, but once it started we realized that if anyone is going to use it everyone is going to use it, and the only question then was how fast it would spread and what would be the barriers along the way." Indeed, everyone who tried the browser, including Barksdale, had the same initial reaction: Wow! "Every summer, Fortune magazine had an article about the twenty-five coolest companies around," Barksdale recalled . "That year [1994] Mosaic was one of them. I not only had read about Clark and Andreessen but had turned to my wife and said, `Honey, this a great idea.' And then just a few weeks later I get this call from the headhunter. So I went down and spoke to Doerr and Jim Clark, and I began using the beta version of the Mosaic browser. I became more and more intrigued the more I used it." Since the late 1980s, people had been putting up databases with Internet access. Barksdale said that after speaking to Doerr and Clark, he went home, gathered his three children around his computer, and asked them each to suggest a topic lie could browse the Internet for-and wowed them by coming up with something for each of them. "That convinced me," said Barksdale. "So I called back the headhunter and said, `I'm your man."' Netscape's first commercial browser-which could work on an IBM PC, an Apple Macintosh, or a Unix computer-was released in December 1994, and within a year it completely dominated the market. You could download Netscape for free if you were in education or a nonprofit. If you were an individual, you could evaluate the software for free to your heart's content and buy it on disk if you wanted it. If you were a company, you could evaluate the software for ninety days. "The underlying rationale ," said Andreessen, "was: If you can afford to pay for it, please do so. If not, use it anyway." Why? Because all the free usage stimulated a massive growth in the network, which was valuable to all the paying customers . It worked.

60 THE WORLD IS FLAT "We put up the Netscape browser," said Barksdale, "and people were downloading it for three-month trials. I've never seen volume like this. For big businesses and government it was allowing them to connect and unlock all their information, and the point-and-click system that Marc Andreessen invented allowed mere mortals to use it, not just scientists. And that made it a true revolution. And we said, "This thing will just grow and grow and grow."' Nothing did stop it, and that is why Netscape played another hugely important flattening role: It helped make the Internet truly inter- operable. You will recall that in the Berlin Wall-PC-Windows phase, individuals who had e-mail and companies that had internal e-mail could not connect very far. The first Cisco Internet router, in fact, was built by a husband and wife at Stanford who wanted to exchange e-mail; one was working off a mainframe and the other on a PC, and they couldn't connect . "The corporate networks at the time were proprietary and disconnected from each other," said Andreessen. "Each one had its own formats, data protocols, and different ways of doing content. So there were all these islands of information out there that were disconnected. And as the Internet emerged as a public, commercial venture, there was a real danger that it would emerge in the same disconnected way." Joe in the accounting department would get on his office PC and try to get the latest sales numbers for 1995, but he couldn't do that because the sales department was on a different system from the one accounting was using. It was as if one was speaking German and the other French. And then Joe would say, "Get me the latest shipment information from Goodyear on what tires they have sent us," and he would find that Goodyear was using a different system altogether, and the dealer in Topeka was running yet another system. Then Joe would go home and find his seventh-grader on the World Wide Web researching a term paper , using open protocols, and looking at the holdings of some art museum in France. And Joe would say, "This is crazy. There has to be one totally interconnected network."

TIII'; TEN FORCES THAT I'LA'l'1'FNFI) THE WORLD 61 In the years before the Internet became commercial, explained Andreessen, scientists developed a series of "open protocols" meant to make everyone's e-mail system or university computer network connect seamlessly with everyone else's-to ensure that no one had some special advantage. These mathematical-based protocols, which enable digital devices to talk to each other, were like magical pipes that, once you adopted them for your network, made you compatible with everyone else, no matter what kind of computer they were running. These protocols were (and still are) known by their alphabet soup names: mainly F"I'P, H'ITP, SSL, SMTP, POP, and TCP/IP. Together, they form a system for transporting data around the Internet in a relatively secure manner , no matter what network your company or household has or what computer or cell phone or handheld device you are using. Each protocol had a different function: TCP/IP was the basic plumbing of the Internet, or the basic railroad tracks, on which everything else above it was built and moved around. FIT moved files; SMTP and POP moved e-mail messages, which became standardized, so that they could be written and read on different e-mail systems. HTML, was a language that allowed even ordinary people to author Web pages that anyone with a Web browser could display. But it was the introduction of H'ITP to move H'l'ML documents around that gave birth to the World Wide Web as we know it. Finally, as people began to use these Web pages for electronic commerce, SSL was created to provide security for Web-based transactions. As browsing and the Internet in general grew, Netscape wanted to make sure that Microsoft, with its huge market dominance, would not be able to shift these Web protocols from open to proprietary standards that only Microsoft's servers would be able to handle. "Netscape helped to guarantee that these open protocols would not be proprietary by commercializing them for the public," said Andreessen. "Netscape came along not only with the browser but with a family of software products that implemented all these open standards so that the scientists could communicate with each other no matter what system they were on-a Cray supercomputer , a Macintosh, or a PC. Netscape was able to provide a real reason for everyone to say, I want to be on open standards for everything I do and for

I am not going to sign up to 'our walled garden anymore. I am only going to stay with you if you interconnect to the Internet with these open protocols."' Netscape began pushing these open standards through the sale of its browsers, and the public responded enthusiastically. Sun started to do the same with its servers, and Microsoft started to do the same with Windows 95, considering browsing so critical that it famously built its own browser directly into Windows with the addition of Internet Explorer. Each realized that the public, which suddenly could not get enough of e-mail and browsing, wanted the Internet companies to work together and create one interoperable network. They wanted companies to compete with each other over different applications, that is, over what consumers could do once they were on the Internet-not over how they got on the Internet in the first place. As a result, after quite a few "format wars" among the big companies, by the late 1990s the Internet computing platform became seamlessly integrated. Soon anyone was able to connect with anyone else anywhere on any machine. It turned out that the value of compatibility was much higher for everyone than the value of trying to maintain your own little walled network. This integration was a huge flattener, because it enabled so many more people to get connected with so many more other people. There was no shortage of skeptics at the time, who said that none of this would work because it was all too complicated, recalled Andreessen. "You had to go out and get a PC and a dial-up modem. The skeptics all said, 'It takes people a long time to change their habits and learn a new technology.' [But] people did it very quickly, and ten years later there were eight hundred million people on the Internet." The reason? "People will change their habits quickly when they have a strong reason to do so, and people have an innate urge to connect with other people,"

THE TEN FORCES THAT FLATTENED THE WORLD 63 said Andreessen. "And when you give people a new way to connect with other people, they will punch through any technical barrier, they will learn new languages-people are wired to want to connect with other people and they find it objectionable not to be able to. That is what Netscape unlocked." As Joel Cawley, IBM's vice president of corporate strategy, put it, "Netscape created a standard around how data would be transported and rendered on the screen that was so simple and compelling that anyone and everyone could innovate on top of it. It quickly scaled around the world and to everyone from kids to corporations." In the summer of 1995, Barksdale and his Netscape colleagues went on an old-fashioned road show with their investment bankers from Morgan Stanley to try to entice investors around the country to buy Netscape stock once it went public. "When we went out on the road," said Barksdale, "Morgan Stanley said the stock could sell for as high as $14. But after the road show got going, they were getting such demand for the stock, they decided to double the opening price to $28. The last afternoon before the offering, we were all in Maryland. It was our last stop. We had this caravan of black limousines. We looked like some kind of Mafia group. We needed to be in touch with Morgan Stanley [headquarters], but we were somewhere where our cell phones didn't work. So we pulled into these two filling stations across from each other, all these black limos, to use the phones. We called up Morgan Stanley, and they said, `We're thinking of bringing it out at $31.' I said, `No, let's keep it at $28,' because I wanted people to remember it as a $20 stock, not a $30 stock, just in case it didn't go so well. So then the next morning I get on the conference call and the thing opened at $71. It closed the day at $56, exactly twice the price I set." Netscape eventually fell victim to overwhelming (and, the courts decided , monopolistic) competitive pressure from Microsoft. Microsoft's decision to give away its browser, Internet Explorer, as part of its dominant Windows operating system, combined with its ability to throw more programmers at Web browsing than Netscape, led to the increasing slippage of Netscape's market share. In the end, Netscape was sold for $10 billion to AOL, which never did much with it. But though Netscape may

64 THE WORLD IS FLAT have been only a shooting star in commercial terms, what a star it was, and what a trail it left. "We were profitable almost from the start," said Barksdale. "Netscape was not a dot-com. We did not participate in the clot-com bubble. We started the dot-com bubble." And what a bubble bubble it was. "Netscape going public stimulated a lot of things," said Barksdale. "The technologists loved the new technology things it could do, and the businesspeople and regular folks got excited about how much money they could make. People saw all those young kids making money out of this and said, `If those young kids can do this and make all that money, I can too.' Greed can be a bad thing-folks thought they could make a lot of money without a lot of work. It certainly led to a degree of overinvestment , putting it mildly. Every sillier and sillier idea got funded." What was it that stimulated investors to believe that demand for Internet usage and Internet related products would be infinite? The short answer is digitization. Once the PC-Windows revolution demonstrated to everyone the value of being able to digitize information and manipulate it on computers and word processors, and once the browser brought the Internet alive and made Web pages sing and dance and display , everyone wanted everything digitized as much as possible so they could send it to someone else down the Internet pipes. Thus began the digitization revolution. Digitization is that magic process by which words, music, data, films, files, and pictures are turned into bits and bytes-combinations of Is and Os-that can be manipulated on a computer screen, stored on a microprocessor, or transmitted over satellites and fiber-optic lines. It used to he the post office was where I went to send my mail, but once the Internet came alive, I wanted my mail digitized so I could e-mail it. Photography used to be a cumbersome process involving film coated with silver dug up from mines halfway across the world. I used to take some pictures with my camera, then bring the film to the drugstore to be sent off to a big plant somewhere for processing. But once the Internet made it possible to send pictures around the world,

THE TEN FORCES THAT FLATTENED THE WORLD 65 attached to or in e-mails, I didn't want to use silver film anymore. I wanted to take pictures in the digital format, which could be uploaded, not developed. (And by the way, I didn't want to be confined to using a camera to take them. I wanted to be able to use my cell phone to do it.) I used to have to go to Barnes & Noble to buy and browse books, but once the Internet came alive, I wanted to browse for books digitally on Amazon.com as well. I used to go to the library to do research, but now I wanted to do it digitally through Google or Yahoo!, not just by roaming the stacks. I used to buy a CD to listen to Simon and Garfunkel-CDs had already replaced albums as a form of digitized music-hut once the Internet came alive, I wanted those music bits to be even more malleable and mobile. I wanted to be able to download them into an iPod. In recent years the digitization technology evolved so I could do just that. Well, as investors watched this mad rush to digitize everything, they said to themselves, "Holy cow. If everyone wants all this stuff digitized and turned into bits and transmitted over the Internet, the demand for Web service companies and the demand for fiber-optic cables to handle all this digitized stuff around the world is going to be limitless! You cannot lose if you invest in this!" And thus was the bubble born. Overinvestment is not necessarily a bad thing-provided that it is eventually corrected. I'll always remember a news conference that Microsoft chairman Bill Gates held at the 1999 World Economic Forum in Davos, at the height of the tech bubble. Over and over again, Gates was bombarded by reporters with versions of the question, "Mr. Gates, these Internet stocks, they're a bubble, right? Surely they're a bubble. They must be a bubble?" Finally an exasperated Gates said to the reporters something to the effect of, "Look, you bozos, of course they're a bubble, but you're all missing the point. This bubble is attracting so much new capital to this Internet industry, it is going to drive innovation faster and faster." Gates compared the Internet to the gold rush, the idea being that more money was made selling Levi's, picks, shovels, and hotel rooms to the gold diggers than from digging up gold from the earth. Gates was right: Booms and bubbles may be economically dangerous; they may end up with many people losing money and a lot of companies

66 THE; WORLD IS FLAT going bankrupt. But they also often do drive innovation faster and faster, and the sheer overcapacity that they spur-whether it is in railroad lines or automobiles-can create its own unintended positive consequences. That is what happened with the Internet stock boom. It sparked a huge overinvestment in fiber-optic cable companies, which then laid massive amounts of fiber-optic cable on land and under the oceans, which dramatically drove down the cost of making a phone call or transmitting data anywhere in the world. The first commercial installation of a fiber-optic system was in 1977, after which fiber slowly began to replace copper telephone wires, because it could carry data and digitized voices much farther and faster in larger quantities. According to Howstuffworks.com, fiber optics are made up of strands of optically pure glass each "as thin as a human hair," which are arranged in bundles, called "optical cables," to carry digitized packets of information over long distances. Because these optical fibers are so much thinner than copper wires, more fibers can be bundled into a given diameter of cable than can copper wires, which means that much more data or many more voices can be sent over the same cable at a lower cost. The most important benefit of fiber, though, derives from the dramatically higher bandwidth of the signals it can transport over long distances. Copper wires can carry very high frequencies too, but only for a few feet before the signal starts to degrade in strength due to certain parasitic effects. Optical fibers, by contrast, can carry very high-frequency optical pulses on the same individual fiber without substantial signal degradation for many, many miles. The way fiber-optic cables work, explains one of the manufacturers, ARC Electronics, on its Web site, is by converting data or voices into light pulses and then transmitting them down fiber lines, instead of using electronic pulses to transmit information down copper lines. At one end of the fiber-optic system is a transmitter. The transmitter accepts coded electronic pulse information -words or data-corning from copper wire out of your home telephone or office computer. The transmitter then processes and translates those digitized, electronically coded words or data into equivalently coded light pulses. A light-emitting diode (LED)

THE TEN FORCES THAT FLATTENED THE WORLD 67 or an injection-laser diode (ILD) can be used to generate the light pulses, which are then funneled down the fiber-optic cable. The cable functions as a kind of light guide, guiding the light pulses introduced at one end of the cable through to the other end, where a light-sensitive receiver converts the pulses back into the electronic digital is and Os of the original signal, so they can then show up on your computer screen as e-mail or in your cell phone as a voice. Fiber-optic cable is also ideal for secure communications , because it is very difficult to tap. It was actually the coincidence of the dot-coin boom and the Telecommunications Act of 1996 that launched the fiber-optic bubble. The act allowed local and long-distance companies to get into each other's businesses, and enabled all sorts of new local exchange carriers to compete head-to-head with the Baby Bells and AT&T in providing both phone services and infrastructure. As these new phone companies came online, offering their own local, long-distance, international, data, and Internet services, each sought to have its own infrastructure. And why not? The Internet boom led everyone to assume that the demand for bandwidth to carry all that Internet traffic would double every three months-indefinitely. For about two years that was true. But then the law of large numbers started to kick in, and the pace of doubling slowed. Unfortunately, the telecom companies weren't paying close attention to the developing mismatch between demand and reality. The market was in the grip of an Internet fever, and companies just kept building more and more capacity. And the stock market boom meant money was free! It was a party! So every one of these incredibly optimistic scenarios from every one of these new telecom companies got funded. In a period of about five or six years, these telecom companies invested about $1 trillion in wiring the world. And virtually no one questioned the demand projections. Few companies got crazier than Global Crossing, one of the companies hired by all these new telecoms to lay fiber-optic cable for them around the world. Global Crossing was founded in 1997 by Gary Winnick and went public the next year. Robert Annunziata, who lasted only a year as CFO, had a contract that the Corporate Library's Nell Minow once

... Everyone thought this was a new world, and it would never stop. You had] competitive firms using free capital, and everyone thought the pie would expand infinitely. So [each company said,] `I will put my fiber down before you do, and I will get a bigger share than you.' It was supposed to be just a vertical growth line, straight up, and we each thought we would get our share, so everybody built to the max projections and assumed that they would get their share." It turned out that while business-to-business and c-commerce developed as projected, and a lot of Web sites that no one anticipated exploded -like eBay, Amazon, and Google-they still devoured only a fraction of the capacity that was being made available. So when the dot- com bust came along, there was just way too much fiber-optic cable out there. Long-distance phone rates went from $2 a minute to 10¢. And the transmission of data was virtually free. "The telecom industry has invested itself right out of a business," Mike McCue, chief operations officer of Tellme Networks, a voice-activated Internet service, told CNET News.com in June 2001. "They've laid so much fiber in the ground that they've basically commoditized themselves. They are going to get into massive price wars with everyone and it's going to be a disaster." It was a disaster for many of the companies and their investors (Global Crossing filed for bankruptcy in January 2002, with $12.4 billion in debt), but it turned out to be a great boon for consumers. Just as the naTHE

TEN FORCES THAT FLATTENED THE WORLD 69 tional highway system that was built in the 1950s flattened the United States, broke down regional differences, and made it so much easier for companies to relocate in lower-wage regions, like the South, because it had become so much easier to move people and goods long distances, so the laying of global fiber highways flattened the developed world. It helped to break down global regionalism, create a more seamless global commercial network, and made it simple and almost free to move digitized labor-service jobs and knowledge work-to lower-cost countries. (It should be noted, though, that those fiber highways in America tended to stop at the last mile-before connecting to households. While a huge amount of long-distance fiber cable was laid to connect India and America, virtually none of these new U.S. telecom companies laid any substantial new local loop infrastructure, due to a failure of the 1996 tele- com deregulation act to permit real competition in the local loop between the cable companies and the telephone companies. Where the local broadband did get installed was in office buildings, which were al- read), pretty well served by the old companies. So this pushed prices down for businesses-and for Indians who wanted to get online from Bangalore to do business with those businesses-but it didn't create the sort of competition that could bring cheap broadband capability to the American masses in their homes. That has started happening only more recently.) The broad overinvestment in fiber cable is a gift that keeps on giving, thanks to the unique nature of fiber optics. Unlike other forms of Internet overinvestment, it was permanent: Once the fiber cables were laid, no one was going to dig them up and thereby eliminate the overcapacity. So when the telecom companies went bankrupt, the banks took them over and then sold their fiber cables for ten cents on the dollar to new companies, which continued to operate them, which they could do profitably , having bought them in a fire sale. But the way fiber cable works is that each cable has multiple strands of fiber in it with a potential capacity to transmit many terabits of data per second on each strand. When these fiber cables were originally laid, the optical switches-the transmitters and receivers-at each end of them could not take full advantage of the fiber's full capacity. But every year since then, the optical switches

70 'iiiE WORLI) IS FLAT at each end of that fiber cable have gotten better and better, meaning that more and more voices and data can be transmitted down each fiber. So as the switches keep improving, the capacity of all the already installed fiber cables just keeps growing, making it cheaper and easier to transmit voices and data every year to any part of the world. It is as though we laid down a national highway system where people were first allowed to drive 50 mph, then 60 mph, then 70 mph, then 80 mph, then eventually 150 mph on the same highways without any fear of accidents. Only this highway wasn't just national. It was international. "Every layer of innovation gets built on the next," said Andreessen, who went on from Netscape to start another high-tech firm, Opsware Inc. "And today the most profound thing to me is the fact that a fourteen- year-old in Romania or Bangalore or the Soviet Union or Vietnam has all the information, all the tools, all the software easily available to apply knowledge however they want. That is why I am sure the next Napster is going to come out of left field. As bioscience becomes more computational and less about wet labs, and as all the genomic data becomes easily available on the Internet, at some point you will be able to design vaccines on your laptop." I think Andreessen touches on what is unique about the flat world and the era of Globalization 3.0. It is going to be driven by groups and individuals , but of a much more diverse background than those twelve scientists who made up Andreessen's world when lie created Mosaic. Now we are going to see the real human mosaic emerge-from all over the world, from left field and right field, from West and East and North and South -to drive the next generation of innovation. Indeed, a few days after Andreessen and I talked, the following headline appeared on the front page of The New York Times (Jule 15, 2004): "U.S. Permits 3 Cancer Drugs from Cuba." The story went on to say, "The federal government is permitting a California biotechnology company to license three experimental cancer drugs from Cuba-making an exception to the policy of tightly restricting trade with that country." Executives of the company, CancerVex, said that "it was the first time an American biotechnology company had obtained permission to license a drug from Cuba, a country that some industry executives and scientists say is surprisingly strong in

More than $1 billion was spent over the years to build and operate research institutes on the west side of Havana staffed by Cuban scientists, many of them educated in Europe." Just to summarize again: The PC-Windows flattening phase was about me interacting with my computer and me interacting with my own limited network inside my own company. Then came along this Internet-e-mail-browser phase, and it flattened the earth a little hit more. It was about me and my computer interacting with anyone anywhere on any machine, which is what e-mail is all about, and me and my computer interacting with anybody's Web site on the Internet, which is what browsing is all about. In short, the PC-Windows phase begat the Netscape browsing-e-nail phase and the two together enabled more people to communicate and interact with more other people anywhere on the planet than ever before. But the fun was just beginning. This phase was just the foundation for the next step in flattening the flat world. FLATTENER #3 WORK FLOW SOFTWARE Let's Do Lunch: Have Your Application Talk to My Application I met Scott Hyten, the CEO of Wild Brain, a cutting-edge animation studio in San Francisco that produces films and cartoons for Disney and other major studios, at a meeting in Silicon Valley in the winter of 2004. I had been invited by John Doerr, the venture capitalist, to test out the ideas in this book to a few of the companies that he was backing. Hyten and I really hit it off, maybe because after hearing my arguments he wrote one an e-mail that said, "I am sure in Magellan's time there were plenty of theologians, geographers, and pundits who wanted to make the world flat again. I know the world is flat, and thank you for your support." A man after my own heart.

72 THh: WORLD IS FLAT When I asked him to elaborate, Hyten sketched out for me how animated films are produced today through a global supply chain. I understood immediately why he too had concluded that the world is flat. "At Wild Brain," he said, "we make something out of nothing. We learn how to take advantage of the flat world. We are not fighting it. We are taking advantage of it." Hyten invited me to come and watch them produce a cartoon segment to really appreciate how flat the world is, which I did. The series they were working on when I showed up was for the Disney Channel and called Higghtown Heroes. It was inspired by all the ordinary people who rose to the challenge of 9/11. Higglytown "is the typical 1950s small town," said Hyten. "It is Pleasantville. And we are exporting the production of this American small town around the world-literally and figuratively . The foundation of the story is that every person, all the ordinary people living their lives, are the heroes in this small town-from the schoolteacher to the pizza delivery man." This all-American show is being produced by an all-world supply chain. "The recording session," explained Hyten, "is located near the artist, usually in New York or L.A., the design and direction is done in San Francisco, the writers network in from their homes (Florida, London, New York, Chicago, L.A., and San Francisco), and the animation of the characters is done in Bangalore with edits from San Francisco. For this show we have eight teams in Bangalore working in parallel with eight different writers. This efficiency has allowed its to contract with fifty `stars' for the twenty-six episodes. These interactive recording/writing/ animation sessions allow its to record an artist for an entire show in less than half a day, including unlimited takes and rewrites. We record two actors per week. For example, last week we recorded Anne Heche and Smokey Robinson. Technically, we do this over the Internet. We have a VPN [virtual private network configured on computers in our offices and on what we call writers' `footballs,' or special laptop computers that can connect over any cat-5 Ethernet connection or wireless broadband connection in the `field.' This VPN allows us to share the feed from the microphone, images from the session, the real-time script, and all the animation designs amongst all the locations with a simple log-in. There-

THE TEN FORCES THAT FLATTENED THE WORLD 73 fore, one way for you to observe is for us to ship you a football. You connect at home, the office, most hotel rooms, or go down to your local Starbucks [which has wireless broadband Internet access], log on, put on a pair of Bose noise-reduction headphones, and listen, watch, read, and comment. 'Sharon, can you sell that line a little more?' Then, over the eleven-week production schedule for the show, you can log in twenty-four hours a day and check the progress of the production as it follows the sun around the world. Technically, you need the 'football' only for the session. You can use your regular laptop to follow the 'dailies' and 'edits' over the production cycle." I needed to see Wild Brain firsthand, because it is a graphic example of the next layer of innovation, and the next flattener, that broadly followed on the Berlin Wall-Windows and Netscape phases. I call this the "work flow phase." When the walls went down, and the PC, Windows, and Netscape browser enabled people to connect with other people as never before, it did not take long before all these people who were connecting wanted to do more than just browse and send e-mail, instant messages, pictures, and music over this Internet platform. They wanted to shape things, design things, create things, sell things, buy things, keep track of inventories, do somebody else's taxes, and read somebody else's X-rays from half a world away. And they wanted to be able to do any of these things from anywhere to anywhere and from any computer to any computer-seamlessly. The wall-Windows-Netscape phases paved the way for that by standardizing the ways words, music, pictures, and data would be digitized and transported on the Internet-so e-mail and browsing became a very rich experience. But for all of us to go to the next stage, to get more out of the Internet, the flattening process had to go another notch. We needed two things. We needed programmers to come along and write new applications-new software-that would enable us really to get the maximum from our computers as we worked with these digitized data, words, music, and pictures and shaped them into products. We also needed more magic pipes, more transmissions protocols, that would ensure that everyone's software applications could connect with everyone else's software applications . In short, we had to go from an Internet that just connected peo-

74 THE WORLD IS FLAT pie to people, and people to their own applications, to an Internet that could connect any of my software programs to any of your software programs . Only then could we really work together. Think of it this way: In the beginning, work flow consisted of your sales department taking an order on paper, walking it over to your shipping department, which shipped the product, and then someone from shipping walking over to billing with a piece of paper and instructing them to churn out an invoice to the customer. took a huge leap forward. Now your sales department could electronically take that order, e-mail it to the shipping department within your own company, and then have the shipping department send out the product to the customer and automatically spit out a bill at the same time. The fact that all the departments within your company were seamlessly interoperable and that work could flow between them was a great boost to productivity-hut this could happen only if all your company's departments were using the same software and hardware systems. More often than not, back in the 1980s and early 1990s, a company's sales department was running Microsoft and the inventory department was running Novell, and they could not communicate with each other. So work did not flow as easily as it should. We often forget that the software industry started out like a bad fire department. Imagine a city where every neighborhood had a different interface for connecting the fire hose to the hydrant. Everything was fine as long as your neighborhood fire department could handle your fire. But when a fire became too big, and the fire engines from the next neighborhood had to be called in, they were useless because they could not connect their hoses to your hydrants. For the world to get flat, all your internal departments-sales, marketing , manufacturing, billing, and inventory-had to become interoperable , no matter what machines or software each of them was running. And for the world to get really flat, all your systems had to ..ERR, COD:1..

THE TEN FORCES THAT FLATTENED THE WORLD 75 made a sale, an item was automatically shipped from your supplier's warehouse, and another item was automatically manufactured by your supplier's supplier, and a bill was generated from your billing department . The disparate computer systems and software applications of three distinctly different companies had to he seamlessly interoperable so that work could flow between them. In the late 1990s, the software industry began to respond to what its consumers wanted. Technology companies, through much backroom wrangling and trial and error, started to forge more common Web-based standards, more integrated digital plumbing and protocols, so that anyone could fit his hose-his software applications-onto anyone else's hydrant. This was a quiet revolution. Technically, what made it possible was the development of a new data description language, called XML, and its related transport protocol, called SOAP. IBM, Microsoft, and a host of other companies contributed to the development of both XML and SOAP, and both were subsequently ratified and popularized as the Internet standards. XML and SOAP created the technical foundation for software program-to-software program interaction, which was the foundation for Web-enabled work flow. They enabled digitized data, words, music, and photos to be exchanged between diverse software programs so that they could be shaped, designed, manipulated, edited, reedited, stored, published, and transported-without any regard to where people are physically sitting or what computing devices they are connecting through. Once this technical foundation was in place, more and more people started writing work flow software programs for more and more different tasks. Wild Brain wanted programs to make animated films with a production team spread out around the world. Boeing wanted them so that its airplane factories in America could constantly resupply different airline customers with parts, through its computer ordering systems, no matter what country those orders came from. Doctors wanted them so that an X-ray taken in Bangor could be read in a hospital in Bangalore, without the doctor in Maine ever having to think about what computers that Indian hospital had. And Mom and Dad wanted them because they wanted their e-banking software, e-hrokerage software, office e-mail, and

76 THE WORLD IS FLAT spreadsheet software to all work off their home laptop and he able to interface with their office desktop. And once everyone's applications started to connect to everyone else's applications-which took several years and lot of technology and brainpower to make happen-work could not only flow like never before, but it could be chopped up and disaggregatcd like never before and sent to the four corners of the world. This meant that work could flow anywhere. Indeed, it was the ability to enable applications to speak to applications, not just people to speak to people, that would soon make outsourcing possible. Thanks to different kinds of Web services-work flow, said Craig Mundie, Microsoft's chief technology officer, "the industry created a global platform for a global workforce of people and computers." The vast network of underground plumbing that made it possible for all this work to flow has become quite extensive. It includes all the Internet protocols of the previous era, like TCP/IP and others, which made browsing and e-mail and Web sites possible. It includes newer tools, like XML and SOAP, which enabled Web applications to communicate with each other more seamlessly, and it includes software agents known as middleware, which serves as an intermediary between wildly diverse applications. The nexus of these technologies has been a huge boon to innovation and a huge reducer of friction between companies and applications . Instead of everyone trying to control the fire hydrant nozzle, they made all the nozzles and hoses the same, creating a much bigger market that stretched across every neighborhood of the world. Then companies started to compete instead over the quality of the hose, the pump, and the fire truck. That is, they competed over who could make the most useful and nifty applications. Said Joel Cawley, the head of IBM's strategic planning unit, "Standards don't eliminate innovation, they just allow you to focus it. They allow you to focus on where the real value lies, which is usually everything you can add above and around the standard." I found this out writing my last book. Once Microsoft Word got established as the global standard, work could flow between people on different continents much more easily, because we were all writing off the same screen with the same basic toolbar. When I was working on my first book, From Beinit to Jenisalem, in 1988, 1 spent part of my year's leave in

the German version of Word. But by 1998, I was so familiar with the Word for Windows writing program, and where the various on-screen icons were, that I was able to point and click my way through the editing on the German version and type my corrections with the English letters on the German keyboard. Shared standards are a huge flattener, because they both force and empower more people to communicate and innovate over much wider platforms. Another of my favorite examples of this is PayPal, which enabled eBay's e-commerce bazaar to become what it is today. PayPal is a money transfer system founded in 1998 to facilitate C2C (customer-to-customer) transactions, like a buyer and seller brought together by eBay. According to the Web site eoommerce-guide.com, using PayPal, anyone with an e-mail address can send money to anyone else with an e-mail address, whether the recipient has a PayPal account or not. PayPal doesn't even care whether a commercial transaction is taking place. If someone in the office is organizing a party for someone else and everyone needs to chip in, they can all do it using PayPal. In fact, the organizer can send everyone PayPal reminders by e-mail with clear instructions as to how to pay up. PayPal can accept money from the purchaser in one of three ways, notes eoommerce-guide.com: charging the purchaser's credit card for any transactions (payments), debiting a checking account for any payments, or deducting payments from a PayPal account established with a personal check. Payment recipients can use the money in their account for online purchases or payments, can receive the payment from PayPal by check, or can have PayPal directly deposit the money into a checking account. Setting up a PayPal account is simple. As a payer, all you have to do is to provide your name, your e-mail address, your credit card information, and your billing address for your credit card. All of these interoperable banking and e-commerce functions flat-

78 THE WORLD IS F LA'I' tened the Internet marketplace so radically that even eBav was taken by surprise. Before PayPal, explained eBav CEO Meg Whitman, "If I did business on eBay in 1999, the only way I could pay you as a buyer was with a check or money order, a paper-based system. There was no electronic way to send money, and you were too small a merchant to qualify for a credit card account. What PayPal did was enable people, individuals , to accept credit cards. I could pay you as an individual seller on eBav with a credit card. This really leveled the playing field and made commerce more frictionless." In fact, it was so good that eBav bought PavPal, but not on the recommendation of its Wall Street investment bankers- on the recommendation of its users. "We woke up one day," said Whitman, "and found out that 20 percent of the people on eBay were saying, `I accept PayPal, please pay me that way.' And we said, `Who are these people and what are they It is the best acquisition we ever made." Here's how I just wrote the above section: I transferred nny notes from the Meg Whitman phone interview from my Dell laptop to my Dell desktop, then fired up my DSL connection and double-clicked on AOL, where I used Google to find a Web site that could explain PayPal, which directed me to ecommerce-guide.com. I downloaded the definition from the ecommerce-guide.com Web site, which was written in some Internet font as a text file, and then called it up on Microsoft Word, which automatically transformed it into a Word document, which I could then use to write this section on my desktop. That is also work flow! And what is most important about it is not that I have these work flow tools; it is how many people in India, Russia, China, Brazil, and Timbuktu now have them as well-along with all the transmission pipes and protocols so they too can plug and play from anywhere.

THE TEN FORCES THAT FLATTENED THE WORLD 79 Where is all this going? More and more work flow will be automated. In the coming phase of Web services-work flow, here is how you will make a dentist appointment: You will instruct your computer by voice to make an appointment. Your computer will automatically translate your voice into a digital instruction. It will automatically check your calendar against the available dates on your dentist's calendar and offer you three choices. You will click on the preferred date and hour. The week before your appointment, your dentist's calendar will automatically send you an e-mail reminding you of the appointment. The night before, you will get a computer-generated voice message by phone, also reminding of your appointment. For work flow to reach this next stage, and the productivity enhancements it will deliver, "we need more and more common standards," said IBM's strategic planner Cawley. "The first round of standards to emerge with the Internet were around basic data -how do you represent a number , how do you organize files, how do you display and store content, and how do you share and exchange information. That was the Netscape phase. Now a whole new set of standards is emerging to enable work flow. These are standards about how we do business work together. For example, when you apply for a mortgage, go to your closing, or buy a house, there are literally dozens of processes and data flows among many different companies. One bank may handle securing your approval, checking your credit, establishing your interest rates, and handling the closing-after which the loan almost immediately is sold to a different bank." The next level of standards, added Cawley, will be about automating all these processes, so they flow even more seamlessly together and can stimulate even more standards. We are already seeing standards emerging around payroll, e-commerce payment, and risk profiling, around how music and photos are digitally edited, and, most important, around how supply chains are connected. All of these standards, on top of the work flow software, help enable work to be broken apart, reassembled, and made to flow, without friction, back and forth between the most efficient producers. The diversity of applications that will automatically be able to interact with each other will be limited only by our imaginations.

80 TILE WORLD IS FLAT The gains in productivity from this could he bigger than anything we have ever seen before. "Work flow platforms are enabling us to do for the service industry what Henry Ford did for manufacturing," said Jerry Rao, the entrepreneur doing accounting work for Americans from India. "We are taking apart each task and sending it around to whomever can do it best, and because we are doing it in a virtual environment, people need not be physically adjacent to each other, and then we are reassembling all the pieces back together at headquarters [or some other remote site]. This is not a trivial revolution. This is a major one. It allows for a boss to he somewhere and his employees to be someplace else." These work flow software platforms, Jerry added, "enable you to create virtual global offices-not limited by either the boundaries of your office or your country-and to access talent sitting in different parts of the world and have them complete tasks that you need completed in real time. And so 24/7/365 we are all working. And all this has happened in the twinkling of an eye-the span of the last two or three years." Genesis: The Flat World Platform Emerges W e need to stop here and take stock, because at this point-the mid-1990s-the platform for the flattening of the world has started to emerge. First, the falling walls, the opening of Windows, the digitization of content, and the spreading of the Internet browser seamlessly connected people with people as never before. Then work flow software seamlessly connected applications to applications, so that people could manipulate all their digitized content, using computers and the Internet, as never before. When you add this unprecedented new level of people-to-people communication to all these Web-based application-to-application work flow programs, you end up with a whole new global platform for multiple forms of collaboration. This is the Genesis moment for the flattening of the world. This is when it started to take shape. It would take more time to converge and really become flat, but this is the moment when people started to feel that something was changing. Suddenly more people from

THE TEN FORCES THAT FLATTENED THE WORLD 81 more different places found that they could collaborate with more other people on more different kinds of work and share more different kinds of knowledge than ever before. "It is the creation of this platform, with these unique attributes, that is the truly important sustainable breakthrough that made what you call the flattening of the world possible," said Microsoft's Craig Mundie. Indeed, thanks to this platform that emerged from the first three flatterers , we were not just able to talk to each other more, we were able to do more things together. This is the key point, argued Joel Cawley, the IBM strategist. "We were not just communicating with each other more than ever, we were now able to collaborate-to build coalitions, projects, and products together-more than ever." The next six flatteners represent the new forms of collaboration which this new platform empowered. As I show, some people will use this platform for open-sourcing, some for outsourcing, some for offshoring, some for supply-chaining, some for insourcing, and some for in-forming. Each of these forms of collaboration was either made possible by the new platform or greatly enhanced by it. And as more and more of us learn how to collaborate in these different ways, we are flattening the world even more. FLATTENER #4 OPEN-SOURCING Self-Organizing Collaborative Communities A lam Cohen still remembers the first time he heard the word "Apache" as an adult, and it wasn't while watching a cowboys-and- Indians movie. It was the 1990s, the dot-com market was booming, and he was a senior manager for IBM, helping to oversee its emerging e-commerce business. "I had a whole team with me and a budget of about $8 million," Cohen recalled. "We were competing head-to-head with Microsoft, Netscape, Oracle, Sun-all the big boys. And we were

"Now you have to remember, back then Microsoft, IBM, Oracle, Netscape were all trying to build commercial Web servers. These were huge companies. And suddenly my development guy is telling me that he's getting ours off the Internet for free! It's like you had all these big corporate executives plotting strategies, and then suddenly the guys in the mail room are in charge. I kept asking, `Who runs Apache? I mean, who are these guys?"' Yes, the geeks in the mail room are deciding what software they will be using and what you will be using too. It's called the open-source movement, and it involves thousands of people around the world coming together online to collaborate in writing everything from their own software to their own operating systems to their own dictionary to their own recipe for cola-building always from the bottom up rather than accepting formats or content imposed by corporate hierarchies from the top down. The word "open-source" comes from the notion that companies or ad hoc groups would make available online the source code-the underlying programming instructions that make a piece of software work-and then let anyone who has something to contribute improve it and let millions of others just download it for their own use for free. While commercial software is copyrighted and sold, and companies guard the source code as they would their crown jewels so they can charge money to anyone who wants to use it and thereby generate income to develop new versions, open-

THE TEN FORCES THAT FLATTLNED THE WORLD 83 source software is shared, constantly improved by its users, and made available for free to anyone. In return, every user who comes up with an improvenment -a patch that makes this software sing or dance better-is encouraged to make that patch available to every other user for free. Not being a computer geek, I had never focused much on the open- source movement, but when I did, I discovered it was an amazing universe of its own, with communities of online, come-as-you-are volunteers who share their insights with one another and then offer it to the public for nothing. They do it because they want something the market doesn't offer them; they do it for the psychic buzz that comes from creating a collective product that can beat something produced by giants like Microsoft or IBM, and-even more important-to earn the respect of their intellectual peers. Indeed, these guys and gals are one of the most interesting and controversial new forms of collaboration that have been facilitated by the flat world and are flattening it even more. In order to explain how this form of collaboration works, why it is a flattener and why, by the way, it has stirred so many controversies and will he stirring even more in the future, I am going to focus on just two basic varieties of open-sourcing: the intellectual commons movement and the free software movement. The intellectual commons form of open-sourcing has its roots in the academic and scientific communities, where for a long time self-organized collaborative communities of scientists have come together through private networks and later the Internet to pool their brainpower or share insights around a particular science or math problem. The Apache Web server had its roots in this form of open-sourcing. When I asked a friend of mine, Mike Arguello, an IT systems architect, to explain to me why people share knowledge or work in this way, he said, "IT people tend to be very bright people and they want everybody to know just how brilliant they are." Marc Andreessen, who invented the first Web browser, agreed: "Open-source is nothing more than peer-reviewed science. Sometimes people contribute to these things because they make science, and they discover things, and the reward is reputation. Sometimes you can build a business out of it, sometimes they just want to increase the store

84 'í'11E WORLD IS FIAT of knowledge in the world. And the peer review part is critical-and open-source is peer review. Every bug or security hole or deviation from standards is reviewed." I found this intellectual commons form of open-sourcing I graduated in 1991, but in 1989, in the early days of the Internet, a friend gave me a copy of a program he had downloaded onto a floppy disk, called `Fractint.' It was not pirated, but was freeware, produced by a group of programmers, and was a program for drawing fractals. [Fractals are beautiful images produced at the intersection of art and math.] When the program started up, the screen would show this scrolling list of e-mail addresses for all the scientists and mathematicians who contributed to it. I noticed that the source code was included with the program . This was my first exposure to the concept of open-source. Here was this program that you just downloaded for free, and they even gave you the source code with it, and it was clone by a community of people. It

THE TEN FORCES THAT FLATTENED THE WORLD 85 started to paint a different picture of programming in my mind. I started to think that there were some interesting social dynamics to the way certain kinds of software were written or could be written-as opposed to the kind of image I had of the professional software developer in the back office tending to the mainframe, feeding info in and taking it out for the business. That seemed to me to be just one step above accounting and not very exciting." After graduating in 1991, Behlendorf went to Berkeley to study physics, but he quickly became frustrated by the disconnect between the abstractions he was learning in the classroom and the excitement that was starting to emerge on the Internet. "When you entered college back then, every student was given an e-mail address, and I started using it to talk to students and explore discussion boards that were starting to appear around music," said Behlendorf . "In 1992, I started my own Internet mailing list focused on the local electronic music scene in the Bay Area. People could just post onto the discussion board, and it started to grow, and we started to discuss differcnt music events and DJs. Then we said, `Hey, why don't we invite our own DJs and throw our own events?' It became a collective thing. Someone would say, `I have some records,' and someone else would say, `I have a sound system,' and someone else would say, `I know the beach and if we showed up at midnight we could have a party.' By 1993, the Internet was still just mailing lists and e-mail and FTP sites [file transfer protocol repositories where you could store things]. So I started collecting an archive of electronic music and was interested in how we could put this online and make it available to a larger audience. That was when I heard about Mosaic [the Web browser developed by Marc Andreessen.] So I got a job at the computer lab in the Berkeley business school, and I spent my spare time researching Mosaic and other Web technologies. That led me to a discussion board with a lot of the people who were writing the first generation of Web browsers and Web servers." (A Web server is a software program that enables anyone to use his or her home or office computer to host a Web site on the World Wide Web. Amazon.com, for instance, has long run its Web site on Apache software.

It was one of the first ad-supported online magazines." HotWired decided it wanted to start by having a registration system that required passwords-a controversial concept at that time. "In those days," noted Andrew Leonard, who wrote a history of Apache for Salon.com in 1997, "most Webmasters depended on a Web server program developed at the University of Illinois's National Center for Super- computing Applications (also the birthplace of the groundbreaking Mosaic Web browser). But the NCSA Web server couldn't handle password authentication on the scale that HotWired needed. Luckily, the NCSA server was in the public domain, which meant that the source code was free to all comers. So Behlendorf exercised the hacker prerogative : He wrote some new code, a `patch' to the NCSA Web server, that took care of the problem." Leonard commented, "He wasn't the only clever programmer rummaging through the NCSA code that winter. All across the exploding Web, other Webmasters were finding it necessary to take matters into their own keyboards. The original code had been left to gather virtual dust when its primary programmer, University of Illinois student Rob McCool, had been scooped up (along with Marc Andreessen and Lynx author Eric Bina) by a little-known company in Silicon Valley named Netscape. Meanwhile, the Web refused to stop growing-and

And we said, `Why don't we take our future into our own hands and release our own [Web server] version that incorporated all our patches?' "We looked up the copyright for the NCSA code, and it basically just said give us credit at Illinois for what we invented if you improve it-and don't blame us if it breaks," recalled Behlendorf. "So we started building our own version from all our patches. None of us had time to be a fulltime Web server developer, but we thought if we could combine our time and do it in a public way, we could create something better than we could buy off the shelf-and nothing was available then, anyway. This was all before Netscape had shipped its first commercial Web server. That was the beginning of the Apache project." By February 1999, they had completely rewritten the original NCSA program and formalized their cooperation under the name "Apache." "I picked the name because I wanted it to have a positive connotation of being assertive," said Behlendorf. "The Apache tribe was the last tribe

88 THE WORLD IS FLAT to surrender to the oncoming U.S. government, and at the time we worried that the big companies would come in and `civilize' the landscape that the early Internet engineers built. So 'Apache' made sense to me as a good code name, and others said it also would make a good pun"-as in the APAtCHy server, because they were patching all these fixes together. So in many ways, Bellendorf and his open-source colleagues-most of whom he had never met but knew only by e-mail through their open- source chat room-had created a virtual, online, bottom-up software factory , which no one owned and no one supervised. "We had a software project, but So you might have `read access' to the repository but not `commit access' to change things. When someone makes a commit to the repository, that patch file gets e-mailed out to all the other developers , and so you get this peer review system after the fact, and if there is something wrong, you fix the bug." So how does this community decide who are trusted members? "For Apache," said Behlendorf, "we started with eight people who really trusted each other, and as new people showed up at the discussion forum and offered patch files posted to the discussion form, we would

THE TEN FORCES THAT FI.A'I'TENED THE WORLD 89 gain trust in others, and that eight grew to over one thousand. We were the first open-source project to get attention from the business community and get the hacking from IBM." Because of Apache's proficiency at allowing a single-server machine to host thousands of different virtual Web sites-music, data, text, pornography- it began to have "a commanding share of the Internet Service Provider market," noted Salon's Leonard. IBM was trying to sell its own proprietary Web server, called GO, but it gained only a tiny sliver of the market. Apache proved to be both a better technology and free. So IBM eventually decided that if it could not beat Apache, it should join Apache. You have to stop here and imagine this. The world's biggest computer company decided that its engineers could not best the work of an ad hoc open-source collection of geeks, so they threw out their own technology and decided to go with the geeks! IBM "initiated contact with me, as I had a somewhat public speaker role for Apache," said Behlendorf. "IBM said, `We would like to figure out how we can use [Apache] and not get flamed by the Internet community , [how we can] make it sustainable and not just be ripping people off but contributing to the process . . .' IBM was saying that this new model for software development was trustworthy and valuable, so let's invest in it and get rid of the one that we are trying to make on our own, which isn't as good." John Swainson was the senior IBM executive who led the team that approached Apache (he's now chairman of Computer Associates). He picked up the story: "There was a whole debate going on at the time about open-source, but it was all over the place. We decided we could deal with the Apache guys because they answered our questions. We could hold a meaningful conversation with these guys, and we were able to create the [nonprofit] Apache Software Foundation and work out all the issues." At IBM's expense, its lawyers worked with the Apache group to create a legal framework around it so that there would be no copyright or liability problems for companies, like IBM, that wanted to build applications on top of Apache and charge money for them. IBM saw the value in having a standard vanilla Web server architecture-which allowed

90 THE WORLD IS FLAT heterogeneous computer systems and devices to talk to each other, displaying e-mail and Web pages in a standard format-that was constantly being improved for free by an open-source community The Apache collaborators did not set out to make free software. They set out to solve a common problem-Web serving-and found that collaborating for free in this open-source manner was the best way to assemble the best brains for the job they needed done. "When we started working with Apache, there was an apache.org Web site but no formal legal structure, and businesses and informal structures don't coexist well," said Swainson. "You need to be able to vet the code, sign an agreement, and deal with liability issues. [Today] anybody can download the Apache code. The only obligation is that they acknowledge that it came from the site, and if they make any changes that they share them hack." There is an Apache development process that manages the traffic, and you earn your way into that process, added Swainson. It is something like a pure meritocracy. When IBM started using Apache, it became part of the community and started making contributions . Indeed, the one thing the Apache people demanded in return for their collaboration with IBM was that IBM assign its best engineers to join the Apache open-source group and contribute, like everyone else, for free. "The Apache people were not interested in payment of cash," said Swainson. "They wanted contribution to the base. Our engineers came to us and said, "These guys who do Apache are good and they are insisting that we contribute good people.' At first they rejected some of what we contributed. They said it wasn't up to their standards! The compensation that the community expected was our best contribution." On June 22, 1998, IBM announced plans to incorporate Apache into its own new Web server product, named WebSphere. The way the Apache collaborative community organized itself, whatever you took out of Apache's code and improved on, you had to give back to the whole community. But you were also free to go out and build a patented commercial product on top of the Apache code, as IBM did, provided that you included a copyright citation to Apache in your own patent. In other words, this intellectual commons approach to open-sourcing encourTHE

TEN FORCES THAT FLATTENED THE WORLD 91 aged people to build commercial products on top of it. While it wanted the foundation to be free and open to all, it recognized that it would remain strong and fresh if both commercial and noncommercial engineers had an incentive to participate. Today Apache is one of the most successful open-source tools, powering about two-thirds of the Web sites in the world. And because Apache can he downloaded for free anywhere in the world, people from Russia to South Africa to Vietnam use it to create Web sites. Those individuals who need or want added capabilities for their Web servers can buy products like WebSphere, which attach right on top of Apache. At the time, selling a product built on top of an open-source program was a risky move on IBM's part. To its credit, IBM was confident in its ability to keep producing differentiated software applications on top of the Apache vanilla. This model has since been widely adopted, after everyone saw how it propelled IBM's Web server business to commercial leadership in that category of software, generating huge amounts of revenue. As I will repeat often in this book: There is no future in vanilla for most companies in a flat world. A lot of vanilla making in software and other areas is going to shift to open-source communities. For most corn- panies, the commercial future belongs to those who know how to make the richest chocolate sauce, the sweetest, lightest whipped cream, and the juiciest cherries to sit on top, or how to put them all together into a sundae. Jack Messman, chairman of the Novell software company, which has now become a big distributor of Linux, the open-source operating system, atop which Novell attaches gizmos to make it sing and dance just for your company, put it best: "Commercial software companies have to start operating further up the [software] stack to differentiate themselves. The open source community is basically focusing on infrastructure " (Financial Times, June 14, 2004). The IBM deal was a real watershed. Big Blue was saying that it believed in the open-source model and that with the Apache Web server, this open-source community of engineers had created something that was not just useful and valuable but "best in its class." That's why the open-source movement has become a powerful flattener, the effects of which we are just beginning to see. "It is incredibly empowering of indi-

92 THE WORLD IS FLAT viduals," Brian Behlendorf said. "It doesn't matter where you come from or where you are-someone in India and South America can be just as effective using this software or contributing to it as someone in Silicon Valley." The old model is winner take all: I wrote it, I own it-the standard software license model. "The only way to compete against that," concluded Behlendorf, "is to all become winners." Behlendorf, for his part, is betting his career that more and more people and companies will want to take advantage of the new flat-world platform to do open-source innovation. In 2004, he started a new company called CollabNet to promote the use of open-sourcing as a tool to drive software innovation within companies. "Our premise is that software is not gold, it is lettuce-it is a perishable good," explained Behlendorf. "If the software is not in a place where it is getting improved over time, it will rot." What the open-source community has been doing, said Behlendorf, is globally coordinated distributed software development , where it is constantly freshening the lettuce so that it never goes rotten. Behlendorf's premise is that the open-source community developed a better method for creating and constantly updating software. CollabNet is a company created to bring the best open-source techniques to a closed community, i.e., a commercial software company. "CollabNet is an arms dealer to the forces flattening the world," said Behlendorf. "Our role in this world is to build the tools and infrastructure so that an individual-in India, China, or wherever-as a consultant , an employee, or just someone sitting at home can collaborate. We are giving them the toolkit for decentralized collaborative development. We are enabling bottom-up development, and not just in cyberspace .. . We have large corporations who are now interested in creating a bottom- up environment for writing software. The old top-down, silo software model is broken. That system said, `I develop something and then I throw it over the wall to you. You find the bugs and then throw it back. I patch it and then sell a new version.' There is constant frustration with getting software that is buggy-maybe it will get fixed or maybe not. So we said, `Wouldn't it be interesting if we could take the open-source benefits of speed of innovation and higher-quality software, and that feel-

THE TEN FORCES THAT FLATTENED THE WORLD 93 ing of partnership 93 ing of partnership with all these stakeholders, and turn that into a business model for corporations to be more collaborative both within and without?, " I like the way Irving Wladawsky-Berger, IBM's Cuban-born vice president for technical strategy and innovation, summed open-sourcing up: "This emerging era is characterized by the collaborative innovation of many people working in gifted communities, just as innovation in the industrial era was characterized by individual genius." T he striking thing about the intellectual commons form of opensourcing is how quickly it has morphed into other spheres and spawned other self-organizing collaborative communities, which are flattening hierarchies in their areas. I see this most vividly in the news profession , where bloggers, one-person online commentators, who often link to one another depending on their ideology, have created a kind of open-source newsroom. I now read bloggers (the term comes from the word "Weblog") as part of my daily information-gathering routine. In an article about how a tine group of relatively obscure news bloggers were able to blow the whistle that exposed the bogus documents used by CBS News's Dan Rather in his infamous report about President George W. Bush's Air National Guard service, Howard Kurtz of The Washington Post wrote (September 20, 2004), "It was like throwing a match on kerosene-soaked wood. The ensuing blaze ripped through the media establishment as previously obscure bloggers managed to put the network of Murrow and Cronkite firmly on the defensive. The secret, says Charles Johnson, is `open-source intelligence gathering.' Meaning: `We've got a huge pool of highly motivated people who go out there and use tools to find stuff. We've got an army of citizen journalists out there."' That army is often armed with nothing more than a tape recorder, a camera-enabled cell phone, and a Web site, but in a flat world it can collectively get its voice heard as far and wide as CBS or The New York Times. These bloggers have created their own online commons, with no barriers to entry. That open commons often has many rumors and wild

94 THE VORLD IS FIAT allegations swirling in it. Because no one is in charge, standards of practice vary wildly, and some of it is downright irresponsible. But because no one is in charge, information flows with total freedom. And when this community is on to something real, like the Rather episode, it can create as much energy, buzz, and hard news as any network or major newspaper . Another intellectual commons collaboration that I used regularly in writing this book is Wikipedia, the user-contributed online encyclopedia , also known as "the people's encyclopedia." The word "wikis" is taken from the Hawaiian word for "quick." Wikis are Web sites that allow users to directly edit any Web page on their own from their home computer. In a May 5, 2004, essay on YaleGlobal online, Andrew Lih, an assistant professor at the Journalism and Media Studies Centre at the University of Hong Kong, explained how Wikipedia works and why it is such a breakthrough . "The Wikipedia project was started by Jimmy Wales, head of Internet startup Bomis.com, after his original project for a volunteer, but strictly controlled, free encyclopedia ran out of money and resources after two years," wrote Lih. "Editors with PhD degrees were at the helm of the project then, but it produced only a few hundred articles. Not wanting the content to languish, Wales placed the pages on a wiki Website in January 2001 and invited any Internet visitors to edit or add to the collection . The site became a runaway success in the first year and gained a loyal following, generating over 20,000 articles and spawning over a dozen language translations. After two years, it had 100,000 articles, and in April 2004, it exceeded 250,000 articles in English and 600,000 articles in 50 other languages. And according to Vebsite rankings at Alexa.com, it has become more popular than traditional online encyclopedias such as Britannica.com." How, you might ask, does one produce a credible, balanced encyclopedia by way of an ad hoc open-source, open-editing movement? After all, every article in the Wikipedia has an "Edit this page" button, allowing anyone who surfs along to add or delete content on that page. It starts with the fact, Lih explained, that "because wikis provide the

According to Wikipedia's guidelines , `The neutral point of view attempts to present ideas and facts in such a fashion that both supporters and opponents can agree . . .' As a result, articles on contentious issues such as globalization have benefited from the cooperative and global nature of Wikipedia. Over the last two years, the entry has had more than 90 edits by contributors from the Netherlands, Belgium, Sweden, United Kingdom, Australia, Brazil, United States, Malaysia, Japan and China. It provides a manifold view of issues from the World Trade Organization and multinational corporations to the anti-globalization movement and threats to cultural diversity. At the same time malicious contributors are kept in check because vandalism is easily undone. Users dedicated to fixing vandalism watch the list of recent changes, fixing problems within minutes, if not seconds. A defaced article can quickly he returned to an acceptable version with just one click of a button. ']'his crucial asymmetry tips the balance in favor of productive and cooperative members of the wiki community, allowing quality content to prevail." A Newsweek piece on Wikipedia (November 1, 2004) quoted Angela Beesley, a volunteer contributor from Essex, England , and self-confessed Wikipedia addict who monitors the accuracy of more than one thousand entries: "A collaborative encyclopedia sounds like a crazy idea, but it naturally controls itself." Meanwhile, Jimmy Wales is just getting started. He told Newsweek that he is expanding into Wiktionary, a dictionary and thesaurus; Wikihooks, textbooks and manuals; and Wikiquote, a book of quotations. He said he has one simple goal: to give "every single person free access to the sum of all human knowledge."

96 TIIL WORLD IS FLAT Wales's ethic that everyone should have free access to all human knowledge is undoubtedly heartfelt, but it also brings us to the controversial side of open-source: If everyone contributes his or her intellectual capital for free, where will the resources for new innovation come from? And won't we end up in endless legal wrangles over which part of any innovation was made by the community for free, and meant to stay that way, and which part was added on by some company for profit and has to be paid for so that the company can make money to drive further innovation? These questions are all triggered by the other increasingly popular form of self-organized collaboration-the free software movement. According to the openknowledge.org Web site, "The free/open source software movement began in the `hacker' culture of U.S. computer science laboratories (Stanford, Berkeley, Carnegie Mellon, and MIT) in the 1960's and 1970's. The community of programmers was small, and close-knit. Code passed back and forth between the members of the community-if you made an improvement you were expected to submit your code to the community of developers. 'Ib withhold code was considered gauche-after all, you benefited from the work of your friends, you should return the favor." The free software movement, however, was and remains inspired by the ethical ideal that software should be free and available to all, and it relies on open-source collaboration to help produce the best software possible to be distributed for free. This a bit different from the approach of the intellectual commons folks, like Apache. They saw open-sourcing as a technically superior means of creating software and other innovations , and while Apache was made available to all for free, it had no problem with commercial software being built on top of it. The Apache group allowed anyone who created a derivative work to own it himself, provided he acknowledge the Apache contribution. The primary goal of the free software movement, however, is to get as many people as possible writing, improving, and distributing software for free, out of a conviction that this will empower everyone and free individuals from the grip of global corporations. Generally speaking, the free

THE TEN FORCES THAT FLATTENED THE WORLD 97 software movement structures its licenses so that if your commercial software draws directly from their free software copyright, they want your software to be free too. In 1984, according to Wikipedia, an MIT researcher and one of these ex-hackers, Richard Stallman, launched the "free software movement" along with an effort to build a free operating system called GNU. To promote free software, and to ensure that its code would always be freely modifiable and available to all, Stallman founded the Free Software Foundation and something called the GNU General Public License (GPL). The GPL specified that users of the source code could copy, change, or upgrade the code, provided that they made their changes available under the sane license as the original code. In 1991, a student at the University of Helsinki named Linus Torvalds, building off of Stallman's initiative, posted his Linux operating system to compete with the Microsoft Windows operating system and invited other engineers and geeks online to try to improve it-for free. Since `Ibrvalds's initial post, programmers all over the world have manipulated, added to, expanded , patched, and improved the GNU/Linux operating system, whose license says anyone can download the source code and improve upon it but then must make the upgraded version freely available to everybody else. Tbrvalds insists that Linux must always be free. Companies that sell software improvements that enhance Linux or adapt it to certain functions have to be very careful not to touch its copyright in their commercial products. Much like Microsoft Windows, Linux offers a family of operating systems that can be adapted to run on the smallest desktop computers, laptops , PalmPilots, and even wristwatches, all the way up to the largest supercomputers and mainframes. So a kid in India with a cheap PC can learn the inner workings of the sane operating system that is running in some of the largest data centers of corporate America. Linux has an army of developers across the globe working to make it better. As I was working on this segment of the book, I went to a picnic one afternoon at the Virginia country home of Pamela and Malcolm Baldwin, whom my wife came to know through her membership on the board of World Learning, an educational NGO. I mentioned in the course of lunch that I was

If you hate shelling out $350 for Microsoft Office or $600 for Adobe Photoshop, OpenOffice.org and the Gimp are surprisingly high-quality free alternatives." Big companies like Google, E'Trade, and Amazon, by combining Intel-based commodity server components and the Linux operating system, have been able dramatically to cut their technology spending-and get more control over their software. Why would so many people be ready to write software that would be given away for free? Partly it is out of the pure scientific challenge, which should never be underestimated. Partly it is because they all hate Micro-

THE TEN FORCES THAT FLATTENED THE WORLD 115 subsidized energy, and lower health-care costs. Just as Y2K took India and the world to a whole new level of outsourcing, China's joining the WTO took Beijing and the world to a whole new level of offshoring-with more companies shifting production offshore and then integrating it into their global supply chains. In 1977, Chinese leader Deng Xiaoping put China on the road to capitalism, declaring later that "to get rich is glorious." When China first opened its tightly closed economy, companies in industrialized countries saw it as an incredible new market for exports. Every- Western or Asian manufacturer dreamed of selling its equivalent of 1 billion pairs of underwear to a single market. Some foreign companies set up shop in China to do just that. But because China was not subject to world trade rules, it was able to restrict the penetration into its market by these Western companies through various trade and investment barriers. And when it was not doing that deliberately, the sheer bureaucratic and cultural difficulties of doing business in China had the same effect. Many of the pioneer investors in China lost their shirts and pants and undenvearand with China's Wild West legal system there was not much recourse. Beginning in the 1980s, many investors, particularly overseas Chinese who knew how to operate in China, started to say, "Well, if we can't sell that many things to the Chinese right now, why don't we use China's disciplined labor pool to make things there and sell them abroad?" This dovetailed with the interests of China's leaders. China wanted to attract foreign manufacturers and their technologies-not simply to manufacture 1 billion pairs of underwear for sale in China but to use low-wage Chinese labor to also sell 6 billion pairs of underwear to everyone else in the world, and at prices that were a fraction of what the underwear companies in Europe or America or even Mexico were charging. Once that offshoring process began in a range of industries-from textiles to consumer electronics to furniture to eyeglass frames to auto parts-the only way other companies could compete was by offshoring to China as well (taking advantage of its low-cost, high-quality platform), or by looking for alternative manufacturing centers in Eastern Europe, the Caribbean, or somewhere else in the developing world.

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472 ACKOwLEllG11EVFS ident of the Indian technology company Wipro, really took me inside the business of the flat world and deciphered it all for me-time and time again. Joel Cawley, the head of IBM's strategic planning team, helped me connect so many of the clots between technology and business and politics on Planet Flat-connections I never would have made without him. Craig Mundie, chief technology officer of Microsoft, walked me through the technological evolutions that made the flat world possible and helped ensure that in writing about them I would not fall flat on my face. He was a tireless and demanding tutor. Paul Romer, the Stanford University economist who has done so much good work on the new economy, took the time to read the book in draft and brought both his humanity and his intellect to several chapters. Marc Andreessen, one of the cofounders of Netscape; Michael Dell of Dell Inc.; Sir John Rose, chairman of Rolls-Royce; and Bill Gates of Microsoft were very generous in commenting on certain sections. My inventor friend Dan Simpkins was enormously helpful in walking this novice through his complex universe . Michael Sandel's always challenging questions stimulated me to write a whole chapter-"Thc Great Sorting Out." And Yaron Ezrahi, for the fourth book in a row, let ne bounce countless ideas off his razor- sharp mind. '1 he same was true for David Rothkopf. None of them is responsible for any mistakes, only for insights. I am truly in their debt. So many other people shared with me their valuable time and commented on different parts of this book. I want to thank in particular Allen Adamson, Graham Allison, Alex and Jocelyn Attal, Jim Barksdale, Craig Barrett, Brian Behlendorf, Katie Belding, Jagdish Bhagwati, Sergey Brin, Brill Brody, Mitchell Caplan, Bill Carrico, John Chambers, Navan Chanda, Alan Cohen, Maureen Conway, Lances El-Hadidy, Rahm Emanuel, Mike Eskew, Judy Estrin, Diana Farrell, Joel Finkelstein, Cariv Fiorina, Frank Fnkuvama, Jeff Garten, Fadi Ghandour, Bill Greer, Jill Greer, Ken Greer, Promod I laque, Steve Holmes, Dan Honig, Scott Ilyten, Shirley Ann Jackson, P. V. Kannan, Alan Kotz, Gary and Laura Lauder, Robert Lawrence, Jerry Lehrman, Rick Levin, Joshua Levine, Will Marshall, Walt Mossberg, Moisés Naín, David Neeleman, Larry Page, Jim Perkowski, 'T'homas Pickering, Jamie Popkin, Clyde Prestowitz, Glenn Prickett, Saritha Rai, Jerry Rao, Rajesh Rao, Amartva

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THOMAS L. FRIEDMAN THE WORLD IS FLAT A Brief History of the Twenty-first Century Farrar, Straus and Giroux / New York

This adds a fine intellectual edge to a delightfully readable book." -Josef Joffe, The New York Times Book Review "A powerful volume that comes as close as anything we now have to a definition of the real character of the new world order." -Francis Fukuyama, The New Statesman

that inhibits you from doing that is your readiness to make use of this infrastructure. So as different businesses, and as different people, get more comfortable using this infrastructure, you are going to see a huge explosion. It is a matter of five to seven years and we will have a huge batch of excellent English-speaking Chinese graduates

their work: Business ,Monthly; BusinessWeek; City Journal; Discovery Channel 1 Discoccry'I'imes Channel; Education Week, Editorial Projects in Education; l,orbes; New Perspectives Quarterly; The International Finance Corporation / World Bank; YaleGlobal Online Magazine (http://yaleglobal.vale.edu/). Excerpts from articles from The Washington Post are a 2004. Reprinted with permission. Library of Congress Cataloging-in-Publication Data Friedman,'Ihomas L. The world is flat :a brief history of the twenty-first centnrv /'T'homas L. Friedman. -I st ed. p. enl. Includes index. ISBN-13: 978-0-374-29288-1 ISBN-10: 0-374-29288-4 (hardcover : alk. paper) 1. Diffusion ..ERR, COD:1.. ..ERR, COD:1..

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