

DEDICATION

There are quite a few men to thank for inventing the Internet, but there are many women I can thank for supporting me while I wrote this book. Writing a book is never an easy task—emotionally it takes a village. So, I want to acknowledge all of the wonderful women in my life who made this book possible.

A warm, loving thank-you to my mother, Hilda, who is and has always been an extraordinarily strong and loving source of support and encouragement.

A grand celebratory glass of cheer to the bright spirits of my grandmothers, Mary and Sally, who taught me always to endeavor and excel in whatever I choose to do in this life, and to hunker down, dig in, and spring up twice as fast when the going gets tough.

Special thanks to my agent extraordinaire, Margot Maley Hutchison (www.WatersideProductions.com), who is always a contributor to my enthusiasm, success, and coffers.

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And roaring applause to my incredibly unwieldy weekly gathering of women called the Wild Women of Wonder

(WiWoWo), a group of Silicon Valley's greatest women ever and our West Coast version of the Algonquin Round Table (with special thanks to Donna Compton, Sue Cooper, Wahida Fazli, Jennifer Jeffrey, Nicole Kidd, Sylvia Paull, Carla Rayacich, Carol Sands, Loni Reeder, Deb Todd, and Meihong Xu).

And last but not least, to my niece Simonne, who loves her computer and supports her Aunt Sally with much love and wonder—I hope that one day there will be many, many more women engineers, programmers, and physicists who will make magic contributions to the Internet of your future.

With much love and gratitude I thank you all.

ACKNOWLEDGMENTS

Of course, I'd like to take this opportunity to thank all those who helped found the Internet as we know it today: the wildly creative Vannevar Bush (the future as he saw it was the science fiction of his time); the humble J.C.R. "Lick" Licklider; Len Kleinrock; Frank Heart; the intense and very honed Larry Roberts; the tremendously inspirational Doug Englebart; the determined Vint Cerf; Jon Postel (I wish I would have had a chance to have known you; your friends think very fondly of you); the dynamic Bob Kahn; Fred Baker, thank you for your saintly patience; the humanistic Bob Taylor; and the larger than life (and fabulous genius guy) David Farber. Also the ever-illusive, clandestine, and encrypted Ted Nelson; Tim Berners-Lee (wherever you are); Marc Andreessen; and the many, many others who didn't and did take part in this book; but who managed to pull together a fabulous legacy that will surely outlive us all.

Len Kleinrock, you have been especially generous with your time and resources, and an inspiration to me in all of your facets as technologist, realist, and dreamer—thank you!

I'm amazed to see how many of the above-mentioned guys still have skin in the game after decades of creating something so phenomenal—I'm in awe of the new companies, endeavors, and tools of power and imagination you're currently creating. I'm glad you're determined to continue in guiding the Internet's evolution.

Thank you for a space that has no center, no beginning,

and no end. And for the greatest tool of all—the tool to communicate freely with anyone in the world. You have given all of us a tremendous gift that you brought forth from your visions of a better day in technology and brought us something as magic as the Gutenberg press; you guys are a national treasure (make that a World Wide Wonder). You built something more powerful than the atomic bomb, an amazing technology with the power to tear down the boundaries of oppressive governments and prejudice of the human mind to bring the people of the Earth together as one small village having a town meeting; I dare say that this accomplishment should entitle you all to the Nobel Peace Prize. There is a Latin phrase that goes *crede quod habes, et habes*. Translated, it means believe that you have it, and you will have it. Thank you for believing. Now we have *IT* (as in Internet Technology) and we're having a fascinating ride trying to figure out what to do with it. I feel like a mesmerized kid with a wonderful creation every time I boot up. You guys rock!

Merci, Jim Hurd, you are a marvelous networker and truly a catalyst who fosters natural explosions—you were a great help in connecting me to some key people at a very serendipitous time.

Paul Hoffman, associate director Academic Technology Services, UCLA—you are *da bomb!* You managed to pull these chapters from the black holes leading to the netherworld residing on my Mac's hard drive (oh yeah, FYI this book was created—and recreated on a Mac G-4) and put them back into place. Thanks for your 13th-hour skills; your software tools are exquisite!

And Jerome “Jerry” Glenn (United Nations University), thank you for putting all of the pieces in place and tethering this gal's need for greater technology (at any price), and not letting up until it finally got into my head that we need to have humanity rest stops on our Information Highway

Acknowledgments

xiii

(unless we want to end up in one of Philip K. Dick's parallel universes).

Thanks, Larry Kay, for finding that great Branch Rickey quote that I had been looking for—you are a very helpful friend.

And let me not forget, the forehead-smacking (metaphorically speaking) candor of John Perry Barlow. Bruce Damer, you have a great outlook on life, virtual and otherwise. Charles Ostman, thank you for pulling out all of the stops to make time.

I searched high and low for women to participate in this book but unfortunately didn't find very many who would return my calls. So, to the few who did, I treasure your thoughts and comments: the fabulously innovative Judy Estrin, the ever-confident Kim Polese (I'm very happy that you're still with us and creating); and the wonderful humanitarian, Lakshmi Pratury, who is changing—right here and now—the way and rate our children are learning to live in this world.

Thank you to everyone who participated in this book to make it a real story of the future, filled with enthusiasm and tempered with wisdom.

My gratitude is yours,
Sally

PREFACE

NO ABSOLUTES

There are some required lessons for us to learn as we endeavor in this life. One of the most relevant ones to our evolution is that there are no absolutes. Time and time again we move forward, only to get stuck, like a needle in the groove of a scratched 78 record, repeating the past as if it were our future . . . over and over again. These sticking points are usually produced by respected naysayer visionaries producing technology “laws” that are therein set as a standard that is repeated by an ever-present Greek chorus whenever a new technology is even imagined by some enthusiastic entrepreneur. In technology all laws are made to be broken, and we’re lucky that visionary technologists exist who look at them only as challenges instead of boundaries to work within. There are also those visionary investors and organizations with grants that believe in early-stage innovation and reward it with cash, and the clients who will buy in early to the dream. Without these three elements there would be no forward movement in technology.

There are many people who would not have brought this visionary dream of the Internet forth had it not been for the path that Vannevar Bush chose and his pitch of a boundless future where communication and knowledge flowed effortlessly over computer networks. It took government funding from DARPA (the U.S. Defense Advanced Research Projects

Agency) to bring this contributed effort to a reality when the commercial sector wouldn't give it the time of day. *Who loves ya now, baby?*

Naysayers don't have a chance in our future, and I have a serious feeling that even our sacred Moore's Law, which did serve its time well, will be one of those absolutes that we'll be shedding some day soon. There are no absolutes in this life—least of all in technology.

I have a signature line on the bottom of my e-mail that I've had there for about two years. It reads, *I think there is a world market for maybe five computers*, said Thomas Watson, chairman of IBM, 1943, and *Computers in the future may weigh no more than 1.5 tons*. I hear a lot of people making absolutist statements about technology—and especially about their products—all the time, and I think, *Boy, I hope someone wrote that one down*. This is a fabulous time we live in and the only absolute thing is that this industry will look extremely (and wonderfully) different from moment to moment.

In these chaotic times, brilliance is bound to bubble to the top, now that all the rest has settled into the dot-com sediment. What many people don't realize, especially some VCs who are still feeling timid about going back and having to tell their fund's investors how much money they're still losing, is that an entirely new industry is now birthed from this burst bubble—one stronger than we ever imagined. This will be the era people will look back upon in 300 years and say, *Man, I was born too late*.

I was fortunate to have hooked up with the brilliant people who forged a technology from almost nothing but concepts, thousands of miles of cable, a need, and the audaciousness that comes from facing a new age where anything is possible. These guys created a technology that bloomed into an entire industry that changed the world. That is *changing* the world. This distributed technology was built to reroute communication if the

network was damaged; it was vastly different from the telephone system we had in place then, or even have in place now, some 30 years later. It's odd both how much things change—and how much they remain the same.

I recently watched, as did most of America, the World Trade Center towers burst into flames and collapse into rubble live on TV. When I went to alternative news sources on the Internet, I found that there was quite a difference in the news I was receiving. I soon found uncensored accounts from newspeople not regulated by the commercial networks (and their sponsors and network chairmen), people in the know speaking freely, first-person Ground Zero accounts, streaming video . . . lists of the dead and missing. So much of this that was not available from my TV, and moreover it was immediate and interactive. And I certainly wasn't enabled to be interactive with the much-disheveled Peter Jennings.

Not only had the Internet made it over the hurdle of rerouting packets and surviving a national disaster, it was the only real source of news that was being delivered uncensored, and the only reliable communications tool. It was also a place where anyone could write whatever they wanted, so we got a real sense of close-to-the-bone stories from all over the world.

Being a journalist who was contemplating covering the war in Afghanistan, I was also able to rely on encryption software to reach people behind *enemy lines* to find out if there was any chance I could still get inside the country at a time when most communications were in danger of being intercepted and my contact was in danger of being revealed. Was this a bad thing for me to do? In sending the messages was I breaking any U.S. laws? Should the government be looking into my business? Did my business become its business as soon as the messages were encrypted?

Not long before I sent those messages to Afghanistan, I spoke out live on CNN against the Department of Justice's

tactics against Dmitry Sklyrov and its controversial use of the Digital Millennium Copyright Act in jailing the Russian programmer. Not long after September 11, I became acutely aware that I had received a huge number of hits from U.S. government and military agencies, and strangely enough from mideastern countries. One government site hit every single web page and link on my home page; what they didn't know is that I have one hell of a backend on my site that allows me to view what they were doing (sans cookies). Either that, or they just didn't care and wanted to make their presence known. Probably the latter; I'm sure they have random AOL accounts they could use if they wanted to be *really* covert.

I made some calls of my own, and some due diligence was exercised on my behalf. I found that it was at first a random keyword search that had brought attention to my web site and landed me in the hot seat. Sure, I have a lot of controversial commentary on my site, but none that could be considered anything that would incite anti-American activity. Those same random words describing recent terrorist activity would have been found on any news site in the world. Nevertheless, I began to feel pangs of concern over the impending Carnivore legislation, a government program that allows "them" to use a software tool that peruses your e-mail by keyword scanning. Sure, I could put up enough security to even keep hacker Kevin Mitnick out of my web site (which is relatively easy now since he's banned from using the Internet as a condition of his parole, but you can see him in his guest role as an agent on the network show *Alias*) and e-mail. I could put up even more mechanisms to block keyword searches, but why? The more security you throw up on your firewall, the harder it becomes for the people you want to visit your site. But, still . . . you have to wonder if government eyes are the answer.

When I put up my web site several years ago, the last thing on my mind was the issue of government involvement in technology. Frankly speaking, I didn't think the government could afford to hire anyone who could possibly know enough about technology to make any trouble for your ordinary Jane or Joe journalist with a web site—after all, they were competing against dot-com salaries in their heyday. Now there are programmers practically sitting on the corners of Palo Alto's streets with signs: *Will code for food*. I recently photographed a group of entrepreneurs on Sand Hill Road (one of the areas in Palo Alto known for its VCs) for *Newsweek*, who were sporting picket signs asking for funding. Apparently the government agencies that are all chomping at the bit to help legislate technology have suddenly found themselves with very generous budgets due to knee-jerk reaction voting since 9/11.

Regardless, when I'm sitting there posting my random thoughts in the early morning hours, should my thoughts be of what's being added to my dossier? I really don't think so. Will the government censor me? No. Should this much power—actually much more—be given to the government? I remember how much time Mitnick was given for poking around where he didn't belong, I think one needs to decide whether the government should be given the equivalent for its hackers' free-for-all.

Back when the Internet was being developed, many of its creators knew what was about to happen—what a Pandora's box they were opening—and how it would never be shut again. The Internet was developed with government nurturing; it survived due to government-sponsored academic programs; and it withstood all of the curve balls that were thrown at it. Now, the orphan rejected by commercial interests in its infancy and the government that carefully nurtured its growth have come back to *leverage* and *control* the behemoth distrib-

uted Network; the snake without a mouth or tail; the never-ending loop of infinity that has worked just fine without boundaries, legislation, or enforcement. Now that 9/11 has occurred, all of that has changed. The flawed design of the telecom system was pointed out and underlined during this crisis, so you can bet the telephone industries are looking even harder at an Internet Protocol (IP) delivery system. The government is paranoid about how terrorists could use encryption and the Internet to plot havoc.

Personally, I feel that once the people in the government—those who would like to throw as many chains of control as they possibly can around this Pandora's Box—can personally write 500 lines of code and make a simple application work, then they can begin to understand the intricacies of what they're trying to build laws around. Then they can finally begin to write laws; but until then, they sure as hell better get a whole lot of technologists' input to help them out. They are on the outside looking in right now, and they are determining the restraints on technologies yet to even be developed; that, my dears, is the most dangerous proposition of them all.

As soon as the government sees that a technology is a major player—TV, radio, phone—it will try to regulate it. But normally not until the technology has proven itself effective as a tool of mass communication. Regulations—as we're starting to see with the Digital Millennium Copyright Act (DMCA)—have a negative effect on research and free markets. I'm guessing the Internet will probably be the central hub for all of the burgeoning technologies we're seeing right now in favor with VCs: Internet appliances (yes, some are still investing in this after the tremendous failures we've seen), nanotech, biotech, wireless, genotech, electronic "radio" ink. All of the incredibly great stuff to empower you in your everyday world. Powerful lobbyists paid by commercial interests influence government laws, even down to regulations that give the phone company

the right to sell your phone numbers to solicitors or to use them for its own purposes. Or how about your credit information that companies sell that give people the ability to steal your identity? I know of this subject because I myself have been a victim of identity theft and a system that is not easily accessible to change fraudulent information.

Now we have the Internet, where, frankly, much of the value of a user comes from information gathered about that user and the ability of a web site to abstract that info, repackage it, and sell/trade it with other companies.

The laws will change; everything will change. We have a recently appointed head of the FBI, and we saw what happened at DefCon 2001—the arrest of 26-year-old Dmitry Sklyrov and the Department of Justice testing the judicial waters of the Digital Millennium Copyright Act. We are now facing a time when technologists and university professors are being threatened. This is not the world the Internet was created for. I think we're having extreme growing pains and have a long way to go. A very long way, indeed. Thank goodness there are people who are willing to work things out; people who are willing to protect rights that most of the people in America don't even know are in the balance.

I recently called Vermont's U.S. Senator Patrick Leahy for an interview for this book. He was, after all, one of the coauthors of the DMCA legislation. His assistant asked me for a letter explaining what the book was about. I said that I'd be happy to send it via e-mail: she said that their e-mail was not even close to being able to take individual requests that would get through because of the overwhelming amount they receive. So, their e-mail address was rendered useless, and they did not have another for press requests. I said I'd be agreeable to sending it via fax: she said it was the same story with the fax machine. She asked that I send a letter; I stifled a laugh. This was the man who was trying to legislate the Inter-

net and his office could not find a way of effectively using it? This is a telling sign.

We're in a precarious position. We're in a recession where technology refuses to sleep, in a country at war, in a somewhat united land that continues to legislate—even if in a knee-jerk reaction, during a time when entrepreneurs and developers still smile in their dreams. The dot-com boom gave us a wild ride, and I'm glad to say I was there for all of it and got to see it firsthand. It taught us all a lot of lessons about the world and how much it was willing to pay for the privilege of anytime, anywhere, any device. Meanwhile, the porn industry grows; and we found out what people weren't willing to pay for. This is my ode to Webvan—the wonderful people who brought me my groceries when I was under the gun on deadline for months at a time, but who couldn't find a way to keep their costs under control and the majority of their clients satisfied and coming back.

What would I say to the Internet personified? *You've come a long way baby!* What would the Internet say back? *I am still a baby, stop expecting so much—but you just wait until I'm a teenager—I can hardly wait until you give me the keys to the car!*

As I sat in Buck's <www.Buckswoodside.com> working on this book, kibitzing with restaurateur Jamis MacNiven about the deals he is still hearing being pitched to VC friends who have many of their meetings at his Woodside, California haunt (even in today's environment), we continue to ponder how anyone planned to make any money, and how any of us would come out of The Boom's Burst Bubble unscathed. Even as I sit at Buck's writing this book on my laptop in a corner booth, with BBC correspondents Peter Day and Neil Koenig holding a microphone in my face and asking me, "Will Silicon Valley survive?" I never wavered.

We crashed and fell so damn hard. For a while there was more than a month-long waiting list to rent a moving truck

because so many of the bespectacled, 23-year-old, bright and shiny MBA *dot-commas* were headed back home to live with their parents, their dreams shattered, their stock worthless, their houses and posh San Francisco flats on the Marina foreclosed, and their Hummers, Land Rovers, and BMWs repossessed. It's always taken more than a wish and a prayer to make it in this town; that's not ever going to change.

People with money mistook the Internet for a TV—a place to unload countless banners and pop-windows—and they expected them to work! They expected truckloads of money. I cannot tell you how many million-dollar startup parties I attended in the heyday of The Boom. I have a multitude of boxes filled with tee-shirts, baseball hats, keychains, boxer underwear, sunglasses, yo-yos, calculators, watches, glow sticks, lip balm sticks, paperweights, and even condoms with dot-com logos splashed all over them. A load of stuff I'll be able to auction off on eBay in 20 years as the legacy left from the careless spending of The Boom.

I went to a friend's house the other day up in the hills of Woodside. He's close to losing it, but he doesn't fret. He knows there's another deal around the corner. He's smart, and he'll land on his feet. He is a determined technologist who has made it through some cycles before. He had a new piece of furniture—a large piece of driftwood with two layers of glass on top to make a table. Pressed in between the layers are either near-worthless, or not worth the paper they're printed on, stock certificates from the companies he had jumped around from as he developed their technology, got them started, and moved on during the three years of The Boom. There were a lot of companies that I recognized . . . names torn from the dot-com obit pages. He smiled and commented that the wood was probably worth more than the stock, drank in the view of the Valley from his window, inhaled deeply, exhaled a few smoke rings, flicked some ashes into the ashtray

that was balanced on the edge of the table, and smiled. “But, I’ll be back,” he said. I felt as though I was in some bad B-movie; one with an ongoing plot, but bad dialogue. I knew what he meant, and I had no reason to doubt him. Cycles are cycles, and he’d probably be having one of his extravagant Solstice parties soon, with the table being the centerpiece of discussion about The Crash that ignited a whole new industry. These guys don’t give up easily—here what doesn’t kill you, kills someone else. And if it’s you that crashes then it’s time for Plan B.

Yeah, we crashed. *What of it?* I ask back. The companies that weather this thing will make for a stronger industry. The people who survive will be the new pioneers in the next era. The fact is, something that began more than 30 years ago is just now picking up incredible speed—at a rate that we can’t stop, and frankly why would we want to? Revel in this wondrous age we live in and sit back and enjoy this ride—if you have an Internet connection, you have purchased the ultimate “E” ticket. If you are helping to create the future; keep scope. If you are trying to legislate IT (as in Internet Technology); don’t bother (Army-McCarthy Hearings proved that prosecuting creatives didn’t work before and it won’t work now). If you want the world at your fingertips 24/7, embrace IT and roll with the punches. One day you’ll be able to buy your groceries online, and next time ’round it’ll work.

IT is everything, and I say the future is so bright I have to wear shades (I am writing this from my laptop in the courtyard of the British Banker’s Club <www.BritishBankersClub.com> near Palo Alto, so I *am* wearing shades—and the sky is sooooo blue). I am connected; I have wireless capability, I have a PDA that allows the Internet to follow me (nearly) anywhere and any time (almost). We may have hit some bumps: three people I know in this industry lost their homes last week to the technology downturn. At least 50 people I know lost their jobs—and

Preface

xxv

many, many more who lost their entire companies and the investments it took to build them. Are they pissed? Yeah. Are they despondent? Maybe a few are—but all they can think about is what they'll be creating next that will help build the next era. The future? Bring it on!

Safe journey,
Sally Richards
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From the Shores of Silicon Valley