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The Year of the Internet

The novelty days of the World Wide Web tend to be recalled in sharply different ways. One way is to remember them wistfully, as an innocent time when browsing came into fashion, when the still-new Web offered serendipity, mystery, and the whiff of adventure. The prominent technology skeptic Evgeny Morozov gave expression to early-Web nostalgia in a lush essay a few years ago that lamented the passing of *cyber-flânerie,* the pleasure of wandering leisurely online without knowing where one would go or what one might find. He wrote that those days of slowly loading Web pages and "the funky buzz of the modem" offered "their own weird poetics" and the promise of "opening new spaces for play and interpretation."[1]

Far more common than gauzy nostalgia is to look back at the early Web with bemusement and sarcasm, to liken the emergent online world of the mid-1990s to a primordial place, when the environment of the Web was mostly barren and boring, not a place to linger, not a place to do much at all. The "Jurassic Web," Farhad Manjoo called it, in an essay posted at Slate.com. What's "striking about the old Web," he wrote, "is how unsure everyone seemed to be about what the new medium was for."[2]

Fair enough. The Internet of 1995 was a place without Facebook, Twitter, or Wikipedia. Google was barely on the horizon: its founders, Sergey Brin and Larry Page, were graduate students who met in 1995 on the campus of Stanford University. Their mutual first reaction was that the other was pretty obnoxious.[3] The Google of the early Web was

the Alta Vista search engine, which claimed to be able to access eight billion words on sixteen million websites.[4] Commercial online services such as America Online, CompuServe, and Prodigy were prospering then, offering an online experience that mostly was segregated, circumscribed, and walled-off to nonsubscribers. By digital reckoning, 1995 was a long time ago—a time before Smartphones, social media, and ubiquitous wireless connections. Even enthusiasts acknowledged that navigating the Internet in 1995 demanded as much patience as knowhow. Surfing the Web then was likened to "a journey to a rugged, exotic destination—the pleasures are exquisite, but you need some stamina."[5]

But to look back and smirk at the primitive character of the online experience, to snicker at the "Jurassic Web," is to miss the dynamism and to overlook the extraordinary developments that took place online in 1995. It was a time when the Internet and its World Wide Web showcase went, in the words of Vinton G. Cerf, one of the fathers of the Internet,[6] "from near-invisibility to near-ubiquity."[7] "World Wide Web" was the word of the year, the American Dialect Society declared.[8] Nineteen ninety-five was when the Internet and the World Wide Web moved from the obscure realm of technophiles and academic researchers to become a household word, the year when the Web went from vague and distant curiosity to a phenomenon that would change the way people work, shop, learn, communicate, and interact.

By the end of 1995, most Americans had at least *heard* about the Internet and vaguely understood that it was a worldwide network of interlinked computers.[9] Everyone seemed to be paying at least some attention to the Internet, and many people could recognize a Web address when they saw one. Although a consciousness about the Internet had taken hold, most people in 1995 had yet to go online. At midyear, the Internet Society estimated that at least twenty million people but not more than forty million people were Internet users.[10] More significantly, 1995 was the year of the emergence of notable entities and applications that shaped and helped define the online world. The year was a moment of innovation crucial to the character, content, and vitality of the World Wide Web.

Nineteen ninety-five saw the emergence of powerful if conflicting sentiments still associated with the Internet: a cocksure swagger encouraged by novelty; a promise of vast treasure to be found in the digital marketplace; and a spirit of collaboration and community that an online environment could uniquely promote. Those cross-cutting sentiments found expression in 1995 in the pretensions of Netscape, the California

This way to the INTERNET

Don't be intimidated by the hype. Here's an easy-to-understand introduction.

BY DAVID PLOTNIKOFF
Mercury News Staff Writer

FOR the most part, we're in the answer business. But just this once, before we ply our stock-in-trade, we have a question we'd like *you* to field:

The Internet is (choose one)
A) a piece of software that came with your new computer.

C) a new way to shop for cubic zirconia earrings without cable TV.
D) something I know I should look into but haven't had the time or energy to figure out just yet.
E) a network of many networks running on the TCP/IP protocol suite, primarily over leased trunk lines.

If you answered anything but

might want to go read something else, because this isn't meant for Net-savvy people such as yourself. (Still, even you might learn something.) This no-geekspeak, basic guide is mostly for those souls who are still sitting on the edge of the global information pool wondering whether to dive in, dip a cautious toe or go hide in the changing room until the

FIGURE 5. Most Americans had not yet gone online in 1995. But most of them had heard about the Internet, in part because of newspaper articles that offered introductions to the emergent digital world.

startup that made a breakthrough Web browser and, with its remarkable initial public offering of stock, catalyzed the dot.com boom of the second half of the 1990s. They found further expression in the quiet emergence of Amazon.com, which has become the Web's greatest commercial success story. And they found expression in the development of the unassuming wiki, the open-editing software that enables Web users to collaborate across distances. Netscape, Amazon, and the wiki, each in its way, testified to the Web's emergent dynamism in 1995; each will be discussed in some detail in this chapter.

To be sure, the digital innovations of 1995 went beyond Netscape, Amazon, and the wiki. Many mainstays of the online world date their emergence to that year. The predecessor to Craigslist.org began in 1995 as a free email listing for apartments, jobs, and the arts in San Francisco. Its founder, Craig Newmark, has called Craigslist "a happy accident"[11] that is "passionate about the mundane and the boring."[12] The online auction site eBay was launched in 1995 as AuctionWeb. Its founder, Pierre Omidyar, wrote the original code over Labor Day weekend while holed up at his home office in California.[13] Omidyar was then

twenty-eight years old; he became a billionaire three years later when eBay went public.[14]

The online dating service Match.com got its start in 1995, and cyber-dating gained recognition as "more than just a passing whim."[15] The *New York Times* made its first, top-dipping forays into the digital land-scape in October 1995, posting reports at http://www.nytimes.com /pope about the visit to the United States of Pope John Paul II. The fore-runner of Salon.com, an early venture into online news, was launched in San Francisco in 1995 as a weekly arts and literature "e-zine." Yahoo! was incorporated in 1995, a little more than a year after the Web directory went online. Yahoo! was the work of Stanford graduate students Jerry Yang and David Filo, who first called their directory "David and Jerry's Guide to the World Wide Web."[16]

Progressive Networks that year introduced its RealAudio technol-ogy, bringing streaming sound and live broadcasts to the Web.[17] Sun Microsystems in 1995 unveiled Java, the programming language that helped awaken and animate the heretofore static world of the Web.[18] Brendan Eich, then a programmer for Netscape, developed JavaScript, a powerful but fairly easy-to-use scripting language popular among Web designers and developers.[19] The first version of Internet Explorer, Microsoft's anemic entry into the market of graphical Web browsers, became available in August 1995. In a few years, the successor versions of Explorer became the Web's dominant browser.

So what made 1995 so digitally fecund? Why were so many veins of innovation fruitfully tapped that year? A variety of factors converged to make the year so rich and exceptional. For one, the Web was still new but had moved beyond its infancy. Tim Berners-Lee, a British software engineer, had developed the Web's fundamental protocols by August 1991, and Mosaic, the first popular graphical Web browser, was avail-able online less than two years later. Mosaic was a marvelous break-through; it was easy to install and easy to use, and it illuminated the Web for technophiles and early adopters. By 1995, moreover, computer use had crossed an important threshold: more than half of American adults were using computers at home, in school, or at work.[20] And many new computers then were shipped with modems installed, encouraging access to the online world.[21] Additionally, the growth of multifaceted, commer-cial online services such as America Online, CompuServe, and Prodigy signaled emergent popular interest in going online, however circum-scribed the experience might be.[22] It was no major leap for subscribers to move directly to the Web and its promise of vast, unrestricted content.

Internet bounding beyond expectations

By Reid Kanaley
INQUIRER STAFF WRITER

Sometimes even Vinton Cerf, a man who is often called the Father of the Internet, seems surprised that his baby is really growing up:

"When I get out on the Net, 90 percent of the time I'm finding the things I intend to look for. It suggests that this whole thing is actually working."

Cerf helped launch the Internet in the late 1960s, when he was a Stanford University researcher, and more of the same, Cerf and others predict. "I project roughly a doubling of the statistics," he said. Depending on whose statistics are used, that could mean anywhere from 20 million to nearly 50 million North Americans online by next Christmas.

The Internet was first proposed for the military. While many of its pioneers and nurturers, like Cerf, expected it to flourish, few could have foreseen the current pace of growth, or the multiple uses — public, private and commercial — to

FIGURE 6. The Internet was the subject of much gee-whiz attention from the news media in 1995. At year's end, an article in the *Philadelphia Inquirer* called attention to the Internet's growing popularity.

The Web, moreover, came to be recognized as a barrier-lowering, micro-targeting platform that could facilitate connections otherwise difficult or impossible to achieve. To varying degrees, entities such as Amazon, Craigslist, eBay, and Match.com all seized on this capacity. They embraced the flexibility, versatility, and relative efficiency of the online world. Their founders recognized the Web's capacity to promote convenience and to foster, if loosely and temporally, a sense of connection among consumers across distances. The feedback option, notably promoted by Amazon, emerged as a confidence-building mechanism for online consumers.

The Internet in 1995 also became the topic of much gee-whiz attention from the news media—attention that had the effect of deepening curiosity about the Web and its potential. For sheer hyperbole, few characterizations exceeded *Newsweek*'s cover story at the end of 1995. It had been "the Year of the Internet," *Newsweek* declared, adding: "Remember when surfing was something you did outdoors, in a bathing suit? That was 1994. Now it's what you do on the Internet—the worldwide network of computers that in 1995 was embraced as the medium that will change the way we communicate, shop, publish and . . . be damned."[23]

"You talk about revolution?" *Newsweek* went on. "For once, the shoe fits."[24]

The Internet hype of 1995 was met by no small amount of scoffing and eye-rolling. Net skeptics and detractors were not especially hard to find. Some of them suggested the Internet was but a transient fad, perhaps a latter-day Citizen's Band radio, the short-range communications device that was popular for a while in the 1970s before lapsing into obscurity.[25] Among the year's most prominent and often-quoted skeptics was Clifford Stoll, a forty-five-year-old astrophysicist with wild, thinning hair. Stoll had been online many years before 1995, when he brought out *Silicon Snake Oil: Second Thoughts on the Information Highway,* a scattershot and sometimes-crabby book that offered a head-on challenge to Internet euphoria. Twenty years on, *Silicon Snake Oil* remains entertaining—if mostly for its jaw-dropping collection of off-target projections. Here is a notable sampling:

> I don't believe that phone books, newspapers, magazines, or corner video stores will disappear as computer networks spread. Nor do I think that my telephone will merge with my computer, to become some sort of information appliance.[26]

> I suspect Big Brother won't have an easy time tracing us. . . . Our privacy will be protected, as it always has been, by simple obscurity and the high cost of uncovering information about us.[27]

> What will the electronic book look like? Some sort of miniature laptop computer, I'd guess. We'll download selections and page through them electronically. Try reading electronic books. They're awful.[28]

> Video-on-demand, that killer application of communications, will remain a dream.[29]

> It's easy to make fancy home pages on the World Wide Web. But jumping from one document to another baffles me even more than watching someone channel surf. I'm never certain of my location in a twisty maze of cross-references.[30]

> Why not send a fax? It's far more universal than e-mail—we not only find fax machines everywhere, but they can all speak to one another. . . . I find it easier [than e-mail] to just scribble a note on a plain piece of paper and send it over a fax. Or address an envelope, lick a stamp, and mail the letter.[31]

Stoll's predictions and observations can be scoffed at as naive and short-sighted. That is easy to do. They also can be recognized as a baseline for understanding what a robust place cyberspace was becoming

twenty years ago. Although Stoll clearly misjudged the Internet's dynamism and potential to produce innovations, it was not as if he were a neo-Luddite. "I have a half-dozen computers in my home," he told an interviewer in 1995. "I have no shortage of e-mail addresses."[32]

A preview of Stoll's book appeared in *Newsweek* in February 1995, beneath the memorable headline "The Internet? Bah!"[33] More so than his book, Stoll's commentary has achieved something approaching cult-like status online. The essay is constantly to be rediscovered online, gaining fresh life and circulation on platforms such as Twitter. Although not especially prominently, Stoll has acknowledged the shortcomings of his predictions in 1995. "Of my many mistakes, flubs, and howlers," he wrote in a discussion forum on BoingBoing.net in 2010, "few have been as public as my 1995 howler. Wrong? Yep." He added: "Now, whenever I think I know what's happening, I temper my thoughts: Might be wrong, Cliff . . ."[34]

Nearly as stunning as Stoll's misguided prophesies was Bob Metcalfe's bizarre prediction that "the Internet will soon go spectacularly supernova and in 1996 catastrophically collapse," leaving behind "only World Wide Web ghost pages."[35] Metcalfe was the multimillionaire inventor of Ethernet technology and founder of 3Com Corporation. He also was publisher of *InfoWorld*, where his "supernova" prediction appeared in December 1995. In his column, Metcalfe wrote that a number of factors would bring about the Internet's spectacular collapse, including security breaches that would send many Internet sites to the safety of firewalls and intranets.[36] In a follow-up commentary, Metcalfe upped the stakes by promising to eat his Internet-collapse column should the "supernova" prediction prove wrong.[37]

It proved wrong, of course, and in what *Wired* magazine described as "highly theatrical public penance,"[38] Metcalfe made good on his pledge to eat his column. He took the stage in April 1997 at an international World Wide Web conference in Santa Clara, California, and acknowledged that the Internet "supernova" had not occurred. Metcalfe put to a voice vote the question of his eating the column; the response was overwhelming. "Eat, baby, eat," conference-goers shouted. Metcalfe then wheeled onto the stage a large cake decorated to look like his misguided *InfoWorld* column. He proposed to eat a large slice of the cake instead—a suggestion greeted by much booing. Metcalfe relented. He ripped his wrong-headed column from *InfoWorld*, tore it into shreds, and sprinkled the remains into an electric blender containing a bit of water. The blender whirred, producing a milky, pulpy substance. To cheers from

the audience, Metcalfe ladled the goop into a bowl and slurped it down.[39] It was, he later boasted, his "greatest publicity stunt of all time."[40] Before taking the stage at Santa Clara, Metcalfe had assured himself that the *InfoWorld* ink was not toxic.[41]

More common than expansive and spectacularly wrong predictions was the tentativeness that attached to the emergent online world of 1995, a tentativeness that nowadays seems quaint and droll. This was evident in phrases devised by journalists to describe the Web and explain its novelty. The phrases were not wrong necessarily, but they clearly were cautious and uncertain, as if the journalists were grabbing in the dark. After all, the vernacular for talking about the online world was still evolving in 1995.[42] As the year began, the *New York Times* described the Web as "a section of the Internet overflowing with sights and sounds."[43] Not long afterward, a *Times* writer referred to the Web as "an electronic amalgam of the public library, the suburban shopping mall and the Congressional Record."[44] In February 1995, a wire service report called the Web "a string of data bases available through the global maze of computer networks known as the Internet."[45]

Near the end of the year, the *New York Times* declared the Web had become "a full-fledged media star, hailed and hyped, part technology and part fashion accessory."[46] About that time, a report in the *Philadelphia Inquirer* about the "fascination with the World Wide Web" described it as "an electronic publishing service for pictures, sound and video, as well as text."[47] Earlier in the year, the *Inquirer* had introduced the Web to its readers by asking: "What do O. J. Simpson, the Louvre, an Australian guy called Wigs, prostitution, the Franklin Institute and a coffeepot in England have in common? Maybe nothing, except that they are all on the Web—the World Wide Web—a multimedia digital universe probably appearing on a computer screen near you."[48] And *Newsweek*'s effervescent year-end cover story hailing 1995 as "the year of the Internet" described the Web as "an awesome construct where the publishing efforts of thousands of people are interlinked into a massive seething monument to human expression, enabling everything from shopping for a new car to keeping track of Madonna's biological clock."[49]

Although the Web was hardly a "massive seething monument" in 1995, it was sufficiently prominent to stir fears about what it would become and what content it would carry. In April 1995, the National Science Foundation ended its management of the Internet's U.S. backbone, handing responsibility to three commercial carriers—Sprint,

Ameritech, and Pacific Bell.[50] The changeover was scarcely noted by users, but it provoked vague fears that the online world was destined to become a corporatized domain, where dissent would be muted and unwelcome.

The *Nation* magazine gave voice to such worries in an article by Andrew L. Shapiro. "Speech in cyberspace," he warned, "will not be free if we allow big business to control every square inch of the Net. The public needs a place of its own." Shapiro suggested the Internet could become a "cyberia," with "no spaces dedicated to public discourse. No virtual sidewalks or park, no heated debate or demonstrators catching your attention, no street-corner activist trying to get you to read one of her leaflets. In fact, you can shape your route so that you interact only with people of your choosing and with information tailored to your desires."[51] Shapiro's fears about "cyberia" were not entirely off-target; it is of course not difficult to shape online visits so as to interact exclusively with views and arguments of one's choosing. Even so, the Internet has hardly turned into a bleak, corporatized landscape, empty of dispute. Web logs—popularly known as blogs—and social media platforms offer viewpoint diversity in teeming profusion.

A fear more prominent and widely shared in 1995 was that the Internet was becoming awash in pornography and that smut was readily accessible to children. These fears were stoked into a media firestorm in June 1995 when *Time* magazine came out with a cover story about "cyberporn." On the cover was an illustration of a pasty youth at a computer, his eyes bulging and his mouth agape in the apparent shock of confronting images of some unmentionable sex act. Inside the magazine, an illustration depicted a naked man in suggestive embrace with a computer.

The centerpiece of the *Time* story was described as "an exhaustive study of online porn" conducted by a "research team at Carnegie Mellon University" that drew on "elaborate computer records of online activity" and measured "for the first time what people actually download, rather than what they say they want to see." The "Carnegie Mellon researchers discovered . . . an awful lot of porn online," the cover story said—specifically that 83.5 percent of images stored at online Usenet newsgroups "were pornographic."[52] The ABC News program *Nightline* drew on the study in devoting an episode to pornography on the Internet. "It's the kind of smut many of the porn stores won't even carry," the *Nightline* host, Ted Koppel, declared in introducing the show. "Now, it's the kind of material you and your kids can see with just the click of a button."[53]

Such characterizations lent an unmistakable impression that much of the Internet abounded in filth. *Time*'s "cyberporn" report implicitly impugned the value of going online: why do so if the place were a virtual cesspool? But soon enough, the online world struck back in what was an early and impressive demonstration of the Internet's capacity to debunk and deflate, to act as a potent vetting mechanism. In the days and weeks following publication of the "cyberporn" story, the corrective power of the Internet was on display in a blizzard of condemnation and commentary posted at online discussion forums.[54] The online commercial magazine *HotWired* memorably took on the "cyberporn" story in a report titled "Journoporn."[55]

Together, the online critiques made clear that *Time*'s cover story was exceedingly alarmist, a messy blend of exaggeration, thin research, and dubious analysis. What *Time* called the "Carnegie Mellon study" was really the work of Marty Rimm, a thirty-year-old undergraduate student in Carnegie Mellon's electrical and computer engineering program. Although Rimm's study was published in the *Georgetown Law Review,* it had been subjected to no rigorous peer-review by experts without a stake in the research. Critics pointed to the study's ambiguous data and methodological shortcomings.[56] They noted that Rimm's study generalized from a narrow data set. Moreover, the research was based largely on data extracted from private online bulletin boards that sold pornographic content to adults using credit cards, which meant they were not readily accessible by children.[57] It was as if Rimm had surveyed adult bookstores in Times Square and then generalized about what was sold in Barnes & Noble stores, said Mike Godwin, general counsel at the Electronic Frontier Foundation, and an implacable critic of Rimm's research.[58]

Confronted with a storm of critiques and complaints, *Time* backpedaled from its "cyberporn" cover story—"at a trot if not a gallop," media critics Jeff Cohen and Norman Solomon wrote.[59] *Time* conceded that serious questions had been raised about the study's methodology and how its data were gathered. A follow-up *Time* article cited management professors at Vanderbilt University who had read Rimm's study and found the statistics "misleading or meaningless." They said, according to *Time,* "that pornographic files represent less than one-half of 1 percent of all messages posted on the Internet."[60]

Fears about cyberporn were hardly extinguished by *Time*'s acknowledgment of error. Debate about pornography online, and how to keep it from children, was percolating in Congress. In February 1995, J. James Exon, a gravelly voiced Democratic senator from Nebraska,

introduced the Communications Decency Act, declaring the measure an urgently needed bulwark against smut online.[61] "I want," Exon said, "to keep the information superhighway from resembling a red light district."[62] The Communications Decency Act was attached to a broader telecommunications-reform bill, which won the Senate's overwhelming approval in mid-June 1995.

To help ensure that the Senate would wrap the Communications Decency Act into the telecommunications bill, Exon compiled a "blue book" of raunchy and explicit images that had been downloaded from the Internet. These graphic images were placed in a thin binder that Exon showed to perhaps a dozen fellow senators. Exon said he doubted whether his colleagues fully understood "the depths of depravity that's available" online. "They think it's just pictures of naked women."[63] Interestingly, Exon, who was seventy-three years old and had announced his retirement from the Senate before taking on cyberporn, was only faintly familiar with the medium he was seeking to regulate. Exon claimed no extensive, first-hand experience with the digital world. In mid-1995, Exon's office on Capitol Hill had neither email address nor Internet connection.[64] The images in Exon's "blue book" binder had been downloaded by a friend.[65]

The Communications Decency Act moved forward despite reservations about its constitutionality and despite the imaginative opposition of online activists. On December 12, 1995, they organized an "Internet Day of Protest," during which more than 10,000 people placed telephone calls and sent email and fax messages to members of Congress, objecting to the measure as little more than heavy-handed censorship.[66] Nevertheless, the telecommunications bill was approved by Congress on February 1, 1996, and President Bill Clinton signed it into law a week later,[67] in a ceremony at the landmark Main Reading Room of the Library of Congress.

Clinton declared the telecommunications measure "truly revolutionary legislation that will bring the future to our doorstep."[68] But he said nothing specifically about the Communications Decency Act, which in its final form forbade the display or transmission of "indecent" or "patently offensive" online material to minors and provided for prison sentences of up to two years and fines of as much as $250,000. As Clinton signed the legislation, hundreds of websites—including those of some members of Congress, radio stations, and the City of Houston—began going dark, to protest the assault on free speech online.[69] In Philadelphia that day, a coalition of civil liberties groups sought a

federal restraining order against imposition of the Communications Decency Act.

In June 1996, a panel of three federal judges in Philadelphia unanimously ruled the act an unconstitutional violation of the First Amendment and barred its enforcement.[70] That ruling was affirmed a year later, when the U.S. Supreme Court struck down key provisions of the decency act. Justice John Paul Stevens wrote in the high court's decision that "in the absence of evidence to the contrary, we presume that governmental regulation of the content of speech is more likely to interfere with the free exchange of ideas than to encourage it. The interest in encouraging freedom of expression in a democratic society outweighs any theoretical but unproven benefit of censorship."[71] It was a major victory for free speech online; it was the day, said the *Washington Post,* when the First Amendment went digital.[72]

James Exon and his allies thought of the Internet as a cesspool oozing smut. Far more enticing and motivating was to think of the Internet as a place of vast and untapped potential, where riches were waiting to be made. In 1995, no entity better represented the panache and wealth-making potential associated with the Internet than Netscape Communications Corporation, a startup in California's Silicon Valley that made a terrific digital product: a graphical Web browser called Netscape Navigator. The first version of Navigator had been shipped in December 1994, just eight months after the company's incorporation. Netscape sold the browser for $39 to commercial users but allowed them to evaluate the product for free, and the company gave the browser away to academics and nonprofit users. Navigator took off quickly, surpassing more humble rivals and winning a commanding share of the emerging browser market.

Netscape was an immediate success, if not in turning a profit then in attracting the goodwill of millions of new Web users. It was an immensely interesting company; its leading figures were said to be right out of central casting.[73] Netscape's chairman was James H. Clark, a founder of Silicon Graphics who was looking for the next big thing. He seeded Netscape with $5 million[74] and infused the company with a certain ardor. "Jim had the Jedi mind trick, the ability to convince you of pretty much anything," said Lou Montulli, one of Netscape's first programmers. "And he really filled our heads up with the idea that we can go and we can change the world—and we're going to make a [lot] of money doing it."[75] Clark recruited James Barksdale, a Mississippi native, from McCaw Cellular to become Netscape's chief executive.

FIGURE 7. Marc Andreessen, the voluble cofounder of Netscape Communications, was hailed by *Newsweek* magazine in 1995 as "the über-super-wunder whiz kid of cyberspace." He was just twenty-four. (Photo credit: Louie Psihoyos/Corbis)

Barksdale was modest and gentlemanly; he was "as mellow as shoofly pie," one technology writer said.[76]

Netscape's defining and most colorful figure was its cofounder, Marc Andreessen, a programmer with an agile mind who talked fast, persuasively, and seemingly nonstop. He was a big guy, standing 6-feet-4, and full of amusing quirks and habits. Andreessen turned twenty-four years old in 1995; he was less than two years out of college and had not shed all the trappings and eccentricities of undergraduate life. He worked late and got up late. His taste in clothes, it was said, ran to "frat-party ready."[77] Barksdale once observed that Andreessen ate hamburgers "like a horse, both in quantity and mannerisms."[78] His technique for interviewing prospective employees hewed to the eccentric. Todd

Rulon-Miller, Netscape's vice president of sales, recalled meeting with Andreessen in 1994 to discuss the job. "When I interviewed with him, he was on a workstation staring intently into the screen. I don't think he looked at me," Rulon-Miller said. "I sat in a chair next to him. He was playing Doom," a then-popular shooter-video game. "And I didn't even know what Doom was."[79]

Andreessen seemed an unlikely character to be identified as "the über-super-wunder whiz kid of cyberspace," as *Newsweek* called him at the end of 1995.[80] Andreessen had grown up in New Lisbon, an information-poor town in rural Wisconsin, where, Andreessen said, "we had the three TV networks, maybe two radio stations, no cable TV. We still had a long-distance party line in our neighborhood, so you could listen to all your neighbors' phone calls. We had a very small public library, and the nearest bookstore was an hour away. So I came from an environment where I was starved for information, starved for connection."[81]

He enrolled at the University of Illinois at Urbana-Champaign and studied computer science, after a fashion. "I was in a degree program," Andreessen said in an interview in 1995, "but it wasn't highly structured. I just tried to keep up. I basically never studied. I attended classes, but that's about it."[82] Andreessen found part-time work at the university's National Center for Supercomputing Applications. There, he and a few fellow programmers developed Mosaic, the predecessor-browser to Netscape Navigator. Mosaic was launched in 1993 and quickly won followers for granting relatively easy, point-and-click access to the previously hard-to-access World Wide Web.[83] In December 1993, Andreessen graduated from the University of Illinois and headed for California.[84] His team of programmers stayed behind in Champaign—for a while.

Andreessen met Clark in early 1994, and they soon decided to set up a company that would outdo Mosaic. Andreessen and Clark recruited several of Andreessen's former undergraduate colleagues at the National Center for Supercomputing Applications and brought them to California as core programmers at Mosaic Communications Corporation, the predecessor to Netscape Communications. Andreessen and his team set to work to develop a better browser. They called it Mosaic Netscape. Officials at the University of Illinois soon learned what was up, cried foul, and threatened to sue, claiming an infringement of its intellectual property. Clark and Andreessen insisted that not a line of the Mosaic code appeared in the new browser. The university was not

mollified and insisted that Mosaic Communications change its name and pay a hefty royalty.[85]

Eventually, and quite reluctantly, Clark and Andreessen changed the name: Mosaic Communications became Netscape Communications; the browser was renamed Netscape Navigator. But they balked at the demand for royalties. In the end, Netscape paid the university about $3 million to settle the dispute, which embittered Andreessen. "They basically tried to shut us down," he later told Rick Tetzeli of *Fortune* magazine. "They started a campaign in the press to make us look like thieves."[86] In doing so, Andreessen said, the university forfeited millions of dollars in his prospective donations.[87]

Netscape was quite capable of impressive innovation. Pre-release "beta" versions of its Navigator 2.0 browser came out in October and December 1995 and were hailed as something of a technological feat. Navigator 2.0 was faster and more powerful than its predecessor, which had claimed about 70 percent of the browser market.[88] Among other advances, Navigator 2.0 incorporated plug-in architecture, allowing programmers to develop applications on the browser. Netscape 2.0 also supported the Java applets that made Web-browsing a more lively and animated experience.

In the summer and fall of 1995, Netscape was on a roll. They were the best of times for the swaggering startup. The company's workforce had grown to 500 employees, a five-fold increase since the beginning of the year. Revenues were climbing, topping $40 million in the year's fourth quarter, which was almost double sales in the previous three-month period. (Netscape's sales came mostly from corporate licensing of its high-profile browser and from a diverse line of Internet servers and server software.) During those heady weeks, Netscape was touted as "the Microsoft of the Internet"[89] and seemed to delight in poking at the software giant and its chairman, Bill Gates. "From a scientific point of view, none of us really respected Microsoft," Lou Montulli recalled years later. "There was definitely a sense of: they've put out of business three or four major companies, and they did it simply by copying what they did and outpricing or outmanuevering them in the market."[90]

Gates had been slow to recognize the potential of the Internet and the Web. He mistakenly thought the Internet was just a precursor to some sort of elaborate, multidimensional information superhighway. He said as much in his 1995 book, *The Road Ahead*.[91] But as Netscape's browser demonstrated, the Web was becoming *the* information superhighway. And the browser's potential as a platform for software applications

represented an undeniable threat to Microsoft's Windows operating system. Andreessen—who sometimes during the mid–1990s was called the "next Bill Gates"[92]—supposedly boasted that Netscape would reduce Windows to a mundane set of poorly debugged device drivers.[93] The insult meant that Microsoft's operating systems, installed on millions of computers, risked becoming superfluous in a robust, Web-based environment. Clark, for his part, likened Microsoft to the "Death Star" of the evil empire in *Star Wars* movies.[94]

The insults were not overlooked at Microsoft's sprawling campus headquarters in Redmond, Washington. Hadi Partovi, the group manager for Microsoft's browser, Internet Explorer, printed out the most provocative comments by Netscape executives and placed them in the hallway of the offices of the Internet Explorer team.[95] Gates himself had cited Netscape in a lengthy memorandum in May 1995 to his executive staff and direct reports. Gates titled the document "The Internet Tidal Wave," and it signaled a definitive though belated embrace of the technology. "A new competitor 'born' on the Internet is Netscape," Gates wrote. "Their browser is dominant, with 70% usage share, allowing them to determine which network extensions will catch on. . . . They have attracted a number of public network operators to use their platform to offer information and directory services. We have to match and beat their offerings."[96]

The smoldering hostility between the companies turned acute on June 21, 1995, at a four-hour meeting at Netscape's headquarters. In the run-up to the meeting, Netscape and Microsoft had tentatively explored a strategic relationship. But according to detailed notes that Andreessen took at the meeting in June, Microsoft's representatives came on strong and proposed that the companies carve up the browser market—with Netscape Navigator confined to the older, less lucrative versions of Windows.[97] Andreessen, who could be disarmingly candid, likened the conduct of Microsoft's team to "a visit by Don Corleone" of *The Godfather* films. "I expected to find a bloody computer monitor in my bed the next day."[98] Microsoft disputed Andreessen's account, saying its representatives had made no attempt to intimidate Netscape.[99]

In any case, the meeting ended without agreement, and Netscape moved forward with plans for its most audacious act of all: a public offering of its shares. Netscape was not quite sixteen months old and had not come close to turning a profit. Typically, as the *New York Times* observed, companies were expected to "show a pattern of profitability over two or more quarters before an underwriter would try to

take them public, but the Internet, as with some other promising technologies, is apparently different."[100]

Netscape had been contemplating an IPO—initial public offering of its shares—for several months. "I wanted us to go public because I thought it'd be good for us from a PR standpoint," recalled Clark, the chairman, "and I did go into this thing to make money, so I was looking for a reward as well."[101] The IPO, underwritten by Morgan Stanley and Hambrecht & Quist, included five million shares of Netscape, priced at $28 per share. The shares went up for sale August 9 on the Nasdaq exchange. But for nearly two hours that morning, an order imbalance kept them from being traded. Finally, the stock opened—at $71 per share. It climbed as high as $74.75 a share before settling at day's end to $58.25.[102]

It was a smashing debut by any measure—"the best opening day for a stock in Wall Street history for an issue of its size," the *New York Times* said.[103] The IPO demonstrated that the Web could be a place to make fortunes fast. Clark's stake in Netscape was worth more than half a billion dollars; Andreessen's was worth more than $58 million. The *Wall Street Journal* observed that it had taken General Dynamics forty-three years to become a corporation worth $2.7 billion in the stock market. It had taken Netscape "about a minute."[104] The IPO, as Robert H. Reid wrote in *Architects of the Web,* "put the Internet indelibly on the map with millions of people who hadn't been there yet."[105]

Fifteen days after Netscape's IPO, Microsoft unveiled its much-anticipated Windows 95 operating system, which coincided with the release of Internet Explorer 1.0, Microsoft's Web browser. Explorer 1.0 was a meager product[106] that, ironically, was based on a licensed version of the Mosaic code that Andreessen had developed at Illinois.[107] Then, on December 7, 1995, came Microsoft's "Pearl Harbor Day" announcement and the unequivocal emergence of a mortal threat to Netscape: Gates spelled out for journalists and industry analysts a comprehensive strategy to insert and expand Microsoft's presence online. Gates declared that Microsoft was "hard-core about the Internet."[108] Among other moves, Microsoft's browser would be improved, made faster, and offered online for free.[109]

The "browser war"—the blood feud between Netscape and Microsoft—was under way. Gates, according to an internal memorandum, acknowledged that Netscape was "quite an impressive competitor."[110] Barksdale, Netscape's chief executive, said the looming browser war promised "to be a dogfight. But we think we have God on our

side."[111] Markets, though, tended to think otherwise. Two days before Gates's "Pearl Harbor Day" announcement, Netscape's per-share price had touched $171. It would never again reach that high. Netscape mania had crested as markets sensed the unfolding browser war could become a lopsided fight that Microsoft would win.

Even so, Netscape entered the browser war with a huge advantage in market share. Its dominance unnerved Microsoft. "Netscape is already entrenched in our markets all over the world," a senior Microsoft executive, Brad Chase, wrote in a confidential internal memorandum in April 1996. "The situation today is *scary*," Chase stated. "We have not taken the lead over Netscape in any market yet."[112] But in time, that equation would change dramatically. As Gates had promised, the Microsoft browser was improved. Internet Explorer 3.0, introduced in 1996, was seen as at least the technological equal to Netscape's latest version, Navigator 3.0.[113]

What's more, computer users, especially new users, had little incentive to download and install Navigator on the Windows platform: Internet Explorer was already there, and technically it was just as good. Moreover, Microsoft had muscled its way into the commercial online market, and the largest service providers—including America Online, CompuServe, and AT&T Worldnet—replaced Netscape Navigator with Internet Explorer as their preferred browsing software.[114] According to an America Online internal email, Gates asked an AOL executive in January 1996, "How much do we need to pay you to screw Netscape?" by designating Internet Explorer as AOL's featured browser. "This is your lucky day," Gates was quoted as saying.[115]

In the months that followed, Netscape Navigator steadily lost market share to Internet Explorer. At Netscape's encouragement, the Justice Department began investigating Microsoft's tactics on anticompetitive grounds. But the government's inquiry would come much too late to rescue Netscape. The company lost $88 million in the fourth quarter of 1997, and its shares shed more than 20 percent of their value, sliding to less than $20.[116] By August 1998, Internet Explorer eclipsed Navigator as the most popular Web browser. The "writing was on the wall," said Brendan Eich, the Netscape software engineer who developed Javascript. "Microsoft was driving their monster truck after us and they were about to pin us to the wall."[117]

Netscape's celebrated run as the flamboyant startup of Silicon Valley reached a bitter end in November 1998, when Barksdale announced the company's acquisition by America Online in a stock deal valued at $4.2

billion.[118] It was the first major merger of Internet companies,[119] and it reduced the once-cocksure Netscape to a forlorn and mostly forgotten outpost of AOL. (In a final indignity years after the "browser war," Microsoft in 2012 acquired from AOL the patents underlying the Netscape browser.)[120]

For a time, Andreessen stayed with the merged entity, as chief technology officer at America Online. He bought a house near AOL headquarters in suburban Virginia as if to underscore his commitment. But a few months later, he returned to California. Many of Netscape's 2,200 employees also left after the merger; the clash of cultures between buttoned-up AOL and freewheeling but humbled Netscape was too pronounced.

Microsoft and the "browser war" were the major but not the exclusive reasons for Netscape's inglorious descent. Netscape never converted its many browser users into paying customers.[121] It never quite knew what to do with its much-visited home page, which, somewhat belatedly, it turned into a Web portal called Netcenter.[122] The Netscape saga—from spectacular rise to near-hegemony to decline and humiliating absorption by AOL—spanned fewer than five years. In its run, Netscape helped define "Internet time," an idiom of the late 1990s that meant everything moved more swiftly online. The compressed arc of Netscape's meteoric trajectory was itself emblematic of Internet time.

More significantly, the rise of Netscape and the popularity of its browser signaled the centrality of the Web in the digital age. Novelist Charles Yu described it this way: "I entered college in 1993 and graduated in 1997. Halfway through, the Internet became a thing. Netscape said: 'Here you go, here's a door to a brand-new place in the existence of the universe. We just started letting people in. Go ahead, it's fun. It'll keep getting bigger for the rest of your life.'"[123] Like no other single event of the early digital age, Netscape's IPO in 1995 brought the Web into popular consciousness. "If the World Wide Web had not yet gotten the public's full attention," Tim Berners-Lee said, the Netscape IPO "put it on center stage."[124]

It can be forgotten how innovative Netscape really was. It developed JavaScript. It was quick to embrace the Java programming language. It introduced the Secure Sockets Layer protocol, which enabled encrypted transactions to be completed online.[125] Netscape's early browsers were marvels for their time. "Every time you go to a Web page," technology writer Walter Mossberg wrote in late 2013, "you are seeing the legacy of Netscape in action."[126] But more than that, Netscape epitomized the

swagger and flamboyance of the early Web and its exuberant promise of wealth swiftly made. Amazon.com in 1995 represented great promise of a less spectacular sort—that the Web could be a reliable, efficient, and customer-friendly source of commerce. Amazon demonstrated this potential by selling a decidedly analog product with a centuries-old past: the book.

Amazon's online bookstore opened on July 16, 1995, and not many people took notice.[127] Such obscurity seems in hindsight a bit astonishing, given how embedded Amazon has become in American life and culture. In the years after 1995, Amazon demonstrated that the Web could be an opportune venue for retailing and, in doing so, dramatically altered the businesses of selling books, music, and video. It became the Walmart of the digital world, and much more. With its line of Kindle devices, Amazon has made electronic books popular and readable. It has become a leader in Web technology services, and it rents space on its formidable computer infrastructure to startups and established businesses[128] as well as government agencies such as the CIA. It is in the same-day grocery-delivery business in a few cities. The company's founder—a geeky guy with large brown eyes and a bellowing, full-body laugh—began the company figuring it had a 70 percent chance of failing. Within a few years, he had a net worth of several billion dollars and was being proclaimed the "Internet's ultimate cult figure."[129] He is a rare 1990s technology-entrepreneur—a founder/chief executive—who still runs the company he started. He's Jeff Bezos, a driven and complex figure of many interests, a man of deep intelligence and a sometimes-savage temper.

The saga of Amazon.com began in 1994 when Bezos, in his telling, saw great opportunity in the Internet's astonishingly swift growth. He quit a well-paying job at the D. E. Shaw investment management firm in New York City and, with his wife, MacKenzie, headed west for Puget Sound in Washington state. Over the next several months, Bezos made a couple of key hires, raised startup money from family and friends, and incorporated the company.

Bezos has cultivated a founding myth that Amazon began inauspiciously, in a poorly heated, unprepossessing garage in Bellevue, Washington. The company's press releases in its early years seldom neglected to mention the humble birth.[130] Bezos has said he purposely looked for a house to rent in suburban Seattle that came with a garage—"in part because we wanted some of that garage-startup legitimacy" that attaches to companies such as Apple and Hewlett Packard. "It wasn't . . . full legitimacy because the garage was enclosed" and had been con-

FIGURE 8. Few people noticed when Jeff Bezos launched Amazon.com on the Internet in mid-July 1995. The company was quick to recognize the power, versatility, and novelty of the Web—and demonstrated how it could be a secure place for commerce. (Photo credit: Brian Velenchenko/Corbis)

verted into a sort of work room, Bezos conceded.[131] But "it wasn't insulated," he said, and "it was very cold, and that gave us some legitimacy."[132] That Amazon got its start humbly, in a suburban garage, has become the stuff of Internet legend; even nowadays, when it matters very little, references to Amazon's undistinguished origins often appear in news reports about Bezos or the company.[133]

By July 1995, when Amazon began selling books online, Bezos had moved the fledgling company from Bellevue to an industrial neighborhood in Seattle and office space above a Color Tile store.[134] Launching Amazon when he did turned out to be impeccable timing: had Amazon.com gone live a year earlier, Robert Spector wrote in his book, *Amazon*

.com: Get Big Fast, "there barely would have been enough personal computers connected to the Internet to keep the company afloat; a year later and the competition would have had an insurmountable lead."[135]

Bezos, who turned thirty-one in 1995, has said he figured it would take years and years for book-buyers to grow accustomed to making purchases online. It was neither instinctive nor intuitive in 1995 to go online and buy a book. Or anything. A report by the Times Mirror Center for the People & the Press in October 1995 said that just 1 percent of all Americans had made a recent purchase online. But the Times Mirror study also noted that "even small percentages can translate into millions of people."[136]

Bezos later acknowledged that he had not anticipated the importance of those online shoppers, the early adopters who typically have a fairly high tolerance for risk and uncertainty.[137] "The thing we had over-looked, at that time, was everybody on the Internet, 100 percent of the population, was what demographers called 'early adopters,'" Bezos said. "These are the first people to use cell phones. The first people to use computers. They're the first people to do everything. And so these guys were very facile at learning new habits, and they adopted very quickly" to buying books at Amazon.com.[138]

The company's first employee, Shel Kaphan, said that it was soon after its launch when Amazon began "getting some traction" online.[139] "It was an exciting time," said Kaphan, who developed the technology that made the Amazon site interactive and responsive to individual users. In the company's early days, he "was often the only person in the office on the weekends and [I remember] just getting phone calls from all over the country, people excited to find the site and wanting to know about us." It was novel in 1995 to be "doing commerce on the Web," Kaphan said, and that "caught people's imagination in a lot of ways. They were excited about it."[140]

In the week after its launch, Amazon logged $12,000 in orders, and $14,000 the week after that.[141] The novelty of online commerce was such that the company's computer terminals were programmed to ring when an order came through. At first, the ringing was entertaining and reaffirming. Bezos recalled that the computers would ring and "you would jump up and go over and look and see what it was. But then it started to be annoying." After a couple of weeks, Amazon's sales had reached a point where the ringing had become a frequent and irritating distraction. So the computers were programmed to silence the sound.[142]

Amazon was extraordinarily cost-conscious in its early days, and a strain of frugality still characterizes the company, despite its riches. Its

desks, for example, were repurposed from doors and four-by-fours. Bezos built the first door-desks himself. Later, he arranged for a Seattle carpentry company to produce them for $130 apiece: $70 for materials, $60 for labor.[143] They are large and functional work surfaces, and not all that ugly.

For a while after Amazon opened for business in 1995, Bezos and the first employees packed books for shipping—on hands and knees, on the cement floor of a small distribution center he had rented. "And we did this for like two weeks and it was back-breaking work and our knees would be raw," Bezos recalled. "I said, 'We've got to do something about this. . . . We've got to get knee pads.'" One of the employees looked at Bezos as if he were from Mars and asked, "Well, what about packing tables?" Bezos said he "thought it was the most brilliant idea I had ever heard in my life. And so we did that, which radically improved things."[144] Bezos also said he would sometimes trundle the packages of books to a post office late at night.[145]

Sales in 1995 topped half a million dollars, but Amazon that year lost a little more than $300,000,[146] the first of many years in which the company did not turn an annual profit. Its focus has been not on earnings but on spending nearly every dollar it brought in, to establish an unrivaled presence online. To "get big fast" was Amazon's central objective.[147] And it did: in 1997, the year of its IPO, Amazon.com reported revenues of $147.8 million, an increase of 838 percent from the year before.[148]

From the start, Amazon sought to promote a sense of the outsize. Its website declared the company "Earth's largest bookstore" and said it offered one million titles. The assertions were more than slight exaggerations.[149] Amazon carried little inventory, preferring to order books from wholesalers after customers had placed their orders.[150] "We didn't have a million books," Kaphan recalled, "but we had a million titles in the sense that we could *order* them. We might find out that the publishers might take several months to get them to us. But in most cases, it would be a matter of weeks and we were always trying to make accurate promises about how long it was going to take to get something" in the early days.[151]

The Amazon.com of today was unimaginable twenty years ago. The company has become a giant of the Internet, the world's largest online retailer—"the everything store," as Brad Stone described Amazon in his book about the company and Bezos.[152] The buildings of its headquarters complex are clustered on the edge of Seattle's downtown. Amazon's

annual revenues were nearly $75 billion in 2013, most of it from sales of electronics and other merchandise. It has more than 115,000 full-time and part-time employees. The company's first employee, Kaphan, has said that at the company's creation no one had any idea how big Amazon could be if it did succeed. "We had modest ideas about what was possible at the beginning," he said.[153] Not only did Bezos expect a far more modest company, he did not intend to call it Amazon.

The company was incorporated in 1994 as Cadabra Inc., a name taken from the magician's incantation, "Abracadabra." But Bezos soon realized that "Cadabra" sounded too much like "cadaver." So it was dropped.[154] He eventually settled on Amazon. The name, he told an audience a few years later, "has absolutely nothing to do with single-breasted female warriors" of mythology. Rather, he said, it was meant to encourage the association of "Earth's biggest river, [with] Earth's biggest bookstore."[155] For a while, Bezos had thought of calling the company "Relentless," to suggest unstinting attention to customer service. But Kaphan helped scotch that name. It was a "horrible" prospective choice, he said. "And I let that be known, and that's one of the reasons it didn't happen." Kaphan said that "both Jeff and his wife looked pretty crestfallen when I objected to 'Relentless.' And I think maybe that was one reason when he proposed 'Amazon,' he did it in such a way" that made it clear he was not going to entertain "any objections to it."[156]

Relentless attention to customer service has been a mantra of Amazon since its early days. In 1999, Bezos said at a program in Washington, D.C., that Amazon's vision "is to be the world's most customer-centric store," a place where "people can come to find and discover anything they might want to buy online."[157] But the obsession on being customer-centric has exacted a toll on Amazon employees. A few months before Bezos's talk in Washington, a former employee described in an article in an alternative newspaper in Seattle the sweatshop-like conditions of Amazon's customer-service department. Richard Howard said he had been a $10-an-hour customer service representative at Amazon.com for a few weeks before being dismissed for failing to fit in and meet the company's performance expectations. Howard's account, titled "How I 'Escaped' from Amazon.cult," described a humorless and inflexible operation that emphasized speedy response while discouraging imaginative interaction or engagement with customers.[158] He wrote:

> As a Customer Service rep, the half of your daily shift not spent on the telephone is consumed by grinding out responses to customer e-mail inquiries.

These can range from requests for help in finding a particular out-of-print title to suggestions that the company shove a particular policy up its corporate ass. One of the first surprises you encounter on the job is that you almost never respond to these queries from scratch. Instead you learn to troll the Blurb Index—a roster of pat responses, or "blurbs"—designed to address practically every conceivable scenario a customer might present. If a genuinely new situation arises more than once, there will probably be a blurb written for it. As my trainer explained, the use of blurbs saves Customer Service reps time and helps impose a consistent voice (in terms of both tone and policy matters) on official interactions with customers. Naturally, we were encouraged to tailor the blurb to fit the specific situation in question, as well as to disguise the more obvious signs of blurbosity. But to respond to the questioner as a person rather than simply a customer, to insert a genuinely personal—much less quirky, off-beat, or engagingly eccentric—tone into the transaction was deemed to be crossing the line and was emphatically discouraged.[159]

Howard also observed that "for all the well-intentioned idealism around Amazon, a sense of humor was in strikingly short supply there; people were too busy taking themselves and their corporate mission oh-so-seriously. Adding to this tone of quasi-religiosity was the unspoken taboo against any speech or expression (including gallows humor) that betrayed your lack of commitment to the long-term success of the enterprise; if you weren't prepared to stoically endure the present purgatory of low wages, long hours, and sweatshop working conditions for a shot at a blissful future of profitability and soaring stock prices, then you were best advised to head back out into the world of cynics and naysayers where you belonged."[160]

Amazon was the occasional subject of other barbed reporting in the late 1990s. Slate.com called the company "Amazon.con" in 1997, disputing its claim to be "Earth's biggest bookstore" and asserting Amazon's deliveries were no speedier than its rivals'.[161] *Barron's* described the company as "Amazon.bomb" in 1999, as the dot.com boom was fading. "Increasingly," the *Barron's* report said, "Amazon's strategy is looking like the dim-bulb businessman who loses money on every sale but tries to make it up by making more sales."[162] But such reports have tended to be anomalous over the years. More often, the company and its founder have been the subjects of glowing media coverage, a tendency that can be traced to 1996 and an admiring front-page article published in the *Wall Street Journal* just ten months after the company opened for business.[163]

The article gave Bezos and the company unprecedented attention, helped boost sales, and represented the ironic effect of old media

spurring the rise of a new media entity.[164] The *Journal*'s article described Amazon as "a singular case in which the frequently hyped Web is actually changing consumers' lives."[165] Extravagant praise has been not uncommon for Bezos, even though it has long been known he can be a harsh and intimidating boss, given to what Stone called "melodramatic temper tantrums that some Amazon employees called, privately, nutters. A colleague failing to meet Bezos's exacting standards would predictably set off a nutter."[166]

Bezos seldom grants interviews, and when he does, it is usually to tout new products, such as additions to Amazon's line of Kindle readers, or to reveal that Amazon has been developing plans to deploy unmanned drones in delivering small packages to some parts of the United States.[167] Otherwise, Bezos makes himself remote from the news media—although he surprised nearly everyone in the media business by buying the *Washington Post* in 2013 for $250 million.[168] "Extending the big buzz-off to the press and the public is a tradition that Jeff Bezos has restored to the commonweal," Jack Shafer, a leading U.S. media critic, wrote shortly after the sale was announced. "The company's disdain for the press seems to know no limits." The no-comment brushoff, Shafer wrote, has become "the default response by Bezos and the company."[169]

Bezos's standoffishness has made the glowing media coverage all the more remarkable. And there has been plenty of fawning over Jeff Bezos. In declaring him its "person of the year" in 1999, *Time* magazine declared: "Every time a seismic shift takes place in our economy, there are people who feel the vibrations long before the rest of us do, vibrations so strong they demand action—action that can seem rash, even stupid. . . . Thomas Watson Jr., overwhelmed by his sense that computers would be everywhere even when they were nowhere, bet his father's office-machine company on it: IBM. Jeffrey Preston Bezos had that same experience when he first peered into the maze of connected computers called the World Wide Web and realized that the future of retailing was glowing back at him."[170] Bezos, said *Time,* "has done more than construct an online mall. He's helped build the foundation of our future."[171]

Wired magazine has said "Bezos may well be the premier technologist in America, a figure who casts as big a shadow as legends like Bill Gates and the late Steve Jobs."[172] In 2012, *Fortune* magazine named Bezos its "businessperson of the year," saying he was "the cerebral founder and chief executive of a $100 billion empire built on books."[173]

Built on books, certainly. But, more accurately, Amazon was built on a reality that began to come into focus in 1995—that the Internet, however chaotic it seemed, could be harnessed, could be made reasonably reliable and efficient for consumer transactions. Amazon was the first online pioneer to exploit the Web's merchandizing potential, to demonstrate that the commercial Web could be welcoming, dependable, and secure. Such virtues were attractive and reassuring to the mainstream populations who in 1995 were just beginning to find their way to the Web.[174]

Bezos and his company responded deftly to the newness of the Web and its versatility and power. In upending the book industry so unequivocally, Amazon demonstrated the Internet's remarkable capacity to innovate and disrupt. Amazon has been a seminal disrupter of the digital age, establishing and developing an expansive presence online that no rival has come close to matching.

Before Amazon.com opened its online store, before Netscape's eye-opening IPO, the first wiki went live and in doing so affirmed that the Internet could be a space for creative collaboration and collective knowledge-sharing. The development of the "wiki"—that is, server-based software allowing users to create, revise, update, expand, and delete Web content using only a browser and a text-entry form[175]—was an early signal that the Web could be more than an environment where, in the words of Berners-Lee, "a few published and most browsed."[176]

The wiki's best-known and most elaborate application is Wikipedia, the popular online encyclopedia read, written, and edited by thousands of people. The wiki's first use was more mundane: it was to enable computer programmers to write about and refine their techniques. The wiki's inventor was Ward Cunningham, a genial technologist and software programmer in Oregon who has called the wiki "a new way to write."[177] On March 25, 1995, Cunningham placed his technology on the Web. At first, though, it lacked a name.

"I started using it and I could tell that it was important," Cunningham recalled. "I had enough of a feel that I knew it was going to work. . . . I knew it needed a name, it needed a good name."[178] He said he thought of calling it "Quick Web," because the software allowed for rapid revisions. Cunningham chose "WikiWikiWeb" instead. He knew from his honeymoon in Hawaii that "wiki" meant "quick" in Hawaiian and that sometimes Hawaiian words were doubled for emphasis. The shuttles running between terminals at the Honolulu International

Airport were called "Wiki Wiki" buses. Cunningham figured that "WikiWikiWeb," though a bit odd, was more fun to say than "Quick Web." The alliteration of "WikiWikiWeb" was appealing, too, Cunningham said, and it evoked "World Wide Web," as well.[179] In time, "WikiWikiWeb" was shortened to "wiki."

Cunningham said he never tried to patent the wiki; he certainly made no fortune from his invention. He showed the then-new technology to a handful of friends and colleagues, one of whom told Cunningham: "I hope you patented this thing. It is amazing." While he saw the importance of the invention, Cunningham said he "also knew that I wasn't going to get any money from a patent unless I went out and sold it. I thought, 'Well, what's the chance of [my] selling this?' About zero." He also said: "I mean, if I wanted to sell rights to use my patent, if I got a patent, I'd have to go to an executive and tell him that I had invented a technology that would allow anybody in the world to write all over [his company's] Web site. And I thought, 'Nobody's going to pay to have somebody abuse their Web site.' So the only thing I could do is develop a community and accomplish something. So I devoted myself to putting it to work for my community" of computer-programmers, he said. Cunningham did concede to a fleeting sense of regret not long after developing the wiki. "I said, 'Gosh, could I have thought about it longer to figure out a way [to monetize it]? And I thought, 'Well, I am using it as a calling card. I'm presenting myself as the person who organized this, as the person who wrote this software, the person who made this happen.' . . . I realized that I didn't have any other option. There was no way somebody was going to pay me for it."[180]

Wiki technology spoke to the Internet's altruistic and selfless side, to virtues of cooperation, community, and collegiality. It helped ensure that the Internet would be something more than a place for retail. The wiki, Cunningham once said, can be thought of as "shopping mall—not."[181] The Internet "actually makes a pretty good shopping mall," he said. "But I wanted to . . . make it a creative space, not just a shopping space: a place where you could do work as well as spend money."[182]

In a real sense, then, the wiki was an affirmation of the Internet's fundamental ethos of promoting collaboration among users across distances and in a decentralized way.[183] In a way, it was an elaboration of a defining objective of Berners-Lee, the Web's inventor. "My vision," Berners-Lee has written, "was a system in which sharing what you knew or thought should be as easy as learning what someone else knew."[184] The writing and editing components of early Web browsers tended to be

ignored or minimized by developers.[185] Without a hypertext editor in the browser, "people would not have the tools to really use the Web as an intimate collaborative medium," Berners-Lee observed.[186] With the wiki, Cunningham effectively confronted that shortcoming. The "editable part" of the Web "got left behind," Cunningham has said. "I figured out a way around that omission" in developing the wiki.[187]

Of course, flaws in wiki use can be striking. Collaboration online can turn ugly. Spamming, abuse, digital vandalism, and pitched battles over obscure arguments and interpretations all can be drawbacks to open-source wikis.[188] Few public experiments in wiki use proved more embarrassing, and short-lived, than the test-run of the wiki-editorial—or "wikitorial"—in 2005 at the *Los Angeles Times*. Seeking to enliven its opinion pages, the newspaper encouraged readers to go online to revise and alter an editorial about the Iraq War. It described its experiment as part of a "constantly evolving collaboration among readers in a communal search for truth."[189] What the *Times* got was chaos. Soon after the wikitorial went live, profanity and pornographic images defaced the site. Within two days, editors were forced to end the experiment.[190] Two months after that, Michael Kinsley, editorial and opinion editor for the *Times* and the wikitorial's principal advocate, was dismissed. He told his staff the publisher "actively wants me gone."[191]

But even open-source wikis are not entirely at the mercy of vicious online trolls. As Robert Niles, then editor of *Online Journalism Review,* pointed out, the *Los Angeles Times*'s wiki software could have been configured to reject images users tried to submit; a "dirty-word filter would have blocked most of the obscene language." And, Niles wrote, "a reasonably competent computer programmer could have found a way to force wikitorial contributors through the Times' website registration process, which would have given the paper a better way to identify, and thus deter, would-be vandals."[192]

A wiki's community of users can be effective in identifying and expunging offensive or superfluous content. Wikipedia relies in part on such collaborative oversight. In fact, Wikipedia's founder, Jimmy Wales, was caught in 2005 making repeated edits to his Wikipedia biography. Among other things, the changes downplayed the contributions of Wikipedia's cofounder, Larry Sanger, who in 2002 cut ties with the site. *Wired* magazine reported that edit logs showed that Wales had changed his Wikipedia biography eighteen times, "deleting phrases describing . . . Sanger as a co-founder of the site." After the deletions were exposed, Wales said contritely: "I wish I hadn't done it. It's in

poor taste. . . . People have a lot of information about themselves but staying objective is difficult."[193]

Wikipedia, which was launched in 2001, has only conceptual ties to Ward Cunningham. He recalled receiving a query one day from Wales, who said the wiki seemed "pretty interesting for you guys. Do you think it would work to write an encyclopedia?" Cunningham replied, saying, "Yes, it would work. But when you were done, you would have to call it a wiki."[194]

If the rise of the wiki demonstrated the Web's potential as a collaborative and intellectual environment, the hours after the bombing of the federal office building in Oklahoma City in April 1995 provided a glimpse of the Web's potential for the rapid dissemination of news about major events. The attack in Oklahoma City signaled that the Internet was destined to be a medium of mass communication. By contemporary standards, the online coverage of the Oklahoma City bombing was halting and pedestrian. Emergent online news sites scrambled to report about the attack, which killed 168 people, devastated Oklahoma City, and stunned the country. The online operation at *USA Today* was just in its third day when the bombing occurred on April 19, 1995. The *USA Today* site was updated within ten minutes of the first wire service report about the attack. Within an hour, screen-grabs of television images were posted online. Not long after that, the site had uploaded a package of articles, photos, and graphic illustrations.[195]

Soon after the bombing, the site Internet Oklahoma had put up a Web page offering news reports, lists of survivors, and telephone numbers for hospitals in Oklahoma City. Jon Katz, then a columnist for *Wired,* noted the Internet Oklahoma response and wrote, presciently: "Inevitably, as the number of online users grow, online news will converge with a massive story, and digital news will become part of the media mainstream."[196]

Going online, though, was a maybe-someday prospect for many news organizations in 1995. Soon after the bombing, the *Daily Oklahoman* newspaper in Oklahoma City found its way to an online presence in a most unintended and unlikely manner. Late on the night of the bombing, Sue Hale, the newspaper's assistant managing editor, took a call from a young man from Internet Oklahoma named Matt Williams.[197] "I would like to put your photos and your stories up on the Internet," Williams told her. As Hale recalled, the *Daily Oklahoman* had been looking into establishing an Internet presence, but covering the bombing was such a demanding priority that going online was a remote concern.

"Have you any idea what I'm going through right now?" Hale asked her caller.[198] "I won't have time to send you stories. I don't have time to get photos for you."

"You don't have to do that," he said. "All you have to do is . . . after the last edition tonight . . . just put the stories on a disk and leave them downstairs at the guard's desk. And any photos you just happen to have laying [*sic*] around, put 'em down there and I'll build you a Web site" featuring the newspaper's stories and photos.

Hale consulted her boss, Ed Kelly, the newspaper's managing editor. "Do you even want to mess with this?" she asked.

She said Kelly replied: "Well, it would certainly get the story out to the world. A lot more people could see if it we did that."

"OK," Hale said. "We'll do it."

That night, Williams stopped at the newspaper's front desk and retrieved the material Hale had left for him. From a floppy disk, he uploaded *Daily Oklahoman* news reports. From prepress proofs known as "color keys," which editors used to adjust the color quality of newspaper pages, Williams scanned and uploaded photographs. The process and the product may have been crude, but, as Hale said, the newspaper "had an Internet site without having an Internet site." When the *Daily Oklahoman* established a full-fledged Internet presence in 1996, Hale was named the site's general manager. Her first hire was Matt Williams.