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TIM BERNERS-LEE INVENTED THE WORLD WIDE WEB. NOW HE WANTS TO SAVE IT

In 1989, Sir Tim revolutionized the online world. Today, in the era of misinformation, addictive algorithms, and extractive monopolies, he thinks he can do it again.

By Julian Lucas

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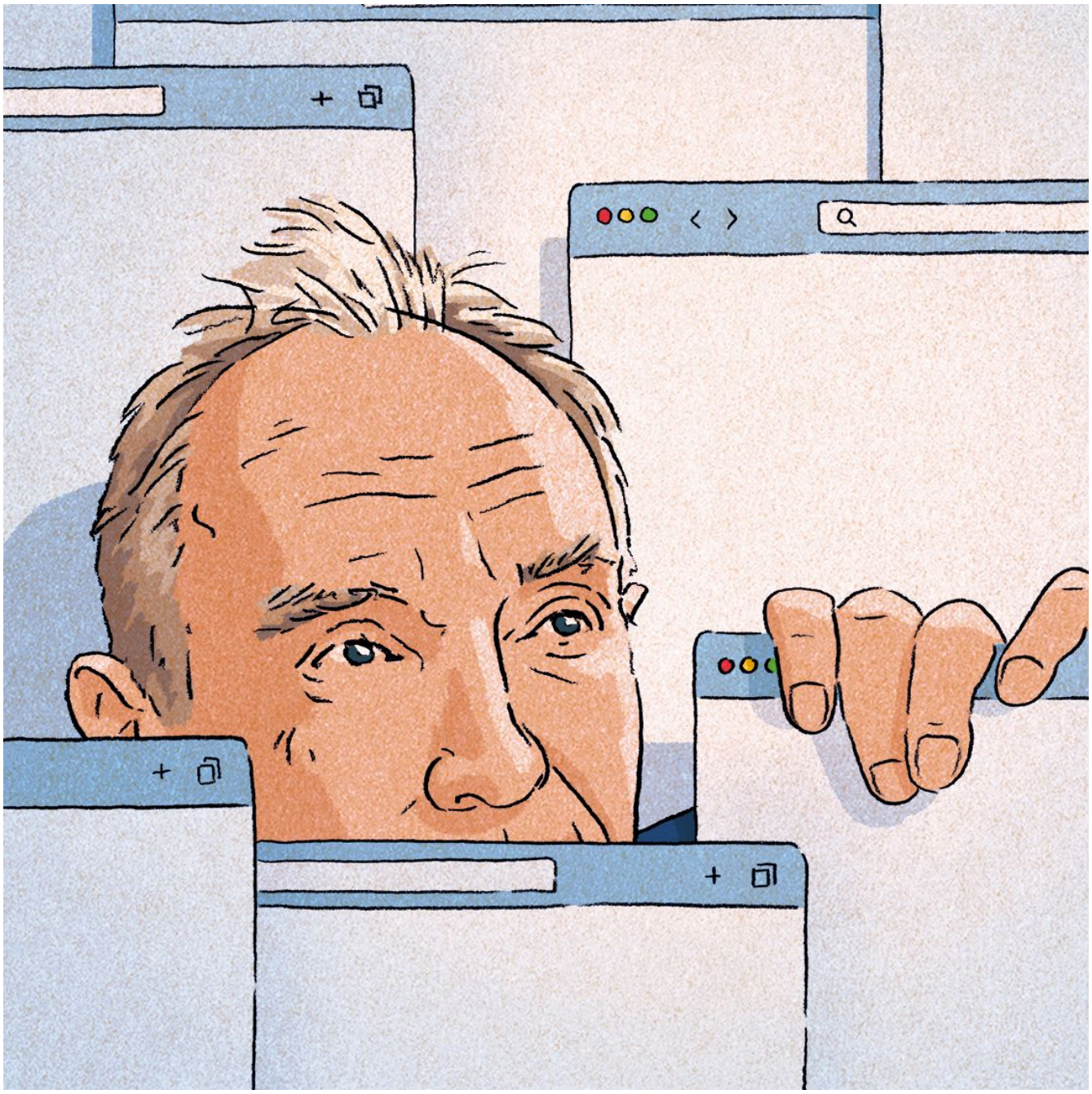


Berners-Lee is building tools that aim to resist the Big Tech platforms, give users control over their own data, and prevent A.I. from hollowing out the open web. Illustration by Tim Bouckley

Tim Berners-Lee may have the smallest fame-to-impact ratio of anyone living. Strangers hardly ever recognize his face; on “Jeopardy!,” his name

usually goes for at least sixteen hundred dollars. Berners-Lee invented the World Wide Web, in 1989, but people informed of this often respond with a joke: Wasn't that Al Gore? Still, his creation keeps growing, absorbing our reality in the process. If you're reading this online, Berners-Lee wrote the hypertext markup language (HTML) that your browser is interpreting. He's the necessary condition behind everything from Amazon to Wikipedia, and if A.I. brings about what Sam Altman recently called "the gentle singularity"—or else buries us in slop—that, too, will be an outgrowth of his global collective consciousness.

Somehow, the man responsible for all of this is a mild-mannered British Unitarian who loves model trains and folk music, and recently celebrated his seventieth birthday with a picnic on a Welsh mountain. An emeritus professor at Oxford and M.I.T., he divides his time between the U.K., Canada, and Concord, Massachusetts, where he and his wife, Rosemary Leith, live in a stout greige house older than the Republic. On the summer morning when I visited, geese honked and cicadas whined. Leith, an investor and a nonprofit director who co-founded a dot-com-era women's portal called Flametree, greeted me at the door. "We're basically guardians of the house," she said, showing me its antique features. I almost missed Berners-Lee in the converted-barn kitchen, standing, expectantly, in a blue plaid shirt. He shook my hand, then glanced at Leith. "Are you a canoer?" she asked. Minutes later, he and I were gliding across a pond behind the house.

Berners-Lee is bronzed and wiry, with sharp cheekbones and faraway blue eyes, the right one underscored by an X-shaped wrinkle. There's a recalcitrant blond tuft at the back of his balding head; in quiet moments, I could picture Ralph Fiennes playing him in a movie—the internet's careworn steward, ruminating on some techno-political conundrum. A twitchier figure emerged when he spoke. He muttered and trailed off, eyes darting, or froze midsentence, as though to buffer, before delivering a verbal torrent. It was the arrhythmia of a disciplined demeanor struggling with a restless mind. "Tim has always been difficult to understand," a former colleague of his told me. "He speaks in hypertext."

He visibly relaxed as we paddled onto the water. Berners-Lee swims daily when it's warm, and sometimes invites members of the World Wide Web Consortium (W3C) to "pondithons," or pond-based hackathons. "We have a joke that if you get any number of them on the island, then they form a quorum, and can make decisions," he said, indicating a gazebo-size clump of foliage. He spoke of the web as though it were a small New England town and he one of the selectmen. Berners-Lee raised his two children in nearby Lexington, the cradle of the American Revolution, and rose early for the annual Patriots' Day festivities. "We took them to the reënactment on the Battle Green," he recalled, "and the midnight ride of Paul Revere."

The Founding Fathers idolized Cincinnatus, who was appointed dictator to save the Roman Republic, then peacefully returned to his fields. Berners-Lee is admired in a similar spirit—not only for inventing the web but for refusing to patent it. Others wrung riches from the network; Berners-Lee assumed the mantle of moral authority, fighting to safeguard the web's openness and promote equitable access. He's been honored accordingly: a knighthood, in 2004; the million-dollar Turing Award, in 2016.

Now Sir Tim has written a memoir, "This Is for Everyone," with the journalist Stephen Witt. It might have been a victory lap, but for the web's dire situation—viral misinformation, addictive algorithms, the escalating disruptions of A.I. In such times, Berners-Lee can no longer be Cincinnatus. He has taken up the role of Paul Revere.

"They thought they were safe," he said, as the boat startled a flock of geese. Platforms had lulled users into complacent dependency, then sealed off the exits, revealing themselves as extractive monopolies. Berners-Lee's escape hatch is a project called the Solid Protocol, whose mission is to revolutionize the web by giving users control over their data. To accelerate its adoption, he launched a company, Inrupt, in 2017. "We can build a new world in which we get the

functionality of things like Facebook and Instagram," he told me. "And we don't need to ask for permission."

Berners-Lee knows that the obstacles are formidable. But he's pulled off a miracle before. "Young people don't understand what it took to make the web," he said. "It took companies giving up their patent rights, it took individuals giving up their time and energy, it took bright people giving up their ideas for the sake of a common idea." The dock slid into view just as he reached a crescendo. Smiling, he set down his paddle. "Shall I drop you here?"

In the beginning, the internet was without form, and void, and data trickled through the ports of the routers. The "series of tubes," in the immortal words of the Alaska senator Ted Stevens, went online in the late nineteen-sixties, though "tubes" exaggerates its concreteness. Technically, the internet is a protocol: a set of rules that let computers send and receive data over various networks by breaking it into "packets." Vint Cerf and Robert Kahn devised this "inter-network" at the U.S. Department of Defense. By the late eighties, it had spread to civilians, who could send e-mail, transfer files, and post on forums through subscription-based services such as CompuServe and AOL. Still, many yearned for a unified ecosystem. "There was a fork in the road," Brewster Kahle, the founder of the Internet Archive, told me. "Are we going to have an information superhighway which is open to all? Or is it going to be five hundred channels of nothing on the net?"

Berners-Lee modestly maintains that anyone might have solved this conundrum. But his upbringing helped. He was born in 1955 to Conway Berners-Lee and Mary Lee Woods, two computer scientists who met while working on an early commercial computer, and raised him in suburban London. Conway, who studied the mathematics of queuing, used water jets to teach Tim about electronic circuits. Mary, a believer in "watchful negligence," would let him and his three younger siblings wrap themselves in extra perforated tape. Tim loved math, the outdoors, and building electronics with transistors. At Oxford, where he studied physics, he

knew that his future was in computing; between terms, he cobbled together a working machine from junk parts.

His career began, ordinarily enough, at a telecom company in southern England, where he and a college girlfriend, then first wife, went to work. But in 1980 he took time off for a fellowship at CERN, the particle-physics lab near Geneva, and returned, four years later, for a full-time job. His unglamorous assignment was to maintain the computer system that processed images of experiments—I.T. work for the heirs of Planck and Einstein. And the only thing more complex than the quarks and bosons they were chasing was the babel of languages, operating systems, storage formats, and filing systems that they employed. "One scientist might have critical information about how to run the accelerators stored in French in a private directory in the central Unix mainframe; another might have information on how to calibrate the sensors stored in English on an eight-inch I.B.M. floppy disk in a locked metal cabinet," Berners-Lee writes. "It was a mess."
Out of this mess came the last great invention of the twentieth century.
The web was a fusion of two earlier technologies: the internet and hypertext, a way of organizing documents non-hierarchically through links. Hypertext dated to the nineteen-forties, when the science administrator Vannevar Bush wrote an article about a device that could represent knowledge "As Freely as We May Think." By the eighties, the technologist Ted Nelson was trying, unsuccessfully, to build a universal hypertext library, which he called Project Xanadu. Berners-Lee's more pragmatic idea was to use hypertext to enhance online collaboration. "Imagine making a large three-dimensional model, with people represented by little spheres, and strings between people who have something in common at work," he wrote in a 1989 proposal.

Colleagues at CERN didn't know what to make of the idea. "For many computer scientists . . . every document belonged in a specified container," Berners-Lee writes. "I was proposing instead to free those documents—essentially to dump the files from their folders onto the floor." A supervisor jotted "vague but exciting" on the proposal, and let him pursue it on the side. In October, 1990, Berners-Lee

began laying the web's foundations: HTML, the language of web pages; HTTP, the protocol that governed their transmission; and URLs, the addresses that linked them together. On August 6, 1991, the web's first page, http://info.cern.ch, went online, introducing itself as "a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents." Soon enough, there would be porn.

In January, 1993, when I was born, there were about fifty web servers on the internet; new hosts customarily e-mailed Berners-Lee to let him know they were online. By my first birthday, there were six hundred, and this magazine had printed the now famous cartoon captioned "On the Internet, nobody knows you're a dog." The first site I remember is Yahooligans, a Yahoo portal for children, where I played chess and downloaded screensavers. Next was Neopets, a virtual-pet game where my uncle, a former photo-lab technician, reinvented himself as a programmer. On the web, I read Jules Verne on Project Gutenberg, gave myself nightmares learning about Japanese war crimes in Manchuria, and laughed with a cousin at the crowdsourced recordings on farts.com. It was just as Berners-Lee wrote: "If you could put anything on it, then, after a while it would have everything on it."

My father, a songwriter and producer who built computers for his home studio, was quick to embrace the dot-com gospel. He bought domain names for everyone in the family and encouraged my early experiments in programming. At recess in middle school, while others played soccer or traded Yu-Gi-Oh! cards, I pored over tomes on HTML, JavaScript, and PHP—which paid off, socially, when I built a proxy server to let classmates access banned Flash games. Eventually, I started coding sites for local businesses, beginning with my mother's. But it was exhausting to keep up with browsers' rival implementations of the languages I'd learned.

Fragmentation menaced the web from the outset. From CERN, it spread quickly through listservs, where enthusiasts shared proto-browsers to replace the bare-

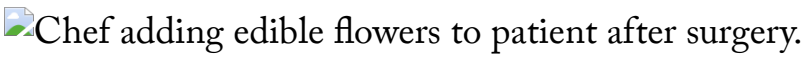
bones command-line program Berners-Lee had written. This was the kind of improvisation he'd hoped for. But it quickly got out of hand.

One day, Berners-Lee had a listserv exchange with a college student named Marc Andreessen, who'd proposed an "<img>" tag to embed pictures in pages. Berners-Lee demurred, saying that he preferred more content-neutral syntax. But Andreessen wasn't asking for his blessing. In 1993, he led the team that launched Mosaic, the first modern browser. The next year, he released a commercial successor, Netscape, whose I.P.O. made him an instant multimillionaire. *Time* put him on its cover—barefoot, leering, perched on a throne—and hailed him as a "Golden Geek." (*Time* profiled Berners-Lee the next year, noting that unlike Andreessen, who drove a Mercedes, Berners-Lee drove an old Volkswagen; he jokingly blamed its carbon-monoxide emissions for the "diffuseness of his answers.") Berners-Lee believed that Andreessen was trying to "hijack" his creation.

His pique wasn't just about money or ego. The web was meant to be universal, and had already outpaced similar networks. Kahle, the Internet Archive founder, had created WAIS, or the Wide Area Information Server, a publishing system with natural-language search. Another competitor was Gopher, developed at the University of Minnesota. Yet both relied on existing file formats and hierarchical menus. When Gopher tried to charge licensing fees, users fled. The web, by contrast, was free, easy to use, and, thanks to hypertext, infinitely flexible. "The markup language was simple," Dan Connolly, who worked with Berners-Lee to codify HTML, told me. "And you didn't have to ask your boss for money."

To keep it that way, Berners-Lee moved to the U.S. and founded W3C, in 1994. In time, the organization would open offices across the world, but its first home was at M.I.T., where it eventually settled into Frank Gehry's flamboyant Stata Center, a jumble of towers and angles that appear to grow in several directions at once. The web, too, seemed in need of a stabilizing center—one that Berners-Lee doubted either he or the market could supply. A consortium, he writes, provided

an alternative to “Balkanization and competing technical fiefdoms.” Companies were invited to shape the web collaboratively, through technical standards reached by consensus, and, later on, agreed not to sue one another over web technology.



“Now he will wake up to a scar and edible flowers.”

Cartoon by Anjali Chandrashekar

“Tim used to call it ‘blue-helmet work,’ like U.N. peacekeepers,” Connolly said of the consortium’s early efforts. Its authority was constantly challenged. “These young engineers were saying, ‘Why do we need a consortium?’ ” Jean-François Abramatic, a former W3C chairman, recalled of an early meeting in San Francisco. “ ‘Why don’t we develop the best products and compete?’ ” But more enlightened self-interest won out. “They realized that the whole market was going to be much bigger if they coöperated,” Berners-Lee told me. He offered a nautical analogy: “When you sail a boat, there’s force on the sail and force on the keel. The boat goes forward, because those forces are very strong, but it’s the constructive tension that drives the boat forward.”

W3C kept the web whole during the “browser wars” of the late nineties, as Microsoft and Netscape pushed their own flavors of HTML. It kept the web’s design supple amid exponential growth, even when that clashed with demands for more features. The lodestar was Berners-Lee’s “principle of least power,” which dictated a minimal architecture. “He’s got this physicist’s picture of things scaling up and scaling down, of very simple rules that work well at any level,” Connolly said. Abramatic recalled the stress of defending this vision from the shortsightedness of various industries. “But if we had to do all of it just for Wikipedia,” he said, “that was worth it.”

"You have to stay with it," Berners-Lee told me. "You invent something, and you have to make sure it's all right." He didn't win every battle. He had imagined the web as a space where everyone would read *and* write; instead, "browsers," a term suggestive of bovine passivity, won out. He still regrets tying web addresses to the Domain Name System, or D.N.S., which allowed domain names like newyorker.com to become speculative assets.

Even so, the early web was a dream realized. As Y2K neared, Berners-Lee was planning the next phase: a "Giant Global Graph," as he later dubbed it, of structured data. In his first book, "Weaving the Web" (1999), he argued that, if websites could be augmented with a layer of machine-readable information, the potential was boundless. "The intelligent 'agents' people have touted for ages will finally materialize," he wrote. "The Web will be a place where the whim of a human being and the reasoning of a machine coexist in an ideal, powerful mixture."

Berners-Lee sipped lemonade and stared at a projected image of Joe Rogan. From Concord, he, Leith, and I had come to M.I.T.'s Center for Constructive Communication, whose director, Deb Roy, knelt on a rolling chair and presented his research on America's "Civic Breakdown." Roy, a media scientist, discussed a project that used large language models as a "listening tool" for group discussion, which he'd piloted at a public high school in Newark.

Berners-Lee and Leith considered. "I'm just thinking of Charlie, Tim," Leith said. "Is there a role for Charlie in this?"

"Well, Charlie is the *individual's* A.I.," Berners-Lee replied, pursing his lips.

"You could make a *group* Charlie, a small-group Charlie," she suggested.

"You could ask Charlie how polarized you are, if he had access to all of your media data," Berners-Lee's young chief of staff chimed in.

"Isn't the balanced person someone who listens to everything?" Leith asked.

Berners-Lee, squinting, wasn't so sure. "Can you do that just by listening to Ezra Klein and Joe Rogan and you've covered the entire spectrum?"

Roy looked flummoxed: "So, 'Charlie'? "

" 'Charlie' is an A.I. that works for you," Berners-Lee said. "It's very, very powerful." A prototype was already being tested at his company, Inrupt.

Berners-Lee has been predicting our age of automation since the late nineties, when he set out to build what he called the Semantic Web. Its mission was to get humanity's data online, and he pursued it zealously for more than a decade. In a 2009 TED talk called "The Next Web," he urged governments, corporations, and citizens to upload all they could: "You hug your database, you don't want to let it go until you've made a beautiful website for it," he said. "But, first, give us the unadulterated data." His demand escalated to a chant. "We have to ask for raw data now," Berners-Lee cried with sermonic fervor. He windmilled his arms like an inflatable tube man. "Can you say 'raw'? Can you say 'data'? Can you say 'now'? Raw data now!"

The idea was to make facts, statistics, and just about any "structured" information as free and flexible online as documents already were. A database of magazines, for instance, could link to further databases maintained by each publisher—and so on down to the facts in particular articles, which, in turn, might link to the sources they cited. It was metadata unchained, and Berners-Lee believed it would change the world. In a 2001 *Scientific American* article, he envisioned a future web of genie-like agents able to book medical appointments or instruct microwaves in the latest manufacturer-approved tips for heating frozen food.

For this utopia to be realized, the web would need an overhaul. HTML had run its course, Berners-Lee decided. Its successor, XHTML, or extensible hypertext markup language, would separate information and the way it was presented more cleanly, making pages easier for machines to read. Many developers, though, had

no interest in such a drastic change. Berners-Lee wanted "raw data now"; they wanted to build interactive web applications.

The clash led to a schism at W3C. In 2004, after losing a vote, a group of browser developers who wanted to keep improving HTML formed a rival standards body. Berners-Lee considered the move a power grab, describing it as "the first real blow to the integrity of the World Wide Web." But when his "extensible" language faltered he backed a reconciliation with the rebels, whose new standard, HTML5, had prevailed. Web applications became the basis of "Web 2.0," powering Twitter's endless scroll and Google's smoothly panning Maps.

The Semantic Web survives in certain contexts. Scientists use it to make the research behind their papers—protein structures, brain scans—programmatically searchable. DBPedia, a crowdsourced database of several billion facts, helped I.B.M.'s Watson win "Jeopardy!" But Berners-Lee's vision of reasoning machines, drawing conclusions from trustworthy data freely shared by individuals, never came to pass. There is plenty of raw data online, but much of it is harvested privately by platforms. The A.I. trained on it doesn't parse carefully encoded labels according to logical rules; it "infers" from wholesale scraping.
After the presentation at M.I.T., the conversation turned to A.I.'s trustworthiness.

"I use some language model daily," Roy said. "Yet there's this slipperiness at the base. They're not accountable."

"They're not accountable in what sense?" Berners-Lee asked.

"If they steer you wrong, whose fault is it?" Roy clarified. "There's a difference between pretending to care and caring."

Berners-Lee paused. "Philosophically, I disagree with you."

"You do?"

"Yeah. If something can pretend to care, it's fundamentally the same operation."

Near the climax of the opening ceremony of the 2012 London Olympics—a living diorama of British history, directed by the filmmaker Danny Boyle—a model house was lifted away to reveal Berners-Lee. Seated at a NeXT Computer, the kind he'd used at CERN, he typed a message that flashed across the stadium: "THIS IS FOR EVERYONE." A light show dramatized the birth of the World Wide Web, its hyperlinks racing from continent to continent. Finally, Berners-Lee stood, maestro-like, from the keyboard, turning to applaud each quadrant of the roaring crowd.

The web was riding high. China had half a billion internet users, who could still criticize the government on the microblogging platform Sina Weibo. Twitter was credited with fuelling the Arab Spring. In the United States, Barack Obama was on his way to reëlection, his campaign driven by the largest social-media and data-analysis operations in political history. The web was broadly seen as a force for justice, destined to uplift the world.

Berners-Lee was spreading his wings, too. In 2010, he divorced his second wife, the mother of his two children, and began a relationship with Leith, whom he knew from philanthropic projects. (They married four years later at the Chapel Royal, in St. James's Palace.) "Once I met Rosemary, my life became an almost non-stop flurry of activity," he writes. Together, in 2009, they had founded the World Wide Web Foundation, to promote global internet access, especially in Africa, where Berners-Lee marvelled at the web-enabled spread of farming techniques, and at the profusion of routers in the palace of Rwanda's President, Paul Kagame.

In 2012, Berners-Lee founded the Open Data Institute, in London, to advocate for digital transparency. One of his protégés, the young activist Aaron Swartz, took more radical measures. In his "Guerilla Open Access Manifesto," Swartz had warned that the world's scholarship and scientific research—much of it publicly funded—was being "digitized and locked up by a handful of private corporations." Then, in 2013, he took his life, after federal prosecutors charged him with a felony

for sneaking into a router closet at M.I.T. to download millions of articles from JSTOR. "Hackers for right, we are one down," Berners-Lee tweeted. "Let us all weep."

Swartz's death foreshadowed a darker turn. In a forthcoming book, "The Age of Extraction," Tim Wu, a Columbia law professor who coined the term "net neutrality," identifies 2012 and 2013 as the years when "platform power" took hold. Since the nineties, it had been assumed that the web would democratize society, empowering bloggers to compete with media conglomerates, and small manufacturers to bypass big retailers. Some of that happened. But the web's Davids had only traded one Goliath for another—corporate platforms that stood between them and their markets. As Wu writes, "Paeans to small-is-beautiful and the transformation of the human existence" soon gave way to "a strategy that extracted from dependent businesses and harvested the time and data of the masses."

Platforms aren't inherently extractive. Wu defines them as any space that "brings together two or more groups to transact or interact while reducing the costs of doing so." The internet itself is a platform. But the new web-based platforms were far less neutral. They grew at breakneck speed, and then, once network effects had made them indispensable, they squeezed sellers, served ads, and otherwise extracted value from users while making exit ever costlier. They bought out rivals and turned into monopolies: between 2007 and 2018, Wu notes, Facebook, Microsoft, Google, and Amazon collectively acquired more than a thousand firms.

Berners-Lee sounded the alarm, warning, as always, about fragmentation: buy a song on iTunes or read a magazine in its proprietary app, and you were no longer on the web. "The more this kind of architecture gains widespread use," he wrote, in *Scientific American*, "the less we enjoy a single, universal information space."

The fight over how to resist platform power led to W3C's deepest rupture. In 2012, Netflix and several other members of the consortium proposed a standard to protect streaming video from piracy by letting browsers play video while blocking

access to the underlying files. This was a form of digital-rights management, or D.R.M.—long anathema to open-web advocates, who not only disliked copyright but were morally opposed to technical limits on the free operation of their computers. (Drivers must obey traffic laws, but their cars don't shut off when they run a red light.) Berners-Lee felt the same but feared that, without D.R.M., streaming companies would retreat to closed, app-based ecosystems. He agreed to hear the proposal.

The backlash was swift, spilling from the consortium's mailing lists into the pages of the *Guardian*. "Stop the Hollyweb," the Free Software Foundation, one of the oldest digital-rights groups, urged in a petition. Video was only the beginning, activists warned: if D.R.M. prevailed, browsers might one day block source-code views, downloads, even cut-and-paste. When the Motion Picture Association of America joined the consortium, in 2014, the fight grew uglier. "Hitler might have caused less of a stir," a W3C staffer recalled on a podcast episode titled "Bring Me the Head of Tim Berners-Lee."

The loudest dissenter was the science-fiction writer Cory Doctorow, who represented the Electronic Frontier Foundation at the consortium. D.R.M., he argued, would hinder accessibility, create security flaws, and make browsers dependent on encryption modules sold by Microsoft and Google. Users could even be charged with a felony for bypassing D.R.M. software. Doctorow warned, "We are Huxleying ourselves into the full Orwell."

Doctorow admired Berners-Lee—both had wept at Aaron Swartz's funeral. "He passed up ten fortunes to devote himself to public service," Doctorow told me. "The web was so important that these companies came and bent the knee to Tim." But now, he believed, the web's knight was the one genuflecting.

By 2016, as a deeply divided W3C debated a new D.R.M. standard, protesters in Guy Fawkes masks gathered outside the Stata Center, chanting "rm D.R.M."—"rm" being the Unix command to delete a file. In the end, Berners-Lee exercised his authority as director to break the deadlock: D.R.M. was in. "Some

people have protested 'no,' but in fact I decided the actual logical answer is 'yes,' " he wrote afterward. Evoking the legendary King Canute, who couldn't hold back the tide, he urged the consortium to accept its limits: "People like to watch Netflix."

"It was a rotten time," Berners-Lee said of the battle, which is conspicuously absent from his memoir. "People we'd counted on as friends began to see the W3C as the enemy."

Doctorow, for his part, is still fighting "to bring back the Web that Tim made." His new book, "Enshittification," vividly dissects our "age of zombie platforms": Google adulterating search results for advertisers; Facebook extorting news organizations; Adobe removing unlicensed colors from users' images after shifting its software to the cloud. He characterizes tech C.E.O.s as graduates of "Darth Vader University, where the first lesson is 'I'm altering the deal. Pray that I don't alter it any further.' "

Yet Doctorow insists there are ways to resist: antitrust actions, data-privacy regulations, and the legalization of "adversarial interoperability," or the right to engineer compatibility between proprietary platforms and more open alternatives. In 2017, Berners-Lee took a hiatus from W3C to launch his own interoperability initiative, Inrupt. "We will build beneficial systems that work for everyone," he wrote in a post announcing the project. "The future is still so much bigger than the past."

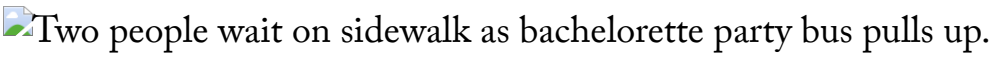
Inrupt's offices occupy a glass tower beside TD Garden, where the Bruins and the Celtics play. The space is lined with whiteboards, and, on the day I visited, a half-dozen employees worked quietly at standing desks. The company's name, a portmanteau of "innovate" and "disrupt," does little to clarify its mission—nothing less than breaking the hold of platforms and reclaiming the open web.

In a conference room, I met the C.E.O., John Bruce, an affable Englishman with a sweep of white hair, who plays the plainspoken foil to Berners-Lee's digital

statesman. When the two met, almost a decade ago, Bruce had just sold a cybersecurity firm to I.B.M., and was interested to hear about the company Berners-Lee planned to start. "A man who invents something like the web is a smart guy," Bruce said. "But it was more than that. He'd nurtured it. He'd fought for it. If this guy had an idea to make it better, I was all ears." They bonded over British television from the sixties, but when it came to Berners-Lee's project, "I couldn't grok it," Bruce admitted. "We had a couple of dinners, and it took me all of those and then some to understand what Tim was talking about."

What needed fixing was obvious enough: web users had surrendered their data to monopolistic platforms that respected neither privacy nor choice. Because their systems were deliberately incompatible, they could wall off the valuable information trails we generated—search histories, purchases, social-media posts—and treat us with impunity, knowing it was nearly impossible for us to leave.

But what if everyone stored their data on personal servers? Platforms would have to request access, or even offer micropayments, letting users comparison-shop. Decoupling data from the services that used it would also spur competition and encourage innovative new applications, since information from various sources could be recombined. All this would be accomplished by what Berners-Lee called Solid Pods: Solid, for "social linked data," Pods, for "personal online data stores." They were online strongboxes devised by the very Pandora who'd unleashed the web itself.



"Uh-oh. Instead of choosing an Uber XL, I accidentally called for a bachelorette-party bus."

Cartoon by Drew Dernavich

Solid grew out of M.I.T.'s Decentralized Information Group, which Berners-Lee had co-founded to help realize his dreams for the Semantic Web. In 2015, he and his colleagues launched the Solid Protocol, hoping that it, like the web, would show how an open, decentralized system could triumph over a patchwork of subscription services. "You can make the walled garden very, very sweet," Berners-Lee said at an event in 2016. "But the jungle outside is always more appealing."

The promise of "data sovereignty," though, was relatively intangible, and twenty-first-century platforms were far more entrenched than nineties AOL. To accelerate Solid's adoption, Berners-Lee decided to go into business. Recommending standards wasn't enough. It was time to move fast and fix things.

"It's been fascinating for me to get things done, to execute," Berners-Lee told me. By the end of 2018, Inrupt had twenty employees, a reported twenty million dollars in V.C. funding, and a tailwind from the Cambridge Analytica scandal, which revealed that leaked Facebook data had been used to target ads in the 2016 U.S. Presidential race. Conveniently, the web was also about to turn thirty. In a BBC segment, Berners-Lee warned of the web's "downward plunge to a dysfunctional future." He used the anniversary to promote Inrupt, which planned to sell enterprise servers to implement Solid. (Because the protocol is open, other companies can do the same.)

In the years after its launch, Inrupt announced a string of partnerships. Solid was piloted by the U.K.'s National Health Service in the hopes of giving patients more control over their medical records. The BBC built a prototype "BBC Box" that could algorithmically recommend shows without retaining user data. The government of Flanders, in Belgium, went further, promising every citizen a Solid Pod as part of its compliance with Europe's General Data Protection Regulation. The momentum coincided with a broader wave of decentralization in tech, from the blockchain boom to federated networks like Mastodon and Bluesky. Once again, Berners-Lee seemed to be on history's leading edge.

Today, Solid looks stalled. Eleni Sharp, who led the BBC pilot, told me the Box never made it out of testing. "People say they want to be more in control of their data," she said. "But do they then want to be more hands-on? Not really!" In Flanders, with nearly seven million residents, only about a thousand actively use Solid; one feature lets graduates send digital diplomas to employers. A Flemish official insisted that more projects were under way, but I couldn't find any residents aware of them. On the r/Vlaanderen subreddit, one replied to my query, "I had no idea we were using some exotic tech by Tim Berders. Did you make that up?"

"I never really used Solid for anything serious," Kjetil Kjernsmo, a Norwegian informatics expert who co-authored the standard, told me. He was Inrupt's first employee, and had expected to work on tools for the hundreds of developers interested in the protocol; instead, the company focussed on selling servers to corporate clients. Berners-Lee mentioned a developer who has built several Solid apps, including a recipe manager and a viewership tracker that aggregates data from multiple streaming services. But that developer's own blog wearily concedes that the protocol "doesn't seem to be going mainstream anytime soon."

Of course, it takes only one "killer app" to vindicate a technology. While I spoke with Bruce, Berners-Lee was meeting with a representative from Visa, which recently announced "the next evolution of digital commerce." Visa believes that consumer purchasing will soon be delegated to A.I. agents, which will make informed decisions based on user data. But whom will they work for? If they answer to platforms, the result could be a more insidious version of algorithmic recommendations—sentient credit cards that read our minds and collude with merchants.

Inrupt's solution is Charlie, a Solid-based chatbot that works for you. Charlie uses personal data to inform its answers, but also protects that data from platforms, allowing security-conscious users reliant on targeted "insights" to have their cake and eat it, too. Greater trust would inspire more data-sharing, facilitating deeper

customization, Berners-Lee explained. “If you give it access to your exercise data, then ask what running shoes you should have, you’ll find that it knows you very, very well.”

He dreamed up Charlie in 2017. Last year, Inrupt built a prototype, which Bruce showed me over Zoom. It was an app on his iPhone, which opened with the prompt “How can I help you today?”

“This is the world without Charlie,” Bruce said of the default mode, which simply queries Anthropic’s L.L.M., Claude. We asked for potential fall getaways, and it suggested Kyoto or Tuscany—each pricey and overrun with tourists. But giving Charlie access to a fictional user’s “data wallet” yielded more bespoke results. “Zoe,” as the user was called, lived in Seattle, loved nature photography, and worked in tech, where salaries are falling. Why not send her to Olympic National Park, in Washington? Charlie thought it was a good fit for her “love of photography” and “practical travel constraints,” adding that her Marriott points would cover the hotel.

“Charlie knew what data was pertinent to this request,” Bruce said. The app had sifted Zoe’s personal information, bundled it with her query, and sent it to Claude. (The final product will be compatible with multiple L.L.M.s, which will run locally in a sealed-off “Trusted Execution Environment.”)

Soon, Bruce added, Charlie will be able to alter files in a data wallet, the first step toward “agentic” powers. But he couldn’t say when it would be released. “It could be rolled out by an Acme, Inc.,” Bruce said. “It could be rolled out by an independent business that wants to operate Charlie for the benefit of everybody. We could roll it out for the benefit of everybody.”

The commendable aim was to mainstream the principle of user control over data. Still, it was hard not to feel that Berners-Lee’s ambitions had narrowed. “We build it now so that those who come to it later will be able to create things that we cannot ourselves imagine,” he once wrote of the web. But, at this critical juncture,

the unimaginable thing he'd chosen to build was a chatbot that helps you pick sneakers.

Charlie may be too late. Google just announced its own agentic commerce platform, and, when I followed up with Visa, the company was evasive about its commitment to Berners-Lee's idea. In any case, stronger measures will be needed to resist what Wu calls the "emergent form of economic power in our time—the artificially intelligent tech platform."

In July, Cloudflare—a firm that shields roughly a fifth of all websites from automated attacks—rolled out tools to block A.I. companies from scraping sites without permission. It's meant to stave off what some call Google Zero, the day when "answer engines" such as Google's Gemini and OpenAI's ChatGPT—which don't drive traffic to the sites that they scrape—replace search engines and destroy publishers reliant on online advertising. "The dystopian horrible outcome is that you starve to death and die as a journalist or a researcher or an academic," Matthew Prince, Cloudflare's C.E.O., told me. His hope is that A.I. firms can be forced to pay for what they consume, with revenue distributed to creators à la Spotify.

"These companies are basically free-riding off of the content and production of others," Lina Khan, who led the Federal Trade Commission under President Biden, told me. A millennial like the web itself, she grew up posting on Xanga and LiveJournal, and is concerned not only with the platform economy's unfairness but also its threat to online creativity. "If creators who are actually producing aren't going to reap the rewards, what's going to be the initial economic incentive?" Last year, a federal judge ruled against Google in an antitrust case that Khan filed against it for monopolizing the search advertising market. Lawyers for the company, which plans to appeal, recently made the startling admission that "the open web is already in rapid decline."

A floatplane skimmed the clear skies over Lake Muskoka, in Ontario's cottage country. "That's the guy who worked for Microsoft," Berners-Lee remarked,

though later he wasn't sure. We had just sat down for lunch on the deck of the summer house he shares with Leith, who emerged from the kitchen bearing asparagus, smoked-trout pâté, peaches, and butter tarts. Friends had cycled through all summer, Leith explained, many with forbidding dietary restrictions. Her solution: "I did what most people do now. I went to Claude and said, 'Claude?' "—she affected the French pronunciation—" 'I need six days of menu planning using the New York *Times*.' "

"Streets of London," by the singer Ralph McTell, started playing; he crooned about a "forgotten hero / and a world that doesn't care." Lately, Berners-Lee has been spending a bit more time on music himself. "As it happens, I've just had a few singing lessons for the first time in decades," he told me. "Have you heard of panto?" He meant British pantomime, a genre of family-friendly slapstick that he first performed with an amateur group in Geneva. "We did 'Peter Pan' and flew everybody to Never Never Land."

I was, he'd told me, the first journalist to visit his summer place: a snug retreat with brown clapboard siding, on a sparsely inhabited island. Earlier, we'd been swimming, and had meant to sail across the lake in Berners-Lee's catamaran until we realized that there wasn't any wind.

Our conversation was similarly becalmed. I'd come not just as a journalist but as a concerned digital native, watching Berners-Lee's web unravel from within. Billionaires were using platform power to distort reality and control politics; Elon Musk's Grok had recently declared itself "MechaHitler." Generative A.I. was flooding the internet with deepfakes and conspiracy theories; a retired relative, who spends a lot of time watching YouTube and querying Gemini, had recently informed me of a likely shift in the magnetic poles, which would fling us into the void as though "God were shaking an Etch A Sketch." The Trump Administration had abolished net neutrality, the principle that internet-service providers should treat all traffic equally. Yahooligans felt further away than ever as news broke that Meta's A.I. was engaging in sexual role-play with children.

Like Dorothy confronting the Wizard of Oz, I wanted Berners-Lee to explain how, exactly, we were all going to get home. Did he really think monopolistic tech companies could be constrained without government intervention? How could Charlie—a mere intermediary between users and L.L.M.s—prevent A.I. from hollowing out the open web? And was anyone, anywhere, actually using Solid Pods? Politely, Berners-Lee bristled. He countered that "public outcry" would protect net neutrality, that A.I. hallucinations could be checked against structured data, and that users were clamoring to take back their privacy. Of algorithms, he said, "It's just the addictive bits we have to worry about," then whipped out a diagram of all the good and bad online. Eventually, we broke off the interview to go kayaking. The conversation turned to Isaac Asimov, who, Berners-Lee observed, had failed to anticipate an A.I. that couldn't be made to follow deterministic rules.

In "This Is for Everyone," Berners-Lee argues that the web's lack of compassion is "a *design issue*" that can be fixed. "There's still time," he writes, "to build machines that serve the human," that "promote the dignity of our fragile species on this isolated globe." It's a moving vision. But it's hard to reconcile with the entropy of today's online world, where all that's solid melts into air, and every protocol is profaned.

Leith returned me to shore in a motorboat. Soon, I was in my hotel room, retracing Berners-Lee's past across the network he had built. Some links were broken, but the Internet Archive filled the gaps. Next month, in San Francisco, the organization will honor Berners-Lee with its Hero Award, to mark the trillionth page its crawlers have downloaded from his World Wide Web. ♦

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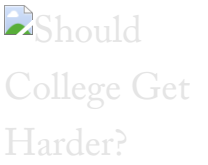

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