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Creator fights to keep Web simple

BERNERS-LEE RECALLS INVENTION'S BIRTH

CAMBRIDGE, Mass. — It's amazing to think today, with the Web now spanning some 7 million sites, that its creator could barely get his colleagues interested at first.

Ten years later, Tim Berners-Lee has different worries: keeping the Web from growing out of control as commercial developers pile layer after layer of software on top of the Web's foundation.

Born as an unsanctioned project at a European physics lab in December 1990, the Web succeeded because of its simplicity— and Berners-Lee wants to keep it that way.

“My worry is that we'll make a system that isn't conceptually clean enough so that in 10 years time, we'll find the technology is limiting,” he said.

Hints of this British computer scientist's humble and shy nature come through as he describes the Web's origins, evolution and future in his cluttered office at the World Wide Web Consortium, an organization he formed in 1994 to develop Web standards.

Unlike scores of other software innovators, Berners-Lee didn't seek to get rich off the Web. For the first three years, he wasn't even sure it would take off.

“At any point, we were waiting for something to happen—a competing commercial product to knock it out of existence,” he recalled.

An information retrieval system called Gopher emerged as a competitor, but many users abandoned it in 1993 when the University of Minnesota tried to charge for the software. Later that year, when a team at the University of Illinois' National Center for Supercomputing Applications released Mosaic, the first browser to combine text and graphics on a single page, Berners-Lee knew his invention would survive.

That NCSA team would soon leave to form Netscape Communications Corp. and develop the first commercial Web browser, piquing the interest of Microsoft Corp. and other developers who would tap the Web's commerce potential.

Berners-Lee first proposed the Web in 1989 while developing ways to control computers remotely at CERN, the Geneva-based European Organization for Nuclear Research.

Essentially, the Web combines two concepts that date to the 1960's: the Internet and hypertext, which is a way of presenting information non-sequentially. Though the two concepts were well

known among engineers, Berners-Lee saw the value of marrying them.

He never got the project formally approved, but his boss suggested he quietly tinker with it anyway. Using a NeXT-step computer, Berners-Lee began writing the software in October 1990, got his browser working by mid-November and added editing features in December. He made the program available at CERN by Christmas day.

At the time, he and colleague Robert Cailliau were the Web's only users. Berners-Lee wanted to show off his browser, but with only one Web site initially, there wasn't much to browse.

“The whole development of the browser was very exciting,” he said. “The difficulty was in knowing what to do next.”

To encourage use, he worked on getting colleagues at CERN to put up a phone book and other resources on the Web. He found interns and research fellows through backdoor channels to work on adapting the browser to other computer systems.

Worked in near-secrecy

He balanced advocacy with keeping things quiet so that upper management wouldn't question the time he spent developing something he hadn't been hired to do.

The first public browser, released in 1991, didn't have the friendly graphical interfaces of today. Rather than click links, users typed in commands.

Its early advocates, though, went on to improve it. Ultimately, Marc Andreessen and the Mosaic team added graphics, made the software simple to install and essentially opened the e Web to the world.

“What amazed me during the early days was the enormous amount of free energy that went into developing the technology,” said Michael Folk, who ran the Mosaic Team after Andreessen left. “People from all over the world contributed huge amounts of time and ideas in a surprisingly non-competitive, collaborative way.”

But the Web’s commercial phase soon began, and Folk notes that these days, many developers apply for patents first and share later, often for a fee.

The later years also brought advertising and e-commerce.

The beauty of the Web, to Berners-Lee, is its vast potential for spreading knowledge. But that does not mean, he insists, that he is troubled by all the commercialism.

“The Web was not designed to be restricted to any one domain at all,” he said.

Non-commercial sites still exist beside the commercial ones: “Hello! If you’re not reading them, it’s because you’re not reading them. It’s not because they’ve been pushed out.”

But Berners-Lee is somewhat troubled by features that track where users come from and collect other personal details. His consortium is developing standards to help software limit the capabilities of business-oriented information gathering.

He also questions search engines and computer desktop links that favor marketing partners and provide commercially biased results.

Vinton Cerf, who invited the Internet communications protocols that made the Web possible, says Berners-Lee’s “notion of using the Web for World’s knowledge is still alive.” Cerf notes that many users have personal Web pages and can access a lot of information for free.

Standardization is Key

What worries Berners-Lee more is the potential for fragmentation—if companies innovate without first agreeing on standards.

Java and other Web-based programming extends the Web’s usefulness, but it could make sites useless to older computers when scripting languages change.

Nowadays, some Web sites exploit certain fancy features in the latest Microsoft or Netscape browsers. But that makes the Web less universal.

Berners-Lee’s Web consortium is trying to develop standards for the Web’s next phase. They include extensible markup language, or XML, which information with hidden codes so businesses can exchange data without having to reformat them.

The Web’s foundation would remain the same. Software at Web sites and users’ computers only

need to understand the Web address, the markup language and the Net transmission scheme.’

Berners-Lee has no regrets about turning down commercial opportunities.

In fact, he says, the Web wouldn’t have grown in popularity without someone pushing for openness and consistency.

“No other businesses would have been prepared to bet their entire company on the Web, as a huge number of businesses do,” Berners-Lee said. “All the volunteers, all the non-profit groups would not have done it. Having a neutral was essential.”

Michael Dertouzos, director of the Laboratory of Computer Science at Massachusetts Institute of Technology, says the Web might not have grown at all had someone other than Berners-Lee invented it.

“While everybody wanted to make the Web theirs,” Dertouzos said, “he wanted to make the Web belong to everybody.”

Berners-Lee says that upon reflection, there was little he would have done differently — except perhaps to craft differently the Web addresses known as uniform resource locators, or URLs.

“I wouldn’t have put the double slashes in,” he said. “I didn’t realize how much people would be writing these URLs out and reading them out and how much time it takes for people to say ‘slash slash.’”



