

TECHNOLOGY

The Web's Creator Looks to Reinvent It

By QUENTIN HARDY JUNE 7, 2016

SAN FRANCISCO — Twenty-seven years ago, Tim Berners-Lee created the World Wide Web as a way for scientists to easily find information. It has since become the world's most powerful medium for knowledge, communications and commerce — but that doesn't mean Mr. Berners-Lee is happy with all of the consequences.

“It controls what people see, creates mechanisms for how people interact,” he said of the modern day web. “It's been great, but spying, blocking sites, repurposing people's content, taking you to the wrong websites — that completely undermines the spirit of helping people create.”

So on Tuesday, Mr. Berners-Lee gathered in San Francisco with other top computer scientists — including Brewster Kahle, head of the nonprofit Internet Archive and an internet activist — to discuss a new phase for the web.

Today, the World Wide Web has become a system that is often subject to control by governments and corporations. Countries like China can block certain web pages from their citizens, and cloud services like Amazon Web Services hold powerful sway. So what might happen, the computer scientists posited, if they could harness newer technologies — like the software used for digital currencies, or the technology of peer-to-peer music sharing — to create a more decentralized web with more privacy, less government and corporate control, and a level of permanence and

reliability?

“National histories, the story of a country, now happen on the web,” said Vinton G. Cerf, another founder of the internet and chief internet evangelist at Google, in a phone interview ahead of a speech to the group scheduled for Wednesday. “People think making things digital means they’ll last forever, but that isn’t true now.”

The project is in its early days, but the discussions — and caliber of the people involved — underscored how the World Wide Web’s direction in recent years has stirred a deep anxiety among some technologists. The revelations by Edward J. Snowden that the web has been used by governments for spying and the realization that companies like Amazon, Facebook and Google have become gatekeepers to our digital lives have added to concerns.

On Tuesday, Mr. Berners-Lee and Mr. Kahle and others brainstormed at the event, called the **Decentralized Web Summit**, over new ways that web pages could be distributed broadly without the standard control of a web server computer, as well as ways of storing scientific data without having to pay storage fees to companies like Amazon, Dropbox or Google.

Efforts at creating greater amounts of privacy and accountability, by adding more encryption to various parts of the web and archiving all versions of a web page, also came up. Such efforts would make it harder to censor content.

“Edward Snowden showed we’ve inadvertently built the world’s largest surveillance network with the web,” said Mr. Kahle, whose group organized the conference. “China can make it impossible for people there to read things, and just a few big service providers are the de facto organizers of your experience. We have the ability to change all that.”

Many people conflate the internet’s online services and the web as one and the same — yet they are technically quite different. The internet is a networking infrastructure, where any two machines can communicate over a variety of paths, and one local network of computers can connect with other networks.

The web, on the other hand, is a popular means to access that network of

networks. But because of the way web pages are created, managed and named, the web is not fully decentralized. Take down a certain server and a certain web page becomes unavailable. Links to pages can corrode over time. Censorship systems like China's Great Firewall eliminate access to much information for most of its people. By looking at internet addresses, it is possible for governments and companies to get a good idea of who is reading which web pages.

In some ways, the efforts to change the technology of creating the web are a kind of coming-of-age story. Mr. Berners-Lee created the World Wide Web while working at CERN, the European Organization for Nuclear Research, as a tool for scientists. Today, the web still runs on technologies of the older world.

Consider payments. In many cases, people pay for things online by entering credit card information, not much different from handing a card to a merchant for an imprint.

At the session on Tuesday, computer scientists talked about how new payment technologies could increase individual control over money. For example, if people adapted the so-called ledger system by which digital currencies are used, a musician might potentially be able to sell records without intermediaries like Apple's iTunes. News sites might be able to have a system of micropayments for reading a single article, instead of counting on web ads for money.

"Ad revenue is the only model for too many people on the web now," Mr. Berners-Lee said. "People assume today's consumer has to make a deal with a marketing machine to get stuff for 'free,' even if they're horrified by what happens with their data. Imagine a world where paying for things was easy on both sides."

Mr. Kahle's Internet Archive, which exists on a combination of grants and fees from digitizing books for libraries, operates the Wayback Machine, which serves as a record of discontinued websites or early versions of pages.

To make that work now, Mr. Kahle has to search and capture a page, then give it a brand new web address. With the right kind of distributed system, he said, "the archive can have all of the versions, because there would be a permanent record located across many sites."

The movement to change how the web is built, like a surprising number of technology discussions, has an almost religious dimension.

Some of the participants are extreme privacy advocates who have created methods of building sites that can't be censored, using cryptography. Mr. Cerf said he was wary of extreme anonymity, but thought the ways that digital currencies permanently record transactions could be used to make the web more accountable.

Still, not all the major players agree on whether the web needs decentralizing.

“The web is already decentralized,” Mr. Berners-Lee said. “The problem is the dominance of one search engine, one big social network, one Twitter for microblogging. We don't have a technology problem, we have a social problem.”

One that can, perhaps, be solved by more technology.

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