Twenty five years of the World Wide Web

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The first successful connection between two computers over the Internet using the World Wide Web was created by Tim Berners-Lee twenty five years ago. What started a quarter of a century ago as a way for researchers at European Laboratory for Nuclear Research (CERN) to better coordinate their work has evolved into a worldwide network of computers directly connecting people from every point on the globe.

Access and use of the World Wide Web has grown exponentially since its inception. In 1994, only a year after CERN put the software in the public domain, there were approximately 3,000 websites online. In 2014, this number grew to one billion, though it has dropped slightly since then. Another way of calculating the size of the web is by looking at how many individual web pages Google has indexed over time: Google indexed 26 million web pages in 1998 (the year Google began) and indexed 30 *trillion* web pages in 2014 (the last year of available data). Three billion people, 40 percent of the world's population, now have access to the Internet through the World Wide Web.

Perhaps the most important factor that has made the Web so popular is its democratic conception. Though Berners-Lee could have patented the software for developing and linking web pages—HTML (Hypertext Markup Language), HTTP (Hypertext Transfer Protocol) and URL (Uniform Resource Locator)—making it proprietary, he envisioned the Web as a universal technology through which people could share information. As a result, he made a conscious decision to release the Web openly and freely.

This has not been easy to maintain. The Web could have been turned into something just as proprietary and controlled as radio and television. To fight this, Berners-Lee founded the World Wide Web Consortium (W3C) in 1994. Corporate giants such as Microsoft and IBM were brought together in an attempt to maintain open technical standards for the Web. It now has 408 members, including Microsoft, Apple, Google and Oracle.

Despite the conflict between private commercial interests and open standards, such as the attempt by Microsoft in the late 1990s to control emerging information technologies, the W3C and other groups have been largely successful in keeping the protocols necessary for the Web to function freely accessible and commonly used. As a result, the nightmare Berners-Lee once imagined of needing “16 different browsers, depending on what you’re looking at” has not materialized.

It would be remiss, however, to separate the growth of the Web from the broader changes in society occurring in the early 1990s, particularly globalization. In an era in which production was localized and did not require instant global communications, the Web would have gained traction with much greater difficulty. The emergence of transnational production, of producing commodities across countries and even continents and the need to coordinate such operations, provided an economic necessity for the ability to store and access information from anywhere in the world. This ensured that the Web became something more than a peculiar tool of particle physicists.

This in many ways mirrors the development of the Internet, the interconnection of computers and networks of computers, upon which the World Wide Web operates. While the Internet today is seen as a sign of human progress, connecting and uniting peoples across all national borders, it paradoxically started as a research project in the 1960s by the US military, directed against the Soviet Union.

As part of the response to the Soviet launching of Sputnik, in 1957, the first successful satellite placed in orbit around the Earth, the US established the Advance Research Projects Agency (ARPA). ARPA's early years

were mostly taken up with researching how to exchange information on a large and international scale. This led to the development of the ARPANET in 1969, four interconnected computers each with only 12 kilobytes of memory.

Further development in the 1970s saw the creation of a variety of new technologies, most notably the ability to link two computers via satellite, the idea for Ethernet and the first email management program. In the 1980s, it became possible to find a connected computer not with an exact path described in numerical and technical language, but by using a more humanly recognizable name. This led to a variety of commercial and academic networks linked to ARPANET. As more and more networks began linking in, particularly one sponsored by the National Science Foundation, the character of ARPANET changed from a system tightly controlled by the US military to the more modern "network of networks," through which was born the Internet.

Alongside these developments were the improvements of technology to transfer information. The massive cables that take information between continents (the Internet backbone) had their bandwidth upgraded to 45Mbit/s in 1991. These cables, which used electricity to transmit information, have now mostly been upgraded to fiber optic cables that have a bandwidth one hundred times higher than electrical cables.

Upon this already existing infrastructure, Berners-Lee developed the now universally used tools to both store information on the Internet and easily access it. The structure created by these tools is what is known as the World Wide Web.

Of course, the emergence of the Web has not been without contradiction. The information transmitted across the Internet is being used by governments and corporations to spy on the world's population in an unprecedented way. Those same entities perform herculean efforts to commercialize and censor the Internet in an effort to discard the democratic roots of the medium. If they could, they would subject the Web and Internet to the same control as all other telecommunications platforms.

At the same time, for the first time in human history, virtually anyone can place information on a collective repository of knowledge and have it be accessed by anyone else. This has profound social implications. It was only because of the widespread use of the Internet, spurred on by the Web, that worldwide coordinated protests took place in February 2003 against the invasion of Iraq. More recently, modern technology has enabled people to record and share the growing rash of police violence across the United States. Scientific and artistic triumphs, both past and present, can be learned about and experienced with a few keystrokes.

Of course, the ability for anyone to produce anything has produced a great deal of material with little value. Yet the success of the *World Socialist Web Site* from its inception in February 1998 shows that there is an interest in serious works. The World Wide Web has allowed such works to find a global audience.

This lends the Internet and the World Wide Web a revolutionary character. Both break the tight grip the state and corporations have over intellectual life and have laid the foundations for a great cultural revival amongst the working class. The technology will play a key role in liberating the working people and oppressed masses all over the world.