

Democratic, but dangerous too: how the web changed our world

In two decades the world wide web has become the most powerful information tool since Gutenberg's printing press, but also the most intrusive and threatening. Aleks Krotoski, presenter of a major new series on the history of the net, reports

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The Observer, Sunday 24 January 2010

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On Thursday, the US secretary of state, Hillary Clinton, gave a speech on internet freedom at a journalism museum in Washington, arguing that the architecture of the web must be free from censorship and manipulation. It is a position that stands in stark contrast with the approach of countries, including China, Egypt and Iran, that seek to curb access – and while there was a whiff of economic self-protectionism in Clinton's words, she opened up the floor to a global discussion about the potential revolutionary power of this invention.

Less than two decades after it came into being, the web is now a pawn in an international public policy debate that could create rifts between nations so deep that they lay the foundation for future wars.

For the past year, I have been working on Virtual Revolution, a four-part documentary series for BBC2, co-produced by the Open University. It aims to identify the true political, economic, social and psychological implications of this new technology. I spoke to an extraordinary cast of characters including the web pioneers, the e-entrepreneurs, and the sceptics who have seen it all before.

We identified the new power brokers in our society, whose non-traditional ascents through the web have challenged hundreds of years of hierarchy. We found the kids who took down the economic, communication and political pillars of an entire country with the press of a button. We looked at the tactics extremists use to radicalise new recruits, and compared them to the methods that have proved so successful in getting a generation that had been dismissed as dispassionate involved in politics.

We also looked at how the trails of information that we leave across the web are not only redefining privacy, but are creating feedback loops that may be narrowing our horizons, rather than opening our eyes to the new. And we discovered how the web is changing how we think and who we are.

I started the journey travelling through Ghana with Sir Tim Berners-Lee, the unassuming Englishman who put the first website in history online on 6 August 1991. He was on a tour with the World Wide Web Foundation, carrying out field research to understand how the web was affecting rural communities who were only now getting connected. He was modest about his role in the development of this technology, making sure to name-check the others who were toying with the same ideas at the same time. His aim had not been to catalyse a worldwide revolution, but to create a framework that would connect lots of information that would not require one person to look after it. But his idealism and belief in the power of web has driven him to take the web to the world.

"Tim Berners-Lee created a new mode of human communication," Stephen Fry told

me. "He created a new way of allowing communication to work in extraordinarily connected ways."

Fry, well-known for his enthusiasm for technology, reflected on what the web had meant to him when he discovered it in the early 1990s. "It seemed like a great new world," he enthused. "It seemed like a new democracy. It seemed like a new way of people coming together and spreading news, of educating, of giving yourself information and access to people and cultures and history. It seemed the most fantastic, radical and extraordinary development since Gutenberg produced his Bible."

His thoughts were echoed by Al Gore, the former US vice-president. "It represents the emergence of a new information ecosystem that will have a more profound impact on human civilisation than did the printing press," he said.

The web has brought about an enormous transformation in what information we have at our fingertips. It is extremely empowering: everyone has the freedom to participate in the library of knowledge collected online, by accessing it or creating it. Anyone who has historically held control over the distribution of information – governments, media, agents – is having to reposition in the face of this information tsunami.

"Individuals without great wealth or bases of power and the industrial world economy can exert influence on others who find their ideas resonating with them," Gore said. "It is inherently democratising and egalitarian and promotes a greater role for the rule of reason."

It is always dangerous, however, to be blinded by idealism. The web is undoubtedly a transformative technology on a par with the printing press, but it's difficult to believe that it will bring the end of inequality or will eradicate international conflict. In fact, some have learned to manipulate the web's power for their own ends.

When this sits well with our personal politics, we celebrate. A 25-year-old from San Francisco can create a piece of software that opens up a channel of communication on the violent streets of post-election Iran, giving protesters the ability to transmit what is happening to the rest of the world. Teenagers in London can organise mass protests on climate change, rallying people from around the country to march on a coal-fired power station in Nottinghamshire. But when the same techniques and tools are used to radicalise new recruits to fundamentalist causes, to attack a country's banks and newspapers, or to promote propaganda within authoritarian states, the web becomes something to condemn.

The debate becomes even more personal when you consider how our use of this overwhelmingly commercial space is transforming what privacy means in the 21st century. As we traipse across the web, our trails of personal information are captured and manipulated. We get services for free, but our actions are analysed to produce precisely targeted advertising that funds the companies behind the websites.

The greatest shock to most people is that we willingly create this commercial pact when we think we're alone. A Google search, for example, transcends the barrier between what we view as public and what we view as private. When we do a search on our computers at home, in the office or on the road, we have a misplaced sense we are transacting only with our machine. In fact, when we type a query in Google's search box, we are divulging our intentions to a technology located across the planet, with hundreds of potential eyeballs sifting through our search terms for the perfect advertising match. Yet we still treat it like an oracle, asking it deeply personal questions and looking for answers in its computer brain.

The surveillance implications for this are clear, but there are wider cultural implications when the money people behind the scenes get their rewards for feeding us exactly what we want. Amazon's recommendation engine, Last.fm's social music service, even news sites such as the Huffington Post, reduce the possibility for

serendipity by serving up what they think we want, channelling us into a loop of confirmation. As author Douglas Rushkoff says: "The more like one of my kind of person I become, the less me I am, and the more I am a demographic type."

Socially, this is as potentially damaging as what the extremists peddle; we are coagulating into tight-knit groups who reinforce our own beliefs. It's a far cry from the global group hug that web proponents such as Fry or Gore had hoped it would be.

In addition, the web may be fundamentally changing how we think. There is evidence that there is a generational difference between how children and adults consume information online. A team of researchers led by Professor David Nicholas, of the independent research group Ciber, at University College London, has begun a series of experiments to test whether the architecture of the web put into place by Berners-Lee is transforming the connections in our brains. A lifetime of use seems to be having a cognitive effect.

Under-18s who have grown up with the web are better at multi-tasking. They also spend less time searching for information before deciding on what they view as the best answer to a question. Most intriguingly, the youngest users, born after 1993, "crowdsource" their knowledge: they look for the wisdom of their friends, networking what they know, rather than holding on to the information for themselves.

My PhD research looked at the social psychological implications of our interactions online. What I have come to conclude is that who we are on the web is simply a reflection of who we already are offline. We project hierarchical systems into the virtual world. We extend our interests and make them happen using the tools the web provides. We seek out things that make us feel good about ourselves. The web is a mirror, and we have to face it in confidence, warts and all.

Our relationship with the web is a synergy: as it matures, so will we. And as it draws us into its networks and its hyperlinks, we will shape them in our global image. It is the most revolutionary evolution that we as a planet have ever participated in. "The sorts of things which the internet brings by connecting people," Berners-Lee said to me while we were travelling to a community centre in Abirih, outside Accra, "is openness and understanding of other people's ideas.

"On a good day," he added. "I hope we have a lot of good days."