

The Struggle to Scale: Keeping Up With the Internet

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Abstract

The staggering pace of the Internet's growth since the introduction of the first web browser in 1993 can be seen as the story of a struggle to scale. Set against the motivations of users, governments and businesses, the key moments in the Internet's cultural, economic, political and social development tell us about a varying ability to cope with ever accelerating growth and its consequences, intended and otherwise. Over the past twenty years, following an initial period of innovation and online exploration, we have witnessed a struggle to impose the frameworks of the old world - state control of borders and security, the unimpeded dominance of transnational corporations in the global marketplace—on the new landscape of the Internet, where the potential for individuals to take control of their own destiny is, arguably, far greater than it has ever been in the history of the modern world. The outcomes of this struggle shape the Internet that we use in our everyday lives—whether we are learning, consuming, sharing or protesting.

By looking back at and re-evaluating significant milestones in the Internet's development, this article will assess what effect they had on reinforcing or diverting the interests and expectations of users, governments, and businesses. From this assessment potential future directions for the Internet will be outlined, particularly in relation to increasing calls for Internet regulation in the areas of security, commerce and sensitive information. The article concludes with a discussion of the implications these future scenarios could have for all those with a stake in the future of the Internet.

Introduction

In 2012, the Internet is approaching near-ubiquity for a significant majority of citizens in developed nations. The proliferation of fast broadband has made viable the publishing, downloading, streaming and sharing of content from a range of providers, both established and some less so. Cheap and accessible wireless and mobile data now let many of us take the web along wherever we roam, making use of new location-aware innovations that further extend its reach and what we do with it. Product and service platforms now channel and churn inordinate quantities of content and currency around the web: 60 hours of video uploaded to YouTube every minute, ~20 exabytes of data every seven days and an estimated \$8 trillion dollar total value (Moore, 2011; Thompson, 2011; YouTube, 2012). It is clear that, while there may be plenty of potential for debate regarding the various cultural, economic, political and social impacts, the Internet has observed phenomenal growth over the period since it entered mainstream society.

We've come a long way since that first email, that much is for certain. Despite the ever evolving and increasingly sophisticated threat posed by adware, spyware, and myriad other malware and viruses, and the reliability and regularity with which web-based businesses rise and fall, the Internet has now achieved maturity in terms of end user trust and confidence. So trusted is it, that we now concede rights with alarming regularity, frequently skating past ream after ream of terms and conditions on our way to registering our acceptance of them, and do so in order to

access various products and services that many of us now consider essential to our everyday lives: self-publishing our thoughts and details about our lives across broad social networks; uploading snapshots of special occasions; shopping for groceries; buying gifts; booking flights; taking online courses; researching a paper; or paying bills. Should we need to organise anything—a birthday party, a guerrilla gig, a flashmob, an occupation of a public space, or even a popular revolution - we will almost certainly use an Internet-based resource at some point.

Alongside the swift transition of our day-to-day existence onto the web, there are other parts of society that have seized upon the enabling aspects of the technology to do something more than go shopping. The link between the Internet and revolution has become more pronounced in the past two years and recent events in Moldova, Iran or Egypt—swiftly characterised as the Twitter and Facebook revolutions—have clearly highlighted the potential of the web as an enabler for the coordination and enactment of political protest. The release of 250,000 US embassy cables by WikiLeaks in early 2011 introduced many to the world of hackers and hacktivists, and in the months that followed collectives such as LulzSec and Anonymous were brought out of the shadows and into the public consciousness. Worries about the dark arts of social media caused much hand-wringing in the wake of the UK riots in the summer of 2011, while even more recently, online tools have underpinned the global ‘Occupy’ movement that seeks to push back against governments’ and businesses’ role in the financial crisis. 2011 was a hell of a year for Internet activists.

The ability of the Internet to ‘shine a light’ on government activity where before there was none is at the root of a rising tension between efforts towards transparency and freedom of access to information on the one hand, and government security on the other. To assume that this is purely the preserve of traditionally repressive states would be a considerable mistake; those struggling with their newly evolving citizenry are often those same western nations who can frequently be spotted spreading democracy in other parts of the world. For example, at the e-G8 summit in May 2011 former French President Nicholas Sarkozy declared that it was time to ‘civilise the Internet’, shortly after which the governments of China and Russia published a joint statement declaring that authority for Internet-related public issues should remain the sovereign right of the nation state (Cellan-Jones, 2011). This desire for more state-driven stability exposes a deeper worry on behalf of governments: that the empowerment of citizens one day will lead to a loss of government power or security the next. While the Arab Spring is a pertinent case in point, this concern also rises from the use of Internet communications by criminal or terrorist groups, who are often invoked when new surveillance powers are suggested.

It is not just the politicians who are looking for more control however. The Internet may now be a stable and safe enough place for consumers and a thriving platform for commerce, but it is still not the tightly regulated domain that many business leaders would have it be. Sensing an opportunity in the growing governmental preference for a more closely regulated Internet, the major corporate players of the entertainment industry have had a busy two years. SOPA, PIPA, HADOPI, DEA, the Copyright (Infringing File Sharing) Amendment Bill¹—major pushes for legislation to curtail copyright infringement on the Internet have been observed in the US, Europe and Australasia, and the US Government has led the secretive ACTA (Anti-Counterfeiting Trade Agreement) process to its conclusion. All these efforts seek to impose strict consequences on Internet users who swap copyrighted files, and in certain cases could change copyright infringement from a civil offence into a criminal one. While it is unproven that

¹ Acronyms explained: Stop Online Piracy Act (SOPA); Protect Intellectual Property Act (PIPA); Digital Economy Act (DEA); Haute Autorité pour la diffusion des œuvres et la protection des droits sur internet (HADOPI);

new laws will actually change the way people use the Internet, and despite popular protests against SOPA, PIPA and ACTA in early 2012, governments seem convinced that copyright infringement can only be solved through legislation.

The Struggle to Scale

The rapid development of the Internet can also be seen as a story of a struggle to scale, to cope with the ever accelerating pace of growth and its consequences, intended and otherwise. That it functions at all remains something of a minor technical miracle given that it runs atop a backbone of technologies, many of which were simply not designed to scale to their current levels, and is facilitated by a fragile collection of standards which are under almost constant attack, either from lamentable failures in implementation or from active efforts to undermine them for competitive advantage. Ubiquitous though it may be, it is arguably a rather fragile thing.

Beyond the often creaking technical infrastructure the challenges of scale are also evident in the legislative responses from governments. The Internet's rapid growth is in part down to the model of openness that thrived in the first period of its existence. Eventually, this innovation pushed against existing interests. Initial responses from legislators attempted to simply stretch and contort existing legal frameworks to fit. The attitude appearing to be: that what *is* can be maintained, and that what *has* worked, can continue to work, if given sufficient powers of surveillance, policing and regulation.

We are now at something of a crunch point. As the Internet has grown and we have passed well over 2 billion Internet users worldwide, governments have attempted to balance the innovative tendencies of users and start-ups with the pleas of corporate players that see their grip on lucrative markets being stripped away by nimbler, hungrier businesses with little use for business structures hemmed to trade frameworks based on set borders and agreements. In particular, the legacy entertainment industries continue their slow and steady decline due in no small part to their inability to re-imagine their existing business models, to properly recognise the changes that the Internet demands, or to seize the opportunities it presents. Their strategy instead is to pressurise politicians to hold intermediaries liable for the problems of scale, and to push for regulation whereby Internet service providers, search engines or even libraries are responsible for policing their users' information-seeking activities, and users are in danger of having their Internet connections slowed or even terminated for alleged copyright infringement.

For their part, governments seem comfortable with the idea of closer surveillance of Internet activity. In an age of terrorism, global crime networks and state-sponsored hacking this is perhaps unsurprising. Cybercrime legislation, filtering and online surveillance are all on the agenda of European Union countries and the United States, for example (Halliday, 2012; Horten, 2012; Zetter, 2012). China and other countries have been censoring and monitoring the Internet for years. The question is whether or not any actions taken by governments or businesses will achieve their end goals. For a start, the ease of hiding one's tracks online through alternate identities, proxy servers, virtual private networks (VPNs) or the backwaters of the Darknet such as Usenet groups, suggests that legislation designed to tackle any nefarious activity online is always going to be one step behind.

We are seeing a struggle to impose the frameworks of the old world - state control of borders and security, the unimpeded dominance of transnational corporations in the global marketplace - on the new landscape of the Internet, where the potential for individuals to take control of their own destiny is far greater than it has ever been in the history of the world. How the Internet is shaped is determined by the activities that occur in those interstices between end users, the

state, and the corporate sector as each struggles to represent its interests and respond to the growth of the web and its various impacts.

By looking back at the period since the advent of the first mass-consumed browser, this paper will seek to identify significant milestones and re-evaluate them to illuminate how we got to where we are today and what effect they had on reinforcing or diverting those interests and expectations of users, governments, and businesses. Can the Internet fulfil the techno-utopian dream or will existing power structures successfully enforce regulations that will preserve their interests before all else?