



Internet Society Discussion Paper:

Preserving the User Centric Internet

The Internet today faces a range of challenges that could impact the distributed, end-to-end and open nature that users have come to take for granted. Some of these challenges are service and architecture related, including but not limited to the Network Neutrality debate in the United States, initiatives on Next Generation Networks, and the discussion in Europe and elsewhere over the future of access regulation (unbundling) and competition. Other challenges relate to the impact changes in Internet usage patterns and the explosion of content consumption and creation are having on Internet architecture and business models.

These challenges are, in many ways, born of the Internet's success. This "network of networks" is enjoyed and shaped by an increasingly diverse range of players, from its users, to those who manage the networks that comprise it, to nations whose economic competitive advantage increasingly depends upon it. The Internet has shown itself to be supremely flexible and adaptable; yet these growing commercial and economic challenges apply pressures that could well change some of the principal elements underlying its success.

The Internet Society (ISOC) believes that the Internet's future depends on a renewed commitment to the principles that have made it so successful to date. For each of the various challenges listed, ISOC is concerned that there has been insufficient focus on the imperative of ensuring that the fundamental user-focused principles that the Internet is built upon are preserved. The National Academies voiced their concern in this regard in their 2001 publication "The Internet's Coming of Age":

*The design values of the Internet have been reinforced by the environment in which the Internet was developed. In its early years as a cooperative research project, it was isolated from some of the stresses and strains associated with commercial marketplace interactions. Whether and how the traditional Internet design values will be maintained is an important issue for the future of the Internet.*¹

The importance of maintaining these design values, and the fundamental principles that are based upon them, is at the heart of the Internet Society's "**User Centric Internet, an initiative that calls for a renewed focus on the openness, transparency, edge-based intelligence and, above all, user choice that are at the heart of the Internet today.**"²

¹ http://newton.nap.edu/html/coming_of_age/na_statement.html

² See also the National Academies' paper and <http://www.ietf.org/rfc/rfc1958.txt>

The changing Internet

The success of the Internet has been due in large part because of a common understanding or compact that the Internet and the fundamental benefits that arise from the Internet model are good for all. As Daniel Weitzner at MIT and W3C describes it:

*The neutrality of the Internet arises out of a combination of basic architectural features of Internet and World Wide Web standards, and business practices on the retail and back-end of Internet service provider networks, all in a delicate balance with the competitive market forces that tie service providers, technology developers, and content providers together in a global, voluntary agreement to maintain these practices and standards. This agreement has been maintained out of an implicit but shared belief that cooperation to keep the Internet functioning as an open, interconnected and non-discriminatory platform serves the interests of the parties individually, as well as collectively.*³

However, this common benefit and “delicate balance” that has stood the test of time so well is now threatened by its very success.

The Internet is mainstream – it is no longer different or special. What is clear is that the ubiquity and indispensability of the Internet have made it an important means of reaching customers and building business opportunity. One of the consequences of the Internet’s success is the desire to exploit it for business and competitive advantage. This in turn could have a significant impact on shaping the Internet’s architecture, on the way commercial offerings are structured and on the way in which the Internet is used.

One of the characteristics of the Internet experience to date has been relatively unconstrained access for reasonable cost. Yet, the days of the Internet “all the bandwidth you can consume” buffet appear to be under threat. Some suggest that the commoditization of Internet access has limited the ability of service providers to compete and invest in new networks, and is forcing them to find new business models and new ways of leveraging their assets. Content differentiation, for example, may well become an increasing characteristic of service offerings, with providers creating new subscription packages that the Internet user can then choose to purchase or not (not dissimilar to the cable model). But, how will evolving subscription packages impact user choice? To what degree will they shape the users Internet experience? The traditional content business is based upon proprietary product and premium content, much of which is increasingly tailored to particular groups of consumers. Will users who are already downloading movies, music, sharing video, and other multimedia pay more for the services they are already accessing? Undoubtedly there will be significant changes in commercial offerings that are based upon or tie into Internet access. Whether they be content focused, metered or Service Level Agreement based, innovation in commercial offerings should not be constrained. That said, at the same time it is important that there is adequate competition in service offerings and that there is a continuing ability for users to exercise choice in that regard. Further, while accessing content is an increasingly important part of a user’s experience, they should also be able to “use” the Internet in ways in which they are accustomed. While it is a somewhat artificial distinction, it is important that future commercial offerings ensure that Internet is available as a tool (for use) as well as another medium for viewing content.

³ <http://dig.csail.mit.edu/2006/06/neutralnet.html>

The future of the Internet is also being shaped by other factors, ranging from changing industry structure to questions related to the sustainability of the Internet given demands on the existing architecture. These factors also are having a direct impact on the user through affecting their ability to choose, inter alia, the service provider and the Internet service subscription of their choice.

Around the globe the traditional communications environment is changing with likely implications for the future of the Internet. In the United States, significant market restructuring is resulting in far greater consolidated local and backbone/transit footprints than before, lessening the dependencies on Weitzner's compact mentioned above. How this will impact the competitive landscape remains to be seen. In Europe, there is a considerable debate over the desirability of continued access regulation such as local loop unbundling, particularly with regards to new infrastructure investment. As the communications landscape changes around the globe, what is clear is that a user's ability to choose among providers is as important as, and has a direct bearing on, their ability to choose among subscription and service packages. User choice is dependent upon flourishing competition, so low barriers to market entry, not only in terms of infrastructure investment, but also content provisioning and user-driven innovation, is essential.

There are also wide-ranging discussions about the future viability of an Internet based on "best effort" delivery. One of the defining characteristics of the Internet is that it is a truly two-way, interactive medium driven by user (individual and community) innovation and creativity. This interactivity, and the ability of users to create content and applications, is driving an unprecedented explosion of user-created content and content sharing. This is not without its consequences, one of which is the suggestion that the networks underpinning the Internet are under increasing strain as more Internet users come on line and the availability and generation of content continues. Typical network based responses would include QoS management and/or bandwidth provisioning. One of the concerns expressed in this regard is whether the user's Internet subscription will be increasingly determined by network management or by traffic type. For example, will services such as HDTV, DVD quality streaming and other high-bandwidth services become part of "premium content" packages that mirror some of the cable business offerings? And if services are broken out by particular characteristics, will those characterized by latency and jitter intolerance for example be priced higher to deliver?

Some look to architectural solutions, with next generation networks promising feature-rich triple or quadruple play converged services, in which quality-of-service (QoS) is ensured, security enhanced and application and service management made simpler. Concerns have been raised that such architectures could remove the control from the user and the intelligence from the edge, and place them into the core of the network. The focus in these multiple-play architectures is also largely on the consumption of content – but how will they facilitate and encourage its creation? Does the future of networking lie in the struggle between two different worlds, that of the Internet model, with its associated openness and freedom and user-centricity, on the one hand, and the closed network model, in which choice and control no longer sits with the user, on the other?

Whatever the future of commercial offerings and network architecture, how the Internet user will benefit and how user-centricity will be preserved should be the yardstick by which they are measured.

The importance of choice

Today's Internet is a user centric focused network of networks. It is, to paraphrase the Federal Communications Commission, the user who decides (largely) the content they wish to access, the applications they wish to use, the devices they wish to attach to the network and the service type or subscription package they wish to acquire.⁴ In each case the user makes choices and they have a set of options to choose from. This issue of choice (and the control that goes hand in hand with it) is fundamental to the user-centricity of the Internet.

Vint Cerf, Chief Internet Evangelist at Google, captured it well when he said:

*The Internet's open, neutral architecture has proven to be an enormous engine for market innovation, economic growth, social discourse, and the free flow of ideas. The remarkable success of the Internet can be traced to a few simple network principles - end-to-end design, layered architecture, and open standards -- which together give consumers choice and control over their online activities.*⁵

A central issue to the Internet Society's focus on the User Centric Internet is the degree to which today's Internet user will have the same "choice and control over their online activities" in the future.

The issue of choice was touched upon briefly above with regards to service offerings and access provision. Yet it is much broader in its importance: users expect to be able to use the Internet as they wish, accessing the people, sites and content of their choice – recognizing that they might be limited by what is legal/illegal and what may not be accessible for technical reasons. At the moment that user experience is largely unconstrained.

One concern that has arisen is whether, with changing business models on the Internet, we are moving, or being moved, from users to consumers. And with that possible change does the Internet start to lose its user centricity and the users their control over this incredible tool? One of the unintended consequences of such a change could be a lessening of the innovation that is a result of not only the Internet's architecture but also its openness and accessibility. Innovation on the Internet has been driven by the user, by the individual, the entrepreneur, by the small business, by the corporation. The nature of the Internet, its ubiquity, openness and simplicity has enabled businesses to be built, communities to be formed, content to be created. How would these have been possible without the ability of the user to leverage the Internet as we know it today? How will the user's ability to wield this tool, for innovation for example, be different in the future?

This fundamental dynamic of choice is what has driven blogging, social networking, VoIP, and other innovations on the Internet. This user-centricity has unleashed innovation in communities, businesses, garage start-ups, and college dorm rooms. The ability to exploit the medium in an unfettered way has been a driver of its success. It is easy to forget that the Internet is more than a network of networks – rather it is a medium and tool that unleashes user creativity and innovation, and that builds communities and human and institutional networks around the globe, and drives commerce in unprecedented ways.

⁴ Also see the Internet Society's principles <http://www.isoc.org/pubpolpillar/principles.shtml>

⁵ <http://commerce.senate.gov/pdf/cerf-020706.pdf>

The future of the User Centric Internet

The Internet of today has been shaped by the fundamental principle that the user is in charge of their online activities: today's users choose and control where they wish to go on the Internet, who they wish to communicate with, the content and communities they wish to access, and the applications they wish to use. And most importantly, the intelligent edge and user centricity have driven innovation, the digital economy, the Information society, while measurably contributing to the wealth of nations. The Internet Society believes that the Internet is a unique tool, and a users' ability to wield this tool should not be fettered.

The Internet Society believes that the debate over issues such as Network Neutrality rules masks a more important discussion related to the future of the user centricity of the Internet and the preservation of the underlying principles that have made it the success that it is today. This is a discussion that merits much greater consideration as it has a direct bearing on the way the Internet will evolve. For example, the user-centricity of the future Internet depends on how we answer some fundamental yet complex questions, including:

- How do we maintain and improve upon the user-defined experience that has driven the overwhelming success of the Internet while encouraging investment and innovation, new services, new content, and other benefits yet unforeseen?
- As the Internet also becomes a significant medium for the provision and consumption of content, how can its fundamental interactivity be preserved so that its use as a tool for human creativity remains as compelling as ever? How does the user remain a user as well as a consumer?
- Will the Internet of the future be accessible and open as a result of new investment, new networks and new business models or will the new networks be closed, tiered and exclusive, carrying only certain content to certain subscribers?

These are not easy issues to balance, but the Internet Society believes that the guiding principles for decision making must be the preservation of the Internet's user-centricity through its design values and its principles of openness, transparency, edge-based intelligence and, above all, user choice. Architectures, business models, and policies that fundamentally shift away from these design values are fundamentally shifting away from the Internet itself. Ensuring innovation, investment and commercial opportunity along with continued and enhanced user centricity will be essential to the Internet's future success.