The Future Internet and the Future DNS: Challenges and Opportunities

Igov2 Project Issue Paper
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The purpose of this paper is to highlight issues to be discussed during a panel at the 2013 Symposium of the Igov2 project, to be held in Oslo on 5th September, 2013.[1] This panel discussion has a double function. First, it is intended to facilitate a broader discussion about the future Internet during the Oslo symposium. In addition, the outcomes from this panel should ideally contribute to the design of research projects on the future of the Internet.

Any discussion of the future of the Internet needs to deal with the inherent uncertainties of forward-looking activity. It may not be possible to predict what the future will bring, but it should be possible to discuss realistic scenarios of future developments. These can be assessed in terms of their technical, political and legal implications. The study of what will be the Internet of the future has been on the agenda of many actors that participate the multi-stakeholder dialogue of Internet governance. Recently, a report [2] funded by the European Commission presented possible scenarios about the Internet in the next 10 years. A similar report, made by the Internet Society[3], tried to offer some insights of what can be expected for a future Internet.

Amongst the issues to be discussed is the future of the Domain Name System (DNS). What does the future hold for the DNS, and will it still be needed? Domain names are first and foremost unique identifiers for easier access to, and communication with, Internet resources. Can this navigation function be achieved differently in the future, maybe through a system that we do not yet know or understand? In addition to the navigation function, domain names help to identify parties to a communication, and they have implications for privacy and security. Trust is another potential function of some domain names: Many people use domain names to decide whether they can trust a given website. They also rely on domain names as an entry point for identifying the responsible person for a particular website through WHOIS (or its possible future replacement). Thus, the domain name can be used as an identifier of the website owner. Yet, perhaps there are better approaches to achieve trust and identification in ways that avoid the many problems with untrustworthy websites and WHOIS entries? Are those functions of domain names (navigation, identification, trust, etc.) still going to be relevant in a future Internet? If yes, are there alternative solutions that could offer the same (or better) functionality than the Domain Name System? Perhaps we could already see some of the contours of these future developments, without actually noticing their potential for disruptive innovation?

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[1] Third Symposium of the IGov2 project at the Norwegian Research Center for Computers and Law (NRCCL), jointly funded by the Norwegian Research Council (NRC) and UNINETT Norid AS. See http://www.jus.uio.no/ifp/english/research/projects/nrccl/internet-governance/events/igov2-symposium-2013.html

[2] http://cordis.europa.eu/fp7/ict/fire/docs/tafi-final-report_en.pdf

[3] http://www.internetsociety.org/internet/how-it's-evolving/future-scenarios

In the past, disruptive innovation (as discussed by Clayton Christensen[4]) has affected numerous sectors, including recently the music industry (with MP3s disrupting the sale of CDs). When disruptive innovations happen, most existing players do not comprehend the nature of the change, often because the innovation does not affect their market share, but rather creates a completely new market. Is it possible to envisage instances of disruptive innovation for the future Internet, for example affecting the market for domain names?

In addition to these more uncertain developments, there are also developments that are already visible, at least in their contours. For example, it is likely that the future Internet will increasingly be based on IPv6, and this will likely contribute to the development of the Internet of things. What implications will these developments have? We are interested in identifying and highlighting not only the potential for technology evolution, but also the governance challenges that accompany these developments.

Questions
A few guiding questions for the debate are included below, distinguishing between the short term (2-3 years), mid-term (3-8 years) and long term (>8 years) perspectives. However, the panel debate will not necessarily be limited to discussing these questions.

Short term
- What will be the effect of the introduction of new gTLDs on the domain name system and market?
- What will be the consequences of Internet growth and development in languages other than English?

Mid term
- What are the governance-related challenges of the Internet of things?

Long term
- Is it likely that a disruptive innovation will diminish the relevance of the DNS? Which characteristics might such innovations have?

Governance questions
- How will the Internet of the future be governed, and by whom?
- Are there any technological changes in sight that can impact upon the current model of Internet governance?
- Can an increased participation of developing countries change the current model of Internet governance?

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[4] Clayton M. Christensen, Scott D. Anthony and Erik A. Roth, *Seeing what's next: using the theories of innovation to predict industry change* (Harvard Business School Press 2004)