A Positive Role for Government Procurement in Promoting Open IT Standards, the Network Effect and the Information Society

August 2006

This paper is contributed for discussion in the Internet Governance Forum by: Susy Struble of Sun Microsystems; Jamie Love and Manon Ress of the Consumer Project on Technology; Robin Gross of IP Justice; Professor Ghosh of the University of Maastricht; and Gwen Hinze and Seth Schoen of the Electronic Frontier Foundation.

In a functioning network, participants work together to provide a benefit that's greater than the simple sum of their individual parts. This truism is often encapsulated in the term “the network effect,” and in the world of IT, the network effect is best gained and maintained through an effective ecosystem of open, adoptable and interoperable IT standards (see Addendum for a suggestion definition of an open standard). The network effect phenomenon is what makes the Internet and the World Wide Web such powerful communication and collaboration tools; it is the magical – and necessary – catalyst behind the growth of the Information Society.

However, this ecosystem of IT standards is under threat, largely because the fragile balance between IPR and the public good – in this case, an ecosystem of open, adoptable and interoperable IT standards – is being undermined. If this ecosystem of technical standards should fail, information access, innovation and economic growth will be harmed.

This paper briefly outlines the relationship between technical standards and the network effect and their impact on expanding participation in the Information Society. Using the OpenDocument Format IT standard as an example, it suggests that government procurement policies can help to support an ecosystem of open IT standards as well as nurture market-based solutions to the problems of non-interoperability, thus improving participation in the Information Society.

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To understand how IT standards impact the Information Society, let's first define IT standards and their relationship to the global IT network – the Internet – and the network effect.

An IT specification, or a formal description of a particular computing function or action, is often called a standard when there is agreement within a larger community that the specification meets its needs. Standards can be *de jure* -- approved by a formal international standards developing organization, such as the International Standards Organization, or by a recognized standards consortia, such as the World Wide Web consortia -- or *de facto* -- meaning specifications that aren't managed through a community process and that gain their “standardization” through market prevalence. Due to differences in their

creation and management processes, licensing terms and interoperability characteristics, standards can also land on a continuum somewhere between being “open” or “restricted.” Most de facto standards are restricted standards, meaning that the greatest possible level of openness, adoptability and interoperability hasn't been met. See this paper's Addendum as well as “An Economic Analysis of Open Standards”[1], a recent EU-sponsored paper on the role of open standards in economic growth by Professor Rishab Ghosh of the University of Maastricht, for suggested definitions of an open IT standard.

IT standards[2] are the cooperation agreements that make a network possible. In a network, the standards that matter to interoperability are those that define the interfaces between different network components: interfaces such as application programming interfaces, protocols, and schemas. Network participants on either “side” of a standard interface can interoperate only because each fully and faithfully implements the same interface. They may vary widely in other aspects, such as quality of service, speed or memory usage, but with regards to the standard interface, they are the same. These standards enable participants to collaborate and create something “bigger” than themselves: the network.

The positive impact of IT standards is straightforward: Interoperability despite heterogeneous environments. And in turn, interoperability means interchangeability and connectability. Interchangeability refers to the ability of one product to substitute for another; connectability refers to the ability of products to work well together without requiring changes.

IT standards directly benefit the Information Society by driving commoditization and innovation while mitigating adoption risks. Multiple, competing implementations and interchangeability between these implementations mean prices drop while innovation flourishes. A competitive market means consumers and small businesses have greater choice. They are more likely to find the product that suits their needs, whether their needs depend on price or features, and should their needs change, they are not locked into a particular vendor. A corollary benefit to this is creator/user control of data. With IT standards, consumers can access the network regardless of their choice of product or platform.

Professor Ghosh defines the network effect as such: “Many applications of technology in the Information Society are subject to network effects: the benefits to a single user are significantly enhanced if there are many other users of the same technology. The value to a user of an e-mail system, for instance, is limited unless the system can be used to send e-mails to many others, and increases enormously with the number of other users. This value, which is over and above

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1"An Economic Basis for Open Standards". MERIT, University of Maastricht. European Commission IST/FP6 Project FLOSSPOLS report. http://flosspols.org/deliverables/FLOSSPOLS-D04-openstandards-v6.pdf

2For the purpose of this paper, “standard” refers to open, de jure standards unless otherwise noted.

the value of a single copy of the technology, is the network externality, i.e. the additional value provided by the network effect."[3]

An effective ecosystem of open, adoptable and interoperable IT standards obviously provides the best foundation for the network effect. We urge readers to carefully review Professor Ghosh's paper, cited above, for an excellent presentation of this point.

However, the new proliferation of software patents and the failure of so-called "reasonable and non-discriminatory" licensing – along with competitive business strategies and trade relations[4] -- are jeopardizing the future of our IT standards ecosystem. This in turn creates drag on the expansion of the network effect, both in existing and new areas, which ultimately hurts consumers around the globe.

Market dynamics around collaboration in the IT industry have changed dramatically with the gradual implementation of intellectual property as a business strategy and revenue source, starting in the 1980s. The concepts around intellectual property – patents, copyright, trade secrets, trademarks, and know-how – are now be used a business tool to thwart collaboration and interoperability, and IT standards are prime targets.

Lamentably, there's been a rise of embedded IPR in technical standards over the past few years. For standards that might be particular to a specific vertical industry or local application, this might not pose much of a threat to the general public. However, embedding IPR in technical standards that are required for effective participation in the network -- say for audio and video feeds or document formats -- is almost certain to have a chilling effect on access and participation by a wide range of consumers, particularly those in developing countries. Indeed, in May 2005, China attempted to raise this as an issue for discussion in the World Trade Organization Committee on Technical Barriers to Trade[5]. Costs will rise, and competition and choice are likely to be thinned; both of these ultimately affect access and participation.

Standards organizations have responded to the rise of software patents and other IPR by creating IP policies that state its members must promise to license any essential IPR under "reasonable and non-discriminatory" terms. However, a close looks proves that these IP policies provide false security. Who gets to define what a "reasonable" cost is? Is what's reasonable for a 20-year-old

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3 Ibid

4 For a view of the importance of standardization to the U.S. ICT sector, see Philip J Bond, "A Call to Action Addressing the Impact of Standards and Technical Regulation on Trade: U.S. Commerce Secretary Evans' Standards Initiative to Strengthen U.S. Competitiveness," The Standards Edge: Dynamic Tension, ed. Sherrie Bolin, 2004, pp. 93-98. Mr. Bond was the Undersecretary for Technology at the U.S. Department of Commerce at the time of the article's publication.

5 See "Intellectual Property Right (IPR) Issues in Standardization," G/TBT/W/251, 25 May 2005. Also see subsequent November 2005 meeting notes of the WTO Committee on Technical Barriers to Trade, G/TBT/M/37.

company in Canada also reasonable for two person start-up in Bangladesh? Who polices the implementation of these licensing terms? Can these terms change over time? How? Are these terms explicitly and publicly known before adoption of the technical standard? And lastly, precluding open source implementations can be argued by some to be “reasonable and non-discriminatory.”

Contrary to popular belief, today there is no guarantee that an IT standard is truly non-discriminatory and “open” just because it's called a standard, was approved by a particular organization, is supported by a set of vendors or – as argued above – is licensed under “reasonable and non-discriminatory” terms. Unfortunately, the consumer has to look at all supporting details in order to really understand how “open” and “standard” the specification actually is.

Government Procurement, Open IT Standards and the OpenDocument Format

Governments can cut through this confusion and support an ecosystem of truly open, adoptable and interoperable IT standards through their purchasing policies. Instituting procurement policies in support of open IT standards, as defined in the Addendum to this paper or in Professor Ghosh's paper, will help shore up the failing IT standards ecosystem against proprietary interests. It will also unfetter the network effect to grow as innovation and consumers demand and bring all the benefits of open IT standards outlined above to government services: the long-term preservation and control of digital information, better pricing, choice and mitigation of adoption risks. These points were discussed at length in a recent government policy discussion in Bangkok that was led by the United Nations' Asia-Pacific Development Information Programme.[6]

We support Professor Ghosh's suggestion that governments worldwide consider implementing procurement policies that support open standards. His recommendations are as follows:

1. Open standards should be defined in terms of a desired economic effect: supporting full competition in the market for suppliers of a technology and related products and services, even when a natural monopoly arises in the technology itself.
2. Open standards for software markets should be defined in order to be compatible with FLOSS[7] licenses to achieve this economic effect
3. Compatibility with proprietary technologies should be explicitly excluded from public procurement criteria and replaced by interoperability with products from multiple vendors
4. Open standards should be mandatory for eGovernment services and

6 See http://www.apdip.net/news/openstds-policydialogue
7 Free/Libre/Open Source Software

preferred for all other public procurement of software and software services."[8]

The ability to freely and easily share data with others on the network is essential to the growth and stability of the Internet Society. The network effect plays a crucial role in this: more value accrues to a consumer if she uses the same technology used by most others. As Professor Ghosh points out, this leads to a situation ripe for monopolistic behavior, and in office productivity suites – the single largest point of capture for digitized information – that's exactly what's happened over the past decades. Until recently, there was no open data format standard, and the market was dominated by one company that held the dominant world position in office productivity suites, with the few competiting vendors forced to figure out technical and business solutions to interoperating with this monopoly vendor or simply settling for remaining outside the monopoly network effect. Innovation was essentially dictated by the one company. If consumers wanted to join the established "network effect" – and who could say no? – they had to choose products from this company or products that were permitted to interoperate with this company's products.

No one can argue that innovation or participation in the Information Society didn't occur during this time. They did. Rather, the question is what *could have* happened had that network effect been established on a truly open data format standard rather than a close, proprietary solution? What if that technology had been freely available to anyone?

In 2002, several companies and individuals collaborated to create an alternative and open data format called the OpenDocument Format (ODF). This XML-based document file format enables consumers to save and exchange editable office documents (including memos, reports, and books), spreadsheets, charts, and presentations.

ODF was developed under the Organization for the Advancement of Structured Information Standards (OASIS) standards consortium and approved[9] by the International Organisation for Standardization (ISO) in May 2006. Its licensing terms[10] are free with no "hooks." It fully meets both Professor Ghosh's definition of an open standard as well as the definition outlined in this paper's addendum. ODF is a genuine vendor-neutral, open standard specification free from intellectual property encumbrances. Everyone is free to work with it. In fact, ODF is the only standard for editable office documents that has been vetted by an independent recognized standards body, has been implemented by multiple vendors, and can be implemented by anyone willing to put in the effort, including proprietary software vendors as well as developers using open source software

8 "An Economic Basis for Open Standards". MERIT, University of Maastricht. European Commission IST/FP6 Project FLOSSPOLS report. http://flosspols.org/deliverables/FLOSSPOLS-D04-openstandards-v6.pdf, p. 21

9 ODF is also known as ISO/IEC 26300

10 See http://www.oasis-open.org/committees/office/ipr.php

licenses such as the GNU LGPL or GNU GPL.

ODF has become an essential IT standard for private consumers, governments, educational institutions, companies, and other organizations who want to ensure long-term access to data stored in office applications. We further suggest that governments follow the lead of Belgium, Malaysia[11], Denmark, the National Archives of Australia, the Commonwealth of Massachusetts and others in adopting ODF as a key open IT standard, one that will promote the network effect to a broad audience and throw open participation in the Information Age.

Addendum

Definition: Open IT Standard

Two areas are equally important in determining whether a technical specification is truly an open standard: how its created and managed and how it can be used.

Creation and Management of an Open Standard

• Its development and management process must be collaborative and democratic:
    • Participation must be accessible to all those who wish to participate and can meet fair and reasonable criteria imposed by the organization under which it is developed and managed.
    • The processes must be documented and, through a known method, can be changed through input from all participants.
    • The process must be based on formal and binding commitments for the disclosure and licensing of intellectual property rights.
    • Development and management should strive for consensus, and an appeals process must be clearly outlined.
    • The standard specification must be open to extensive public review at least once in its life-cycle, with comments duly discussed and acted upon, if required.

Use and Licensing of an Open Standard

• The standard must describe an interface, not an implementation, and the industry must be capable of creating multiple, competing implementations to the interface described in the standard without undue or restrictive constraints.

11 See http://computerworld.com/action/article.do?command=viewArticleBasic&articleId=9002089

Interfaces include APIs, protocols, schemas, data formats and their encoding.

• The standard must not contain any proprietary “hooks” that create a technical or economic barriers

• Faithful implementations of the standard must interoperate. Interoperability means the ability of a computer program to communicate and exchange information with other computer programs and mutually to use the information which has been exchanged. This includes the ability to use, convert, or exchange file formats, protocols, schemas, interface information or conventions, so as to permit the computer program to work with other computer programs and users in all the ways in which they are intended to function.

• It must be permissible for anyone to copy, distribute and read the standard for a nominal fee, or even no fee. If there is a fee, it must be low enough to not preclude widespread use.

• It must be possible for anyone to obtain free (no royalties or fees; also known as “royalty free”), worldwide, non-exclusive and perpetual licenses to all essential patent claims to make, use and sell products based on the standard. The only exceptions are terminations per the reciprocity and defensive suspension terms outlined directly below. Essential patent claims include pending, unpublished patents, published patents, and patent applications. The license is only for the exact scope of the standard in question.

    • May be conditioned only on reciprocal licenses to any of licensees' patent claims essential to practice that standard (also known as a reciprocity clause)
    • May be terminated as to any licensee who sues the licensor or any other licensee for infringement of patent claims essential to practice that standard (also known as a “defensive suspension” clause)

• The same licensing terms are available to every potential licensor

• The licensing terms of an open standards must not preclude implementations of that standard under open source licensing terms or restricted licensing terms