



Patents and Open Standards

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Introduction

Two years into the work of NISO's OpenURL standards committee, NISO learned of patent applications filed by Openly Informatics, Inc. for a method of link resolution used by that company's LinkBaton system. The NISO Board of Directors was concerned that some implementations of OpenURL might infringe upon the Openly Informatics patent, should that patent be granted. Openly Informatics is a NISO Voting Member, and the company's President, Eric Hellman, is a member of NISO's OpenURL standards committee.

In subsequent communications with NISO, Mr. Hellman maintained that the claims made in the patent application were not necessary or essential for implementation of OpenURL, and that OpenURL could be implemented without infringing on the patent if granted. He also offered to grant no-cost licenses for the patented technology to NISO and its members for the purposes of implementing OpenURL. [1]

Following examination of patent application materials granted under a nondisclosure agreement with Mr. Hellman, a Board-appointed committee concluded there was a strong possibility that, "with a broad interpretation of the patent claims, implementers of OpenURL resolvers will infringe on the patent." The Board reserved the option of accepting the no cost licensing offer should the patent be granted, but noted "even a free license places responsibility on any implementer to gain and renew the license. If Openly Informatics were to be acquired, would a new owner be as sensitive to the open access point of view that NISO and the OpenURL standard represent?" [2]

This event was a timely reminder that all those involved in standards development need to understand the relationship between standards, patents, and the policies of standards development organizations. This paper reviews some patent basics and then considers the following questions: What is an "open standard?" What are the policies of other standards setting organizations governing patented contributions to standards? And what light does this shed on the OpenURL situation, and future actions by NISO?

Patents and Standards

A patent is a government-granted monopoly on the use of an invention. "Design patents" are granted for original designs of articles of manufacture, while "utility patents" are granted for inventions. In the U.S., utility patents are issued by the U.S. Patent and Trademark Office (USPTO) and consist of "the right to exclude others from making, using, offering for sale, or selling" the invention in the United States or importing the invention into the United States. Other countries have their own patent-granting organizations and procedures.

Every patent application must contain one or more "claims," or detailed definitions of precisely what is being patented. For a patent to be obtained, the invention must be judged to be novel and inventive. If an invention as defined in a claim is described in its entirety in a document published before the filing of the application, then that claim is not novel and should not be granted. Documents describing an invention in whole or in part are known as "prior art." Prior art does not invalidate a claim unless it describes all features of the claim.

The patent system was developed in order to encourage invention for the public good. Because patents are published, anyone can see and learn from the description of the patented invention. [3] In exchange, the patent-holder is granted exclusive rights to the invention for a period of 20 years. The owner of the patent may simply enjoy the monopoly

on the invention, for example, by being the only party to bring a product to market, or he may license use of the invention to others and collect royalty fees. The patent system therefore combines monetary incentive to the inventor with public dissemination of information.

In recent decades the patent situation has become quite complex. Although historically patents were only granted for physical inventions, it is now possible to patent computer software and business methods. The USPTO receives roughly 375,000 patent applications annually, and the length of a typical patent application has grown to 20-40 pages. [4] Many observers believe patent claims have become broader and deliberately more vague. In this environment, it is common for companies who can afford to do so to obtain large quantities of patents for use as bargaining chips with other companies holding their own large portfolios of patents. Known as “defensive patenting,” the patents can be used to negotiate more favorable terms of use of competitors’ patented technologies, or as ammunition if a company is sued for infringement. Indistinct and overlapping patent rights require developers of new technologies to obtain licenses from multiple patent holders. Far from encouraging innovation, this “patent thicket” has been criticized for stifling innovation, particularly in the areas of computers and the Internet. [5]

Patents have long been a contentious issue in the standards community. No major standards organization rejects patented technology outright, but working with and around patented technologies are both problematic. One vexing question is the trade-off between the “best” technology and less optimal but unencumbered (patent-free) technology. It is widely agreed that it is acceptable to include less optimal unencumbered technology in a standard, but where the line is drawn is a matter of judgement.

Another problem for standards organizations is minimizing the impact of patent rights on the standards development process. Most participants on standards committees are technical experts, not legal counsel or marketing executives. As such, they may have limited knowledge of their own company’s patents and patent applications, and no interest in or skill in conducting patent searches. The necessary desire of standards bodies to free these participants as much as possible from the burden imposed by the patent thicket strongly influences disclosure policies.

At the same time, undiscovered patent claims can impact the use of standardized technology through unanticipated royalties, complex licensing requirements, or litigation. Some see the “fear, uncertainty and doubt” introduced into the standards development process as a greater problem than the patent claims themselves. [6] Perhaps the greatest fear is of so-called “submarine patents,” claims which only become known after (sometimes many years after) the affected standards have been issued. The case of JPEG is a sobering example.

The original JPEG standard (formally IS 10918-1/ ITU-T T.81) was a product of the Joint Photographic Experts Group (JPEG) and the Joint Bi-Level Image experts Group (JBIG), both joint committees of the International Telecommunication Union (ITU) and ISO/IEC. A patent had been filed for JPEG compression technology in 1986 by Compression Labs, but no royalties had ever been claimed by that company. In 1997, a small Texas video networking company called Forgent Networks acquired Compression Labs, including its patent rights. By that time, JPEG compression had become a fundamental Internet and mass-market technology. In 2002, Forgent announced that it had rights to exclusive use of the patented technology and that it would be seeking royalties from all companies implementing JPEG compression in all fields of use except for satellite broadcasting.

The JPEG committee is collecting a portfolio of prior art in order to challenge the claim. At this time the dispute remains unresolved, and it is possible that ISO will withdraw JPEG as a formal standard if Forgent continues to demand royalties.

Open Standards

An obvious question raised by the NISO incident is whether patented intellectual property belongs in open standards at all. To begin to answer this question, one first has to clarify what is meant by “open standards,” which, like many of the terms in common use, has no single authoritative definition. Although we assume that NISO standards are meant to be open standards, the term does not appear in the NISO Bylaws or Operating Procedures, nor is it used on the NISO website. Both NISO and ANSI describe their standards not as open standards but as “voluntary consensus standards.”

A narrow definition of an open standard is one developed through an open, consensual process in which all identifiable stakeholders have been invited to participate. ANSI does require “openness” as an essential requirement of due process in an ANSI-accredited standards development organization.

1.2.1 Openness. Participation shall be open to all persons who are directly and materially affected by the activity in question. There shall be no undue financial barriers to participation. Voting membership on the consensus body shall not be conditional upon membership in any organization, nor unreasonably restricted on the basis of technical qualifications or other such requirements. [7]

According to Ken Kretchmer of the University of Colorado International Center for Standards Research, the ANSI open standards process requires not only openness as defined above, but also consensus (that all interests are discussed and agreement found) and due process (a defined balloting and appeals process). It also requires that “holders of intellectual property rights (IPR) must identify themselves during the standards development process.” [8] Under this definition, then, patented technology could be included in an open standard, provided the other criteria were met.

Bruce Perens, best known as a leader in the open source and Linux communities, does not include open process in his criteria for open standards. He does, however, include availability, meaning that the standards are available for all to read and implement. He defines as best practice making the text available on the Internet for free download, a criteria met by NISO standards. Acceptable practice is that, “Any software project should be able to afford a copy without undue hardship. The cost should not far exceed the cost of a college textbook.” [9] (Interestingly, ISO standards may not meet this criterion. For example, the cost of ISO 10161-1 and 10161-2, the two parts of the Interlibrary Loan Application Protocol Specification, is roughly \$240.00.)

Like Kretchmer, Perens would allow patented technologies in open standards, provided the standards are free for all to implement with no royalty or fee. “Patents embedded in standards must be licensed royalty-free, with non-discriminatory terms.” Other criteria for open standards include that they do not lock the customer into a particular vendor, that they do not favor one implementer over another, that they can be extended or subsetted, and that they can protect against “predatory practices” by license terms that require the publication of reference information for any extension of the standard.

Robin Cover in an extensive Cover Pages essay (labeled as an “incomplete draft document”) on “Patents and Open Standards” appears to go a step further, requiring open standards to be freely implementable not only without fees, but also without licensing:

By “open” we do not refer simply to standards produced within a democratic, accessible, and meaningfully “open” standards process; we refer to standards that can be implemented without asking for someone’s permission or signing a license agreement which demands royalty payments. We mean “open” in the sense of implementable within an open source framework, free of legal encumbrance. [\[10\]](#)

Given this range of opinion, one can’t simply assume that patents have no place in open standards. The standards-using community needs to clarify its thinking on open standards, an achievement that would be facilitated if standards-making organizations clearly documented their own definitions of open standards.

Patent Policies in Standards Organizations

The standards community distinguishes between Standards Developing Organizations (SDOs) and Standards Setting Organizations (SSOs). An SDO is an organization that is an accredited representative to the International Organization for Standardization (ISO) or the International Electrotechnical Commission (IEC), or has been accredited by such an organization. The American National Standards Institute (ANSI) is the sole U.S. representative to ISO/IEC, and in turn, ANSI accredits more than 270 public and private standards developers that adhere to ANSI criteria for developing voluntary consensus standards. In contrast, Standards Setting Organizations (SSOs) include not only formal SDOs, but trade organizations, consortia, alliances, and other groups that develop *de jure* or *de facto* specifications within their industries or spheres of concern.

Because NISO is an ANSI-accredited SDO, patent policies in ISO/IEC and ANSI itself are particularly relevant. The IETF, OASIS, and the W3C would be considered SSOs, and their patent policies are independent of those governing SDOs.

Standards Developing Organizations

ISO/IEC

The ISO/IEC patents policy was most recently updated in 1995. It states that, “If, in exceptional situations, technical reasons justify such a step, there is no objection in principle to preparing an International Standard in terms which include the use of items covered by patent rights... even if the terms of the standard are such that there are no alternative means of compliance.” [\[11\]](#) The originator of a proposal for a standard, and any participant in the preparation of the standard must disclose any patent rights of which they are aware. Drafts submitted for comment must also solicit notification of any known patent rights. The patent holder must record a statement of willingness to negotiate rights on reasonable and non-discriminatory terms. If the patent holder refuses to do so, the patented item may not be included in the standard without authorization from the IEC Council or ISO Council. If it is found that licenses cannot be obtained under reasonable and non-discriminatory terms after a standard is published, the standard is referred back to committee for further consideration.

The policy requiring reasonable and non-discriminatory terms is known as RAND, and it has been the predominant policy of standards-setting organizations since the 1970s. Some have argued that the lack of a clear, equitable, and easily understood definition of RAND has been a major problem for the information technology and communications industry for at least that long. [12] The intent of RAND, however, is clearly to prevent patent issues from becoming a barrier to the adoption of standards by ensuring that licenses will not be withheld and that the cost to adopters will not be prohibitive.

Although the policy refers to “exceptional conditions,” ISO/IEC standards are commonly rife with patent encumbrances, and not only submarine patents as in the case of JPEG. ISO IEC MPEG-4, for example, was developed with full knowledge that the underlying technologies were patented. MPEG-4 visual compression is subject to so many patent claims that 18 different rights holders have formed a “patent pool” (joint licensing scheme) administered by a Denver company, MPEG LA LLC. (Yet another corporation handles licenses for MPEG-4 Audio.) In January 2002, MPEG LA announced a new licensing scheme that lowered royalties but imposed a hugely unpopular per minute use fee for disseminating the video data. The news shook the video industry, causing Apple Computer to delay release of its MPEG-4 based QuickTime Media Player, and boosting the development of alternative technologies such as On2’s VP5.

ANSI

The patent policy of the American National Standards Institute (ANSI) is of interest because it formally governs NISO’s minimum requirements. The policy is defined in the *ANSI Essential Requirements* which state, “There is no objection in principle to drafting a proposed American National Standard in terms that include the use of a patented item, if it is considered that technical reasons justify this approach.” [13] The policy goes on to state that if ANSI receives notice that a proposed standard may require use of a patented invention, ANSI will require a statement from the purported patent holder declaring either that this is not the case, or that a license will be made available to implementers with terms acceptable to ANSI. Acceptable terms are either “without compensation” or “under reasonable terms and conditions that are demonstrably free of any unfair discrimination.”

ANSI’s policy is silent on the extent to which an accredited standards developer must strive to identify patented inventions within its standards, or the method(s) that should be used to do so. The policy states only that ANSI itself is not responsible for identifying patents for which a license may be required, or for investigating the validity or scope of patents called to its attention.

Standards Setting Organizations

IETF

The Internet Engineering Task Force (IETF) is responsible for technical standards underlying the Internet. The official specification documents defined by the IETF are recorded and published as standards track “RFCs” (Request for Comments documents). Although originally the IETF rejected encumbered technologies outright, in 1996 a revised policy was issued as RFC 2026. [14]

One of the goals of RFC 2026 was to make it easier to include encumbered technologies when it made sense to do so. Intellectual property rights including patents are addressed in section 10, which mandates that individuals contributing to a specification must disclose the existence of “any proprietary or intellectual property rights in the contribution that are reasonably and personally known to the contributor.” It is acknowledged that the contributor may not know of all property rights owned by his own or other companies. If patents or patent applications are made known to the Internet Engineering Steering Group (IESG), the IESG will include a statement in the document indicating the existence of real or claimed rights, and the IESG will attempt to attain a written statement agreeing to RAND licensing to any party implementing the specification. Failure to do so, however, will not affect the advancement of the specification through the approval process. In 2002 the IETF chartered an Intellectual Property Rights Working Group to update and clarify section 10. The description of the Working Group notes that the “Tao of the IETF” has been to use unencumbered technology, but acknowledges there are some cases where encumbered technology is used.

OASIS

OASIS (Organization for the Advancement of Structured Information Standards) is a consortium dedicated to the development and advancement of interoperable, mostly XML-based standards for e-business. OASIS specifications include ebXML, DocBook, SAML, and UDDI. OASIS labels its specifications “open standards” and cares enough about the “open” designation that its Web address is www.oasis-open.org/. The OASIS Policy on Intellectual Property Rights is nearly identical, in both content and wording, to that of the IETF as documented in RFC 2026, with “OASIS Board” substituted for “IESG.”

W3C

The policy of the World Wide Web Consortium (W3C) is of interest not only because of the “weight” of the W3C in information-related technology, but also because it marks a radical departure from the traditional policies of standards organizations. The W3C Patent Policy became a formal W3C policy in May 2003, having been under development since the formation of the Patent Policy Working Group in October 1999.

The evolution of the policy is well documented in a series of working drafts available on the Web. One notable feature of its development is a round rejection of RAND in favor of Royalty Free (RF) licensing. An early document, “W3C Patent Policy Framework,” proposed that when W3C working groups were chartered they be assigned to work in one of two modes: RF or RAND. W3C members would not be required to offer RF terms, but would have to agree to RAND licensing where applicable, with some exceptions. The outpouring of negative responses received during the public comment period caused the Working Group to drop the RAND track and focus on defining RF licensing in its next draft. The impossibility of defining “reasonable” fees was a major objection: what is reasonable to IBM or Hewlett Packard may not be reasonable to a small startup company or an open source developer. Some other themes of the comments were that RAND is contrary to the spirit of the Internet and the Web, that the RAND policy will make W3C irrelevant to its constituency, that W3C should not be promoting proprietary technologies, and that RAND would hurt open source developers. The Open Source community was, in fact, vehement in its opposition to RAND, and powerfully influential in its arguments to the W3C. [15]

The policy as finally approved is limited to “Essential Claims,” which are defined as “claims in any patent or patent application in any jurisdiction in the world that would necessarily be infringed by implementation of the Recommendation.” [16] In effect, if an implementer has no non-infringing alternative method of implementing a normative part of a W3C standard, the claim is an Essential Claim. With certain exclusions, the holder of an Essential Claim must agree to the W3C Royalty Free licensing requirements. A license “not conditioned on payment of royalties, fees or other consideration” must be made available to all implementers of the Recommendation, regardless of whether they are W3C members, for the purpose of implementing the Recommendation. The license may, however, be conditioned upon the granting of reciprocal RF licenses to Essential Claims owned by the licensee. The license must be made available for as long as the Recommendation is in effect, for the life of the patent.

The Patent Policy also includes clear rules of disclosure. By virtue of participating in a W3C Working Group an organization commits to the W3C RF licensing requirements for Essential Claims related to the work of that Working Group. Working group members do not need to disclose their knowledge of relevant patents so long as their organization commits to licensing them according to the W3C RF policy. However, disclosure is required when the organization does not commit to RF licensing. Patents can be excluded from the RF licensing requirements by disclosing specific Essential Claims within well-defined time periods designed to maximize the amount of time Working Group members are aware of the excluded claims.

The W3C Patent Policy is notable because it expressly states its goal is to ensure that Recommendations produced under the policy can be implemented on a royalty free basis. However other key elements are also of interest: the obligations of the policy apply only to Working Group participants, they apply only in the case of Essential Claims, and disclosure is required only under exception conditions.

Patent Policies and NISO Standards

The OpenURL situation has made it clear that NISO needs to develop a patent policy explicitly governing tolerance for encumbered technologies and procedures for disclosure. Because of the extended work of the W3C Patent Policy Working Group, much of the recent discussion about standards organizations and patents has focused on the relative merits of RAND versus royalty-free licensing. The debate has shown a clear and strong preference for royalty-free terms, and may in time cause a re-evaluation of the RAND-based patent policies of other standards organizations. However, because NISO is an ANSI-accredited standards developer, NISO’s policy will have to be consistent with ANSI’s own policy which currently allows patented technologies on both royalty-free and RAND terms.

There are other lessons that can be learned from the recent experience of the W3C, beyond the opposition to RAND. It is striking that the W3C debate did not focus on the appropriateness of including patented technologies in standards. Even in organizations with a “Tao of unencumbrance,” the idea that the best technology for a standard may at times be a patented technology appears to be widely accepted.

It is also worthy of note that the new W3C policy departs from traditional policies in relation to disclosure. While older policies such as those of the SDOs and the IETF have strong requirements for disclosure but weaker requirements related to licensing, the W3C policy has strong requirements for licensing but much weaker requirements related to disclosure.

While this may appear to be counter-intuitive, it may reflect a new reality that high-tech companies value the secrecy of their development plans more highly than they value revenue from patent royalties. A story by Karen Coyle is revealing:

One organization I sat in on, EBX, refused to move its standard from .9 to 1.0 unless all organizations involved disclosed any patent interests. I sat in a room and watched folks from Microsoft, Adobe, Xerox and other companies sit stone-faced, each refusing to [speak] first, and finally the organization dissolved. [17]

If OpenURL were a W3C Working Draft, subject to the W3C Patent Policy, Mr. Hellman would probably not have had to disclose his patent interests because the method of link resolution is not an Essential Claim. OpenURL is a syntax that can be used for communicating information between an information service and a link resolution service; it is not a prescription for the methodology or functionality of either of the services. Although the OpenURL standard itself is agnostic to link resolution methods, some vendors' methods of link resolution using OpenURL are likely to be similar enough to the method used by LinkBaton to infringe on the patent. This however seems to be not a concern so much for NISO as for vendors of link resolution services. It is certainly reasonable to expect that, as commercial entities and corporate rivals, vendors of link resolution systems might want to invent and patent distinct methods of link resolution. There is, in fact, no standard for link resolution per se, and there have been no claims to date that this should be an "open" technology.

Clearly, patents are a fact of life which will continue to dog developers and implementers of technical standards for the foreseeable future. Debates such as those in the W3C and now taking place in NISO are healthy in that they raise awareness of intellectual property issues and encourage the community to articulate its values and expectations. The adoption of an explicit NISO patent policy will be a positive step, but certainly not the last word in this evolving dialogue.

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NISO Patent Update

On September 25, 2003 the NISO Board of Directors unanimously approved a NISO Patent Policy. NISO's policy statement begins: "To promote the widest possible adoption and use of NISO standards, NISO seeks to develop and promote standards that avoid embedded patents whenever possible." The Policy acknowledges that this may not always be possible. If a patent claim is essential for implementation of a NISO standard then NISO would seek to assure that a free license would be offered, or that the patent holder would not enforce the patent, or that a license would be made available under reasonable and nondiscriminatory terms. NISO's policy is consistent with ANSI requirements. The full text of the policy is in the Resources section of the NISO website.