Standards, Patents and the Dynamics of Innovation on the World Wide Web

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Introduction

The key challenge posed by patents in any standards arena is that participants in a standards body will be unwilling and unable to work collaboratively if, at the end of the process, the jointly-developed standard can only be implemented by meeting licensing terms that are unduly burdensome, unknown at the beginning or even the end of the design process, or considered unreasonable. At the same time, many commercial and academic participants in standards processes are unwilling to simply waive all of their patent claims at the door of the standards group. So, careful policies are required to establish whether and on what terms patent claims may be used by those who participate in the design of standards. As this paper will explore, standards involving network interoperability for the World Wide Web raise an variety of challenges new to traditional standards-setting environments. In order to enable the ongoing development of the Web as an open, global, decentralized information space, a patent policy for Web standards must consider both the development dynamics of Web standards themselves, and the environment in which Web standards have been implemented over the lifetime of the World Wide Web.

I. General characteristics of the Web: A universal information space

Developing a patent policy for Web standards requires understanding of the unique characteristics of the World Wide Web: both the fundamental goals of the technology and the environment in which such technology can best be produced and standardized. The World Wide Web was designed to be an easy-to-use, universally accessible open platform for publishing and accessing information, enabling linking and distribution of documents amongst computers, regardless of operating system or hardware platform, all around the world. While the Web does not yet reach every single person in the world, it has enabled an unprecedented exchange of knowledge, information, goods and services around the world. Of critical importance to the rise of electronic commerce as a new marketplace, Web technology allows a wide variety of new systems and technologies to be built on top of the basic architecture of the Web, thus enabling continual innovation in the design of Web-based applications and services. Two key attributes of Web standards are responsible for the ubiquity and flexibility of the Web: 1) simple, extensible design, and 2) open, unencumbered standards.

In the history of the Web, low legal and financial barriers to use of Web standards have been as important as ease of deployment from a technical perspective. W3C Recommendations are often implemented in a large number of individual software environments. Indeed, the Web standards design process depends on the implementation experience of a large number of developers to assure that each component of the Web is well designed and satisfies the needs of the increasing diverse communities of Web users. Gathering early implementation experience from a wide range of developers is particularly important for security-related standards. This broad experience helps assure that security standards are subject to rigorous testing before being finalized. Open source implementations have played an essential role in the evolution and broad access to Web technology.

Among the most popular versions of Web server software, Apache, is produced on an open source licensing basis. In recent years, open source browsers such as Mozilla and Konqueror have become popular with users and important platforms for existing and new Web standards. On a variety of platforms, many of W3C's new standards are implemented early with open source code, enabling large numbers of developers, commercial and non-commercial, to incorporate new Web features into software they are writing without having to develop those features from scratch. Finally, the diversity of content represented by the over 2 billion Web pages is only possible because the creators of each of those pages is able to use key web standards such as HTML (hypertext Markup Language) and CSS (style sheets) without paying a royalty.

The pattern of innovation on the Web today still shows many of the same characteristics as the early days of the Web: standards advance in many case through the design and deployment efforts of a higly diverse collection of individuals and organizations working together in a fast-moving collaborative environment. XML is a set of standards for structured data on the Web, is recognized as one of the critical advances in Web technology since the initial foundations of http, HTML and CSS. The basic design of XML was set out by a group of just eleven individuals in roughly 3 months of feverish work. The striking feature of this group is their diversity: they come from academic and commercial organizations, and some of them just worked on their own behalf. The so-called XML 11, listed here, were the authors of the first XML specification.

THE "XML 11"
Arbortext - Eve Maler
Dyansoft - Steve DeRose
Hewlett-Packard - Dave Hollander
Independent - Elliot Kimber
Independent - James Clark
Microsoft - Jean Paoli
NCSA - Tom Magliery
Softquad - Peter Sharp
Sun - Jon Bosak
Textuality - Tim Bray
Univ. Illinois - Michael Sperberg-McQueen

This group illustrates the environnment that has given rise to the continued technical evolution of the Web. This nature this group also puts significant contraints on the type of patent policies that are likely to work in the Web community. Some of these individuals come from organizations that have considerable legal resources and robust patent portfolios. Others are simply individuals with the vision and commitment to work hard to advance a certain aspect of Web technology. If these eleven had been forced to start their work together by negotiating details patent licenses and royalty structures, it seems clear that they never would have even gotten a start of their technical work. Hence, the de facto royalty-free environment that surrounded their work was critical to the success of this vital addition to the architecture of the Web.

II.History of Patents and the Development of the World Wide Web

The second decade of the Web has already demonstrated that patents will be a factor in the ongoing development of the World Wide Web infrastructure. A variety of factors suggest that the Web will be increasingly affected by the patent process. The following factors are significant:

1. Convergence: The Web had its origins in the personal computer software industry, where patents had seldom been a factor in development dynamics. However, as the Web comes into contact with the telecommunications, broadcast media and consumer electronics industries, there is pressure to change the traditional role patents have played in Web standards.
2. Rise in patent issuance: Patent offices, led by the U.S. PTO, are issuing patents, especially in the software sector, at record rates. Recent debate regarding the patentability of software under European will also have an impact in this regard.
3. Experience of Internet-related standards bodies: A number of standards bodies including W3C and IETF, as well as consortia such as the WAP Forum, have encountered potential barriers to acceptance of standards because of licensing requirements perceived as onerous.
4. Popularity of Business Method patents: Beginning with the State Street decision in the United States and continuing through high-profile litigation between Amazon.com and Barnesandnoble.com, business method patents have become an increasingly significant factor in the ecommerce marketplace.

All of the core technical standards (W3C Recommendations) that defined the Web architecture were developed on the de facto understanding that they would be implementable on a Royalty-Free basis. In the first four years of W3C's history, no serious issues regarding patents had been raised at all. All energy was concentrated on developing technical specifications. In the last few years several patents issued by the United States Patent and Trademark Office have stalled, or at least delayed, W3C technical work.

- **P3P and the Intermind Patent** : A patent (US Patent #5862325) claiming rights related to metadata control structures between clients and servers which, according to Intermind, covered implementations of W3C's Platform for Privacy Preferences (P3P) standard. Intermind, at the time a W3C Member and participant in the P3P working groups, offered a "licensing program that will be compatible with the growth of standards for communications object technology," but did not make the precise terms public. Gradually, it became clear that the demand that implementers pay royalties was chilling the development of the technical specification, and rendering deployment of P3P-compliant technologies unlikely. After unsuccessful efforts to come to some agreement with the patent holder, another approach to removing this barrier was necessary. W3C commissioned an analysis of the Intermind patents to assess both the likelihood that compliance with P3P would require infringement of the patents and also to evaluate the validity of claims. The analysis conducted by Barry Rein of Pennie & Edmonds, and made available to both W3C Members and the public, established a reasonable basis for believing that implementers could comply with P3P without infringing the patent. Today, P3P is a W3C Recommendation and widely implemented across the Web.
- **Microsoft Style Sheet Patent**: During the development of W3C's style sheet specifications, Microsoft announced that it had been issued a patent (US Patent #5860073) which might cover W3C's Cascading Style Sheet (CSS) Recommendations. Microsoft was a participant in various W3C style sheet activities and quickly offered royalty-free licenses to W3C members in order to assure that implementation of this standard would proceed.
- **Sun XLink Patent** : A patent (US Patent #5659729) on technologies relevant to the XLink specification was disclosed by Sun during the process of developing the XLink specification. Though there was not a clear model for Royalty-Free licensing in W3C, Sun worked to develop a license that would enable Royalty-Free implementation of this standard.

After considerable effort on the part of W3C Members and staff, each of these situations were, indeed, resolved in a way that enabled widespread adoption of the standards in question. However, the general trends cited, and the specific situations in which patent claims have been potential or actual roadblocks to standardization have made it clear that the W3C must have a clear and effective patent policy to ensure that the Web continues to develop as an open, universal information platform.

As will be discussed below, W3C recently encountered a challenge by Eolas to an important aspect of the HTML standard, one of the most important and widely used foundations of the Web. At the

time of this writing the United States Patent Office has provisionally determined that the claims of the claims of the Eolas patent (US Patent #5,838,906) are invalid, based on a reconsideration launched by the PTO Director at the urging of W3C Director Tim Berners-Lee. (See section IV.B below.) The final disposition of this matter is still pending, however.

III. Web Community Response to Patent Threats Against W3C Standards

A. Policy History

Responding to increasing concerns about patents, W3C created the Patent Policy Working Group (PPWG) in July 1999 to forge a patent policy that would:

- address the growing challenge of patent claims around Web technologies,
- foster an environment within W3C where technical decisions can be made unencumbered by patent claims.

Whether patents and claims related to W3C technologies are in fact valid or not, the risk of costly, time-consuming litigation and possible limitations on use by the right holders, is sufficient to suffocate much of the dynamic development activity that has been driving the Web industry. A variety of factors already discussed suggest that the Web will be increasingly affected by the patent process, and so W3C created the Patent Policy Working Group to create a clear and effective policy.

Participants in the Patent Policy Working Group included representatives from AOL Time Warner; Apple; AT&T; Avaya; Daisy Consortium; Hewlett-Packard Company; IBM; ILOG.; Intel; Lexmark; Microsoft Corporation; MITRE; Motorola; Nokia; Nortel Networks; The Open Group; Oracle Corporation; Reuters, Ltd.; Sun Microsystems; Xerox Corporation; as well as invited experts from the Free Software Foundation, Software in the Public Interest, and the Open Source Initiative.

The Patent Policy Working Group's first proposal suggested a two-track approach to patent policy at W3C, allowing both RAND and RF licensing modes. According to the proposal, each time a new Working Group is formed to develop a standard, a choice would be made about whether the standard should be developed to be implementable on a royalty-free or RAND basis.

Responses to that draft was dramatic, both from W3C Members and the public. Support from W3C Members was mixed, and reviewers sent all manner of detailed comments. Public reaction to the draft was almost uniformly negative, primarily because the framework would allow W3C to include in its Recommendations technology known to be patent-encumbered, and that implementors might therefore have to pay a license fee to implement a W3C Recommendation. The strongest reaction came from various communities of open source developers who declared, (in several thousand emails sent to the W3C public comment mailing list) that a RAND approach would cause open source developers to stop using W3C web standards, impel some to form alternate Web standards, thus balkanizing the Web, and overall constituted a take-over of the Web by large corporate interests.

W3C responded to input from W3C Members and the public by adding invited experts to the Patent Policy Working Group to represent the Open Source community, creating a task force within the Patent Policy Working Group to examine how to accommodate the Open Source community, and creating a public home page for the PPWG, publishing public meeting records, and committing to regular public circulation of new drafts before the policy was finalized.

B. Summary of the W3C Patent Policy

The primary goal of the W3C Patent Policy is to enable W3C Recommendations to be implemented on a royalty-free basis. The policy also requires patent disclosure by W3C Members when they are aware of patents that may be essential to the implementation of W3C Recommendations.

In simple terms, the Patent Policy provides that:

- All who participate in the development of a W3C Recommendation must agree to license essential claims (that is, patents that block interoperability) on a royalty-free (RF) basis.
- Under certain circumstances, Working Group participants may exclude specifically identified patent claims from the Royalty-Free commitment. These exclusions are required shortly after publication of the first public Working Draft, reducing the likelihood that surprise patents will jeopardize collective Working Group efforts.
- Patent disclosures are required from W3C Members and requested of anyone else who sees the technical drafts and has actual knowledge of patents that may be essential.
- Patent claims not available with terms consistent with the W3C Patent Policy will be addressed by a exception handling process.

In some cases, W3C may become aware of technologies proposed for inclusion in Web standards that are not available according to the conditions defined in the Patent Policy. These situations may arise when a patent holder wants to charge a fee, or because of inconsistencies with of one of the nine other Patent Policy licensing requirements. In this case, W3C will convene a "Patent Advisory Group" (PAG) to investigate the issue. Each PAG consists of representatives from W3C Members participating in the Working Group. The PAG may recommend a legal analysis of the patent, instruct the Working Group to attempt to design around the patent or remove the patented feature, or may suggest stopping all work in the area.If all avenues to reach a result consistent with W3C Licensing requirements have been exhausted, the PAG may recommend to the W3C Membership that the technology be included anyway. Such a recommendation requires that the precise licensing terms are publicly disclosed and will be subject to review by the public, the W3C Membership, and the Director.

The W3C Patent Policy Working Group chose to include a narrow window for considering non-royalty-free license terms in a desire to preserve a degree of flexibility for unexpected situations. The policy retains its fundamental commitment to royalty-free standards for the Web. In crafting the exception process, we have proposed a multistage process with feedback and approvals. As a result, nearly unanimous support is required for such exceptions. This should only be used in rare cases and is only available after all other alternatives have been tried.

The premise of the policy is that it is in the interests of all who participate in building and using the Web -- including patent holders and all others alike -- to enable royalty-free implementation of Web standards. To this end, the policy doesn't require giving up one's entire patent portfolio; it concerns only those patent claims held by W3C Working Group participants that are essential to implement the specific W3C standard. The W3C royalty-free license requirements are consistent with generally recognized Open Source licensing terms. This royalty-free definition provides reasonable assurance that the Recommendations themselves are available to all users and implementors of the Recommendation.

C. Intended Impact of the Patent Policy on Standardization at W3C

The first effect of the policy is to set expectations about W3C's licensing goals: the goal of each W3C Working Group is to produce a Recommendation that is not only technically sound, but that can be implemented according to the W3C Royalty-Free License requirements. Note that there is no "W3C license," only conditions a license must meet in order to satisfy the policy.

Though Working Group participants keep this goal in mind, the policy is designed to enable them to concentrate on technical design without worrying about patents at every step. The policy establishes up front that:

1. By virtue of participating in a Working Group, the participating organization formally commits to the W3C Royalty-Free License requirements for patents found to be "essential" to the Recommendation. An "essential claim" is one that would necessarily be infringed by an implementer of the Recommendation; in other contexts this may be called a blocking patent.
2. Working Group participants are not required to disclosure known patents as long as the

> participating organization commits to licensing those patents according to the W3C Royalty-Free License requirements.

Thus, as long as no patents are brought to the attention of the Working Group, the group can concentrate on technical issues. The policy does not encourage W3C to stick its collective head in the sand, however. The policy requires public disclosure of patents and patent applications if someone in a Working Group developing a W3C Recommendation has "actual knowledge" that the patent contains claims that may be essential, and that person does not agree to the W3C Royalty-Free License requirements. No one is required to perform a portfolio search in order to satisfy the disclosure requirement.

The policy also accounts for the situation where a Working Group participant may not wish that a particular patent be subject to the W3C Royalty-Free License requirements. The policy allows participants, in certain conditions, to exclude specific patent claims from the licensing commitment (within a well-defined time limit). This has the dual effect of raising the Working Group's awareness of a possible obstacle to progress, and allowing patent holders to participate knowing that they can exclude strategic technology early in the process and still contribute to the overall effort.

The second major goal is to promote the widespread implementation of W3C Recommendations first by making the W3C Royalty-Free License requirements clear. By clarifying specific licensing requirements, the Policy aims to remove uncertainty about the licensing terms that will be available to implementers, with the goal of reducing time-consuming negotations for both licensors and implementer/ licensees alike. To qualify under the policy, a license must satisfy the following requirements (see the policy for additional details and conditions):

- The license must be available to all implementers and users whether or not they are W3C Members;
- The license may be limited to implementations of the Recommendation;
- The license may require a royalty-free "grant back" or reciprocal licenses either to the original patent holder or to all other implementers;
- The license must not charge a fee or royalty;
- The license may be suspended if the licensee sues the licensor;
- The license must not impose any other material conditions, such as requirements to use other technologies, etc.

Thus, the policy promotes implementation of W3C Recommendations by clearly establishing licensing requirements, by ensuring that a license is available to all, and by ensuring that exclusions and disclosures are public.

D. Community Reaction to Royalty-Free Policy

By the time the W3C Director, Tim Berners-Lee, approved the Patent Policy, there was strong support within the Membership and Web community-at-large. The total number of W3C Members supporting the policy is very high, higher, in fact, than any technical Recommendation recently adopted. Public support for the royalty-free goal of the policy has been significant. In his decision adopting the policy, Berners-Lee wrote:

> "The Policy affirms and strengthens the basic business model that has driven innovation on the Web from its inception. The availability of an interoperable, unencumbered Web infrastructure provides an expanding foundation for innovative applications, profitable commerce, and the free flow of information and ideas on a commercial and non-commercial basis.
>
> This decision on the W3C Patent Policy coincides almost exactly with the tenth anniversary of CERN's decision to provide unencumbered access to the basic Web protocols and software developed there, even before the creation of W3C. In fact, the success of technical work at the World Wide Web Consortium depended significantly on that decision by CERN. The decision to base the Web on royalty-free standards from

> the beginning has been vital to its success until now. The open platform of royalty-free standards enabled software companies to profit by selling new products with powerful features, enabled e-commerce companies to profit from services that on this foundation, and brought social benefits in the non-commercial realm beyond simple economic valuation. By adopting this Patent Policy with its commitment to royalty-free standards for the future, we are laying the foundation for another decade of technical innovation, economic growth, and social advancement.

Numerous issues were raised and resolved in the three years during which the policy was under development. By the time the policy was approved, a few objections remained, but not enough to block consensus support for the policy. Some objections are notable:

- RAND (reasonable and non-discriminatory terms) licensing is necessary and justified by success in other standards-setting arenas: Several commenters suggest that the policy should be more accepting of RAND licensing, which may include payment of royalty fees. In some cases, the commenters seek RAND terms as part of the policy because their business model depends on generating revenue based on the inclusion of patented technology in standards. Commenters also suggest that RAND licensing has worked well in technologies such as compact discs and various telecommunications technologies. Although it is clear that the RAND model has worked for other standards bodies, the experience of Web standards suggests otherwise. Web standards have flourished when participants have eschewed royalty payments and encouraged the widest possible implementation. However, when patent holders have sought fees, the process of developing and deploying open standards has been held up. We do not argue with the successes of other standards bodies with RAND licensing, however those successes are not enough to persuade us to radically alter the fundamental business model that has made the Web such a success.
- Some commenters who prefer a RAND policy suggest that the W3C Patent Policy will not be able to guarantee that all implementers can comply with W3C Recommendations on RF terms. The PPWG recognized that no policy, whether RAND or RF, can promise protection against third-party patents. We believed, however, that by securing a RF commitment from all who participate in the development of a Recommendation will cover much of the legitimate intellectual property essential to interoperability. Furthermore, the reciprocity provisions allowed by the W3C RF Licensing requirements are also available to require, at the option of patent holder, all implementers to license any essential they themselves have on RF terms. In the event that third-party patents are discovered and RF licenses not available, the Recommendation may either be modified or rescinded altogether, in the extreme case.
- Concern about compatibility with the GNU General Public License: The policy allows, but does not require, licensors to impose what are known as 'field-of-use' restrictions which limit RF licenses to implementations of the Recommendation in question. Both Member and public commenters expressed concern that the W3C Patent Policy would bar GPL implementations. The most immediate response to this concern is to note that there are no field-of-use restrictions whatsoever required by the policy. Hence, the fact that a Recommendation issues under the policy does not impose any field-of-use restrictions on an implementer. Recent public comments from a Free Software Foundation official indicate that the possibility that a field of use restriction could be imposed is no bar to release of code under the GPL.

In the end, despite these concernes, the policy gain strong support from the Membership and the Web community at large.

IV. Royalty-Free Patent Policy: Early Implementation Experience at W3C

Early implementation experience reveals that the W3C Patent Policy is useful in clarifying the licensing status of W3C technologies, encourages (rather than discourages, as some feared) Member to bring new technology for standardization at W3C, and provides a useful structure within which to resolve patent-related threats to interoperability on the World Wide Web.

A. RF Commitments

-large number of WGs started under the PP, indicating willingness to bring new technology to w3c

Since adopting the patent policy less than one year ago, W3C has launched more than ten @@check@@ new technical activities and transitioned more than twenty existing standardization projectes (Working Groups) to the use of the new Policy. In each case, all of the participants must agree to make Royalty-Free licensing commitments for any patent claims that end of being required to implement and comply with the specification. In addition, the launch of a new activity often entails substantial contribution of intellectual property (including patents) from one or more W3C Members. While there was some concern that Members would balk at bringing new technologies to W3C given the royalty-free licensing requirement, no such reluctance has actually been observed. To the contrary, in the first year of the Policy's operation, a number of W3C Members have made Royalty-Free commitments, including the following organizations:

> Systinet, DaimlerChrysler, IBM, Tibco, IONA, SUN Microsystems, Fujitsu, Canon, Microsoft, Macromedia, ProgressSoftware, Intel, Matsushita, Real Networks, Cisco, Genesys, Health LevelSeven, Hewlett-Packard, HeyAnita, Motorola, Nokia, Openwave, Scansoft, SnowShore, TelecomItalia, Vocalocity, and many others...

Nearly as important as technology work which has been enabled by the Patent Policy, are the debates that we have been able to *avoid* having since adopting the policy. A key goal of the Policy is to free technical working groups from having to ever discuss the difficult and devisive legal questions regarding the sufficiency of a particular license offer, or whether a working group participant has fulfilled his or her patent disclosure obligation. The W3C policy aims to minimize these discussions to the extent policy, and at minimum more them to venues outstide technical working groups where lawyers and others who have the expertise to resolve such matters can work effectively in a transparent but efficient manner. The high cost of having to discuss patent issues in technical working groups was recently revealed in the IETF's effort to standardize an anti-spam technology call SPF. While the group was in the middle of trying to come to consensus on technical details, a dispute erupted over whether a license offered by Microsoft was sufficiently open to accommodate open source implementations. While the license was described as 'royalty-free', some other terms were considered objectionable by some in the open source community. After a few weeks of debate, the IETF decided that the working group would not be able to come to agreement on the licensing issus raised, so closed the group down altogether. Regardless of ones view of the merits of the dispute, it illustrates the difficulty of negotiating licensing details in a technical working group environment. One clear benefit of the W3C Patent Policy is that the basic licensing requirements are agreed to in advance. Anyone participating in a technical activity has a yes or no choice about whether or not to accept them. There is no debate over terms. And, as described elsewhere, if there are patent-related disputes, the policy provides a Patent Advisory Group as an venue composed of responsible experts to sort out differences.

B. Patent dispute resolution: Patent Advisory Groups

Another early test of the new Patent Policy came, ironically enough, when a very old W3C Recommendation, HTML, was challenged by the actions of a small company called Eolas. Holder of a patent claiming to cover browsers that parse the <object> tag in a certain manner, Eolas won a $521 Million judgment against Microsoft and demanded that Microsoft alter its Internet Explorer web browser to avoid infringing the patent. Following the Patent Policy, W3C convened a Patent Advisory Group (PAG) to determine whether there was a threat to the HTML standards. Out of concern that the Eolas patent could have a erode the interoperability of the Web and case harm far beyond the fact that one W3C Member (Microsoft), the PAG recommended that the W3C Director take action to urge the United States Patent and Trademark Office to re-examine the Eolas patent. In a letter to the Director of the patent office, Tim Berners-Lee wrote:

> "The impact of the [Eolas] '906 patent reaches far beyond a single vendor and even beyond those who could be alleged to infringe the patent. The existence of the patent and associated licensing demands compels many developers of Web browsers, Web

pages, and many other important components of the Web to deviate from the fundamental technical standards that enable the Web to function as a coherent system. In many cases, those who will be forced to incur the cost of modifying Web pages or software applications **do not even themselves infringe the patent** (assuming it is even valid). Given the interdependence of Web technology, those who wrote Web pages or developed software in reliance on Web standards will now have to retrofit their systems in order to accommodate deviations from standards forced by the '906 patent. These deviations will either reflect individual decisions by developers about how to avoid infringement liability, or will be an effort to be compatible with decisions individual vendors make in the course of their own re-design. What's more, the inevitable fragmentation and re-tooling costs caused by the ability to enforce this patent, which we believe to be invalid, cannot even be remedied by individual parties choosing simply to pay licensing fees to the patent holder. If some parties are granted a license, while others either don't or can't obtain one, we will still be left with impared functionality of the Web. Global standards have been the basis of assuring interoperability on the Web. A patent whose validity is demonstrably in doubt ought not be allowed to undo the years of work that have gone into building the Web."

[..]

The Web functions **only** on the strength of its common standards. The costs of widely divergent implementation of standards is borne by all who rely on the Web. The enormous expense and the more general threat the '906 patent poses to the Web community is completely unwarranted because the '906 patent is, we firmly believe, invalid in view of the prior art described in our filing to the Patent Office under the authority of 35 U.S.C. Section 301.

[..]

Changes forced by the '906 patent will also have a **permanent impact on millions of Web pages that may have historical importance** but are no longer actively maintained by their creators. In many cases these pages contain non-commercial content or older material that is not generating revenue, hence there is no way to cover the cost of modifying those pages to bring them into compliance with whatever changes are made in response to the '906 patent. The Web community has traditionally recognized the problem of historically-important but dormant pages and has therefore sought to ensure 'backward compatibility' when developing new technical standards and new software. However, in this case, the behavior of those historically important pages will be significantly impaired because the changes were forced by the '906 patent, without consideration of backward compatibility.

The barriers imposed on the information technology industry by the '906 patent are of such concern because they cause fragmentation in the basic standards that weave the Web together. Denial of access to any particular technology is a problem that engineers can successfully address, provided they have knowledge of the barrier **before** it becomes part of a standard. However, as the '906 patent threatens widely deployed, standard technology, the damage is magnified. If the '906 patent remains in force, Web page designers and software developers will face a dangerous dilemma. They may comply with globally-recognized Web standards resulting in an inadequate user experience of their content. Or, they may attempt to design to the various work-arounds chosen by different browser developers and face the uncertainly of not knowing who will be able to use their content or applications properly. W3C's development and the industry's acceptance of a single common base of standards for Web infrastructure arose out of a need to avoid just this sort of dilemma. The '906 patent is a substantial setback for global interoperability and the success of the open Web.

Soon after receiving this letter, the USPTO launched a re-examination of the Eolas patent and has, in the first two stages of the re-examination process, declared that the patent is entirely invalid. While the matter is still in process at the time of this writing, the web community has felt satisfied enough

with the outcome to date that Web designers continue to use Web standards and Microsoft has not made any interoperabilty-impeding changes to it's browser, as originally demanded by Eolas.

V. Conclusion

Nearly four years under development, the W3C Patent Policy has still only been used for about one year at the time of this writing. There is much to learn about how the royalty-free licensing model will function on the web standards environment. What is clear is that the vast majority of the technical community that innovates, develops, maintains and uses the Web believes that it is essential to make this policy work. The community has learned, through ten years of actually buidling the Web and debate over the policy, that continued innovation and advances in Web technology depend on the success of the policy.

Please note that the views expressed in this paper are solely those of the author and do not reflect the opinion of the W3C Membership, any individual W3C Members or other W3C staff. The author thanks Ian Jacobs and Alan Kotok, both of W3C, for the extensive contributions in both explaining and implementing the W3C Patent Policy.

Short Biograph:

Daniel Weitzner heads the World Wide Web Consortium's Technology and Society activities. He is responsible for development of technology that enables the Web to address legal and public policy requirements, including the Platform for Privacy Preference (P3P) and XML Security technologies. As a leading figure in the Internet policy community, he was the first to advocate user control technologies such as content filtering to protect children and avoid government censorship. These arguments played a critical role in the landmark Internet First Amendment case, Reno v. ACLU (1997). In 1994, he won legal protections for email and web logs in the Electronic Communications Privacy Act.

As Principal Research Scientist at MIT's Computer Science and Artificial Intelligence Laboratory, Weitzner teaches course on Internet policy and technology design, and is a founding member of MIT's Center for Information Security and Privacy. Weitzner was a member of the National Academy of Sciences committee on Authentication Technologies and Their Privacy Implications.

Previously, Mr. Weitzner was co-founder and Deputy Director of the Center for Democracy and Technology, and Deputy Policy Director of the Electronic Frontier Foundation.

Weitzner has law degree from Buffalo Law School, and a B.A. in Philosophy from Swarthmore College. His writings have appeared in the Yale Law Review, Global Networks, MIT Press, Computerworld, Wired Magazine, Social Research, Electronic Networking: Research, Applications & Policy, and The Whole Earth Review.

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