Moving Towards Open Standards

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Abstract

Standards are designed to promote the interoperability of products and systems by enabling different parties to develop technologies that can be used together. There is an increasing expectation in many technical communities, including open source communities, that standards will be 'open'. However, standards are subject to legal rights which impact upon, not only their development, but also their implementation. Of central importance are intellectual property rights: technical standards may incorporate patented technologies, while the specification documents of standards are protected by copyright. This article provides an overview of the processes by which standards are developed and considers the concept of 'interoperability', the meaning of the term 'open standard' and how open standards contribute to interoperability. It explains how intellectual property rights operate in relation to standards and how they can be managed to create standards that are open, not only during their development, but also in implementation.

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1. Introduction

Standards are designed to ensure consistency across devices, platforms and systems. They promote the interoperability of products and systems by enabling different parties to develop technologies that will be able to be used together. There is an increasing expectation in many technical communities (such as open source software developers and users) that standards will be 'open'. However, standards are subject to legal rights which impact upon, not only their development, but also their implementation. Of central importance are intellectual property rights: technical standards may incorporate patented technologies, while the specification documents of standards are protected by copyright. In moving towards greater use of open standards, IP rights will have to be managed both during the development of standards and in their implementation if expectations of openness are to be met.

This article provides an overview of the processes by which standards are developed and considers the concept of 'interoperability', the meaning of the term 'open standard' and how open standards contribute to interoperability. It explains how intellectual property rights operate in relation to standards and how they can be managed to create standards that are open, not only during their development, but also in implementation. In particular, the article considers how copyright-protected standard specification documents and patented technologies included in standards can be managed to ensure that standards are open.

2. Development of Standards in Australia

An extremely wide range of things can be subject to standards, from the colour of traffic lights and the shape of electrical plugs to digital file formats such as mp3 and PDF. The definition provided by Standards Australia, the nation's peak standards development body, focuses on the documented specification, explaining that it is 'a published document which sets out specifications and procedures designed to ensure that a material, product method or service is fit for its purpose and consistently performs in the way it was intended.'[1]

Standards may be categorised as de facto, de jure and proprietary depending on how the standard is developed:

- De facto (or informal) standards are standards that have acquired recognition, as such, by the relevant industry through widespread use, even though they have not been officially endorsed by a Standard Setting Organisation (SSO). In essence, de facto standards attain market approval even though they have not been officially defined, researched and prescribed by an SSO. De facto standards are common in the information technology (IT) sector.[2]

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[1] Standards Australia, 'Submission to the Review of the National Innovation System' (2008) available at http://www.innovation.gov.au/innovationreview/Documents/427-Standards_Australia.pdf (accessed 23 Jul 09).

[2] Brian Kahin explains: 'IT standards are so critical, so time sensitive, so market–oriented and strategic that they do not fit well within the traditional institutional model [and] many IT standards are developed outside the formal international standards system…': B. Kahin, 'Common and Uncommon

- De jure standards are developed by an SSO. These standards must be ratified by recognised international SSOs such as the International Organization for Standardization (ISO) or the International Electrotechnical Commission (IEC). De jure standards are developed through a detailed process which emphasises consensus and vendor-neutrality.

- Proprietary standards are distinguished through ownership. As the term suggests, these standards are the property of a party (an individual or an organisation) that can exercise its rights to restrict access to and use of the standard. A standard can be both a de jure standard and a proprietary standard.

The peak body for the development, approval and management of standards is Standards Australia Ltd ('Standards Australia') – an independent company limited by guarantee.[3] It has no direct association with the Federal or State governments, although its membership includes government bodies.[4] The organisation is managed by a Chief Executive and governed by a Board of Directors elected by the Standards Australia Council.[5] The Council comprises representatives of the members of the company who are nominees of the State and Federal governments, industry, professional and community organisations.[6]

Under a Memorandum of Understanding, entered into with the Federal Government in 1988, Standards Australia is responsible for providing national leadership in establishing documentary Australian standards.[7] In 2003, Standards Australia sold its commercial operations to its wholly owned subsidiary, SAI Global Ltd, which it licensed to publish, distribute and market its products.[8] Standards Australia's

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Knowledge: Reducing Conflict between Standards and Patents' (Revised September, 2007) available at http://www.ccianet.org/docs/papers/Kahin%20on%20Standards&Patents.pdf (accessed 23 July 09).

[3] See 'Memorandum of Understanding Between the Commonwealth of Australia and Standards Australia International Limited' (2003) Article 4.1, available at www.pc.gov.au/__data/assets/pdf_file/0016/13516/sai1.pdf (accessed 23 Jul 09). See also Standards Australia, 'Governance and Constitution' available at http://www.standards.org.au/cat.asp?catid=25 (accessed 23 Jul 09).

[4] Standards Australia, 'Standardization Guide – SG-001: Preparing Standards' (revised 1 October 2008), at 2 available at http://www.standards.org.au/cat.asp?catid=8 (accessed 23 Jul 09); Standards Australia, 'Standardization Guide – SG-005: Technical Governance of Standards Development' (revised 12 March 2008), at 1-4 available at http://www.standards.org.au/cat.asp?catid=8 (accessed 23 Jul 09).

[5] *Ibid.*

[6] *Ibid.*

[7] Standards Australia, 'Governance and Constitution' available at http://www.standards.org.au/cat.asp?catid=25 (accessed 23 Jul 09).

[8] In that same year, SAI Global Ltd was floated on the Australian Stock Exchange. Standards Australia, 'Standardization Guide – SG-001: Preparing Standards' (revised 1 October 2008), at 2, available at http://www.standards.org.au/cat.asp?catid=8 (accessed 23 Jul 09); Standards Australia, 'Standardization Guide – SG-005: Technical Governance of Standards Development' (revised 12 March 2008), at 1-4, available at http://www.standards.org.au/cat.asp?catid=8 (accessed 23 Jul 09).

collection of more than 7,000 Australian Standards and associated publications are available in a variety of formats through SAI Global.[9]

3. Standards and Interoperability

Interoperability refers to the ability of diverse systems and organisations to work together or interoperate.[10]   The benefits of interoperability were considered in a 2007 report by Urs Gasser and John Palfrey of Harvard University's Berkman Center, *Breaking Down Digital Barriers: When and How ICT Interoperability Drives Innovation* ('the Berkman Study').[11] Interoperability leads to innovations that enable technological systems to work together more easily, creating more jobs and higher rates of productivity in many countries around the world.[12]   It also provides consumers with more choice about what to buy or use and competitors with a more level playing field to develop innovations based on existing technologies.[13]

Standards seek to ensure that:

- systems can be harmonised within and between organisations and across borders;

- different parties or entities can produce technologies that work together in order to foster mass adoption of those technologies by the community and to promote competition;

- new players can more easily enter existing markets and manufacture new technologies or products that work with existing technologies and products; and

- consumers and users can be instantly familiar and comfortable with new systems, products and emerging technologies

Since standards are developed to promote the production of technologies that work together, there is a direct relationship between standards and interoperability. The importance of standards to interoperability, in the context of geospatial information systems, was highlighted in Booz Allen Hamilton's 2005 report for the US National Aeronautics and Space Administration (NASA) Geospatial Interoperability Office:

> *Geospatial Interoperability is the ability for two different software systems to interact with geospatial information. Interoperability between heterogeneous computer systems is essential to providing geospatial data, maps, cartographic and decision support services, and analytical functions. Geospatial interoperability is dependent*

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[9] See SAI Global, 'SAI Global Infostore' available at http://infostore.saiglobal.com/store (accessed 23 Jul 09).

[10] Wikipedia Editors, 'Interoperability' (last edited 22 Jul 09) available at http://en.wikipedia.org/wiki/Interoperability (accessed 23 Jul 09).

[11] U Gasser and J Palfrey, *Breaking Down Digital Barriers: When and How ICT Interoperability Drives Innovation* (Boston: Berkman Center for Internet and Society at Harvard University, 2007) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1033226 (accessed 6 May 09).

[12] *Ibid.*

[13] *Ibid.*

on voluntary, consensus-based standards, as set forth in OMB Circular A-119.[14] These geospatial standards are essential to advancing data access and collaborations in e-Government, natural hazards, weather and climate, exploration, and global earth observation.[15]

4. Open Standards

Demand is growing among the users and implementers of standards for standards to be more 'open' and SSOs are responding with statements of their commitment to 'open standards'.[16]   The open source community have been especially strong advocates for open standards, arguing that open standards together with open source software ensure multiple, portable, interoperable implementations with fair access to all.[17]   According to the Open Source Initiative (OSI), the only software-related standards which enable customers to invest in technology without having to pay monopoly rent or risk litigation are those that permit and encourage open source implementations.[18]

However, the term 'open standard' invariably has different meanings for different stakeholders.[19]   For some, the quality of openness is found in the transparency and openness of the procedures followed to develop the standard. As an example, the American National Standards Institute (ANSI) explains an open standards development process as one whose features include consensus by a group; broad-

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[14] United States Office of Management and Budget (OMB), 'Circular No. A-119 Revised, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities' (1998) available at http://www.whitehouse.gov/omb/circulars/a119/a119.html (accessed 8 May 09).

[15] Booz Allen Hamilton, *Geospatial Interoperability Return on Investment Study* (United States of America: Report for the National Aeronautics and Space Administration Geospatial Interoperability Office, 2005), at iii available at www.egy.org/files/ROI_Study.pdf (accessed 8 May 09).

[16] For example, in a February 2009 policy statement, the UK Government Cabinet Office stated that, '[t]he Government will support the development of open standards and specifications': Cabinet Office, 'Open Source, Open Standards and Re-Use: Government Action Plan' (2009) available at http://www.cabinetoffice.gov.uk/government_it/open_source/policy.aspx (accessed 2 April 09).

[17] S Bolin, *Open Source, Open Standards: Maximizing Utility While Managing Exposure* (Report of a conference held at Scottsdale, Arizona, 12-14 September 2004), at 14, available at http://www.thebolingroup.com/OSOSAnalysis.pdf (accessed 23 Jul 09). See also Ken Krechmer's explanation of the relationship between open source software, open standards and open architecture at: K Krechmer, 'Open Standards Requirements' (2005), at 3, available at http://www.csrstds.com/openstds.pdf (accessed 23 Jul 09).

[18] Open Source Initiative, 'Open Standards Requirements for Software – Rationale' (2006) available at http://www.opensource.org/osr-rationale (accessed 20 April 09).

[19] B Perens, 'Open Standards: Principle and Practice' available at http://perens.com/OpenStandards/Definition.html (accessed 23 Jul 09); D Wheeler, 'Is an Open Document an Open Standard? Yes!' (2006) *Groklaw*, available at http://www.groklaw.net/article.php?story=20060209093903413 and http://www.dwheeler.com/essays/opendocument-open.html (accessed 23 Jul 09); K Krechmer, 'Open Standards Requirements' (2006) 4(1) *The International Journal of IT Standards and Standardization Research*, available at http://www.csrstds.com/openstds.pdf and http://www.csrstds.com/openstds.html (accessed 23 Jul 09).

based public review and comment on draft standards; incorporation of approved changes into a draft standard; and availability of appeal by participants.[20]

For others, the focus on the standards development process, to the exclusion of any consideration about whether the standard can be implemented by users, is regarded as too limited a basis on which to regard a standard as open. From this perspective, the question of whether or not a standard is open centres on the basis on which patented technologies included in patents are available for use by those who implement the standard in their own products. According to Lawrence Rosen, 'while process is obviously important … process alone does not necessarily an open standard make.'[21] He considers that semi-public processes alone do not guarantee that users can implement standards without having to pay onerous patent royalties or experience undue burdens.[22] Rosen leans towards the view that 'open standards' are standards which are available for anyone to implement. Similarly, Wheeler argues that the central feature of open standards is that they allow any user to implement the standard by having unobstructed access to select and switch between many implementations.[23]

When used in the wider sense, an 'open standard' is one which is open at both the development stage and the implementation and use stage. That is, not only has it been developed through an open process, but users also have access to the technology embodied in the standard.[24] Some commentators who adopt this view of open standards have proposed lists of criteria that must be satisfied before a standard can be considered open. For example, Krechmer sets out ten features that must be present in open standards, including open meeting and due process, open intellectual property rights, open interface and open access.[25] As to whether fewer requirements would suffice, Krechmer considers that the question must be answered by each individual

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[20] American National Standards Institute (ANSI), 'Critical Issues Paper on Open Standards' (2005) available at
http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/Critical%20Issues%20Papers/Open-Stds.pdf (accessed 23 Jul 09) as reproduced in ANSI's comments to the European Commission's one-day workshop on intellectual property rights and ICT standards on 19 November 2008 in Brussels, available at
http://ec.europa.eu/enterprise/ict/policy/standards/ws08ipr/contributions/20081106ANSI_en.pdf (accessed 23 Jul 09).

[21] L Rosen, 'Defining Open Standards' (2005), at 2, available at
http://www.rosenlaw.com/DefiningOpenStandards.pdf (accessed 23 Jul 09).

[22] *Ibid.*

[23] D Wheeler, 'Is an Open Document an Open Standard? Yes!' (2006) *Groklaw*, available at
http://www.groklaw.net/article.php?story=20060209093903413 and
http://www.dwheeler.com/essays/opendocument-open.html (accessed 23 Jul 09).

[24] See 'Executive Interviews: Bruce Sewell on the Role of Intellectual Property in Standards', available at http://www.intel.com/standards/execqa/qa0405.htm (accessed 23 Jul 09).

[25] K Krechmer, 'Open Standards Requirements' (2006) 4(1) *The International Journal of IT Standards and Standardization Research*, at 9, 14-28, available at http://www.csrstds.com/openstds.pdf and
http://www.csrstds.com/openstds.html (accessed 23 Jul 09). For a similar analysis, see Bruce Perens's six principles which form the basis of open standards: B Perens, 'The Open Source Definition' in C. DiBona, S. Ockman, & M. Stone (eds.), *Open Source Voices from the Open Source Revolution* (Sebastopol: O'Reilly & Associates, 1999), at 171–189; B Perens, 'Open Standards: Principle and Practice' available at http://perens.com/OpenStandards/Definition.html (accessed 23 Jul 09).

stakeholder, based on an understanding of what they could be giving up if the concept of 'open standard' were defined more narrowly.[26]

The Open Source Initiative (OSI) has produced a list of criteria – the Open Standards Requirement for Software (OSR) – which sets out openness requirements for standards applying to open source software. The OSR criteria require that, for compatibility with open source software, a standard must not withhold any detail necessary for interoperable implementation; it must be freely and publicly available under royalty-free terms at reasonable and non-discriminatory cost; all patents essential to implementation of the standard must be licensed under royalty free terms for unrestricted use or be covered by a promise of non-assertion when practiced by open source software; and implementation of the standard must not require any other technology that fails to meet the OSR criteria.[27]

It is evident that there is currently no universally accepted definition or criteria for what constitutes an open standard. While an open and transparent development process is important, openness should go beyond procedural issues and extend to encompass considerations as to how standards can be adopted or used. In an open standard, the existence of copyright and patent interests should be made clear from the outset, as should the terms upon which these interests are licensed. Importantly, each SSO should clearly explain what they mean by 'open standard' and expressly state just what users can and cannot do with standards and standard specifications that are licensed to them.

5. The Tension Between Intellectual Property (IP) Law and Standards

Like law, standards have a norm creating function – they can establish requirements that, though not expressed in formal legal instruments, are in practice mandatory and must be implemented by participants in certain fields of technical or business activity. However, property rights conferred by law (notably the rights granted for intellectual property) may frustrate the development and implementation of standards.

There is a significant interaction between standards and IP law. Standards (and directions as to how they should be implemented) are often expressed in specification documents, which can be subject to copyright protection under law. Furthermore, technical standards can encompass technology that is the subject of patent protection.

There is an apparent tension between intellectual property rights (IPRs) and standards – standards foster harmonisation and compatibility through shared and common systems, whereas IPRs stimulate the development of the new and different by creating exclusivity in the market.[28] Observing this tension can lead to arguments that IPRs

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[26] K Krechmer, 'Open Standards Requirements' (2006) 4(1) *The International Journal of IT Standards and Standardization Research*, at 31, available at http://www.csrstds.com/openstds.pdf and http://www.csrstds.com/openstds.html (accessed 23 Jul 09).

[27] Open Source Initiative, 'Open Standards Requirement for Software' (2006), available at http://www.opensource.org/osr (accessed 23 Jul 09).

[28] P Drahos and I Maher, 'Innovation, Competition, Standards and Intellectual Property: Policy Perspectives from Economics and Law', (2004) 16 *Information Economics and Policy,* 1-11, available at http://www.anu.edu.au/fellows/pdrahos/articles/pdfs/2004innovationcompetitionIP.pdf (accessed 23 Jul 09).

and standards are inherently in conflict.[29] For example, the European Committee for Standardization (CEN) has produced a document entitled, *CEN/CENELEC Guide 8: Standardization and Intellectual Property Rights (IPR)*, which states:

> *The underlying philosophies of standardization and IPR-protection are opposites. Standardization is intended to put ideas into the public domain, whereas protection of IPR makes them private property. Therefore, any use of IPR by a standard is an anomaly, sometimes an unavoidable one, which needs careful management.[30]*

However, CEN's view that 'underlying philosophies of standardization and IPR-protection are opposites' is not universally accepted. Dissenters argue that it is unusual for one actor to own all the technologies encompassed within a technological system, and that in these cases of decentred ownership, IPRs may actually help to bring about the creation of a standard because they allow parties to engage in 'Pareto-improving trades'.[31] In considering the relationship between ICT interoperability and IPR, in the Berkman Study[32] Gasser and Palfrey viewed liberal IP licensing practices as a cost-efficient way of promoting higher degrees of interoperability, especially where 'transaction costs are minimized by way of sophisticated and "streamlined" licensing procedures.'[33]

6. Copyright and Standard Specifications

Copyright has assumed importance in relation to standards because, as Professor Pamela Samuelson has observed, SSOs 'increasingly claim copyright in standards and charge substantial fees for access to and rights to use standards such as International Organisation for Standardisation (ISO) country, currency and language codes.'[34]

Standards are developed by SSOs through the participation and collaboration of members who contribute effort and input – often in the form of textual or diagrammatic materials – to the process. A SSO will often require a member who has contributed to the development of a standard to assign to the SSO any copyright that the member may own in the ensuing standard. On one hand, there is a purely

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[29] *Ibid.*

[30] CEN/CENELEC, 'Guide 8: Standardization and Intellectual Property Rights (IPR)' (2001), at 1, available at http://www.cen.eu/boss/supporting/guidance+documents/gd029+-+normative+references/cclcgd008.pdf (accessed 23 Jul 09).

[31] G Lea and P Hall, 'Standards and Intellectual Property Rights: an Economic and Legal Perspective" (2004) 16 *Information Economics and Policy,* 67-89, available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V8J-49Y3HXX-1&_user=62921&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000005418&_version=1&_urlVersion=0&_userid=62921&md5=4dd776166ae374a3cfe380377ace5af5 (accessed 23 Jul 09).

[32] U Gasser and J Palfrey, *Breaking Down Digital Barriers: When and How ICT Interoperability Drives Innovation* (Boston: Berkman Center for Internet and Society at Harvard University, 2007) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1033226 (accessed 6 May 09).

[33] *Ibid*, 23.

[34] P Samuelson, 'Questioning Copyright in Standards' (2006) *Berkeley Center for Law and Technology. Law and Technology Scholarship (Selected by the Berkeley Center for Law & Technology)*, Paper 22 at 1, available at http://repositories.cdlib.org/bclt/lts/22 (accessed 23 Jul 09).

practical reason for this requirement. It ensures that copyright ownership is vested in one party, rather than spread it amongst multiple parties who would have to agree every time the copyright material is used or licensed. This enables the SSO to more freely license the standard for common usage within the community. On the other hand, this means that SSOs have ultimate control over what may be done with standards and how standards may be disseminated. Where SSOs charge licensing fees for the right to reproduce or communicate the standard, copyright interests may conflict with the fundamental objective that standards are made available for easy adoption by, and implementation in, the wider community.

Professor Samuelson questions whether standards such as ISO country, currency and language codes and medical and dental procedure codes – promulgated by the American Medical Association and the American Dental Association – should be eligible for copyright protection at all, particularly where their use is mandated by government rules.[35] She observes that public policy concerns are raised by private ownership of standards, particularly where the use of those standards is mandated by law.[36]

Professor Samuelson also considers whether the principal argument by SSOs in favour of copyright protection for industry standards – that SSOs need copyright incentives to develop and maintain them - can be sustained.[37] She questions this claim, advancing several arguments against it:

(1) SSOs generally have ample incentives to develop standards for use by professionals in their field, even without copyright;

(2) SSOs, generally, do not actually develop the standards in which they claim copyright – instead they typically rely on volunteer service by experts in the field;

(3) SSOs generally use the revenues they derive from selling or licensing the standards to subsidise other activities of their organisations, rather than to recoup investments in making the standard;

(4) the internet now makes it very cheap and easy to disseminate standards;

(5) once a standard has achieved success through widespread adoption, this very success enables the SSO to charge monopoly rents for use of or access to the standard; and

(6) copyrighting standards may create perverse incentives for SSOs to invest in persuading governments to mandate use of their standards.[38]

The arguments set out by Professor Samuelson have considerable force and apply equally to standards used in the Australian context. Here, the potential for ownership of intellectual property rights (in the form of copyright) does not provide the incentive

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[35] *Ibid.*

[36] *Ibid*, 19.

[37] *Ibid*, 21.

[38] *Ibid*. See also P Samuelson, 'Copyrighting Standards: Should Standards be Eligible for Copyright Protection?' (2006) 49(6) *Communications of the ACM*, available at http://portal.acm.org/citation.cfm?id=1132491&coll=GUIDE&dl=GUIDE&CFID=40789861&CFTOKEN=38521596&ret=1#Fulltext (accessed 12 May 09).

for the development of a standard. Rather, the incentive for SSOs to develop standards is to meet a need and a demand in the community.

David Friedman, on the other hand, has advanced some arguments in support of the appropriateness of asserting copyright in standards documents:

> *Even where inventing a standard is not costly, making it a standard may be. The Lotus menu tree, or some almost equally good alternative, could perhaps have been designed in a few weeks by an intelligent user familiar with both Visicalc and the capabilities of the new IBM PC. But converting the menu tree from a description on a piece of paper to a standard in worldwide use required massive expenditures to produce and market a product using that standard. Where such expenditures are necessary to make something a standard, and where the existence of standards is valuable, the reward provided by the legal ownership of the standard may provide an important incentive to produce it…Opponents of protection for standards have sometimes argued that such protection would force competing firms to adopt inconsistent standards. But a central element of a market system is trade for mutual advantage. If a particular standard is much more valuable if widely used, then the owner of the standard has an incentive to license it widely.[39]*

However, the licence fees charged by SSOs can be substantial and allowances are not always made for participants who contributed material to the specification (for which they are now required to pay) or for users who lack the economic means to pay the licence fee. For example, potential users may be required to pay to access a standard specification, if only to read the specification and determine whether the standard is in fact appropriate for their business or product. If the standard is not relevant, then the specification may never be used by that person again. A user may have to pay multiple times to access several different specifications before they find the one that suits their needs. This process could be economically inhibitive to small business owners in particular.

A related concern is where the participant is a government body contributing material that has been acquired or generated through the use of public funds. For publicly-funded material contributed by governmental bodies, both the government and the public could legitimately expect to be able to access and use that material for free. In this sense, the situation is not unlike that considered by the open access movement in relation to publicly funded research.

Where SSOs grant rights to re-use standard specifications, these rights are often restrictive and fail to allow, for example, any modifications to the specification. The copyright policies of SSOs typically do not explain with sufficient specificity what uses would or would not be permitted under the licence.

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[39] D Friedman, 'Standards as Intellectual Property: An Economic Approach' (1994) 19 *University of Dayton Law Review*, 1109, available at
http://www.daviddfriedman.com/Academic/Standards/Standards.html (accessed 23 Jul 09).

A key source of conflict is whether standards can be adapted or modified by implementers or other standards organisations (a process known as 'profiling'). Implementers commonly add to, delete from, or otherwise modify a standard, particularly when creating 'application profiles' relevant to an individual, group or region. In implementing a standard, it may be necessary to tailor it to meet the specific needs of an industry or organisation, by creating, for example, a manual explaining how the standard is to be implemented, or annotating the standard so that it is more readily understood by those who will use it in practice. In some cases, SSOs purport to assert ownership over any modified versions of the specification developed by users of the standard in tailoring it to their individual circumstances.

Problems arise because some SSOs forbid, as part of their licensing conditions, users from making annotated versions of standards or derivative works. The reason advanced for such conditions is that the SSOs are concerned that the standard would become fragmented or distorted from its original purpose if users were permitted to make annotations or derivatives. Professor Mark Lemley explains that this 'forking' of standards into incompatible versions may defeat the purpose of standardisation.[40]

IMS Global Learning Consortium (IMS-GLC) is an SSO which not only permits profiling of its standards, but which has developed processes to assist profilers and to certify profiles as IMS approved. The IMS Application Profile Guidelines, issued on 10 October 2005, defines Application Profiling as 'the tailoring of a specification (by amending the binding of the specification) to suit the needs for its application to a particular community.'[41] The Guidelines set out the benefits of a consistent approach to application profiling, and explains when application profiles will or will not be appropriate.[42] IMS has also established the IMS Profile Registry, where candidate profiles can be submitted and shared with the community under a royalty-free licence to encourage broader adoption and usage.[43] Profiles that gain widespread adoption may be selected to become accredited profiles, in which case compliance tests are conducted and a compliance mark is attached to the profile to aid implementers.[44]

Notwithstanding the relative openness of IMS's approach to profiling, a recent dispute erupted between IMS and the Industry Standards and Technology Organization (IEEE-ISTO)[45] / Learning-Education-Training Systems Interoperability (LETSI)[46] over a collection of standards known as SCORM. SCORM is an acronym for Shareable Content Object Reference Model and is defined by Wikipedia as 'a

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[40] M Lemley, 'Intellectual Property Rights and Standard-Setting Organizations' (2002) *Boalt Working Papers in Public Law,* Paper 24, at 125, available at http://repositories.cdlib.org/boaltwp/24 (accessed 23 Jul 09).

[41] IMS Global Learning Consortium Inc, 'IMS Application Profile Guidelines Overview: Part 1 – Management Overview (Version 1.0)' (2005), at 6 available at http://www.imsglobal.org/ap/apv1p0/imsap_oviewv1p0.html (accessed 23 Jul 09).

[42] *Ibid*, at 8-10.

[43] IMS Global Learning Consortium, 'IMS GLC Profiles and Compliance Program' (2009) available at http://www.imsglobal.org/conformance/pcbackground.html (accessed 1 June 09).

[44] *Ibid.*

[45] IEEE-ISTO, 'Homepage' available at http://www.ieee-isto.org/index.html (accessed 23 Jul 09).

[46] Learning Education Training Systems Interoperability (LETSI), 'Homepage' available at https://letsi.org/ (accessed 23 Jul 09).

collection of standards and specifications for web-based e-learning.'[47] The SCORM standard uses XML and is based on the results of work done by AICC, IMS Global, IEEE and Ariadne.[48] In a letter dated 25 April 2008, lawyers for IMS wrote to IEEE-ISTO arguing that the status of licensing of IMS standards for SCORM derived from an agreement between IMS and the Advanced Distributive Learning (ADL) initiative that granted ADL certain rights in return for it meeting specific conditions in working with IMS members to achieve consensus on the profiles used by SCORM.[49] IMS alleged that ADL failed to meet the conditions of the agreement, putting the status of the licences in question.[50] To our knowledge, this dispute has not yet been resolved.

6.1 Creative Commons Licences in Standards – A Potential Response

The application of open content licences, such as Creative Commons licences,[51] may be useful for contributions provided to SSOs by participants[52] and/or completed standard specifications. It is important to note that open content licences can be applied to documented standard specifications (whether in text, illustrations, tables or diagrams) but will not apply to functional elements embodied in the standard.

Open content licences are a potential mechanism for ensuring that open standards remain open from a copyright perspective. For example, imposing a 'share alike' condition through a Creative Commons licence would have the practical affect that the material covered by the licence must be used and shared on the same terms as set out in the original licence. The advantages of open content licences are that they allow broad reuse rights for users while still enabling the copyright owner to retain control over their material, and that they are clear and easy to understand and use. Creative Commons licences have already been successfully applied to standard specifications in practice. For example, the IEEE licensed its XSD Schema under a Creative Commons Attribution – Share Alike licence.[53] Microsoft has also released some of its standard specifications under Creative Commons licences. Notably, in

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[47] Wikipedia Editors, 'SCORM' (last edited 8 May 2009) available at
http://en.wikipedia.org/wiki/SCORM (accessed 1 June 09).

[48] *Ibid*.

[49] J. Laferrera, Gesmer Updegrove Attorneys at Law, Boston, for IMS Global Learning Consortium, 'Letter to Mr. Thomas C. Wettach, Cohen & Grigsby P.C. for IEEE ISTO' (25 April 2008) available at www.wiki.letsi.org/download/attachments/4751846/20080429101140871.pdf (accessed 1 June 09).

[50] *Ibid*.

[51] For more information, see Creative Commons, 'Homepage' available at
http://www.creativecommons.org and Creative Commons Australia, 'Homepage' available at
http://www.creativecommons.org.au (accessed 23 Jul 09).

[52] However, for any participant intending to apply an open content licence to their contributions, it may be necessary to first check any contractual terms governing participation in the standards development process, which may preclude such actions.

[53] See 'Index of/reading/ieee/downloads/LOM/lom1.0', available at
http://standards.ieee.org/reading/ieee/downloads/LOM/lomv1.0/ (accessed 2 April 09).

June 2005, it released its RSS 'Longhorn' Simple List Extensions under a Creative Commons Attribution – Share Alike Licence.[54]

7. Patent Law and Technical Standards

During the process of developing a technical standard, patented technology may be inadvertently (by mistake) or knowingly (of necessity) incorporated into the standard. As a consequence, the patent owner is entitled to charge licences fees (or royalties) whenever those who implement the standard use the patented technology. The requirement to pay royalties (or fear of infringement proceedings for failure to pay) may act as a disincentive to the broader adoption of standards. Failure or reluctance on the part of users and product manufacturers to adopt standards can impede the interoperability of new technologies, leading to market fragmentation, slow market growth and communication breakdown between devices and (subsequently) persons.[55]

An illustration of the kind of problem that can arise from the inclusion of patented technologies in standards is found in the Commonwealth Science and Industrial Research Organisation's (CSIRO) experience with its patented wireless local area networking (WLAN or 'wifi') technology. Wifi technology enables multiple networks and devices to share frequencies but not interfere with each other.[56] In 1996, CSIRO was granted a patent by the US Patent Office for wifi technology invented by its scientists working in the field of radio astronomy (US patent no. 5,487,069, entitled 'Wireless LAN'). This technology was included in the IEEE's draft 802.11n standard for wifi equipment. However, in the five years since it was first proposed in 2004, this standard has remained in draft form, largely due to CSIRO's inability to offer licensing arrangements that users considered satisfactory. Many large technology companies have since utilised this wifi technology, including Dell, Hewlett Packard, Netgear, Intel and Microsoft, and CSIRO has brought patent infringement suits. In 2006, CSIRO was successful in its suit against Buffalo Technology and in April 2009 it was announced that CSIRO had successfully settled its dispute with Hewlett-Packard and another 13 companies (including Intel, Dell, Toshiba, Netgear, Nintendo and Microsoft).[57] It has been reported that uncertainty over CSIRO's patents

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[54] Microsoft Press Pass, 'Microsoft to Deliver RSS Support to End Users and Developers in Windows "Longhorn"' (2005) available at http://www.microsoft.com/presspass/press/2005/jun05/06-24RSSIntegrationPR.mspx (accessed 2 April 09).

[55] See, for example, B Kahin, 'Common and Uncommon Knowledge: Reducing Conflict Between Standards and Patents' available at
http://www.ccianet.org/docs/papers/Kahin%20on%20Standards&Patents.pdf (accessed 23 Jul 09); P Samuelson, 'Are Patents on Interfaces Impeding Interoperability?' (2009, forthcoming) *Minnesota Law Review,* available at http://ssrn.com/abstract=1323838 (accessed 23 Jul 09).

[56] Grose, S (Jan/Feb 2007) 'CSIRO Wins Important Wifi Patent Case' *Australasian Science,* 14-15, http://www.moray.com.au/resources/6-January-February_2007.pdf.

[57] See 'Timothy', 'CSIRO Wins Wi-Fi Settlement From HP' (2009) available at
http://yro.slashdot.org/article.pl?sid=09/04/02/2242204&tid=155 (accessed 23 Jul 09); S Hutcheon, 'Bonanza for CSIRO after landmark patent win' (2009) available at
http://www.brisbanetimes.com.au/news/biztech/bonanza-for-csiro-after-landmark-patent-win/2009/04/22/1240079730838.html (accessed 23 Jul 09); N MacBean, 'Patent proceeds to fund new CSIRO research' (2009) available at http://www.abc.net.au/news/stories/2009/04/22/2549678.htm (accessed 23 Jul 09); 'Soulskill', 'CSIRO Settles With Tech Giants Over Wifi Patent Spat' (2009) available at http://yro.slashdot.org/article.pl?sid=09/04/22/1545238&from=rss (accessed 23 Jul 09).

contributed to the slowness of progress towards finalisation and ratification of the 802.11n wireless standard, which enables wireless devices within a WLAN to be connected at three times the current speeds of wireless devices.[58]

In the standards development process, where it appears that a standard is to include technology that may be covered by a granted patent or a pending patent application, issues arise as to whether the patent owner is required to disclose the existence of the patent or patent application to the SSO and at what stage in the development process such disclosure is required. Often, SSOs will have in place Patent Policies that require participants in the development process to disclose any relevant patent interests. However, these policies are not always clear as to when and how disclosure is to occur. Furthermore, for contractual privity reasons, SSOs cannot impose disclosure obligations on patent owners who are not involved in developing the standard, and SSOs will usually state that they will not undertake patent discovery procedures due to a lack of resources.[59] This may mean that patent interests may go undiscovered before the completion of a standard and adoption of it by users.

This disclosure issue is beginning to reach the courts. In December 2008 the US Court of Appeals for the Federal Circuit handed down its decision in *Qualcomm Inc v Broadcom Corp.* which concerned a patent infringement action after the patent owner had remained silent in the face of a duty to disclose patents to an SSO.[60] The court found that Qualcomm had breached its duty to disclose and ruled that its patent was unenforceable. This decision provides a strong demonstration of why patent owners, as well as standards users, need to understand how the law applies to patents included in standards.

Professor Mark Lemley has discussed the need to ensure that SSOs' patent policies are clearly drafted and brought to the attention of all parties concerned. He states that patent policies have largely been an afterthought for SSOs and put together without much participation from lawyers.[61] He suggests that new groups often copy the policy of whatever SSO they happen to be familiar with or they develop a policy on an ad hoc basis, reacting to issues as they arise rather than as part of a considered effort to develop a well-drafted policy.[62] A key factor contributing to this problem is that 'SSOs have little incentive to compete on the basis of their IP policy to attract

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[58] B Winterford, 'No Backdown from CSIRO over Wi-Fi Patents' (2007) available at http://www.zdnet.com.au/news/communications/soa/No-backdown-from-CSIRO-over-Wi-Fi-patents/0,130061791,339282521,00.htm (accessed 23 Jul 09).

[59] See, for example, B. Kahin, 'Common and Uncommon Knowledge: Reducing Conflict between Standards and Patents' (Revised September 2007) available at http://www.ccianet.org/docs/papers/Kahin%20on%20Standards&Patents.pdf (accessed 23 July 09); B Perens, 'The Problem of Software Patents in Standards' available at http://www.perens.com/works/articles/PatentFarming.html (accessed 23 Jul 09).

[60] *Qualcomm Inc. v. Broadcom Corp.*, 548 F.3d 1004 (Fed. Cir. 2008) (available at http://www.cafc.uscourts.gov/opinions/07-1545.pdf).

[61] M Lemley, 'Intellectual Property Rights and Standard-Setting Organizations' (2002) *Boalt Working Papers in Public Law,* Paper 24, available at http://repositories.cdlib.org/boaltwp/24 (accessed 23 Jul 09).

[62] *Ibid*.

members, and the market will not punish an SSO that selects an objectively inferior IP policy.'[63]

Issues also arise as to the basis on which patented technologies included in a standard are to be made available for use by parties implementing the standard. Some patent owners may agree to allow their patented technology to be used on a royalty-free basis, but this is unusual. Often, SSOs will ask patent owners to license their patent on 'reasonable and non-discriminatory' (RAND) terms. Yet to date, there is no consistent or common understanding of what RAND means in this context.[64] Further, Brian Kahin comments that although SSOs may request participants to license on RAND terms, SSOs often lack the will and capacity to oversee or enforce this requirement.[65] The consequence is that, in practice, it is left to the patent owners to decide what are 'reasonable' licensing terms for any given transaction.

Kahin suggests that, to accommodate standards, it may be necessary to create exceptions to patent holders' rights to enforce their patents:

> *Patents are uniquely powerful against standards. If patent holders are endowed with power to threaten investments on this scale, they should at least be obliged to make their rights known in a timely manner. If not they should lose the ability to sue those who do no more than practice an open standard. It is far more efficient to put patentees who presumably know the field in which they are patenting on notice of a relatively small number of open standards than to put multitudes of implementers and users on notice of multitudes of patents.[66]*

A question arises as to whether standards that incorporate patents licensed on RAND terms which require the payment of a royalty are, in fact, open standards given that they cannot be implemented freely. The strongest definitions of open standard usually require the standard to be made available for use freely and unconditionally. According to the criteria for open standards listed by Perens,[67] open standards must be 'free for all to implement, with no royalty or fee.'[68] In practice, this means that patents embodied in the standard must be licensed royalty-free and on non-

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[63] *Ibid*.

[64] B. Kahin, 'Common and Uncommon Knowledge: Reducing Conflict between Standards and Patents' (Revised September 2007) available at http://www.ccianet.org/docs/papers/Kahin%20on%20Standards&Patents.pdf (accessed 23 July 09).

[65] *Ibid*, 6-7.

[66] *Ibid.*

[67] Wikipedia Editors, 'Bruce Perens' (last edited 30 October 2008) available at http://en.wikipedia.org/wiki/Bruce_Perens (accessed 3 December 2008). These are similar to the criteria set out by Krechmer in K Krechmer, 'Open Standards Requirements' (2006) 4(1) *The International Journal of IT Standards and Standardization Research*, at 9, 14-28, available at http://www.csrstds.com/openstds.pdf and http://www.csrstds.com/openstds.html (accessed 15 August 2008).

[68] B Perens, 'The Open Source Definition' in C. DiBona, S. Ockman, & M. Stone (eds.), *Open Source Voices from the Open Source Revolution* (Sebastopol: O'Reilly & Associates, 1999), at 171–189; B Perens, 'Open Standards: Principle and Practice' available at http://perens.com/OpenStandards/Definition.html (accessed 23 Jul 09).

discriminatory terms.[69]   Similarly, in the *European Interoperability Framework of Pan-European E-Government Services,* the European Commission's Interchange of Data Between Administrations stated that an 'open standard' is one whose intellectual property is 'irrevocably available on a royalty-free basis' with 'no constraints on the re-use of the standards.'[70]

Some standards organisations have also adopted the broad view that open standards must be able to be implemented without payment of royalties. An example is the Digital Standards Organization (dubbed 'Digistan'), which was founded by open standards professionals in 2007 with the goal of promoting customer choice, vendor competition, and overall growth in the global digital economy through the understanding, development, and adoption of free and open digital standards.[71] Digistan's definition of a 'free and open standard' includes the requirement that '[t]he patents possibly present on (parts of) the standard are made irrevocably available on a royalty-free basis.'[72] Another example is the Open Geospatial Consortium, Inc. (OGC), a non-profit, international, voluntary consensus standards organisation that is leading the development of standards for geospatial and location based services.[73] OGC's IP policy requires that any contributor to a standards working group must agree that if the proposed standard to which they are contributing is ultimately approved by OGC, the contributor will provide a licence to all patent claims they own, without compensation and otherwise on a RAND basis to all implementers.[74] The same approach is adopted by the World Wide Web Consortium (W3C), an international organisation whose objective is to develop open (non-proprietary) Web standards.[75] W3C has developed a comprehensive patent policy, the goal of which is to ensure that all W3C standards (called W3C Recommendations) can be implemented on a royalty-free basis.[76] Its licensing objectives are stated as follows:

> *In order to promote the widest adoption of Web standards, W3C seeks to issue Recommendations that can be implemented on a Royalty-Free (RF) basis. Subject to the conditions of this policy, W3C will not approve a Recommendation if it is aware that*

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[69] *Ibid.*

[70] European Commission, 'European Interoperability Framework for pan-European eGovernment Services' (Version 1.0) (2004), at 9, available at http://europa.eu.int/idabc/en/document/3761 (accessed 23 Jul 09).

[71] Digital Standards Organization, 'Homepage' available at http://www.digistan.org/start (accessed 1 May 09).

[72] Digital Standards Organization, 'Definition of a Free and Open Standard', available at http://www.digistan.org/open-standard:definition (accessed 1 May 09).

[73] Open Geospatial Consortium, 'Homepage' available at http://www.opengeospatial.org/ (accessed 6 Jul 09).

[74] Open Geospatial Consortium, 'Intellectual Property Rights Policy of the Open Geospatial Consortium, Inc.' (2008), at Section 3.2.1, available at http://www.opengeospatial.org/about/ipr (accessed 6 Jul 09).

[75] World Wide Web Consortium, 'About the World Wide Web Consortium (W3C)' available at http://www.w3.org/Consortium/ (accessed 30 Apr 09).

[76] World Wide Web Consortium, 'W3C Patent Policy' (2004) available at http://www.w3.org/Consortium/Patent-Policy-20040205/ (accessed 30 Apr 09).

Essential Claims exist which are not available on Royalty-Free terms.[77]

Before standards can be confidently adopted by users, it is necessary that users are aware of any patented technologies included in the standard and the terms on which that technology can be used. Clear policy statements and licences in relation to patent interests are fundamental to achieving widespread adoption and use of standards. Where an open standard is one for which no royalties are payable, it would need to be made clear in the patent policy or licence agreement that the technologies in the patent can be used without payment by persons implementing the standard.

8. Conclusion

Open standards are important to promote the wider adoption of standards and the corresponding development of interoperable and innovative technologies. There is often a degree of openness in the processes followed in the development of standards. However, it is the openness of the legal interests in standards – namely, users' rights to access, use and share of the technology embodied by a standard and its documented specifications – that is of fundamental importance in promoting interoperability and innovation.

In moving towards open standards it is necessary that the legal rights and restrictions that apply to standards and standard specifications are properly managed. In particular, it is crucial that copyright and patent interests are clearly disclosed to all developers and users of standards from an early stage and that the terms upon which these interests are licensed are made clear. Comprehensive copyright and patent policies and clear definitions of terms such as 'open standard' and 'reasonable and non-discriminatory' will facilitate understanding. The promotion of royalty-free RAND licences for patent interests will advance the development of standards that are open in the broadest sense. Finally, open content licensing models (such as Creative Commons licences) can be used to ensure openness of the documented specifications of standards.

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[77] *Ibid*, clause 2.