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Technological Protections in Copyright Law - Is More Legal Protection Needed?

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The digital world poses both promises and threats for copyright owners. Currently, the threats loom more prominent. The challenges of digital technology to copyright owners have manifested recently in the high-profile cases in the United States involving the peer-to-peer file sharing software known as Napster^[2] and the encryption code for motion pictures distributed on DVD known as CSS.^[3] But, digital technology also holds promise for copyright owners; promise of significantly reduced manufacturing and distribution costs. One method of capturing the promise and minimizing the threats employs technology to stem the tide of unauthorized copying. Relying solely on legal prohibitions which must be enforced through court action, is hardly effective given the nature of the Internet and the inability of copyright owners to bring legal process to bear on, literally, millions of individuals spread across the globe.^[4] Movements such as the Secure Digital Music Initiative (SDMI)^[5] and the Content Protection System Architecture (CPSA)^[6] are examples of digital rights management initiatives that, when employed, have the potential to provide significant technological protections against unauthorized access and copying.^[7] The level of control afforded by these digital rights management systems far exceeds the rights currently granted by copyright law.

While copyright owners have used technology to discourage unauthorized copying for decades,^[8] the technological protection measures being developed today, unfortunately, threaten to create a world in which monopolistic stagnation and increased censorship exist. More importantly, technological protections, if left unchecked by the law, will bring the world truly into an "age of access" where learning and knowledge will be accessible only by those with the ability to pay. Without significant overhaul of wealth allocation, this age of access will further widen the gap between the knowledge haves and the knowledge have-nots.

Technological protections employed by copyright owners however, are vulnerable to circumvention. Once circumventing technology exists, it too can rapidly spread throughout the globe on the Internet. This paper argues that while legal protection *for* technological measures employed by copyright owners will encourage more content to be available in digital form and may ameliorate the technological arms race that might otherwise occur between content owners and hackers, legal protection *from* such technological measures to assure certain access and use rights must also be adopted in order to avoid monopolistic stagnation, increased rates of private censorship, and widening the knowledge gap.

I. Technological Protections Technological protections in the digital age take several forms, but, all seek to provide a means for content owners to effectively dictate the permissible access to, and uses of, a work. A technological protection can be as simple as requiring a password before access to a work or a collection of a works is permitted. Without a proper password, those files cannot be viewed, downloaded, or heard. Technological protections can also involve much more complicated

rights management systems which are capable of monitoring and metering all conceivable uses of a work.[9]

Current conceptions of content protection systems rely on encryption to fully integrate the system into all devices.[10] In order to manufacture a device which will display or play a digital file that has been encrypted, the device manufacturer will need to license the decryption technology. The licensed decryption technology requires that the device adhere to all control choices that the content owner chooses to embed in the code.

A. Benefits of technological protection

By minimizing the risks of rampant infringement inherent in the digital world, technological protections enable copyright owners to capture the promise of digital technology. Technological protection in the digital age allows the dissemination of content in a manner that provides a level of control for content owners which counter-balances the ease of unauthorized digital reproduction. Copyright owners believe this level of control is necessary as the only meaningful way to protect their works given the rampant global infringement.[11] Without technological protections, distributing a digital copy of the work could result in unlimited unauthorized reproduction throughout the Internet.[12] Depending on the level of control these technological protections can provide, technology may allow a copyright owner to feel confident that allowing authorized distribution of her work in digital form, will not result in a complete loss of control and correlating loss of revenue.

Instead of succumbing to the whim of the Internet, technological protections allow the copyright owner to determine, prior to initial distribution, the types of uses permissible and the terms of use. These choices then are enforced through the computer code of the technological protection software or can even be "baked-in" to the microchips of devices.[13] In some ways the ability of computer code to govern behavior can be much more effective than mere laws.[14] Computer code defines the possibility in the digital world just like physics define the possibilities in the analog world. The laws of physics dictate that we cannot walk through walls. The computer code can dictate whether a digital file is read-only/copy-never, meaning it cannot be copied or modified; whether a digital file is copy-once, meaning the file can only be copied a single time and subsequent attempts at copying will fail; or any number of possible options.[15]

By controlling the digitization and digital distribution of copyrighted works, technological protections hold much promise for copyright owners. Presumably, a portion of this reduced distribution cost will also benefit consumers by reducing the price paid for copies of works. Thus, both owners and users of copyrighted works stand to benefit from technological protections.

B. Problems created by technological protections

While technological protections promise increased control for copyright owners and potential savings for users of copyrighted material, they also create problems. First, a technological arms race results from the interaction of copyright owners employing technological protections and the hacker community seeking to, and succeeding in, cracking through those protections. Second, a certain amount of unwarranted loss of access and use rights is inevitable when copyright owners utilize these technological protections.

1. The technological arms race

Utilizing technological protections results in efforts to crack or hack those protections. The level of cracking that occurs results in a greater investment in stronger technological protections. In turn, this higher level of protection translates into even more efforts expended to crack those technological protections. For some in the hacker community, utilizing stronger protections merely constitutes a

greater challenge to determine if someone can crack the heightened security.

From the standpoint of copyright policy, this technological arms race is wasteful, at best. The Anglo-European vision of copyright is based on a utilitarian model. Copyright protection is meant to promote progress and learning. A state of affairs which results in copyright owners investing substantial resources in the development of technological protections does not further that goal. Even in countries in which copyright protections is founded on labor or natural rights theories, the technological arms race is not within the goals of such systems. Instead of creating and disseminating works of authorship to the public, resources are spent on building bigger fences and the costs of such fence building is passed on to users.[16]

2. Locking up knowledge

Technical regimes for digital content protection threaten copyright's traditional balance designed to ensure certain levels of access and use. These access and use rights may vary from country to country, and in some countries may involve the payment of compulsory license fees, however, no country has provided absolute monopoly rights to all copyright owners.[17] Yet technological protections have the potential to provide absolute monopoly rights.

Utilizing technological protection systems can give content owners far greater protections than current copyright laws provide. For example, nothing prohibits the use of technological protections for works that are in the public domain. *Hamlet*, *The Tale of Genji*, *The Iliad*, and *The Odyssey* could all be distributed in encrypted form utilizing these technological protections with coding for read-only, copy-never. Copyright law would not prohibit the free copying of these works, but the technology would. The public domain is meant to be the global storehouse of knowledge, a store house that is added to each year as copyright protection in works expires. If technology can be used to prevent what the law has expressly chosen to allow, we risk a system of perpetual monopoly rights which leads to monopolistic stagnation.

A perhaps slightly more difficult example to understand is the loss of use rights during the term of copyright protection for a work. Copyright laws in most countries are designed to allow for certain permissible uses of copyrighted works that do not require the authorization of the copyright owner. Primary examples are fair use in U.S. copyright law, and educational and fair comment privileges in European law. The doctrine of fair use, codified in the Copyright Act of the United States,[18] can permit a user to make a copy of a entire work,[19] a portion of a work,[20] or even to publicly perform a work in certain circumstances. Technological protections can make such uses impossible, producing several far-reaching implications. For example, if critics are unable to copy clips of sound recordings or motion pictures for commentary purposes, their ability to effectively communicate their criticisms is hindered.

A final example is the ability of a purchaser of a copy of a work to transfer that copy to another, even temporarily. In the analog world, we are all familiar with the common practice of lending a friend a book. In copyright parlance, we refer to the fact that the law does not allow the copyright holder to control subsequent transfers of a copy as the first sale doctrine. The first sale doctrine has a long and venerable history, and even attempts to control the terms of subsequent transfers have been rebuffed by the courts.[21] However, in the digital world, copyright owners are not only attempting to control subsequent transfers by contract provisions, but are controlling subsequent transfers through technological protections. The technical ability to allow for only a single copy renders the first sale doctrine a nullity.[22] This loss of the first sale right not only impacts individuals, but public lending by libraries as well. The only way to obtain access to a work distributed with such technological protections will be to pay the copyright owner for access. Those without the resources to pay for access will have no alternatives.

II. Capturing the Benefits and Solving The Problems

A. Anti-circumvention protection

The World Intellectual Property Organization ("WIPO") Copyright Treaty,^[23] adopted by Diplomatic Conference on December 20, 1996, requires countries to provide "adequate protection" against the circumvention of technological protections employed by copyright owners to protect their works from infringement.^[24] The United States promptly enacted the Digital Millennium Copyright Act, designed to fulfill its obligations under this treaty,^[25] and the European Community is progressing toward a Directive designed to comply with this provision of the WIPO Copyright Treaty.^[26] By encouraging countries to provide adequate legal protections against the circumvention of technological protections, the WIPO treaty encourages copyright owners to embrace digital media by employing technology which provides a guard against unauthorized uses of copyrighted content. This encourages copyright owners to capture the benefits of technological protections which, as described above, have positive ramifications for both copyright owners and users of copyrighted works.

Adequate legal protections for technological protections also reduce the likelihood for an "arms race," avoiding the wasteful investment in bigger and better technology. While providing legal protections for these technological protections will not completely end the technological arms race -- there will always be hackers -- it should slow the pace of the arms build-up.

Because legal protections for technological protections encourage copyright owners to capture the promise of digital distribution and reduce the cost of one of the negative effects of technological protections, providing a level of legal protection for technological protections represents a rational policy choice. However, merely providing legal protection *for* such measures does not address the second major problem created by technological protection, the loss of access.

B. Possible methods of solving the loss of access problem

Technological protections will be used by copyright owners, regardless of whether the laws of a particular country prohibit the circumvention of those technological measures, or prohibit the distribution of devices which circumvent those measures. As discussed above, legal protections for technological measures do reduce a potentially wasteful investment in technological protections and slow the rate at which security measures may be defeated. At the same time, however, legal protections for technological protections do not address the other problem created by the implementation of technological protections - a loss of access and use rights for the users of copyrighted works. There have been attempts to address those problems, and proposals for additional ways to address the loss of access, none of which are completely satisfactory.

1. Allowing cracking for certain uses

One attempt to address the loss of access problem is to permit circumvention of technical measures when undertaken to engage in an access or use right recognized under law. In other words, if the circumvention is done in order to make a lawful use of the protected work, then such circumvention is lawful. For example, in the United States, circumventing a technological protection that prevents access to a work is prohibited.^[27] However, if the act of circumvention is undertaken for one of six different reasons,^[28] the circumvention is not unlawful. Refusing to deem unlawful certain circumvention activity still places the burden on the user to crack the technological protection. In effect, this "balancing" of circumventing rights does little to alleviate the loss of access burden created by the implementation of technological protection systems. Even if the legislation is drafted carefully to only prohibit circumvention for the purpose of infringement, if the legislation also outlaws the distribution of technology that facilitates circumvention (which the U.S. law does), only the technologically savvy will be able to exercise the ability to lawfully circumvent for lawful purposes.^[29]

2. Application of copyright misuse doctrine

A second possibility for ensuring use rights would be to penalize those copyright owners who use technological protection measures to prohibit uses which copyright law allow. Similar to the copyright misuse doctrine in U.S. law, if a copyright owner overreaches using technology and gains more than the law will allow, an equitable doctrine of technology misuse could provide consequences. In traditional copyright misuse, overreaching results in the court not protecting the copyright owner's rights until the misuse is cured.^[30] In the context of technology misuse, it is difficult to conceive of an effective remedy that would solve the loss of access problem. If, as a result of technology misuse, the court would refuse to enforce a copyright owner's rights to prevent circumventing, individuals will still need to circumvent the technological protection measure that the copyright owner has impermissibly utilized. If, instead, the court would refuse to enforce the copyright rights for the work to which the technological protection measure is employed, this would discourage the use of technological protection measures to decrease access to copyrighted works, but would do nothing to discourage the use of technological protection measures to decrease access and use rights for public domain works. To discourage the latter, additional penalties are necessary. Determining what those penalties should be and when they should be applied, strays further from the equitable underpinnings of the misuse doctrine and begins to resemble the proposal described in section III, below.

3. Implementation of a key escrow requirement

Another possible way to minimize the loss of access and use rights in connection with the implementation of technological protection systems would be to require the copyright owners to deposit the technical "keys" for accessing a work with a central repository. These keys could then be utilized by individuals seeking to exercise access or use rights protected by copyright law. Burk and Cohen have proposed a key escrow system as a means for the continued viability of fair use in the face of technological protection measures. They propose that these keys could be accessed by anyone, with no preauthorization determination of whether the access or use proposed in fact is permitted under copyright law.^[31] While the key escrow system is an intriguing proposal, and Burk and Cohen are to be commended for opening a dialog on this possibility, the political reality of copyright owners handing over the keys to their "crown jewels" is unlikely in the extreme. Unless pre-release controls are placed on access to those keys, an escrow system will not muster the political support to be adopted. Yet pre-release controls, or pre-authorization determinations for a key escrow system create their own set of problems.^[32]

III. "Baking-in" Use Rights

The first two proposals discussed above will allow only a fraction of the access and use rights recognized by copyright law to occur and the final proposal is a politically unlikely reality. To ensure that access and use rights are preserved, the law must require that the technological protection systems be designed to permit those uses to occur, with monetary penalties for failing to so provide. Technological protection systems already are designed to code-in or bake-in the permissible access and use for any particular work based on the copyright owner's choices. If we are to preserve certain access and use rights, these rights also must be "baked-in" along with the permissible access and use choices made by the copyright owner. Without recognition of these rights incorporated into technological protection system, they will no longer exist, or they will exist only when the copyright owners chooses to allow them.

A. Are legal prescriptions on access and use rights required?

While it is imperative that these access and use rights be "baked-in," some will argue there is insufficient evidence to demonstrate that the legal requirements for baking-in such use rights are currently necessary. Advocates of the free market will insist the market will provide appropriate

feedback and ensure that odious restrictions will not be accepted.[33] Accepting such an argument cedes those rights to copyright owners merely as a result of the medium in which the work is embodied. The market argument could be made for works in analog form, but we long ago decided that certain restrictions on access and use were impermissible. An assertion that in digital medium the result should be different could be based on the technical capability of copyright owners to control uses which were extremely difficult to control in the analog world. However, certain access and use rights were excluded from the copyright owner's bundle of rights, not because they were difficult to enforce, but because the benefit that those uses provide facilitate the ultimate aim of copyright protection.

While the market is, indeed, attempting to shape the design of some of the technological protection systems and provide certain use rights,[34] the market is wholly ineffective in ensuring that use and access rights are incorporated into technological protection systems.[35] A few recent examples in the United States may be helpful in providing concrete evidence of the type of control content providers are seeking. Ebook publisher, VolumeOne, Inc., recently distributed copies of Lewis Carroll's *Alice in Wonderland*, at work that is in the public domain, with technological protections prohibiting any kind of copying, even prohibiting copying of short excerpts.[36] At hearings before the Copyright Office, Bernard Sorkin, representing Time Warner Inc., indicated opposition to a first sale right in digital copies.[37] Additionally, software manufacturers routinely attempt to prohibit any transfer of a copy of a computer program through restrictive licenses.[38]

In addition to a general distrust of content owners building in appropriate access and use rights, pervasive market failure is another reason why the market alone will not guarantee appropriate use rights. The external benefits of certain use rights create a market failure demonstrating why the market cannot be trusted to fulfill the public policy goals of copyright law.[39] A consumer's ability to transfer her copies to another not only creates a potential economic gain for that particular consumer (for example if the consumer resells her copy), but circulating copies of copyrighted works translates into greater possibilities for access to the work by subsequent users, which in turn translates into increased knowledge and learning, the ultimate goal of Anglo-European copyright law. While an individual consumer may internalize her potential benefit to be gained by having a resale right, and may be willing to forgo that right for a reduction in cost, an individual consumer fails to internalize the external benefits of a first sale right to a society at large.[40]

Other access and use rights have similar external benefits. In part, because of these external benefits, countries have designed their copyright laws to exclude copyright owners from controlling certain access and use rights. These rights should not now be placed within the control of the copyright owner merely because digital technology makes that possible.

Others may assert that legal regulation of the technological protection measures would be premature, that we should wait to see if the type of overreaching by copyright owners envisioned actually materializes. First, evidence abounds that copyright owners are impeding certain use rights through the implementation of technological protections.[41] Second, including access and use protections at an early stage in the development of these comprehensive protection systems is essential. Once equipment has embedded a protection system that does not preserve this use rights, it is impossible to modify the equipment without a product recall. Finally, once legal protections fortify the integrity of the technological protection measures, there should be greater urgency to address the potential abuses.[42]

B. What use rights should be "baked-in"?

Each country places different access and use rights outside the control of the copyright owner. However, these content protection systems are being implemented on a global scale. Thus, a dialog must occur at the international level to agree on certain rights that should be preserved globally in the face of the implementation of technological protection measures. Various access and use rights

could be coded for.

First, the law might require no technological measure interfere with the ability to copy a public domain work. Content providers wishing to distribute public domain material could employ technological protections in order to gain revenue for their distribution, but their revenues would be limited by potential free copying of others.[43] One further step could require no interference with the ability to make multiple generation copies of public domain works.

Perhaps more controversial would be the ability of users to make first generation personal use copies of categories of copyrighted works. Such technical capability is not without precedent, at least in the United States. The Audio Home Recording Act requires the adoption of a technological protection system known as the Serial Copy Management System (SCMS). The SCMS and the legal protections afforded the system[44] also permit consumers to make first generation copies for non-commercial purposes.[45] Additionally, provisions of the Digital Millennium Copyright Act requires the incorporation of certain copy control technology in analog VCRs. Those same provisions also prohibit the use of such copy control technology to prevent consumers copying of free over the air television broadcasts.[46] While both of these statutory precedents were implemented in schemes that also required the implementation of copy control technology, such legal requirements can be implemented divorced of a broader technical scheme.[47]

Next, countries could adopt legal restrictions on technological protections which interfere with the first sale right. While perhaps technically difficult, code permitting the ability to transfer digital files upon technological proof of the destruction of the original purchaser's file could be designed. A narrower access and use right that should be preserved would be a lending right for libraries.

While coding for a first sale right may be somewhat difficult, the technical difficulties are not insurmountable. Other use rights are much more problematic from a coding perspective. The use rights difficult to code for are those that are context dependent. In the United States, for example, fair use is determine ex post by a court on a case-by-case basis, considering four broad statutory factors. Even the most complicated algorithms could not capture the full contours of fair use.[48] Thus, a general concept of fair use rights cannot be built into the computer code. Instead, general context dependent use and access rights will need to be preserved through a different mechanism, such as a key escrow system.

While agreement on which rights should be preserved in the face of technological protection measures may be difficult to achieve on a global scale, a dialog must begin. Pressures for global harmonization of copyright law have lead to stronger protections for copyright owners. It is time for harmonization to include recognition of access and use rights as well. The threat to the balance of rights in copyright law is not the legal protection afforded technological protections. The biggest threat is the unregulated use of technological protections themselves. Ideally what is needed is a combination of access and use rights determined ex ante and built into the technological protection system coupled with ex post safety valves, possibly in the form of a key escrow system with sufficient safeguards from abuse. Ex post determination should be on a country by country basis, thus affording those countries the opportunity to allow a greater latitude of circumvention. while remaining within the requirements of the WIPO Copyright Treaty.

Conclusion

Discussion of user rights in digital media must occur on a global level. Already, various use rights are being "baked-in" to the digital rights management systems being developed. Decisions concerning the access and use rights are already being made, not by policy makers, but by private parties with a clear stake in the narrowing those use rights to the greatest extent that the market will bear. Governments need to assert themselves into the decision making process by requiring certain technical realities.

The law has never granted copyright owners an absolute monopoly. Instead, the laws strike a balance between granting a certain level of protection and guaranteeing a certain level of access and use. The unregulated implementation of technological protection measures enables content providers to obtain protections the law does not afford. Technological protection systems can and should be employed by copyright owners to capture rights permitted by copyright law. The law, however, needs to guard against the use of technological protection systems to capture rights not permitted by copyright law.

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[2] *A&M Records, Inc. v. Napster, Inc.*, 239 F.3d 1004 (9th Cir. 2001).

[3] *Universal City Studios v. Reimerdes*, 111 F. Supp. 2d 294 (S.D.N.Y. 2000).

[4] The jurisdictional problems of intellectual property enforcement in the context of the Internet are beyond the scope of this paper.

[5] See Secure Digital Music Initiative <<http://www.smdi.org>>.

[6] The designers describe Content Protection System Architecture as a comprehensive framework "that makes it possible to integrate major existing content protection technologies." See <<http://www.4centity.com/4centity/tech/index.html#CPSA>>. "Content Protection System Architecture: A Comprehensive Framework for Content Protection" available for download in PDF format from their website at <http://www.4centity.com/4centity/data/tech/cpsa/cpsa081.pdf>.

[7] For descriptions of additional technological protection measures, see, Eric Schlachter, *The Intellectual Property Renaissance in Cyberspace: Why Copyright Law Could be Unimportant on the Internet*, 12 BERKELEY TECH. L. J. 15 (1997).

[8] Examples of earlier "technical" protections include using backgrounds on printed paper that caused blurring when photocopied, and tracking codes that made VHS video tapes grainy when copied.

[9] Dan L. Burk and Julie E. Cohen, *Fair Use for Copyright Management Systems*, at 6 Georgetown University Law Center 2000 Working Paper Series in Public Law and Legal Theory, Working Paper No. 239731 (available from the Social Science Research Network Electronic Paper Collection at http://papers.ssrn.com/paper.taf?abstract_id=239731).

[10] See, e.g., "Content Protection System Architecture: A Comprehensive Framework for Content Protection" supra n. 1 at 8 (encryption is the "'hook' that compels equipment manufacturers to honor the provisions of the content protection system.").

[11] *WIPO Copyright Treaties Implementation Act; and Online Copyright Liability Limitation Act: Hearing on H.R. 2281 and H.R. 2280 Before the Subcomm. On Courts and Intellectual Property of the House Comm. on the Judiciary 105th Cong. 78 (1997)* (statement of Jack Valenti concerning losses caused by online infringement); see also Julie E. Cohen, *Copyright and the Jurisprudence of Self-Help*, 13 BERKELEY TECH. L. J. 1089, 1092 n.8 (1998).

[12] This potential has been referred to as being "napsterized", referring to the rampant file sharing that has occurred in the field of musical works and sound recordings through the use of the Napster software. See Larry Downes, *Napsterized*, *The Industry Standard*, September 11, 2000, available at

<<http://www.thestandard.com/article/display/0,1151,18279,00.html>> .

[13] Throughout this article, "baked-in" is used to refer to a process by which technical choices are incorporated into either computer software or into the hardwiring of a microchip.

[14] See, LAWRENCE LESSIG, *CODE AND OTHER LAWS OF CYBERSPACE* (1999); Joel R. Reidenberg, *Lex Informatica*, 76 *TEX. L. REV.* 553 (1998).

[15] See "*Content Protection System Architecture: A Comprehensive Framework for Content Protection*" *supra* n. 1 at 7-9 (describing the methods by which these choices are comprehensively incorporated into files and devices).

[16] One side benefit of this technological arms race is, indeed, the development of better technological protections which could be utilized in other areas, for example to protect sensitive data or trade secrets. While this may, indeed, be a benefit of the never-ending cycle between copyright owners employing technological protections and the hacker community, it is not a benefit that is central to the utilitarian goals of copyright.

[17] Ruth Okediji, *Toward an International Fair Use Doctrine*, 39 *COLUMBIA TRANSNAT'L LAW J.* 75, 82 n.19 (2000).

[18] 17 U.S.C. § 107.

[19] See, e.g., *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984).

[20] See, e.g., *Hofheinz v. AMC Productions, Inc.*, No. CV-00-5827(CPS) (E.D.N.Y., Jan. 2, 2001), reported at 61 *Patent, Trademark, Copyright Journal* 291 (BNA 2001).

[21] *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339, 349-350, 28 S.Ct. 722, 725-26, 52 L.Ed. 1086 (1908).

[22] Only if the individual transfers the computer or device on which that single copy has been loaded can they effect a subsequent transfer of the copy.

[23] WIPO Doc. CRNR/DC/94 (Dec. 23, 1996). As of February 1, 2001, 51 countries are signatories to the treaty and 22 have filed documents of Ratifications and Accessions.

<http://www.wipo.org/treaties/ip/copyright/index.html>. The treaty enters into force three months after 30 countries have deposited their ratifications or accession documents with WIPO. WIPO Copyright Treaty Art. 20

[24] WIPO Copyright Treaty, Art. 11. This treaty also establishes several norms for copyright law in the digital age. Pamela Samuelson, *Intellectual Property and the Digital Economy: Why the Anti-Circumvention Regulations Need to Be Revised*, 14 *BERKLEY TECH. LAW J.* 519, 528-30 (1999).

[25] Legitimate arguments existed that the United States law already met the obligations of Art. 11. See, e.g., Pamela Samuelson, *Big Media Beaten Back*, *WIRED*, March 1997 at 64; Samuelson, *supra* n. 9 at 532. Nonetheless, the WIPO Copyright Treaty was cited as requiring the legislation.

[26] February 14, 2001 EU Copyright Directive cleared one of the final hurdles before it is signed into law.

[27] 17 U.S.C. § 1201(a)(1)(A).

[28] Under section 1201, the following reasons for circumventing a technological protection will

exempt that circumvention from being unlawful: Librarians are allowed to circumvent in order to make a good faith determination of whether to acquire a work §1201(d); law enforcement may circumvent §1201(e); reverse engineering in certain contexts §1201(f); encryption research §1201(g); protection of personally identifying information §1201(i); security testing §1201(j). Each of these subsections contains detailed requirements that must be met to qualify for these exemptions.

[29]Samuelson, *supra* n. 9 at 546-55.

[30]Brett Frischmann and Dan Moylan, *The Evolving Common Law Doctrine of Copyright Misuse: A Unified Theory and Its Application to Software*, 15 Berkeley Tech. L.J. 865 (2000).

[31]Burk and Cohen, *supra* n. 3.

[32]*Id.* at 15-17.

[33]Schlachter, *supra* n. 2 at 21-38.

[34]For example, the SDMI claims that the system will allow users to make personal copies if the individual is in possession of the original CD. See Leonardo Chiariglione, Executive Director, SDMI, *An Open Letter to the Digital Community*, September 28, 2000, available at <http://www.sdmi.org/pr/OL_Sept_28_2000.htm> (describing these use rights in an effort to answer "some misconceptions and unfounded fears that have recently emerged.").

[35]*Id.* (indicating the input of groups such as the Electronic Frontier Foundation in attempting to raise public policy issues that should inform the design of SDMI, although acknowledging that SDMI has "agreed to disagree" with their positions).

[36]It was VolumeOne's license term that indicated the work could not be read aloud that brought the license terms into public view in December, 2000. Jennifer L. Alvey, *E-Book's ban on Reading words aloud From Public Text Sparks Fair Use Firestorm*, Computer Technology Law Report, vol.2 no. 4 at 64 (BNA Reports February 16, 2001). The prohibition on reading aloud, merely indicated that the system's voice reader could not be used for this work. VolumeOne asserted that it was not attempting to prohibit parents from reading to their children. *Id.*

[37]*Copyright Office/digital Works: Content Industry, Users and Dot.coms at Odds*

Over Copyright in Digital Era, 61 Patent Trademark and Copyright Journal 109 (BNA Reports, December 1, 2000).

[38]While such license prohibitions may be understandable when the technology allows multiple copies without any proof of destruction of previous copies, technology could be designed to permit a transfer only upon proof of destruction of authorized copies.

[39]Cohen, *supra* n. 4 at 1127-28 (exploring the various ways in which "allocative efficiency is a poor measure of social welfare" in the context of copyright policy).

[40]While individuals have grown accustomed to being able to make a wide range of uses of a copyrighted work in the analogue world, it is not necessarily self-evident that they would resist giving up those uses in a digital world, particularly if there was a reduction in price in it for them. *Cf.* CARL SHAPIRO & HAL VARIAN, *INFORMATION RULES* 98 (1998) (discussing how consumers may value the ability to make various uses of a work); Samuelson *supra* n. 9 at 565-66.

[41]See *supra* nn. 15 - 15 and accompanying text.

[42] As Burk and Cohen have observed, this balance of legal protections and legal prohibitions would be similar to the regulation of the use of barbed-wire fences during the infamous "range wars" in American west. Not only was the cutting of such fences deemed unlawful, but the use of such fences to enclose public land was also prohibited. Burk and Cohen, *supra* n. 3 at 11.

[43] To the extent that this would not allow for appropriate compensation for the service of digitizing, entities should develop new business models as a means of profiting from public domain works. *See* David McGowan, *Legal Implications of Open-Source Software*, (available from the Social Science Research Network Electronic Paper Collection at http://papers.ssrn.com/paper.taf?abstract_id=243237).

[44] The AHRA represented the United States' first foray into providing legal protection for technological protection systems by making unlawful the distribution of devices that circumvented those protection systems. 17 U.S.C. § 1201(c).

[45] 17 U.S.C. §1008.

[46] 17 U.S.C. §1201(k)(2).

[47] Indeed, in both of the statutory examples given, legal requirements for the implementation of the protection schemes were needed to force equipment manufacturers to include the system. In digital technology today, the encryption of content provides the required hook to force equipment manufacturers to incorporate the technological protection system in order to obtain the decryption technology from copyright owners. *See, supra* n 3.

[48] Cohen and Burk *supra* n. 3 at 12-15.