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# TACTICAL WATERMARKS

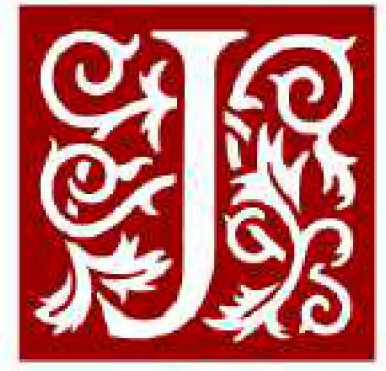
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Self-Help in the Digital Jungle

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Source: *The Journal of Legal Studies*, Vol. 28, No. 2 (June 1999), pp. 393-412

Published by: The University of Chicago Press for The University of Chicago Law School

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before discussing the ways in which self-help systems can deal with these policy conflicts, it is important to understand the vulnerabilities of such systems.

### III. THE ROBUSTNESS OF SELF-HELP SYSTEMS

Any electronic on-line system is vulnerable to attack. That is close to an axiom in the field of computer security.<sup>19</sup> So too, therefore, are self-help systems vulnerable. In the typical case, electronic on-line systems are attacked by nonparties (for example, a third party intercepting a message). But in the case of self-help systems, an additional important vulnerability lies in the prospect that an intended recipient of content may have an interest in defeating the conditions of access (for example, copying without paying).

Inevitably other technologies will arise to defeat self-help systems. For example, computer programs can be written to detect and, either automatically or at the discretion of a content recipient, strip off invisible messages and controls. Similarly, one can anticipate the rise of software technologies to detect digital watermarks and to wash them out. Some technologies developed for other purposes can degrade watermarks. For example, compression techniques are normally “lossy”; that is, they involve eliminating some information and thus may destroy some information in a watermark, information that is not restored when an image document is subsequently expanded (decompressed).

The fact that technologies used to defeat self-help systems may and probably will have other uses suggests that care should be taken in any legislation designed to protect self-help systems from attack. The Digital Millennium Copyright Act wisely limits its prohibition with respect to circumventing technology to that which is “primarily designed or produced for the purpose of circumventing protection” and which “has only limited commercially significant purpose or use other than” circumvention.<sup>20</sup>

Can anything general be said about the vulnerabilities of self-help systems? One key point is that although self-help systems work and are likely

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and making available of the content. Moreover, this content subject to conditioned access is often, perhaps usually, uncopyrightable. Thus, self-help systems constitute simply a further evolution of what has existed for some time without much controversy (except for concerns about privacy).

<sup>19</sup> Peter G. Neumann, *Computer-Related Risks* (1995).

<sup>20</sup> 17 U.S.C. § 1201(b)(1). Aside from any arguments about user rights, this provision reflects a broader technology policy that it is unwise to declare any technology unlawful, especially in the electronics realm, in view of the rapid progress in the field that constantly builds on recent technologies developed for quite different initial uses. A fortiori one should not criminalize use of a technology that has benign uses simply because it also has harmful uses.



to be defeated only occasionally, with minor consequences for their utility, some self-help systems depend heavily on their robustness for their usefulness. For example, some integrity uses (say in photojournalism) require time stamps to determine when the digital original was taken; where the photograph is sufficiently controversial that its integrity is open to question, the time stamp needs to be robust against hostile attack. Similarly, someone who posts content (say artwork) on the web may use time stamps to be able to prove subsequently when it was posted, say in a contest over who was first; here again, the time stamp must be robust.<sup>21</sup>

The warfare analogy of a race between offense and defense comes readily to mind. For those who sympathize with content providers, one can view the copier as the attacker, with the content provider responding to copying by using “defensive” self-help systems. Then offensive techniques will arise to overcome the defenses to copying (or to alteration) not authorized by the content provider, and so on ad infinitum.

#### IV. FAIR USE AND SELF-HELP: LEGISLATION AND STANDARDS

The Digital Millennium Copyright Act enacted in October 1998 takes the first step in addressing the relationship between fair use and self-help systems. It applies only to copyright and therefore leaves open the question of noncopyrightable content, such as databases lacking sufficient creativity to be copyrightable.

Recognizing the vulnerability of self-help systems, the Act prohibits circumvention of any “technological measure that effectively controls access” to a copyrighted work as well as the manufacture, importation, or offer to the public of any technology primarily produced for the purpose of such circumvention.<sup>22</sup> But since such measures against circumvention may affect the exercise of fair use rights, the statute establishes a system for determining whether users of particular classes of works are “adversely affected by virtue of such prohibition in their ability to make noninfringing uses of that particular class of works.”<sup>23</sup> Users of such classes of works are not subject to the circumvention prohibition. The mechanism to be used to determine what those classes of works are is a rule-making proceeding carried out by the Librarian of Congress. In that rule-making proceeding, the Librarian is to consider the impact of the circumvention prohibition on “criticism, comment, news reporting, teaching, scholarship, or research.” Those six categories are, of course, the kinds of potential fair use mentioned

<sup>21</sup> The WebArmor system is designed to meet this need. See note 8 *supra*.

<sup>22</sup> 17 U.S.C. § 1201(a)(1)(A).

<sup>23</sup> *Id.* § 1201(a)(1)(B).



in the preamble to the Copyright Act's fair use provision.<sup>24</sup> The fair use provision does not, however, grant fair use rights automatically to users in those six categories but rather sets forth four factors to be weighed in determining whether fair use status is to be accorded. The Digital Millennium Copyright Act also sets forth factors for the Librarian to apply, but they are different and include "such other factors as the Librarian considers appropriate."<sup>25</sup> In short, the impact of the Act on self-help systems remains somewhat up in the air. And since the rule-making proceeding is to be repeated each 3 years, that impact will perhaps remain up in the air for some time.<sup>26</sup>

The American Law Institute Tentative Draft (April 15, 1998) of the UCC Article 2B on licenses permits self-help systems in the commercial law context.<sup>27</sup> A review of its various provisions and of the reporters' notes suggests some principles that could be useful in more general regulation of self-help systems. One is that the content provider might be required to make the content recipient, including someone who independently finds the content provider website, aware of the limitations on the ability to copy, transfer, or alter the file containing the content. But it would be possible to go further to encourage or even require a content provider to take technical steps to facilitate some kind of negotiation between licensor and licensee in certain defined "fair use" types of situations. Indeed, one can imagine a scenario in which a recipient upon clicking, for example, a reviewer button

<sup>24</sup> *Id.* § 107.

<sup>25</sup> *Id.* § 1201(a)(1)(C).

<sup>26</sup> The Digital Millennium Copyright Act also contains a narrowly drafted exemption from the circumvention prohibition to nonprofit libraries, archives, and educational institutions to gain access to a commercial work solely for the purpose of determining whether to acquire a copy in an otherwise lawful way. 17 U.S.C. § 1201(d)(1).

<sup>27</sup> Section 2B-310 of the April 15, 1998, draft states that a party "entitled to enforce a limitation on use of information which does not depend on the existence of a breach of contract" may utilize a "restraint" (defined as a "program, code, device, or similar electronic or physical limitation that restricts use of information") under certain defined circumstances. Subsection (b)(2) makes clear that restraints may be used to prevent uses not granted by license whether they involve "uses . . . inconsistent . . . with rights under informational property rights law" or, more controversially, "uses . . . inconsistent with the agreement"; in other words, Section 2B-310 places contract on a par with copyright with regard to self-help. In this respect Article 2B is consistent with the approach of *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257 (1979), and *ProCD v. Zeidenberg*, 86 F.3d 1447 (7th Cir. 1996), recognizing that contract applies between the parties, whereas copyright offers protection against third-party uses of intellectual property. Since Article 2B involves commercial law, it does not deal squarely with a major potential use of self-help systems, especially those employing encryption, which is to prevent copying where there is no contract and no intellectual property right. Another relevant provision is Section 2B-716 on Electronic Self-Help, limiting the right of an information licensor to use electronic means to exercise rights under Section 2B-715 in the case of a breach by an information licensee.



would thereby obtain unrestricted access but be representing that access is for the purpose of writing a review and that copies will not be used for nonreview distribution. Since the putative reviewer could later be legally held to this representation, content providers who seek reviews for their own success would likely find this kind of “fair use” button access attractive.<sup>28</sup>

This fair use access principle can be generalized. The market failure explanation for fair use, which is that fair use normally involves a market failure situation precluding negotiation between the parties,<sup>29</sup> leads to the conclusion that by making negotiations automatic, transactions costs can be reduced greatly through electronic means.<sup>30</sup> Of course, where we are talking about derivative works, the content provider will want special payment, but at least self-help systems can, as suggested earlier, facilitate contact between the content provider and the person seeking to create derivative works. In academia and many technical fields, transformative uses will be favored by content providers so long as the accessing recipient agrees to give appropriate recognition (say by citing the source) to the content provider; a “citation button” can be used to make the appropriate contractual commitment to give such recognition where use is made.<sup>31</sup>

Some readers may leap to the conclusion that such fair use buttons should be required. I believe such regulation would be unwise, and for three reasons. First, some such arrangements will arise spontaneously because it is in the interest of the content provider in many cases to make them. Second, such a requirement may undercut some desirable effects of some self-help technologies, such as the use of invisible digital watermarks in tracing the origin of knock-off copies sold to the public. Third, the technological add-ons may raise the costs of self-help systems in some instances to an extent that would make them less useful in achieving their desirable goals. On the other hand, in the Librarian of Congress rule-making proceeding en-

<sup>28</sup> See William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 *J. Legal Stud.* 325, 358–59 (1989), indicating why publishers as a class benefit from even unfavorable reviews. The same principle is likely to apply to electronic content providers.

<sup>29</sup> See Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 *Colum. L. Rev.* 1600 (1982); Landes & Posner, *supra* note 28, at 357–61.

<sup>30</sup> Trotter Hardy, *Property (and Copyright) in Cyberspace*, 1996 *U. Chi. Legal F.* 217.

<sup>31</sup> Of course, in some fair use situations, such as parody, agreement would often not be possible even at zero transactions costs, and therefore self-help systems are unlikely to provide for, say, a “parody button.” See *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 592 (1994). In other words, even with the much lower transactions costs that electronic means provide, few content providers are likely to want, at least *ab initio*, to consider licensing a parody.



visaged by the Digital Millennium Copyright Act, one possible outcome would be to find that no person can be “adversely affected” by the Act’s circumvention provision “in their ability to make noninfringing uses” to the extent that self-help systems provide fair use buttons.

In any case, some content providers may find that fair use buttons or related devices are in their own interest and therefore may want to encourage other content providers to use similar devices. If so, the development of industry standards is likely to be a preferable and more flexible approach, allowing different kinds of content providers to approach the fair use issue in quite different ways, thereby avoiding the deficiencies of a one-kind-fits-all legislative or rule-making approach.<sup>32</sup>

#### V. MORAL RIGHTS AND DETERRENCE

Criticisms of self-help systems often contrast providers’ private quest for greater revenues with the public interest values embodied in the concept of fair use. Usually completely overlooked is that self-help systems can also serve purposes akin to moral rights, first by assuring attribution to the author, artist, or composer, and second by ensuring the integrity of documents, images, and music. The value of the attribution function is fairly straightforward, and means of achieving it through self-help systems have already been discussed above.

Integrity is a much less appreciated function. Self-help systems can harness the feature of digital copies that they will normally all be identical with one another. Self-help systems can help ensure that identity for the protection of the reputation of an author, artist, or composer. But many other integrity concerns that crop up repeatedly in a complex modern society can potentially be met by self-help systems. For example, they can also help protect against liability where distortion of the digitized information might lead to liability concerns—for example, a digitized human X-ray. Problems involving alteration of evidence in litigation or of digitized scientific data in scientific misconduct disputes can be avoided by linking source and time

<sup>32</sup> See Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. Chi. Legal F. 207, 214. Among the reasons that content providers might utilize the standards process are that industry-developed standards may (1) be more user friendly, enhancing user understanding and acceptance; (2) reduce the costs of implementation as off-the-shelf software incorporates the standards; and (3) avoid free-riding by content providers who find competitive advantage in being less open to fair use. It should be noted that it is private-sector standardization rather than legislation and regulation of the often proposed information superhighway variety that has led to nearly all of the progress in private networking and the internet. See generally Joel R. Reidenberg, *Lex Informatica: The Formulation of Information Policy Rules through Technology*, 76 Tex. L. Rev. 553 (1998); and see Larry Lessig, *Reading the Constitution in Cyberspace*, 45 Emory L. J. 869, 896 (1996), on the crucial importance of “rules, or laws, inscribed in the software itself—the code, we might say.”



stamps to documents through invisible messages that can only be removed by a determined attacker. So too distortion of photographs and archives in political-historical contexts can be avoided by such techniques and by source and time information included in digital watermarks.

Still another little-appreciated function of some kinds of self-help systems is deterrence. Self-help systems are normally thought of as protecting the content provider. But where, for example, artistic works are involved, some self-help systems can protect artists who do not even use self-help systems. Take the invisible digital watermark. Pirates who become aware that such watermarks are being used to trace piracy would naturally choose to copy those artistic works that do not contain a watermark and avoid those works that do contain a watermark. But since watermarks are invisible to them, piracy of all artistic works posted on the web will be deterred (at least in part), not just those works that actually contain the watermark.

As revealed in this invisible watermark example, self-help systems belong to a class of measures recently the subject of considerable economic research involving what may be called “unobservable victim precaution.”<sup>33</sup> Such precautions produce positive externalities because they are unobservable. For example, in a study of Lojack, a hidden radio-transmitter device used for retrieving stolen vehicles, Ayres and Levitt found that the use of Lojack in a community results in a sharp decrease in auto theft at the same time that the rate of other kinds of crime in the community remains unchanged. Moreover, the authors calculated that those auto owners who use Lojack capture only one-tenth of the benefits of their use, yet the marginal social benefit of an additional unit of Lojack is 15 times greater than the marginal social cost in high-crime areas. Needless to say, Ayres and Levitt conclude that Lojack is underused.<sup>34</sup> Viewing invisible watermarks as an inexpensive application of the principle of unobserved victim precaution, one could easily conclude that the use of hidden watermarks, far from being viewed as a threat to the purposes of the copyright system, should be positively encouraged because it will deter a broad class of piracy involving images and audio.<sup>35</sup>

<sup>33</sup> Ian Ayres & Steven D. Levitt, *Measuring Positive Externalities from Unobservable Victim Precaution: An Empirical Analysis of Lojack*, 113 *Q. J. Econ.* 43 (1998).

<sup>34</sup> *Id.* See the Ayres & Levitt article for citations to other economic work bearing on positive externalities from unobserved victim precaution.

<sup>35</sup> The Ayres-Levitt study involves unobservable precautions and implies that they will have a salutary effect even if they do not work perfectly. Even more obviously observable self-help precautions will deter misappropriation even if they can be defeated by clever hackers. See Lessig, *supra* note 32, at 897: “But from the fact that ‘hackers could break any security system,’ it no more follows that security systems are irrelevant than it follows from the fact that ‘a locksmith can pick any lock,’ that locks are irrelevant.”





## VI. CONCERNS ABOUT SELF-HELP SYSTEMS

At the outset of any discussion of objections to electronic on-line measures, it is useful to consider analogies from earlier periods. For example, self-help systems are sometimes analogized to commercial self-help remedies such as repossession. But other nonelectronic self-help technologies and techniques are perhaps more relevant to the general case of using electronic self-help systems to protect content. All kinds of technologies make it difficult for users to copy, even where they are entitled to do so.

The lock on my office door may make it difficult for even the most well-meaning scholar or journalist to copy part of a manuscript or document, indeed even where copying would surely constitute fair use under the copyright statute. Similarly, simple business methods can make access in fact difficult. Indeed, even "widely copied" content will be difficult to copy if the copier cannot, because of technology, access the material. Any company may have hundreds, even thousands of copies of highly sought-after information available in the hands of its employees and customers (let's say in a beta test period). Imagine, for example, how many unauthorized users might like to copy the early source code on the next Windows version (which is likely to be already available to scores of application programming firms). Most, if not all, of that source code would be unprotectable under *Computer Associates*<sup>36</sup> and other software copyright decisions. Yet firms like Microsoft use a network of beta test confidentiality agreements to make the source code available to some firms but to prevent access by others. In considering the concerns that have been raised about self-help systems, a question worth considering is why electronic self-help systems should be treated differently from other more primitive, but often highly effective, technologies and business methods.<sup>37</sup>

<sup>36</sup> *Computer Associates v. Altai*, 61 F.3d 6 (2d Cir. 1995).

<sup>37</sup> One possibility would be to distinguish between published and unpublished material, limiting the power of a copyright holder to use self-help systems with regard to published materials on the ground that once published, materials should be generally available on the same terms to all. The examples in the text concerning locked offices and beta testing involve unpublished materials where there is arguably a stronger case for allowing self-help protection. However, the Copyright Act specifically states that the "fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors." 17 U.S.C. § 107. Publication still plays some role, however, in fair use doctrine where the unpublished nature of materials has been found to be a factor in denying a fair use defense in an infringement action. See *Harper & Row v. Nation Enterprises*, 471 U.S. 539 (1985), and, for an analysis, William M. Landes, *Copyright Protection of Letters, Diaries, and Other Unpublished Works: An Economic Approach*, 21 *J. Legal Stud.* 79 (1992). But this distinction, even if recognized, would not preclude the use of self-help systems for content provided only subject to the self-help system (that is, otherwise unpublished). Nor does it address the use of self-help systems outside the realm of copyrighted material. In any event, nothing in the law of fair use requires a copyright holder to continue publishing or to



## VII. THE ROLE OF CONTRACT IN ON-LINE INFORMATION SYSTEMS

In one important sense, an analysis of self-help issues as copyright issues presents much too narrow a framework. Perhaps the academic writing revolves around copyright and fair use because copyright doctrine is widely taught and understood. But with self-help systems, content is going to be charged for whether or not the content provider has any intellectual property rights in the content. It is the convenience of access that people will pay for. (Of course, they would rather not pay for it if they could avoid it, but that is another question.) For example, much of the content will be purely factual. There will be no pretense of copyright. In the worlds of business, personal investment, and, increasingly, personal entertainment, information—especially convenient just-in-time information—is of great value. People want it and want it now and will pay for it. In short, in an information-based services-oriented society, convenience is a driving factor behind contract. The exclusivity of the information, and especially the property rights in it, are not the economic basis driving the explosion of on-line contracting for information. In short, self-help systems can become an important facilitating device in an information-based service society.

Information is, for this purpose, much like tangible things that people want and will pay for. One has to ask what possible justification could be advanced for interfering with the market system by in effect legitimizing third-party actions that make transacting more difficult or more costly. Surely noncopyrightable information is as much an economic good as unprotectable functional tangible products whose design can be freely copied (provided one can get close enough to them to actually copy without violating unrelated laws, such as those against trespassing). By increasing transactions costs, a prime result will likely be that less content will be provided. Higher costs mean less supply, for reasons obvious even to those offended by economics. This conclusion is not affected by placing the label “public domain” on the content. To say that something is in the public domain is to say that it is not protected by copyright, not that one who has it has to make it easy to copy and cannot take measures to make it more difficult to copy. The Louvre has the Mona Lisa, a prototypical public domain painting, but surely the Louvre is not required to allow students and artists (or even art reviewers and parodists) to set up easels for copying it

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refrain from charging once a copy has been given away free or at a lower price. Indeed, if a work has already been published, there are presumably copies of the copyrighted work “out there” available to the fair user so that there is no absolute need for the fair user to access new copies being made available only under self-help systems. Nothing in copyright law requires a copyright owner to make special arrangements to facilitate copying by a fair user.



or to allow them to take photographs or even to admit them without charge to the museum so that they can copy covertly.

What most people have in mind who would like to limit self-help systems is, I suspect, that thought and ideas should be disseminated as broadly as possible. Although that objective surely underlies the institution of copyright, it is not clear that it means that the copyright owner should be under a greater obligation to facilitate copying or even to avoid steps to make copying harder just because some user may be a fair user. Such a principle would, if applied without qualification, have unforeseeable ramifications. Would such a principle mean that an author or publisher should be required to print a minimum number of copies so that those who wished to photocopy would more easily be able to find one to copy? Would it mean that a motion picture company would be required to make movies available in videotape form and could not simply limit their availability to conventional movie theaters? Would someone who republishes a book in the public domain have, a fortiori, an even stronger obligation to make the republished book easily available for copying?

All of this kind of analysis is great fun and games. But it is a reasonable conjecture that self-help systems will facilitate, not stem, the spread of ideas. This conclusion is based in part on the belief that most people do not like the idea of transgressing others' rights, though many will do so if they perceive that it is difficult to obtain permission or to make payment.

Self-help systems will make small payments easy and efficient. When digital cash becomes common for storing in a computer or on a smart card insertible in a computer, users can effectively pay the small amount that will be charged for the right to make a copy. Indeed, digital cash can become the small change of the information economy; it can be available for micropayments and, especially important in the realm of ideas, can preserve the anonymity of the payer (just as I can buy a newspaper or a political tract with pocket change without revealing my identity).

#### VIII. SELF-HELP AND SOCIAL NORMS

On another plane, self-help systems will also facilitate the change in public mores that will be required to make paying for information seem to be the thing to do rather than an encroachment on freedom. (In the realm of tangible information goods, most people would rather pay for a daily paper than steal a copy from a newsstand even if they were sure that they would not be caught; yet many of those same people will simply take a copy if there is nobody around to receive payment.)<sup>38</sup> The notion that on-line infor-

<sup>38</sup> I recognize that physically taking a copy of a newspaper may in some cases deprive another reader access to that newspaper copy, unlike the on-line case where my downloading



mation should be free is one that, I predict, will prove to be heavily influenced by the ease of payment, an important element of transactions costs. Technology can promote ethics and the public good by reducing transactions costs.<sup>39</sup>

My argument in this respect is inspired by recent work on social norms.<sup>40</sup> Much of the social norm discussion emphasizes the role of government in promoting desirable social norms and widespread adherence to them. What I argue here is that in the self-help systems context private contracting can be the vehicle for promoting the development of such social norms and adherence to them. The technology of self-help systems lowers transactions costs (especially when coupled with digital cash through increasing the convenience of payment) and thereby reduces undesirable social behavior such as free-riding appropriation of content created by others. As transactions costs go down (including convenience going up), it is easier for people to do what they intuitively feel is the “right thing” (that is, paying or obtaining permission for copying content others have created). As more people do this “right thing,” others are more likely to be motivated to do it as well, thereby further strengthening the influence of what until now has been in the on-line context a quite shaky social norm. This argument is independent of the additional point that self-help systems, by making piracy difficult, encourage content creators to provide more content in the widely available low-cost internet environment.<sup>41</sup>

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or copying information does not affect other users. (The difference is not so great in practice as in the classroom since theft from a newsstand usually simply reduces the return to the publisher or distributor by the amount of money the thief fails to pay.) The point, however, is that the decision to take with or without paying is one that is heavily influenced by the ease of paying.

<sup>39</sup> To use a well-known analogy, many people now find it natural to segregate their trash even though it takes time and effort when previously they found it an outrageous infringement on their personal freedom to be asked to do so. The change is not merely the result of public preaching about the environment. It also has to do with the various techniques—different colored trash containers and the like—that municipalities have used to make the separation easier, faster, and more convenient. In the trash case, transactions costs of high-minded acts have been reduced by municipal assistance measures.

<sup>40</sup> See, for example, Cass R. Sunstein, *Free Markets and Social Justice* 32–69 (1997). On social norms, see generally Eric A. Posner, *Efficient Norms*, *New Palgrave Dictionary of Economics and the Law* 19 (Peter Newman ed. 1998).

<sup>41</sup> Computer and software technology, by lowering transactions costs (including enhancing convenience), can be expected to contribute to more optimal social behavior in other realms as well. For example, James T. Hamilton, in *Channeling Violence* 302–3 (1998), makes a persuasive case that the combination of privately developed systems of TV ratings using the privately developed PICS standard together with privately developed V-chip technology could reduce exposure of some children to violent TV programming: “The rating system reduces the transaction cost to parents of determining program content, so that they do not have to bear extensive costs of investigating the content of unfamiliar programs or movies [while the] V-chip technology dramatically lowers the costs of acting upon the ratings infor-



# SELF-HELP IN THE DIGITAL JUNGLE

KENNETH W. DAM\*

## ABSTRACT

Self-help systems, protecting electronic content from unauthorized copying, are controversial, especially with copyright scholars who see them as endangering the fair use defense permitting certain forms of socially useful copying. Self-help systems, by harnessing both technology and the institution of contract instead of relegating contract providers to legal actions to enforce intellectual property rights, promise to expand the amount and diversity of content while reducing transactions and search costs. These systems also further moral rights of attribution and integrity. Such systems can evolve to accommodate fair users (especially through industry-wide standards setting), deter unauthorized copying through unobserved victim precaution, and strengthen social norms against such copying.

**A** WORD about my title: “Digital jungle” is designed to evoke a content provider’s perspective on the dangers to be run in putting valuable content on the internet. “Self-help” refers to an expanding set of technologies and systems designed to protect content from unauthorized copying and to facilitate electronic commerce involving content. I use “content” broadly to include text, data, images, audio, video, and all of the other media that patrons of the web are familiar with.

There may be a jungle out there, but if so it is an exceedingly fertile one. From every perspective the internet is growing at an astonishing rate and in steadily more diverse directions. I see no reason to repeat all of the projections on the opportunities for creation of on-line communities, the flourishing of political speech in totalitarian states, and the potential growth of

\* Max Pam Professor of American and Foreign Law, University of Chicago Law School. An earlier version of this paper was given at a conference of the New York University Law School Engelberg Center on Innovation Law and Practice held in La Pietra, Italy, in June 1998. The proceedings of the conference will be published by the Oxford University Press in a book edited by Rochelle Dreyfuss entitled “Expanding the Bounds of Intellectual Property: Innovation Policy for the Knowledge Society.” I should like to thank for their comments and suggestions the participants in that conference and, in addition, Eliot Dam, Jack Goldsmith, William Landes, Douglas Lichtman, Henry H. Perritt, Jr., Richard Posner, and Cass Sunstein. And for generous support of the research for this paper I thank The Sarah Scaife Foundation Fund and The Lynde and Harry Bradley Foundation Fund.

[Journal of Legal Studies, vol. XXVIII (June 1999)]

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Even on the intellectual property home turf of copyright, a key point is that self-help systems can also be developed that will facilitate some of the core ideas behind copyright by inducing people to abide voluntarily with the policy behind those ideas. The first-sale rule, for example, is not one that limits just the rights owner; it also has implications for users. Users could be induced to live by the spirit of the first-sale doctrine through self-help systems that, as previously discussed, make it difficult to transfer a downloaded file without submitting to the erasure of their own file. Most of us do not photocopy a book before lending it to a friend, not just because it is “wrong” to do so, but also because it is inconvenient.

Similarly, it is probable that some kinds of content providers, at least in the realm of ideas, will want to facilitate transformative uses so long as acknowledgment of their own work is made. Self-help systems may contribute to the academic ethic by, as suggested above, allowing users to copy a file by clicking on a button that constitutes acknowledgment of their duty to cite the copied work if it is included in their own future work. To fail to make the citation will weigh on most academics’ minds, and failure to cite under such circumstances may indeed affect the copier’s academic reputation.

For content providers, workable technological arrangements to accommodate fair users would be a win-win solution. They would receive protection against piracy while, by recognizing the public policy goals of fair use principles, accommodating what is likely to be political opposition to self-help systems.

One can of course invent situations where it is difficult to imagine the technology that could accommodate the fair user, but anyone who sells technology short by saying “it can’t be done” has very little experience with technology. And even if there is a one-off situation that can be invented in the classroom, it does not follow that fair users as a class will not be far ahead because the added security for content and the ease of payment by users will greatly increase the content available.<sup>42</sup>

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mation.” On the private development of the PICS standard, see Reidenberg, *supra* note 32, at 558–60.

<sup>42</sup> An important question is what, other than the inconvenience (high transactions costs) of obtaining permission and making payment, accounts for the widespread belief within American society that uncompensated copying of materials on the net by end users is unobjectionable and should even be sacrosanct. Professor Ginsburg has addressed this question in passing in discussing the relative rights of authors and users. Ginsburg, *supra* note 1, at 17–18. I do not have a good answer to this puzzle, but no doubt it has something to do with several generations brought up on videotaping, audio cassette copying, and photocopying. Perhaps anthropologists and sociologists can tell us whether such attitudes are irreversible. But I insist that we will never know for certain unless obtaining permission and making payment become a great deal more convenient.



Some critics will of course object categorically to any system that is used, especially on the net, to charge for access. The fact that information can be a public good often obscures the appropriate analysis. Too often noneconomists draw the conclusion that, since one person's use of information does not raise the costs of another person's use, such uses should be free. But the problem is of course that information is costly to produce and often costly to distribute. Hence, we have the patent and copyright systems. Contract, backed up by self-help systems, can solve the public goods problem by generating the resources necessary to fund the production and distribution of information. With competition in the content provider industries, there is no more reason to expect monopoly returns than there is in tangible goods industries. On the contrary, competition and the desire to be first to market with new kinds of content can be expected to drive per-use prices down sharply, just as they often do for software, which also has public goods characteristics. Indeed, in this sense, contract with self-help may be superior in some circumstances to copyright and patent protection.

With regard to fair users as a class, I have serious doubts that there will in practice prove to be a serious "fair use" problem, even if I am wrong in predicting (see earlier discussion) that self-help systems will evolve to accommodate many classes of fair users, such as reviewers. All that will be precluded by most self-help systems is the ability to use a computer software cut-and-paste function. It will still be possible to use the fair use techniques of yesteryear of simply writing down what is on the screen, or, if one copy is permitted, to "cut and paste" (using old-fashioned nonvirtual scissors and paste) from that copy. This example suggests that technology will in general put fair users ahead of where most of them were little more than a decade ago and in the typical case put them far ahead because of the greater volume of content available. The problem that self-help systems solve is to permit the society to benefit from the lower transactions costs of on-line delivery and of the much lower search costs of putting information buyers and sellers together while at the same time lowering costs of misappropriation and free riding on the creation and distribution of convenient information.

In sum, if we refrain from the kinds of regulation and legal rules that discourage self-help systems, fair users as a class are likely to benefit because the amount and quality of content available over the net will expand at a far greater rate for the reasons previously given. The challenge is thus how to harness self-help systems technology to further the broad societal aims implicit in the fair use concept without adopting measures that will make it more difficult or costly to implement such systems.



on-line publishing and electronic commerce. The projections and estimates grow steadily, on the basis of faster than anticipated adoption.

One issue is whether self-help systems will play an important positive role, especially in the development of commercial applications and more generally in the growth of electronic commerce. The question that interests many intellectual property specialists is whether self-help systems may go too far—by interfering, for example, with “user rights.”<sup>1</sup> In my view, self-help systems will not only reduce the incidence of copyright violations and be one of the crucial success factors in electronic commerce but, more specifically, these systems are likely to evolve to meet most of the concrete objections of those who criticize such systems from an intellectual property doctrinal point of view.

Self-help systems will never meet, however, the goals of those who believe that the internet should be “free.” Nor should we expect them to meet those goals. On the contrary, it would be an error in economic policy to adopt rules that would de facto incapacitate self-help systems. In any case, it is not my purpose to debate with those who, in the name of user rights or of freedom of the net, would effectively emasculate copyright. I take copyright law as given and as desirable and indeed necessary intellectual property law. Since self-help systems can greatly limit unauthorized copying of copyrighted materials, there is not necessarily any need to rewrite copyright law to fit the on-line environment. But I do not limit the value of self-help systems to protection of copyrighted content. Self-help systems also protect uncopyrightable and uncopyrighted (including public domain) materials. And because they do so by facilitating contracting between content providers and users, they should not be viewed as conflicting with the intellectual property law of copyright.<sup>2</sup>

<sup>1</sup> Many intellectual property commentators have analyzed the issue as one of copyright law. Those who dislike self-help systems often have the conception that fair use should necessarily be interpreted as broadly as possible. Exaggerating only a little, one can say that in their eyes the key principle, especially in the on-line world, should be free use, and that copyright should be considered an exception. This theme is especially strong in the writings of those who emphasize “user rights.” For critical comments on the user rights approach, see Jane C. Ginsburg, *Authors and Users in Copyright*, 45 *J. Copyright Soc’y* 1 (1997).

<sup>2</sup> See *ProCD, Inc. v. Zeidenberg*, 86 F.3d 1447 (7th Cir. 1996). Compare *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257 (1979). The view stated in the text concerning the relationship between contract and copyright is obviously controversial. I state it as a conclusion as to the desirable policy outcome and do not, in this comment, attempt to deal with all of the technical legal issues raised by a number of writers on this subject. I do note, nevertheless, that the case law finding preemption of contracts by intellectual property law is quite limited. References to the shrink-wrap cases are irrelevant because the issue in those cases is whether there is a contract in the first place. Finally, the notion that “click-on” instantaneous contracts are contracts of adhesion and therefore somehow invalid finds little support in the case law. See Tom W. Bell, *Fair Use vs. Fared Use: The Impact of Automated Rights Management in Copyright’s Fair Use Doctrine*, 76 *N.C. L. Rev.* 557, 607–8 (1998). Even if





The views one brings to the table in this area depend a great deal on where one enters the thicket of legal, ethical, and policy issues involved. My own perspective is that electronic commerce can, if promoted through appropriate legislation and left relatively free from impediments to free and open contracting, be as important to the next century as the industrial revolution was to the late eighteenth and early nineteenth centuries. I base this unprovable conjecture on the twin propositions that our society is predominately and increasingly a service society, and that the service portion of the society is increasingly based on information. Electronic commerce may be useful for groceries and the host of other things that can now be ordered on the net for delivery through the mails and delivery services, but the big payoff lies in information, which can not only be ordered but delivered electronically.

Mine is not, I suspect, the perspective of most intellectual property scholars. Most of those who write on self-help are particularly interested in copyright law. I shall not attempt to deal here with all of the copyright and even constitutional points that have been raised to question the propriety and legality of using self-help systems.<sup>3</sup> Those are important issues but, as I shall argue, they place too much weight on one side of public policy scales.<sup>4</sup>

The current state of legislation is that the Congress, in the Digital Millennium Copyright Act of 1998, recognized the need to protect both self-help

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they were contracts of adhesion, that would mean only that courts could scrutinize the contracts more closely for ambiguities or for unconscionable terms and conditions. See, for example, *Fireman's Fund Insurance v. M.V. DSR Atlantic*, 131 F.3d 1336 (9th Cir. 1998).

<sup>3</sup> One line of concern about self-help systems is that they involve possible invasion of a user's privacy. See Julie E. Cohen, *Some Reflections on Copyright Management Systems and Law Designed to Protect Them*, 12 *Berkeley Tech. L. J.* 161, 183-87 (1997). Privacy for on-line users is a general concern that needs to be dealt with, and it is in no way limited to self-help systems. The Digital Millennium Copyright Act, discussed below, deals in part with this concern by allowing circumvention of a self-help system to the extent that it "contains the capability of collecting or disseminating personally identifying information reflected in the online activities of a natural person" without allowing that person an ability to opt out of the collection or dissemination of that information. 12 U.S.C. § 1201.

<sup>4</sup> A different issue is how much self-help systems will actually contribute to the growth of electronic commerce in information. Clearly there are a variety of business models for providing information on the web, not all of which require the same protection of content. Dyson, in an illuminating discussion, concludes that selling copies through self-help systems is unlikely to be the dominant business model because "there's all that competing stuff for free." Esther Dyson, *Release 2.0*, at 154 (1997). Many business models involve free use of content to sell something in the off-line world. This does not mean, however, that self-help systems will not play a crucial role in one important part of what seems destined to become an enormous on-line market. On the question of business models, the fact that copy-protection systems for software fell out of favor due to buyer resistance should, of course, make one cautious about predicting unqualified market success for self-help systems. See Henry H. Perritt, Jr., *Property and Innovation in the Global Information Infrastructure*, 1996 *U. Chi. Legal F.* 261, 303-4.



systems against circumvention and fair user rights in the context of such protection. In an all too typical compromise, the Congress, unable to balance these two somewhat conflicting objectives, delegated the task to the Librarian of Congress, who is to determine in a rule-making proceeding the extent of a fair user exception to the Act's general prohibition against circumvention of any "technological measure that effectively controls access to a work protected" under the Act.<sup>5</sup> Because the Act protects only copyrighted works and the Congress specifically dropped any protection of databases, the legislation says nothing about self-help systems in the uncopyrightable database context. After considering the nature of self-help systems and the values at stake in their use, I shall review briefly this legislation.

#### I. SELF-HELP SYSTEMS

The two most important factual points about self-help systems are, first, they are here now and, second, they are, of course, still quite primitive compared to what experience suggests they are likely to become. I shall describe briefly what now exists and what one can expect, especially with the right incentives, only a few years from now. Both because of the demand for self-help systems and the rapid growth of sophistication in software programming, one may expect them to be much more sophisticated in the next few years (especially if government and the courts do not get in the way). The special importance of the rapid evolution in self-help technology is that it holds out the possibility of helping to achieve the objectives of both the proponents and opponents of self-help systems.

These systems are often called copyright management systems, but the underlying information need not be copyrighted. It may be protectable, say as a trade secret, where the use of such a system will help the trade secret owner to demonstrate that all reasonable steps have been taken to keep the information secret (or, better still, to avoid the leakage of the information in the first place and hence the necessity for litigation). Or the underlying information may not be protectable at all. It may be just a compilation or purely factual, or indeed it could be information for which a third party owns the copyright—for example, it may be pirated content.<sup>6</sup>

I shall use the phrase "self-help systems" rather than "copyright management systems" for two reasons. They can and will be used for noncopy-

<sup>5</sup> 17 U.S.C. § 1201(1)(A).

<sup>6</sup> In the last case, self-help systems may be used to facilitate piracy. Thus, a music pirate might send copyrighted music to a wide circle, whether for personal or commercial reasons, within a cryptolope in order to avoid being detected by the copyright owner. See the discussion of cryptolopes below.



righted content. And the word copyright is likely to make us dwell too much on copyright doctrine rather than on the underlying goals and values we would like to promote in an information society.

I also avoid the term “rights management systems” because I see little reason to get into a case-by-case analysis as to whether the content is copyrightable or otherwise independently protectable by legal action. After all, telephone books have a convenience value, even if not copyrightable. We surely would not argue that because telephone books in tangible form normally cannot be copyrighted, it should be lawful simply to steal them. To permit outright theft would make consumers worse off, not better off, because although theft may be just an economic transfer, the “sweat of the brow” investment in time and money required to generate them warrants encouragement. This is not a legal argument nor necessarily a plea for intellectual property protection for telephone books, but simply an observation that allowing people to protect by their own means what they create is usually socially optimal where the law does not provide a cheaper, more effective remedy.<sup>7</sup> That is the central argument, for example, for allowing freedom to use encryption to protect private communications, even though some who do so may be drug dealers or terrorists. So, too, society not only allows those with houses, apartments, and cars to lock them but increasingly favors such self-help through various legal and contractual (for example, insurance) measures.

## II. WHAT CAN SELF-HELP SYSTEMS DO?

In the simplest application, self-help systems enable a content provider to transmit content to a potential reader (or viewer, listener, etc.) by posting it on a web site, e-mailing it, and so on, while preventing anyone from accessing it without, say, paying the content provider (for example, by giving a credit card number or, in newer electronic commerce applications, by using digital cash). Note that I use the concept of a “content provider” in the broadest possible sense to include all forms of information and without

<sup>7</sup> Most scholars of intellectual property law have supported the Supreme Court decision in *Feist v. Rural Tel. Serv. Co.*, 499 U.S. 340 (1991), in rejecting the “sweat of the brow” doctrine as the basis for copyright protection. I do not believe it necessary to enter into that question to analyze contract protection for self-help systems. But it is worth noting that scholarly approbation of the Feist doctrine is by no means unanimous. For skeptical thoughts on Feist, see, for example, Rochelle Dreyfuss, *A Wiseguy’s Approach to Information Products: Muscling Copyright and Patent into a Unitary Theory of Intellectual Property*, 1992 *Sup. Ct. Rev.* 195, 209–20 (1993). For a general argument in the patent law context for state law protection of unpatentable innovation on grounds somewhat analogous to “sweat of the brow,” see Douglas Gary Lichtman, *The Economics of Innovation: Protecting Unpatentable Goods*, 81 *Minn. L. Rev.* 693 (1997).



distinction as to whether or not the information is legally protected against access by unintended recipients through intellectual property rights.

#### A. Encryption

Normally, the basic technology is encryption. The encrypted content is placed within a digital envelope (called a cryptolope by IBM and a DigiBox by InterTrust)<sup>8</sup> so that the content provider can indicate in unencrypted text on the envelope what a potential reader has to do to decrypt the content.<sup>9</sup>

#### B. Digital Watermarks

Another class of self-help systems involves placing a digital watermark on an image so that any copies can be identified not just as originating with the content provider but as being copied from an image transmitted to a specified party. The idea is to discourage sending the copy on to a third party who might make copies unauthorized by the content provider. This technique, which can be thought of as an application of the cryptographic technique of hiding messages within other messages by slightly altering the intensity or color of pixels (“steganography”), can also work for music but not normally for alphanumeric text (although fonts might be minutely altered for this purpose). Digital watermark technology may be combined by a content provider with a search program that roams the net looking for the provider’s watermark, thereby ferreting out unauthorized use of the content in web pages.<sup>10</sup> One can well imagine the development of ASCAP/BMI

<sup>8</sup> For detailed descriptions of the self-help technologies discussed in this paper, one can contact the providers of those technologies. For a brief discussion of each technology, the best single source is a Compendium of Digital Copyright Protection Technologies, which is appended to ITAA Discussion paper, Intellectual Property Protection in Cyberspace: Towards a New Consensus (available at <http://www.ita.org/copyrite.htm>). This compendium includes the URL and mail address of each provider. Other useful sources include Eric Schlachter, *The Intellectual Property Renaissance in Cyberspace: Why Copyright Law Could Be Unimportant on the Internet*, 12 *Berkeley Tech. L. J.* 15, 38–48 (1997); Bell, *supra* note 2, at 564–67. See also I. Trotter Hardy, *Project Looking Forward* (May 1998) (available on the U.S. Copyright Office web site).

<sup>9</sup> Obviously, the development of a nationwide public key infrastructure, something this and prior administrations have done little or nothing to foster, would enable much more varied ways of using encryption to protect content. For example, once the intended recipient had paid or otherwise met the requirements of the content provider (say by membership in a designated group or by establishing credit arrangements), the content provider could send the content encrypted with the intended recipient’s public key and only the intended recipient could decrypt it. See Kenneth W. Dam & Herbert S. Lin, eds., *Cryptography’s Role in Securing the Information Society* 375–76 (1996).

<sup>10</sup> The Stanford Copy Analysis System (SCAM) developed by the Stanford Computer Science Department performs this kind of search of web and FTP sites and Usenet newsgroups. See note 8 *supra*.



types of rights companies that would roam the internet to find copies via watermarks and obtain payments for the authors. Since the equivalent of watermarks can be used to insert inaudible information within audio,<sup>11</sup> it may be that ASCAP and BMI themselves will come to fulfill the same function on the net that they perform with regard to radio and TV.

One of the common misunderstandings about self-help systems is the assumption that they exclusively benefit content providers to the detriment of users. But watermarks are not just for content providers; they can enhance a user's capabilities. For example, a graphic artist using a program like Adobe Photoshop can use a watermark reader to determine the source of a watermarked photo, enabling the user to communicate directly with the original photo owner, facilitating agreement on enhancements to the photo for a particular kind of use.<sup>12</sup>

The foregoing applications involve hiding watermarks for future detection. However, in some applications, where the watermark does not detract from the usefulness of the image (say for blueprints or other utilitarian images), watermarks may be made readable by the human eye in order to facilitate not just rights clearances but normal research conventions. One can imagine such applications facilitating academic research, where the visible watermark attached to a historical document gives citation material that does not disappear when the document is cropped or poorly copied. Still another class of watermarks may be used to protect moral rights. A "fragile" watermark technique can be used by a content provider, say an artist, to determine whether an image has been tampered with.<sup>13</sup>

### C. Invisible Messages

Self-help systems can attach messages to content (say to a web page) that are not visible to the eye, but that nonetheless make it impossible to copy the content or that allow only a single copy, or that send a message back to the content provider indicating how many copies are being made.<sup>14</sup> Much of the debate about circumvention and "stripping off" involves this class of self-help systems.

<sup>11</sup> MusiCode by ARIS performs this function. See note 8 supra.

<sup>12</sup> The Digimarc digital watermark reader is such a program. See note 8 supra.

<sup>13</sup> See the discussion of IBM watermark technologies in Fred Mintzer, Jeffrey Lotspiech, & Norishige Morimoto, *Safeguarding Digital Library Contents and Users*, D-Lib Mag., December 1997 (available at <http://www.dlib.org/dlib/december97/ibm/12lotspiech.html>).

<sup>14</sup> The Xerox Digital Property Rights Language (DPRL) is an example. See note 8 supra. For a conceptual discussion of the use of digital rights languages, see Mark Stefik, *Shifting the Possible: How Trusted Systems and Digital Property Rights Challenge Us to Rethink Digital Publishing*, 12 *Berkeley Tech. L. J.* 137, 140 ff. (1997).



A subset of this class involves locking mechanisms. Content can be locked so that it has to be unlocked by each recipient. Thus, if the content provider transmits content to an original recipient who unlocks it (say by payment) and then retransmits it (forwards it) to a friend, the friend will receive a locked copy and cannot unlock it without paying. Thus, each recipient, whether or not a recipient intended by the content provider, must pay.<sup>15</sup> Similarly, it would be possible to require payment for each hard copy made.

These locking and similar invisible message technologies can easily evolve to enable the objectives of those who worry that self-help systems will spell an end to doctrines promoting access, such as fair use and first sale. For example, technology can allow a recipient to “loan” an authorized copy to a particular third person for a particular period of time or indeed to “sell” it to a third person.<sup>16</sup> During the period of the loan or after the sale the copy is no longer accessible by the recipient and is accessible only by the particular third person. Thus, self-help systems can support, from a practical standpoint, a digital version of the objective of the first-sale doctrine. As we will see later, this is just one of a number of ways in which self-help systems can facilitate implementation of many of the ideas underlying pro-competitive and fair use ideas embedded in copyright and other intellectual property law.

Similarly, self-help systems can facilitate the kinds of negotiations that copyright law itself contemplates. For example, content can be accompanied by recipient-readable copyright information that will enable those who are anxious to establish their right to make derivative works to contact the original content provider.<sup>17</sup>

The foregoing are just a few variations on the concept of a self-help system. So long as the integrity of the self-help technology is maintained, almost any conceivable combination or variation of the ideas just discussed is possible. Many bells and whistles can be added, and some of them will help resolve policy conflicts over the propriety of self-help systems.<sup>18</sup> But

<sup>15</sup> For example, the SoftLock system. See note 8 *supra*.

<sup>16</sup> See Stefik, *supra* note 14, at 147–48.

<sup>17</sup> For example, the NetRights @ttribute system. See note 8 *supra*.

<sup>18</sup> In one sense self-help systems, no matter how complex, are not new but simply more sophisticated versions of techniques for conditioned access. Conditioned access systems have been around for some time, first on specialized proprietary systems such as Lexis and Westlaw, then on general closed services such as America Online, and finally on the internet. In the internet environment, access is sometimes conditioned on payment (say by providing a credit card number) but often just in return for registration, where the registrant is required to provide personal information, which when packaged together with information from other registrants constitutes valuable information that the content provider is able to sell to third parties. Obviously the ability to sell this information provides an incentive for the creation

