Summer 2009

Economic Interests and Jacobsen v. Katzer: Why Open Source Software Deserves Protection under Copyright Law

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ECONOMIC INTERESTS AND *JACOBSEN V. KATZER*: WHY OPEN SOURCE SOFTWARE DESERVES PROTECTION UNDER COPYRIGHT LAW

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I. INTRODUCTION

Jacobsen v. Katzer[1] has been widely praised as a victory for open source software;[2] however, the sweeping statements it contains about protecting open source are not central to its conclusion. The court's reasoning and the unusual open source license involved suggest that its true holding may be considerably more narrow. Nevertheless, the argument that "[c]opyright holders who engage in open source licensing have the right to control the modification and distribution" of their works[3] is compelling from an economic perspective. This note argues that the most efficient way to ensure that authors retain this control is by amending the copyright law to explicitly protect open source licenses in copyright.

The term "open source software" refers to software created by "peer production"; that is, by large-scale collaboration among individuals.[4] Open source software is software for which the source code is freely available, and which may be used, modified, and redistributed in either the original or modified form.[5]

The right to use and modify open source software is granted by means of a license.[6] A threshold question in interpreting these licenses is whether their terms are conditions to a license or covenants to a contract.[7] This note argues that the economic interests of open source authors justify treating many open source licenses[8] as conditional grants of copyright rights and not as covenants of contracts.

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1. 535 F.3d 1373 (Fed. Cir. 2008).

2. *E.g.*, Charles Babcock, Open Source Code on Firmer Ground After Jacobsen Ruling, http://www. informationweek.com/news/software/open_source/showArticle.jhtml?articleID=210004213 (last visited Feb. 23, 2009); Roberta Cairney, Landmark Case Upholds Open Source Licenses, http://radar.oreilly.com/2008/08/ landmark-case-upholds-open-sou.html (last visited Feb. 23, 2009); Lawrence Lessig, Huge and Important News: Free Licenses Upheld, http://lessig.org/blog/2008/08/huge_and_important_news_free_l.html (last visited Feb. 23, 2009).

3. *Jacobsen*, 535 F.3d at 1381.

4. *See* Yochai Benkler, *Coases's Penguin, or, Linux and the Nature of the Firm*, 112 YALE L.J. 369, 375 (2002). It is important to note that terminology is a contentious issue in the open source world. *See, e.g.*, RICHARD STALLMAN, *Why "Free Software" Is Better Than "Open Source," in* FREE SOFTWARE FREE SOCIETY: SELECTED ESSAYS OF RICHARD M. STALLMAN 55, 55–60 (2002) (discussing why different people prefer different labels within this movement). This note uses the term "open source" in lowercase to generically refer to peer-produced software. The terms "Open Source" and "Free Software" are capitalized when referring to the organizations and philosophies that go by those names. See Part II.C, *infra*, for a summary of these philosophies.

5. Klaus M. Schmidt & Monika Schnitzer, *Public Subsidies for Open Source? Some Economic Policy Issues of the Software Market*, 16 HARV. J.L. & TECH. 473, 475 (2003).

6. *See* ANDREW M. ST. LAURENT, OPEN SOURCE & FREE SOFTWARE LICENSING 4–6 (2004). Licenses are discussed in Part III.B.1, *infra*.

7. *See* Sun Microsystems, Inc. v. Microsoft Corp., 188 F.3d 1115, 1122 (9th Cir. 1999).

8. In particular, non-copyleft licenses. *See infra* Part V.B.3.

While there may be some societal costs associated with protecting open source,[9] these costs are easily outweighed by the benefits to users, authors, and the public.

By making quality software available at no cost, open source benefits both users and authors. In return, open source authors require only minimal protection.[10] As the Federal Circuit observed, however, contract remedies are inadequate because courts are likely to find no damages and because license enforcement is best achieved through injunctive relief, which is difficult to obtain under contract law.[11] Copyright, on the other hand, avoids the transaction costs associated with contracts and allows easier access to the remedy of injunctive relief.[12] Amending the copyright laws to explicitly protect open source would ensure that protection is available to open source software regardless of which license is used.

Part II of this note explains the relevant background in software and open source. Next, Part III looks at the *Jacobsen* case. Part IV lays out necessary legal background, concentrating on law and economics, contract, and copyright. Finally, Part V tackles the question of whether open source deserves protection and, if so, what sort of protection is appropriate. The note concludes that open source deserves protection and that such protection is best achieved under copyright law. Accordingly, Part V.C suggests a starting point for how the law could be changed to accomplish this.

II. SOFTWARE AND OPEN SOURCE

This section contains background material useful in understanding *Jacobsen*. First, it explains the basics of how software works and how it is protected. This leads naturally into an explanation of the two major software distribution models that exist: proprietary and open source. Because the various motivations of open source authors are particularly important to the analysis, this Part also describes the two most prominent open source philosophies.

A. *How Software Is Written*

To understand how software is protected, it is necessary to know how software is produced.[13] Programmers create software by writing text documents in human-readable languages such as C++ or Java. These documents are called "source code." Source code is both functional and expressive: the same problem can be solved in many different ways, most of which are crude and inelegant but all of which solve the problem.

For software to be useful, the source code must be transformed from its human-readable form into something a computer can understand. This transformation is called "compiling" the code, and the compiled code is called object code (in fact, object code is what most people mean when they refer to a "program"). This ob-

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9. The potential costs of protecting open source are explored in Part V.B.3, *infra*.

10. In general, open source licenses seek only to prevent others from gaining a monopoly over the released code. ST. LAURENT, *supra* note 6, at 4 ("The fundamental purpose of open source licensing is to deny anybody the right to *exclusively* exploit a work.").

11. Jacobsen v. Katzer, 535 F.3d 1373, 1382–83 (Fed. Cir. 2008). See *infra* Part V.B.1.a for a discussion of the inadequacy of expectation damages for enforcing violations of open source licenses.

12. *See* discussion *infra* Part V.B.2.

13. *See generally* Schmidt & Schnitzer, *supra* note 5, at 475–77.

ject code is simply a series of ones and zeroes. When executed by a computer, however, object code can cause the computer to do something useful. For example, a clever programmer might be able to write source code that, when compiled and executed, was capable of writing legal articles about open source.[14]

Of critical importance, however, is the fact that object code cannot readily be converted back into source code, and is therefore not useful for creating derivative works.[15] Students who, possessing a copy of an article-writing program, desired a program that would write articles about bankruptcy law, would have no choice but to write their own source code, starting from scratch. However, if the source code to the article-writing program were available, future students could modify it to create all manner of legal analysis, thereby saving students the trouble of writing not only the software but their articles as well. Some programmers might simply give away the source code to such a program, but a law student will seek to maximize her profits. To do so, she must first decide upon one of the two major software distribution models: proprietary or open source.

B. *Proprietary Software*

Software projects can be divided into two categories: open source and proprietary. Most people are familiar with proprietary software. Proprietary software authors treat software like property—they sell it like any other good or service.[16] Microsoft Word[17] and Photoshop[18] are typical proprietary products; users exchange money for a copy of the software. Proprietary authors release only their object code, which is protected under copyright law.[19] By withholding the source code, authors can protect it under both copyright and trade secret law.[20]

The biggest threat to proprietary software developers is copying. Both object and source code can be copied and distributed at virtually no cost. Without some form of technological or legal protection, nothing can stop users from obtaining software without paying. Unfortunately, nothing can be done technologically to prevent object code piracy.[21] If only the object code of the article-writing program is distributed, the author will have only ethics and the threat of lawsuits to prevent purchasers of the program from giving copies of it to their friends.

Source code piracy represents a more serious problem for authors of proprietary software. A person who gains possession of source code can create a compet-

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14. Currently, however, it is easier to simply write the article.

15. Dr. José J. González de Alaiza Cardona, *Open Source, Free Software, and Contractual Issues*, 15 TEX. INTELL. PROP. L. J. 157, 164–65 (2007).

16. *See* Yochai Benkler, *Intellectual Property and the Organization of Information Production*, 22 INT'L REV. L. & ECON. 81, 87 (2002). Benkler refers to this as "direct appropriation." This term contrasts with "indirect appropriation," where an author benefits from the software by some other means, for example by increased reputation or by selling related services. Indirect appropriation is discussed more extensively in the analysis. *See infra* Part V.A.

17. Word is a popular word processing program. A comparable open source product is Open Office Writer. *See* OpenOffice.org, http://www.openoffice.org/why_easy.html (last visited Apr. 27, 2009).

18. Photoshop is a popular image editing program. A comparable open source product is Gimp.

19. *See* Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1249 (3d Cir. 1983).

20. BRUCE ABRAMSON, DIGITAL PHOENIX 31–32 (2005).

21. *See* BRUCE SCHNEIER, SECRETS AND LIES: DIGITAL SECURITY IN A NETWORKED WORLD 250–53 (2000) (explaining that software authors cannot prevent copying, but can only hope to make it difficult). However, as pirates are unlikely to be paying customers, the loss may be minimal. *Id.* Furthermore, piracy increases market share, which can lead to future sales. *Id.*

ing product without incurring the fixed costs that would otherwise be necessary. This is a significant advantage. If the source code to the article-writing program were available, competitors could use it to enter the market without experiencing the development costs incurred by the original author. The desire to avoid creating competition is the reason proprietary developers distribute only object code. Because source code cannot easily be reverse engineered from object code, distributing object code without its source effectively stops competitors from avoiding development costs, thereby leveling the playing field.

C. Open Source

An important alternative to the proprietary model is open source. There are varying definitions for the term open source, but in general, open source software is software for which the source code is freely available, and which everybody has the right to use, modify, and to redistribute in either the original or modified form.[22] Rather than directly appropriating benefits from software by charging for it, open source authors obtain benefits indirectly.[23]

Discussions of the development of the open source movement inevitably begin with one of its early pioneers, Richard Stallman. Frustrated by a printer vendor that refused to allow him access to code he needed to add features he desired, Stallman felt that he was faced with a "stark moral choice": he could become a proprietary developer, or he could create a new way of distributing software.[24] Stallman quit his job and began writing free software under what was to become the most well-known public license for software: the General Public License (GPL).[25] Shortly thereafter, he founded the Free Software Foundation (FSF) to promote what he calls "free software."[26] Today, the FSF advocates for free software, holds many of the GNU copyrights, and enforces the GPL.[27]

Free software refers not to price, but to freedom.[28] According to Stallman, freedom consists of four things:

- Freedom 0: The freedom to run the program, for any purpose.
- Freedom 1: The freedom to study how the program works, and adapt it to your needs. (Access to the source code is a precondition for this.)
- Freedom 2: The freedom to redistribute copies so you can help your neighbor.
- Freedom 3: The freedom to improve the program, and release your improvements to the public, so that the whole community benefits.[29]

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22. Schmidt & Schnitzer, *supra* note 5, at 475.

23. For example, by offering consulting services related to their software. *See infra* Part V.A.

24. Richard Stallman, *The GNU Project*, *in* Free Software Free Society: Selected Essays of Richard M. Stallman 15, 17 (2002).

25. *Id.* at 18–21. There are now three versions of the GPL. Citations to the GPL in this note refer to version 2.

26. *Id.* at 21.

27. *See* What Is Free Software and Why Is It So Important for Society?, http://www.fsf.org/about/what-is-free-software (last visited Feb. 27, 2010).

28. Richard Stallman, *Free Software Definition*, *in* Free Software Free Society: Selected Essays of Richard M. Stallman 41, 41 (2002).

29. *Id.*

The GPL aims primarily to maximize the amount of software having these qualities.[30] To accomplish this, it requires that any derivative works be released under the GPL.[31] This feature, known as "copyleft,"[32] is perhaps the most unique feature of the license,[33] and the reason why the GPL is often referred to as a "viral" license.[34] That is, GPL code acts like a virus, "infecting" any project into which it is inserted by requiring the project to be released under the GPL.[35] The viral nature is intentional: the GPL is primarily concerned with propagating a system of ethics of software, and the copyleft is how it accomplishes this. As a consequence, the FSF, which enforces the GPL for many GPL copyright holders, is not concerned with monetary damages, but rather with bringing users into compliance with the license terms (and thus Stallman's ethics).[36]

Not everyone agreed with Stallman's approach. In 1998, Eric Raymond and others created the Open Source Initiative[37] (OSI). OSI licenses do not seek the ethical goals of the FSF; in fact, as Stallman notes, the main difference between the FSF and the OSI is that the OSI deliberately avoids ethical and moral issues.[38] OSI's account of the differences between the two organizations is less charitable, claiming that the OSI was founded because "it was time to dump the moralizing and confrontational attitude that had been associated with 'free software' in the past and sell the idea strictly on . . . pragmatic, business-case grounds."[39]

Accordingly, instead of freedom, the OSI is concerned with obtaining the practical benefits of public licensing. It defines Open Source as "a development method [that seeks] better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in."[40] In other words, these licenses permit modifications when they are likely to improve the reputation of the software or its authors. These goals are not unique to Open Source; rather, Open Source could be thought of as Free Software minus the copyleft clause. This eminently utilitarian philosophy fits well with existing copyright law.

Jacobsen involved source code released under the Artistic License. This license is an open source license granting users the rights "to use and distribute the [software] in a more-or-less customary fashion, plus to make reasonable modifica-

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30. *See* GPL Preamble, *available at* http://www.opensource.org/licenses/gpl-2.0.php (last visited May 10, 2010); *see also* St. Laurent, *supra* note 6, at 36.

31. *See* GPL ¶ 2; *see also* St. Laurent, *supra* note 6, at 38–40.

32. Brian W. Carver, *Share and Share Alike: Understanding and Enforcing Open Source and Free Software Licenses*, 20 Berkeley Tech. L. J. 443, 455–56 (2005). The term "copyleft" refers to the portion of the GPL that requires that any work derived from code licensed under the GPL can only be distributed under the GPL. An important consequence of this is that GPL code cannot be made proprietary.

33. *Id.* at 448.

34. *See, e.g.*, Christian H. Nadan, *Open Source Licensing: Virus or Virtue?*, 10 Tex. Intell. Prop. L. J. 349, 359–60 (2002) ("[I]f you incorporate some GPL code in your proprietary software product, arguably your whole proprietary product becomes open source and must be licensed by you under the GPL.").

35. *Id.*

36. *See* Licensee Violations and Compliance, http://www.fsf.org/licensing/compliance (last visited Jan. 13, 2009).

37. For the history of the formation of the OSI, see http://www.opensource.org/history (last visited Jan. 13, 2009).

38. Stallman, *supra* note 4, at 59 ("'[O]pen source' was designed not to raise [moral and ethical issues].").

39. History of the OSI, http://opensource.org/history (last visited Feb. 27, 2010).

40. Open Source Initiative, http://opensource.org (last visited Apr. 29, 2009).

tions."[41] Users may also modify the software, provided that they insert notices into each modified file describing the changes,[42] and provided that either the changes are made freely available or other arrangements are made with the copyright holder.[43] Users are also required to leave all original copyright notices and disclaimers untouched.[44]

The Artistic License is less ambitious than either the GPL or most OSI licenses. Instead of seeking to promote a philosophy or methodology, the Artistic License was designed largely to protect the Perl programming language.[45] Its objective is to allow "the Copyright Holder [to] maintain[ ] some semblance of artistic control."[46] To maintain this integrity, the license imposes conditions on those making modifications: they must indicate how to obtain the original code, and they must include "prominent notice" of when and how each change was made.[47] These restrictions reduce the likelihood that new projects will be "forked" from Perl, causing confusion or reducing the number of users or developers of the project.[48] In some respects, the original Artistic License appears to attempt to use copyright to pursue goals more appropriately achieved through trademark law, a fact that was noticed when the Artistic License was updated to version 2.0.[49]

III. BACKGROUND

A. Background Economics

This note examines open source through the lens of Law and Economics. The premise behind the Law and Economics movement is that economics provides "a scientific theory to predict the effects of legal sanctions on behavior."[50] This section introduces the two main economic phenomena relevant to open source: monopolies and the public goods problem.

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41. Artistic License Preamble, *available at* http://www.opensource.org/licenses/artistic-license-1.0.php (last visited May 11, 2010).

42. *Id.* ¶ 3.

43. *Id.* There are two other options (using a modified version only internally within a company, and renaming executables) which are not relevant to this note.

44. *Id.* ¶ 1. The License contains a variety of additional restrictions that are not relevant here. It was originally written to protect the "Perl" programming language. St. Laurent, *supra* note 6, at 91. Because of this, many of its terms only make sense in the context of the unique features of that language. Terms of the Artistic License not relevant to DecoderPro are not discussed in this note.

45. St. Laurent, *supra* note 6, at 91.

46. Artistic License Preamble. Essentially, Wall wanted to prevent others from making high-level changes to his project in ways he did not agree with. Additionally, he did not want others making changes or forks that would damage Perl's reputation and market share. *See* St. Laurent, *supra* note 6, at 173. This note uses the term "project integrity" to refer to these goals.

47. Artistic License ¶¶ 3–4.

48. *See* St. Laurent, *supra* note 6, at 94–95, 173. "Forking" is when an author starts a new project based on an existing open source project, creating two competing projects. The appearance of a second, similar project creates confusion for existing users who must decide which project to use in the future. Additionally, users may abandon the original project in favor of the new one, and new users or developers may choose the new project over the original. Since open source authors benefit in proportion to the number of users and developers they attract, forking is harmful to them.

49. *See* Perl6's License Should Be (GPL—Artistic-2.0), http://dev.perl.org/perl6/rfc/346.html (last visited Apr. 27, 2009) ("[D]ue to the limits of copyright law, no copyright license can be written that truly makes sure that 'If it's called Perl, it is Perl'. [sic] This is addressed best with trademark law.").

50. Robert Cooter & Thomas Ulen, Law & Economics 3 (5th ed. 2008). For more on Law and Economics, see generally Richard A. Ippolito, Economics for Lawyers (2005); Steven Shavell, Foundations of Economic Analysis of Law (2004).

Legal economic analysis looks at the impact of a law or regulation on some economic metric.[51] For individuals, this metric is consumer surplus.[52] The consumer surplus realized by an individual in a transaction is the difference between what that person was willing to pay and what they actually did pay.[53] For society at large, the relevant metric is "social welfare."[54]

1. Monopolies

A monopoly is a firm that, unlike a market participant (who is constrained by supply and demand) can fix its own prices.[55] The ability to avoid market pricing leads to two inefficiencies:[56] deadweight loss[57] and rent erosion.[58]

Monopolies are only possible when barriers to entry, typically either legal or technological, prevent competitors from appearing.[59] The major barriers to entry for software are intellectual property rights[60] and network effects.[61] Intellectual property rights allow proprietary firms to charge monopoly prices by barring others from taking certain competitive actions.[62] Network effects, on the other hand, make it easier for a monopoly to come into existence.[63] They exist where the nature of a product is such that the value of the product increases the more people use it.[64] Phone networks, railroads, and highway systems are examples of traditional networks.[65]

Once a monopoly arises, it attempts to maximize its profits.[66] It does this by finding the price where marginal revenue equals marginal cost.[67] After the point at

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51. Shavell, *supra* note 50, at 595–96.

52. It is perhaps more accurate to say that the individual metric is utility. *Id.* However, consumer surplus is the dollar value of utility, *see* Ippolito, *supra* note 50, at 74–75, and this note will generally consider effects on individuals in terms of consumer surplus.

53. Ippolito, *supra* note 50, at 48.

54. *See* Shavell, *supra* note 50, at 597. Although there is "a vast multitude of ways" of measuring social welfare, this note, like most discussions of social welfare, avoids this complication by generally assuming that social welfare is roughly correlated with consumer surplus. *See id.*

55. Ippolito, *supra* note 50, at 153–54.

56. Inefficiencies are situations where it costs more than it should to produce a given level of output. *See* Cooter & Ulen, *supra* note 50, at 17.

57. Deadweight loss is a loss to one person not offset by a gain to another. Ippolito, *supra* note 50, at 70.

58. This refers to a loss of surplus that results from competition to secure property rights. *Id.* at 164. For example, if several people perform similar research to obtain a patent, the duplicated work of the people who do not ultimately receive the patent is a form of rent erosion. *See id.* at 207.

59. *See* Cooter & Ulen, *supra* note 50, at 33–34.

60. *See* Bruce Abramson, *Promoting Innovation in the Software Industry: A First Principles Approach to Intellectual Property Reform*, 8 B.U. J. Sci. & Tech. L. 75, 83 (2002) ("IP protection . . . confers a monopoly on the holder of the IP rights.").

61. *See id.* at 118–19.

62. *See id.* at 92.

63. *See* Cooter & Ulen, *supra* note 50, at 135–36.

64. *See* Abramson, *supra* note 20, at 13.

65. *Id.*

66. *See* Ippolito, *supra* note 50, at 155.

67. *Id.* at 156. Marginal revenue is the amount of additional income generated by producing another product. *Id.* Marginal cost is the amount it costs to produce that additional product. Cooter & Ulen, *supra* note 50, at 26. For example, it might cost $1 to produce an additional copy of the article-writing program, but an additional $5 in profits could be made by producing it. Because the price a consumer is willing to pay decreases with additional consumption, marginal revenue decreases as well. *See* Ippolito, *supra* note 50, at 4. This is due to the phenomenon of diminishing marginal utility, which dictates that consumers attach higher values to initial units of consumption than to subsequent units. *Id.*

which these two are equal, marginal revenue is actually less than marginal cost, and the monopolist begins to lose money.[68] However, by setting the price this way, consumers who would have purchased the good for less are unable to purchase it at all. The loss of the consumer surplus that would have resulted from these sales is a deadweight loss.

2. The Public Goods Problem

The threat that cheap, widespread duplication poses to software is well known to economists: it is the public goods problem. Economists define a public good as any commodity which has large fixed costs and is both nonrivalrous and nonexcludable.[69] For example, a fireworks display is a public good: watching the fireworks does not leave less fireworks for others to watch, and preventing non-paying individuals from watching may be difficult or impossible. This provides temptation for people to be "free riders," i.e., to watch the fireworks without paying. The difficulty and expense of preventing free riders often results in the under-production of public goods.[70]

B. *Background Law*

An open source license is either a contract, a license, or both. This section provides the relevant law necessary to understand the legal consequences of any decision as to which group the license belongs to.

1. Contract Law

A contract is "[a]n agreement between two or more parties creating obligations that are enforceable or otherwise recognizable at law."[71] A contract becomes enforceable when parties to it manifest their assent to an exchange of promises or actions.[72] Contracts are enforced in actions for breach, which generally award either damages or specific performance to make the parties whole.[73] All of these areas can pose problems in the open source license context.

a. Transaction Costs

Transaction costs are costs incidental to exchanges.[74] Exchanges (and therefore transaction costs) can be broken down into three stages: searching for an exchange partner, negotiating a deal, and enforcing that deal.[75] Transaction costs tend to be low when goods or services are standardized, or when there are a small number of

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68. *See* COOTER & ULEN, *supra* note 50, at 26. In other words, when it costs $1 to produce another copy of the article-writing program but doing so would generate less than $1 of income, a monopolist will not produce the additional copy.

69. *See* IPPOLITO, *supra* note 50, at 195. A nonrivalrous good is one whose consumption by one person does not leave less for any other person. COOTER & ULEN, *supra* note 50, at 45. A nonexcludable good is a good for which it is prohibitively expensive to charge users for consuming. *Id.*

70. *See* Abramson, *supra* note 60, at 92–93.

71. BLACK'S LAW DICTIONARY 341 (8th ed. 2004).

72. RESTATEMENT (SECOND) OF CONTRACTS § 17 (1981) [hereinafter RESTATEMENT].

73. 24 RICHARD A. LORD, WILLISTON ON CONTRACTS § 64:1 (4th ed. 2002).

74. *See* COOTER & ULEN, *supra* note 50, at 91.

75. *Id.* at 91–92.

parties on good terms with one another.[76] Costs increase when the parties are unfriendly or unknown to each other, when there are many parties, or when the issues are complex.[77] Transaction costs are important both because they can reduce efficiency and because when they are too high, bargaining becomes impractical.[78]

Search costs are incurred in the formation and policing of contracts. From the user perspective, search costs are incurred in finding an appropriate open source product.[79] From the author's standpoint, search costs may be incurred in attempting to determine if license violations have occurred. This is so because an open source author is usually not aware of who is using his software.

Negotiation costs are incurred in specifying the conditions and consequences of the contract. In an ideal world, contracts would be "complete."[80] A complete contract is said to be pareto-efficient, meaning that no change could be made to it that would make it better to either party.[81] Because all relevant outcomes have been accounted for, the measure of damages for such a contract is immaterial.[82] Any circumstances that might cause a party to choose to breach the contract will be specified in the contract, along with the appropriate consequences.

Unfortunately, all contracts are incomplete.[83] The most obvious reason for this is that the cost of negotiating all relevant outcomes is unreasonably high.[84] Because of this, courts typically use expectation as a measure of damages to fill in the gaps for outcomes not explicitly addressed.[85] This measure is an efficient means of arriving at appropriate damage amounts without incurring excessive negotiation costs.

Finally, enforcing the contract incurs transaction costs. First, a court must determine if a contract was formed.[86] Courts must also interpret language (for example by deciding if a term is a covenant or condition) and fill in gaps.[87] If a contract has been breached, the court must determine what remedies are appropriate.[88] Because contract law is state law,[89] any of these issues may be subject to litigation in multiple states, subject to varying laws, and with varying results.

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76. *Id.* at 94. For example, a half-inch drill bit can easily be purchased at any hardware store, but a 3.141 millimeter drill bit would need to be custom made.

77. *Id.* These are examples of negotiation costs. It is easier to get two people to agree than ten or one hundred.

78. *See id.* at 95–96.

79. *See id.* at 92.

80. A contract is complete if it specifies outcomes for all relevant situations. *See* SHAVELL, *supra* note 50, at 292.

81. *See id.* at 293.

82. *See id.* at 342–43.

83. *See id.* at 299.

84. *See id.*

85. *See* SHAVELL, *supra* note 50, at 345 ("It has been seen that under the expectation measure . . . there will be performance in precisely the contingencies that would have been set out in a mutually optimal completely specified contract.").

86. To form a contract, there must be a manifestation of assent to the bargain. RESTATEMENT § 17(1). The most common ways to achieve this are by offer and acceptance or by acceptance by performance. *Id.* § 22. Offer and acceptance is convenient when the two parties negotiate face to face. *Id.* However, an offer may also be accepted by performance. *Id.* § 53. If open source licenses are contracts, they are offers which are accepted by performance. *See infra* Part V.B.1.

87. *See* COOTER & ULEN, *supra* note 50, at 217–20; SHAVELL, *supra* note 50, at 293.

88. *See* SHAVELL, *supra* note 50, at 304–09.

89. *See* RESTATEMENT (SECOND) OF CONFLICT OF LAWS § 188 (1971).

Transaction costs are the focus of Professor Ronald Coase's first article, *The Nature of the Firm*.[90] Coase theorized that transactions take place within firms when it is less costly than transacting in the marketplace.[91] This can happen when market transactions are costly, for example when participants must discover parties and prices and when they must negotiate and enforce contracts for each transaction.[92] These are precisely the types of costs incurred by open source authors trying to enforce their licenses under contract law. This suggests that, at least under a contract theory, software can be produced more efficiently by firms.

In *Coase's Penguin*, Professor Yochai Benkler expanded upon Coase's market/firm dichotomy, suggesting that peer production is a third major type of project organization.[93] Peer production enjoys substantial advantages in identification of resources for solving problems. Benkler divided these advantages into two types: information gains and allocation gains.[94]

The term "information gain" refers to the process of deciding how best to use human capital. Markets do this by turning uncertainties into valuations; firms do this by contracting in ways designed to reduce uncertainty. Both approaches facilitate efficient allocation of resources. Similarly, good peer production projects provide mechanisms for agents to see available opportunities and to select the task they are best suited to perform.[95] This is potentially more efficient than the market or firm approaches because it reduces search and negotiation costs. As Benkler observes, "an organization model that does not require contractual specification of effort but allows individuals to self-identify for tasks will be better at gathering and utilizing information about who should be doing what."[96]

The second advantage, "allocation gains," refers to the fact that firms are limited to using only their own employees and property. Firms incur transaction costs in finding and acquiring the people and property necessary to be productive.[97] Peer production projects are not limited this way, and can potentially draw on a much larger pool of innovators and resources. As Raymond notes, "[p]erhaps in the end the open-source culture will triumph . . . simply because the closed-source world cannot win an evolutionary arms race with open-source communities that can put orders of magnitude more skilled time into a problem."[98] By avoiding the transaction costs associated with property and contract that limit firms and markets, peer production projects can be more efficient.[99]

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90. Ronald H. Coase, *The Nature of the Firm*, 4 Economica 386 (1937).

91. *Id.* at 392.

92. *See* Stewart J. Schwab, *Coase's Twin Towers: The Relation Between the Nature of the Firm and the Problem of Social Cost*, 18 J. Corp. L. 359, 360–61 (1993).

93. Benkler, *supra* note 4, at 375–76.

94. *See id.* at 406–23.

95. *See id.* at 413.

96. *Id.* at 414.

97. *See id.* at 416.

98. The Social Context of Open-Source Software, http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/ar01s11.html (last visited Feb. 27, 2010).

99. *See* Benkler, *supra* note 4, at 377.

b. Remedies

A prevailing party in an action for breach will typically be able to recover monetary damages or obtain specific performance.[100] Damages are the most common remedy for breach,[101] and are awarded as either expectation damages, reliance damages, or restitution.[102] Expectation damages, which are the default measure of damages, attempt to put the party in the position it would have occupied had the contract been completed.[103] Reliance damages attempt to restore the party to the position he occupied before the contract.[104] Finally, restitution damages recover from a party amounts that that party obtained unjustly.[105]

Specific performance is awarded by an order preventing[106] or compelling the fulfillment of a promise.[107] However, restrictions against such relief are deeply ingrained.[108] To get a preliminary injunction, for example, a party must establish the likelihood of success on the merits, the likelihood of irreparable harm absent preliminary relief, that the balance of equities tips in his favor, and that the injunction is in the public interest.[109] Specific performance is more likely to be given in situations where obtaining the substantial equivalent of performance is difficult.[110]

In summary, contract law is efficient when the parties are known to each other and when monetary damages are an acceptable remedy for breach. However, the requirements of privity, the fact that the law varies on a jurisdiction-by-jurisdiction basis, and the difficulty of obtaining equitable relief can make contract law inappropriate for some types of agreements.

2. Copyright

Copyright is the second way to interpret an open source license. This section explains the utilitarian origins of American copyright law and how it is related to the problem of public goods. Enacted law, case law regarding licenses, and remedies for infringement are also discussed.

a. Origins and Theory

The copyright law finds its origin in the Constitution: "The Congress shall have power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[111] Its purpose, then, is to promote progress; it accom-

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100. LORD, *supra* note 73, § 64:1. However, such actions can only occur between contracting parties; persons not party to the contract generally can neither sue nor be sued for its breach. *See* E. ALLAN FARNSWORTH, CONTRACTS § 10.1, at 672 (3d ed. 1999).

101. JOHN D. CALAMARI & JOSEPH M. PERILLO, THE LAW OF CONTRACTS § 14.1, at 540 (4th ed. 1998).

102. *Id.* § 14.4, at 545.

103. *Id.*

104. *Id.* § 14.9, at 556.

105. *See* CALAMARI & PERILLO, *supra* note 101, § 15.2, at 600.

106. Orders preventing action are called injunctions. BLACK'S LAW DICTIONARY 800 (8th ed. 2004). A preliminary injunction is "[a] temporary injunction issued before or during trial to prevent an irreparable injury from occurring before the court has a chance to decide the case." *Id.*

107. *See* CALAMARI & PERILLO, *supra* note 101, § 16.1, at 612.

108. *Id.* at 613.

109. *See* Winter v. Natural Res. Def. Council, 129 S. Ct. 365, 374 (2008).

110. Anthony T. Kronman, *Specific Performance*, 45 U. CHI. L. REV. 351 (1978).

111. U.S. CONST. art. I, § 8, cl. 8.

plishes this by striking a bargain with authors giving them a limited monopoly in exchange for disclosure and dissemination of their works.[112]

While this bargain allows authors to derive income from their works, reward to the owner is secondary to the public interest in progress.[113] The economic philosophy behind the clause is the conviction that encouragement of individual effort by personal gain is the best way to advance the public welfare.[114] There is an inherent tension here, however, because greater protection reduces dissemination.[115] Striking the correct balance between protection and dissemination is a key problem in copyright law.[116]

b. Enacted Law

The first Copyright Act was passed by Congress in 1790 and largely resembled the law from England.[117] Since then, Congress has revisited copyright several times, and the scope of term and protection has steadily increased.[118]

Copyright law defines the scope of what is protected as "original works of authorship fixed in any tangible medium of expression."[119] Section 102 goes on to list eight categories of works that are protected, the most important of which for this note is "literary works."[120] Authors of protected works are granted the exclusive right to copy, distribute, or prepare derivative works of their copyrighted works.[121]

The most recent sweeping changes to copyright law came with the 1976 Copyright Act.[122] Important changes included preemption,[123] harmonization,[124] and divisibility and assignment of rights.[125] At about the same time, a National Commission on New Technological Uses of Copyrighted Works (CONTU) was created to study new technology, including software.[126]

The 1976 Act introduced language intended to abolish state copyright law. In particular, state law rights equivalent to any of the exclusive rights of § 106 were explicitly preempted.[127] The section provides three conditions which, if met, render

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112. *See* Stewart v. Abend, 495 U.S. 207, 228 (1990) (citing Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984)); *see also* Eldred v. Ashcroft, 537 U.S. 186, 260 (2003) (Breyer, J., dissenting).

113. Mazer v. Stein, 347 U.S. 201, 219 (1954) (quoting United States v. Paramount Pictures, 334 U.S. 131, 158 (1948)).

114. *Id.* at 219.

115. William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright*, 18 J. LEGAL STUD. 325, 326 (1989).

116. *Id.*

117. *See* BENJAMIN KAPLAN, AN UNHURRIED VIEW OF COPYRIGHT 25 (1967).

118. *See* ROBERT A. GORMAN & JANE C. GINSBURG, COPYRIGHT: CASES AND MATERIALS 6–9 (6th ed. 2002).

119. 17 U.S.C. § 102 (2006).

120. *Id.*

121. *See id.* § 106(1)–(3).

122. Pub. L. 94-553, 90 Stat. 2572 (1976).

123. Act of Oct. 19, 1976, Pub. L. 94-553, Title I, § 101, 90 Stat. 2572 (1976) (codified at 17 U.S.C. § 301 (2006)).

124. *See* Cardona, *supra* note 15, at 186–87. International law is especially relevant to open source licenses, which purport to govern worldwide use of software. Harmonization is therefore an important argument in favor of copyright protection for such licenses. However, the international law aspects of copyright are outside the scope of this note.

125. 17 U.S.C. § 201(d).

126. Act of December 31, 1974, Pub. L. No. 93-573, 88 Stat. 1873 (1974).

127. *See* 17 U.S.C. § 301.

a state law invalid: (1) the right protected by state law must be equivalent to any of the exclusive rights of § 106; (2) the right must be in a work of authorship fixed in a tangible medium; and (3) the work must come within the subject matter specified in §§ 102 and 103.[128]

On July 31, 1978, CONTU issued its final report, which focused almost entirely on the scope of copyright protection for computer programs.[129] In 1980, Congress passed a law adding a definition of computer programs to the copyright code: "A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."[130] This definition includes source and object code, and has been interpreted as adding software to works protected by copyright under § 106.[131]

c. Licenses

To obtain value from the exclusive rights, authors grant licenses. A license is "permission . . . to commit some act that would otherwise be unlawful."[132] However, because "a licensee infringes the owner's copyright if its use exceeds the scope of its license,"[133] the possession of a license does not authorize the licensee to take any and all actions, but only those actions within the scope of the license.[134] Although state law determines how the license is construed, a copyright license is presumed to prohibit any use it does not authorize.[135]

Sun Microsystems, Inc. v. Microsoft Corp.[136] involved a licensee trying to avoid injunction by characterizing part of the license as a covenant. When Sun tried to enjoin Microsoft from distributing non-compliant implementations of its Java programming language, Microsoft countered with the claim that the provisions in question were contractual covenants.[137] The court recognized the importance of the question, noting that "'[t]he rules for obtaining a preliminary injunction are less onerous [when the presumption of irreparable harm exists].'"[138] It concluded that whether a license term is a covenant or condition is a preliminary issue that must be decided before the presumption of irreparable harm can apply, and remanded to the district court to decide that issue.[139]

In *MDY Industries, LLC v. Blizzard Entertainment, Inc.*,[140] the Ninth Circuit faced the question of whether license provisions were contractual covenants or limitations on the scope of a license. At the outset, the court noted that use of the

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128. *Id.*
129. William Patry, *Copyright and Computer Programs: It's All in the Definition*, 14 Cardozo Arts & Ent. L.J. 1, 29 (1996).
130. Act of Dec. 12, 1980, Pub. L. 96-517 § 10(b), 94 Stat. 3015, 3028 (1980) (codified at 17 U.S.C. § 101 (2006)).
131. *See* Patry, *supra* note 129, at 30–32.
132. Black's Law Dictionary 938 (8th ed. 2004).
133. *See* S.O.S., Inc. v. Payday, Inc., 886 F.2d 1081, 1087–88 (9th Cir. 1989).
134. *See id.* at 1088.
135. *See id.*
136. 188 F.3d 1115 (9th Cir. 1999).
137. *Id.* at 1117.
138. *Id.* at 1122 (quoting Video Trip Corp. v. Lightning Video, Inc., 866 F.2d 50, 52 (2d Cir. 1989)).
139. *Id.*
140. No. CV-06-2555-PHX-DGC, 2008 WL 2757357 (D. Ariz. July 14, 2008).

software was controlled by both a contract and a license.[141] Looking to the purpose of the various clauses, the court was able to identify which parts of the license were limitations on scope.[142] Specifically, it found that the language "designed to preserve and protect Blizzard's proprietary interests in its software . . . , including its copyright interests"[143] was a limitation on scope. Language meant only to "regulate relatively minor matters" was deemed to operate in contract.[144] Having decided which language limited the scope of the license, the court needed only to determine whether the alleged infringer acted outside of that scope to decide the case.[145]

d. Remedies

Anyone who violates the exclusive rights of the copyright owner is an infringer.[146] Action for infringement may be brought by the owner of the exclusive right violated.[147] The main remedies available under the copyright law are damages (including statutory damages as well as actual damages and profits)[148] and injunctive relief.[149] Costs and attorney's fees are available at the court's discretion.[150]

The prevailing view is that the presumption of irreparable harm arises when the plaintiff makes out a prima facie case of infringement.[151] However, *eBay v. MercExchange*[152] points out that such rules are suspect. In *eBay*, the Supreme Court struck down a Federal Circuit case holding that patent owners are entitled to injunctive relief upon adjudication of patent validity and infringement.[153] A general rule of this type was not a proper test of when injunctive relief was available.[154] Instead, plaintiffs seeking such relief must demonstrate (1) that they have suffered irreparable injury, (2) that the remedies available at law are inadequate, (3) that, considering the balance of hardships between plaintiff and defendant, a remedy at equity is justified, and (4) that injunction would not be against the public interest.[155] Nevertheless, the nature of copyright infringement is such that the four factors are often met, and injunctions on the basis of infringement would likely continue even in the absence of the presumption of irreparable harm.

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141. *Id.* at *5.
142. *Id.* at *5–6.
143. *Id.* at *5.
144. *Id.* at *6.
145. *Id.* at *6–7.
146. *See* 17 U.S.C. § 501(a) (2006).
147. *See id.* § 501(b).
148. *See id.* § 504.
149. *See id.* § 502.
150. *Id.* § 505.
151. *See, e.g.*, Sun Microsystems, Inc. v. Microsoft Corp., 188 F.3d 1115, 1119 (9th Cir. 1999); Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1254 (3d Cir. 1983); Autoskill, Inc. v. Nat'l Educ. Support Sys., Inc., 994 F.2d 1476, 1487 (10th Cir. 1983); Atari, Inc. v. N. Am. Philips Consumer Elecs. Corp., 672 F.2d 607 (7th Cir. 1982), *overruled on other grounds by* Scandia Down Corp. v. Euroquilt, Inc., 772 F.2d 1423 (7th Cir. 1985); *see also* 4 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 14.06[A], at 14-126 n.21 (2008) (collecting authorities).
152. 547 U.S. 388 (2006).
153. *Id.* at 393–94.
154. *Id.* at 394.
155. *Id.* at 391.

IV. STATEMENT OF THE CASE

A. Facts

Plaintiff-Appellant Jacobsen is a professor of physics and a model train enthusiast.[156] As part of his hobby, Jacobsen managed an open source software group called the Java Model Railroad Interface (JMRI).[157] Jacobsen held copyright[158] in source code for software created by this group known as DecoderPro.[159] Decoder-Pro was made available free of charge on Sourceforge[160] under the Artistic License.[161]

Defendant-Appellee Katzer is CEO and Chairman of the Board of Kamind Associates, Inc. (KAM), a software company active in the model train market.[162] KAM offers a product, Decoder Commander, that competes with JMRI's DecoderPro.[163] Katzer obtained patents on technology allegedly contained in DecoderPro and attempted to enforce one of these patents by sending bills to Jacobsen demanding royalties.[164] Katzer later disclaimed the patent.[165]

Early in the litigation, it was discovered that files from DecoderPro had been incorporated into KAM's Decoder Commander.[166] However, KAM had not complied with the Artistic License: it had omitted author attribution, copyright notices, copies of the Artistic License, identification of the JMRI website, and descriptions of changes made to the DecoderPro files.[167] It also had changed file names without documenting the changes.[168]

Jacobsen registered his copyright in the DecoderPro files after the alleged infringement.[169] Upon being informed of the infringement claims, KAM voluntarily ceased all potentially infringing activities.[170]

B. Procedural Posture

Jacobsen sued for declaratory judgment of patent invalidity and to request an injunction based on copyright infringement.[171] The district court held that there was no cause of action for infringement and denied the request for injunctive re-

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156. Jacobsen v. Katzer, No. C 06-01905 JSW, 2007 WL 2358628, at *1 (N.D. Cal. Aug. 17, 2007).

157. Jacobsen v. Katzer, 535 F.3d 1373, 1376 (Fed. Cir. 2008).

158. For more about copyright, see Part III.B.2, *supra*.

159. *Jacobsen*, 535 F.3d at 1375–76.

160. SourceForge, http://www.sourceforge.net (last visited Feb. 27, 2010). SourceForge is a popular site for development and distribution of open source projects.

161. *Jacobsen*, 535 F.3d at 1376.

162. Jacobsen v. Katzer, No. C 06-01905 JSW, 2007 WL 2358628, at *1 (N.D. Cal. Aug. 17, 2007).

163. *Jacobsen*, 535 F.3d at 1376.

164. *Jacobsen*, 2007 WL 2358628 at *1.

165. Declaration of Katzer in Support of Defendant's Motion to Dismiss Counts 1, 2, and 3 in Plaintiff's Second Amended Complaint As Moot, Jacobsen v. Katzer, No. C06-1905-JSW (filed Feb. 12, 2008). A disclaimer is a renunciation of a patent claim. BLACK'S LAW DICTIONARY 496 (8th ed. 2004).

166. *Jacobsen*, 535 F.3d at 1376; *see also* JMRI Defense: Evidence KAM Copied from JMRI, http://jmri.sourceforge.net/k/copycomparison.html (last visited Feb. 23, 2009) (containing a comparison of, among other things, file versions, spelling errors, and capitalizations that are identical in KAM's files).

167. *Jacobsen*, 535 F.3d at 1376–77.

168. *Id.*

169. *Jacobsen*, 2007 WL 2358628 at *5.

170. *Id.*

171. *Jacobsen*, 535 F.3d at 1377.

lief.[172] Jacobsen appealed the order denying the motion for preliminary injunction to the Federal Circuit.[173]

KAM argued that because it had ceased the allegedly infringing actions the case was moot.[174] However, the district court disagreed, as it could not find as a matter of law that it was absolutely clear that the alleged behavior could not recur.[175]

C. The Lower Court's Ruling

The district court denied Jacobsen's motion for preliminary injunction.[176] To obtain an injunction, Jacobsen was required to show both probable success on the merits and the possibility of irreparable injury.[177] Jacobsen claimed that by removing the copyright and license information and not tracking changes, KAM had violated the Artistic License[178] and infringed Jacobsen's copyright.[179] Copyright infringement would create a presumption of irreparable harm, allowing Jacobsen to obtain an injunction.[180]

The court found that there was not a likelihood of success on the merits.[181] In particular, it noted that JMRI distributed its code under the Artistic License, which the court characterized as nonexclusive and intentionally broad:[182]

> Plaintiff's copyrighted decoder definition files are subject to an open source software license that permits potential licensees, members of the public who have access to the files on the internet, to make copies, distribute and create derivative works from the software, provided the licensees give proper credit to the JMRI Project original creators.[183]

Under California law, implicit in a nonexclusive license is the promise not to sue for copyright infringement.[184] The court reasoned that a claim for infringement was thus precluded, but that, if the license were to be construed as a contract, a claim for breach might still be available.[185]

Perhaps realizing it had ignored most of the conditions of the license, the court continued its copyright analysis. Since the existence of a license does not preclude infringement, infringement can still occur where the licensee's use exceeds the

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172. *Id.*

173. *Id.* at 1375. Federal Circuit jurisdiction was proper under 28 U.S.C. § 1292(c)(1) (2006) because the district court case was based in part on patent law. 28 U.S.C. § 1338(a).

174. *Jacobsen*, 2007 WL 2358628 at *5.

175. *Id.*

176. *Id.* at *7.

177. *Id.* at *5.

178. Amended Complaint for Declaratory Judgment, Violations of Copyright and Federal Trademark Laws, Unfair Competition, and Unjust Enrichment ¶ 41, Jacobsen v. Katzer, No. C 06-01905 JSW (N.D. Cal. Jan. 5, 2009).

179. *Id.* ¶ 100.

180. *Jacobsen*, 2007 WL 2358628 at *5.

181. *Id.* at *7.

182. *Id.* at *6–7.

183. *Id.* at *6.

184. *Id.*

185. *Id.* This finding is called into question by the court's willingness, both here and on remand, to find that copyright law preempts state law claims. *See id.* at *2–3; *see also* Order Granting Motion To Dismiss for Mootness; Denying in Part and Granting in Part Motion To Dismiss for Failure To State a Claim; Denying Motion To Strike; and Denying Motion for Preliminary Injunction at 7–8, Jacobsen v. Katzer, No. C 06-01905 JSW (N.D. Cal. Jan. 5, 2009).

scope of the license.[186] Focusing again primarily on what the license allowed (not what it prohibited), the court correctly observed that the license was quite broad.[187] However, once again the court limited its analysis of the conditions of the license to the attribution requirement, simply stating that "[t]he condition that the user insert a prominent notice of attribution does not limit the scope of the license."[188] The court ruled that a claim for the breach of such a condition should be brought under contract law, not copyright law.[189] Under this reasoning, Jacobsen had not shown a likelihood of success on the merits, and injunction was not available.[190]

D. The Federal Circuit Opinion

Jacobsen appealed the denial of preliminary injunction to the Court of Appeals for the Federal Circuit.[191] On appeal, the Federal Circuit framed the issue broadly as "the ability of a copyright holder to dedicate certain work to free public use and yet enforce an 'open source' copyright license to control the future distribution and modification of that work."[192]

The court set up its opinion by providing an overview of public licenses and their goals. Public licenses "are used by artists, authors, educators, software developers, and scientists who wish to create collaborative projects and dedicate certain works to the public."[193] To illustrate the scope of work subject to these licenses, the court provided several examples. One public license, the Creative Commons license, applies to more traditional copyrightable material (pictures, literature, etc.) and is estimated to be used for over 100,000,000 works, including all courses at the Massachusetts Institute of Technology.[194] Additionally, the Wikimedia Foundation, through its popular website wikipedia.com, licenses some 9,000,000 articles written by more than 75,000 authors.[195]

Open source licenses are public licenses specific to software. The court provided examples of open source software, including the Firefox[196] web browser, the GNU/Linux operating system,[197] and the Apache[198] web server.[199] The court explained that authors distribute such valuable software for free in exchange for non-monetary economic benefits.[200] In particular, authors gain new contributors[201] and can

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186. *Jacobsen*, 2007 WL 2358628 at *7.

187. *Id.*

188. *Id.*

189. *Id.*

190. *Id.*

191. *Jacobsen*, 535 F.3d 1373, 1375 (Fed. Cir. 2008).

192. *Id.*

193. *Id.* at 1378.

194. *Id.*

195. *Id.*

196. Firefox is used by approximately 20 percent of all web surfers. *See* Browser Market Share, http://marketshare.hitslink.com/browser-market-share.aspx?qprid=0 (last visited Feb. 1, 2009).

197. Accurate Linux server usage statistics can be difficult to find. IDC estimates Linux had a 13.6 percent share of revenues for servers in 2008. *See* IDC Press Release, http://www.idc.com/getdoc.jsp?containerId=PRUS21703309 (last visited Mar. 2, 2009).

198. Apache powers approximately one half of all websites in the world. *See* Netcraft, January 2009 Web Server Survey, http://news.netcraft.com/archives/2009/01/16/january_2009_web_server_survey.html (last visited Feb. 1, 2009).

199. *Jacobsen*, 535 F.3d at 1378.

200. *Id.* at 1379.

201. *Id.* at 1382. Users will sometimes become authors if they feel they have something to contribute.

achieve faster and less expensive development, increased market share, improvements or suggestions for improvements, and enhanced reputation.[202] To secure these benefits, open source licenses enforce certain terms that ensure that downstream users are informed of the identity of the author and the terms of the license.[203]

Having laid out a policy basis for protecting open source, the court proceeded to what it considered the "heart of the argument": whether the terms of the Artistic License were conditions of the license or covenants to it.[204] If they were conditions, as Jacobsen contended, they would limit the scope of the license and would be governed by copyright law.[205] However, if the copyright protected no economic value, it might be unenforceable.[206] If, on the other hand, the terms were only covenants, they would be governed by contract law.[207]

Examining the language of the license, the Federal Circuit determined that the terms were conditions.[208] The court looked to California contract law to determine that language such as "provided that" creates a condition, not a covenant.[209] Furthermore, it found that these conditions are "vital to enable the copyright holder to retain the ability to benefit from the work of downstream users."[210] Because copyright licenses are designed to support the right to exclude, money damages are not a sufficient remedy; however, a copyright holder can grant certain rights while retaining others.[211] This, the court noted, is "exactly the purpose of adding conditions to a license grant."[212]

Turning its attention to the policy issues at stake, the court presented the economic case for protecting open source with copyright law:

> Copyright holders who engage in open source licensing have the right to control the modification and distribution of copyrighted material . . . . The choice to exact consideration in the form of compliance with the open source requirements of disclosure and explanation of changes, rather than as a dollar-denominated fee, is entitled to no less legal recognition. Indeed, because a calculation of damages is inherently speculative, these types of license restrictions might well be rendered meaningless absent the ability to enforce through injunctive relief.[213]

Finally, the court returned its attention to the case before it. Having concluded that the Artistic License was enforceable in copyright, the court observed that

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202. *Id.* at 1379.
203. *Id.*
204. *Id.* at 1380. A covenant is simply a promise made in a contract. *See* BLACK'S LAW DICTIONARY 391 (8th ed. 2004). A condition is "an uncertain act or event that triggers or negates a duty to render a promised performance," and might apply to either a contract or a license. *Id.* at 312.
205. *Jacobsen*, 535 F.3d at 1380.
206. *Id.* at 1380–81. This is the "moral rights" argument. Because this argument is particular to the Artistic License and is also outside the scope of the economic analysis, it is not discussed in this note.
207. *Id.* at 1380.
208. *Id.* at 1381.
209. *Id.*
210. *Id.*
211. *Id.* at 1381–82.
212. *Id.* at 1382.
213. *Id.* at 1381–82.

KAM "appears to have conceded that they did not comply" with the conditions.[214] However, as the district court had not made findings of fact regarding the likelihood of success on the merits of the copyright claim, the Federal Circuit remanded with instructions to determine whether the copyright claim could satisfy the requirements for injunction.[215]

V. ANALYSIS

According to the Federal Circuit, "[o]pen source licensing has become a widely used method of creative collaboration that serves to advance the arts and sciences in a manner and at a pace that few could have imagined just a few decades ago."[216] This would undoubtedly be sufficient to justify the protection of open source under the Constitution; however, the Federal Circuit frames its argument in economic, not constitutional, terms, observing that the Artistic License contains "significant economic goal[s] of the copyright holder that the law will enforce":[217]

> Traditionally, copyright owners sold their copyrighted material in exchange for money. The lack of money changing hands in open source licensing should not be presumed to mean that there is no economic consideration, however. There are substantial benefits, including economic benefits, to the creation and distribution of copyrighted works under public licenses that range far beyond traditional license royalties.[218]

This section examines the economic interests at stake, whether those interests justify the protection of open source, and if so, what protection is warranted.

A. Open Source Increases Social Welfare

From the standpoint of economics, protection is only deserved if open source increases social welfare.[219] This section demonstrates that open source provides substantial benefits to users and authors.

The most obvious benefit of open source is to the individuals and firms that get the benefit of the software at no cost.[220] Free Software and Open Source licenses permit users to access software for free and to use that software as they see fit. Unless open source harms the entire field of software development, this alone justifies protecting it. Additionally, because source code is available and can be modified, products can easily be made compatible with one another. This inherent compatibility makes it difficult for an individual or firm to extract profits from any network effects that develop.[221] Also, because network effects develop fastest

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214. *Id.* at 1382–83.
215. *Id.* at 1383.
216. *Id.* at 1378.
217. *Id.* at 1382.
218. *Id.* at 1379.
219. *See* Abramson, *supra* note 60, at 109.
220. *See, e.g.*, RICHARD STALLMAN, *The GNU Manifesto*, in FREE SOFTWARE FREE SOCIETY: SELECTED ESSAYS OF RICHARD M. STALLMAN 31, 34 (2002); Open Source Definition (Annotated), http://www.opensource.org/docs/definition.php (last visited Apr. 27, 2009) (prohibiting licenses from requiring fees and mandating that source code be available at little or no charge).
221. *See* Abramson, *supra* note 60, at 138–39.

when goods are available to the greatest number of people, users may benefit most from them when software is free.

Significant benefits also accrue to authors. Originally, when he started the Free Software movement, Richard Stallman hoped to build a "new software sharing community."[222] Stallman quickly realized he could make a living providing consulting services related to his open source products.[223] Indeed, consulting, ads, books, and support are now the most obvious avenues of monetization for authors.[224] The Federal Circuit opinion catalogs numerous additional indirect economic benefits available to authors. For example, it notes that releasing code as open source software can enhance a programmer's reputation.[225] In addition, releasing code often results in bug fixes, ideas, and contributions from a very skilled community,[226] allowing open source projects to be written and debugged faster and more cheaply than proprietary software.[227] Some of these advantages build network value.[228] Additionally, firms can generate market share by distributing some components free of charge.[229] Ultimately, the *Jacobsen* court felt these economic motives were worthy of protection.

Benefits also accrue to authors of derivative or even competing works. For example, authors of competing works will incur fewer total costs when they jointly work on common code as open source.[230] Furthermore, by indicating a set of conditions under which software can be used, open source reduces the cost of using existing works, thus facilitating innovation.[231]

Finally, benefits accrue to the public. Many governments are looking to open source for their needs.[232] For example, the government of Peru mandated open source products to ensure that citizens had free access to public information, that such information did not become obsolete when proprietary file formats were no longer supported, and to increase the security of citizens and the government.[233] Governments also turn to open source to decrease acquisition and maintenance costs, and to reduce the chance of being locked in to specific vendors.[234] Increased innovation, discussed below,[235] is also viewed as a benefit to the public.

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222. STALLMAN, *supra* note 24, at 18–19.

223. *Id.* at 48.

224. *See* Benkler, *supra* note 4, at 424–25.

225. *Jacobsen*, 535 F.3d at 1379.

226. *Id.* at 1378–79, 1382.

227. *Id.* at 1379.

228. *See id.* (quoting Planetary Motion, Inc. v. Techsplosion, Inc., 261 F.3d 1188, 1200 (11th Cir. 2001)) ("[A]s the Software improved, more end-users used his Software, thereby increasing . . . the likelihood that the Software would be improved further.").

229. *Id.*

230. Ernan Haruvy et al., *Competition with Open Source as a Public Good*, 4 J. INDUS. & MGMT. OPTIMIZATION 199, 209 (2008).

231. *Cf.* Landes & Posner, *supra* note 115, at 332.

232. *See* Jyh-An Lee, *New Perspectives on Public Goods Production: Policy Implications of Open Source Software*, 9 VAND. J. ENT. & TECH. L. 45 (2006).

233. ABRAMSON, *supra* note 20, at 197.

234. Lee, *supra* note 232, at 70–73. Because source is available to be used or modified, vendors cannot use secret or protected formats to prevent competitors from making compatible products.

235. *See infra* note 258 and accompanying text.

Open source increases social welfare by conferring significant benefits to users, authors, and the public. Because of these benefits, it deserves protection to the extent necessary to ensure optimal production.

B. Copyright Protection Is Preferable to Contract for Open Source Licenses

As *Jacobsen* makes clear, the choice between enforcing licenses in contract or in copyright is a critical one. This section examines the implications of each choice, looking especially at the remedies available under each theory.

This note restricts itself to the modest idea of protecting open source by means of enforcing existing licenses under copyright law.[236] Because many believe that current intellectual property protection for software is excessive,[237] various authors have examined radical reform.[238] Such reform may be the best answer; however, transition costs, which may well be huge,[239] pose substantial challenges to radical reform.[240] In contrast, protecting open source licenses under copyright is likely to have minimal transition costs,[241] yet, by acting as a counterbalance to the overprotection of proprietary software, retains the potential for a significant social benefit.

1. Enforcement of Open Source Licenses in Contract Is Inadequate

The enforcement of open source licenses as contracts presents a number of difficulties.[242] However, even assuming that these difficulties can be overcome, contract law is still inadequate as a method of achieving the benefits of open source.

a. Expectation Damages Are Useless in the Open Source Context

By fixing damages for nonperformance, contracts allow parties to take actions in expectation of future performance.[243] These actions can raise the value of contracts for both parties.[244] Viewed as a contract, the goal of the open source license is to secure future compliance with the license terms in return for the release of the source code and the granting of rights to make and distribute changes to the code. On one side, open source authors rely on the license being enforceable in deciding to release the code. On the other side, creators of derivative works rely on having a right to modify the code.

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236. Changes to intellectual property regimes come in two forms: conservative and radical. *See* Abramson, *supra* note 60, at 110–11. Conservative reform consists generally of small changes to existing laws, for example changing the length of copyright terms. An example of radical reform would be creation of an entirely new form of legal protection for software separate from copyright law.

237. *Id.* at 136 ("[T]he combined copyright and trade secret protection . . . provides software developers with protection that is broader than conventional copyrights, possibly deeper than conventional copyrights, and of effectively infinite length.").

238. *See, e.g.*, Pamela Samuelson, Randall Davis, Mitchell D. Kapor & J. H. Reichman, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 Colum. L. Rev. 2308 (1994).

239. Abramson, *supra* note 60, at 90, 154.

240. *Id.* at 112.

241. *Id.* ("[T]he closer the new rights are to the existing set, the smaller the necessary transition costs.").

242. *E.g.*, Cardona, *supra* note 15, at 192–204 (discussing the difficulties in enforcing the GPL in contract).

243. Shavell, *supra* note 54, at 310.

244. *Id.* at 310. However, it is possible to have too much reliance. *See id.* at 358 n.26.

Clearly, open source authors are not bargaining for financial gain. Instead, as discussed above,[245] what they are seeking ranges from integrity of the project, to indirect appropriation of benefits, all the way to effecting social change. Whether enforcement of public licenses in contract is sufficient to ensure authors receive what they bargained for depends upon what remedies are available when a downstream author breaches the license.

Because authors are bargaining for indirect benefits, it is difficult to measure their damages when the license, viewed as a contract, is breached. As the Federal Circuit noted, "[b]ecause a calculation of damages is inherently speculative, these types of license restrictions might well be rendered meaningless absent the ability to enforce through injunctive relief."[246] However, the strong presumption towards monetary damages in contract actions can make injunctive relief difficult to obtain.[247] Even when a party can show probable success on the merits, it must also show the possibility of irreparable injury; however, this can be difficult for an author who gives his work away at no charge.

The use of expectation damages thus presents a difficulty to open source authors. Because they do not charge for their work, it is easy for courts to conclude that their expectation damages should be zero.[248] Indeed, the parties in *Jacobsen* agreed that "there might be no way to calculate any monetary damages under a contract theory."[249] Awarding expectation damages would essentially permit downstream users to violate open source licenses with impunity, thereby eliminating the consideration relied upon by authors in choosing to release code as open source. This would ultimately have the effect of seriously undermining the entire open source licensing model.

b. Enforcement of Open Source Licenses in Contract Imposes Excessive Transaction Costs

In addition to the lack of adequate remedies, enforcement in contract adds substantial transaction costs. First, open source licenses are intended to bind large numbers of parties. The costs of negotiation increase as the number of parties increases. These parties may be in different jurisdictions, which will have different laws governing contracts. Additionally, simply identifying the contracting parties could pose substantial search costs. Second, from the perspective of the user, once an open source product has been found, the user must examine its license to determine whether the benefit of using the product exceeds the cost of complying with the license terms. If the user is willing to comply with the license in return for use of the product, a bargain has been made and there is sufficient consideration.[250]

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245. *See supra* Part III.A.2.

246. Jacobsen v. Katzer, 535 F.3d 1373, 1382 (Fed. Cir. 2008).

247. *See* 24 LORD, *supra* note 73, § 64:1.

248. *See* Jacobsen v. Katzer, No. C 06-01905 JSW, 2007 WL 2358628, at *3 (N.D. Cal. Aug. 17, 2007) ("Because [the code was made] available for free, there was not an expectation of compensation.").

249. *Jacobsen*, 535 F.3d at 1383 n.6.

250. *See* RESTATEMENT §§ 71–79. The requirement of consideration mandates that each party bargain for the performance or return promise they receive. Consideration need not be of equivalent value to what is bargained for. *Id.* § 79 cmt. a. It can even be a promise, if the action promised would itself be consideration. *Id.* § 75.

Open source, which is simply peer produced software, enjoys reduced transaction costs due to the information and allocation gains inherent in peer production. Enforcement of licenses in contract, however, effectively reinstates the transaction costs that peer production avoids. Because contract law also provides insufficient or even meaningless remedies, open source authors will be less likely to release software under this regime, resulting in under-production of open source and a missed opportunity to increase social welfare.

2. Copyright Provides a More Desirable Means of Protection

The alternative to enforcement under contract law is enforcement in copyright. The very term "license" suggests copyright, and indeed, most authors have assumed that the various open source licenses would be read under copyright law and not contract law.[251] This section examines the costs and benefits of using copyright law to interpret open source licenses.

Software, even proprietary software, is for all intents and purposes a public good. Because software is easily copied and distributed, it can be used essentially by everyone, and is perfectly nonrivalrous. Additionally, because of the difficulty in protecting software,[252] authors can generally prevent only honest users from benefiting from software without paying, making software effectively nonexcludable. As CONTU observed, "if the cost of duplicating information is small, then it is simple for a less than scrupulous person to duplicate it. This means that legal as well as physical protection for the information is a necessary incentive if such information is to be created and disseminated."[253] CONTU tried to ameliorate this public goods problem by protecting software under the copyright laws.

Copyright has had only limited success addressing the public goods problem for proprietary software. Unfortunately, copyright protection only renders software excludable to the extent that users respect the copyright. Unscrupulous users can still pirate the code. Because proprietary software authors only distribute object code, the incentive to innovate suffers to the extent that users pirate the object code. Many authors do quite well under these conditions (for example, Microsoft). If proprietary authors were forced to release their source code, however, pirates could easily use it to make derivative works, or could make the proprietary software freely available. The combination of increased license enforcement expenses and likely price erosion would reduce the profit motive and ultimately result in less innovation.

By eschewing direct appropriation, open source sidesteps these issues. Open source authors do not attempt to prevent people from using their source code. Instead, they impose minimal obligations on downstream authors of derivative works to protect their ability to appropriate value indirectly. This greatly reduces the costs they must incur to exclude prohibited uses of their software. In fact, such costs are limited to the occasional costs of litigating cases like *Jacobsen*.

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251. For example, the GPL states that users "are not required to accept this License . . . [h]owever, nothing else grants [users] permission to modify or distribute the Program or its derivative works." GPL ¶ 5.

252. *See supra* note 21 and accompanying text.

253. Nat'l Comm'n on New Technological Uses of Copyrighted Works, Final Report of the National Commission on New Technological Uses of Copyrighted Works 10 (1978).

Enforcing open source licenses in copyright also reduces transaction costs. Because there is no requirement for consideration, parties do not need to seek out one another and negotiate. Furthermore, because copyright law is federal, and indeed enjoys some degree of international harmonization, authors and users alike avoid the need to determine the meaning of the license in numerous jurisdictions.

Furthermore, the availability of injunction under copyright protects the benefits sought by open source authors. As discussed above, different licenses attempt to achieve different goals. However, the licenses are similar in that all seek to facilitate indirect appropriation of benefits from projects. The least ambitious is the Artistic License, which simply seeks to ensure project integrity. Next, Open Source licenses seek integrity and rapid development. Finally, the GPL seeks all of the above, but also attempts to proscribe the direct appropriation of benefits from the software. While money damages under contract law cannot ensure these goals are achieved, the injunctive relief available under copyright law is well adapted to providing this sort of protection.

Accordingly, copyright is a natural fit for open source. First, the goals of compliance are best achieved through injunctive relief. Because a copyright holder is entitled to the presumption of irreparable harm, this is easier to obtain under copyright. Second, the availability of statutory damages can help fund litigation, which might otherwise be a problem for projects that generate no income. Finally, copyright law is uniform throughout the states, and even enjoys some degree of international harmonization.[254] Enforcing licenses in copyright thus gives the information and allocation gains their greatest scope, increasing surplus for projects suited to peer production.

3. The Costs of Enforcing Open Source in Copyright Do Not Outweigh the Benefits

Enforcement of open source licenses in copyright law is not without its disadvantages. The lengthy terms of copyright protection and the restrictive conditions imposed by some licenses deserve to be carefully considered. In addition, by providing software at no charge, open source may reduce profit incentives for firms, potentially reducing or changing the type of innovation that occurs. This section examines these potential problems.

Copyright terms are considered excessively long for software.[255] Current copyright protection lasts for a minimum of seventy years, or approximately the amount of time computers have existed. Software becomes obsolete in much less time. The Supreme Court has recently cleared the way for even longer terms, further exacerbating the problem.[256] Such an extreme imbalance in the length of protection would ordinarily be detrimental to the public, which benefits from the disclosure of intellectual property in return for the limited monopoly of intellectual property rights. However, this imbalance is mitigated for open source. Because source is distributed and many licenses allow liberal use of the source code, the

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254. Cardona, *supra* note 15, at 186–87.

255. Abramson, *supra* note 60, at 136.

256. *See* Eldred v. Ashcroft, 537 U.S. 186 (2003).

effects of lengthy copyright terms are mostly felt by authors who would like to use open source in their proprietary projects.

Another potential downside to enforcement of open source licenses in copyright is that it would strengthen the GPL's copyleft clause. Copyleft has been criticized for reducing open source adoption rates and increasing transaction costs by creating legal uncertainties.[257] Indeed, disagreement over copyleft was an important reason for the creation of the OSI. Authors who do not want their code to be subject to GPL often must recreate software that already exists. They must also be careful to avoid having their project infected by copyleft. However, if all open source licenses were copyleft-free, open source authors could borrow from one another without incurring this cost. The existence of copyleft all but ensures that interesting or valuable open source projects will be written twice. Like competition for patent monopolies, this duplication of effort is a deadweight loss. However, to the extent that authors are currently avoiding the GPL, this cost is already being incurred.

Open source also creates difficulty for proprietary firms that would like to charge monopoly prices for software. The availability of high quality open source products makes it difficult for firms to charge profitable prices for proprietary software, thereby threatening that proprietary software will disappear where open source is successful. Users who would have preferred to pay for the proprietary software, perhaps because it better addressed their needs, experience a loss in consumer surplus due to this reduction in alternatives. However, where an open source product is successful, the increased surplus experienced by users of the free product may outweigh the inability of some users to purchase a slightly different commercial product.

Nonetheless, pressure on proprietary firms could result in a reduction in innovation. Innovation is regarded as a social benefit because "most societies value the gains from [innovation] more than they fear its destructive effects."[258] By creating intellectual property rights, society allows innovators to profit from their ideas. Society is willing to fund this profit because it believes the increased innovation is of greater value.[259] At least one author contends that even a reduction in the ability to extract monopolistic terms reduces innovation.[260] Of course, some innovation is likely to occur even when there is no profit to be had.[261]

A more likely consequence of the reduced profitability of proprietary software is that the type of innovation that takes place would be changed. Most open source is written by sophisticated users, for sophisticated users.[262] As a consequence, it has been most successful when addressing the rather specialized needs of those users.[263] In contrast, proprietary firms maximize profits when they address widely

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257. Greg R. Vetter, *"Infectious" Open Source Software: Spreading Incentives or Promoting Resistance?*, 36 RUTGERS L.J. 53, 152 (2004).

258. COOTER & ULEN, *supra* note 50, at 120–21.

259. Abramson, *supra* note 60, at 94.

260. *See id.* at 147–48. Because the marginal cost of software is zero, all commercial software uses monopoly pricing to some extent. The question is whether the price (both in terms of monopoly price and in terms of surplus lost to rent erosion) exceeds what society is willing to pay for the innovation embodied in the software.

261. *See* Benkler, *supra* note 4, at 424–25.

262. *See* Schmidt & Schnitzer, *supra* note 5, at 485–86.

263. *Id.*

felt consumer needs. Thus, proprietary developers have a "strong profit motive to identify the needs of consumers through market research and to develop software that satisfies those needs."[264] To the extent that open source is able to make proprietary development unattractive, the needs of unsophisticated consumers are unlikely to be met. This could explain why Linux has succeeded so well on the server side, but has been unable to make significant inroads with desktop users, who overwhelmingly choose Microsoft or Apple products.[265]

Of course, it could simply be the case that some projects are better suited to peer production than to firms or markets. Benkler has characterized peer production as a third method of organizing labor that complements markets and firms,[266] suggesting that just as firms come into existence when it is possible for them to use property more efficiently than a market could use it, peer production emerges when inexpensive communication between a large set of people creates gains that exceed the costs of not having a market or firm.[267] In this case, success of an open source project at the expense of proprietary software would not represent a social cost, but simply the choice of the most efficient organizational model for solving the problem.

The potential costs of enforcing open source in copyright are not as bad as they initially seem. Excessive copyright terms, although problematic for proprietary software, are less formidable when source code is available under public license. Changes in the amount or quality of innovation appear unlikely as consumers will continue to be willing to pay for innovation not provided by open source authors. Even the most serious problem, the duplication of effort by authors who do not want to be constrained by copyleft, is no worse than the rent erosion problems that have long been tolerated in the patent system. Because these potential costs are far outweighed by the benefits of open source, the question becomes not whether to protect open source licenses, but how.

C. The Best Way to Provide Copyright Protection to Open Source Licenses Is to Amend the Copyright Statutes

The *Jacobsen* decision did not fully address the problems facing open source licenses. Although it is tempting to view *Jacobsen* as standing for the proposition that open source licenses are enforceable in copyright, the case is better read as limited to its facts. The question before the court was directed neither at open source software nor at the broader movement toward peer production. Instead, the court was tasked with applying California law to interpret the quirky, relatively uncommon Artistic License. It is possible that future cases will extend the *Jacobsen* holding to other licenses; however, it is also possible that future courts will once again focus on the damages issue. A more complete solution than *Jacobsen* is

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264. *Id.* at 485.

265. *See, e.g.*, Greg R. Vetter, *Exit and Voice in Free and Open Source Software Licensing: Moderating the Rein over Software Users*, 85 Or. L. Rev. 183, 198–99 (2006) (explaining that while Linux has captured a large market share of internet infrastructure, it has lagged behind on the desktop, where it is not generally perceived as equivalent to Windows).

266. Benkler, *supra* note 4, at 412.

267. *Id.* Benkler is restating, in a more rigorous way, Eric Raymond's maxim that "given enough eyeballs, all bugs are shallow." The implications of peer production as a third archetype of project organization are discussed in Part IV.C.2, *supra*.

needed. Given the overwhelming benefits of open source, this question should not be left to chance.

Amending the copyright law to ensure that open source licenses are enforceable in copyright would provide a foundation that authors could rely upon. Because open source developers have always presumed that their licenses would be enforced under copyright law, such an addition would merely codify existing expectations. This codification would also ensure that authors can continue to enjoy the economic benefits recognized by the Federal Circuit in *Jacobsen*. However, just as the district court failed to recognize the scope of these benefits, the Federal Circuit's holding, necessarily concentrating on the facts before it, also failed to address the full scope of the issue. A statutory presumption protecting public licenses would benefit not only software, but potentially all peer produced intellectual property subject to the copyright laws. This already includes substantially more than just software, and promises to increase dramatically in the near future. Such a presumption would not only be consistent with the Federal Circuit's desire to protect the economic rights inherent in indirect appropriation, but would also be a great leap forward in promoting progress in the sciences and useful arts.

The most natural place to insert such a change is in 17 U.S.C. § 301. This statute preempts state law for matters of federal copyright. A provision preempting state law in favor of copyright law for open source licenses would fit naturally there. Such a provision should be designed to make it clear that open source licenses are governed by federal copyright law, not state contract principles.

Of course, such a law would need to define which public licenses are covered. This could be addressed most simply by extending the protection to licenses approved by the OSI. Protection could be extended to FSF licenses if copyleft is not considered too objectionable. However, the negative effects of copyleft suggest that caution should be exercised in protecting it. Alternatively, Congress might choose to sanction open source licenses on a case-by-case basis, or perhaps even to develop a national open source license. Discussion need not be limited to software, but might also include copyrightable content covered by other peer production licenses. For example, protection could be extended to photographs or other media licensed under the Creative Commons. This is only a starting point for discussion of what material might be protected; a full examination of this topic is beyond the scope of this note.

VI. CONCLUSION

Open source software confers substantial benefits to society. In return for these benefits, authors, through open source licenses, ask only for the minimal protection necessary to secure to them the ability to indirectly appropriate value from their work. Unfortunately, enforcement of these licenses in contract renders them meaningless.

The Federal Circuit's opinion in *Jacobsen* contained sweeping language to the effect that open source licenses are enforceable in copyright. However, given the underlying facts, this language is not essential to the holding, which seems to rely instead on California contract law. Only time will tell which rationale courts will apply as different licenses are litigated in the future.

Protection should not be limited to the Artistic License or even to open source. Public licenses allowing authors to indirectly appropriate value provide incentives for innovation. Promoting such innovation is squarely within Congress's power. Statutory changes facilitating such protection represent an easy step that could benefit everyone.