Ownership Still Matters: IP in the Open Source Generation

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I. Introduction

Free or Open Source Software (FOSS) is widely misunderstood, and many people think that there are no legal implications given its name. Because laws regulate activity, it is necessary to understand what activities are currently at play in the FOSS community. Freely sharing and developing software was the original model for software licensing.[1] For example, AT&T Bell Laboratories developed the Unix operating system in the 1960s.[2] Because of AT&T's market power, the US Justice department prohibited AT&T from profiting on Unix.[3] In response, AT&T released the source code, the human-readable format, under licensing terms that allowed users to modify and redistribute it, which in turn led to Unix's mass adoption and popularity.[4] Then, in 1983, the Justice department lifted the prohibition.[5] In turn, AT&T commercialized Unix and restricted the distribution of Unix to only object code, the machine-readable format.[6] In 1984, Richard Stallman began the GNU (GNU's Not Unix) project, which brought FOSS back into the software developing community.[7] Linux launched in 1991 from an open source project and quickly became a mainstream success.[8] In 1993, Tim Berners-Lee, creator of the World Wide Web at CERN, and others advocated for CERN to open source the underlying code for the World Wide Web.[9] Open sourcing the World Wide Web sparked rapid innovation in the Internet.[10] In 1998, Netscape coined the term "open source software" when it distributed the source code for Mozilla, the web browser, in hopes of people finding and fixing software bugs.[11] In a way, the modern internet was born as FOSS.[12]

The underlying concept behind FOSS is that users should be free to modify, copy, update, fix, add to, and distribute the source code freely with others.[13] The key themes that emerge out of the open source community are openness, noncredentialism, verifiable and reversible contributions, clear outcomes, and self-organization.[14] The FOSS community is open to everyone

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[1] Heather Meeker, Open Source Licensing: What Every Technologist Should Know, OPENSOURCE.COM (Sept. 21, 2017), http://opensource.com/article/17/9/open-source-licensing.
[2] Id.
[3] Id.
[4] Id.
[5] Id.
[6] Id.
[7] Joel West and Jason Dedrick, Open Source Standardization: The Rise of Linux in the Network Era, KNOWLEDGE, TECHNOLOGY, & POLICY 14, no. 2, 88, 98(2001).
[8] Id.
[9] History of the Web, WORLD WIDE WEB FOUNDATION, http://webfoundation.org/about/vision/history-of-the-web/ (last visited Sept. 16, 2017).
[10] Id.
[11] West and Dedrick, supra note 7, at 89, 100.
[12] See History of the Web, supra note 9.
[13] Richard Stallman, Why Open Source Misses the Point of Free Software, GNU OPERATING SYSTEM, http://www.gnu.org/philosophy/open-source-misses-the-point.en.html (last visited Sept. 16, 2017).
[14] ANDREW MCAFEE AND ERIK BRYNJOLFSSON, MACHINE, PLATFORM, CROWD: HARNESSING OUR DIGITAL FUTURE, 241 (ebook).

regardless of credentials or experience.[15] With more contributors looking at the software, the crowd can verify or reverse other people's work based on the clear outcome that the project was designed to do.[16] By allowing people to work on their projects and self-organize, there is decentralized control over the project.[17] These underlying concepts and themes appear to put FOSS at odds with traditional intellectual property rights and theories.

As the usage of open source software has become more ubiquitous, the open source universe has also become more litigious. Now that open source software is packaged inside of virtually every commercial product, people are applying the same mechanisms of legal enforcement as those with proprietary, closed source software. The two legal claims for relief that are most common to open source disputes are copyright infringement under intellectual property law and breach of contract under contract law. Intellectual property is often thought of as a limited monopoly because it gives the owner an exclusive right for a limited time to exclude others from using their invention.[18] The underlying notion of rewarding creators with the right to exclude others from using their creation incentivizes others to innovate as well.[19] While intellectual property law seems like the natural legal theory to base a software dispute on, contract law also plays a part.[20] Simply because FOSS is referred to as free or open does not mean that it is necessarily free from costs or that it comes without licensing terms.[21] Because many companies are not sufficiently aware of the legal ramifications of improperly using FOSS, legal issues will continue.

Part I of this paper outlines what FOSS is. Part II explains FOSS in relation to intellectual property and the various FOSS licenses that are in use. Part III explores the changing nature of FOSS as enterprises have become both users and contributors to open source. Part IV details recent legal developments enforcing the conditions of FOSS licenses signaling to the community that it is a bad idea to go against the openness that these licenses afford users. Finally, Part V looks forward at new developments in the FOSS community.

II. What is Open Source

While there is no agreed-upon definition of FOSS, FOSS is software that is licensed or distributed to the public in a way that satisfies any of the ten criteria set by the Open Source Initiative or any version of the Free Software Foundation's definition.[22] Mainly, the source code must be freely redistributed so that anyone can modify, copy, update, fix, add to, and distribute

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[15] Id. at 241-242.
[16] Id. at 243.
[17] Id.
[18] KURT M. SAUNDERS, INTELLECTUAL PROPERTY LAW: LEGAL ASPECTS OF INNOVATION AND COMPETITION 4-5 (2016).
[19] Id. at 4.
[20] See Artifex Software, Inc. v. Hancom, Inc., No. 16-CV-06982-JSC, 2017 WL 4005508, at *1 (N.D. Cal. Sept. 12, 2017); see also Jacobsen v. Katzer, 535 F.3d 1373, 1380 (Fed. Cir. 2008) (holding that failure to comply with a FOSS copyright license is copyright infringement).
[21] Stallman, supra note 13.
[22] See The Open Source Definition, OPEN SOURCE INITIATIVE, http://opensource.org/osd (last updated Mar. 22, 2007).; see also Stallman, supra note 13 (noting the common misunderstandings regarding the definition of free and open source software).

the source code freely with others regardless of personal attributes, abilities, or affiliations.[23] Because the open source community uses the word "free," it is often misinterpreted as zero cost.[24] In practice, it is more appropriate to think of it as "free speech," not "free beer."[25]

Perhaps the best and most widely used example of open source is Linux.[26] In 1991, Linus Torvalds posted on a messaging board, "I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu…I'd like to know what features most people would want. Any suggestions are welcome, but I won't promise I'll implement them."[27] While Torvalds could have bought a commercial operating system (OS), he wanted to create an OS that was free to view, modify, redistribute, and receive open feedback from the community.[28] Originally licensed under the GNU GPLv2 license, Linux can be found in almost every product that uses software today.[29]

Equally important to a brief introduction on the history of FOSS is an understanding of how collaboration mainly takes place in the FOSS community today. Collaborations primarily take place through GitHub, a site that software developers use to collaborate on code and manage their projects.[30] The collaboration utilizes git, which is a version control system that facilitates working with others and tracks file changes.[31] Git is a free and open source project that was created by Linus Torvalds and is licensed under the GNU GPLv2.[32] While Git is a command line tool, GitHub is the interface that serves as the hub that stores the projects in repositories on the site.[33] A repository, or repo, contains all of the project files and stores each file's revision history.[34] Repositories can have multiple collaborators and can be either public or private.[35]

When you create a repository, the default branch is called the master branch.[36] A branch is a parallel version of a repository.[37] It is contained within the repository, but it does not affect the primary or master branch, which allows you to work freely without disrupting the "live"

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[23] Stallman, supra note 13.
[24] Id.
[25] Id.
[26] MCAFEE ET AL., supra note 14, at 240.
[27] Linus Benedict Torvalds, What Would You Like to See Most in Minix, COMP.OS.MINIX, http://groups.google.com/forum/#!msg/comp.os.minix/dlNtH7RRrGA/SwRavCzVE7gJ.
[28] MCAFEE ET AL., supra note 14, at 240.
[29] Id.
[30] Klint Finley, What Exactly Is Github Anyway, TECHCRUNCH (Jul. 14, 2012), http://techcrunch.com/2012/07/14/what-exactly-is-github-anyway/.
[31] Seth Kenlon, What is Git?, OPENSOURCE.COM (Jul. 7, 2016), http://opensource.com/resources/what-is-git.
[32] Git – Fast, Scalable, Distributed Revision Control System, GIT, http://github.com/git/git/blob/master/README.md (last updated Mar. 1, 2017).
[33] Finley, supra note 32.
[34] Id.
[35] Cameron Rambert, What is Git and GitHub: A Summary of Terms and Definitions, COREDNA, http://www.coredna.com/blogs/what-is-git-and-github-part-two (last updated May 29, 2017).
[36] Id.
[37] Id.

version.[38] The branch you are working on is commonly referred to as the downstream while the upstream is the original.[39] When done making your changes, you can merge them with the master.[40] When you make a change to a file, it is called a commit, which creates a unique ID, or a hash, that allows everyone to track the changes made.[41] If you want to make changes to a repository without affecting the original or you do not have write access to the project, you can fork the repository.[42] Forks remain attached to the original, allowing you to submit a pull request to the original's author to notify him of your changes.[43] Pull requests are proposed changes to a repository submitted by a user and accepted or rejected by the repository's collaborators.[44] If the changes are accepted, the original creators merge your changes with the original repository.[45] You can also keep your fork up to date by pulling in updates from the original.[46] Pulls are when you pull in changes and merge them with your copy.[47] These terms and workflows represent some of the concepts a common user of GitHub encounters.

GitHub is not just for software. As a version control system and repository hub, there are many use cases when multiple people are collaborating on the same document or want to share their documents with the public. For example, Cooley, LLP, a law firm, created a repository for some Series Seed legal documents on GitHub so startups and investors may use the documents.[48] Cooley released the documents under the Creative Commons 1.0 Universal Public Domain Dedication license.[49] Also using GitHub as a document release tool to the public, GitHub, as a company, recently its latest employee IP agreement in recognition of how the core themes and concepts of open source play a role in their employees' lives.[50] Aptly named, the Balanced Employee IP Agreement (BEIPA) covers all forms of IP and allows the employee to retain control of the IP that they create in their free time.[51] The new agreement also does not extend past the employee's period of employment with the company.[52] Like Cooley, GitHub released the agreement under Creative Commons 1.0 Universal Public Domain Dedication License for others to use in their employee IP agreements.[53]

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[38] Id.
[39] Id.
[40] Id.
[41] Id.
[42] Finley, supra note 32.
[43] Id.
[44] Id.
[45] Id.
[46] Rambert, supra note 37.
[47] Id.
[48] Brad Newman, Announcing New Series See Convertible Note and Updated Equity Financing Documents and Generator, COOLEY GO, https://www.cooleygo.com/announcing-new-series-seed-equity-and-note-financing-documents-and-generators/ (last visited Sept. 16, 2017).
[49] Id.
[50] Id.
[51] Id.
[52] Id.
[53] Id.

III. Intellectual Property in Open Source

Simply because the source code is available to the public does not mean that it comes without any form of protection.[54] The broad understanding is that software is a work of authorship.[55] In the traditional sense, software can be protected by copyrights and trade secrets while the implementation or system is patentable.[56] Traditional IP protection gives one person the exclusive right to use and exclude others from using their work.[57] Exclusive rights do necessarily always run counter to the inclusive and open collaboration nature of FOSS.[58] As such, FOSS uses open licensing agreements in recognition of the value of open sourcing and to preserve certain rights regarding how the software may be used.[59]

A. Copy what?

Copyright is "a set of exclusive rights granted to authors as to the ownership and use of their creative work."[60] The work must be a work of authorship, fixed in a tangible medium, demonstrate some minimal level of creativity, and represent the expression of the idea rather than simply the underlying idea itself.[61] Moreover, copyrights do not have to be registered to be legally effective.[62] Once the work is created, it is protected by copyright law.[63] The duration of protection lasts for the life of the author plus 70 years.[64] Copyright law protects both literary and non-literary elements of a piece of work.[65] Applied to software, if the developer or developers of original software code creatively and originally fixed the work in a tangible medium, then the software is a work of authorship.[66] The source code and the object code are the literary elements.[67] The sequence, structure, and organization are the non-literary elements.[68] Therefore, software is subject to the scope of protection of traditional copyright upon the creation of the code.[69] Even though copyrights protect software, there may be instances when there is only one

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[54] No license, CHOOSEALICENSE.COM, http://choosealicense.com/no-license/ (last visited October 1, 2017).
[55] See SAUNDERS, supra note 18, at 299.
[56] Joshua Simmons, Software IP – It's Not Just for Tech Cos. Anymore, LAW360 (Aug. 3, 2017, 2:37 PM), http://www.law360.com/articles/947616/software-ip-it-s-not-just-for-tech-cos-anymore.
[57] SAUNDERS, supra note 18, at 2.
[58] Gideon Myles, How to Participate in Open Source While Maintaining IP Integrity, IPWATCHDOG (Sept. 13, 2017), http://www.ipwatchdog.com/2017/09/13/how-to-participate-in-open-source-while-maintaining-ip-integrity/id=87858/.
[59] Id.
[60] SAUNDERS, supra note 18, at 259.
[61] Id. at 262, 266.
[62] Id. at
[63] Id. at
[64] Id. at 261.
[65] Id. at
[66] Id. at
[67] Id. at 299.
[68] Id.
[69] Id. at 299.

or a limited number of ways to express the underlying idea of the program.[70] When this is the case, the merger doctrine protects creators from infringement because the expression of the idea merged with the underlying idea itself.[71]

With an understanding of the limitations of traditional copyright law, the FOSS community takes a different approach to protecting their work.[72] The common view is that the best way to make software freely available is to upload it to the public domain without any copyright protection.[73] The problem is that some people are opportunistic.[74] Rather than continuing to contribute to the software, people exploit the opportunity to turn someone else's work into proprietary software and then sell it without the consumer ever knowing the difference.[75] As a means, all FOSS licenses address opportunism in some way.[76] FOSS has two overarching categories of licenses: permissive licenses and copyleft licenses.[77] A permissive license allows users to freely use the software and create derivative works provided that they give attribution to the original developers of the licensed code that they use.[78] By contrast, the copyleft licenses adds a few more conditions to its licensing terms.[79] Copyleft allows for derivative works to be created but requires those works to be released under the same license as the original work.[80] In doing so, the copyleft license ensures that the software will remain freely accessible.[81] The copyleft license tries to remove the opportunism discussed above while still maintaining the open source core concepts by incentivizing others to contribute to the software.[82]

While there are hundreds of FOSS licenses, only a few licenses account for a majority of open source projects.[83] The most widely used FOSS licenses is the MIT license, a permissive license.[84] The MIT license is a concise agreement. The license permits, free of charge, a licensee to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software" provided the software displays a copy of the MIT license, copyright notice, and a disclaimer for all warranties and damages.[85] In effect, this license allows for the reuse of the licensed software within

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[70] Id.
[71] Id. at 293.
[72] Greg Vetter, Opportunistic Free and Open Source Development Pathways, 30 HARV. J. L. & TECH. 167, 188 (2017)
[73] Id.
[74] Id.
[75] Id.
[76] Id.
[77] Id.
[78] Id.
[79] Id.
[80] Id.
[81] Id.
[82] Id.
[83] Top Open Source Licenses, BLACK DUCK, http://www.blackducksoftware.com/top-open-source-licenses (last visited Oct. 1, 2017).
[84] Id.
[85] MIT License, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/MIT (last visited October 1, 2017).

proprietary software provided a copy of the MIT license terms and its copyright notice are included.[86] Even though the license is a permissive license, it is compatible with many other copyleft licenses including the GPL.[87]

The second most widely used FOSS license is GNU's GPL. The GPL is a copyleft license and has two versions: GPLv2 and GPLv3.[88] The GNU GPLv2 is also one of the most widely used FOSS licenses.[89] The GPLv2 grants a licensee the permission to copy, modify, and distribute the software on the condition that the licensee also publishes their work under the GPL.[90] Because of the condition to also publish one's work under the GPL, the license is often referred to as a viral license.[91] Addressing patents, the GPLv2 states that a licensor not in compliance with the license cannot distribute their program and charging a patent royalty is not consistent with the license.[92] The GPLv2, first released in 1991, also specifies that the licensor has the option to follow any later version of the GPL license released by the Free Software Foundation.[93] In 2007, the Free Software Foundation did just that and released the GPLv3.[94] The purpose was to fix certain loopholes and to promote more usage of the license. Unlike the GPLv2, the GPLv3 expressly prohibits patents and includes a wide-ranging patent license.[95]

The Apache License 2.0, a permissive license, specifically addresses a licensee's rights regarding copyrights, patents, and trademarks.[96] The license allows for the worldwide, non-excusive, free of charge and royalty right to reproduce, create derivative works, publicly display or perform, sublicense, and distribute the licensed work. Under the licensing agreement, it is important to track your modifications. Intentionally submitted modifications are implicitly under the Apache License of the original work. Along with being compatible with the GPLv3, the Apache license is a recommended FOSS license for those wanting mass adoption of their project including closed software and are not concerned about having access to modified versions unlike the GPL.[97]

The BSD License comes in two forms that are both very short. One BSD License is BSD 2-Clause "Simplified" or "FreeBSD" License and the other BSD License is BSD 3-clause "New"

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[86] See id.
[87] Various Licenses and Comments about Them, GNU OPERATING SYSTEM, https://www.gnu.org/licenses/license-list.en.html#GPLCompatibleLicenses (last visited Oct. 16, 2017).
[88] GNU General Public License, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/gpl-license (last visited October 1, 2017).
[89] Top Open Source Licenses, supra note 83.
[90] GNU General Public License version 2, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/GPL-2.0 (last visited October 1, 2017).
[91] Id.
[92] Id.
[93] Id.
[94] GNU General Public License version 3, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/GPL-3.0 (last visited October 1, 2017).
[95] Id. at Section 11.
[96] Apache License, Version 2.0, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/Apache-2.0 (last visited October 1, 2017).
[97] Various Licenses and Comments about Them, supra note 89.

or "Revised" License. Both forms of the license allow for the redistribution of source or object code with or without modifications if it contains the required copyright notice as well as the conditions and disclaimers listed in the license. Additionally, if redistributed in object form, it reproduces the previous mentioned requirements. The BSD 3-clause only adds one more stipulation that the copyright holder or the names of the contributors cannot be used to endorse the derivative works for the licensed software without specific permission.[98]

The GNU Lesser General Public License (LGPL) has three versions: LGPL 2, LGPL 2.1, and LGPL 3. The LGPL is commonly describe as a weak copyleft license because it permits collaboration with proprietary software without making the proprietary software subject to a copyleft license.

The Artistic License 2.0 allows anyone to copy and distribute verbatim copies of the licensed material.[99] A key difference with the Artistic License is that changes are not allowed.[100] Therefore, the creator maintains some control over the development of the software while still making it publicly available.[101]

When working with FOSS, every project does not necessarily have a license attached to it.[102] Although hosting platforms like GitHub may allow people to view and fork code without a license, it does not mean that you have permission from the creator to use, modify, or share their software.[103] By default, the work is under copyright protection.[104] In recognition of this problem, GitHub launched CHOOSEALICENSE.COM to help users pick a license for their projects.[105] If this problem arises during the course of business, there are three general options: ask the maintainers of the code to add a license, negotiate a licensing agreement, or don't use the code.[106]

B. Trademarks

A trademark is a source identifier in "the form of a word, phrase, symbol, design, or a combination of such that allows consumers to distinguish between different merchants."[107] Trademarks also represent a merchant's goodwill.[108] In order to obtain a trademark, the mark must be affixed to the product and already used in the sale of goods or services.[109] The mark

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[98] The 3-Clause BSD License, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/BSD-3-Clause (last visited October 1, 2017).
[99] Artistic License 2.0, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/Artistic-2.0 (last visited October 1, 2017).
[100] Id.
[101] Id. at Preamble.
[102] 2017 Open Source Security & Risk Analysis, BLACK DUCK, https://www.blackducksoftware.com/open-source-security-risk-analysis-2017 (last visited Sept. 29, 2017) (finding that 53% of the applications analyzed had "unknown" licenses).
[103] Simon Phipps, GitHub Finally Takes Open Source Licenses Seriously, INFOWORLD (Jul. 15, 2013), http://www.infoworld.com/article/2611422/open-source-software/github-finally-takes-open-source-licenses-seriously.html.
[104] Id.
[105] Id.
[106] No license, supra note 156.
[107] SAUNDERS, supra note 18, at 470.
[108] Id.
[109] Id. at 473.

must also be distinctive, furthering the source-identifying function, and nonfunctional so other merchants are not prohibited from using practical features of a product.[110] Once filed and approved by the United States Patent and Trademark Office (USPTO), the mark is protected nationally.[111]

FOSS projects, compared to traditional corporations, require more planning around handling the project's trademarks. The issue in particular is that US trademark law does not recognize multiple owners of a trademark.[112] FOSS projects are developed through the inclusion of others.[113] Often, there is no single owner of the project.[114] There is often a single repository that is be controlled by an individual or group.[115] When individuals are acting together, the project may be considered a common law partnership.[116] Legal entities have also been formally established to serve as the owners of a FOSS project's trademarks. For example, the Linux Foundation is the owner of trademarks from its numerous projects.[117] Trademark law is focused on source identification that ensures consistent quality of goods.[118] As seen with some of the FOSS licensing terms regarding attribution or display of license, source identification as a way to ensure quality is important. Therefore, a trademark strategy should be established at the onset of a project if it is intended to be widely used.

C. Patents

A patent is an inventor's right to exclude others from using his or her invention during the 20 year duration of the patent.[119] In order to be patent eligible, the invention must be patentable subject matter, useful, novel, nonobvious, and have an adequate written description as to embodiment.[120] By publicly disclosing the invention and in recognition of the inventor's efforts, an inventor is given patent protection for a limited time over the invention[121] Society also receives a social benefit by having access to the invention to create new inventions derived from the full disclosure of the innovation.[122]

Becoming more common in FOSS are royalty free (or zero-rate royalty) patent licenses. Under this licensing scheme, the license provides the licensee with broad access to patented technology at no cost.[123] In return, the patent holder expects some non-monetary gain from an

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[110] Id.
[111] Id.
[112] Pamela S. Chestek, Who Owns the Open Source Project Name, 103 THE LAW JOURNAL OF THE INT'L TRADEMARK ASS'N 1240, 1240 (2013).
[113] Id. at 1244.
[114] Id. at 1245.
[115] Id. at 1246.
[116] Id. at 1263-64.
[117] The Linux Foundation's Trademarks, THE LINUX FOUNDATION, http://www.linuxfoundation.org/trademark-usage/. (last visited Oct. 16, 2017).
[118] Chestek, supra note 114, at 1260.
[119] SAUNDERS, supra note 18, at 97.
[120] Id.
[121] Id.
[122] Id.
[123] Eli Greenbaum, Puzzles of the Zero-Rate Royalty, 27 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1, 7 (2016).

obligation in the licensing agreement or from the sale of complementary goods.[124] For example, Tesla, Google, and IBM have made patent pledges to not assert their patent rights over certain patents.[125] The agreements allow for users to use the enumerated patents royalty free and without fear of patent infringement lawsuits.[126] First announced in 2005, IBM's patent pledge is a commitment to not assert about 500 enumerated patents against the open source community.[127] Intended to be legally binding and enforceable, IBM states that the pledge can be terminated against any person that files a lawsuit against any open source software.[128] Google also has an open patent pledge with similar terms.[129] The Google Open Patent Pledge differs in that it can be terminated against any person that files any patent infringement lawsuit against Google, a Google affiliate, or a Google product or service.[130] In 2014, Elon Musk announced that Tesla would join the open source movement by pledging patents to advance electric vehicle technology.[131] Musk wrote, "Technology leadership is not defined by patents, which history has repeatedly shown to be small protection indeed against a determined competitor." [132]Tesla's pledge that it "will not initiate patent lawsuits against anyone who, in good faith, wants to use our technology."[133] Accordingly, a party is "acting in good faith" if the party has not brought a patent claim against Tesla or another electronic vehicle technology company or copied "the design or appearance of a Tesla product or which suggests an association with or endorsement by Tesla."[134]

While some companies are open sourcing their patents, companies looking to patent proprietary software should be cognizant of the FOSS licenses used in that software.[135] Noted in the Copyright section above, different FOSS licenses come with different terms and conditions. For example, charging a patent royalty for software that is also under the GPLv2 license is a violation of the license.[136] The licensor can only charge the licensee for the cost of transferring the software.[137] The GPLv3 is more hostile to patents stating, "Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent

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[124] Id. at 3.
[125] Id at 13-15.
[126] Id.
[127] IBM Statement of Non-Assertion of Named Patents Against OSS, IBM, http://www.ibm.com/ibm/licensing/patents/pledgedpatents.pdf (last visited Oct. 1, 2017).
[128] Id.
[129] Open Patent Non-Assertion Pledge, GOOGLE, https://www.google.com/patents/opnpledge/pledge/ (last visited Oct. 1, 2017).
[130] Id.
[131] Elon Musk, All Our Patent are Belong to You, TESLA BLOG (June 12, 2014), http://www.tesla.com/blog/all-our-patent-are-belong-you.
[132] Id.
[133] Id.
[134] Patent Pledge, TESLA (June 12, 2014), http://www.tesla.com/about/legal#patent-pledge.
[135] Paul Keller and Sue Ross, A Few Things to Consider Before Patenting Blockchain Tech, LAW360 (Sept. 27, 2016, 12:57 PM), http://www.law360.com/articles/843185/a-few-things-to-consider-before-patenting-blockchain-tech.
[136] Id.
[137] Id.

claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version."[138] The GPLv3 provisions are prompted by anyone conveying or propagating the code, which is especially troubling for distributed software systems like Blockchain.[139] While the MIT and BSD licenses do not mention patents, the Apache 2.0 license explicitly includes patents.[140] If a company receives a patent for its contribution to the Apache licensed work and asserts their patent against someone else, the company loses the right to use the Apache 2.0 licensed code for itself.[141] Without an understanding, a company could expend significant resources in obtaining a patent that the underlying free or open source software might condition that it is given away freely without patent protection.[142]

D. Trade Secrets

Trade secret law can be an alternative legal protection for innovations that may not be protectable by patent or copyright law.[143] However, limitations around the extent of trade secret protection exists. A trade secret is information that "derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and is the subject of efforts that are reasonable under the circumstances to maintain its secrecy."[144] Information that is widely known by the public or within a specific industry does not qualify for trade secret protection.[145] Additionally, the owner must make a reasonable effort under the circumstances to maintain the trade secret's relative secrecy.[146] By not divulging the source code, companies maintain trade secret protection over its software. For example, Apple uses more than 200 open source projects throughout its product offerings.[147] Obviously, the key components that make Apple's software unique are not open to the public. Further, many of the components may not be novel, unique, original, or creative.[148] However, trade secret protection exists in the unique arrangement of the components separate from any other considerations about copyrights or patents.[149] Once the trade secret is disclosed, all trade secret protection is lost.[150]

Clearly, trade secret protection is at odds with FOSS where the point is to openly share the source code with others. In order to maintain trade secret protection, companies should formulate early on in the development process a policy for separating proprietary software from open sourced software. Not understanding open source licenses could be detrimental to a company's trade secrets.

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[138] GNU General Public License version 3, supra note 94.
[139] Keller and Ross, supra note 135.
[140] Id.
[141] Id.
[142] Id.
[143] SAUNDERS, supra note 18, at 25.
[144] UNIF. TRADE SECRETS ACT § 1(4) (amended 1985), 14 U.L.A. 433 (1990).
[145] SAUNDERS, supra note 18, at 28.
[146] Id. at 35.
[147] APPLE OPEN SOURCE, http://opensource.apple.com (last visited Oct. 16, 2017).
[148] SAUNDERS, supra note 18, at 27.
[149] Id. at 27.
[150] Id. at 23.

IV. Enterprises Adopt and Contribute to Open Source

FOSS is no longer exclusively for the software hobbyist or only software companies. Software now touches all aspects of a company. Companies using FOSS are able to get to market faster, lower development costs, and increase innovation.[151] Even companies as highly innovative as Facebook and Apple use open source projects.[152] Many of Facebook's projects are licensed under a BSD + Patents license.[153] The BSD + Patents license is a copyright usage license with an additional patent license provided that the licensee does not sue the licensor for patents infringement.[154] In effect, Facebook retains the copyright over React.js but agrees to make the source code open.[155] As well, the licensee to any patent under this license cannot sue Facebook for patent infringement.[156] If the licensee does sue, the licensee's patent rights are automatically revoked.[157] When the company announced that it would license React.js under a similar licensing scheme, the company received criticism from the open source community.[158] In response, Facebook agreed to license React.js under the MIT license.[159]

Apple, a notoriously secretive company, maintains OPENSOURCE.APPLE.COM and releases some source code every year as its operating systems (OS) utilize hundreds of various open source projects.[160] In recognizing the power of the developer community having access to certain projects, Apple also open sourced its Swift language and its XNU (XNU is not Unix) kernel for iOS and macOS. Swift is the language used to develop apps for iOS, Mac, Apple TV, and Apple Watch. By open sourcing Swift, more developers are able learn the programming language and spend time creating apps specifically developed for Apple products.[161] The ability to open source certain components of a tech company's products allows the company to monetize on better complementary products.

Software is not limited to pure technology companies. As internet connected devices proliferate or a company's internal software needs grow, open source projects are used to meet this demand. For example, in 2016, Walmart's research division released OneOps, an open

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[151] 2017 Open Source Security & Risk Analysis, supra note 104.
[152] See FACEBOOK OPEN SOURCE, https://code.facebook.com/projects/ (last visited Oct. 16, 2017); see also APPLE OPEN SOURCE, supra note 149.
[153] Adam Wolfe, Explaining React's License, FACEBOOK OPEN SOURCE (Aug. 18, 2017), http://code.facebook.com/posts/112130496157735/explaining-react-s-license/.
[154] BSD+Patent, OPEN SOURCE INITIATIVE, http://opensource.org/licenses/BSDplusPatent (last visited Oct. 16, 2017).
[155] See id.
[156] See id.
[157] Id.
[158] Wolfe, supra note 155.
[159] Id.
[160] See Romain Dillet, Apple Open-Sourced the Kernel of iOS and macOS for ARM Processors, TECHCRUNCH (Oct. 1, 2017), http://techcrunch.com/2017/10/01/apple-open-sourced-the-kernel-of-ios-and-macos-for-arm-processors/.
[161] See Jacob Kastrenakes, Apple's New Programming Language Swift is Now Open Source, THE VERGE (Sec. 3, 2015, 11:20 AM), http://www.theverge.com/2015/12/3/9842854/apple-swift-open-source-released.

source cloud management and application lifecycle management platform.[162] Also in 2016, BMW caught a headline after a user requested a copy of the GPL licensed source code used in BMW's i3 car.[163] In 2011, ExxonMobil developed a developer toolkit for oil and gas companies to adopt standard data formats.[164] It is clear that FOSS has brought about changes to traditional companies that would not have been considered technology companies in the past. These are just brief examples of how companies leverage FOSS to create products.

V. Key Legal Developments

Even though FOSS has grown in popularity, compliance with FOSS licenses remains low.[165] As previously mentioned, think "free speech," not "free beer."[166] The growth of litigation is a cause for concern in the FOSS community. What started as developers seeking to enforce the FOSS license requirements has turned into complex litigation. In light of the changing lawsuits, the common theme throughout the brief history of FOSS litigation is that ignorance of one's obligations is not a legal defense.

A. Jacobsen v. Katzer

Perhaps the most notable FOSS case is Jacobsen v. Katzer, which was the first U.S. case that contemplated the enforceability of a FOSS license. Filed in 2006, the case put forward the issue of whether failure to comply with the licensing terms of open source software constitutes copyright infringement.[167] In Jacobsen, the licensor sued a licensee for infringing the Artistic License attached to his open source project that allowed train hobbyist to control their model training using a computer.[168] Katz, the licensee, sold a commercial product that incorporated Jacobsen's, the licensor, software without complying with the Artistic License.[169] Interpreting the Artistic license, the District Court decided that the Artistic License allowed for the right to use the copyrighted material subject to contractual restrictions.[170] On appeal, the Federal Court held that a licensee can be liable for copyright infringement if the copyright license includes preconditions to its grant.[171]

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[162] Frederic Lardinois, Wlmart Launches OneOps, an Open-Source Cloud and Application Lifecycle Management Platform, TECHCRUNCH (Jan. 26, 2016), http://techcrunch.com/2016/01/26/walmart-launches-oneops-an-open-source-cloud-and-application-lifecycle-management-platform/.

[163] Simon Sharwood, BMW Complies with GPL by Handing Over i3 Car Code, THE REGISTER (Mar. 30, 2016, 8:40 PM), http://www.theregister.co.uk/2016/03/30/bmw_complies_with_gpl/.

[164] Klint Finley, Open Source Won. So, Now What, WIRED (Aug. 11, 2016), http://www.wired.com/2016/08/open-source-won-now/.

[165] 2017 Open Source Security & Risk Analysis, supra note 104 (finding that 85% of the applications analyzed were out of compliance with parts of the licenses used).

[166] Stallman, supra note 13.

[167] Jacobsen, 535 F.3d 1373, at 1380.

[168] Id. at 1375-76.

[169] Id.

[170] Id. at 1376.

[171] Id. at 1381-82.

The distinction between a contract and a license is important for FOSS especially for available forms of relief.[172] A contract creates covenants and if the FOSS license is only a set of contractual covenants, then injunctive relief is barred.[173] If the copyright licenses uses both covenants and conditions to limit the scope of another's use of the copyrighted material, then then unlicensed activities constitute copyright infringement making injunctive relief possible.[174] The conditions of the Artistic License, like other copyright licenses, contain covenants and conditions to define the scope of the license.[175] The Federal Court, briefly acknowledging the value of open source, recognized the economic interests a license protects including growing market share, enhancing the author's reputation, and allowing for rapid development.[176] Despite not having a monetary value, a FOSS license conveys economic value that is worth protecting under copyright law.[177] Therefore, the Artistic License, as a FOSS license, is an enforceable copyright license subject to copyright infringement remedies.[178]

B. BusyBox Litigation

In 2007, the Software Foundation Law Center filed the first U.S. copyright infringement lawsuit on behalf of BusyBox based on a GPL violation.[179] BusyBox is a set of Unix utilities that are commonly used in embedded systems and is licensed under the GPLv2.[180] Monsoon Multimedia acknowledged that it used BusyBox in its firmware but does not provide users with the BusyBox source code as required by the GPL.[181] The complaint, filed in the United States District Court for the Southern District of New York, sought an injunction and damages against Monsoon.[182] The case quickly settled for an undisclosed amount and Monsoon Multimedia agreed to comply with the GPL licensing terms as well as appoint an open source compliance officer.[183] The Software Freedom Law Center followed the Monsoon settlement with two new

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[172] Heather J. Meeker, Open Source and the Age of Enforcement, 4 HASTINGS SCI. & TECH. L.J. 267, 276 (2012).
[173] Id.
[174] Id.
[175] Jacobsen, 535 F.3d at 1380.
[176] Id. at 1379.
[177] Id. at 1379.
[178] Id. at 1382.
[179] Erik Andersen and Rob Landley v. Monsoon Multimedia, Inc., No. 07CV08205, 2007 WL 2777698 (S.D.N.Y Sept. 19, 2007) (settled).
[180] On Behalf of BusyBox Developers, SFLC Files First Ever U.S. GPL Violation Lawsuit, SOFTWARE FREEDOM LAW CENTER (Sept. 20, 2007), http://www.softwarefreedom.org/news/2007/sep/20/busybox/.
[181] Id.
[182] Erik Andersen and Rob Landley v. Monsoon Multimedia, Inc., No. 07CV08205, 2007 WL 2777698 (S.D.N.Y Sept. 19, 2007) (settled).
[183] BusyBox Developers and Monsoon Multimedia Agree to Dismiss GPL Lawsuit, SOFTWARE FREEDOM LAW CENTER (Oct. 30, 2007), http://www.softwarefreedom.org/news/2007/oct/30/busybox-monsoon-settlement/.

lawsuits against Xterasys and High-Gain Antennas.[184] The Software Freedom Law Center continued to file more lawsuits against various companies including Bell Microproducts, Super Micro Computer, Best Buy, JVC, Samsung, and Verizon Communications on behalf of BusyBox.[185] The lawsuits mentioned settled and resulted in some form of an agreement to comply with the GPL terms, the payment of an undisclosed sum, and the appointment of an officer to oversee future open source compliance.[186]

BusyBox's lawsuits were not about collecting monetary damages even though damages and injunctions were listed as forms of relief.[187] The lawsuits were about promoting the open source community by forcing companies to comply with the GPL licensing terms.[188] A common misunderstanding is that the GPL requires companies to disclose proprietary software used in conjunction with the GPL software.[189] However, it simply requires the company to distribute the GPL licensed code, which can be compartmentalized from any proprietary code for the purposes of redistribution.[190] The BusyBox lawsuits show that companies should establish compliance protocols for the open source software that is used and work with the FOSS originators before a lawsuit is filled.[191]

C. Oracle v. Google

While Oracle America, Inc. v. Google, Inc. is not strictly an open source law case, the case revolves around the copyrightability of Java, which serves as the base for both companies' open source platforms.[192] The issue presented was whether Oracle could claim copyright protection on the Java APIs, which would make Google's use copyright infringement when it created its own version of Java for it Android platform.[193] Google used the same names, organization, and functionality as the Java APIs.[194] Initially, the Northern District Court of California held that APIs are not copyrightable material.[195] The court viewed the APIs as a utilitarian and functional

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[184] Erik Andersen and Rob Landley v. Xterasys Corp., No. 07-CV-10455 (S.D.N.Y. 2007) (settled); Erik Andersen and Rob Landley v. High-Gain Antennas, L.L.C., No. 07-CV-10456 (S.D.N.Y. 2007) (settled).

[185] Best Buy, Samsung, Westinghouse, and Eleven Other Brands Named in SFLC Lawsuit, SOFTWARE FREEDOM LAW CENTER (Dec. 14, 2009), http://www.softwarefreedom.org/news/2009/dec/14/busybox-gpl-lawsuit/.

[186] See Beth Z. Shaw, Recent Lawsuits Reflect Open Source Software User's Copyright Compliance Obligations, LEXOLOGY (May 7, 2010), http://www.lexology.com/library/detail.aspx?g=a3d48bb1-7298-4963-8b44-1d0ef16eb015.

[187] Id.

[188] Id.

[189] See id.

[190] Id.

[191] See id.

[192] Richard Fontana, 7 Notable Legal Developments in Open Source in 2016, OPENSOURCE.COM (Jan. 2, 2017), http://opensource.com/article/17/1/yearbook-7-notable-legal-developments-2016. The APIs at issue were licensed under GPLv2. Google's Android platform is licensed for the most part under the Apache License 2.0. Id.

[193] Oracle Am., Inc., v. Google, Inc., 750 F.3d 1339, 1348-49 (Fed. Cir. 2014).

[194] Id. at 1350.

[195] Oracle Am., Inc., v. Google, Inc., 872 F. Supp. 2d 974, 976-77 (N.D. Cal. 2012).

set of instructions with only one way to write the code.[196] Oracle appealed the decision to the U.S. Court of Appeals.[197] Reconciling the Java platform with the merger doctrine, the court held that Google could have written its own declaring code and implementing code to execute Java's functionality; therefore, the merger doctrine did not apply.[198] Since Google could have built Android differently based on different arrangements of the code to express and implement the functionality of the program, Google infringed Oracle's copyright.[199] Because an API is subject to copyright protection, the decision created the possibility for Google to raise a fair use defense.[200]

Even though the court found that the API was copyrightable, a jury found that Google's use was lawful under the fair use doctrine.[201] Four factors are considered for analysis under the fair use doctrine: (1) the purpose and character of the use; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect upon the potential market for or value of the copyrighted work.[202] Addressing the four factors, Google first conceded that its actions in using the APIs were for purely commercial purposes, which weighs against the first factor.[203] However, Google also released Android as free and open source, which the jury could see as lessening Google's commercial objectives.[204] Second, the jury determined that the construction of the APIs served more of a functional purpose rather than a design purpose.[205] Third, Google copied "a minimal amount of the 37 API packages to preserve inter-system consistency in usage" while still constituting a transformative use.[206] Fourth, the court reasoned that Google's use did not cause harm to the market for Java. Additionally, the Java APIs were made available as FOSS as part of the OpenJDK project before Android's release, which further showed a lack of market harm.[207] Thus, the jury found that Google's use constituted fair use.[208] At the time of this writing, the issue is still on appeal; however, Google asserts that "no court has ever overturned a jury's determination on fair use."[209] Nevertheless, Google has shifted to using Oracle's GPL-licensed OpenJDK for the Java APIs.[210]

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[196] Id.
[197] Oracle, 750 F.3d at 1353.
[198] Id. at 1361.
[199] Id. at 1361, 1381.
[200] Id. at 1381.
[201] Oracle Am., Inc., v. Google, Inc., No. C 10-03561 WHA, 2016 WL 3181206, at *6 (N.D. Cal. June 8, 2016).
[202] Id.
[203] Id. at *7.
[204] Id.
[205] Id. at *11.
[206] Id.
[207] Id.
[208] Id.
[209] Brief of Defendant-Appellee/Cross-Appellant Google, Inc. at 1, Oracle Am., Inc. v. Google Inc., Nos. 17-1118, -1202, (Fed. Cir. May 22, 2017).
[210] Emil Protalinski, Google Confirms Next Android Version Will Use Oracle's Open-Source OpenJDK for Java APIs, VENTUREBEAT (Dec. 29, 2015, 1:31 PM),

D. XimpleWare v. Versata Saga

Versata represents another shift in FOSS litigation showing that not only independent developers have an interest in enforcing the terms of the FOSS license that it uses. Versata is the creator of Distribution Channel Management (DCM) software and licensed the software to Ameriprise to use third-party contractors to modify the software subject to its terms.[211] Versata sued Ameriprise claiming that one of the third-parties was using the DCM software to create a competing product.[212] Ameriprise denied the claim and stated that Versata violated the DCM license because the software included XimpleWare VTD XML software, which was licensed under the GPLv2.[213] XimpleWare offers a closed commercial license for VTD XML along with the making it open sourced under the GPLv2, but Versata did not obtain a commercial license.[214] Therefore, the Versata software should be available with the GPLv2 and Versata's software is a derivative work that would also allow Ameriprise to decompile and modify the software without the need for an agreement.[215] Additionally, XimpleWare alleged that Versata removed the required copyright notices and copy of the source code of the VTD XML software along the development process.[216] In turn, XimpleWare sued Versata, Ameriprise, and all of Versata's DCM customers for breach of the GPLv2 and patent infringement.[217] This issue resulted in five lawsuits.[218]

The cases ultimately settled but provided a new interpretation of the GPLv2 regarding third parties and customers of infringing parties. First, distributing the code to third parties is considered distribution because the GPLv2 does not distinguish between contractors and third parties.[219] Second, violation of the license by the distributor, Versata, does not mean that the customers violated the license as well.[220] The license is between XimpleWare as the creator,

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http://venturebeat.com/2015/12/29/google-confirms-next-android-version-wont-use-oracles-proprietary-java-apis/.

[211] Versata Software, Inc. v. Ameriprise Fin., Inc., No. A-14-CA-12-SS, 2014 WL 950065, at *1 (W.D. Tex. Mar. 11, 2014).

[212] Id.

[213] Id.

[214] XimpleWare Corp., v. Versata Software, Inc. et al., No. 13-CV-05160-SI, 2014 WL 6681163, at *1 (N.D. Cal. Nov. 25, 2014).

[215] Versata Software, Inc., 2014 WL 950065, at *4-5.

[216] Amended Complaint at 11, XimpleWare Corp. v. Versata Software, Inc. et al., No 3:13-cv-05160-SI, 2013 WL 8599692 (N.D. Cal. Dec. 17, 2013).

[217] Versata Software, Inc. v. Infosys, Case No. 1:10cv792, U.S. District Court, Western District of Texas (dismissed); Versata Software, Inc. v. Ameriprise et al., Case No. D-1-GN-12-003588, 53rd Judicial District Court of Travis County, Texas; Versata Software, Inc. v. Ameriprise Fin., Inc., No. A-14-CA-12-SS, 2014 WL 950065, at *1 (W.D. Tex. Mar. 11, 2014); XimpleWare v. Versata Software, Inc., et al., No. 5:13-cv-05161-PSG, 2014 WL 2080850, at *5-6 (N.D. Cal. May 16, 2014); XimpleWare Corp., v. Versata Software, Inc. et al., No. 13-CV-05160-SI, 2014 WL 6681163, at *1 (N.D. Cal. Nov. 25, 2014).

[218] Id.

[219] XimpleWare v. Versata Software, Inc., et al., No. 5:13-cv-05161-PSG, 2014 WL 2080850, at *5-6 (N.D. Cal. May 16, 2014).

[220] Id.

Versata as the distributor, and Ameriprise as a contractor of Versata.[221] Third, GPLv2 violations can be both contract violations and copyright infringement.[222] The affirmative obligation to disclose source code is a contractual obligation while the obligation not to copy, modify, or distribute unauthorized code is related to the scope of copyright protection.[223] These cases signal a new turn in the development of FOSS litigation. In the prior FOSS cases, failure to comply with a FOSS license generally entailed a software foundation alerting the infringing party of noncompliance and an albeit simple settlement reached. However, XimpleWare asserted itself as the first commercial enforcer of a FOSS license and sued everyone that came into contact with the software including the unknowing customers. While the case provided new guidance on the GPLv2, it serves as warning for software vendors failing to do proper due diligence in regard to their own software when they are downstream users of open sourced software.

E. Artifex v. Hancom

Artifex, the developer of an open-source PDF interpreter called Ghostscript, sued Hancom Office, a developer of office applications that distributed Ghostscript.[224] Artifex provides Ghostcript under a dual licensing scheme offering a commercial license for the software or obtaining the software through the GPL.[225] Hancom did not obtain a commercial license nor did it provide make the source code available under Ghoscript's GPLv3.[226] Subsequently, Artifex sued for breach of contract and copyright infringement as well as relief in the form of a royalty payment for Hancom's non-compliant use and for Hancom to stop distributing Ghostscript.[227]

The lawsuit has now been through two motions: a motion to dismiss and a motion for summary judgment on the breach of contract claim.[228] On the motion to dismiss, the court determined that Artifex sufficiently stated facts in support of its breach of contract claim.[229] Additionally, the non-compliance showed a loss of revenue for Artifex based on its dual licensing scheme.[230] In the motion for summary judgment ruling, the court stated, "the language of the GPL suggests that Defendant's obligations persisted beyond termination of its rights to propagate software using Ghostscript ... because the source code or offer of the source code is required each time a 'covered work' is conveyed, each time Defendant distributed a product using Ghostscript there was arguably an ensuing obligation to provide or offer to provide the source code."[231] Therefore, the breach of contract claim could go forward as there was insufficient evidence to rule otherwise.[232] The case will continue to move forward and will

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[221] Id.
[222] Versata Software, Inc., 2014 WL 950065, at *5-6.
[223] Id.
[224] Artifex Software, Inc. v. Hancom, Inc., No. 16-CV-06982-JSC, 2017 WL 4005508, at *1 (N.D. Cal. Sept. 12, 2017).
[225] Id. at *2.
[226] Id.
[227] Id.
[228] Id.
[229] Artifex Software, Inc. v. Hancom, Inc., No. 16-CV-06982-JSC, 2017 WL 1477373, at *3 (N.D. Cal. Apr. 25, 2017).
[230] Id.
[231] Artifex Software, 2017 WL 4005508, at *5.
[232] Id. at *6.

certainly add another useful interpretation of the GPL especially for commercial businesses offering its software under a dual licensing scheme.

F. Free Software Foundation v. Cisco

Free Software Foundation v. Cisco represents the first time that the Free Software Foundation filed a lawsuit related to GPL compliance of its own software.[233] Cisco, through its Linksys division, actively used FOSS in its products but failed to take compliance with the licenses seriously.[234] After two years of ongoing communication, Cisco remained non-compliant with the licenses.[235] Shortly following the complaint, Cisco settled.[236] The terms of the settlement required Cisco to make a monetary contribution to the Free Software Foundation, hire a Free Software Director to ensure license compliance, and take other steps to notify users of its programs containing Free Software Foundation programs.[237] The case is important because it was the first time that a major software company like Cisco was sued over GPL compliance.[238] Complying with the GPL is not an onerous task.[239] The lawsuit shows the importance of understanding FOSS licenses to avoid costly and embarrassing litigation.[240]

VI. Looking Forward

New technology continues to be built on top of the backs of FOSS. With innovative technologies like blockchain, FOSS continues to pose challenging legal issues. Today, blockchain applications come in many different forms including public blockchains, private blockchains, and consortium blockchains.[241] For example, Bitcoin is a public blockchain, and the core software is open sourced under the MIT license.[242] Also, in 2016, The Linux Foundation launched the Hyperledger Project, an open source consortium effort to develop cross-industry

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[233] Ryan Paul, Free Software Foundation Lawsuit Against Cisco a First, ARS TECHNICA (Dec. 12, 2008, 9:56 PM), http://arstechnica.com/information-technology/2008/12/free-software-foundation-lawsuit-against-cisco-a-first/.

[234] Complaint at 8-11, Free Software Foundation, Inc. v. Cisco Systems, Inc., 2008 WL 8449470 (S.D.N.Y Dec. 11, 2008) (No. 1:08CV10764).

[235] Id.

[236] Brett Smith, FSF Settles Suit Against Cisco, FREE SOFTWARE FOUNDATION (May 20, 2009, 10:00 AM), http://www.fsf.org/news/2009-05-cisco-settlement.html.

[237] Id.

[238] Id.

[239] See Bradley M. Kuhn ET AL., A Practical Guide to GPL Compliance, SOFTWARE FREEDOM LAW CENTER (Augusts 26, 2008), http://www.softwarefreedom.org/resources/2008/compliance-guide.pdf (last visited Sept. 29, 2017).

[240] See Edward J. Naughton, Complying with Source-Disclosure Obligations, AMERICAN BAR ASSOCIATION (Sept. 20, 2011), http://apps.americanbar.org/litigation/committees/intellectual/articles/fall2011-complying-source-disclosure-obligations.html.

[241] See Vitalik Buterin, On Public and Private Blockchains, ETHEREUM BLOG (Aug. 7, 2015), http://blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/.

[242] Bitcoin Core Integration/Staging Tree, GITHUB: BITCOIN/BITCOIN, http://github.com/bitcoin/bitcoin (last visited Oct. 12, 2017).

blockchain applications.[243] As blockchain technology proliferates, so do blockchain patent filings.[244] In response, the Chamber of Digital Commerce created the Blockchain Intellectual Property Council (BIPC) to develop an industry-led defensive patent strategy to stymie blockchain patent trolls.[245] Along with patent strategies, the BIPC will explore other IP strategies like non-aggression agreements, patent pools, and agreements not to sell patents without first granting a license to all group members.[246] As discussed with the various types of FOSS licenses, it is important for developers to understand the licenses that govern the software that they are using as different licenses allow or prohibit patenting derivative works.[247] Because many of the blockchain initiatives are developed using open source code or are open source projects themselves, these projects must consider the challenges they face when they file for IP rights.[248]

It is clear that FOSS will continue to impact the daily operations of all companies deploying software. Through recent judicial decisions, it is also clear that failing to comply with FOSS licenses can put companies at significant legal risks including monetary damages and injunctions. Understanding FOSS is not just about mitigating legal risks. As we have seen more innovation through open sourcing, enhanced compliance means a greater FOSS community that delivers better quality products.

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[243] Brian Behlendorf, Meet Hyperledger an "Umbrella" for Open Source Blockchain & Smart Contract Technology, HYPERLEDGER BLOG (Sept. 13, 2016), http://www.hyperledger.org/blog/2016/09/13/meet-hyperledger-an-umbrella-for-open-source-blockchain-smart-contract-technologies.

[244] See Shai Jalfin, Protecting IP in the Blockchain Sector, IPWATCHDOG (June 30, 2017), http://www.ipwatchdog.com/2017/06/30/protecting-ip-blockchain-sector/id=84581/.

[245] Id.

[246] Id.

[247] See Keller and Ross, supra note 135.

[248] See id.