

The Freedoms of Software and its Ethical Uses*

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Abstract

The “free” in “free software” refers to a cluster of four specific freedoms identified by the Free Software Definition. The first freedom, termed “Freedom Zero,” intends to protect the right of the user to deploy software in whatever fashion, towards whatever end, he or she sees fit. But software may be used to achieve ethically questionable ends. This highlights a tension in the provision of software freedoms: while the Definition explicitly forbids direct restrictions on users’ freedoms, it does not address other means by which software may indirectly restrict freedoms. In particular, ethically-inflected debate has featured prominently in the discussion of restrictions on “Digital Rights Management” (DRM) and privacy-violating code in Version 3 of the GPL (GPLv3). The discussion of this proposed language revealed the spectrum of ethical positions and valuations held by members of the free software community. In our analysis, we will provide arguments for upholding Freedom Zero; we embed the problem of possible uses of software in the broader context of the uses of scientific knowledge, and go on to argue that the provision of Freedom Zero mitigates against too great a moral burden—of anticipating possible uses of software—being placed on the programmer and that, most importantly, it

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facilitates deliberative discourse in the free software community.

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The fundamental difference between free and proprietary software lies in the nature of the actions that users of the software are permitted to take. Proprietary software, relying on trade secret, licensing, and copyright law, restricts user actions via End User License Agreements (EULAs);¹ free software licenses eliminate, to varying degrees, restrictions on user actions. The difference between proprietary and free software, as established by software licenses, is not a question of price. A free software package may cost as much as a proprietary package; that it is “free” only affects what the user may do with it once she has procured it.

Free Software

The “free” in “free software” refers to a cluster of four specific freedoms identified by the Free Software Definition (FSD):

“Free software” is a matter of liberty, not price. To understand the concept, you should think of “free” as in “free speech,” not as in “free beer.” Free software is a matter of the users’ freedom to run, copy, distribute, study, change and improve the software. More precisely, it refers to four kinds of freedom, for the users of the software:

- The freedom to run the program, for any purpose (freedom 0)

¹ Wikipedia. Software license agreement. Retrieved November 2, 2007, from <http://en.wikipedia.org/wiki/EULA>

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

Taken together, these four freedoms describe a range of possibilities for user action; the commitment to uphold these choices provides a normative framework for the behavior of software developers, as each of these freedoms for the user can only be ensured through appropriate action on the part of software developers. Software users, particularly in the free software world, may become the developers of the next generation of software, in which case they, too, would become subject to these normative constraints. The sustenance of these freedoms over the course of time thus requires active dissemination and adoption of the values that undergird these freedoms.

The Software Freedoms

In a rhetorically suggestive move, the first freedom enumerated in the Free Software Definition is termed “Freedom Zero.” At one level, this is an example of playful hacker

² Free Software Foundation. Free Software Definition. Retrieved October 28, 2007, from <http://www.fsf.org/licensing/essays/free-sw.html>. Similar enumerations of software freedoms can be found in Open Source Initiative, The Open Source Definition (Annotated). Retrieved November 15, 2007, from <http://www.opensource.org/docs/definition.php>, and Debian, The Debian Free Software Guidelines. Retrieved November 15, 2007, from http://www.debian.org/social_contract#guidelines.

humor (in some programming languages, counting begins at zero), but it also signals a bedrock principle. Freedom Zero intends to protect the right of the user to deploy software in whatever fashion, towards whatever end, he or she sees fit. Correspondingly, the creator of the software must relinquish control over how his work will be used, thus granting full autonomy, and ancillary responsibility, to the user. In particular, this means that the software creator must give up the possibility of asserting rights, such as the *droit moral* granted to artists under European copyright law, pertaining to the disposition of her work.³ Freedom Zero is historically grounded in the hacker ethic, which values unfettered access to information.⁴ Hackers have sought to uncover the inner workings of systems like telephone or computer networks; their investigations rely on putting the components of these systems to use in ways not envisioned by their designers. Restrictions on how phones, computers, or software could be used would limit the scope of such explorations. It is the hacker's aversion to restrictions on the ability to tinker with technological systems which appears to motivate Freedom Zero.

At first glance, Freedom One appears to treat only freedoms important to programmers—the freedoms to examine and modify code. Yet all users, even those who are not trained programmers, should have the freedom to adapt software to their own needs, whether through their own efforts to learn how to program, or through contractors, friends, or others who do the work for them; this freedom is a vital aspect of user autonomy. Distinctions between “developer” and “user” are erased by this freedom: the provision of source code creates the possibility for a user to become a developer. Freedom One enshrines the potential for transformation: both of code, which may be

³ Wikipedia, Moral rights. Retrieved October 17, 2007, from http://en.wikipedia.org/wiki/Moral_right.

⁴ Levy, Stephen. *Hackers: Heroes of the Computer Revolution*, pp. 40–45. Penguin, 1984.

altered in form, content, and functionality; and of the user, who may be transformed through study. Both sorts of transformation rely on direct access to the source code; neither experimental study of high-level functionality, nor even reverse engineering, i.e., determining how the program was written by analyzing its binary code and output, is sufficient.

The ethical content of Freedom Two has little to do with the technical nature of its subject: it is a straightforward statement of communitarian principles. Yet the normative demand of this freedom—to be able to make copies freely—relies on software’s nonrival character and ease of reproduction and distribution. The significance of Freedom Two to the free software community was graphically demonstrated during the heated discussion⁵ over the licensing of the X Window System, a ubiquitous graphical user interface for Unix workstations as well as GNU/Linux systems.

The X Consortium, developers of the X Window System, had asked free software developers to release their software under a licensing scheme that would not require developers who modified free software to release their source code back to the free software community. The X Consortium’s policy was motivated by its desire to ensure acceptance of the X Window system by proprietary software vendors, effectively making these corporations the arbiters of licensing decisions in this programming community. As Richard Stallman pointed out at the time, under such a licensing scheme, “Those who granted the X Consortium’s request entrusted the community’s future to the good will of the X Consortium.”⁶

⁵ Micah Yoder. X11 non open-source? Retrieved November 8, 2007, from <http://archives.seul.org/seul/leaders/Apr-1998/msg00022.html>

In 1997, control of the X Window System codebase passed to The Open Group,⁷ who changed the licensing terms in 1998 with the release of the X11R6.4 version. The new license kept the source code open and continued to allow the creation of derivative work, but it required licensors who generated revenue from products that included X11R6.4 to pay a licensing fee. The imposition of this additional requirement made it difficult for small, innovative software companies to develop software that incorporated or relied on the X Window System, and was therefore regarded as a betrayal by the free software community.⁸ After a critical response from the development community, the Open Group re-released it under the same free software license that was used for X11R6.3, thus restoring the freedoms that developers had been accustomed to.

The Open Group's imposition of licensing fees on X11R6.4 had abridged Freedom Two. As the Free Software Definition states,

[Y]ou should be free to redistribute copies, either with or without modifications, either gratis or charging a fee for distribution, to anyone anywhere. Being free to do these things means (among other things) that you do not have to ask or pay for permission.⁹

Any terms restricting redistribution, then, whether financial or logistical, violate Freedom Two.

⁶ Richard M. Stallman. The X Window System Trap. Retrieved November 8, 2007 from <http://www.gnu.org/philosophy/x.html>

⁷ The Open Group: Home Page. Retrieved November 8, 2007, from <http://www.opengroup.org/>

⁸ Christopher B. Browne. X11R6.4 Sample Implementation Changes and Concerns. Retrieved November 8, 2007, from <http://cbbrowne.com/info/x11r6.4.html>

⁹ Free Software Definition, *op. cit.*

Redistributing copies is not the only way to help one's neighbor by sharing software. A user could share her computer with a friend who stops by to write his community newsletter; he would be using the software but not making a copy for himself. Or, software could be provided as a web service. The Free Software Definition's explicit protection of the freedom to make and distribute copies anticipates that users' freedom to share software would be most effectively restricted by blocking copying.

Freedom Three is framed in terms of facilitating programmers' innovation and making the fruits of this innovation available to the community of programmers and users. This freedom is not only an extension of Freedom One but also an explicit statement of the importance of community. It is easily understood as the formal statement of an important component of Richard Stallman's initial announcement of the GNU project: "I consider that the golden rule requires that if I like a program I must share it with other people who like it."¹⁰ Freedoms Two and Three most explicitly acknowledge the social context of code: it is written in response to a felt human need, and must be made available to all without restriction.

The benefits that accrue from these freedoms flow equally to users and developers. Each freedom is stated without reference to a particular political ideology; each ensures a particular independence. Taken jointly, Freedoms One, Two, and Three work to ensure a "fair use" of software, and thus concomitantly make a statement against the inappropriate application of property regimes in the domain of software: 'protections' on software, whether enforced by copyright or trade secret law, should not restrict these freedoms.

¹⁰ Richard M. Stallman. Initial Announcement. Retrieved October 6, 2007, from <http://www.gnu.org/gnu/initial-announcement.html>

The Freedom Zero Problem

Freedom Zero is grounded in the hacker ethic, which valorizes unfettered access to information, for restrictions on running software may directly restrict inquiry and access to information. But software may be used to achieve ethically questionable ends. For instance, free software might be run for the purposes of infringing privacy, debugging proprietary software, sending spam, streaming child pornography videos, performing stem-cell research, and a host of other 'nefarious' activities. This tension is well understood within the free software community. As the Free Software Foundation stated as part of a recent educational campaign:

We've long believed that it should be possible to use software for any purpose . . . to implement DRM, guide nuclear missiles, or run your own organized crime syndicate—just as you can use it to administer a court, run an animal shelter, or organize your community.¹¹

This permissiveness may create an ethical dilemma for a programmer who, while committed to Freedoms One, Two, and Three, is not comfortable with Freedom Zero. Consider a developer who creates software implementing an especially accurate method for dynamically calculating flight trajectories of powered aerial vehicles.¹² This software has many applications, most of which have no potential to do harm. The developer, however, is opposed to the continued development of nuclear weapons, and does not want his software used in the guidance system of a nuclear missile. This software, then, could not be licensed as free software while simultaneously reflecting the developer's

¹¹ Free Software Foundation. Busting GPLv3 FUD. Retrieved November 10, 2007, from

<http://www.fsf.org/blogs/licensing/2007-10-18-gplv3-fud>

¹² We thank Matt Butcher for this example.

intended restriction on the military application of his software and its derivative works. This highlights a tension in the provision of software freedoms: while the Free Software Definition explicitly forbids direct restrictions on users' freedoms, it does not address other means by which software may restrict freedoms directly or indirectly.

This dilemma asks us to seek justifications for Freedom Zero grounded in a societal perspective broader than the hacker ethic, and to consider the question of why the Free Software Definition should not include moral rights pertaining to usage for programmers. A discussion of the potential uses of software is no less complicated than a discussion of the application of scientific knowledge: particular restrictions run the risk of being vague, too inclusive, or perpetually subject to amendments in light of new developments. Or perhaps placing restrictions on specific uses of software is a misdirected effort—our pacifist developer, rather than forbidding his software from being used in missile guidance systems, should instead work toward global nuclear disarmament. Yet forbidding this particular application of his software may be a small step toward nuclear disarmament.

The Ethical Use of Scientific Knowledge

Penetrating research and keen scientific work have often had tragic implications for mankind, producing, on the one hand, inventions which liberated man from exhausting physical labor, making his life easier and richer; but on the other hand, introducing a grave restlessness into his life, making him a slave to his technological environment, and—most catastrophic of all—creating the means

of his own mass destruction. This, indeed, is a tragedy of overwhelming poignancy.¹³

These remarks reiterate an old ethical problem for the scientist: should I allow others to use the knowledge I have produced, knowing as I do that it may be used for morally questionable ends?

This dilemma has not lost its importance over the years: in 1995, the US Committee on Science, Engineering, and Public Policy articulated a normative claim about the most appropriate role for scientists when society is considering potential applications for their research:

Even scientists conducting the most fundamental research need to be aware that their work can ultimately have a great impact on society. Construction of the atomic bomb and the development of recombinant DNA . . . are two examples of how seemingly arcane areas of science can have tremendous societal consequences. The occurrence and consequences of discoveries in basic research are virtually impossible to foresee. Nevertheless, the scientific community must recognize the potential for such discoveries and be prepared to address the questions that they raise. If scientists do find that their discoveries have implications for some important aspect of public affairs, they have a responsibility to call attention to the public issues involved. They might set up a suitable public forum involving experts with different perspectives on the issues at hand. They could then seek to develop a consensus of informed judgment that can be disseminated to the public. A good example is the response of biologists

¹³ Albert Einstein. A Message to Intellectuals, in *Ideas and Opinions*, p. 148, Souvenir Press, London, 1973.

to the development of recombinant DNA technologies—first calling for a temporary moratorium on the research and then helping to set up a regulatory mechanism to ensure its safety.¹⁴

When confronted with a particular problem concerning the use of scientific knowledge, scientists commonly employ a wide range of tactics to influence decision making both within the scientific community and the public at large. These include technical arguments, cost-benefit analyses, political persuasion, appeals to conscience,¹⁵ and voluntary abstention from work. These often-contentious discussions, which serve to highlight political, ethical, and technical differences within the scientific community, are a necessary part of the public discourse through which the values and agenda of the scientific community evolve. Thus, rather than seeking formally to proscribe particular applications of scientific discoveries, which might constrain other promising avenues of inquiry, concerned scientists have sought to arrive at a consensus within the community regarding these decisions. There are instructive parallels here that may help us resolve the dilemma of Freedom Zero, for the strategies adopted by the scientific community to deal with the ethical import of the uses of scientific knowledge are all strategies that could be (and are) used by the free software community today.

But more generally, should creators—of artistic, literary or scientific works—be allowed, or even required, to place restrictions on the use of their works? These potential restrictions may arise from a diverse set of political perspectives and ethical impulses. In the context of the present discussion, it might be that there is a greater moral expectation

¹⁴ Committee on Science, Engineering, and Public Policy. *On Being a Scientist: Responsible Conduct in Research*. pp. 20-21, National Academy Press, Washington, D.C., 1995.

¹⁵ For example, the Pugwash Conferences, <http://www.pugwash.org>

placed on the scientist and engineer because of the functional nature of their creations. The scientist or creator may wish to restrict the uses of his work to those he deems morally correct; could the imposition of such a restriction be considered morally objectionable? Society may wish to require creators to anticipate any possible morally objectionable use of their works and then place restrictions accordingly; would it be a moral failure on the creator's part not to place such restrictions? Note that these questions cannot be answered merely by checking whether the relevant legal regime provides *droit moral* or requires proscription of possible uses; neither legal permissibility nor sanction translate to normative requirement.

The free software community is perhaps unique in that it has chosen explicitly to make Freedom Zero a central freedom. The provision of an explicit right-to-use, for any purpose whatsoever, is not generally associated with discussions about new inventions or newly discovered scientific knowledge. As we have noted, while there can be debate in the scientific community about uses of knowledge or particular directions that research might take,¹⁶ it is not commonly thought that scientists themselves should place legally enforceable restrictions on such use.

¹⁶ See, for example, Glen McGee, Ed. *The Human Cloning Debate*, Berkeley Hill Books, 2000; M. C. Nisbet, D. Brossard, and A. Kroepsch. Framing Science: The Stem Cell Controversy in an Age of Press/Politics. *The Harvard International Journal of Press/Politics*. 8(2): pp. 36–70, 2003; The Coalition of Americans for Research Ethics. The “Political Science” of Stem Cells. Retrieved on November 23, 2007, from <http://www.stemcellresearch.org/polisci/index.html>; S. Parry. The politics of cloning: mapping the rhetorical convergence of embryos and stem cells in parliamentary debates. *New Genetics and Society* 22(2): 145-168, 2003.

Scientific Knowledge and Property Rights

The debate over Freedom Zero takes place within a particular discursive and legal framework of licenses and their terms, of putative restrictions and freedoms. Freedom Zero is ultimately protected by copyright law, as developers choose to license their software under a license that protects software freedoms. It is the developer's assertion of property rights in his code that ensures the provision of this freedom.

In science, such assertions of property rights typically take place in the realm of patents. Thus, a patent holder may refuse to license a patent on commercial grounds such as insufficient license fees or the threat of direct competition. Or, the patent holder may refuse a license for a use the patent holder finds objectionable—for example, a biomedical researcher may refuse to grant patent licenses for a newly synthesized anti-coagulant to abortion clinics. Thus, discussions of ethical uses of scientific knowledge take on a different dimension in a frame constructed by property rights. When society grants some degree of monopoly control over new knowledge, the holder of this control may deploy it in order to further an agenda. Or, they may choose to leave questions of the use of this knowledge to society. Discussions of nuclear weapons might look very different if the physical process of nuclear fission, discovered by Ernest Rutherford in 1919,¹⁷ were patentable and only selectively licensed. Similarly, holders of patents on artificial processes for inducing fission could conceivably only issue licenses for the peaceful applications of these processes.¹⁸

¹⁷ John Campbell. Rutherford—A Brief Biography. Retrieved November 8, 2007, from <http://www.rutherford.org.nz/biography.htm>

¹⁸ Enrico Fermi received US Patent No. 2,708,656 in 1955 for a “Neutronic Reactor” for creating and controlling fission chain reactions; the patent is assigned to the United States, as represented by the U.S.

The chemist who discovers and characterizes a particular reaction in the laboratory has a more tenuous ownership relation with it than the engineer who invents a novel method for ball-bearing manufacture. In the former, because the chemical reaction was a pre-existent fact of nature, the creative relationship is weaker:¹⁹ it seems odd to claim that the discoverer has a right to prevent future research on such knowledge or to forbid its military use. At best, she could appeal to the conscience of her fellow scientists and larger community. In the case of the inventor, the creator relationship is putatively stronger. But no invention is *ab initio*, as each draws upon the previously accumulated knowledge of inventors and discoverers. It would grant too much power to the last person in the line of invention to draw perhaps arbitrary restrictions on its use.²⁰

The presence of such property regimes does not foreclose community-wide discussion about ethical uses of scientific knowledge. As the US National Committee on Science, Engineering and Public Policy noted, decisions pertaining to the ethical use of scientific knowledge need to be informed by community-wide discussion and debate. For the balance of this paper, we intend to make our contribution to the debate about Freedom Zero in the free software community. In particular, we note that Freedom Zero itself acts as a catalyst for community discussion about the uses of software.

Atomic Energy Commission.

¹⁹ This sentiment is evinced in the public outrage over the granting of patents on seeds, molecules and other naturally occurring objects.

²⁰ These arguments parallel those made in critiques of the overzealous restrictions placed by copyright holders on their works. See, for example, Lawrence Lessig. *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*. Penguin Books, 2004.

In Defense of Freedom Zero

There is an insuperable difficulty in circumscribing Freedom Zero: restricting one use of software could easily lead to suggestions for more restrictions. A particular license could say, “You are not allowed to use this software to simulate nuclear explosions,” while others could forbid use of licensed software in stem cell research laboratories or proscribe uses in surveillance. The anticipation of problems like these motivates the “No Discrimination Against Fields of Endeavor” clause of the Open Source Definition, as these restrictions “tend to be moral or political . . . however well-intentioned such restrictions might be, they are antithetical to the notion of open source, and in practice are damaging to its objectives.”²¹

The Hactivismo Enhanced Source Software License Agreement (HESSLA) is a license similar to free software licenses with one important distinction:

[HESSLA] discriminates against undesirable activity such as surveillance, introduction of certain kinds of malicious code, and human rights violations, as well as discriminating against 'proprertizing' behavior. . . . Subject to these narrow restrictions, Licensees . . . enjoy very broad latitude to change, use, explore, modify, and distribute the software much broader than they would enjoy with typical “proprietary” software packages.²²

That is, the license vigorously violates the spirit of Freedom Zero precisely with the aim of safeguarding many of the freedoms supported by free software activists. But within the

²¹ Andrew M. St. Laurent. *Understanding Open Source & Free Software Licensing*, p. 10. O'Reilly Media, 2004.

²² Hactivismo. The Hactivismo Enhanced-Source Software License Agreement. Retrieved November 1, 2007, from <http://www.hactivismo.com/about/hessla.php>.

free software community such an approach is generally regarded as unnecessary, because access to source is enough to prevent feared abuses (for example, to disable spyware features in licensed software); ineffective, as proprietary alternatives are often available; and counterproductive, as it weakens free software's normative stance.²³ Such restrictions on the use of software present the unappealing prospect of a balkanization of the free software corpus, with borders appearing along arbitrary ideological fault lines and inhibiting the further dissemination and adoption of free software.

Such slippery-slope arguments are not hypothetical: they featured prominently in the debate surrounding the inclusion of restrictions on “Digital Rights Management” (DRM)²⁴ and privacy-violating code in Version 3 of the GNU General Public License (GPLv3),²⁵ the archetypal free software license which covers seventy percent of all free software.

The recently-released GPLv3, the first new version of the license in fifteen years, went through four discussion drafts, supported by a sophisticated tool for soliciting public comment. The language in the first discussion draft looked like an abridgment of Freedom Zero:

As a free software license, this License intrinsically disfavors technical attempts to restrict users’ freedom to copy, modify, and share copyrighted works. Each of its provisions shall be interpreted in light of this specific declaration of the

²³ Free Software Foundation. HESSLA’s Problems. Retrieved November 1, 2007, from <http://www.gnu.org/licenses/hessla.html>.

²⁴ Wikipedia. Digital rights management. Retrieved October 15, 2007, from http://en.wikipedia.org/wiki/Digital_rights_management

²⁵ Free Software Foundation. GNU General Public License, version 3. Retrieved October 10, 2007, from <http://www.gnu.org/licenses/gpl-3.0.html>.

licensor's intent. Regardless of any other provision of this license, no permission is given to distribute covered works that illegally invade users' privacy, nor for modes of distribution that deny users that run covered works the full exercise of the legal rights granted by this License.²⁶

While this language carefully refers only to "distribution" of works rather than their use, it nonetheless prompted a passionate critical response from the free software community. The tone of these comments suggested that a vital freedom would be compromised: "Why not, for instance, deny distribution to covered works that are components of weapons of mass destruction?"²⁷ "This is an unacceptable restriction on the functionality of modified versions and discriminates against possible uses of the work."²⁸ "I'm concerned that this may be a restriction on use of the works disguised as a restriction on distribution."²⁹ "This makes about as much sense as a tool designer withholding permission to manufacture and sell hammers that illegally hurt users' thumbs."³⁰

This language was removed in the second draft and replaced with the following:

²⁶ Free Software Foundation. GNU General Public License, Discussion Draft 1 of version 3. Retrieved October 10, 2007, from <http://gplv3.fsf.org/comments/gplv3-draft-1.html>.

²⁷ kop. Comment 236: Privacy is outside the scope of the 4 freedoms. Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?filename=gplv3-draft-1&id=236>.

²⁸ firx. Comment 697: A hammer with a notice stating 'you cannot use me to break people's heads.' Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?filename=gplv3-draft-1&id=697>.

²⁹ jacob0. Comment 349: Restriction on use. Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?filename=gplv3-draft-1&id=349>.

³⁰ andersa. Comment 673: Too wide and unclear scope. Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?id=673>.

3. No Denying Users' Rights through Technical Measures.

Regardless of any other provision of this License, no permission is given for modes of conveying that deny users that run covered works the full exercise of the legal rights granted by this License.³¹

Other concerns about the restrictions this clause engendered were now raised: “Will the downloaded work still be protected by this clause when a DRM vendor decides to decrease their rights after conveyance?”³² “What happens if it is not the mode of conveying that denies the users their rights when they try to run covered works?”³³ “I’m uneasy about “legislating” technology like this, and it seems an all-or-nothing approach works best, but that means GPL should be forked into two distinct licenses.”³⁴

The final version of GPLv3 incorporated the following language, which cleverly protects GPL licensees from DRM by making it possible for them to undo its effects and providing them legal cover for these modifications:

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

³¹ Free Software Foundation. GNU General Public License, Discussion Draft 2 of version 3. Retrieved October 10, 2007, from <http://gplv3.fsf.org/comments/gplv3-draft-2.html>.

³² robmyers. Comment 2214: DRM. Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?filename=gplv3-draft-2&id=2214>.

³³ rlschmei. Comment 1724: what if it is not the mode of conveying that denies exercise. Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?filename=gplv3-draft-2&id=1724>.

³⁴ franks. Comment 1565: Should be made clearer. Retrieved October 11, 2007, from <http://gplv3.fsf.org/comments/rt/readsay.html?filename=gplv3-draft-2&id=1565>.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.³⁵

The traces of this discussion demonstrate how community-wide discussion not only helps to address ethical concerns of both licensors and licensees but also can produce solutions that are more elegant on both aesthetic and pragmatic grounds. In the final version of the license, no particular uses of the code are even mentioned; however, it is precisely those pernicious uses of code which are of concern to the free software community that have been rendered impossible to accomplish with GPL-licensed software.

The ethical principles underlying this debate are reminiscent of those that also underlie the ongoing discussion in the free software community over the relative merits of different free software licenses, which may be classified on their allocation of

³⁵ Free Software Foundation. GNU General Public License, Discussion Draft 3 of version 3. Retrieved October 10, 2007, <http://gplv3.fsf.org/comments/gplv3-draft-3.html>.

freedoms to developers and users.³⁶ BSD-style licenses,³⁷ for example, allow licensees to distribute their modifications subject only to the minimal constraint that they retain previous copyright notices. Copyleft licenses³⁸ such as the GPL require their licensees to distribute source code if they distribute modifications of the licensed work. Proponents of BSD-style licenses argue that they are the most permissive and hence the most ‘free’ of the free software licenses; proponents of copyleft licenses argue in turn that the bar on non-reciprocal borrowing from the software commons more effectively preserves the freedoms of the free software community. The contours of this dispute are roughly the same as the one we have considered above: one perspective argues that a restriction on free software acts to preserve some valuable moral good; the other suggests that the placing of this restriction might instead compromise core community values.

In addition to these concerns about the difficulties in determining the appropriate restrictions on the distribution and use of software, it seems that restrictions on the use of software are destined to fail: software is an easily reproducible and disseminable artifact. In many jurisdictions, artists do have legally protected moral rights concerning the uses to which their works are put. Many of these rights are contingent upon the tangibility and irreproducibility of the art in question—painters and sculptors may have a strong voice in where and how their pieces are exhibited. These rights however, might not be granted in some legal jurisdictions; in the US, copyright-based licenses may *not* restrict use, with

³⁶ S. Chopra and S. Dexter. A comparative ethical assessment of free software licensing schemes.

Proceedings of the Sixth International Conference of Computer Ethics: Philosophical Enquiry (CEPE2005). Enschede, The Netherlands, July 2005.

³⁷ Wikipedia. BSD Licenses. Retrieved October 15, 2007, from http://en.wikipedia.org/wiki/BSD_license.

³⁸ Free Software Foundation. What is Copyleft? Retrieved October 20, 2007, from <http://www.gnu.org/copyleft/>

the exception of provisions for some works of visual art under the Visual Artists Right Act (VARA) of 1990.³⁹ In this sense, free software licenses are in consonance with US copyright law.

In the case of artistic works, the artist might want to place restrictions on uses of the work which compromise its original artistic vision. Members of the radical protest band Rage Against the Machine⁴⁰ might be upset if US Army soldiers were to conduct invasive searches in an Iraqi town while playing their songs on trucks, or a radical poet might object to her poems being used as propaganda by a government whose policies she disagrees with. In these cases, the use of the artist's work is in conflict with an explicit artistic aim. Or, there may be technical or aesthetic reasons for artists asserting control over the use of their work; a photographer might object to the display of his images in a manner that fails to produce the desired aesthetic impact.

But restrictions on use for intangible works such as poetry and music are difficult to characterize and enforce, particularly if these restrictions infringe the free speech rights of others.⁴¹ Perhaps poets, musicians, and writers, as well as free software developers,

³⁹ U.S. Code Title 17, section 106A. Retrieved November 12, 2007, from http://www.law.cornell.edu/uscode/17/usc_sec_17_00000106---A000-.html.

⁴⁰ Wikipedia. Rage Against the Machine. Retrieved November 12, 2007, from http://en.wikipedia.org/wiki/Rage_against_the_machine.

⁴¹ See, however, Lars Brandle. Waits Wins Spanish Appeal on Ad Sound-Alike Case. *Billboard*, January 20, 2006. Retrieved October 26, 2007, from http://www.billboard.com/bbcom/news/article_display.jsp?vnu_content_id=1001882361, for an example of a musician asserting his moral right over the reproducibility of his work; or Anderson Strathern. Can Musicians Stop Political Parties 'Spinning' Their Discs? 2002. Retrieved October 18, 2007, from http://www.andersonstrathern.co.uk/knowledge/media_area/?content_id=585, for a

realize the futility of trying to impose restrictions on the dissemination and use of easily reproducible artifacts. From the perspective of the enrichment of the cultural commons, placing restrictions on the use of works, whether fine art or software, is counterproductive—such restricted works would no longer be held in common. While we could conceive of an artist wanting to restrict use of his work during his lifetime, this work will ultimately fall into the public domain, at which time all restrictions on its use will lift.

Finally, Matt Butcher has suggested John Rawls' "veil of ignorance"⁴² thought experiment supports an argument for Freedom Zero. In this experiment, we consider free software projects to be communities focused on a common interest, and a free software license as a constitution agreed upon by the community. Suppose this community were assembled behind a veil of ignorance: none of the group knows in advance which position in the community they will hold. Individuals would not know their social and political positions, or others' reasons for being interested in the project. Some will be users of the software, some will be core developers and maintainers, while others will write code and documentation. In order to determine a just allocation of rights and responsibilities, the group is asked, still behind the veil, to determine which rights should be granted to whom. Most plausibly, the community would choose to grant Freedom Zero to all. If a particular subgroup in the community could unilaterally decide for what purposes a program could be used, each member would be justified in fearing that such a subgroup could prevent his legitimate use of the software. Alternatively, the group as a whole could try to arrive at a set of restrictions by consensus, but such a process could be

discussion on whether musicians can assert rights over performances of their works.

⁴² John Rawls. *A Theory of Justice*. Harvard University Press, 1971.

intractable if no-one knows their eventual position in the community.

Community Discourse and Freedom Zero

The arguments we have considered thus far rely on a predominantly utilitarian stance that limiting Freedom Zero is less desirable than any alternative. These arguments never directly interact with the two primary deontological prescriptions that frame the debate: those against ‘immoral’ applications and those against restrictions on individual freedoms. This is a familiar impasse in ethical deliberation; perhaps a different perspective might clarify the issues at stake.

An alternative argument for Freedom Zero is that it supports deliberative discourse within the development and user communities. This kind of idea has been elaborated by Nick Couldry⁴³ in an analysis of the extent to which the Internet (broadly construed) might be cast as a 'discursive design'. Couldry begins with John Dryzek's⁴⁴ definition of discursive design:

a social institution around which the expectations of a number of actors converge [which] . . . therefore has a place in their conscious awareness as a site for recurrent communicative interaction among them . . . as citizens, not as representatives of the state or any other corporate or hierarchical body.

A free software community is clearly an example of the kind of “social institution” characterized by this definition. Within it, “recurrent communicative

⁴³ Nick Couldry. Digital divide or discursive design? On the emerging ethics of information space. *Ethics and Information Technology*. 5(2) pp. 89–97. June 2003.

⁴⁴ John Dryzek. *Deliberative Democracy: Politics, Policy, and Political Science*. Cambridge University Press, 1990.

interaction” allows for a set of community-wide ethical principles to evolve. The “convergence” of this community toward decisions or shared ideals is constantly driven by its intense, open and public discussion. In this context, the placement of arbitrary restrictions on the usage of software would be a move radically out of place.

The desirability of such a discursive framework is further made evident in Plaisance’s⁴⁵ sketch of a "discursive-network model" for the media:

At the core . . . is a fundamental shift in our understanding of audience expectation and participation. Conceiving of the "public" served by media as a population for moral agency requires more than the instrumental application of ethics [T]his model sets forth the justification . . . to expect news practitioners not merely to view ethical standards . . . as proscribing their own behavior . . . by rather that the cultivation of moral agency be embraced as a central objective of the press.

Thus, if we analogize the social good provided by free software with a free press then perhaps the normative significance of Freedom Zero is that it cultivates moral agency through the facilitation of deliberative democratic discussion—about the possible uses of software—in the free software community. If an owner or creator were able unilaterally to forbid a particular use of some licensed software it would limit opportunity for a rich discussion and concomitant education about the moral dimensions of technology.

It is not only the inventors or discoverers of an ethically-charged idea or object that are invested in its fate: individuals who may be benefited or harmed by it, as well as

⁴⁵ Patrick Lee Plaisance. The Mass Media as Discursive Network: Building on the Implications of Libertarian and Communitarian Claims for News Media Ethics Theory. *Communication Theory*. 15(3): 292–313. August 2005.

society, may legitimately stake a claim in the discussion about its uses. If so, discussions about possible uses and bans on them involve the entire community and invite the broadest deliberation and discussion. As the contentious cloning and stem-cell debates demonstrate, all the stakeholders in a discussion may need to be identified and engaged before any decisions can be made about research agendas and social policies. Indeed, such a public discussion is one of the components of the scientific community's practices:⁴⁶ a research program brings with it a public discussion that may influence its future direction.

The Ethical Uses of Software

So, is Freedom Zero wrong? Can a free software licensor be morally culpable for granting Freedom Zero? We suggest no more than a mathematician whose work on partial differential equations is later applied in optimizing munitions delivery. The mathematician, like the programmer, is not expected, nor should he be, to anticipate all possible uses of his creation. To do so would be to place too great a moral burden on him. Consider the following ethical requirement that one might place on a scientist or programmer:

A scientist/programmer must place substantive legal restrictions on the use of knowledge/programs created by him when a morally objectionable use of the work in question can be anticipated. If no such use can be anticipated then the scientist is justified in releasing this knowledge for untrammelled use by everyone. No moral approbation should be attached to this release.

⁴⁶ Helen Longino. *Science and Social Knowledge: Value and Objectivity in Scientific Inquiry*. Princeton University Press, 1990.

This requirement considerably underspecifies the deliberative process by which the scientist may discover possible objectionable uses. It does not specify how likely such objectionable uses could be. Furthermore, agreeing on a list of morally objectionable uses is not trivial; no substantive moral difference is made by proscribing the most obvious moral violations. If a programmer releases his 3-D graphics toolkit with the restriction, “You may not use this software to torture babies,” the burden of ethical decision making has not been made any lighter.

From a historical point of view, the Free Software Definition articulates beliefs that have been widely held in hacker communities: that programs, like tools, should be usable for doing anything, and that sharing, customization and modification are all essential freedoms. But neither the past nor present circumstances suggest the immutability of the Free Software Definition: like all constitutions it is amendable following a process of democratic debate. We could imagine Freedom Zero being withdrawn sometime in the future but only after much deliberation across the community. But even then it seems implausible that specific uses of software would be forbidden. We suspect rather, that free software licenses might include clauses that would allow programmers to revoke Freedom Zero if an objectionable use was identified. For this to happen, the community would have had to arrive at a rough consensus about uses of software that are the most threatening to software users at large. The debate about the DRM clause in GPLv3 suggests the possible contours of such a future deliberation.

Licenses by virtue of their terms grant rights to, or take them away from, users. As the discussion about GPLv3 showed, it was possible to flirt with the idea of abridging some user freedoms (in that case, in response to concerns about potential uses in software

that might infringe users' privacy). It is not inconceivable, then, that future free software licenses by their terms might force further discussion about possibly amending the Free Software Definition itself, just as Bruce Perens' proposed Debian Free Software Guidelines were modified after discussions in the community.⁴⁷

The US National Committee on Science, Engineering, and Public Policy emphasized that anticipating all possible uses of scientific knowledge is virtually impossible for the community, let alone the individual. As Henry Sidgwick points out, a normative requirement of ethical codes themselves is that they not require too much of moral agents⁴⁸. Instead, this is a task best done in co-operation with the community at large, which would both create a space for deliberative democratic discussion and distribute the moral burden.

So, perhaps a weaker formulation of the prescription above is in order:

A scientist/programmer is justified in placing substantive legal restrictions on the use of knowledge/programs created by him when a morally objectionable use of the work in question can be anticipated. If no such use can be anticipated then the scientist is justified in releasing this knowledge for the untrammelled use by everyone. No moral approbation should be attached to this release.

This definition makes it permissible for the scientist to place restrictions on the use of his work. But such restrictions now must be evaluated in light of how they preclude

⁴⁷ Bruce Perens. The Open Source Definition, in *Open Sources: Voices from the Open Source Revolution*, Chris DiBona, Sam Ockman, and Mark Stone, Eds. O'Reilly Media, 1999. Retrieved November 6, 2007, from <http://www.oreilly.com/catalog/opensources/book/perens.html>.

⁴⁸ Henry Sidgwick. *The Methods of Ethics*, 7th ed. Hackett Publishing Company, London, 1981. See also Michael Slote. *From Morality to Virtue*. Oxford University Press USA, 1992.

opportunities for others to shape the ethical discussion. In the case of free software, the option of licensing software under a more restrictive non-free license (e.g., the HESSLA license) is available to an original developer. As our discussions above indicate, it is not clear that this move is either practical or appropriate from either a utilitarian or communitarian perspective.

For the free software developer, the question of whether Freedom Zero should be granted is orthogonal to a relative assessment of free and proprietary software licensing schemes. The fundamental distinction among contemporary software licenses is the issue of access to, and usage of, source code. If the most important question were, “How should software be used?” then the taxonomy of software licenses would have a much different form, one in which licenses were classified according to the usage restrictions they imposed. Conceivably, some who now find themselves in opposition regarding the availability and unrestricted use of source code might find themselves in agreement over whether their software could be used to build nuclear missiles. Thus, we could decide what uses software could be put to without having decided whether source code should be available or not; we could decide whether source code should be available without having decided what uses software should have. Deciding what uses the original software could be put to—the only decision to which Freedom Zero applies—is distinct from deciding whether to make modifications to the supplied source, to distribute the modified product, and whether to distribute the modified source.

While Freedom Zero was originally intended to support the hacker’s instinct for tinkering, its continued provision, as this paper itself shows, serves to facilitate a broader debate about software’s larger social significance.

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