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The Implications for Law of User Innovation**

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With growing frequency, people who acquire mass-produced products are modifying them. The producers of some of those products seek to curb this practice. The law currently enables the producers to prevent or penalize some but not all of the ways in which their creations are being modified. Should those doctrines be altered – either to expand or to contract the producers’ power? A substantial body of literature addresses this question with respect to modifications of what might be called cultural products—sound recordings, movies, photographs, and the like. This essay seeks to enrich that literature in two respects. First, it argues that user modifications of more tangible products—what might be called “equipment”—are equally common and deserve equal attention. Second, it offers a critical review of the policy arguments that have been or could be deployed in this area. The primary conclusion of that review is that the most forceful argument in favor of encouraging user modifications with respect to both cultural goods and equipment is not that it would promote economic efficiency or distributive justice, but that it would advance a substantive vision of human flourishing.

Today, most consumer goods are mass-produced, not custom-made. If you want a pair of shoes, you go to a shoe store and purchase them “off the rack”; you don’t go to a tailor to have them made to fit your feet or your walking habits. If you want a book, you buy a copy of one already published; you don’t hire an author to write one. There are exceptions to be sure; some people still have suits or dresses made especially for them. But they are rare.

For as long as this has been true, some consumers have been altering the mass-produced products they purchase. Recently, the frequency of this behavior has increased sharply. The producers of some products welcome innovation by users, but the producers of others are trying to control or prevent it.

Producers whose wishes are defied by consumers are turning increasingly often to the courts. The responses of the courts have been inconsistent. Sometimes they have come

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to the producers' aid; sometimes they have refused. Both sides claim that they are being treated unfairly and seek changes in the law that would strengthen their positions.

This essay tries to help lawmakers in deciding how to respond to these competing requests. The analysis proceeds as follows: Part I documents the increasingly common practice of user innovation. Part II identifies the characteristics shared by its many manifestations. Part III surveys the variety of ways in which producers have reacted to this conduct. Part IV examines the legal doctrines that are currently used to resolve conflicts between producers and innovators. Part V, the longest portion of the essay, tests the claims of producers and users against several normative criteria. Part VI returns to the law, suggesting some specific reforms that would advance the most convincing of the policy arguments examined in Part V.

I. Users' Behavior

The phenomena with which we are concerned are best described by example. Let's start with modifications of cultural goods. These will be familiar to most readers, so we can canvass them quickly.

Digital mashups are created by combining audio, video, graphical, or textual material from pre-existing works into new digital works.¹ A classic in this genre is *The Grey Album*, created in 2004 by Brian Burton (better known as Danger Mouse), which integrated material from the Beatles' *White Album* with rapper Jay-Z's *Black Album*. Widely circulated on the Internet, it received favorable reviews in *The New Yorker*, *Rolling Stone*, *Entertainment Weekly*, and *The Village Voice*. Laurent Fauchere and Antoine Tinguely subsequently combined a portion of *The Grey Album* with excerpts from the Beatles' movie, *A Hard Day's Night*, and a video recording of a rap performance by Jay-Z to create the popular *Grey Video*.²

Some mashups are parodies; they poke fun at one or more of the works that they draw upon. Examples include Söderberg's "Read My Lips," which mocks the close relationship between Gorge W. Bush and Tony Blair,³ Jason Woliner's "Spec-Attack-ular," which mocks John Ashcroft's alarmist and partisan response to terrorist threats,⁴ and "The Shining," an unauthorized trailer that combines excerpts from the movie with a song by Peter Gabriel in a way that makes the famous horror film seem a "feel-good" romance.⁵ Others draw upon existing works, not to comment upon them, but for independent artistic objectives.⁶

Typically, mashups are fixed in a digital format and then made available for public listening, viewing, or downloading on the Internet. Thousands—most of them created by

¹ The most thorough study of the practice, culture, and economics of making mashups is Lawrence Lessig, *Remix: Making Art and Commerce Thrive in the Hybrid Economy* 1-19, 68-76 (2008).

² See Matthew Rimmer, *Digital Copyright and the Consumer Revolution* 130-34 (2007); Derek E. Bambauer, *Faulty Math: The Economics of Legalizing The Grey Album*, 59 *Alabama Law Review* 345, 349-50 (2008).

³ Available at <http://video.google.com/videoplay?docid=3580315324203381023#>. For a description and analysis of the work, see Lessig, *Remix*, 73-74.

⁴ Available at <http://aspecialthing.ning.com/video/video/show?id=1978181:Video:1682>.

⁵ Available at http://www.youtube.com/watch?v=sfout_rgPSA.

⁶ See, e.g., "Alice," available at <http://www.youtube.com/watch?v=pAwR6w2TgxY>.

amateurs—can be found on YouTube.⁷ Recently, however, organizations like Eclectic Method have begun making mashups spontaneously and performing them in clubs. Some of these “live” mashups seek to respond to the mood and even incorporate the behavior of the audience.⁸

Artists working in nondigital media also commonly incorporate preexisting mass-produced works. Sculptures (such as Jeff Koons’ “String of Puppies”⁹), collages (such as Koons’ “Niagra”¹⁰), paintings (such as Joy Garnett’s “Stones”¹¹), and lithographs (such as Shepard Fairey’s Obama “Hope” poster¹²) often either are based upon or integrate other images. Thousands of less famous works employ similar techniques.¹³

“Edits” of movies consist, as the name suggests, of abridged versions of commercially released films. Some are prepared and distributed by companies catering to niche markets—for example, consumers less tolerant of violence or nudity than most moviegoers.¹⁴ Others are prepared by amateurs who believe (often with good reason) that they can improve films by removing scenes or characters. For instance, several “edits” of *Star Wars, Episode I: The Phantom Menace* have been created and made available over the Internet.¹⁵ Unlike mashups, which are most often intended to be humorous, movie edits usually represent serious efforts to strengthen the originals.¹⁶

Narrowly defined, “fan fiction” consists of stories that place characters from popular works (such as Captain Kirk and Spock from the television show and movie series, *Star Trek*) in novel settings. More broadly defined, it consists of “any kind of written creativity that is based on an identifiable segment of popular culture, such as a television show, and is not produced as ‘professional’ writing.”¹⁷ Writing of this sort has been produced for centuries,

⁷ See, e.g., Lady Gaga vs Christopher Walken-Poker Face, <http://www.youtube.com/watch?v=nGH5vgIKyT0>; Christian Bale takes David to the Dentist, <http://www.youtube.com/watch?v=70r-Ca8weVg>; Tick-Toxic, <http://www.youtube.com/watch?v=gRHfd9Yto0A>; Walk It Out Fosse, <http://www.youtube.com/watch?v=KU3N5c2Kxw>.

⁸ Good examples can be found at <http://video.com/7355745> and <http://video.com/7147850>. The website for Eclectic Method, <http://www.eclecticmethod.net>, provides a helpful explanation of this new approach. I am grateful to Scott Nichols for the reference.

⁹ See *Rogers v. Koons*, 960 F.2d 301 (CA2), cert. denied, 506 U.S. 934 (1992).

¹⁰ See *Blanch v. Koons*, 467 F.3d 244 (CA2 2006).

¹¹ See John Armitage & Joy Garnett, *Radicalizing Refamiliarization*, 8 *Journal of Visual Culture* 176 (2009). For many additional examples, see Famous Painters Copied Photographs, http://www.fogonazos.es/2006/11/famous-painters-copied-photographs_06.html.

¹² Full disclosure: After I presented the lectures embodying this essay, I was asked – and agreed – to represent Shepard Fairey in the lawsuit in which the Associated Press contends that his unauthorized use of an AP photograph constitutes copyright infringement. See “Judge: ‘HOPE’ Artist Can Switch Lawyers in AP Suit,” *New York Times*, November 10, 2009. Although the argument presented here was formulated before I became involved in the litigation, it is possible that the final version of the essay has been affected by my engagement in the case.

¹³ See, e.g., <http://www.collageart.org/>.

¹⁴ See Cleanflicks, available at <http://www.cleanflicks.com/>.

¹⁵ The most widely circulated of those modified versions, “The Phantom Edit,” is available at <http://www.mininova.org/tor/711354>.

¹⁶ See William W. Fisher, III, *Promises to Keep: Technology, Law, and the Future of Entertainment* (2004).

¹⁷ Rebecca Tushnet, *Legal Fictions: Copyright, Fan Fiction, and a New Common Law*, 17 *Loyola of Los Angeles Entertainment Law Journal* 651, 655 (1997). See also Karen Hellekson & Kristina Busse, *Fan Fiction and Fan Communities in the Age of the Internet: New Essays* (2006).

but as a recognized genre, fan fiction seems to have originated in the United States in the late 1960s. (A parallel genre, known as doujinshi, emerged in Japan at approximately the same time.¹⁸) In recent years, the ability of fan-fiction writers to share their creations with fellow fans over the Internet has amplified its popularity enormously.¹⁹

Among the many sub-genres of fan fiction is “Mary Sue fiction.” Stories of this sort rewrite famous narratives either by bringing a minor character to the fore or by inserting an entirely new character—typically a stand-in for the author.²⁰ Another flourishing sub-genre is known as “slash fiction.” These stories, typically written by women, place well known male fictional characters (often drawn from science fiction) in homoerotic settings.²¹ A recent, even more controversial variation on this theme is “real person slash.” Stories in this vein depict famous living people—almost always men; usually athletes, actors, or musicians—engaged in homosexual relationships or encounters.²²

A final example: purchasers of computer games routinely modify them. A growing percentage of game manufacturers, aware of consumers’ tastes for customization, provide them “toolkits,” which facilitate the process of creating new features.²³ Many players, however, find the commercial toolkits inadequate and develop their own. Players of *The Sims*, a complex and popular game, are especially innovative. Some of the features they create are simple—for example, new colors for the games’ characters. Others are more complex—for example, new types of furniture that can be used to decorate the artificial worlds produced in the game. Still others are highly sophisticated—for example, a system that enables the games’ characters to vote on issues.²⁴ Most of the customizers share their innovations with other players, usually through the Internet. Notably, the more sophisticated an innovation, the more likely it is to be shared.²⁵ Demand for customized features is high; some of the most complex user innovations have been downloaded more than 100,000 times.²⁶

¹⁸ See Lawrence Lessig, *Free Culture: The Nature and Future of Creativity* 25-28 (2004).

¹⁹ Many such communities can be found at <http://www.fanfiction.net/> or <http://archiveofourown.org/media>.

²⁰ See Anupam Chander & Madhavi Sunder, *Everyone's a Superhero: A Cultural Theory of "Mary Sue" Fan Fiction as Fair Use*, 95 *California Law Review* 597, 602-609 (2007).

²¹ See Henry Jenkins, *Textual Poachers: Television Fans and Participatory Culture* 188-89 (1992); Sonia Katyal, *Performance, Property, and the Slashing of Gender in Fan Fiction*, 14 *Journal of Gender, Social Policy & the Law* 463, 481-97 (2006).

²² See Andrew Furlow, *A Glimpse into the Lawless World of 'Real Person Slash,'* unpublished paper, May 15, 2009 (on file with the author). One might fairly ask: is it accurate to describe stories of this last sort as involving the appropriation or modification of preexisting cultural products? Response: yes, at least to the extent that the personae of the persons depicted therein can plausibly be described as “constructed.”

²³ See L.B. Jeppesen, *The Implications of User Toolkits for Innovation*, Copenhagen Business School Working Paper (2002); C. Pearce, *Emergent Authorship: The Next Interactive Revolution*, Computer & Graphics (2002). One study found that, in a sample of 94 computer games, 35% made such toolkits available to users. L.B. Jeppesen & M.J. Molin, *Consumers as Co-Developers: Learning and Innovation Outside the Firm*, 15 *Technology Analysis and Strategic Management* 363 (2003). “Toolkits in practice with computer games range from what are called level builders (which allow players to create their own game environments) to character-building kits (which enable users to create individual avatars). Some games even provide users with the code or scripting language to create their own games; these functions are referred to as mods.” Reinhard Prugl & Martin Schreier, *Learning from Leading-Edge Customers at The Sims: Opening up the Innovation Process Using Toolkits*, forthcoming in *R&D Management* (2005). (citing Pearce, *Emergent Authorship: The Next Interactive Revolution*).

²⁴ Prugl & Schreier, *Learning from The Sims*, 16.

²⁵ *Id.* at 19.

²⁶ *Id.* at 21.

In recent years, these and other ways of modifying cultural products have become extraordinarily popular. John Palfrey and Urs Gasser, for example, report that roughly one in four young people now engage in “remixing” digital content into their own artistic creations.²⁷ It is not surprising that this trend has attracted considerable attention—both among members of the public and among legal scholars. Less familiar, especially to legal scholars, are types of user innovation that involve more tangible products.²⁸ Illustrative instances are described below.

Purchasers of sports equipment frequently alter them to fit their bodies or needs. For instance, as Eric von Hippel has shown, the modifications of windsurfers that enable them to be used for jumping and other high-performance maneuvers were originally made by users and only later adopted by manufacturers.²⁹ Similarly, many innovations in the rapidly developing field of kite surfing (for example, the shapes of the boards and the mechanisms for releasing kites in emergencies) have been made by the surfers themselves³⁰—and then shared with other surfers through blogs.³¹ Rock and ice climbers are constantly modifying their equipment. For instance, the “leashes” that enable ice climbers to hang on their ice axes and ice hammers when climbing frozen waterfalls were originally designed by climbers and only later incorporated by the axe and hammer manufacturers.³² The same is true of Big Bros chocks and many other forms of “protection” employed by rock climbers.³³ Snowboarders and rodeo kayakers engage in similar levels of innovation.³⁴ Fly fishermen have the same penchant for tinkering. Some modify their rods—for example, by using fine sandpaper to remove the sheen from new graphite rods, thereby reducing the chances that the fish will be spooked by reflected sunlight. Many more tie their own flies, creating new patterns and then posting them to fly-fishing Internet sites.³⁵

²⁷ See John Palfrey & Urs Gasser, *Born Digital*, 113 (2007).

²⁸ An important exception to legal scholars’ disinterest in this phenomenon is Katherine J. Strandburg, *Users as Innovators: Implications for Patent Doctrine*, 79 *University of Colorado Law Review* 467 (2008). In Part V, below, we’ll take up Strandburg’s suggestions concerning how legal doctrine might be adjusted to accommodate behavior of this sort.

²⁹ See Eric von Hippel, *Democratizing Innovation*, chpt. 1 (2005).

³⁰ See Nikolaus Franke, Eric von Hippel & Martin Schreier, *Finding Commercially Attractive User Innovations: A Test of Lead User Theory*, *Journal of Product Innovation Management* 17, Table 4 (2005). The nature and scale of the sport are sketched in the following passage: “Kite surfing is a water sport in which the user stands on a special board, somewhat like a surfboard, and is pulled along by holding onto a large, steerable kite. Equipment and technique have evolved to the point that kites can be guided both with and against the wind by a skilled kite surfer, and can lift rider and board many meters into the air for tens of seconds at a time. Today there are between 100,000 and 250,000 kite surfers worldwide.” Franke, von Hippel & Schreier, *Attractive User Innovations*, 10.

³¹ See, e.g., <http://www.kiteforum.com/blogs.php>.

³² Photographs of some of the original amateur leashes and some modern commercial versions can be found at <http://cyber.law.harvard.edu/people/tfisher/Ice%20Axe%20Leashes.pdf>.

³³ See Cameron Cross, *In Memoriam: Craig Luebben (1960-2009)*, *Climbing* October 2009.

³⁴ See Christoph Hienereth, *The Commercialization of User Innovations: The Development of the Kayak Rodeo Industry*, Vienna University of Economics and Business Administration (2004); Sonali Shah, *Sources and Patterns of Innovation in a Consumer Products Field: Innovations in Sporting Equipment*, MIT Working Paper, No. 4105 (2000); Carliss Baldwin, Christoph Hienereth & Eric von Hippel, *How User Innovations Become Commercial Products: A Theoretical Investigation and Case Study*, (2006). Rodeo kayakers perform flips, spins, aerobic maneuvers, and other tricks in white water. A representative video of these activities is available at <http://www.youtube.com/watch?v=xxWsv0InLw8>.

³⁵ See, e.g., HipWader.com’s Fly Fishing Forums and Fly Tying Message Board, <http://flyfishingforums.hipwader.com/viewforum.php?id=7>; Virtual Flybox,

A surprisingly active zone of user innovation is basketball shoes. As Johann Fuller and his colleagues have shown, huge numbers of basketball players participate in online communities.³⁶ The most popular of the fora, Niketalk, has 34,000 members and receives 5000 posts a day.³⁷ A substantial percentage of those contributions discuss modifications of basketball shoes.³⁸ Some of these changes are aesthetic (the additional of paint, glitter, or other decorations); others are functional. Most involve modest adjustments to existing designs, but a few offer detailed plans for entirely new designs.³⁹

Another field characterized by high levels of user innovation is bicycling. For decades, racing cyclists have been modifying their machines in quest of optimum performance. Less well known are the myriad ways in which bicycles are modified in developing countries for more prosaic purposes. Many such innovations can be found on the remarkable website: Afrigadget.⁴⁰ For example, bicycles are often customized to enable them to carry large loads or to serve as ambulances. Other innovations are more ingenious. For example, one man added several features to his bicycle enabling it both to carry and to power a knife sharpening system.⁴¹ In the most famous of these instances of modern-day bricolage, William Kamkwamba of Malawi used the frame, chain, and rear wheel of a bicycle (along with some PVC pipe and a tractor fan) to provide the heart of a windmill that drives a small generator used to charge cellular telephones in a region lacking electric power.⁴²

Cellular phones themselves represent another area of intense user innovation. For example, many purchasers of Apple iPhones have developed applications that either improve upon or supplement the limited set of applications that Apple provides. Instinctiv Shuffle, for instance, replaces the Shuffle system associated with the iPod component of the phone. Its key feature: by analyzing the songs you skip, it provides you a collection of songs that, instead of being drawn at random from your entire collection, fit your current mood and activity.⁴³ Thousands of other unauthorized applications have been developed for the iPhone and are readily available on the Internet.⁴⁴

Cooks, both amateur and professional, also innovate frequently. Recipes, of course, are constantly being tweaked. Less well known is the tendency of cooks to invent or adapt tools, enabling them to improve their concoctions or make them faster. Examples include:

<http://www.virtualflybox.com/patterns/index.php>; Flyfishing Fly Swap, <http://about-flyfishing.com/library/weekly/aa020100a.htm>.

³⁶ See Johann Füller, Gregor Jawecki & Hans Mühlbacher, *Innovation Creation by Online Basketball Communities*, 60 *Journal of Business Research* 60 (2007).

³⁷ See Id. at 63.

³⁸ See Id. at 64-68.

³⁹ See Id. at 67.(describing one such comprehensive proposal, contributed by Vocaldigital23 to the Niketalk forum)

⁴⁰ See <http://www.afrigadget.com/>.

⁴¹ A video, demonstrating the system, can be found at http://www.youtube.com/watch?v=9bx_PkNIkK4.

⁴² The windmill is depicted and described at <http://www.afrigadget.com/2009/07/>. For more about Kamkwamba's background and inventions, see William Kamkwamba & Bryan Mealer, *The Boy Who Harnessed the Wind* (2009), available at <http://williamkamkwamba.typepad.com/>

⁴³ Instinctiv Shuffle is described – and can be obtained (for free) – at <http://www.appleiphoneschool.com/2009/01/13/instinctiv-shuffle-an-ipod>.

⁴⁴ See, e.g., iPhone Hacks, http://www.iphonehacks.com/iphone_applications/; Robert Mullins, "Unauthorized iPhone Apps Market Flourishes," *PC World*, September 27, 2007, available at http://www.pcworld.com/article/137766/unauthorized_iphone_apps_market_flourishes.html.

pantyhose liners for strainers, which are then used to create smooth sauces; paint rollers wrapped with tea towels, used to apply oil to grills; segments of curtain rods used as mandrels for phyllo straws; and cedar shingles, soaked in water, used to roast salmon.⁴⁵

Boats constitute another arena of intense user innovation. The owners of recreational motorboats and sailboats are constantly customizing their crafts—to enhance speed, safety, or convenience. Boating magazines and websites, such as *Sail* and *Cruising World*, commonly feature designs and “gear” that can be used for these purposes.⁴⁶ More interesting for our purposes are the ideas for customization developed by the boat owners themselves. Such ideas are often shared informally among friends, among competitors at regattas, or when boat owners wander the docks at marinas, admiring others’ crafts. The owners and operators of commercial boats are even more likely to modify them to suit their purposes. A review of the advertisements for used “sternpickers” (gillnet boats employed to catch salmon in the Pacific Northwest) or lobsterboats (employed primarily in Northern New England and Eastern Canada) reveals an extraordinary array of adjustments and innovations.⁴⁷

Motorcycle owners also tend to be innovative. The owners of Harley Davidsons, in particular, are especially likely to customize their bikes. Various independent companies offer “kits” that can be used to make those modifications,⁴⁸ but many owners go much further than the kits allow. The website for the Harley Owners Group contains a forum in which members can exchange customization ideas and plans.⁴⁹ Many motorcycles that have undergone this process are available for sale on the Internet.⁵⁰

Cars, similarly, seem to cry out for customization. For many years, of course, young men (and occasionally women) have been tinkering with cars, usually in efforts to make them go faster.⁵¹ An especially intriguing subset of modified cars are known as “lowriders.” These consist of classic American cars (1964 Chevrolet Impalas are especially prized) whose suspensions have been modified to make them ride even closer to the ground than they originally did. Often, their shock absorbers have been replaced with hydraulic devices that can be controlled independently by the driver. Cars altered in this way can be made to

⁴⁵ See Amanda Hesser, *Quick, Hide the Tools. Here Comes a Chef*, New York Times, September 16, 1998.

⁴⁶ See, e.g., Cruising World, “Gear and Systems,” http://www.cruisingworld.com/gear_and_systems.jsp; “How to Customize Your Boat for Lake Fishing,” eHow, http://www.ehow.com/how_2031813_customize-boat-fishing.html; “Customizing your canoe,” Piragis Boundary Waters Catalogue, <http://www.boundarywaterscatalog.com/browse.cfm/2,116.html>.

⁴⁷ See Permit Master, “Gillnet Combos,” http://www.permitmaster.com/boat_listings.php?list_type=cat&catid=10; Athearn Marine Agency, “Lobster Boats,” http://www.athearnmarine.com/vesl_Lobster_1.htm; BoatQuest.com, “New and Used Lobster Boats for Sale,” <http://www.boatquest.com/Lobster/1/allcategoryboats.aspx>.

⁴⁸ See, e.g., AME Chopper Products, http://www.ame-chopper.de/Seiten_USA/A00_index.htm; Team Cycle USA Motorcycle Kit Specialist, <http://www.teamcycle.com/>; AR Harley & Sons, <http://www.harleycustom.com/>.

⁴⁹ See www.hog.com; Gil McWilliam, *Building Stronger Brands through Online Communities*, 41 MIT Sloan Management Review (2000).

⁵⁰ See, e.g., <http://www.autabuy.com/Vehicles/Details.cfm?VID=397552&Year=2005&Make=Harley-Davidson&Model=Softail%20Custom%20FXSTC>; <http://www.classybike.com/68253>.

⁵¹ Among the many films celebrating the culture that has grown up around this practice is *Grease*.

dance. Lowriders were originally confined to the Chicano community in Los Angeles, but have since become popular among the youth in many cities in southwestern United States.⁵²

Woodworkers, both amateur and professional, are constantly altering their tools to make them more precise, efficient, and flexible. Large power tools, in particular, can usually be improved with custom-made accessories. Common additions include: extensions for table saws,⁵³ tables and fences for radial arm saws,⁵⁴ router tables,⁵⁵ shaper tables,⁵⁶ and drill-press platforms.⁵⁷ Two zones of especially intense user innovation involve workbenches⁵⁸ and router jigs. To a woodworker, a “router” means not an electronic device used to connect two or more computers but rather a high-speed motor that drives a wide variety of bits designed to make grooves of different shapes in wood. Routers work most effectively when paired with accessories, known as jigs, that guide the placement of the grooves. Commercial versions of such jigs can be purchased, but most woodworkers make their own. Jig patterns are exchanged and evaluated on various websites, the most popular of which is “RouterForums.”⁵⁹

Another zone where user innovation flourishes is medicine. For example, Christian Luthje reports that more than one third of a large sample of surgeons working in German university clinics had developed or improved a piece of medical equipment. The primary motivation of most of them was neither a desire to enhance their reputations nor the prospect of additional income, but rather a felt “need for performing surgery easier, faster, cheaper, more convenient[ly] and less invasive[ly] for the patient.”⁶⁰

⁵² A thorough description of the history and culture of lowriders (including many pictures of the modified cars) can be found at <http://www.ognation.org/lowrider.html>. Many examples of lowriders for sale may be found at <http://www.cars-on-line.com/lowrider.html>.

⁵³ See, e.g., Wayne of the Woods, “Free Table Saw Extension Plans,” <http://wayneofthewoods.com/table-saw-extension.html>; Woodworking Online, “Build Your Own Custom Powermatic Table Saw,” <http://www.woodworkingonline.com/2007/12/27/build-your-own-custom-powermatic-table-saw/>.

⁵⁴ See, e.g., Lumberjocks, “Multi-purpose cutting station with miter saw and radial arm saw,” <http://lumberjocks.com/projects/23050>.

⁵⁵ See, e.g., John English, “Router Table Tips,” Dewalt.com, <http://www.dewalt.com/us/articles/article.asp?Site=woodworking&ID=201>.

⁵⁶ See, e.g., “Make a Good Router/Shaper Table for use with a Moto Tool,” http://www.airfieldmodels.com/information_source/how_to_articles_for_model_builders/tools/dremel_router_shaper_table_v2/index.htm.

⁵⁷ See, e.g., <http://www.anneldavis.com/bobandanne/drillpresstable.htm>.

⁵⁸ See, e.g., Ron Hazelton’s House Calls, “How to Build a Custom Workbench,” http://www.ronhazelton.com/archives/howto/Workbench_Construction.shtm.

⁵⁹ See <http://www.routerforums.com/>. Patterns for router jigs may also be found through the website for *Fine Woodworking* magazine: <http://www.finewoodworking.com/Workshop/WorkshopDirectory.aspx?dir=Router+Jigs>; and on YouTube, see, e.g., <http://www.youtube.com/watch?v=mlrYfl1t5oB8>.

⁶⁰ See Christian Luthje, “Customers as Co-Inventors: An Empirical Analysis of the Antecedents of Customer-Driven Innovations in the Field of Medical Equipment,” unpublished paper on file with the author. See also Wim G. Biemans, *User and third-party involvement in developing medical equipment innovations*, 11 *Technovation* 163 (2002); Bernard Shaw, *The Role of the Interaction between the User and the Manufacturer in Medical Equipment Innovation*, 15 *R&D Management* 283 (1985).

At the opposite end of the social-utility spectrum is “circuit bending.”⁶¹ Invented (or at least named) by Reed Ghazala in the 1960’s, circuit bending consists of deliberately short-circuiting mass-produced electronic devices to produce unusual sounds.⁶² The devices commonly used for this purpose include children’s keyboards, toy guitars, and synthesizers. The technique is one of trial and error: one removes the cover or rear panel of the device and then, using a jumper wire, begins connecting terminals at random, listening to the sounds that are produced. When an intriguing noise is generated, one replaces the temporary circuit that produced it with a semi-permanent connection plus a switch, enabling the sound to be reproduced later. Instruments created in this fashion can then be used to perform electronic music.⁶³ Circuit benders participate in annual festivals,⁶⁴ produce podcasts, and exchange ideas on the blog, Getlofi.com.⁶⁵ CDs and compilations of MP3 recordings of “bent” music can now be obtained on the Internet.⁶⁶

This completes our tour of varieties of user innovation, both with respect to cultural goods and with respect to equipment. The examples could be multiplied, but these seem sufficient to suggest the flavor and variety of these activities.

In the past decade, the popularity of user innovation of these sorts has increased sharply. With respect to cultural goods, the recent surge can be attributed in large part to technology. Audio and video recordings, photographs, games, and so forth have been distributed increasingly widely in digital formats. At the same time, software enabling those materials to be modified and combined have become ever more widely available. The result, not surprisingly, has been a rapid increase in the frequency with which consumers have modified the digital products they acquire.⁶⁷

With respect to equipment, the role of technology in facilitating user innovation is less straightforward. In some settings—such as circuit bending—technology has made more widely available the tools, skills, and products that enable users to play. In other areas, the increasing availability and decreasing cost of sophisticated programs for computer-aided-design programs are expanding sharply the set of consumers who can engage in innovation.⁶⁸ However, in other settings—such as cars—the increasing complexity of the underlying products has made tinkering harder, not easier.

⁶¹ I’m grateful to Paul Ohm for alerting me to this phenomenon.

⁶² The title and subtitles of Ghazala’s book on the subject suggests much concerning both the technique of circuit bending and the culture that surrounds it: Qubais Reed Ghazala, *Circuit Bending: Build Your Own Alien Instruments; Feel the Ghost in the Machine; Create the Sounds of Another Dimension; This is Totally Twisted; How to Get New Noise from Old Toys* (Indianapolis: Wiley, 2005).

⁶³ The most accessible introduction to the nature and purposes of circuit bending is the “Circuit Bending Documentary,” available at <http://absurdity.biz/CircuitBending/Bent.htm>.

⁶⁴ See <http://www.bentfestival.org/>.

⁶⁵ See GetLoFi – Circuit Bending Synth DIY, <http://www.getlofi.com/>.

⁶⁶ See, e.g., *Noise and Toys*, Volume 1, available at <http://www.wearerecords.com/noistoys.htm>.

⁶⁷ See Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, chapters 1, 8 (2006); Palfrey & Gasser, *Born Digital*, 122-23; Edward Lee, *Warming Up to User-Generated Content*, 2008 *University of Illinois Law Review* 1459, 1500-01 (2008). Benkler convincingly argues that the surge in user modifications of cultural products was not “determined” by the new technologies. Rather, technological change created a new set of “affordances” that made the modifications easier and more likely. See Benkler, *Wealth of Networks*, 16-18. In Part V.B. we will consider the forces or impulses in addition to technology that may have contributed to the surge.

⁶⁸ See von Hippel, *Democratizing Innovation*, Chpt. 9.

In both contexts, however, technology has had one clear-cut impact: it has radically increased the ability of innovating users to communicate with each other—to exchange ideas concerning techniques and products, and to form communities centered on their shared interests.⁶⁹ This has both made user innovation more popular and raised its profile.

II. Similarities and Differences

How much do these two set of activities really have in common? They share, of course, one crucial feature: they both involve modifications of products that have been produced and distributed in large quantities.⁷⁰ But if they differ on other important fronts, it may not make sense to lump them together for analytical or policymaking purposes.

One potential difference is that user innovation in the context of cultural goods typically generates modified products that are more easily replicated and redistributed than the modified products generated by user innovation in the context of equipment. An unlimited number of perfect copies of a digital mashup can easily be made and circulated on the Internet. It is more costly to reproduce a tablesaw extension or set of windsurfer footstraps.

To some economists and intellectual-property scholars, this contrast might suggest that modifications of cultural goods differ in a fundamental respect from modifications of equipment: the former are “public goods,” while the latter are not.⁷¹ In other words, the former share two related characteristics: they may be used and enjoyed by unlimited numbers of persons without being exhausted; and it is difficult to exclude the public at large from access to them once they are made available to anyone. The latter have neither of these features.

If this way of characterizing the difference between the two sets of modified products were accurate, it would have crucial implications for legal policy. But, on reflection, it proves to be overstated. In both contexts, the products themselves are often rivalrous. Each of the VHS tapes used to store and distribute *The Phantom Edit* and the Clean Flicks abridged movies could only be used at one time by one household. The same is true of Garnett’s “Stones” painting, each of the limited set of Obama “Hope” posters,⁷² and so forth. The nonrivalrous dimension of each of these things is not the object itself, but rather the innovation the object embodies, the creative contribution that makes it both

⁶⁹ See Benkler, *Wealth of Networks*, 372-75.

⁷⁰ Some of the products being modified – such as popular songs and automobiles – have been produced and distributed in truly enormous numbers. Others – such as the greeting card upon which Koon’s “String of Puppies was based, or technical ice axes – are sold in smaller markets. But all have been produced in quantities sufficiently large to render irrelevant the policy issues implicated by alterations of unique or rare works. Cf. 17 U.S.C. 106A (limiting the coverage of the Visual Artists’ Rights Act to works of art produced in fewer than 200 copies).

⁷¹ For the theory of “public goods” on which this argument is based, see, e.g., John Stuart Mill, *Principles of Political Economy* 932-33 (1909); J.G. Head, *Public Goods and Public Policy*, 17 *Public Finance* 197 (1962).

⁷² The rivalrous character of the Hope posters is confirmed by the fact that they are being traded (to the dismay of Fairey) on Ebay. See, e.g., http://cgi.ebay.com/OBAMA-POSTER-FAIREY-OBEY-HOPE-SIGNED-FUNdraiser-EDITION_W0QQitemZ200410114316QQcmdZViewItemQQptZArt_Posters?hash=item2ea95fa90c#ht_500wt_1182 (“buy it now” price of \$900).

different from the original product and desirable. The same is true of modified equipment. It may be costly to reproduce footstraps, but the underlying idea—the discovery that, by attaching footstraps to a windsurfer one could jump waves without falling—is just as much a public good as the creative contribution that lies behind *The Grey Album*. These observations do not make the difference between the two sets of activities disappear. The fact remains that most modifications of the cultural products are more easily copied and shared than most modifications of equipment. But it is a difference of degree, not kind. At least for now, it should not prevent us from treating them as members of the same family.

Another potential distinction between the two groups is that they advance different ends. As their labels suggest, cultural products entertain or enlighten us, while equipment is “functional” in the colloquial sense. But again, the difference proves to be, at most, a matter of degree. Many of the modifications of equipment involve entertainment just as much as modifications of cultural goods. Why does one trick out a Harley, alter a car to make it capable of dancing, or create a rodeo kayak? Not to get from point A to point B more efficiently. Rather, the goal, as is true of many modifications of cultural goods, is to play. A related point: a secondary (and occasionally primary) objective of many of the modifications of equipment, like modifications of cultural goods, is aesthetic. Putting glitter on one’s basketball shoes does not enable one to jump higher. New designs for flies are valued as much for their elegance and ingenuity as for their ability to attract fish. Again, these observations do not efface the distinction, but they make it less categorical and fundamental.

Once these apparent differences are muted, the similarities between the two sets of activities loom large. First and foremost, they both demand and express creativity. Second, large numbers of persons engage in both of them. Third, often (though not invariably) the participants in these activities organize themselves into communities.⁷³ Finally, the members of those communities typically share their innovations with one another freely and without charge. Many of their innovations are both valuable and, as we will see, could be protected under intellectual-property law. So the innovators could charge for access to them if they wished. But they rarely do.⁷⁴

It is tempting to argue that yet another feature unites both types of innovation: the people who engage in them typically are amateurs. Or, to put the point slightly differently, both types of activity are typically undertaken for “noncommercial,” rather than “commercial,” purposes. But that turns out to be wrong. As the examples surveyed above make clear, many of the modifiers are amateurs, but many are professionals. Jeff Koons, Joy Garnett, Shepard Fairey, and the Clean Flicks editors—these are all surely professionals. The same is true of the lobstermen, surgeons, and alpine guides who constantly tinker with their tools. The professionals are somewhat more likely, as one might expect, to charge for access to their innovations. But most, remarkably, do not.

A subtler point: when one reads the biographies or autobiographies of many of the participants in these activities, one’s confidence in the distinctions between amateur and professional, and between noncommercial and commercial motives, is shaken. Bradford

⁷³ For examples from the sphere of cultural goods, see Lessig, *Remix*, 77-80, 200.

⁷⁴ For examples from the sphere of cultural goods, see Benkler, *Wealth of Networks*, ----; Lessig, *Remix*, 143-76. For substantiation of this generalization with respect to equipment, see von Hippel, *Democratizing Innovation*, Chpt. 6.

Washburn, for example, began his extraordinary mountaineering career climbing in New England with his friends. He then spent some summers in Chamonix, hiring professional guides to help him hone his skills and lead him up harder routes. Gradually the guides came to treat him as an equal, even though he was still paying them. Later he led a series of increasingly demanding expeditions in Alaska, sometimes funding the ventures himself, then by selling the stories and photographs that grew out of them. Still later, the National Geographic Society financed some of his trips. Throughout this process, he was constantly modifying his climbing and his photography equipment. And both the mountaineering and the equipment modifications that accompanied it seem to have been motivated primarily by a combination of curiosity and passion.⁷⁵ Was Washburn an amateur or a professional? Were his motives noncommercial or commercial?

One might answer: he began as an amateur and gradually became a professional. A similar trajectory might be traced in the life stories (or aspirations) of many other user innovators. Examples would include: most of the people who now make their livings creating “appropriation art;” the participants in the Niketalk forums whose novel designs eventually earned them jobs working for shoe companies;⁷⁶ and Gav, who introduced himself to the members of RouterForum as follows:

Hey everyone, I've been looking at the forum on and off for a while now and finally decided to sign up. I'm into woodworking as a hobby but hope to start making some money from it during the winters. My main interest is making products from reclaimed, recycled or reused materials. Here in Croatia it's hard enough to just to find some decent router bits let alone any info on jigs or building your own router table, so no doubt I'll be asking lots of question in the future.

If this pattern were typical, it might suggest that, for analytical and policymaking purposes, we could differentiate amateur and professional user innovations—and acknowledge that some people make a transition over the course of their lives from one sphere to another.⁷⁷ But that approach does not seem terribly satisfactory. Some of the people with whom we are concerned—like Graeme Obree, the pioneer Scottish bicycle racer who made many breakthroughs in bicycle design—seem to move during their careers back and forth across the professionalism boundary, and their orientations and motives at any one point are hard to characterize.⁷⁸ More importantly, this approach would neglect the similarity between the outlooks, behavior, and culture of the people who earn their livings modifying things and those of the people who do it “for fun.” The carpenters employed by boatyards to modify customers’ sailboats are surely not identical to the people working nearby on their own boats, but they share more than one might imagine. The same can be said of artists who do graphic design for customers and those who do it “for themselves.”

In short, at least for now, it seems most sensible to avoid separating user innovators into professionals and amateurs.

⁷⁵ See David Roberts, *The Last of his Kind: The Life and Adventures of Bradford Washburn, America's Boldest Mountaineer* (2009).

⁷⁶ See Füller, Jawecki & Mühlbacher, *Innovation Creation*.

⁷⁷ See, e.g., Lessig, *Remix*, 254-59. (suggesting that we treat amateur and professional remixes differently)

⁷⁸ See *The Flying Scotsman* (2006) (documenting Obree's career and equipment innovations).

III. Producers' Responses

The reactions to these activities by the manufacturers and distributors of the products being modified vary widely. At one extreme are producers who enthusiastically embrace user innovation. For example, many musicians are now making their recordings available to the public under Creative-Commons licenses that permit users to prepare derivative works.⁷⁹ There are several variations of this approach: users can be required to allow others to modify their derivative works—or not; users can be allowed to make and distribute their derivative works for commercial purposes—or not.⁸⁰ What they have in common is express authorization of modifications. This posture is not limited to little-known musicians hoping to make names for themselves; some high-profile groups, like Nine Inch Nails, have taken the same position.⁸¹ Game manufacturers have long adopted a similar posture, encouraging their customers to modify their products.⁸² Last but not least, Edward Lee has shown that, recently, many representatives of the television and motion picture industries (including spokespersons for Viacom, Warner Brothers, CBS, NBC Universal, MTV, and the MPAA) have indicated that their companies or organizations now endorse modifications and mashups of their creations, at least so long as they are “noncommercial.”⁸³

Some equipment manufacturers also affirmatively embrace user modifications of their products. Here's one:

The Portable Light Project is a non-profit research, design and engineering initiative established by KVA MATx that creates new ways to deliver decentralized renewable power and light to the developing world. Each Portable Light unit is a simple, versatile textile with flexible photovoltaics and solid state lighting that can be adapted to local cultures and customized by people using traditional weaving and sewing technologies in an open source model. This creates the opportunity for greater levels of cultural acceptance and stewardship of this technology, particularly for women who are often among the most vulnerable in developing countries.⁸⁴

Among the many adaptations that have been made in reliance on this invitation are vests into which the PLP photovoltaic panels are sewn, which are then used by boda-boda⁸⁵ drivers in Ghana to power portable lights and to charge their cell phones.⁸⁶

⁷⁹ See, for example, Matt Haughey, “Independent Musicians,” <http://creativecommons.org/audio/musicians>; Thomas Goetz, “Sample the Future,” *Wired* 12.11 (November 2004), <http://www.wired.com/wired/archive/12.11/sample.html>,

⁸⁰ Copies of the licenses at issue may be found at <http://creativecommons.org/choose/>.

⁸¹ See Nine Inch Nails, *The Slip*, <http://dl.nin.com/theslip/signup>.

⁸² See J.D. Lasica, *Darknet: Hollywood's War Against the Digital Generation* 250-51 (2005).

⁸³ See Lee, *Warming Up*, 1515-18. For the reasons discussed in the preceding section, the limitation of permission to “noncommercial” uses is problematic – and will be difficult to apply in practice. See also Chander for more copyright-related examples.

⁸⁴ The quotation is from the website for the project: <http://portablelight.org/about>.

⁸⁵ In Ghana, a boda-boda is a bicycle taxi. (In some other countries, such as Uganda, a boda-boda is a motorcycle taxi.)

One step removed from the endorsers are producers who, when faced with unauthorized modifications of their products, acquiesce. For example, Laura Malone, Associate General Counsel for the Associated Press, reports that the AP “picks its battles.” Ordinarily, it does not challenge remixes of its copyrighted works unless they appear to “have legs”—in other words, pose economically significant problems for the AP.⁸⁷ In practical terms, this seems to give rise to toleration of most noncommercial modifications. Similarly, the owners of copyrights in sound recordings typically take no action when their works are “sampled” or mashed up. In one well-publicized incident, Radiohead initially objected to a remix of their album, *In Rainbows*, by Amplive but retreated when fans criticized their posture.⁸⁸

Most equipment manufacturers currently behave the same way. They are plainly aware of at least some circumstances in which users are modifying their products. They do not formally endorse or authorize those activities, but they have not, as yet, taken any action to stop them. For example, the management of General Motors is surely aware of the ways in which its cars are being modified to produce “lowriders,” but it has neither encouraged nor objected to the practice. Similarly, the manufacturers of mountaineering equipment must be aware of the frequency with which their products are customized by climbers. But despite the risks of injury associated with some of those alterations, the manufacturers have not as yet sought to discourage the practice.

The next position along the spectrum of responses is occupied by producers to seek to block some, but not all, modifications of their products. A good example, within the field of cultural goods, is J.K. Rowling. Reportedly, Rowling tolerates most forms of fan fiction, but aggressively pursues the writers of stories that include “pornographic or sexually explicit material clearly not meant for kids.”⁸⁹ Within the field of equipment manufacturers, the most notorious practitioner of this approach is Apple. When Apple first introduced the iPhone, it did not permit users to develop their own software applications that could run on the device.⁹⁰ It later relented, but only partially. Currently, independent developers of applications must submit their programs to Apple for approval. Only if they receive Apple’s imprimatur may they be loaded on the phones. The primary criteria that Apple applies when reviewing proposed applications are: (1) an application may not touch or enhance the functionality of either the phone itself or the iPod media player that the iPhone also houses; (2) no processes may run in the background of the iPhone operating system; and (3) no application may facilitate copyright infringement. Thousands of proposed programs have failed these tests—among them, Instinctiv Shuffle, discussed above, (which violates rule 1); and third-party instant-messaging and cut-and-paste systems (which violate rule 2).⁹¹

⁸⁶ See Erik Hersman, *A Wearable Flexible Solar Panel Vest*, Afrigadget, September 5, 2009, <http://redo.me.uk/b2dk6/www.afrigadget.com/category/flap-bag-project/>

⁸⁷ Comments by Laura Malone at a panel on “Clicking ‘Refresh’: A New Look at Fair Use in the Digital Age,” New York City Bar Association, October 7, 2009.

⁸⁸ See Eliot Van Buskirk, *MP3s: Amplive's "Rainyday?" Remix of Radiohead's "In Rainbows" Album*, Wired (2008), http://www.wired.com/listening_post/2008/02/mp3s-amplives-r/; Lee, *Warming Up*, 1503.

⁸⁹ See Ariana Eunjung Cha, *Harry Potter and the Copyright Lawyer*, Washington Post, June 18, 2003.

⁹⁰ See Jonathan L. Zittrain, *The Future of the Internet -- And How to Stop It*, 2 (2008).

⁹¹ See Matt Buchanan, “Why We Still Need the iPhone Black Market,” Gizmodo, July 23, 2008, <http://gizmodo.com/5027790/why-we-still-need-the-iphone-app-black-market>.

A fourth response is to monetize the innovative impulses of one's customers and users. This approach is becoming increasingly common among equipment manufacturers, who are being nudged in this direction by many scholars and commentators on marketing. It takes many forms. A straightforward variant is simply to incorporate a user innovation into one's commercial products without compensating the original innovator. For example, when Mercury Marine learned that Steven Lough (a repairman working for a boat dealership in Sarasota, Florida), through "some trial and error [work] with his grandfather's metal lathe," developed a modified "upper seal assembly" that reduced corrosion in Mercury's popular stern drives, Mercury mimicked Lough's invention and included it in the next generation of Mercury stern drives—and subsequently prevailed in a patent infringement suit brought by Lough.⁹² Another variant of the monetization approach, already mentioned, is to sell customers "toolkits" that enable them more easily to modify the products they purchase.⁹³ Yet another variant is to create institutions that enable and encourage consumers to participate in the processes of designing or testing the manufacturers' products. Such institutions include manufacturer-sponsored "idea competitions,"⁹⁴ the so-called "collective customer commitment method,"⁹⁵ and "collaborative customer co-design" systems.⁹⁶ In all

⁹² See *Lough v. Brunswick Corp.*, 86 F.3d 1113 (1996).

⁹³ The considerable financial benefit to the manufacturers of providing customers these toolkits is substantiated by experiments reported in Nikolaus Franke & Frank Piller, *Value Creation by Toolkits for User Innovation and Design: The Case of the Watch Market*, 21 *Journal of Product Innovation Management* 401 (2004).

⁹⁴ Piller and Walcher describe this technique as follows: "Idea competitions build on the nature of competition as a means to encourage users to participate at an open innovation process, to inspire their creativity, and to increase the quality of the submissions. When the contest ends, submissions are evaluated by an expert panel. Users whose submissions score highest receive an award from the manufacturer, which is often granted in exchange for the right to exploit the solution in its domain." Frank T. Piller & Dominick Walcher, *Toolkits for Idea Competitions: A Novel Method to Integrate Users in New Product Development*, *R&D Management* (2006).

⁹⁵ Ogawa and Piller describe the method as follows: "[C]ollective customer commitment exploits the commitment of users to screen, evaluate and score new designs as a powerful mechanism to reduce flops of new products. The method breaks with the known practices of new product development. It utilizes the capabilities of customers and users for the innovation process. The process starts when an idea for a product is posted on a dedicated web site by either a (potential) customer or the developers of a manufacturer. Second, reactions and evaluations of other consumers towards the posted idea are encouraged in form of internet forums and opinion polls. Based on the results of this process, the manufacturer investigates the possibility of commercialization of the most popular designs. Is this evaluation positive, the company decides about a minimum amount of purchasers necessary to produce the item for a given sales price, covering its initial development and manufacturing costs (and the desired margin). The new product idea is then presented to the customer community, and interested customers are invited to express their commitment to this idea by voting for the design or even placing an order. Accordingly, only if the number of interested purchasers exceeds the minimum necessary lot size, investments in final product development are made, merchandising is settled and sales are commenced." Susumu Ogawa & Frank T. Piller, *Collective Customer Commitment: Turning Market Research into Sales*, 47 *Sloan Management Review* (2006).

⁹⁶ See Christoph Berger, Kathrin Moslein, Frank Piller & Ralf Reichwald, *Cooperation between Manufacturers, Retailers, and Customers for User Co-Design: Learning from Exploratory Research*, 1 *European Management Review* (2005); Per Kristensson, Anders Gustafsson & Trevor Archer, *Harnessing the Creative Potential Among Users*, 21 *Journal of Product Innovation Management* (2004); Frank Piller, Petra Schubert, Michael Koch & Kathrin Moslein, *Overcoming Mass Confusion: Collaborative Customer Co-Design in Online Communities*, 10 *Journal of Computer-Mediated Communication* (2005). Piller et al. describe this approach as follows: "In this article we challenge the assumption that offering customized products requires an individual (one-to-one) relationship between the customer and the supplier. We argue that individuality does not always mean one-to-one. On the contrary, collaboration among customers in online communities (and not directly with the online merchant) can help to overcome the mass confusion phenomenon of customized products. We will introduce the concept of a collaborative customer co-design environment which aims at reducing mass confusion. In this context

of these strategies, the manufacturer in some way channels and then capitalizes on the innovative impulses of its customers, enabling it to make more money.

Last but not least, many producers seek to prevent all unauthorized modifications of their products. Some adopt this stance to force modifiers to pay them license fees. For example, the estate of Margaret Mitchell forbids the creation of unauthorized sequels to *Gone With the Wind*—but grants licenses to sequel writers who both pay sizeable license fees and abide by restrictions on their plots (Scarlett may not die, no homosexuality, etc.). Other producers seem uninterested in license fees; they seek to prevent modifications altogether. For example, some authors have announced blanket prohibitions on fan fiction based upon their works.⁹⁷ And the owners of the copyrights in some sets of sound recordings—for example, EMI, which owns the copyrights to the Beatles’ works—seem bent upon blocking mashups like *The Grey Album*, even if their creators are willing to pay fees.⁹⁸

Many equipment manufacturers have adopted similarly absolute positions. Typically, their first line of defense is to adopt design features that make it hard to disassemble or change their products. For example, Shimano, the leading manufacturer of high-end bicycle components, deliberately constructs its parts in ways that frustrate the efforts of purchasers to repair or change them.⁹⁹ Similarly, many manufacturers of consumer electronic devices—such as TiVo and Apple—make it physically hard for users to gain access to the “guts” of their systems. The second line of defense is a threat to withdraw customer support: TiVo, Apple, and like-minded equipment manufacturers typically take the position that any effort to modify their products voids their warranties.¹⁰⁰ These two tactics work in tandem. It is hard to modify these products. Then, if you attempt to modify them and something goes wrong, you have no recourse against the manufacturer.

Jonathan Zittrain argues that the frequency of this last response is increasing, at least with respect to devices that implicate information technology. Ironically, the trend is being driven at least in part by the demand of a subset of users for secure, “glitch-free” equipment. Manufacturers are responding by producing “locked-down,” tamper-resistant devices.¹⁰¹ If the trend continues, the set of products susceptible of adaptation will shrink.

collaborative customer co-design refers to the use of toolkits for customer co-design which are used interactively between different actors. Using dedicated design toolkits, customers can jointly work on a customized variant, either delivered to just one member of the group or to all of them.”

⁹⁷ See Bambauer, *Faulty Math*, 350.; Tushnet ___; Lee, *Warming Up*, 1532. For examples of cease-and-desist letters sent by authors within this group, see ___.

⁹⁸ See Bambauer, *Faulty Math*, 350. See also Lee, *Warming Up*, 1519.

⁹⁹ See Paul Rosen, *Up the Vélorution: Appropriating the Bicycle and the Politics of Technology*, in *Appropriating Technology* 365-89, (Ron Eglash, et al. eds., 2004).

¹⁰⁰ The distributor of DVRupgrade, a kit that increases the recording capacity of a TiVo DVR, offers the following blunt statement of this stance: “Some people are using several of the items that we sell to upgrade their TiVo. You must understand that this is dangerous. High voltages are present inside your TiVo and you can be hurt if you open the case. You must also understand that it WILL VOID YOUR TiVo WARRANTY. Simply put, this means that it WILL VOID YOUR TiVo WARRANTY if you open your TiVo. Like as in don't call or email me or TiVo or Philips or Sony or anybody else if you damage something. Don't even touch those Torx screws unless you fully understand this and are prepared to toss it in the trash can if something goes wrong.” <http://9thtee.com/tivo-dt2.htm>.

¹⁰¹ See Zittrain, *Future of the Internet*, 101-03.

In sum, a growing number of consumers are adapting products, while a substantial and apparently growing number of producers are trying to prevent or control that activity. In the context of cultural goods, the conflict between these trends has produced fierce litigation. To date, lawsuits have been much less frequent with respect to equipment. That seems likely soon to change.

IV. Law

The legal system currently contains several rules that might be invoked by either producers or user-innovators when their interests conflict. We'll begin by reviewing the various doctrines that the producers do or might call upon. We'll then consider the doctrines within which the user-innovators do or might take refuge.

First, all of the products that we have been calling cultural goods—audio and video recordings, photographs, games, etc—fall within the coverage of copyright law. Until the late twentieth century, the requirement that, to obtain copyright protection in the United States, one had to comply with various “formalities” (notice, registration, renewal, and so forth) had the practical effect of confining copyright protection to a small subset of cultural goods. However, those requirements have now been eliminated. The result is that all cultural goods that evince a bare minimum of creativity and that are fixed in any tangible medium of expression (snapshots, blog entries, finger paintings, etc.) enjoy protection.¹⁰² The holders of these copyrights have the exclusive rights to reproduce them, prepare derivative works based upon them, distribute them, and publicly perform or display them.¹⁰³ As we have seen, most of the cultural goods that users wish to modify are produced in large quantities by companies. Almost invariably, those companies have acquired the underlying copyrights—either through assignments or licenses from the original creators or by hiring employees to create them.¹⁰⁴ As a result, the companies are well positioned, if they wish, to prohibit modifications of those goods. If users defy those prohibitions, they may be forced to pay the companies very substantial damages.¹⁰⁵

The percentage of products that we have been calling “equipment” that are subject to copyright law is much smaller; only those that have aesthetic features that are either physically or “conceptually” separable from their utilitarian functions are covered.¹⁰⁶ However, many forms of equipment contain components or features that are subject to patent protection. Unlike copyright protection, patent protection does not arise automatically upon fixation. Rather, the inventor must apply for a patent, persuade the Patent and Trademark Office that the invention is novel, nonobvious, and useful, provide extensive information concerning how to “practice” the invention, and pay some significant fees. These hurdles discourage many inventors. However, a large percentage of the products that users wish to modify are manufactured and distributed by companies that have been willing to assume these burdens. Typically, their primary purpose in obtaining patent protection has been to strengthen their positions with respect to their competitors, not their customers. But the companies’ right to prevent others from “making” the products (or the

¹⁰² See Chris Sprigman, *Reform(aliz)ing Copyright*, 57 *Stanford Law Review* 485 (2004).

¹⁰³ See 17 U.S.C. §106.

¹⁰⁴ See Fisher, *Promises to Keep*, chpt. 2.

¹⁰⁵ See 17 U.S.C. §504.

¹⁰⁶ See, e.g., *Pivot Point Int'l v. Charlene Products, Inc.*, 372 F.3d 913 (CA7 2004).

patented components of those products) may also be asserted against users who either reconstruct them in the course of modifying them or make additional modified versions to share with their friends.¹⁰⁷

The producers of both cultural goods and equipment can also sometimes invoke trademark law to discourage or penalize unauthorized modifications. Specifically, if a modifier sells the altered product, and the producer can show that the modifier's behavior is likely to cause a significant group of consumers to believe either that the altered version was produced by the original manufacturer or that the manufacturer "sponsored" the modification, the modifier will be subject to liability under the Lanham Act. It is also possible that the modifier could be held liable for "dilution" under the Lanham Act or under parallel state statutes if his or her conduct had the effect of "tarnishing" the reputation of the trademark under which the manufacturer is distributing the original product.¹⁰⁸

Last but not least, a user who surmounts a technological barrier that a manufacturer has erected to discourage modifications of its products may be subject to serious criminal sanctions under the Digital Millennium Copyright Act. Specifically, if a manufacturer has included in the product a "technological measure that effectively controls access" to a copyrighted work, and the user, in order to modify the product, "circumvents" that system (in other words, "avoid[s], bypass[es], remove[s], deactivate[s], or impair[s]" it), then the user may have to pay a sizeable fine or go to jail.¹⁰⁹ Because "copyrighted works" include computer programs, and because even modest technological fences are considered "effective,"¹¹⁰ a large group of user innovators risk liability under this provision.

In short, the manufacturers and distributors of products modified without their consent have lots of legal weapons they can use to pursue the modifiers. But the modifiers are not defenseless. Each of the doctrines summarized above is subject to important limitations and exceptions.

The principal relevant limitation to the copyright entitlements that the producers could assert is the fair-use doctrine. In brief, that doctrine instructs courts to excuse putatively infringing behavior if, after considering a list of factors—the "purpose and character" of the behavior, the "nature" of the copyrighted work at issue, the amount of copyrighted material the defendant took, and the impact of the behavior, if it became widespread, on the "potential market" for the copyrighted work—that behavior seems, on balanced, fair.¹¹¹ When sued, modifiers of copyrighted works have frequently sought solace in the fair-use doctrine—sometimes successfully, sometimes not.¹¹²

¹⁰⁷ See 35 U.S.C. §271.

¹⁰⁸ See 15 U.S.C. 1125(c) (Lanham Act 43(c)). To my knowledge, no published judicial opinion has relied on this theory, but the current (generous) version of section 43(c) is relatively new; we don't yet know how broadly it will be applied.

¹⁰⁹ 17 U.S.C. §1201(a)(1). For a recent application of this provision, see *Blizzard Entertainment, Inc. v. Jung*, 422 F.3d 630 (CA8 2005).

¹¹⁰ See, e.g., *Universal City Studios v. Reimerdes*, 111 F. Supp. 2d 294, 318 (SDNY 2000), *aff'd sub nom. Universal City Studios v. Corley*, 273 F.2d 429 (CA2 2002).

¹¹¹ See 17 U.S.C. §107.

¹¹² For discussion of some recent examples, see Jeannine Marques, *Fair Use in the 21st Century: Bill Graham and Blanch v. Koons*, 22 Berkeley Technology Law Journal 331 (2007).

Modifiers of patented products can use a different shield. Whereas alterations of patented products sufficiently extensive to constitute “reconstruction” of the products at issue are deemed to violate the patentees rights, alterations modest enough to be considered “repairs” are permissible. Not surprisingly, user innovators have tried to fit their behavior into the latter category. In recent years, they have been successful more often than not, but sometimes they fail.¹¹³

The defenses available to modifiers accused of Lanham Act violations are latent in the doctrine of “consumer confusion” itself. Courts, when asked to determine whether a defendant’s behavior will give rise to confusion concerning either “source” or “sponsorship” look to a laundry-list of factors.¹¹⁴ In some cases, some of those factors point in the modifiers’ direction.¹¹⁵

The text of the Digital Millennium Copyright Act provides few footholds that can be employed by user innovators who seek to avoid liability for circumventing technological shields. But the federal courts, loath to apply the statute as broadly as its drafters seem to have intended, have adopted some additional requirements that the government must establish to secure a conviction under the statute—which might benefit some modifiers.¹¹⁶

Finally, all of the doctrines that producers can invoke in their efforts to suppress unauthorized modifications are limited by one overarching legal norm: the protection secured by the First Amendment for freedom of expression. Generally speaking, courts are reluctant to rule that application of a federal statute in a particular case will violate the federal Constitution. But they have been willing to do so increasingly often in order to shield from liability especially expressive forms of user modifications.¹¹⁷ And even when they don’t expressly ground their rulings in the First Amendment, courts will sometimes adopt

¹¹³ For a review of the relevant case law, see Chisum on Patents, §16.03[3]. In the past, patentees have rarely pursued the modifiers themselves; rather, they have brought contributory-infringement suits against the companies that produced and sold the components that the modifiers employed to refurbish or alter their products. But as the visibility and scale of user modifications grows, this may change.

¹¹⁴ The set of factors varies slightly by circuit. For comparisons of the tests and empirical studies of their applications, see Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 95 California Law Review 1581 (2006); Kevin Blum, Ariel Fox, Christina J. Hayes & James Hanjun Xu, *Consistency of Confusion? A Fifteen-Year Revisiting of Barton Beebe's Empirical Analysis of Multifactor Tests for Trademark Infringement* at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1424142.

¹¹⁵ For cases that seek to provide guidance concerning when confusion of this sort will or will not arise, see, for example, *Champion Spark Plug v. Saunders*, 331 U.S. 125 (1947); *Davidoff & Cie v. PLD International Corp.*, 263 F.3d 1297 (CA11 2001); *Storz Endoscopy America v. Surgical Technologies, Inc.*, 285 F.3d 847 (CA9 2002); and *Nitro Leisure Products v. Acushnet Co.*, 341 F.3d 1356 (CAFC 2003).

¹¹⁶ See *Chamberlain Group, Inc. v. Skylink Technologies, Inc.* 381 F.3d 1178 (CAFC 2004) (holding that, to establish a violation of the DMCA, it must be shown that the technological protection measure being circumvented bears some “reasonable relationship to the protections that the Copyright Act otherwise affords.”); *Storage Technology Corp. v. Custom Hardware Engineering and Consulting, Inc.*, 421 F.3d 1307 (CAFC 2005) (same). Cf. *Lexmark International v. Static Control Components, Inc.*, 387 F.3d 522 (CA6 2004) (holding that the DMCA does not apply where the circumvented technological protection measure does not prevent reading or copying the computer program at issue).

¹¹⁷ See, e.g., *Hoffman v. Capital Cities/ABC, Inc.*, 255 F.3d 1180 (2001) (right of publicity); *L.L. Bean, Inc. v. Drake Publishers, Inc.*, 811 F.2d 26, 33 (CA1 1987) (trademark dilution); *Suntrust Bank v. Houghton Mifflin Co.*, 252 F.3d 1165 (CA11 2001) (per curiam) (copyright).

generous versions of statutory defenses to ensure that opportunities for expressive freedom are preserved.¹¹⁸

V. Policies

How should the doctrines reviewed in the preceding part be construed or reformed? Should the rights of the producers be expanded, constricted, or preserved intact? Little guidance in answering those questions can be gleaned from the pertinent statutory or constitutional provisions. We must look, instead, to the policies implicated by the various forms of user innovations at stake. A sizeable body of literature examines those policies in the context of modifications of cultural goods. This Part summarizes and assesses the arguments that have been made on behalf of the producers and on behalf of the user-innovators—and then considers the extent to which each of those arguments has salience in the context of modifications of equipment.

A. Arguments for Producers

Three arguments are commonly made in favor of granting the producers of cultural goods broad authority to control or prohibit modifications of their products. Each constitutes a reasonably straightforward application of one of the three major theoretical traditions concerned with the justification and scope of intellectual-property rights.

The first of the three is utilitarian in character. For the reasons already mentioned, the innovations that underlie most cultural goods are “public goods.” In other words, they can be enjoyed by unlimited numbers of people without being “used up,” and once they have been made available to one person, it is difficult to prevent others from gaining access to them for free.¹¹⁹ Those circumstances make it difficult for the creators of such goods to recoup the costs of creation. Aware of that difficulty, many potential creators will seek other jobs—which, in turn, will deprive the public at large of the benefits of their potential creations. To avoid this outcome, the government must somehow ensure that creators are adequately compensated. It might do so in several different ways, but the technique that governments have employed most often in the past few centuries has been to grant the creators rights to suppress competition in the production and distribution of embodiments of their innovations.¹²⁰ Initially, those rights did not include a right to prevent the making of derivative works, but lawmakers gradually came to believe that talented people would have not have optimal incentives to put their talents to work unless they could control, not just the distribution of verbatim copies of their creations, but also translations, abridgements, and adaptations thereof. In other words, the social benefits (resulting from increased innovation at the “primary” level) generated by enlarging creators’ rights along these dimensions were thought to exceed the social costs (including diminution of creativity at the “secondary” level) of those adjustments.

¹¹⁸ See, e.g., *Mattel, Inc. v. Universal Music International*, 296 F.3d 894 (9th Cir. 2002), cert. denied, 537 U.S. 1171, 123 S.Ct. 993 (2003).

¹¹⁹ The most notorious recent illustration of these characteristics is the promiscuous sharing of sound recordings through peer-to-peer networks.

¹²⁰ See Fisher, *Promises to Keep*, 200-201.

Assuming, for the moment, that this argument rests upon a coherent account of the potential impact of monetary incentives on creativity,¹²¹ there is no doubt that its strength varies radically by context. In some settings, nonmonetary incentives seem more than sufficient to support optimal (or excessive) levels of creativity.¹²² Snapshots and academic scholarship come to mind. In other settings, the creators of literary and artistic works are able to earn monetary rewards more than sufficient to cover the costs of creation without relying on intellectual-property protection at all. The classic example is trade books.¹²³ In still other settings, intellectual-property protection of some sort seems necessary (at least if no other alternative mechanism for compensating creators is available), but a simple prohibition on the unlicensed making and distribution of verbatim copies would suffice; creators do not need the additional revenue that they could reap by licensing modifications of their works. Arguably, an intuition that this is true of computer software helps explain the stringent requirements that the courts have imposed on plaintiffs who assert that defendants' programs, though not identical, are excessively similar in "structure, sequence, and operation."¹²⁴ Finally, there may be circumstances in which a generously construed exclusive right to prepare derivative works is both necessary and sufficient to create an optimal system of incentives. Stewart Sterk argues that such circumstances are rare, but offers one context that might fit the bill: "when the original work is an extraordinarily high-budget movie with the potential for sales of toys, t-shirts, and the like."¹²⁵ Derek Bambauer is similarly skeptical of this argument in general, but presents evidence concerning the economics of the comic-book business that suggests that it may also qualify.¹²⁶

Where along this spectrum do the types of cultural goods that are employed in the various forms of user innovation considered in this essay fall? The short answer is that, while we can speculate, we don't know. For example, it seems unlikely that the incentives of motion-picture studios to produce commercial films would be diminished significantly if the courts excused the creation of parody trailers—or even the production and distribution of editions purged of nudity and violence. But in truth, we don't have the data necessary to make such judgments with confidence.

Recently, copyright owners in some fields—the music industry and journalism are the principal examples—have begun making an additional argument that further complicates the task of determining the optimal set of copyright entitlements. Our core businesses are dying, they contend. If we are to avoid extinction, we must find new sources of revenue. One such source is licensing income from people who wish to "mashup" our products. You tell us that user innovation is rapidly becoming more popular? That's all the more reason to defend our rights to charge the people involved. If you don't, the innovators may soon find that they have nothing to mashup. Opinions concerning the plausibility of this claim vary

¹²¹ But see Julie E. Cohen, *Copyright, Creativity, Catalogs: Creativity and Culture in Copyright Theory*, 40 U.C. Davis Law Review 1151 1192-93 (2007). (arguing that the argument radically oversimplifies both the nature of creativity and the potential impact of law upon it).

¹²² For an intriguing examination of contexts in which nonmonetary motivations seem sufficient, see Rebecca Tushnet, *Economics of Desire: Fair Use and Marketplace Assumptions*, 51 William & Mary Law Review 513, 522-36 (2009).

¹²³ See Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 Harvard Law Review 281 (1970).

¹²⁴ See, e.g., *Computer Assocs. Int'l v. Altai*, 982 F.2d 693 (CA2 1992).

¹²⁵ See Stewart Sterk, *Rhetoric and Reality in Copyright Law*, 94 Michigan Law Review 1197 1216 (1996).

¹²⁶ See Bambauer, *Faulty Math*, 381-82.

widely,¹²⁷ but they are only opinions. Until we get better data, the best we can do is count this argument as a colorable but not overwhelming argument in favor of the producers.

Economists have developed some variations on this primary utilitarian argument that seem to offer clearer justifications for allowing creators to control modifications of their works. For example, it has been observed that giving a creator the exclusive right to prepare derivative works (a right distinct from her right to make identical or “substantially similar” copies of her creation) enhances her ability to engage in price discrimination—a practice that, by both increasing the creator’s revenues and reducing the numbers of persons “priced out of the market” for the creation, may enhance social welfare.¹²⁸ It has also been argued that permitting a creator to control modifications reduces transaction costs by centralizing (in her hands) the right to grant licenses to make uses of the chains of derivatives that fan out from the original.¹²⁹

Again, however, these arguments turn out to vary radically by context. Both theoretical work and empirical studies show that price discrimination (and thus the legal rules that enable it) are socially beneficial in some settings but not in others.¹³⁰ Similarly, a failure to prohibit unauthorized modifications of some cultural goods might indeed raise transaction costs. (Suppose that you wanted to broadcast one of the expurgated Clean Flicks movies; from whom must you obtain permission?) But as Sterk has observed, in other settings the most effective way to reduce transaction costs would likely be simply to eliminate altogether the prohibition on the preparation of derivative works.¹³¹

The second of the three arguments commonly advanced on behalf of producers leads to a similarly uncertain and unstable conclusion. It looks for guidance, not to considerations of social utility, but to rights. The creators have worked extraordinarily hard to provide us the cultural goods that we so value. In some instances (e.g., commercial films), generating the products required enormous effort, time, and money. In other instances (e.g., photographs), the products were generated with little effort, but considerable labor and resources were invested by the creators in acquiring the skills and equipment necessary to produce them. It’s only fair to compensate the creators when one uses their products. As John Tehranian puts the point: “derivative rights are entirely consistent with a natural-law vision of copyright, which maintains that an author should have exclusive control over any works derived from their creations.”¹³² To shore up this argument, the creators and their advocates point to various bodies of scholarship: the writings of John Locke and the

¹²⁷ Compare Andrew Keen, *The Cult of the Amateur* (2007); Robert P. Merges, *IP: Social and Cultural Theory* at <http://uchicagolaw.typepad.com/faculty/2009/03/ip-social-and-cultural-theory.html>. with Madhavi Sunder, *IP: Social and Cultural Theory* at <http://uchicagolaw.typepad.com/faculty/2009/03/ip-social-and-cultural-theory-madhavi-sunder.html>.

¹²⁸ See William Landes & Richard Posner, *The Economic Structure of Intellectual Property Law* 39 (2003); Michael J. Meurer, *Copyright Law and Price Discrimination*, 23 *Cardozo Law Review* 55, 99 (2001).

¹²⁹ See Landes & Posner, *The Economic Structure of Intellectual Property Law* 110-11; Glynn S. Lunney, *Reexamining Copyright's Incentives-Access Paradigm*, 49 *Vanderbilt Law Review* 483, 513 (1996).

¹³⁰ See William W. Fisher, III, *When Should We Permit Differential Pricing of Information?*, 55 *UCLA Law Review* 1 (2007); Bambauer, *Faulty Math*, 364-69.

¹³¹ See Sterk, *Rhetoric and Reality*, 1217. See also Naomi Voegtli, *Rethinking Derivative Rights*, 63 *Brooklyn Law Review* 1213-1246 (1997); Bambauer, *Faulty Math*, 359-61.

¹³² See John Tehranian, *Et Tu, Fair Use? The Triumph of Natural-Law Copyright*, 38 *U.C. Davis Law Review* 465-489-91 (2005). See also Sterk, *Rhetoric and Reality*, 1227-29.

tradition in political theory based upon it; social psychologists' writings on "equity theory"; and so forth.¹³³ But the heart of this argument intuitive: it's immoral to make use of intellectual and artistic creations without paying the creators.

To many, perhaps most, people, this argument has considerable force when applied to unauthorized reproductions of creative works. But whether it extends beyond the making of verbatim copies to the preparation of derivative works is far less clear. Is it immoral to make a mashup of *The White Album*? Robert Nozick's famous rhetorical question—if I own a can of tomato juice and pour it into the ocean, do I thereby come to own the ocean?¹³⁴—suggests that, at some point, the portion of the derivative work that is fairly attributable to the original work becomes too small to support the support the assertion of immorality. But when that line is crossed is extremely difficult to say.

The third argument commonly made on behalf of producers is rooted in the "personality" or "personhood" theory of property in general and intellectual property in particular. The central proposition of that theory is that the creators of intellectual products define themselves in or through their creations. Works of art, in particular, constitute manifestations or extensions of the personalities of the artists. The law, it is said, should recognize and protect those connections by giving creators the power to prevent the destruction or mutilation of their creations even after they have been given away or sold.¹³⁵ In Europe, this attitude finds expression in an extensive and enthusiastically enforced system of "moral rights." In the United States and other common-law countries, the more narrowly circumscribed Visual Artists Rights Act and a patchwork of state art-preservation statutes reflect weaker (but growing) commitment to the underlying theory.¹³⁶

The force of this third argument in the settings with which we are concerned is reduced by the fact that all of the products being modified have been manufactured and distributed in large quantities. Many people, even in the United States, are outraged when a unique sculpture is destroyed or defaced. The outrage is nowhere near so strong when one of a million VHF tapes containing a motion picture is cut and spliced to produce an expurgated version of the film. To be sure, we may feel that the director of the film still has a complaint: the altered version is untrue to his artistic vision. But that is a different, and less compelling, objection than the plea that can be made by or on behalf of the sculptor. Moreover, as Larence Lessig points out, it could be at least partially neutralized, ironically, by a legal rule *permitting* the editing of the film.¹³⁷ So long as unauthorized modifications of cultural goods are (or are widely thought to be) unlawful, then members of the public seeing such a modification are likely to assume that the original creator either made or permitted the change. If the altered version does indeed distort the creator's vision, the creator will be hurt. By contrast, if modifications are (and are known to be) lawful and if modified versions

¹³³ See William W. Fisher, *Theories of Intellectual Property*, in *New Essays in the Legal and Political Theory of Property*, (Stephen R. Munzer ed., 2001).

¹³⁴ See Robert Nozick, *Anarchy, State, and Utopia* 174.

¹³⁵ See Seanna Valentine Shiffrin, *Intellectual Property Theory*, in *The Blackwells Companion to Contemporary Political Philosophy*, (Goodin & Pettit ed., 2006).

¹³⁶ Cf. Cyrill P. Rigamonti, *The Conceptual Transformation of Moral Rights*, 55 *American Journal of Comparative Law* 67 (2007). (offering a more complex history of the relationship between personality theory and the spread of moral rights)

¹³⁷ See Lessig, *Remix*, 257.

are clearly marked as such, the creator's pain would surely diminish. Not dispelled entirely, perhaps. Seeing one's work "bastardized" may still sting. But the hurt will be at least less severe.

In combination, these three arguments are probably sufficient to create a prima facie case for the recognition of a right on the part of the creators of cultural goods to control modifications thereof. In other words, if no comparable or more powerful counterarguments could be made on behalf of the modifiers, the law should probably favor the original creators. Before asking what those counterarguments might be, we need to determine the strength of each of these arguments in the related context of modifications of equipment.

The first of the three arguments—that the ability to control modifications is necessary to sustain socially optimal levels of creativity—seems, on balance weaker in the context of equipment. Empirical studies suggest that, except in the pharmaceutical and biotechnology industries, patent rights play at most a modest role in creating incentives for innovation.¹³⁸ If the ability to prevent *competitors* from mimicking their technologies is not central to managers' decisions concerning when and whether to engage in research and development, it seems unlikely that those decisions would be affected significantly by whether the managers had the right to prevent or license modifications. Even if the right to control modifications did stimulate additional research by producers, it is far from clear that such research any longer materially advances social welfare. The reason: as Carliss Baldwin and Eric von Hippel argue, the pace of user innovation may now be so great that research and development by producers is now largely superfluous.¹³⁹

However, as was true in the context of cultural goods, the salience of these considerations surely vary by context. In some industries, the ability to control the markets for adaptation and accessories are more valuable than others. For example, the management of Apple seems to think that the ability to control the distribution of applications for the iPhone is critical to the success of the product. The primary reason is not that Apple stands to earn a great deal of money from the developers or users of applications (although the fact that Apple currently keeps 30% of the revenue generated by sales of authorized applications¹⁴⁰ suggests that this factor is not trivial). The primary reason, rather, seems to be that Apple believes that its reputation for bug-free, reliable, fully interoperable hardware and software would be endangered by the promiscuous circulation and use of unscreened applications.¹⁴¹ In the view of at least some observers, Apple is correct—and, indeed,

¹³⁸ See A. Arundel, *The Relative Effectiveness of Patents and Secrecy for Appropriation*, 30 *Research Policy* 611 (2001); W.M. Cohen, A. Goto, A. Nagata, Richard R. Nelson & J.P. Walsh, "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States", 31 *Research Policy* 1349 (2002); H. Sattler, *Appropriability of Product Innovations: An Empirical Analysis for Germany*, 26 *International Journal of Technology Management* 502 (2003); Giovanni Dosi, Luigi Marengo & Corrado Pasquali, *How much should society fuel the greed of innovators? On the Relations Between Appropriability, Opportunities and Rates of Innovation*, 35 *Research Policy* 1110 (2006); James Bessen & Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators At Risk* (2008).

¹³⁹ See Carliss Baldwin & Eric von Hippel, *Modeling a Paradigm Shift: From Producer Innovation to User and Open Collaborative Innovation*, MIT Sloan School of Management Working Paper # 4764-09 (2009).

¹⁴⁰ See John Markoff & Laura M. Holson, *Apple's Latest Opens a Developers' Playground*, *New York Times*, July 10, 2008; David B. Yoffie & Michael Slind, *Apple, Inc.*, Harvard Business School Case Study 9-708-480 (2008).

¹⁴¹ See Robert Mullins, *Unauthorized iPhone Apps Market Flourishes*, *PC World* September 27, 2007. (identifying reasons why "Apple is being protective of its platform": "If someone installs an unauthorized application and

shrewd management of applications may be critical to commercial success in the PDA market.¹⁴² Against this backdrop, it is plausible that depriving manufacturers of the ability to control applications would indeed adversely affect levels of innovation in PDAs. In other industries (cars, boats, and fishing equipment come to mind) the ability to control modifications seems far less critical. Similarly, while in some industries (kitesurfing and rodeo kayaking come to mind) the intensity of user innovation may well be so great that, as Baldwin and von Hippel argue, society gains little or nothing by offering financial carrots to manufacturers, in other industries (automobiles for example) this speculation seems implausible.

The second of the three arguments – that it is immoral to appropriate, without compensation, some of the value of the labor invested by the original producer -- seems, if anything, slightly stronger as applied to modifications of equipment than as applied to modifications of cultural goods—for the simple reason that, on average, it probably requires more time and money to generate equipment of the types that users like to tweak than it does to generate most cultural goods. Once again, however, within each category there are wide variations. High-quality sound recordings and photographs are increasingly cheap to produce,¹⁴³ but movies and multi-user online games are still very expensive. Cars, boats, and power tools are expensive, but bicycles, phones, and keyboards are relatively cheap. With respect to cultural goods, popular receptivity for the moral argument seems to vary directly with cost.¹⁴⁴ The MPAA-sponsored previews that plead with the audience to respect the legitimate interests of the key grips at least does not provoke catcalls, while a similar pitch with respect to sound recordings surely would. Much the same is likely true with respect to types of equipment.

Finally, the argument grounded in personality theory seems distinctly weaker as applied to equipment. The notion that mashing up a song threatens the personhood of the composer or performer is at least colorable. A claim that customizing a boat poses a comparable threat to the personhood of the naval architect or the builder is not.

Where does this leave us? Again, the three arguments, in combination, seem sufficient to create a prima facie case for restricting modifications of equipment. But that case seems less strong, all things considered, than the comparable case in the context of cultural goods.

B. Arguments for Users

Even in circumstances in which one or more of the arguments reviewed in the preceding section have bite, it may make sense nevertheless to permit the interests of users to modify works without restriction to trump the interests of the producers to prevent or

it breaks some other part of the iPhone, a customer will blame Apple, not the developer. If an iPhone software upgrade somehow disables an unauthorized app, Apple can't have to worry about apps it doesn't support in the first place.") Not all observers are persuaded. Jonathan Zittrain, for example, argues that Apple is motivated at least in part by the simple desire to maintain the high profit margins associated with its dominance of the multi-function PDA-cell phone market.

¹⁴² See Markoff & Holson, *Apple's Latest*.

¹⁴³ See Fisher, *Promises to Keep*, 30.

¹⁴⁴ The attitudes that likely underlie this reaction are explored in J. Stacy Adams, *Toward an Understanding of Inequity*, 67 *Journal of Abnormal and Social Psychology* 422, 424 (1963).

control the conduct of the users. Three reasons for doing so have been advanced in the context of modifications of cultural goods.

1. Efficiency

An important group of scholars contends that the producers should be compelled to give way when (and only when) the social costs of permitting them to exercise their rights—in particular, their exclusive right to prepare derivative works—would exceed the benefits thereof.¹⁴⁵ This is most likely to occur “when the costs of transacting with the copyright owner over permission to use the copyrighted work would exceed the benefits of transacting.”¹⁴⁶ One such context is parody. Parodies, economists generally recognize, are socially valuable. They entertain people, and they sometimes provide consumers useful information concerning the demerits (or merits) of the works being parodied. But if creators have the right to block parodies, they will do so. Why? Partly for the obvious reason that creators, like most of us, do not like to be made fun of. Partly for the less obvious reason that a parodist cannot charge consumers enough to cover the full social benefits of the parody (for example, the benefits reaped when the first set of consumers retell the jokes)—and thus will not be able to offer the original creator a license fee high enough to offset the injury the creator anticipates experiencing. Thus, even though the aggregate social benefit of the parody exceeds the social cost, the transaction necessary to permit the parody to be created and distributed will not occur. To prevent such market failures, these scholars argue in favor of excusing as “fair uses” modifications of copyrighted works that constitute genuine parodies.¹⁴⁷ Plainly, adoption of this approach would have the effect of excusing an important subset of the types of modifications of cultural goods with which we are concerned—at least until alternative mechanisms for overcoming the transaction costs could be devised.¹⁴⁸

How much force does this argument have in the context of equipment? At first glance, not much. None of the various ways described in Part I by which equipment is modified by users constitute parodies.¹⁴⁹ But the general approach exemplified by the economists’ analysis of parody might have much more general applicability to equipment than originally thought. An especially ambitious and insightful version of such an argument can be found in the pioneering work of Eric von Hippel. He contends that five circumstances, in combination, strongly suggest that users should be permitted to modify the

¹⁴⁵ See, e.g., Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 Columbia Law Review 1600 (1982); William Patry & Richard Posner, *Fair Use and Statutory Reform in the Wake of Eldred*, 92 California Law Review 1639, 1646 (2004). But cf. Wendy J. Gordon, *Market Failure and Intellectual Property: A Response to Professor Lunnery*, 82 Boston University Law Review 1031 (2002). (suggesting that this is not the only circumstance in which the fair use doctrine should apply).

¹⁴⁶ Richard Posner, *When is Parody Fair Use?*, 21 Journal of Legal Studies 67 (1992).

¹⁴⁷ See, e.g., *Id.* at 71-73. For Posner, a genuine parody is one that “uses the parodied work as a target rather than as a weapon” and does not “take so large a fraction (somehow computed) of the copyrighted features of the original work as to make the parody a substitute for that work.”

¹⁴⁸ See Tom W. Bell, *Fair Use vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine*, 76 North Carolina Law Review 557, 581-84 (1998).

¹⁴⁹ One could imagine such things. A grotesque exaggeration of a feature of a basketball shoe (thickness of the sole? size of the cushioning bladder) meant to make the feature in question look silly? Sewing multiple overlapping pockets on a flyfishing vest in order to mock the packrat tendencies of flyfishermen? But they are likely to be rare.

products they purchase. First, users' needs are diverse; customization of consumer products is essential to fully to satisfy those needs. Second, many users are skillful customizers, and the increasing availability and decreasing cost of technologies that facilitate customization is leading to a rapid growth in their ranks. Third, manufacturers are surprisingly bad customizers, in part because the information they need to ascertain and meet consumers' diverse needs is "sticky." Consumers only develop that information through experience and have difficulty recording it and transmitting it to manufacturers. One manifestation of manufacturers' clumsiness in this regard is the remarkably high percentage of consumer products that fail commercially. Fourth, "agency costs" sharply limit the ability of consumers to hire either manufacturers or third parties to do the customization for them. Last, but not least, many users like to innovate. The process, in other words, provides a substantial subset of consumers important experiential benefits in addition to the increased functionality of the customized products it generates. In short, allowing users to innovate will make everyone better off. Users' needs will be better addressed. Users will have more fun. And manufacturers will make more money, because fewer products will fail and because users are willing to pay more for products with which they are permitted and able to tinker.¹⁵⁰

This is a powerful argument. Understood as an outline of a business plan, it is compelling. Understood as a justification for legal reform, however, it seems to be missing one key element: a theory of market failure. It is hard to see why the welfare-maximizing state of affairs would not emerge through voluntary transactions between manufacturers and users. If von Hippel is correct, manufacturers should permit their customers to alter their products freely (and indeed, should provide them toolkits to assist them in doing so) and then raise the prices they charge for those products. As we have seen, many manufacturers are doing exactly that. But not all. Apparently, those that have thus far eschewed von Hippel's approach have done so, not because transaction costs prevent them from monetizing consumers' desire for freedom to innovate, but because they believe that it will cost them more in some other way—for example, through erosion of their reputations for interoperable, bug-free products.¹⁵¹ In the absence of a reason why the premium that users would pay for the right to innovate does not capture all of the social benefits of permitting them to do so, it is hard to see why the law should be altered to force the manufacturers to do what they believe is not profit-maximizing. Such a reason may be forthcoming, but until then, this first argument for trumping the manufacturers' right to prevent or control modifications seems vulnerable.

2. Justice

The second of the three approaches seeks to promote not economic efficiency, but rather distributive justice, defined broadly as the fair distribution of income, wealth, and power. The starting point of the argument is the uncontroversial proposition that, currently, income, wealth, and power are all highly concentrated, both in the United States and in the world at large. Some data: as of 2007, the top 10% of Americans earned 49.7% of total

¹⁵⁰ See von Hippel, *Democratizing Innovation*, chpt. 8.

¹⁵¹ See Jenna Wortham, *Apple's Game Changer, Downloading Now*, *New York Times*, December 6, 2009.

income in the United States.¹⁵² That percentage is higher than the comparable percentage at any point during the twentieth century—well above the rate of roughly 34% that prevailed between World War Two and 1980 and slightly higher than the rate during the stock-market bubble of 1928.¹⁵³ Moreover, as of 2007, the top 1% of Americans earned 24% of total income in the United States—well above the rate of roughly 10% that prevailed between the War and 1980 and just slightly lower than during 1928, the previous high.¹⁵⁴ Inequality of wealth is even greater. As of 2000, the top 10% of Americans owned roughly 70% of total household wealth (defined as “the value of all physical and financial assets less debts”).¹⁵⁵ When the frame of reference is expanded to the world, the disproportion becomes even more extreme. As of 2000, the richest 10% of adults owned roughly 85% of global household wealth; the richest 1% owned 40%.¹⁵⁶ No similarly concrete indicators of the concentration of political power are available, but there is little doubt that the same generalization holds: both in the United States and worldwide, a small percentage of people enjoy disproportionate influence over the rules, policies, and practices by which we are governed. Nor is there much doubt that economic and political power are correlated.¹⁵⁷ Last but not least, in most modern societies, semiotic power—control over the fog of symbols in which we move and with which we define ourselves—is also highly concentrated. Most observers think that the degree of concentration increased steadily during the late nineteenth and twentieth centuries, as the density of the fog grew and as the number of movie studios, television networks, record companies, advertising agencies, and political consultants with significant influence on it shrank. Optimistic commentators contend that the Internet is facilitating a reversal of that trend, but there is little doubt that the degree of concentration of semiotic power remains high.¹⁵⁸

The next step of the argument is the somewhat more controversial proposition that this degree of concentration is excessive, and that the law should be reformed so as to reduce the levels of inequality in each of these dimensions. By how much? On that question, philosophers and political theorists have argued for centuries. Among the major contending efforts to define the standard with respect to which the current situation falls short are Ronald Dworkin’s proposal of “equality of resources,”¹⁵⁹ John Rawls’ “difference principle,”¹⁶⁰ Derek Parfit’s “prioritarianism,”¹⁶¹ and Harry Frankfurt’s “sufficientism.”¹⁶²

¹⁵² See Emmanuel Saez, *Striking it Richer: The Evolution of Top Incomes in the United States* at <http://elsa.berkeley.edu/~saez/saez-UStopincomes-2007.pdf>.

¹⁵³ See *Id.* at Figure 1.

¹⁵⁴ See *Id.* at Figure 2.

¹⁵⁵ See UNU-WIDER, *Launch of the WIDER Study on The World Distribution of Household Wealth* at http://www.wider.unu.edu/events/past-events/2006-events/en_GB/05-12-2006/.

¹⁵⁶ See *id.*

¹⁵⁷ See Lawrence Lessig, *What Everybody Knows and What Too Few Accept*, 123 *Harvard Law Review* 104 (2009). (discussing the relationship between economic power and judicial decisionmaking – and how it might be better managed).

¹⁵⁸ See, e.g., Michael Madow, *Private Ownership of Public Image: Popular Culture and Publicity Rights*, 81 *California Law Review* 125, 140 (1993); John Clarke, *Pessimism versus Populism: The Problematic Politics of Popular Culture, in For Fun and Profit: The Transformation of Leisure into Consumption*, (Richard Butsch ed., 1990).

¹⁵⁹ See Ronald Dworkin, *What is Equality? Part 1: Equality of Welfare*, 10 *Philosophy and Public Affairs* 185 (1981); Ronald Dworkin, *What is Equality? Part 2: Equality of Resources*, 10 *Philosophy and Public Affairs* 283 (1981).

¹⁶⁰ See John Rawls, *A Theory of Justice* §46:266, §11:54-56 (revised ed. 1999); John Rawls, *Justice as Fairness: A Restatement*, §13:42-43, 49, §17:58-59 (2001).

¹⁶¹ See Derek Parfit, *Equality or Priority*, Lindley Lecture, University of Kansas (1991).

But we need not plunge into this debate, because there is widespread agreement that, when measured by any of these standards, the levels of concentration that currently prevail both in the United States and the world are unjustifiably high.

The set of rules governing modifications of cultural goods is one of the many doctrinal contexts in which scholars have sought to identify reforms that would help alleviate that concentration. Three recommendations—all pointing toward greater latitude for user innovation—emerge from their work. First, Molly Van Houweling argues that the fair use doctrine should be adjusted so as to increase its capacity to advance one of its traditional functions—namely, reducing the costs borne by “poorly financed creators” and the prices paid by “poor consumers who benefit from the recasting of expensive works.”¹⁶³ Specifically, “[c]ourts could simply take ability to pay into account as part of the fair use calculus. Or, to use the language of the statutory fair use provision, avoiding unaffordable license fees could be considered a valid ‘purpose’ of unauthorized copying.”¹⁶⁴ Second, modifications of cultural goods that reflect or enable attacks on concentrations of economic or political power should be privileged. Some examples are obvious: parodies of Presidents or favorable depictions of stone-throwing demonstrators. Others are less obvious and more interesting. For instance, Anupam Chander and Madhavi Sunder have shown that modifications of the relative importance of the characters in Star Wars episodes frequently evince criticism of the subordinate roles played by women and racial minorities in almost all of those episodes. More broadly, the “[f]lattering self-insertion” characteristic of much Mary Sue fiction “offers a partial antidote to a media that neglects or marginalizes certain groups.” On that basis, they argue persuasively that the law should afford greater latitude to works of this genre.¹⁶⁵ The third, most sweeping, and (as I among others have argued previously) most powerful of the recommendations is that all modifications of mass-produced cultural goods should be treated more favorably because they both manifest and promote “semiotic democracy”—decentralization of the power of making cultural meanings.¹⁶⁶ This particularly true when the recordings are not kept private, but are widely disseminated.

Which, if any, of these recommendations has bite in the context of modifications of equipment? The second and third don’t seem to have much salience. Few if any of the

¹⁶² See Harry Frankfurt, *Equality as a Moral Ideal*, 98 *Ethics* 21 (1987).

¹⁶³ See Molly Shaffer Van Houweling, *Distributive Values in Copyright*, 83 *Texas Law Review* 1535, 1543-45, 1568-69 (2005).

¹⁶⁴ See *Id.* at 1569.

¹⁶⁵ See Chander & Sunder, *Everyone's a Superhero*, 602-609.

¹⁶⁶ Among the many works that have explored this theme are Michael Madow, *Private Ownership of Public Image: Popular Culture and Publicity Rights*, 81 see *id.* at 125 (1993); John Fiske, *Television Culture* (1987); Rosemary Coombe, *Objects of Property and Subjects of Politics: Intellectual Property Laws and Democratic Dialogue*, 69 *Texas Law Review* 1853 (1992); David Lange, *At Play in the Fields of The Word: Copyright and the Construction of Authorship in the Post-Literate Millennium*, 55 *Law & Contemporary Affairs* 139 (1992); Niva Elkin-Koren, *Cyberlaw and Social Change: A Democratic Approach to Copyright Law in Cyberspace*, 14 *Cardozo Arts & Entertainment Law Journal* 215 (1996); William W. Fisher, III, *Property and Contract on the Internet*, 73 *Chicago-Kent Law Review* 1203 (1999); Joseph P. Liu, *Owning Digital Copies: Copyright Law and the Incidents of Copy Ownership*, 42 *William & Mary Law Review* 1245 (2001); Fisher, *Promises to Keep*, chpt. 1; Jack M. Balkin, *Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society*, 79 *N.Y.U. Law Review* 1 (2004); Madhavi Sunder, *IP3*, 59 *Stanford Law Review* 257 (2006); Benkler, *Wealth of Networks*, Chpt. 8; Sonia Katyal, *Semiotic Disobedience*, 84 *Washington University Law Review* 489 (2006); Chander & Sunder, *Everyone's a Superhero*; Oren Bracha, *The Googlization of Everything and the Many Faces of Property*, 85 *Texas Law Review* 1799 (2007); Neil Netanel, *Copyright's Paradox* (2008).

examples we have seen of user innovation in the context of equipment could fairly be described as political commentary. And increasing opportunities for innovation in this domain would do little to advance semiotic democracy, for the simple reason that neither the products being modified nor the modified versions are often important vehicles of cultural meanings. To be sure, the trademarks they bear and the advertisements by which they are sold are crucial arenas for semiotic expression and contestation. But the objects themselves—the fishing rods, surgical equipment, boats, keyboards, and so forth—are not crucial components of the fog. And it is the objects, not the trademarks or ads, that the users are tweaking.

The first of the scholars' recommendations, however, may be more relevant than first appears in the context of equipment. Increasing opportunities for user modifications may help the global poor. A suggestive example is provided by Ethan Zuckerman.¹⁶⁷ He points out that many residents of the Congo—indeed, of rural areas throughout the developing world—cook their food over charcoal fires. This is bad for them in many ways:

Charcoal is an environmental nightmare. You get it by cutting down living trees, digging pits and partially burning them. Then you take the resulting coal and put it into sacks and sell it to women, who bring it home to cook with. They often cook inside, creating fumes and smoke that damages their children's health. Basically, the only good thing you can say about charcoal is that it's cheap and people like to use it. Except that it's not cheap anymore. As the authorities in the [Congo] try to prevent destruction of gorilla habitat, they're protecting the forests from logging. This means lots less wood to turn into charcoal, which means rising prices.

Zuckerman describes how a philanthropic organization named Wildlife Direct, working closely with two German equipment manufacturers, sought to remedy the problem. They developed, produced, and distributed in the Congo elegant stoves capable of burning plant oils, which could be obtained easily and cheaply from palm nuts and other readily available crops. The well-intentioned project failed. What succeeded (or rather, is in the process of succeeding) is “biomass charcoal,” a technology developed by the Africans themselves that employs simple presses to squeeze plant waste into a form that can be burned. From this (and many other examples), Zuckerman distills some lessons that echo von Hippel's guidelines: to effectively meet the needs of the global poor, a technological innovation must be locally made, use local materials, be repairable locally, and conform to local culture.

The story of biomass charcoal does not implicate any of the legal rules with which we are concerned. But lurking in Zuckerman's narrative is a general proposition that does merit our attention: decentralized user innovation may be of special importance to the poor, particularly in developing countries. If so, we should be leery of erecting legal rules that would inadvertently impede such projects. Also lurking in the narrative, however, is a note of caution. The German plant-oil stoves may actually have been better for the Congolese than biomass charcoal. The failure of the former and the success of the latter may illustrate

¹⁶⁷ See Ethan Zuckerman, *Innovation from Constraint (The Extended Dance Mix)* at <http://www.ethanzuckerman.com/blog/2008/10/17/innovating-from-constraint/>.

the general phenomenon of “local maxima”: modest improvements of existing technologies may prevent adoption of more disruptive but, in the long run, superior new technologies.¹⁶⁸ Thus we should not assume that Zuckerman’s recommendations hold—and should guide legal reform—in all circumstances.¹⁶⁹

3. Human Flourishing

The last of the arguments that can be made on behalf of user-innovators has a different flavor. It begins by developing a substantive vision of human flourishing and then asks what adjustments of legal doctrine would provide as many people as possible access to a life consistent with that vision. Analyses of this general sort are unusual in modern American legal scholarship, in part because they repudiate the principle central to both the dominant form of economic analysis and to the dominant form of contemporary liberalism: that the state ought to remain neutral concerning alternative conceptions of the good.¹⁷⁰ But this argument has deep roots, both in philosophy (for example, in the work of Aristotle, the Stoics, Marx, John Stuart Mill, T.H. Green, and Michael Sandel) and in political practice (for example, in the “republican” tradition in eighteenth-century British and American politics; the Populist movement of the late nineteenth century; and the New Left of the 1960s and ‘70s). Many years ago, I tried to distill from these sources a conception of human flourishing that could be used as the foundation for a critical analysis of copyright law. The passage (abridged and stripped of footnotes) in which I described that conception is set forth below.¹⁷¹

The good life is a life of self-determination, commitment, moderate risk, and meaningful work. The activities, bonds, and communities through which a person defines himself are freely chosen; the person is engaged in projects and relationships that carry with them a chance of failure; work is important and, for the most part, creative. Brief explications of the components of this conception and an explanation why they do not conflict with one another follow.

Work.—Marx’s most durable insight is that productive activity is “the life of the species”—that work is natural, not something to be endured or escaped, and that the quality of a person’s existence is closely related to the quality of his work. What is good work? The adjective that best captures Marx’s answer is “meaningful.” Meaningful work requires skill and concentration, presents the laborer with challenges and problems he can

¹⁶⁸ See Mark Roe, *Chaos and Evolution in Law and Economics*, 109 *Harvard Law Review* 641, 643 (1996); Adrian Vermeule, *System Effects and the Constitution*, 123 *Harvard Law Review* 4, 52 (2009).

¹⁶⁹ An example of a successful philanthropic effort that does not conform (at least, does not conform fully) to Zuckerman’s guidelines is the development by a group of Danish and African engineers of a biogas stove and lamp that can be used by poor African and Southeast Asian families to cook food and light their homes. See <http://www.superflex.net/tools/supergas/>; <http://www.superflex.net/tools/supercopy/lamp.shtml>. The Superflex project that developed and produces the stove and lamp more closely resembles the failed German plant-oil initiative than the successful biomass charcoal initiative. (I am grateful to Anupam Chander and Madhavi Sunder for alerting me to the Superflex project – although I am not sure either of them would interpret it as I do.)

¹⁷⁰ See Louis Kaplow & Steven Shavell, *Fairness versus Welfare* (2002); Ronald Dworkin, *A Matter of Principle* 181-204 (1985).

¹⁷¹ See William W. Fisher, III, *Reconstructing the Fair Use Doctrine*, 101 *Harvard Law Review* 1661 1746-51 (1988).

overcome only through the exercise of initiative and creativity, and is part of a larger project he considers socially valuable and must take into account in making his decisions....

Risk and Vulnerability.—Excessive security makes for a flat life. Excessive desire for security -- for certainty that one's projects will succeed, that one's relationships will not deteriorate, and that one will not be hurt physically or emotionally—leads to unambitious and unrewarding projects, shallow relationships, and dull play. The good life is an intense life, and intensity depends in part on adventurousness. To be vulnerable, to be not fully in control of one's life, is a good thing, a condition to be sought, not shunned. To avoid friendship and love, to eschew all attachment to possessions, to refuse to nourish or gratify one's passions because all of those things expose one to the risk of loss, to the vagaries of fortune, and to the wills of others, is to be not fully human.

The notion that some degree of risk and vulnerability is desirable coheres in two ways with the value of meaningful work. First, engagement in meaningful work fosters confidence, innovativeness, and sense of worth, which in turn support a willingness to take chances. Second, the possibility that a project on which one is working will not realize one's hopes helps prevent creative work from "degenerat[ing] into narcissism or self-indulgence"; the worker's desire to succeed, and knowledge that he may not, keeps his mind off "self-realization" and increases the likelihood that he will attain it.

Self-Determination.—To live well means, among other things, to take responsibility for one's self. "One's dignity resides in being, to some important degree, a person of one's own creating, making, choosing, rather than being merely a creature or a socially manufactured, conditioned, manipulated, thing: half-animal and half mechanical and therefore wholly socialized."

To emphasize self-determination is not to deny that our identities are substantially socially determined—that both our initial senses of self and our capacity to reflect upon the selves we wish to become derive to a large extent from the communities in which we are reared, and that those communities inevitably exert powerful influences over our subsequent lives. But the person who depends too much for his identity and life-plan on inherited outlooks and habits—who does not achieve sufficient distance from his original community either deliberately to make the tradition his own or to transcend it—is not fully alive....

Nor is it to deny the importance of attachment to groups. Participation in families, friendships, teams of workers, local political bodies, communities of faith, and other cooperative ventures is more than a strategy for achieving our individual ambitions and desires; it is a crucial way in which we define ourselves. To be most meaningful, however, such engagements should derive from choice and commitment, not drift or ascription.

Since I wrote this passage, two new lines of scholarship have emerged that provide support for this general approach but also suggest ways in which it could be refined.¹⁷² The first is a branch of social psychology known as Self-Determination Theory. Proponents of this theory, led by Edward Deci and Richard Ryan, derive from a substantial body of empirical work, some generalizations concerning human nature. People, they contend, have three innate psychological needs: for competence (the ability “to experience oneself as capable and competent in controlling the environment and being able to reliably predict outcomes”); for autonomy (the ability “to self-organize experience and behavior and to have activity be concordant with one's integrated sense of self”); and for relatedness (the ability “to feel connected to others—to love and care, and to be loved and cared for”).¹⁷³ The ways in which people typically seek to satisfy these needs in different societies vary, but the needs themselves are universal. If jobs or tasks are structured in ways that enable participants to satisfy these three needs, then the participants develop powerful “intrinsic motivations” that both sustain their commitments to those projects and help them succeed. So for example, people learn faster, perform sports better, and more effectively resolve health problems if, in doing so, they are able to address these three needs.¹⁷⁴ By contrast, “if the social world provides no reliable paths that allow fulfillment of these critical needs, and if people have to stay in situations that consistently block need satisfaction, [Self-Determination Theory] predicts significant psychological costs and accommodations. Indeed, the etiology of various forms of psychopathology resides primarily in developmental deprivations concerning basic

¹⁷² In addition to these lines, several individual works have been published that explore or defend compatible conceptions of human flourishing. See, for example, Andrew Sayer, *Contributive Justice and Meaningful Work*, 15 Res Publica 1 (2009). Within legal scholarship, an important example is Yochoai Benkler's *Wealth of Networks*, which elaborates ideals of autonomy and community that are fully consistent with the vision offered here – despite Benkler's stubborn insistence on characterizing his outlook as a form of “liberalism.” See Benkler, *Wealth of Networks*, Chpts. 5, 10. An ambitious forthcoming book by Madhavi Sunder will apply a compatible theory to the law of intellectual property. See Sunder, iP (forthcoming, Yale University Press).

¹⁷³ See Edward L. Deci & Richard M. Ryan, *The "What" and "Why" of Goals Pursuit: Human Needs and the Self-Determination of Behavior*, 11 *Psychological Inquiry* 227, 231 (2000). The body of work on which these conclusions are based includes Edward L. Deci & Richard M. Ryan, *The empirical exploration of Intrinsic motivational processes*, 13 *Advances in Experimental Social Psychology* 39 (1980); Edward L. Deci & Richard M. Ryan, *Intrinsic Motivation and Self-Determination in Human Behavior* (1985); Richard M. Ryan & J.P. Connell, *Perceived Locus of Causality and Internalization: Examining Reasons for Acting in Two Domains*, 57 *Journal of Personality and Social Psychology* 749 (1989); Edward L. Deci & Richard M. Ryan, *A Motivational Approach to Self-Integration in Personality*, 38 *Perspectives on Motivation* 237 (1990); R.F. Baumeister & M.R. Leary, *The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation*, 117 *Psychological Bulletin* 497 (1995); K.M. Sheldon & A.J. Elliot, *Goal Striving, Need Satisfaction, and Longitudinal Well-Being: The Self-Concordance Model*, 76 *Journal of Personality and Social Psychology* 546 (1999).

¹⁷⁴ See Richard M. Ryan & Edward L. Deci, *Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being*, 55 *American Psychologist* 68 (2000); Richard M. Ryan & Edward L. Deci, *Active Human Nature: Self-determination Theory and the Promotion and Maintenance of Sport, Exercise, and Health*, in *Intrinsic Motivation and Self-determination in Exercise and Sport* (M.S. Hagger & N. L. D. Chatzisarantis eds., 2007); Richard M. Ryan, Heather Patrick, Edward L. Deci & Geoffrey C. Williams, *Facilitating Health Behaviour Change and Its Maintenance: Interventions based on Self-Determination Theory*, 10 *European Health Psychologist* 2 (2008); Hyungshim Jang, *Supporting Students' Motivation, Engagement, and Learning During an Uninteresting Activity*, 100 *Journal of Educational Psychology* 798 (2008).

psychological needs.”¹⁷⁵ In sum, satisfaction of these needs is essential, Deci, Ryan and their colleagues conclude, for “ongoing psychological growth, integrity, and well-being.”¹⁷⁶

The second line of scholarship is a branch of moral and political philosophy known as the “capabilities approach.” Pioneered by Amartya Sen and Martha Nussbaum, this approach argues that all persons have certain fundamental capabilities or freedoms that together constitute the “substantial preconditions for a dignified human life.”¹⁷⁷ The principal responsibility of a government is to establish a set of social, economic, and political conditions that enable persons to realize these capabilities. In Nussbaum’s words:

At the heart of the Capabilities Approach is an idea that it borrows from and shares with most of the world's great religious traditions: the idea that all human beings are precious, deserving of respect and support, and that the worth of all human beings is equal. What respect centrally involves, the Capabilities Approach holds, is supporting human beings in the development and exercise of some central human abilities.¹⁷⁸

So what are these capabilities? For Sen, they are ultimately reducible to engagement and choice—“the liberty of ‘acting as citizens who matter and whose voices count, rather than living as well-fed, well-clothed, well-entertained vassals.’”¹⁷⁹ Nussbaum has developed a more detailed and elaborate list:

(1) Life. Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.

(2) Bodily Health. Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.

(3) Bodily Integrity. Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.

(4) Senses, Imagination, and Thought. Being able to use the senses, to imagine, think, and reason - and to do these things in a "truly human" way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic

¹⁷⁵ Deci & Ryan, *What and Why*, 248. See also Kennon M. Sheldon & Lawrence S. Krieger, *Understanding the Negative Effects of Legal Education on Law Students: A Longitudinal Test of Self-Determination Theory*, 33 *Personality and Social Psychology Bulletin* 883 (2007).

¹⁷⁶ Cf. Steven J. Horowitz, *Designing the Public Domain*, 122 *Harvard Law Review* 1489 (2009). (using self-determination theory to illuminate competing arguments concerning the proper shape of the public domain).

¹⁷⁷ See Martha C. Nussbaum, *Constitutions and Capabilities: "Perception" Against Lofty Formalism*, 121 *id.* at 4 6 (2007).

¹⁷⁸ *Id.* at 10-11.

¹⁷⁹ See Amartya Sen, *Development as Freedom*, chpt. 12 (1999).

speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid nonbeneficial pain.

(5) Emotions. Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)

(6) Practical Reason. Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)

(7) Affiliation.

A. Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.)

B. Having the social bases of self-respect and non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of nondiscrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin.

(8) Other Species. Being able to live with concern for and in relation to animals, plants, and the world of nature.

(9) Play. Being able to laugh, to play, to enjoy recreational activities.

(10) Control over One's Environment.

A. Political. Being able to participate effectively in political choices that govern one's life; having the right of political participation, protections of free speech and association.

B. Material. Being able to hold property (both land and movable goods), and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers.¹⁸⁰

¹⁸⁰ See Martha C. Nussbaum, *Women and Human Development: The Capabilities Approach* 78-80 (2000). See also Martha C. Nussbaum, *Frontiers of Justice: Disability, Nationality, Species Membership* 76-78 (2006); Martha C. Nussbaum, *Constitutions and Capabilities: "Perception" Against Lofly Formalism*, 121 *Harvard Law Review* 4 15-16 (2007). For a provocative effort to combine Nussbaum's argument with postmodern critical theory and the "strict constructionist theory of technology" in a way that illuminates copyright law, see Cohen, *Creativity and Culture*.

The sets of conditions commended by Self-Determination Theory, by the Capabilities Approach, and by my own vision of the good life are not identical. But the overlap between them is striking. On five dimensions, they converge. And all five suggest that user innovation —both of cultural goods and of equipment—is life-fulfilling and merits legal protection.

The first dimension concerns choice. People live well when they freely choose their projects, big and small. Autonomy in this sense plainly characterizes the user innovators. They select the products to tweak and the ways of tweaking them. But, admittedly, this observation doesn't get us far. A thousand other vocations and avocations would involve as many choices. What's so good about this one?

The second dimension enables us to narrow the field a bit. A sense of “competence,” to use Deci and Ryan's term, is crucial to the good life. A recurring theme in accounts of user innovation is that confronting and solving problems, developing the skills necessary to do so, helps foster justified feelings of mastery. I know what I'm doing. In Nussbaum's words, I'm in “control of my material environment.” I may not own that environment. (In my view, Nussbaum overstates the importance of property rights to this dimension.) But I can shape it.

These observations lead naturally to the third value: engagement. A rewarding life, it seems, is active, not passive. Modern western culture, despite and in part because of the material comforts it affords, is hazardous on this score. Its tendency is to reduce us to (in Sen's words) “well-fed, well-clothed, well-entertained vassals” or (in George Kateb's words) “socially manufactured, conditioned, manipulated, thing[s].” Innovative activity of the sorts reviewed in this essay can be an antidote to the poison. When done at work, innovation helps make that work “meaningful” (in the Marxist sense); the innovator takes control of the tools of her trade, adapts them in hopes of doing the job better. When done outside of work, it makes for more active play. In both contexts, the sense of responsibility for the fruits of one's efforts sharpens the mind, heightens the senses of involvement and responsibility.¹⁸¹

The fourth dimension is self-expression. Most defenders of freedom to modify cultural goods rightly emphasize this value. Lessig, for example, offers as the epitome of read-write culture the moment when his son first suggested an alteration of the plot of “‘monster man' story.” The reason the moment was so powerful: “What we want to see in our kids is their will. What we want to inspire is a will that constructs well.”¹⁸² Most

¹⁸¹ Jonathan Zittrain makes a similar point when explaining one of the benefits of “generative” products: “[T]here is a unique joy to be had in building something, even if one is not the best craftsperson. This is a value best appreciated by experiencing it; those who demand proof may not be easy to persuade. Fortunately, there are many ways in which people have a chance to build and contribute. Many jobs demand intellectual engagement, which can be fun for its own sake. People take joy in rearing children: teaching, interacting, guiding. They can also immerse themselves in artistic invention or software coding.” Zittrain, *Future of the Internet*, 90.

¹⁸² See Lessig, *Remix*, 87. John Palfrey and Urs Gasser make a similar point – and connect it to a theory of human flourishing: “The vast majority of Digital Natives are dreaming of neither fame nor fortune when they create online. Often, they simply want to express themselves, just as human beings have wanted to do since they first began painting in caves more than 30,000 years ago. The desire to express one's own beliefs and opinions – to share them with others – is central to human nature.” Palfrey & Gasser, *Born Digital*, 124.

modifications of equipment are equally expressive—and deserve nourishing for the same reason. People contribute to online discussions their ideas concerning basketball shoe designs, router jigs, fly-tying patterns and so forth for many reasons, but surely among them is hunger for self-expression. One of the indicators of that impulse is the strong desire of most of the contributors for attribution. They almost never ask for money, but they do want to be given credit when credit is due.

Those same online discussions implicate the fifth and final dimension. All of the theories recognize participation in freely chosen communities as crucial to human flourishing. The most striking aspect of most modern forms of user innovation is the frequency with which they give rise to, and are fueled by, communities. Typically, the innovative activity itself is solitary, but the larger social practice it sustains is collective. User innovators rarely “bowl alone.”¹⁸³ This is equally true with respect to cultural goods and with respect to equipment. A few examples, drawn from disparate settings, should suggest the importance of these groups:

The ethos of [fan fiction] is one of community, of shared journeys to understanding and enjoyment. Regardless of literary value, fan fiction is a pleasurable and valuable part of many fans' experiences. The political importance of fandom stems from sharing secondary creations. Fans feel that they are making significant life choices when they share their work with a broader community of like-minded people.¹⁸⁴

Summer is the most popular season for lowriders, as the weather often encourages being outside either in or nearby the vehicle. Some lowrider clubs have weekly meetings in the summer where owners and friends will have a BBQ/cookout followed by cruising a popular drag (or strip) after dark. Aside from local drags and their parking lots, lowriders are most commonly seen at privately organized lowrider car shows that often feature a variety of different vehicular and joto non-vehicular events, the most popular of which are the wet T-shirt/bikini contests and the hop and dance hydraulic competitions where competitors compete against each other to see who can hop the highest or complete a list of moves within a time limit (dancing).¹⁸⁵

The vision of cycling promoted by [“do-it-yourself”] cycling counterculture participants such as Ballantine, Burrows and others takes a holistic approach that celebrates all forms of cycling and opposes narrower views (such as the hostility to mountain bikes found in more traditional cycling circles). These members of the cycling counterculture are especially committed to commuter cycling as an alternative to motorised traffic, and this has resulted both in a conscious search for practical designs that can overcome the limitations of established models, and in a championing of wider transport campaigning issues, both of which have been accomplished through the pages of a succession of small-run magazines.... There is a clear

¹⁸³ See Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (2000).

¹⁸⁴ Tushnet, *Legal Fictions*, 657.

¹⁸⁵ Lowrider History, <http://www.ognation.org/lowrider.html>.

desire here to raise the status of cycling in Britain closer to that seen in northern European countries such as the Netherlands, Denmark and Germany. This is accompanied by a sense of belonging to a cycling community, and a belief in the need for some degree of collective action to bring this about -- something that contrasts perhaps with the individualism of some sports cycling.¹⁸⁶

The bonds shared by router-jig designers, real-person slash writers, kite-surfers, and so forth take different forms, but are equally strong.

In short, on five related dimensions – autonomy; competence; engagement; self-expression; and community – user innovation offers opportunities for self-fulfillment. The argument should not be overstated. The activity of modifying mass-produced products is plainly not the only way in which one can live a good life. There exist many other ways of satisfying the fundamental needs outlined above. Active citizenship of the sort celebrated by the advocates of classical republicanism¹⁸⁷ and engagement in meaningful work of the sort celebrated by Marxist scholars¹⁸⁸ come immediately to mind. Nor, surely, is freedom to modify either cultural goods or equipment sufficient to support a good life. But, for a growing number of people, it offers one important component. If, as Sen and Nussbaum argue, the principal responsibility of the state is to create conditions that provide people access to rewarding lives, then it seems that we ought to adjust the legal system to increase the ability of people to engage in activities of the sorts addressed in this essay.

But is legal reform really necessary? At the end Section IV.B.1, above, we observed that the efficiency-based argument for affording greater latitude for user innovation was weakened by the absence of a clear theory of market failure – an explanation for why manufacturers and users would not voluntarily agree to arrangements that permitted the latter (for a fee) to tinker freely. Is not the argument based on human flourishing vulnerable to the same objection? Perhaps. But the premises of the two approaches are different. The efficiency argument is tied to principle of consumer sovereignty, which takes as given people's current preferences for goods, services, and states of affairs. Poetry is no better than pushpin;¹⁸⁹ an active life is no better than a passive one. The theory of human flourishing is not so confined. Rather, it asserts that, in combination, a stunted educational system and the process of cognitive dissonance have caused many people to develop a durable set of habits, expectations, and desires that cause them to prefer lives less fulfilling than the one sketched above.¹⁹⁰ The implication for the topic before us: the set of consumers hungry for opportunities to innovate, large as it is, is nevertheless smaller than it should be. Too many of us prefer the reliability of an iPhone or TiVo to the flexibility of a

¹⁸⁶ Rosen, *Up the Vélorution*, in 382.

¹⁸⁷ See, e.g., Frank Michelman, *Law's Republic*, 97 Yale Law Journal 1493 (1988); Cass R. Sunstein, *Interest Groups in American Politics*, 38 Stanford Law Review 29 (1985).

¹⁸⁸ See the text accompanying note ____, supra. Some evidence that, in the United States, access to meaningful work is diminishing, rather than increasing, may be found in a recent survey by The Conference Board. See "U.S. Job Satisfaction at Lowest Level in Two Decades" (Jan. 5, 2010), http://www.conference-board.org/utilities/pressDetail.cfm?press_ID=3820.

¹⁸⁹ See Jeremy Bentham, *The Rationale of Reward* 206 (1825).

¹⁹⁰ See, e.g., Jon Elster, *Sour Grapes: Studies in the Subversion of Rationality* (1983); Cass R. Sunstein, *Legal Interference with Private Preferences*, 53 University of Chicago Law Review 1129, 1135, 1138-39, 1146-50 (1986); Pierre Bourdieu, *Practical Reason* (1994); Sayer, *Contributive Justice and Meaningful Work*, 11-12.

Droid. The government, through law, should thus strive to open more opportunities for user innovation than manufacturers and the current population of users, left to their own devices, would create.¹⁹¹

VI. Implications

Let's take stock. With respect to conflicts involving modifications of mass produced products, we have identified three potential arguments for the producers and three potential markets for the user-innovators. Some have more bite when applied to modifications of cultural goods; others have more bite when applied to modifications of equipment. In summary, they are:

Arguments for Producers

	Cultural Goods	Equipment
<i>Economic Efficiency (incentives)</i>	Uncertain; highly context specific	Uncertain; highly context specific
<i>Labor-Desert Theory</i>	Moderate in some contexts; weak in others	Moderate in some contexts; weak in others
<i>Personality Theory</i>	Weak	Very weak

Arguments for Innovators

	Cultural Goods	Equipment
<i>Economic Efficiency (market failures)</i>	Strong in some contexts; weak in others	Weak
<i>Distributive Justice</i>	Strong in some contexts; weak in others	Weak in most contexts
<i>Human Flourishing</i>	Strong	Strong

How should a lawmaker—whether a legislator considering a new rule or a judge construing an existing one—respond to this pattern? The answer is far from obvious. Not only are the weights of some of the arguments very difficult to measure, but several are incommensurable. Specifically, the arguments listed in the first layer of each chart could be combined into a single calculus of the overall impact of social welfare of each type of innovation, but the others cannot be integrated in that way. The lawmaker would thus be forced to compare apples to oranges.

¹⁹¹ For the theory of paternalism upon which any assertion of this sort must depend, see Fisher, *Fair Use*, 1762-66.

In the face of these difficulties, one's temptation may be to throw up one's hands. Another instance of radical indeterminacy, it seems. But the lawmaker does not have this luxury. She must decide. How?

Two alternative strategies suggest themselves. A lawmaker skeptical of the argument that seeks to derive wisdom from a substantive theory of human flourishing is likely to observe that all of the other arguments, both for and against user innovation, are either weak or vary radically by context. That observation would, in turn, point toward a strategy of disaggregation. Don't attempt to resolve broadly the question of the legitimacy of user innovation. Rather, select rules—like the fair-use doctrine in copyright law—that require close attention to the facts and circumstances of each case. Doctrines of that sort would enable—could even require—the judges and juries who administer them to assess the force of each of the considerations we have identified when applied to the particular type of product and the particular form of user innovation at issue. This approach would have the familiar advantages of flexibility and potential precision in the pursuit of social goals and the familiar disadvantages of unpredictability and expense.

A lawmaker who embraces the substantive theory of human flourishing would likely react very differently. Taking into account the strong endorsement that theory provides for user innovations of all sorts and the weakness or variability of all of the other arguments, she would likely look for broad rules that expanded the freedom enjoyed by innovators.

Let's assume, optimistically, that she selects the second path. What adjustments of current doctrines might she make? Here are a few:

(1) Increase the weight given, when administering the fair use doctrine, to the question of how “transformative” was the defendant's activity. To be more precise, she might define the term, “transformative use,” expansively—to mean any use of copyrighted material that either constitutes or facilitates creative engagement with intellectual products¹⁹²—and then elevate the importance of such a finding in the fair use calculus. Such an approach would focus on the process by which the defendant's work was produced, rather than (as is now customary) the relationship between the defendant's work and the plaintiff's.¹⁹³

(2) Interpret the first-sale doctrines (as they arise in copyright, patent, and trademark law) more expansively. This would both increase the freedom of purchasers of products to modify the objects they now own and, as Pam Samuelson persuasively suggests, would better align the law with public attitudes, in which the notion that you should be able to do what you want with something you have paid for is nearly universal.

¹⁹² See *Id.* at 1768. But cf. Cohen, *Creativity and Culture*, 1203-04. (arguing that we should abandon the fair-use framework altogether and instead narrow a copyright owner's exclusive right to prepare derivative works so as to exclude from its ambit (a) noncommercial fan fiction and (b) commercial sequels that do not “continu[e] the narrative voice established by the original”).

¹⁹³ See *Campbell v. Acuff-Rose Music*, 510 U.S. 569 (1994).

(3) Interpret the First Amendment to insulate from liability expressive forms of user innovation, whether they involve cultural goods or equipment.¹⁹⁴

(4) Increase the scope of the “experimental use” defense to patent infringement—specifically, to immunize a wider set of activities in which, following Katherine Strandburg, the defendant is “experimenting on,” not just “experimenting with,” the plaintiff’s patented technology.¹⁹⁵

(5) Modify the distinction between “repair” and “reconstruction” of patented items, so that more forms of user innovation fall into the first of these baskets.¹⁹⁶

(6) Modify the doctrines of unconscionability and preemption so as to invalidate contractual provisions that either (a) specify that any alteration of a consumer product, regardless of its actual impact on the functionality of the product, voids the warranty or (b) seek to limit the freedom that purchasers would enjoy under the fair-use and first-sale doctrines.¹⁹⁷

(7) Amend the Digital Millennium Copyright Act to exempt either, circumvention of technologies that control “access to a copyrighted work,” when the principal purpose of that circumvention is to enable the circumventer to modify the underlying product, or (more broadly) circumvention (for any purpose) of encryption systems that do not incorporate mechanisms to accommodate the traditional exceptions to copyright protection, such as the fair-use doctrine.¹⁹⁸

(8) Last but not least, with respect to audio and video recordings distributed in digital forms, replace the copyright regime by which the creators of such recordings currently are compensated with an alternative compensation system, under which the creators are periodically paid, out of a government fund, sums proportional to the relative frequency with which their works are watched or listened to.¹⁹⁹ Because such a reform would have the effect of legalizing the preparation of derivative works based upon the recordings (as well as the verbatim copying and redistribution of recordings), it would create the most generous of the safe harbors for user innovators.

¹⁹⁴ For arguments along these lines in the context of cultural goods, see Balkin, *Digital Speech*, 43; Netanel, *Copyright's Paradox* 190-93. Cf. Note, *"Recoding" and the Derivative Works Entitlement: Addressing the First Amendment Challenge*, 119 *Harvard Law Review* 1488 (2006). (advocating adoption of a “cultural saturation exception to the right to control derivative works” in order to reconcile First Amendment concerns and the general objectives of copyright law).

¹⁹⁵ See Katherine J. Strandburg, *What Does the Public Get?: Experimental Use and the Patent Bargain*, 2004 *Wisconsin Law Review* 81 (2004); Strandburg, *Users as Innovators*.

¹⁹⁶ See Strandburg, *Users as Innovators*, n.72.

¹⁹⁷ Cf. *Quanta Computer, Inc. v. LG Electronics*, 128 S.Ct. 2109 (2008) (limiting in other respects the capacity of sellers of patented materials to use contractual provisions to narrow the scope of the first-sale doctrine).

¹⁹⁸ See Fisher, *Promises to Keep*, 153; Dan L. Burk & Julie E. Cohen, *Fair Use Infrastructure for Rights Management Systems*, 15 *Harvard Journal of Law and Technology* 41 (2001).

¹⁹⁹ See Neil Netanel, *Impose a Noncommercial Use Levy to Allow Free P2P File Sharing*, 17 *Harvard Journal of Law and Technology* 1 (2003); Fisher, *Promises to Keep*, Chpt. 6.

Conclusion

In the past two decades, conflict between the producers of cultural goods and the people who wish to modify those goods has generated a spate of litigation and a corresponding body of legal scholarship discussing whether the interests of the producers or the interests of the users should take precedence. A similar conflict is now intensifying between producers of equipment who wish to prevent or control modifications of their products and a growing group of users who wish to defy those restrictions. This Essay offers a critical review of the policy arguments that have been deployed in the first setting and then assesses the potential force of each of those arguments in the second setting. Most of the arguments, on both sides, prove either to be weak or to vary radically by setting. One argument, however, proves powerful and broad, both as applied to cultural goods and as applied to equipment: user innovation conduces to human flourishing. For that reason, the law ought to afford users the room they need.