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GIANT PINK SCORPIONS: FIGHTING PIRACY WITH NOVEL DIGITAL RIGHTS MANAGEMENT TECHNOLOGY

Andrew V. Moshirnia*

ABSTRACT

The music and movie industries have dominated the discussion on Internet piracy. Both industries have employed the use of technologies that limit the ability to share digital files of their audiovisual works, known as digital rights management technology. In addition, both industries have pursued aggressive legal action campaigns to enforce intellectual property rights against individuals who are illegally downloading files and websites that facilitate piracy. But by all counts, these efforts have failed to control the problem, and arguably damaged their reputations.

Though music and movie piracy has received the most headlines, the PC video game industry has similarly suffered. The video game industry, too, has pursued the traditional enforcement routes that other industries have used to combat piracy, with the same middling results. Thus, some developers have turned to alternative means of combating piracy, which are primarily aimed at changing the hearts and minds of its gaming community. By fostering a negative social stigma towards piracy, developers have found an effective means of protecting their intellectual property.

This Article focuses on two primary methods that video game developers have used to combat Internet piracy. The first method is the use of open pricing models, whereby purchasers pay what they want for a particular game or package of games. The second

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method is the use of endogenous digital rights management technology that does not entirely restrict access to the game, but which can severely frustrate game play, often in a comical manner. The success of this latter method is unique to the game industry. Ultimately, these methods have had a positive effect on the industry's attempt to combat piracy.

Intellectual property laws have already been amended and employed to combat piracy. Legislation and litigation are often the first responders to changing industry landscapes. Yet these traditional avenues have been ineffective in protecting intellectual property on the Internet. Perhaps, then, the answer lies in the video game industry's approach.

I. INTRODUCTION

Discussion of Internet piracy has thus far been dominated by a focus on the music and film industries.¹ Indeed, the law provides incredible punishments for those pirates who are unlucky enough to be caught illegally distributing audiovisual files.² Yet comparatively little attention has been paid to another industry where piracy is far more rampant: the PC video game industry. It is not uncommon for popular games to have a piracy rate above 90%, a rate far higher than the piracy rate for the very same games on closed console platforms.³ In an environment where intellectual property laws are openly flouted and legal enforcement is impractical, video game producers have attempted to employ creative, consumer-side barriers to stem piracy. Traditionally,

1. See, e.g., Kyle Orland, *Ubisoft Boss: Free-to-play a Natural Reaction to High Piracy Rates*, ARSTECHNICA (Aug. 22, 2012), <http://arstechnica.com/gaming/2012/08/ubisoft-boss-free-to-play-a-natural-reaction-to-high-piracy-rates/> (noting that the piracy rate for PC games is "around 93-95 percent.").

2. Eben Allen, *When the Empire Strikes Back: A Rebel's Guide to Limiting Statutory Damages to Taking Only a Hand Instead of an Arm and a Leg*, 8 INTELL. PROP. & TECH. L.J. 24 (2012) (noting that a \$675,000 damages award was reinstated in *Sony BMG Entm't v. Tenenbaum*, 660 F.3d 487 (1st Cir. 2011), cert. denied, 182 L. Ed. 2d 1075 (U.S. May 21, 2012) (No. 11-1019)).

3. Koroush Ghazi, *PC Piracy Examined*, 1, 4-6 TWEAKGUIDES (April 2012), http://www.tweakguides.com/Piracy_1.html.

rights-holders of intellectual property in digital formats have employed technologies that restricted undesired uses, known as digital rights management (“DRM”). The use of DRM has generally been at best ineffectual and at worst a source of irritation for legitimate purchasers. While mechanics to block immediate piracy of a game (so-called “zero-day piracy”)⁴ have been successful at times, they have engendered negative feelings in the legitimate-purchaser base. Seeing the inherent danger in such an approach, some producers are attempting to employ social shaming as a means of deterring piracy. This Article focuses on two alternate methods to traditional DRM of changing the PC piracy culture: open pricing models and DRM using in-game elements (endogenous DRM).

Digital piracy is surprisingly simple: technology has progressed to the point that users can create lossless copies of works and distribute these copies anonymously over digital networks.⁵ The piracy of video games, and PC video games in particular, has received little attention, though the rate of piracy in that arena rivals, if not surpasses the piracy rate of the wider entertainment industry.⁶ The shocking prevalence of piracy with regard to PC games is just one of the reasons compelling analysis focused specifically on software piracy. PC game piracy arguably represents a more damaging form of copyright infringement than

4. *Id.* at 8; Craig Pearson, *Why Steam Works: How Valve is revitalising PC gaming*, COMPUTERANDVIDEOGAMES (Mar. 27, 2008), http://www.computerandvideogames.com/185565/features/why-steam-works/?page=2#top_banner (“Day zero piracy is where a game is released for free by pirates before the official release. It’s disastrous for the developer and publisher because whatever route gets the game out to the gamer first will be the favoured choice, so a game uploaded to the internet before the release date will have a huge impact on sales.”).

5. Digital copies typically do not have the degradation in quality associated with analog copies.

6. See Jethro Dean Lord IV, *Would You Like to Play Again? Saving Video Games from Virtual Extinction through Statutory Licensing*, 35 SW. U. L. REV. 405, 408 (2006) (Noting that “some may argue that video game piracy is largely ignored because the video game industry lacks the ‘star power’ that the music industry obtains from major label recording artists . . . , the real difference lies in how the two industries exploit their catalog.”).

piracy in the wider entertainment industry.⁷ The costs of piracy are heightened in this arena, due to continued drains on resources by infringing users beyond the initial copying of the game: pirates frequently utilize end user help lines⁸ thereby inflating personnel costs, and they download official patches, boosting the developer's need for more bandwidth.⁹ Faced with the economic threat of PC piracy, developers have migrated to video game consoles,¹⁰ which provide more effective copy protection,¹¹ or have changed to

7. Opponents of anti-piracy legislation often point to the fact that the quantitative damage of piracy is uncertain. *See, e.g.,* Julian Sanchez, *SOPA, Internet Regulation, and the Economics of Piracy*, ARSTECHNICA (Jan. 18, 2012), <http://arstechnica.com/tech-policy/2012/01/internet-regulation-and-the-economics-of-piracy/>. The study of video game piracy at least presents some concrete losses outside of lost sales to justify intervention.

8. Chris Remo, *Ritual's Mike Russell on Piracy*, SHACK NEWS (Jul. 25, 2006, 10:00 PM), <http://www.shacknews.com/article/43067/rituals-mike-russell-on-piracy> (noting that "gamers with pirated copies of Emergence requesting support outnumbered gamers with legitimate copies of Emergence requesting support by a ratio of nearly five to one"); *See also* Michael Larabel, *LGP Introduces Linux Game Copy Protection*, PHORONIX (June 23, 2008), http://www.phoronix.com/scan.php?page=article&item=lgp_copy_protection&num=1 (Discussing the decision to add DRM to games: "Trust me, I don't like it, I'm not happy about it, but we HAVE to do this. I've fought for 6 years against the need for any kind of protection system and all that's happened is that for every legitimate copy of an LGP game out there, there are probably 3-4 pirated copies . . . [W]e have to face reality in that many many people buy games and put them online for people to download. Hell, we even get people asking for tech support on games we KNOW are pirated.").

9. Byron Acohido, *Windows Pirates Encouraged to Install Security Patches*, USA TODAY (Feb. 1, 2010), <http://content.usatoday.com/communities/technologylive/post/2010/02/windows-pirates-encouraged-to-install-security-updates/1#.UI12EWIKnrM>.

10. For example, Microsoft's XBOX 360, Sony's PlayStation 3, or Nintendo's Wii.

11. Many developers and managers at gaming companies have weighed in on this migration. *See* Ghazi, *supra* note 3, at 5. Cliff Bleszinski, a lead creator at Epic Games noted the effect of piracy in the PC gaming industry, saying "Here's the problem right now: the person who is savvy enough to want to have a good PC to upgrade their video card, is a person who is savvy enough to know bit torrent to know all the elements so they can pirate software. Therefore, high-end videogames are suffering very much on the PC. Right now, it makes sense

incremental sales models.¹² The current situation provides developers with incentive to attempt unconventional anti-piracy

for us to focus on Xbox 360 for a number of reasons. Not least PCs with multiple configurations and piracy. Ghazi, *supra* note 3, at 5.

Emphasizing the extreme economic impact piracy has had on PC game developers, Chris Taylor of Gas Powered Games claims:

[P]eople are going to stop making [games] on the PC because of . . . what's happened on the PC with piracy. The economics are ugly right now on the PC. You're not going to see these gigantic, epic investments of dollars on the PC when it just doesn't work. The economics have to work. You're going to see those investments made on the console side and it's going to become a more console-centric investment. And then you're going to see them ported back over to the PC and that creates a different experience on the PC.

Erik Brudvig, *GDC 2008: Chris Taylor on PC Piracy*, IGN (Feb. 19, 2008), <http://www.ign.com/articles/2008/02/20/gdc-2008-chris-taylor-on-pc-piracy>.

Robert Bowling, manager at another popular game developer, clearly links the move away from PC game development with piracy:

[W]e pulled some disturbing numbers this past week about the amount of PC players currently playing Multiplayer (which was fantastic). What wasn't fantastic was the percentage of those numbers who were playing on stolen copies of the game on stolen / cracked CD keys of pirated copies (and that was only people playing online). . . . [th]e amount of people who pirate PC games is astounding.

Ben Kuchera, *Piracy to Blame for Slowing PC Game Sales?* ARSTECHNICA (Jan. 17, 2008), <http://arstechnica.com/gaming/2008/01/pc-sales-slow-as-some-despair-over-piracy/> (quoting Bowling's blog).

See also *PC piracy forces Crytek to support consoles*, VIDEOGAMER.COM (Apr. 29, 2008, 5:38 PM), http://www.videogamer.com/pc/crysis/news/pc_piracy_forces_crytek_to_support_consoles.html ("I believe that's the core problem of PC Gaming, piracy. To the degree PC gamers that pirate games inherently destroy the platform. Similar games on consoles sell factors of 4-5 more. It was a big lesson for us and I believe we won't have PC exclusives as we did with Crysis in future. We are going to support PC, but not exclusive anymore.").

12. See Orland, *supra* note 1 ("On PC it's only around five to seven percent of the players who pay for F2P, but normally on PC it's only about five to seven percent who pay anyway, the rest is pirated," he said. "It's around a 93-95 percent piracy rate, so it ends up at about the same percentage. The revenue we get from the people who play is more long term, so we can continue to bring content.").

methods. Furthermore, due to the interactive nature of games, developers have a unique opportunity to convey a variety of anti-piracy messages.

While the law provides for protection of developers' intellectual property, the games industry has largely avoided the consumer lawsuit model that has been followed at times by the music and film industries.¹³ Such an approach would be unlikely to succeed and would surely provoke backlash from the wider game playing community.¹⁴ Instead, developers have engaged in consumer-side copy protection, implementing numerous anti-piracy measures as part of digital rights management ("DRM").¹⁵ Consequently, developers are in an arms race, deploying more complex (and often invasive) DRM, which crackers inevitably defeat.¹⁶ In the midst of this battle, legitimate users are caught in the crossfire, frustrated by crippling anti-piracy measures.¹⁷

13. See David Kravets, *Copyright Lawsuits Plummet in Aftermath of RIAA Campaign*, WIRED MAGAZINE, May 18, 2010, <http://www.wired.com/threatlevel/2010/05/riaa-bump/>; Joe Satran, *Richard O'Dwyer Memo Leaked To TorrentFreak Reveals MPAA's Insecurity In Piracy Fight*, HUFFINGTON POST (Aug. 8, 2012), http://www.huffingtonpost.com/2012/08/08/richard-odwyer-memo-torrentfreak-mpaa_n_1757472.html.

14. John Walker, *Splendid: CD Projekt To Stop Legal Threats, Rock, Paper, Shotgun*, ROCK, PAPER SHOTGUN (Jan. 12, 2012), <http://www.rockpapershotgun.com/2012/01/12/splendid-cd-projekt-to-stop-legal-threats/> ("While we are confident that no one who legally owns one of our games has been required to compensate us for copyright infringement, we value our fans, our supporters, and our community too highly to take the chance that we might ever falsely accuse even one individual. So we've decided that we will immediately cease identifying and contacting pirates.").

15. Greg Voakes, *Why Don't We Have A Comprehensive Solution For Video Game DRM Yet?*, FORBES (June 12, 2012), <http://www.forbes.com/sites/gregvoakes/2012/06/12/why-dont-we-have-a-comprehensive-solution-for-video-game-drm-yet/> (listing different approaches to DRM).

16. Susana Polo, *Ubisoft's Assassin's Creed 2 DRM Has Been Cracked*, GEEKOSYSTEM (Apr. 23, 2010), <http://www.geekosystem.com/assassins-creed-2-drm-crack-ubisoft/> ("Thank you Ubisoft, this was quite a challenge for us, but nothing stops the leading force from doing what we do. Next time focus on the game and not on the DRM. It was probably horrible for all legit users. We just make their lives [sic] easier.").

17. ROBERT SPACE INDUSTRIES, <http://www.robertspaceindustries.com/>

A technologically-impervious DRM is unlikely to emerge.¹⁸ Rather, a change in the norms of the PC gaming community — which currently tolerates, excuses, and often encourages piracy — is necessary. While policymakers are focused on enhanced legal threats and possible cutoffs (the so called “three strikes” plans,¹⁹ as well as SOPA²⁰ and PIPA²¹) as a means to enforce respectful intellectual property norms, these changes seem unlikely to succeed in the face of anonymity and the costs of bringing lawsuits. Instead, developers should seek a user-centered solution. This Article examines two means to shame and discourage pirates: open pricing models and endogenous DRM. Part II of this Article details the prevalent and uniquely damaging nature of piracy in PC gaming and surveys the current state of DRM, which presents a mixed record of preventing certain types of piracy while aggravating legitimate users. Part III of this Article presents the open pricing models currently used to dissuade piracy. Part IV examines endogenous DRM, which typically draws favorable responses from legitimate users and presents crackers with the more difficult task of hacking a game with multiple function-inhibiting levels of anti-piracy measures.

II. RAMPANT PC GAME PIRACY

Over the past several years, advances in technology have paved the way for new piracy. As methods of pirating PC games, and

forums/topic/please-dont-use-drm/ (last visited Nov. 30, 2012).

18. Starforce, a DRM provider has admitted as much. See Ghazi, *supra* note 3, at 8 (“The purpose of copy protection is not making the game uncrackable - it is impossible. The main purpose is to delay the release of the cracked version. Maximum sales rate usually takes place in the first month(s) after the game release. If the game is not cracked in that period of time, then the copy protection works well.”).

19. Eldar Haber, *The French Revolution 2.0: Copyright and the Three Strikes Policy*, 2 HARV. J. SPORTS & ENT. L. 297, 297 (2011).

20. Julianne Pepitone, *SOPA explained: What it is and why it matters*, CNNMoney (Jan. 12, 2012), http://money.cnn.com/2012/01/17/technology/sopa_explained/index.htm.

21. Larry Magid, *What Are SOPA and PIPA And Why All the Fuss?*, FORBES (Jan. 18, 2012), <http://www.forbes.com/sites/larrymagid/2012/01/18/what-are-sopa-and-pipa-and-why-all-the-fuss/>.

networks based around such efforts have continually increased, the threat of PC piracy has become a substantial problem for the PC gaming industry. Despite various efforts to curb methods of piracy and the distribution thereof, PC pirates have had an easy time of bypassing industry controls. This section addresses this trend, examining the state of online piracy in general; the methods employed most frequently in online piracy; the prevalence of piracy in the realm of PC video games; the economic harms of this loss; and the tolerance and encouragement of piracy in the wider PC audience.

A. Online Piracy

Online piracy of video games can violate several exclusive rights granted to rights-holders under the Copyright Act of 1976.²²

22. See 17 U.S.C. § 106 (2006). Copyright law protects “original works of authorship fixed in any tangible medium of expression” including “literary works, motion pictures and other audiovisual works.” *Id.* § 102(a)(1) - (8). In 1980, the Computer Software Copyright Act added computer programs to the scope of copyright law. The Act defined a computer program as “a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.” *Id.* § 101. Shortly thereafter, the Second Circuit first extended copyright protection “for arcade video games as audiovisual works.” See Lord, *supra* note 6 (citing *Stem Elec. v. Kaufman*, 669 F.2d 852, 857 (2d Cir. 1982)). Such audiovisual works are defined as, “works that consist of a series of related images which are intrinsically intended to be shown by the use of machines or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds.” 17 U.S.C. § 101. The Second Circuit determined that the copyright protections should not be restricted to only the code on which the video game was based, but extended the protection to the game’s images and sounds as well. See *Kaufman*, 669 F.2d at 853–55. The court understood that restricting protections to only code would allow for reproduction of the most popular and recognizable aspects of video games—the audiovisuals, not the code. *Id.*

The *Kaufman* court also rejected Defendant’s argument that the audiovisuals of video games were not, as the Copyright Act requires, based in a “tangible medium of expression.” *Id.* at 855–56. Defendant argued that because the player’s actions can change the audiovisuals, there was no fixed medium. *Id.* at 855; see Lord, *supra* note 6, at 413. In rejecting this argument, the court determined that there were enough consistency in the constitutive audiovisuals to warrant protection. *Kaufman*, 669 F.2d at 856.

Video game piracy, in its most basic iteration, reproduces and distributes lossless copies of a protected game.²³

While piracy has always been a major concern of the wider entertainment industry, the arrival of digital distribution technologies has greatly increased the prevalence and reach of piracy.²⁴ For example, while the music industry earlier claimed that cassette recording was “killing” music, the impact of consumer side copying was muted because analog copying resulted in an inherent iterative loss of quality and distribution was limited to the physical realm.²⁵ In contrast, the advent of online Peer-to-Peer (“P2P”) file sharing services such as Napster and, more recently, BitTorrent clients, has allowed users to easily obtain and share illegitimate lossless copies of works.²⁶

Industry pundits have blamed Internet piracy for falling music sales over the last decade.²⁷ The International Federation of Phonographic Industry estimates that approximately 95% of digital music files worldwide have been downloaded illegitimately.²⁸ The

As copyright protection was already extended to the code of video games, as literary works, the *Kaufman* court meant that video games were also protected as audiovisual work. Lord, *supra* note 6, at 414. As a result, video game copyright owners “are given the exclusive right to reproduce the copyrighted game, to prepare derivative works based upon the copyrighted game, to distribute copies of the copyrighted game to the public, to perform the copyrighted game publicly, and to display the copyrighted game publicly.” *Id.* The exclusive rights protected by copyright law leave little, if any, room for PC game pirates to operate.

23. *Id.* § 106(1) (right to reproduce); § 106(3) (right to distribute).

24. See Julio Ojeda-Zapata, *Computer Game Makers Lose Increasing Number of Sales to Online Piracy*, ST. PAUL PIONEER PRESS, Feb. 5, 2004, at A1 (“[D]igital game files are much bigger than digital music files and therefore far more cumbersome to swap over the Internet. But with the increasing popularity of high-speed Internet connections and the emergence of online-swapping technologies . . . that move large files more efficiently through cyberspace, illegal game distribution has begun to skyrocket.”).

25. Mark A. Lemley, *Is the Sky Falling on the Content Industries?*, 9 J. TELECOMM. & HIGH TECH. L. 125, 125 (2011).

26. *Id.* at 130-31.

27. Eric Pfanner, *Music Industry Counts the Cost of Piracy*, N.Y. TIMES, Jan. 21, 2010, <http://www.nytimes.com/2010/01/22/business/global/22music.html>.

28. *Id.*; see also Stephen Siwek, *The True Cost of Sound Recording Piracy to the U.S. Economy*, IPI CTR. FOR TECH. FREEDOM, POLICY REPORT, 188 (2007),

response of the wider entertainment industry has been five-fold: implementing consumer-side anti-copying measures (*i.e.* DRM),²⁹ filing lawsuits against users and sharing websites,³⁰ launching anti-piracy education campaigns,³¹ campaigning for tougher anti-piracy legislation,³² and sending warning letters to Internet Service Providers (“ISPs”) in an effort to reach users.³³ The efficacy of these approaches is up for debate.³⁴ It does seem, however, that

available at http://www.ipi.org/docLib/20120515_SoundRecordingPiracy.pdf; BPI RESEARCH AND INFORMATION, THE IMPACT OF ILLEGAL DOWNLOADING ON MUSIC PURCHASING (2009), available at <http://www.ifpi.org/content/library/The-Impact-of-Illegal-Downloading.pdf>.

29. Consumers will be familiar with many forms of copy protection. DVDs are ostensibly protected by CSS. Blu-rays are protected by ACSS, BD+, and most recently (and controversially) Sony’s proprietary Cinavia watermarking. See Ganesh T S, *Cinavia DRM: How I Learned to Stop Worrying and Love Blu-ray’s Self-Destruction*, ANANDTECH (Mar. 21, 2012 11:00 AM), <http://www.anandtech.com/show/5693/cinavia-drm-how-i-learned-to-stop-worrying-and-love-blurays-selfdestruction/2>. Apple uses proprietary FairPlay DRM for applications, video, and iBook iTunes content. Brian Bishop, *Apple’s FairPlay DRM for eBooks Cracked by Requiem App*, THE VERGE (Feb. 25, 2012 10:18 AM), <http://www.theverge.com/2012/2/25/2823218/apples-fairplay-drm-ebooks-cracked-requiem-app>.

30. See *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 125 S. Ct. 2764 (2005); *A&M Records, Inc. v. Napster, Inc.*, 239 F.3d 1004 (2001).

31. The most famous of these being the “Piracy. It’s a Crime” series, which likened movie downloading to stealing movies and cars. See Zervas, *Piracy, It’s a Crime*, THE STRATEGIC RETREAT (Nov. 14, 2007), <http://thestrategicretreat.com/piracy-its-a-crime/>. This campaign was widely mocked in the Internet meme “You wouldn’t download a car” and did not see a decrease in traffic to illegal downloading or streaming sites.

32. Haber, *supra* note 19, at 303-305 (detailing the role of the music industry in pushing three strikes plans in various countries).

33. Bob Moon, *Entertainment Industry to Launch New Anti-Piracy Campaign*, MARKETPLACE (Oct. 17, 2012), <http://www.marketplace.org/topics/tech/entertainment-industry-launch-new-anti-piracy-campaign>.

34. “T[he] recording industry’s long-running battle against online music piracy has come to resemble one of those whack-a-mole arcade games, where the player hammers one rubber rodent’s head with a mallet only to see another pop up nearby.” Steve Lohr, *Ideas & Trends: The Sharing Society; In the Age of the Internet, Whatever Will Be Will Be Free*, N.Y. TIMES, Sept. 14, 2003, <http://www.nytimes.com/2003/09/14/weekinreview/ideas-trends-sharing-society-age-internet-whatever-will-be-will-be-free.html>.

music piracy is falling in the United States, although many commentators attribute this drop to the availability of legal streaming services, such as Spotify and Pandora.³⁵

B. Main Piracy Tools

In order to provide a full understanding of the current state of PC piracy, it is important to review the technologies — namely, the methods of bypassing DRM, and the distribution mechanisms — that facilitate piracy. DRM has taken on heightened importance due to the failure of governments to shutter file distribution networks. Because P2P sharing is predominantly decentralized, and efforts to shutter centralized cyberlockers³⁶ face a myriad of legal difficulties under current law, anti-piracy campaigns targeting piracy infrastructure are unlikely to succeed.³⁷ In its most common form, digital piracy roughly breaks down into two steps. First, a pirating user must circumvent or defeat any DRM attached to a protected work. In the second step, the DRM-free files constituting the work are then distributed digitally over a variety of distribution channels.

There are three main methods of defeating DRM. First, pirating users may find exploits in DRM code that allow the user to defeat the DRM without loading additional software onto the target computer. For example, a pirating user may edit a computer's registry or delete specific files in order to prevent DRM from functioning.³⁸ Second, pirating users may use Key Generator software — or “KeyGens” — to produce a counterfeit serial

35. Ernesto, *Music Piracy Continues to Decline Thanks to Spotify*, TORRENTFREAK (Sept. 28, 2011), <http://torrentfreak.com/music-piracy-continues-to-decline-thanks-to-spotify-110928/>.

36. Netlockers, or cyberlockers, enable file uploads, which can then be accessed over the internet by the uploader and usually other users as well. Examples of netlockers include megaupload.com and filestube.com.

37. Cyberlockers are often hosted offshore, outside the jurisdiction of the United States and other Berne signatories. See Jart Armin, *Top 40 Countries for Copyright Piracy & Cyberlockers*, INTERNETEVOLUTION (Mar. 2, 2011), http://www.internetevolution.com/author.asp?section_id=679&doc_id=204305.

38. *How-to-x.info*, citation on file with the Journal and the author.

number that can be used to unlock game content.³⁹ Finally, pirating users can modify — or “crack” — a game’s code to prevent the game from triggering DRM.⁴⁰

Once the DRM has been defeated, pirating users enjoy a vast variety of distribution channels. Perhaps the most common avenue of transferring pirated works is the BitTorrent protocol.⁴¹ BitTorrent is a decentralized P2P sharing protocol that allows for the rapid delivery of large files.⁴² A file distributed by torrent is segmented into small pieces, or “bits,” which may be downloaded out of sequence.⁴³ The initial file is “seeded” by a user, and leeched by other users seeking to download the file.⁴⁴ Users running a BitTorrent client may download any piece of the targeted file from any other user who has that piece and is currently “leeching” or “seeding” that targeted file.⁴⁵

BitTorrent has three features conducive to piracy. First, it reduces the drain on the bandwidth and hardware resources of the original seeder.⁴⁶ As more users in a swarm gain pieces of the file, each user may begin distributing those pieces, increasing the

39. Joshua J. Dubbelde, Note, *A Potentially Fatal Cure: Does Digital Rights Management Ensure Balanced Protection of Property Rights?*, 2010 U. ILL. J.L. TECH. & POL’Y 409, 423 (2010). Games, especially games that are marketed through playable demos, may require a serial-number to unlock the game. *Id.*

40. *Software Piracy*, DIGITAL RIVER, <http://www.developer-resource.com/software-piracy.htm> (last visited Nov. 30, 2012). Cracks are also known as Warez. Shawn Knight, *US BitTorrent Traffic Decline Credited to Legal Alternatives*, TECHSPOT (May 28, 2012), <http://www.techspot.com/news/48770-us-bittorrent-traffic-decline-credited-to-legal-alternatives.html>.

41. Ryan Singel, *Is Netflix Reducing Illicit File Sharing? Depends on Which Stats You Believe*, WIRED MAGAZINE, Apr. 28, 2011, http://www.wired.com/business/2011/04/netflix-file-sharing/?utm_source=Contextly&utm_medium=RelatedLinks&utm_campaign=Previous.

42. Mark F. Schultz, *Fear and Norms and Rock & Roll: What Jambands Can Teach Us About Persuading People to Obey Copyright Law*, 21 BERKELEY TECH. L.J. 651, 686-88 (2006).

43. *Id.*

44. *Id.*

45. Okechukwu Benjamin Vincents, *When Rights Clash Online: The Tracking of P2P Copyright Infringements v. The EC Personal Data Directive*, 16 INT’L J. L. & INFO. TECH. 270, 274 (2007).

46. *See generally id.*

availability of the file without taxing the original provider. This lowers the cost of distributing illegitimate files, as the original seed is supplemented by users who have completed the download and are seeding the copy, and by users who have not completed the download but are uploading selected pieces. It also provides an incentive for robust pirating networks, because a greater number of users leeching a file will actually increase the speed of download and the likelihood of successful download.

Second, the decentralized nature of BitTorrent makes it exceptionally difficult to shut down the distribution of any one file. Rather than existing on any particular server, the file exists on countless computers. Governments have succeeded in shutting down particular trackers, including Suprnova,⁴⁷ EliteTorrents,⁴⁸ BtJunkie⁴⁹ and Demonoid,⁵⁰ but the effect of these shutdowns has

47. See, e.g., Ernesto, *Suprnova.org: Two Years Since the Shutdown*, TORRENTFREAK (Dec. 19, 2006), <http://torrentfreak.com/suprnovaorg-two-years-since-the-shutdown/> (noting that the sites servers were seized by Slovenian police in cooperation with a French anti-piracy group); The Associated Press, *File-Swap Site Folds for Good*, WIRED MAGAZINE, Dec. 20, 2004, <http://www.wired.com/entertainment/music/news/2004/12/66099>.

48. Enigmax, *Dramatic BitTorrent Site Shutdowns of the Decade*, TORRENTFREAK (Dec. 31, 2009), <http://torrentfreak.com/dramatic-bittorrent-site-shutdowns-of-the-decade-091231/>; Jon Healey, *U.S. Shuts Website in Piracy Crackdown*, L.A. TIMES (May 26, 2005), <http://articles.latimes.com/2005/may/26/business/fi-torrent26>.

49. Zach Walton, *BTJunkie Shuts Down Over Fears of Legal Action*, WEBPRONNEWS (Feb. 6, 2012), <http://www.webpronews.com/btjunkie-shut-down-2012-02> (voluntarily shut down after megaupload's take down, leaving with the note: "This is the end of the line my friends. The decision does not come easy, but we've decided to voluntarily shut down. We've been fighting for years for your right to communicate, but it's time to move on. It's been an experience of a lifetime, we wish you all the best!"); Ernesto, *BitTorrent Giant BTJunkie Shuts Down for Good*, TORRENTFREAK (Feb. 6, 2012), <http://torrentfreak.com/btjunkie-shuts-down-for-good-120206/>.

50. Adrian Covert, *Ukraine Officials Shut Down Demonoid to Impress US Government*, GIZMODO (Aug. 6, 2012), <http://gizmodo.com/5932143/ukraine-officials-shut-down-demonoid-to-impress-the-us-government> (noting that the site's servers were seized by the Ukrainian government as a good will gesture to the United States); Enigmax, *Demonoid Busted as a Gift to the United States Government*, TORRENTFREAK (Aug. 6, 2012),

been negligible.⁵¹ Furthermore, sites are now taking infrastructural steps to avoid future shutdowns.⁵²

Third, BitTorrent is relatively simple to use. A user need only install a BitTorrent client,⁵³ search for a torrent file, and load the file in the client. General purpose search engines such as Google provide torrent results, as do torrent specific search engines. By contrast, other piracy methods such as file trading⁵⁴ on Internet Relay Chat require knowledge of unintuitive text-based commands.⁵⁵

<http://torrentfreak.com/demonoid-busted-as-a-gift-to-the-united-states-government-120806/>.

51. Surya R. Praveen, *BitTorrent Usage Increases in Europe, Following the Blockade of The Pirate Bay*, SURYA R. PRAVEEN (July 6, 2012), <http://suryarpraveen.wordpress.com/2012/07/06/bittorrent-usage-increases-in-europe-following-the-blockade-of-the-pirate-bay/> (last visited Nov. 30, 2012) (noting that European bittorrent use actually increased after the blocking of the most popular bittorrent tracker, The Pirate Bay); Paul Resnikoff, *The MegaUpload Shutdown Hasn't Reduced File-Trading at All . . .*, DIGITAL MUSIC NEWS (Feb. 10, 2012), <http://www.digitalmusicnews.com/permalink/2012/021012postmegaupload> (noting that though global internet traffic decreased by 2 percent after the closure of megaupload, full traffic resumed shortly thereafter).

52. Sebastian Anthony, *The Pirate Bay Moves to the Cloud to Evade the Police*, EXTREME TECH (Oct. 17, 2012), <http://www.extremetech.com/computing/138037-the-pirate-bay-moves-to-the-cloud-to-evade-the-police> (noting that the popular tracker site, The Pirate Bay, has moved to redundant cloud servers to prevent future shutdowns).

53. Popular BitTorrent clients include qTorrent, Vuze, and Transmission.

54. Users typically trade files with each other or download from a file server (f-serve). To access these f-serves, users must type the correct Client-to-Client Protocol trigger (ctcp) and accept an invitation to join the f-serve. The text-only interface of IRC is quite intimidating to a user more accustomed to modern graphical user interfaces. New users may have to rely on help from current users or access guides to better understand the nature and etiquette of IRC forums. *See e.g., Downloading Files from IRC/File Server (fserve) Guide*, WIKIBOOKS, [http://en.wikibooks.org/wiki/Downloading_Files_from_IRC/File_Server_\(fserve\)_Guide](http://en.wikibooks.org/wiki/Downloading_Files_from_IRC/File_Server_(fserve)_Guide) (last visited Nov. 30, 2012).

55. These commands, such as “!list, dir, and /ctcp” are difficult for users who have not had experience with a command prompt interface, such as the DOS/UNIX command line. *See id.* (The command prompt style interface will probably look like gibberish to you at first if you are unfamiliar with the DOS/UNIX command line.). *See also* David Caraballo & Joseph Lo, *The IRC*

Direct Download Hosting Service, or “cyberlockers” are another popular means for distributing pirated works.⁵⁶ So-called cloud storage allows users to upload files to remote servers, which in turn host files for download. These services provide users with the opportunity to access their files from multiple computers and guard against local machine failure. Although nominally marketed for legitimate uses, cyberlocker services are also frequently used for copyright infringement.⁵⁷ As a consequence of their centralized nature, cyberlockers have recently come under concerted legal (and extra-legal) attack from various governments. In January of 2012, for example, the United States government shut down cyberlocker Megaupload.com with extralegal cooperation from the New Zealand government.⁵⁸ It remains to be

Preclude, IRCHELP.ORG, <http://www.irchelp.org/irchelp/new2irc.html> (last updated June 1, 2000).

56. Ernesto, *Cyberlockers Take Over File-Sharing Lead From BitTorrent Sites*, TORRENTFREAK (Jan. 11, 2011), <http://torrentfreak.com/cyberlockers-take-over-file-sharing-lead-from-bittorrent-sites-110111/> (noting that “[i]n terms of visitor traffic Cyberlockers have taken over the file-sharing lead from BitTorrent sites.”); see also MarkMonitor, *Traffic Report: Online Piracy and Counterfeiting*, MARK MONITOR, 7 (Jan. 2011), https://www.markmonitor.com/download/report/MarkMonitor_-_Traffic_Report_110111.pdf (finding that the top two cyberlocker services, RapidShare and MegaUpload received nearly 12 billion and 5 billion visits annually respectively).

57. See, e.g., Skidrow’s use of the cyberlocker uploader to distribute cracked games. Citation is on file with the Journal and the author.

58. Juha Saarinen, *Inside N.Z. Police Megaupload Files: U.S. Investigation Began in 2010*, WIRED MAGAZINE, Sept. 26, 2012, <http://www.wired.com/threatlevel/2012/09/megaupload-police/>; The Associated Press, *New Zealand apologizes for spying on Megaupload founder*, CBC NEWS (Sept. 28, 2012, 11:05 AM), <http://www.cbc.ca/news/technology/story/2012/09/28/tech-megaupload-spying-new-zealand.html>; Enigmax, *IIPA Reports BitTorrent Sites and Cyberlockers To US Government*, TORRENTFREAK (Feb. 14, 2012), <http://torrentfreak.com/iipa-reports-bittorrent-sites-and-cyberlockers-to-us-120214/>; but see, Ernesto, *Game Changing Study Puts Piracy in Perspective*, TORRENT FREAK (Mar. 11, 2011), <http://torrentfreak.com/game-changing-study-puts-piracy-in-perspective-110311/>.

seen if the impact on piracy of any one cyberlocker shutdown will be substantial.⁵⁹

C. Exclusive and Elite DRM breakers: The Warez Scene

The efficiency of piracy distribution channels is all the more remarkable because the first step of defeating copy protection appears to be most commonly conducted by only a few dedicated pirate communities.⁶⁰ These communities are collectively known as “The Scene” or “The Warez Scene.”⁶¹ When a new piece of software is released, various groups will create different cracks, KeyGens, etc. Ironically, these groups often stress the importance of contributing to the Scene, and deplore freeriding “leechers.” Some well-known groups that focus largely on cracking video game DRM are ReLoaded and Skidrow.

It is important to distinguish between first-order or “hardcore” piracy from second-order piracy, which is the great majority of piracy. First-order pirates (also known as “sceners”) are part of a dedicated social group who are ideologically driven and receive praise and support for their impressive intellectual efforts. Thus, some of the motivations of hardcore pirates — pride, community loyalty, peer reinforcement⁶² — are absent from second-order

59. Compare Ernesto, *MegaUpload Alternatives See Surge in Traffic After Shutdown*, TORRENTFREAK (Jan. 26, 2012), <http://torrentfreak.com/megaupload-alternatives-see-surge-in-traffic-after-shutdown-120126/> (noting that “millions of former MegaUpload users are migrating to other sites”); with Ernesto, *Major Cyberlocker Filesonic Goes Offline After Traffic Plummets*, TORRENTFREAK (Aug. 31, 2012), <http://torrentfreak.com/major-cyberlocker-filesonic-goes-offline-after-traffic-plummets-120831/> (noting the rapid disappearance of cyberlockers Oron and Filesonic).

60. Enigmax, *Interview with a Warez Scene Releaser*, TORRENTFREAK (May 16, 2007), <http://torrentfreak.com/interview-with-a-warez-scene-releaser/>.

61. *Id.* The Scene has a detailed hierarchy, with releasegroups or people who actually release cracked software into the Scene, at the top. *The Warez Scene Hierarchy*, SCEPER, <http://sceper.eu/2006/06/the-warez-scene-hierarchy.html> (last visited Nov. 30, 2012).

62. Enigmax, *supra* note 60; Enigmax, *Top Pirate Reveals Warez Scene Secrets, Attracts MPAA Lawyer’s Attention*, TORRENTFREAK (Nov. 19, 2007), <http://torrentfreak.com/top-pirate-reveals-warez-scene-secrets-071119/>.

pirates, who merely implement the cracks authored by first-order pirates. There is considerable tension between the groups,⁶³ in part because second-order pirates may be impatient for cracked releases,⁶⁴ complain about performance issues with particular cracks,⁶⁵ and fail to contribute (in either bandwidth or money) to a community.⁶⁶

63. See Ghazi, *supra* note 3, at 3. Ghazi provides the example of Reloaded, a cracking group, which puts the following message in its releases:

We, RELOADED members, would like You - Dear User, to know the following:

1. We do not want You to spread our releases outside of The Scene.
2. Do NOT contact technical support if You have some issues with our releases.
3. We hate Peer2peer networks (torrents, bearshare, . . .), rapidshare etc.
4. We do not make our releases for YOU - Mr. P2P user, we make them for The Sceners, who contribute something - unlike YOU.
5. To all people who repack our cracks/keygens with spyware/malware: F*** YOU
6. We do NOT fix game bugs, unless we can. And the most important:
7. IF YOU LIKE THIS OR ANY OTHER GAME: BUY IT!!!
(Yes, we mean it)

Id.

64. See, e.g., user comments on the Skidrow webpage for Serious Sam III: “WHERE IS THE CRACK??? The game was released 1 week ago . . . so SKIDROW release the crack we need to play this game”; “where i can get the crack? [sic] it’s 5 days after the game was on sale. :/”; “I couldnt w8 [sic] for the crack to release so i bought it.” Citation is on file with the Journal and the author.

And website warnings: “PS: No ETA & do not ask. It will be out as soon as FIFA 13 is cracked. PLEASE BE PATIENT ! Stop with your rude & amatuer [sic] comments, we will not tolerate this kind of attitude and abusers will be permanent [sic] banned.” Citation is on file with the Journal and the author.

65. *Id.*

66. See Reloaded Message, *supra* note 63.

D. The Harms of PC Game Piracy

The actual economic loss of piracy is difficult to gauge, due to that fact that many pirates claim they never would have purchased the game in the first instance. However, video games provide an opportunity to compare the sales of essentially identical goods over different mediums with different copy protection schemes.⁶⁷ Purchasing patterns indicate that sales are much higher on consoles, which have stricter copy protection schemes.⁶⁸

Developers are most concerned with “zero-day” piracy.⁶⁹ Zero-day, or 0-day, piracy is the successful defeat of DRM on or before the launch date of the product. It is considered to be the most damaging form of piracy because first adopters are notoriously eager to gain access to games as soon as possible, and pirate versions may afford immediacy.⁷⁰ Accordingly, a developer’s most fervent fans, many of whom would otherwise pay for the product, may choose to download an advance copy. More troubling is the pirating of beta-versions of games, which may suffer from bugs that are absent from the finished game.⁷¹ Pirates

67. See Ghazi, *supra* note 3, at 4-5.

68. See *id.*

69. See *id.* at 8 (quoting the makers of StarForce DRM: “The purpose of copy protection is not making the game uncrackable - it is impossible. The main purpose is to delay the release of the cracked version. Maximum sales rate usually takes place in the first month(s) after the game release. If the game is not cracked in that period of time, then the copy protection works well”); Pearson *supra* note 4 (“Day zero piracy is where a game is released for free by pirates before the official release. It’s disastrous for the developer and publisher because whatever route gets the game out to the gamer first will be the favored choice, so a game uploaded to the internet before the release date will have a huge impact on sales.”).

70. See Pearson, *supra* note 4; *Pirate Free*, VIGILANT DEFENDER, <http://www.vigilantdefender.com/DRM.php> (last visited Nov. 30, 2012) (collecting statistics on average cracking time by game and DRM system, noting “all Games have a selling shelf-life of roughly 6 months. So we have defined a successful DRM as one that has survived half that time . . . pirate free for a period of 90 days or more.”).

71. See, e.g., Brendan Sinclair, *Ubisoft Sues Over Assassin’s Creed Leak*, GAMESPOT (August 6, 2008, 5:34 PM), <http://www.gamespot.com/news/ubisoft-sues-over-assassins-creed-leak-6195570> (detailing a law suit of a publisher

are likely to opine on the flaws of the game and thereby discourage legitimate purchasers.⁷² Due to this heightened risk of economic harm, developers have incentive to employ extensive anti-piracy methods during the initial release of a game.

The greater entertainment industry has produced a number of substitution studies, claiming that the economic loss of piracy amounts to the total value of each downloaded copy. However, these studies have been met with widespread criticism that pirates either lack the funds or motivation to purchase the media that they pirate. While the economic loss in the entertainment industry is likely overstated, the video game context presents unique financial drains aside from direct loss and damage to economies of scale. Even if one accepts the dubious proposition that *all* pirates would not have paid *any* amount for the games they pirate,⁷³ piracy still drains developer resources. Pirated games do not represent a one-time loss,⁷⁴ as pirates often continue to consume resources devoted to sustaining the game for legitimate purchasers. For example, users using illegitimate copies may download patches or other additional content for the game, such as game skins or

claiming that the deliberate bugs in a leaked beta version of Assassin's Creed damaged sales).

72. Letter from an Indie PC Developer Regarding Piracy, DIGITALBATTLE! (Jan. 31, 2012), <http://digitalbattle.com/2012/01/31/letter-from-an-indie-pc-developer-regarding-piracy/>; Susan Arendt, *THQ Blames Pirates for Titan Quest Studio Closure*, WIRED MAGAZINE, Mar. 3, 2008, <http://www.wired.com/gamelifelife/2008/03/thq-blames-pira/> (“Bad enough that they were stealing the game to begin with, but players with cracked copies would sometimes complain that the game was buggy, apparently oblivious to the fact that what was crashing their game was Titan Quest’s copy protection protocols.”).

73. karaganis, *NPD Confidential II: Die, Substitution Studies, Die*, THE AM. ASSEMBLY, COLUM. UNIV. (Oct. 18, 2012), <http://piracy.americanassembly.org/npd-confidential-ii-die-substitution-studies-die/> (criticizing substitution studies).

74. *Op-Ed: Android Piracy Is Huge Problem for Game Devs*, WIRED MAGAZINE, May 3, 2012, <http://www.wired.com/gamelifelife/2012/05/wired-uk-android-game-piracy/> (“The thing is, people who make games do lose from piracy. We lose from the small percent of pirated copies that are lost sales, but we also have direct costs, both financial and opportunity costs, which can be attributed to every version, pirated or not. Whether that be server costs (for skin downloads), support costs (believe it or not, pirates still ask for customer support) and wasted time trying to deal with it all.”).

modifications (“mods”), increasing bandwidth costs for developers. Similarly, pirates may use multiplayer functions, overloading servers tied to the game.

Pirates also consume support resources. Game developers provide support lines for users experiencing technical difficulty. Users employing cracked versions of games are likely to experience bugs and many such users seek help from developers, either by phone or by posting their problems in developer forums.⁷⁵

Piracy may also disrupt online multiplayer competition, thus harming the market for a game. The steps users take to defeat DRM also allow users to modify games in order to cheat.⁷⁶ The clearest examples of this market effect are speed or invincibility mods, which grant the player’s character attributes that all but guarantee victory in online play.⁷⁷ Developers’ attempts to ensure a level playing field may require mass player bans, which may

75. See, e.g., PORTAL PRELUDE, <http://www.portalprelude.com/2008/10/about-pirating-and-stuff.php> (last visited Dec. 1, 2012) (Denying repeated requests for technical support for pirates attempting to use the Prelude mod on a pirated copy of Portal, the developer of the mood noted: “Seriously guys, stop sending us emails because you can’t install the game, because you can’t launch the game, or because you have weird errors everywhere. We’re not going to help you make the mod work on pirated versions of Portal or without Steam. This mod needs an original and legit Portal because it also uses some of the content of Half-Life 2 that extends Portal. Of course, this content doesn’t seem to be included in the pirated version of Portal.”).

For more on modding, see Note, *Spare the Mod: In Support of Total-Conversion Modified Video Games*, 125 HARV. L. REV. 789 (2012); Andrew V. Moshirnia & Anthony C. Walker, *Reciprocal Innovation in Modding Communities as a Means of Increasing Cultural Diversity and Historical Accuracy in Video Games* 362 (Situated Play, Proceedings of DiGRA 2007 Conference, 2007), available at <http://www.digra.org/dl/db/07311.28264.pdf>; David Kushner, *It’s a Mod, Mod World*, IEEE SPECTRUM (Feb. 2003), <http://spectrum.ieee.org/consumer-electronics/gaming/its-a-mod-mod-world>).

76. Thomas Whitehead, *Nintendo Determined to Beat Hackers with Wii U and 3DS*, NINTENDOLIFE (July 4, 2012), http://www.nintendolife.com/news/2012/07/nintendo_determined_to_beat_hackers_with_wii_u_and_3ds.

77. Arm1, *A Player’s Guide to Mario Kart Wii Hackers*, MARIOKARTWII.COM, <http://www.mariokartwii.com/f7/players-guide-mario-kart-wii-hackers-36136.html> (last updated Jan. 26, 2009).

engender negative feelings, even in non-cheating players.⁷⁸ However, if developers take no actions, users are likely to forgo online play.⁷⁹

E. PC Game Piracy is Widespread

Given the dubious validity of substitution studies and the predominantly decentralized nature of piracy distribution channels,⁸⁰ it is difficult to assess how many users are pirates.⁸¹ Developers frequently quote piracy rates above 90%,⁸² but the sources that support these estimates are typically unknown.⁸³ Nonetheless, there are numerous indications that PC piracy is widespread.

Developers have compared total sales figures to the number of support downloads in order to determine the breadth of piracy. For example, if a game requires a secondary “skin” download to adjust to different resolutions, developers may compare the number of skin downloads with actual sales:

As our sales passed the 10,000 mark, I asked to see the figure for skin downloads; it was up to 113,000.

78. Ben Kuchera, *Microsoft: Difference Between Cheat, Exploit? None. Banned!*, ARSTECHNICA (Dec. 4, 2009), <http://arstechnica.com/gaming/news/2009/12/microsoft-difference-between-cheat-exploit-none-banned.ars>.

79. Jared, *Mario Kart Wii—Cheating, Hacks, and Disappointment*, GEEK INSPIRED (Oct. 6, 2008), <http://www.geekinspired.com/geekinspired/gaming/mario-kart-wii-cheating-hacks-disappointment/>.

80. Matt Ployhar, *Gaming Piracy – Separating Fact from Fiction*, INTEL SOFTWARE (Sept. 22, 2012), <http://software.intel.com/en-us/blogs/2012/09/22/gaming-piracy-separating-fact-from-fiction>; karaganis, *NPD Confidential*, *supra* note 73 (criticizing substitution studies).

81. Robert Purchase, *How Bad is PC Piracy Really?*, EUROGAMER (Sept. 30, 2011), <http://www.eurogamer.net/articles/2011-09-30-how-bad-is-pc-piracy-really-article> (noting that “[h]ard facts and figures are hard to come by” when discussing piracy).

82. Wesley Yin-Poole, *Football Manager Dev Hopes to Stick with Android Despite 9:1 Piracy Rate*, EUROGAMER (Apr. 24, 2012), <http://www.eurogamer.net/articles/2012-04-24-football-manager-dev-hopes-to-stick-with-android-despite-9-1-piracy-rate>.

83. See Whitehead, *supra* note 76; Purchase, *supra* note 81.

Because every installed copy of the game—legitimately bought or not—needs a skin, we were able to make a pretty direct comparison between our sales figures and our actual user base.⁸⁴

For games with an online component, either through online play or a reported high score feature, developers have also compared the number of unique Internet provider (“IP”) addresses recorded with the total number of sales. In the case of *World Of Goo* by 2D Boy, developers initially reported a piracy rate of 90% based the number of IPs logging high scores on the game’s servers. When the accuracy of this figure was questioned, the developers conducted a thorough analysis involving numerous factors that might have served to inflate their initial conclusion, such as multiple legitimate installs.⁸⁵ This secondary analysis still yielded a very high piracy rate of 82%.

84. Miles Jacobson, *Dear Android: a 9:1 Piracy Rate for Games is Not Good Enough*, WIRED.CO.UK (May 2, 2012), <http://www.wired.co.uk/news/archive/2012-05/02/android-market-game-piracy>.

85. 90%, 2D BOY (Nov. 13, 2008, 11:51 PM), <http://2dboy.com/2008/11/13/90/> (“[B]ased on the number of unique IPs and unique player IDs, we found that on average, there are 1.3 unique IP addresses per player (there is 1 player id for each profile created on any installation that submits scores to our server) 76% of players have contacted the server from 1 IP[,] 13% from 2 IPs[,] 5% from 3 IPs[,] 3% from 4 IPs[,] 1% from 5 IPs[,] 1% from 6 IPs[,] 1% from more than 6[. T]his tells us that the dynamic IP issue is a relatively small factor in this calculation . . . [W]e also looked at how many players IDs were created (rather than used) from each IP address. [G]iven that the vast majority of player IDs are associated with only a single IP, this is a fairly accurate measure of how many profiles the average user created. [O]n average, a player has 1.15 profiles per installation. when we take the total number of player IDs (which is smaller than the number of unique IPs from which leaderboard entries came) and divide it by 1.15 (the average number of profiles per installation) the number of estimated unique installations drops by about 35% as compared to the estimate based on unique IPs. [L]et us further say that the average user installs the game on 1.25 computers with different IPs (i.e. not behind the same router), which [I] think is a high estimate. [T]hat lowers the estimated unique installations by another 20%. [A]fter factoring both of these in, the piracy rate would still be 82%, and we should keep in mind that this number doesn’t include those who never opted to submit scores to the leaderboard (it’s an option that’s off by default). [S]o while it’s possible that the

The statistics provided by torrent trackers also support the notion that PC game piracy is rampant. Torrent Freak, which is a weblog dedicated to BitTorrent news, publishes an annual list of the most frequently downloaded games on BitTorrent, compiled from several sources including public torrent trackers.⁸⁶ In 2011, the top five most pirated PC games — *Crysis 2*, *Call of Duty: Modern Warfare 3*, *Battlefield 3*, *FIFA 12*, and *Portal 2* — each had more than three million estimated downloads; *Crysis 2* reached nearly four million. By comparison, in the console arena, only two Nintendo Wii games were north of one million, and no Microsoft XBOX 360 game had more than 900,000 downloads. These numbers were in line with estimates for 2010 (five PC games with three million downloads)⁸⁷ and represented an increase over estimates for 2009, where only two PC games were downloaded more than three million times.⁸⁸

Pirates often contend that the economic loss from these downloads is slight; a user who pirates a game may purchase the game after trying it out. This argument, however, is not supported by the ratio of downloads to PC unit sales. In the case of *Call of Duty: Modern Warfare 3*, the 4.1 million pirated downloads via torrent far outnumbered the title's 300,000 legitimate sales. By way of comparison, the console version of the same game sold six million copies against approximately one million pirated.

F. Post-Piracy Responses are Ineffective

While this Article focuses on psychological shaming and social stigmatization as a means of piracy prevention, readers may rightly

actual piracy rate is lower than 90%, it's unlikely that it's significantly lower. 2d boy hopes this satisfies the more rigorous number crunchers out there." (original emphasis omitted).

86. For a list of the ten most pirated games, visit: <http://torrentfreak.com/top-10-most-pirated-games-of-2011-111230/>.

87. Ernesto, *Call of Duty: Black Ops Most Pirated Game of 2010*, TORRENTFREAK (Dec. 28, 2010), <http://torrentfreak.com/call-of-duty-black-ops-most-pirated-game-of-2010-101228/>.

88. Ernesto, *Modern Warfare 2 Most Pirated Game of 2009*, TORRENT FREAK (Dec. 27, 2009), <http://torrentfreak.com/the-most-pirated-games-of-2009-091227/>.

wonder whether legal punishment, in and of itself, can sufficiently deter piracy. The law does indeed provide for substantial fines for copyright infringement and DRM circumvention;⁸⁹ however, post-piracy actions are quite unpopular and ineffective.

Some publishers have intermittently attempted to address piracy by sending out threat letters or pre-litigation letters demanding low level settlements from alleged pirates. But this strategy has little chance of success. The record industry attempted a similar strategy in 2007-08, sending threat letters to college students with little impact—aside from generating terrible public relations.⁹⁰ The Recording Industry Association of America (the “RIAA”) pursued this strategy to much derision and ultimately abandoned this approach in 2008.⁹¹ Critics pointed out that the industry spent nearly \$20 million dollars annually on such suits, while receiving only a small portion of damage awards.⁹² Moreover, this strategy was a “public-relations disaster for the industry, whose lawsuits targeted, among others, several single mothers, a dead person and a 13-year-old girl.”⁹³

While developers have the ability to sue users and secure large damages awards, this strategy has been ineffective and counter-productive in other industries, and game companies risk consumer boycotts for such actions.⁹⁴ To date, game publishers have not conducted a widespread legal campaign against individual users.⁹⁵

89. Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 2860 (1998) (codified in scattered sections of 17 U.S.C.). See 17 U.S.C. § 1201 (2006).

90. Anne Broache, *RIAA Marks One Year of College Threat-letter Drive*, CNET (Feb. 21, 2008), http://news.cnet.com/8301-10784_3-9876121-7.html.

91. Sarah McBride & Ethan Smith, *Music Industry to Abandon Mass Suits*, WALL ST. J., Dec. 19, 2008, <http://online.wsj.com/article/SB122966038836021137.html>.

92. Greg Sandoval, *RIAA Chief: ISPs to Start Policing Copyright by July 1*, CNET (Mar. 14, 2012), http://news.cnet.com/8301-31001_3-57397452-261/riaa-chief-isps-to-start-policing-copyright-by-july-1/. Mike Masnick, *RIAA Spent \$17.6 Million in Lawsuits. . . To Get \$391,000 in Settlements?*, TECHDIRT (July 14, 2010), <http://www.techdirt.com/articles/20100713/17400810200.shtml>.

93. McBride & Smith, *supra* note 91.

94. Enigmax, *Square Enix, Eidos & Other Game Giants All Demand Cash from Pirates*, TORRENTFREAKS (Jan. 15, 2012), <http://torrentfreak.com/square-enix-eidos-other-game-giants-all-demand-cash-from-pirates-120115/>; Julio

Publishers may also alert ISPs directly of the copyright infringement and ask for a termination or throttling of infringing users' service after repeated abuses. The RIAA is currently moving to such an approach.⁹⁶ Despite legal safe harbors,⁹⁷ ISPs do have incentives to block pirates, who can strain networks with large data consumption. However, attending legal concerns of this policy worry many academics and consumer rights groups.⁹⁸ Moreover, previous attempts to implement a three-strike ISP cut-off program, such as the HADOPI program in France, have been ineffective, expensive, and inequitable.⁹⁹

Franco, *Witcher 2 Devs Suing Pirates, Claim to be Sure Who Downloaded Illegally*, TECHSPOT.COM. (Dec. 19, 2011), <http://www.techspot.com/news/46715-witcher-2-devs-suing-pirates-claim-to-be-sure-who-downloaded-illegally.html>.

95. See Ojeda-Zapata *supra* note 24, at A1 (“While the computer-game industry hasn’t taken civil action against individual downloaders, as the music industry has, it is working with law-enforcement agencies to prosecute some of the Internet’s more flagrant game distributors and developing anti-piracy technology.”).

96. Sandoval, *supra* note 92.

97. See, e.g., 17 U.S.C. § 512 (2012).

98. See, e.g., Andrew Moshirnia, *Hey, When Did This Slope Get so Slippery? The Danger of Self-Surveillance in Three Strikes Internet Laws*, CITIZEN MEDIA LAW PROJECT (Aug. 12, 2010), <http://www.citmedialaw.org/blog/2010/hey-when-did-slope-get-so-slippery-danger-self-surveillance-three-strikes-internet-laws>; Jason Koebler, *Internet Service Providers Close to Implementing System to Punish Piracy*, US NEWS & WORLD REPORT (Apr. 4, 2012), <http://www.usnews.com/news/articles/2012/04/04/internet-service-providers-close-to-implementing-system-to-punish-piracy>. “€12 million per year and 60 officials; that’s an expensive way to send 1 million emails.” *Id.* Filippetti also stated that “the suspension of Internet access seems to be a disproportionate penalty given the intended goal.” *Id.*

99. Richard Chirgwin, *France Backs Away from Hadopi*, THE REGISTER (Aug. 6, 2012), http://www.theregister.co.uk/2012/08/06/hadopi_under_fire/. See also Andrew Moshirnia, *Each Man an Island? Record Industry Denies that Three Strikes Ban Will Be Collective Punishment*, CITIZEN MEDIA LAW PROJECT (Jan. 29, 2010), <http://www.citmedialaw.org/blog/2010/each-man-island-record-industry-denies-three-strikes-ban-will-be-collective-punishment>; Frank LaRue, UN REPORT HUMAN RIGHTS COUNCIL, REPORT OF THE SPECIAL RAPPORTEUR ON THE PROMOTION AND PROTECTION OF THE RIGHT TO FREEDOM OF OPINION AND EXPRESSION, 21 (May 2011), <http://www2.ohchr.org/english/bodies/>

II. THE PRO-PIRACY DOCTRINE

Any effective response to the PC game piracy epidemic will need to grapple with the ideological motivations underscoring the phenomenon. PC game piracy is so pervasive now that infringing users frequently expound publicly on the moral rightness of the act.¹⁰⁰ An examination of piracy forums shows a distinct set of arguments that pirates employ to justify their conduct. These arguments generally fall into three categories: the rational economic actor, entitlement to non-rivalous luxury, and enjoyable challenge.

A. Pirates are Rational Economic Actors

The rational economic actor justification is premised on the belief that games are too expensive. One pirate articulated this justification thus:

\$60 for one video game? Forget that, I'm going to download it. If I spend \$60 on this game, that means having to skip a future game I might like even more I think \$20 is the max I'd pay for a digital game. Someone out there right now is thinking, "What?! We spent \$25 million making this game, there's no way we can make a profit selling it at \$20." Not my problem. If you want me to buy it, you've got to get the price down. Here's an idea, don't drop \$25 million making one stupid game.¹⁰¹

hrcouncil/docs/17session/A.HRC.17.27_en.pdf ("The Special Rapporteur considers cutting off users from Internet access, regardless of the justification provided, including on the grounds of violating intellectual property rights law, to be disproportionate and thus a violation of article 19, paragraph 3, of the International Covenant on Civil and Political Rights.").

100. *Talking to Pirates*, POSITECH, <http://www.positech.co.uk/talkingtopirates.html> (last visited Dec. 22, 2012).

101. *Why I Pirate - An Open Letter To Content Creators*, INSIGHT COMMUNITY (Dec. 5 2011), <https://www.insightcommunity.com/step2/311/>

This argument has great appeal in that it implies that pirates are not necessarily wrong-doers, but rather acting as anyone in that situation would do: as rational market actors. They *would* buy the products they pirate, so goes this theory, *if only* those products were more fairly priced. This model therefore assumes that once the monetary value of the effort necessary to pirate exceeds the price of the target good, the rate of piracy will approach zero.

The increasing ease of piracy and continuing economic crisis appears to support this model. As BitTorrent and cyberlockers have reduced the costs of distributing or attaining pirated material, the piracy rate has increased.¹⁰² At the same time, in this period of recession, consumers have less discretionary income.

While the argument has at its core a relatively innocuous economic model, it also has a powerful ideological underpinning: piracy would not need to exist but for corporate greed.¹⁰³ If one accepts that piracy could be greatly reduced merely by dropping the cost to consumers, a DRM-based approach to piracy prevention, rather than lowering the cost of goods, becomes a testament to corporate stubbornness and avarice.¹⁰⁴

why-i-pirate-an-open-letter-to-content-creators?qa-rewrite=311/why-i-pirate-an-open-letter-to-content-creators; Nate Anderson, *Report: Piracy a "Global Pricing Problem" with Only One Solution*, ARSTECHNICA (Mar. 14, 2011), <http://arstechnica.com/tech-policy/2011/03/report-piracy-a-global-pricing-problem-with-only-one-solution/>; Rab Florence, *Lost Humanity 6: Killing Pirates*, EUROGAMER (Aug. 1, 2012), <http://www.eurogamer.net/articles/2012-08-01-lost-humanity-6-killing-pirates> (“[A]ccept that the system as we’ve known it is a farce. The prices we’ve been forced to pay over the short lifespan of the games industry have been a bad joke.”); *see also* Brad Wardell, *Consumer Report 2008*, STARDOCK (Oct. 20, 2008), <http://www.stardock.com/media/stardockcustomerreport-2008.pdf>.

102. For a dip in Piracy statistics circa 1999, *see* SEVENTH ANNUAL BSA GLOBAL SOFTWARE PIRACY STUDY 2 (June 2002), *available at* <http://www.bsa.org/country/Research%20and%20Statistics/~media/B7B6D8B30236445AB525A8BDCA869962.ashx>.

103. Farhad2k8, Comment to *Is Piracy All That Bad?*, N4G (June 4, 2012), <http://n4g.com/news/1004681/is-piracy-all-that-bad> (“In this day and age, games are just too expensive IMO. Which leads to excessive pirating. So developers have themselves to blame.”).

104. Cory Shultz, *Diablo 3 DRM Shows How Greedy Blizzard Has Become*, FOR THE LOVE OF GAMING (May 22, 2012), <http://4logpc.com/diablo-3-drm-shows-how-greedy-blizzard-has-become/>.

A related economic argument justifying piracy emphasizes that pirated editions are free from the intrusive DRM that reduces the value of the official product.¹⁰⁵ Again, pirates are portrayed as rational economic actors. This argument is used to justify piracy of even very cheap games, because the cracked version of the game is worth more than the official, DRM-crippled game.

Of course, this argument also has punitive overtones. Pirates claim that developers essentially force users to embrace piracy or accept hampered functionality of games. Indeed, pirates may claim to target only those developers that continue to use DRM, and may focus their attention on games with particularly onerous DRM. But this claimed targeting is not supported by available evidence. Many frequently-pirated games have very little DRM and several infrequently pirated games feature intrusive DRM.¹⁰⁶

Also related to the rational economic actor theory is the idea that piracy is a means of information gathering, similar to game rentals. Pirates frequently contend that they only pirate games in order to gain some hands-on experience with a likely purchase. In theory, if the game is well-made and enjoyable, the pirate will purchase that game regardless of having secured a free, cracked copy.¹⁰⁷

105. Jonathan Bailey, *5 Ways Content Creators Can Cause Piracy*, PLAGIARISM TODAY (Apr. 4, 2012), <http://www.plagiarismtoday.com/2012/04/04/ways-creators-can-cause-piracy/>; Evan Narcisse, *Download Site Says DRM Causes Piracy*, TIME (Apr. 12, 2011), <http://techland.time.com/2011/04/12/download-site-says-drm-causes-piracy/> (“What I will say isn’t popular in the gaming industry, but in my opinion, DRM drives people to pirate games rather than prevent them from doing that. Would you rather spend \$50 on a game that requires installing malware on your system or to stay online all the time, and that crashes every time the connection goes down? Or would you rather download a cracked version without all that hassle?”).

106. See Ghazi, *supra* note 3, at 8.

107. See, e.g., Pnukup, *Comment to Piracy? or Try Before you Buy?* MASS DEBATE, FACEPUNCH (Oct. 5, 2012), <http://facepunch.com/showthread.php?t=1197218&page=12> (“When it comes to games with no demo, I don’t see the harm in downloading a pirated version of the game. It’s usually not of the same quality as a legit copy and won’t have multiplayer. I know several cases [sic] where I downloaded a pirated version [sic] of a game to try it out before I spend money [sic] on it. And if I like it, I’ll buy the game legally to get the best experience from the game that it has to offer.”).

Lastly, pirates may justify their actions as rational market actors by emphasizing their dislike of certain game publishers, usually by pointing out that their games are buggy,¹⁰⁸ uncreative, or low-value sequels to existing games.¹⁰⁹ In the 1990s, low value sequels were typical in fighting games. As an example, when the game developer Capcom released the game *Street Fighter II* for the Super Nintendo, the player could not select four locked boss characters.¹¹⁰ Capcom included the ability to play as bosses in a subsequent game, *Street Fighter II Turbo*. More recently, sports franchise game producers, especially Electronic Arts (the publisher of the Madden Football series), have been widely criticized for selling users the same game every year.¹¹¹ The hatred for EA is

108. The phenomenon of releasing half-finished or buggy games has become increasingly common. Users are expected to download patches to fix errors not caught during beta-testing. See e.g., Ben Kuchera, *Fallout: New Vegas is Buggy as Hell; Where's the Outrage?* ARSTECHNICA (Oct. 25, 2010), <http://arstechnica.com/gaming/news/2010/10/fallout-new-vegas-is-buggy-as-hell-but-wheres-the-outrage.ars>; Romudeth in Piece of Mind, *Video Game Developers Continue to Release Buggy Games. When Will the Madness End?*, WORDPRESS BLOGSPOT (Oct. 25, 2010), <http://coolstufftheblog.wordpress.com/2010/10/25/why-are-companies-putting-out-buggy-games/>; *Broken or Buggy? What is the Difference?*, MIRRORED32's BLOG (Aug. 25, 2011, 4:29 AM), <http://www.operationsports.com/mirrored32/blog/14349-broken-or-buggy-what-is-the-difference/>; Andy Robinson, *Owners of Buggy or Glitch Video Games are Entitled to a Full Refund*, CVG, (Dec. 24, 2010), <http://www.computerandvideogames.com/281679/buggy-game-purchasers-entitled-to-refund/>. Modding communities will often attempt to address these game issues before the release of official patches. See, e.g., *Soulstorm Bugfix Mod 1.41*, RELICNEWS (last visited Dec. 1, 2012), <http://forums.relicnews.com/showthread.php?193645-Soulstorm-Bugfix-mod-1.41>.

109. So called updated rereleases can allow game developers to sell essentially the same game many times over. For example, the *Street Fighter II* Series saw four major arcade rereleases within three years (1991 – 1994) (*Street Fighter II: the World Warrior*; *Street Fighter II': Champion Edition*; *Street Fighter II': Hyper Fighting*; *Super Street Fighter II: The New Challengers*; *Super Street Fighter II Turbo: The Ultimate Championship*) and three rereleases for the Super Nintendo (*Street Fighter II: the World Warrior*; *Street Fighter II Turbo*; *Super Street Fighter II*). *Street Fighter II*, WIKIPEDIA, http://en.wikipedia.org/wiki/Street_Fighter_II (last visited Dec. 1, 2012).

110. *Id.*

111. Ryan Rigney & Chris Kohler, *FIFA Fake-Out: EA Sells Last Year's Soccer Game as New*, WIRED MAGAZINE, Oct. 4, 2012,

evident in piracy discussions. Even opponents of piracy will single out EA for abuse while decrying the piracy of independent developer games.¹¹²

B. Piracy is a Non-rivalrous Activity

Pirates often argue that piracy does not harm the games industry in any way because pirating users would never have paid for the games in the first place. The lynchpin to this argument is the notion that because pirating is non-rivalrous, it is not stealing, and thus not harmful.¹¹³ The term “non-rivalrous” means that one person’s use of the information does not reduce the ability or availability of that information for another person’s use, thus more than one person at a time can possess the information.¹¹⁴

Another variant of this argument posits that users may buy a set number of games a year and pirate the rest. Each argument rests on the dubious idea that because pirates are not actually robbing sales from developers, pirates have a right to enjoy free games.

<http://www.wired.com/gamelifelife/2012/10/fifa-13-wii> (“EA is selling old products to unsuspecting consumers at a premium price, and fans are confused and angry.”); Robert Reynolds, *Op-Ed: Indie Games Drive Innovation*, TENNESSEE JOURNALIST (Mar. 8, 2011), <http://tnjn.com/2011/mar/08/op-ed-indie-games-drive-innova/>.

112. See, e.g., Jeff Atwood, *My Software Is Being Pirated*, CODING HORROR (Dec. 27, 2008), <http://www.codinghorror.com/blog/2008/12/my-software-is-being-pirated.html> (“World of Goo is not a game that deserves to be pirated . . . this is a game built with love, not another commercial product extruded from the bowels of some faceless Activision-EA corporate game franchise sweatshop.”).

113. Florence, *supra* note 101. (“Piracy suggests villainy of some kind, when in truth all that punters are doing when taking something for free is “taking something for free”. It’s like lifting a leaflet, or taking one of those samples of cheese from Tesco’s deli counter.”); Sebastian Anthony, *Why I Pirate*, EXTREMETECH (Jan. 18, 2012), <http://www.extremetech.com/computing/114493-why-i-pirate/2>.

114. See Aaron T. Dozeman, Note, *Salinger and eBay: When Equitable Considerations Undermine Exclusivity*, 21 DEPAUL J. OF ART, TECH. & INTELL. PROP. LAW 323, 327 (2011) (explaining the nonexcludable and nonrivalrous characteristics of intellectual property).

C. Piracy is an Enjoyable Challenge

While the pro-piracy arguments discussed thus far have rested upon pained economic justifications that simply fall apart under close inspection, another line of argument justifies piracy upon simple hedonistic grounds. That is, the *act* of piracy — particularly the first step of defeating DRM — is fun, regardless of whether it is viewed simply as a taboo activity, like a Robin Hood-esque fight against bloated capitalist developers, trolling developers, or as a desperation induced by poverty.¹¹⁵ Piracy requires some skill and pirates may derive pleasure from showcasing that skill.

This view is supported by the fact that even when pirates could distribute copies of a game without DRM, they instead choose to focus on cracking DRM-copies. For example, two versions of the game *Witcher II* were released, one with DRM and one without. However, pirates chose to distribute the DRM-cracked version, leading developers to ask

why pirate the more difficult DRM-protected version? CD Projekt and GOG have no idea other than guessing it offers no challenge to a pirate. CD Projekt CEO Marcin Iwinski suggests that the piracy scene is all about the “game and the glory.” In other words, if there’s nothing to crack, why bother?¹¹⁶

115. Yet, this view could be supported on economic grounds in that consumers find utility in cracking the game. Therefore, game developers could attempt to make cracking the game less “fun.”

116. Matthew Humpries, *The Witcher 2 DRM Cracked Even Though DRM Free Version Available*, GEEK (May 21, 2012), <http://www.geek.com/articles/games/the-witcher-2-drm-cracked-even-though-drm-free-version-available-20120521/>.

IV. CURRENT RESPONSES: DRM AND MOVES TO SERVER-AUTHENTICATED GAMES

Video game developers could not afford to leave such ubiquitous piracy unaddressed for long. This section discusses developers' efforts to combat piracy thus far, including: obtaining legal protection for DRM with the Digital Millennium Copyright Act; specific implementations of DRM; the blowback from onerous DRM; and the decision by some developers to abandon DRM.

A. The DMCA's Protection of DRM

Because piracy is difficult to combat through ex-post legal action, intellectual property policy and treaties clearly contemplate a DRM-based copy protection regime. In 1998, Congress passed the Digital Millennium Copyright Act ("DMCA"),¹¹⁷ thereby implementing the World Intellectual Property Organization ("WIPO") copyright treaty. The Act put in place criminal sanctions for individuals who circumvent control access measures¹¹⁸ or distribute technologies primarily designed to defeat content protection.¹¹⁹ Circumvention includes descrambling or decryption.¹²⁰ The DMCA has by and large successfully encouraged the spread of DRM.

B. Industry Implementation of DRM

Rightly or wrongly, a DRM-based approach to combating piracy has emerged as the industry norm, aided by multilateral treaties granting special protection to DRM. Developers use a variety of DRM methods, which work primarily by restricting user access to the targeted work. Some of these methods resemble traditional

117. Pub. L. No. 105-304, 112 Stat. 2860 (1998) (codified in scattered sections of 17 U.S.C.). See 17 U.S.C. § 1201 (2006).

118. 17 U.S.C. § 1201(a)(1) ("No person shall circumvent a technological measure that effectively controls access to a work protected under this title").

119. *Id.*

120. *Id.*

password systems, while other methods restrict product use to a specific regional player or even a specific machine.

1. *Conventional, non-game-based DRM methods*

In the early 1980s and 1990s, PC games relied on a primitive form of DRM that required the user to enter a word or graphic from a particular line and page of the game's instruction manual to gain access to the game.¹²¹ This method operated on the assumption that photocopying and distributing a game manual would be prohibitively expensive or too cumbersome to materially affect the market.

Modern, disk-based DRM methods typically rely on information that is present on an officially licensed copy of a work, such as a commercial DVD, and lost when the work is transferred to another format without permission of the rights owner. Earlier disk-based DRM inserted small errors on a disk that were required by the game loader software in order for the game to play. When pirates attempted to copy the disk, ripping programs would correct these errors, thereby creating an unplayable copy. More recent disk-based DRM, such as SecuROM, rely on differences in data density.¹²² A DVD typically has more dense information storage near the center of the disk and less dense information storage near the edge of the disk.¹²³ However, publishers may arbitrarily alter this density.¹²⁴ Again, copying methods may elide these differences, indicating that the disk is an illegitimate copy.¹²⁵

121. *History of DRM & Copy Protection in Computer Games*, YOUTUBE (Oct. 26, 2012), <http://www.youtube.com/watch?v=HjEbpMgiL7U&feature=g-u-u>; David Houghton, *Gaming's Most Fiendish Anti-piracy Tricks*, GAMESRADAR (Feb. 26, 2010), <http://www.gamesradar.com/gamings-most-fiendish-anti-piracy-tricks/>.

122. M. S. Smith, *An Introduction to SecurROM: What you Need to Know*, ALTERED GAMER (May 22, 2011), <http://www.alteredgamer.com/pc-gaming-tech/19232-an-introduction-to-securrom-what-you-need-to-know/>; *CD Protection – SecuROM*, ENCRYPT (June 17, 2009), <http://www.encrypt.ro/cd-encryption/cd-protection-securrom.html>.

123. *Id.*

124. *Id.*

125. *Id.*

Programs like SecuROM¹²⁶ also install Ring 0 drivers, which can detect emulation software on a target computer. Users frequently argue that these programs conflict with other legitimate programs installed on target machines or that these programs create security problems, which hackers can exploit.

2. *Developer attitudes towards DRM*

Developers have frequently noted that although they would prefer to release games without DRM, the current climate of piracy mandates use of DRM, especially as DRM can prevent disastrous zero-day piracy. One developer, Martin Slater of 2K Australia, discussed the success of the DRM used in the game *BioShock* but the accompanying rage the DRM engendered in the game's fanbase:

We achieved our goals. We were uncracked for 13 whole days. We were happy with it. But we just got slammed. Everybody hated us for it. It was unbelievable . . . There is a lot of strain on our content-delivery servers and things like that, where everyone has to download a 10MB executable. I don't think we'll do exactly the same thing again, but we'll do something close. You can't afford to be cracked. As soon as you're gone, you're gone, and your sales drop astronomically if you've got a day-one crack.¹²⁷

While users greatly dislike DRM, and no DRM is immune to cracks, many developers will continue to use DRM as long it can provide effective protection against zero-day piracy. DRM also requires that developers devote resources to DRM development and implementation, which in the end will only add costs to game development.

126. Ken Fisher, *Clearing the Air: BioShock Does Not Contain a Rootkit*, ARSTECHNICA (Aug. 26, 2007), <http://arstechnica.com/gaming/2007/08/clearing-the-air-bioshock-does-not-contain-a-rootkit/>.

127. Randolph Ramsay, *Strict PC Piracy Measures Here to Stay: 2K Australia*, GAMESPOT (Nov. 21, 2007), <http://www.gamespot.com/news/strict-pc-piracy-measures-here-to-stay-2k-australia-6183311>.

C. *The Blowback from Onerous DRM*

DRM can create a public relations nightmare for developers.¹²⁸ This subsection details how the gaming press regularly criticizes developers for use of intrusive DRM, how pirates exploit the presence of DRM to justify their activities, and users frequently view DRM as a means to suppress consumer rights in the guise of anti-piracy.

Game reviewers occupy an important place in gaming culture, signaling trends and focusing consumer attention on upcoming titles. Gaming publications routinely decry DRM generally and highlight particularly onerous DRM. For example, several online reviews described *The Settlers 7: Paths to a Kingdom*, a PC game released by the major publisher Ubisoft Entertainment S.A., as unplayable due to DRM.¹²⁹ Game site reviews have given games lower scores based on DRM.¹³⁰ Moreover, publications often feature articles criticizing DRM, drawing attention to developers or publishers with poor records on implementing DRM. Aside from the potential market impact, this negative publicity directly

128. See Luke Plunkett, *Some of Ubisoft's PC Games Won't Work Next Week. Not Even Singleplayer*, KOTAKU (Feb. 3, 2012), <http://kotaku.com/5881867/some-of-ubisofts-pc-games-wont-work-next-week-not-even-singleplayer>.

129. See, e.g., Richard Lane, *The Settlers 7: Paths to a Kingdom Review*, STRATEGYINFORMER (Apr. 7, 2010), <http://www.strategyinformer.com/pc/settlers7pathstoakingdom/reviews.html> (“It’s a shame that Ubisoft have burdened The Settler’s 7 with such an unreliable anti-piracy measure, as it is likely to put a lot of people off purchasing what is a pleasurable, complex and involving strategy game.”); Andy Chalk, *Settlers 7 DRM Problems Still Unresolved*, THE ESCAPIST (Apr. 7, 2010), <http://www.escapistmagazine.com/news/view/99770-Settlers-7-DRM-Problems-Still-Unresolved>.

130. *Settlers 7 Review*, DING, NEXT! (Apr. 9, 2010), <http://dingnext.com/2010/04/the-settlers-7-review/> (“Because I’ve so thoroughly enjoyed The Settlers 7, I am only going to deduct half of a point for the DRM issues. If DRM disconnects persist, then I will likely wish I had of dropped the score lower, but for now I feel that Blue Byte did an excellent job with The Settlers 7 and without DRM I would have awarded the game a near-perfect score.”).

impacts developers, who often have review-threshold incentives in contracts with publishers.¹³¹

Recent ire has been directed at so-called Constant Internet Connection (“CIC”) DRM,¹³² which, as the name describes, requires users keep a constant Internet connection so that the game servers may monitor which users are playing the game. Ubisoft, for example, implemented an aggressive Constant Internet connection DRM for its game *Assassin’s Creed 2*, even though the game had no online modes.¹³³ The DRM encountered severe consumer protests.¹³⁴ Game journalists noted that the DRM prevented members of the armed forces, travelers, and anyone with a spotty Internet connection from playing the game.¹³⁵ Numerous commentators noted that “[m]any people are not buying the game on principle or simply because they can’t rely on their internet

131. Keza MacDonald, *Is Metacritic Ruining The Games Industry?*, IGN (July 16, 2012), <http://www.ign.com/articles/2012/07/16/is-metacritic-ruining-the-games-industry> (arguing that “[t]he reliance on Metacritic in certain hugely important parts of the games industry is bad for everyone: it’s bad for developers, it’s bad for critics, and ultimately that means it’s bad for gamers too.”).

132. See, e.g., Tovan, *Ubisoft Bringing Back Constant Internet Connection Requirement For PC Games*, HOTBLOODEDGAMING (July 27, 2011), <http://www.hotbloodedgaming.com/2011/07/27/ubisoft-brings-back-constant-internet-connection-requirement-for-pc-games/> (discussing constant internet connection or permanent internet connection DRM).

133. ddrfr33k, *Digital Rights Management Is Ruining My Gaming Experience*, Treasure Bin BlogSpot (Oct. 26, 2011, 2:09 PM), <http://treasurebin.blogspot.com/2011/10/digital-rights-management-is-ruining-my.html>.

134. *PC Gamer on Ubisoft DRM*, GAMEPOLITICS (May 27, 2010), <http://gamepolitics.com/2010/05/27/pc-gamer-ubisoft-drm> (last visited Nov. 29, 2012) (“Last month, PC Gamer took the extraordinary step of recommending against the purchase of an otherwise excellent game, solely on the basis of its obnoxious digital rights management (DRM). The victim was *Assassin’s Creed 2*, and the perp was software that required the player to maintain a constant internet connection while playing—even though AC2 has no multiplayer component.”).

135. Ben Kuchera, *Official Explanation of Controversial Assassin’s Creed 2 DRM*, ARSTECHNICA (Feb. 18, 2010), <http://arstechnica.com/gaming/2010/02/ubisoft-details-drm/>.

[sic] connection (or Ubisoft's servers) and don't want to risk it."¹³⁶ Consequently, Ubisoft has backed off of its DRM stance.¹³⁷

Blizzard Entertainment, another game developer, also implemented CIC DRM for the highly anticipated and wildly popular game, *Diablo III*. Blizzard, too, faced a wave of criticism when its DRM servers crashed minutes after the game's release,¹³⁸ denying non-infringing users access to the game even when an Internet connection was not otherwise required for gameplay.¹³⁹

Academics and consumer advocates criticize DRM for retarding innovation and harming user experience.¹⁴⁰ Encryption may prevent access to source code, restricting the ability to build upon

136. Devin Coldewey, *Assassin's Creed II DRM Finally Removed – By Pirates*, TECHCRUNCH (Apr. 21, 2010), <http://techcrunch.com/2010/04/21/assassins-creed-ii-drm-finally-removed-by-pirates/>.

137. John Walker, *Interview: Ubisoft On DRM, Piracy And PC Games*, ROCK, PAPER SHOTGUN (Sept. 5, 2012), <http://www.rockpapershotgun.com/2012/09/05/ubisoft-drm-piracy-interview/>; Simon Parkin, *Ubisoft Removes Constant Online Authentication DRM For PC Games*, GAMASUTRA (Jan. 4, 2011), http://www.gamasutra.com/view/news/32261/Ubisoft_Removes_Constant_Online_Authentication_DRM_For_PC_Games.php#.UGe7HqQ18ug; Ben Kuchera, *EA relents, changes Spore DRM. Too little, too late?* ARSTECHNICA (Sept. 19, 2008), <http://arstechnica.com/gaming/2008/09/ea-relents-changes-spore-drm-too-little-too-late/>; ddrfr33k, *Digital Rights Management Is Ruining My Gaming Experience*, *supra* note 133 (noting that developers using DRM attracted denial of service attacks and now have “some serious damage control to do.”).

138. IFockinghateThat, *If Diablo III Was a Girl*, YOUTUBE (May 16, 2012), http://www.youtube.com/watch?v=I43GUnZN_s4 (mocking the “error 37” error message displayed when a user cannot connect to the game servers); Erik Kain, *'Diablo III' Fans Should Stay Angry About Always-Online DRM*, FORBES (May 17, 2012), <http://www.forbes.com/sites/erikkain/2012/05/17/diablo-iii-fans-should-stay-angry-about-always-online-drm/>.

139. Michael Lacerna, *Diablo 3 Servers Crash Within Minutes of the Game's Launch*, IGXPRO.COM (May 15, 2012), <http://www.igxpro.net/2012/05/15/diablo-3-servers-crash-within-minutes-of-the-games-launch/0416423>.

140. “Corporations claim that DRM is necessary to fight copyright infringement online and keep consumers safe from viruses. But there's no evidence that DRM helps fight either of those. Instead DRM helps big business stifle innovation and competition by making it easy to quash ‘unauthorized’ uses of media and technology.” *DRM*, ELECTRONIC FRONTIER FOUNDATION, <https://www.eff.org/issues/drm> (last visited Dec. 1, 2012).

or modify the game, thereby stifling user creativity.¹⁴¹ While case law had previously allowed fair use reverse engineering, the DMCA arguably invalidated this body of law.¹⁴²

D. *The Movement Away from DRM*

In light of widespread criticism, some developers have explicitly stated that they will not use DRM.¹⁴³ When users complained that DRM was causing poor frame rate and load times in *Witcher II*, the developer, CD Projekt, released a patch removing all DRM from the game. However, CD Projekt did not turn a blind eye to piracy. CD Projekt instead began monitoring torrents of the game and sent out numerous pay-or-else threat letters:

Of course we're not happy when people are pirating our games, so we are signing with legal firms and torrent sneaking companies. In quite a few big countries, when people are downloading it illegally they can expect a letter from a legal firm saying, "Hey, you downloaded it illegally and right now you have to pay a fine."¹⁴⁴

As of Dec 2011, CD Projekt estimated that *Witcher II* has been illegally downloaded four million times, against two million licensed sales. However, CD Projekt's legal strategy resulted in

141. *Spare the Mod: In Support of Total-Conversion Modified Video Games*, *supra* note 75.

142. See Joe Linhoff, *Video Games and Reverse Engineering: Before and After the Digital Millennium Copyright Act*, 3 J. TELECOMM. & HIGH TECH. L. 209, 228-29 (2004); see also *RealNetworks, Inc. v. DVD Copy Control Ass'n*, 641 F. Supp. 2d 913, 942 (N.D. Cal. 2009).

143. John Walker, *Ubisoft Scrapping Always-On DRM for PC Games*, ROCK, PAPER, SHOTGUN (Sept. 5, 2012, 8:00 AM), <http://www.rockpapershotgun.com/2012/09/05/ubisoft-scrapping-always-on-drm-for-pc-games/>.

144. Wesley Yin-Poole, *Witcher 2 Torrents Could Net You a Fine*, EUROGAMER (Nov. 22, 2010), <http://www.eurogamer.net/articles/2010-11-22-witcher-2-torrents-could-net-you-a-fine>.

widespread outcry in the gaming community, eventually forcing the developer to abandon legal action against pirates.¹⁴⁵

In sum, developers find themselves in a difficult position. The current climate of rampant piracy counsels the use of DRM, but users, reviewers, and consumer advocates loathe DRM. Developers' attempts to use alternate enforcement tools, such as lawsuits or threat letters, have similarly inspired negative PR.

V. INITIATING AN IDEOLOGICAL SHIFT

As previous sections illustrate, neither traditional DRM nor legal action is best equipped to handle the problem that piracy presents to PC gaming. This Article takes the position that as long as communities tolerate or encourage piracy, legal interventions will remain severe but ineffectual. However, its position is far from defeatist. Instead, it suggests that the industry can initiate a shift away from subversive ideological norms in the gaming community through implementation of open pricing models that hinge upon voluntary payment, and endogenous DRM. These implementations are promising because voluntary payment models undercut many (but not all) of the asserted moral justifications for piracy, while endogenous DRM introduces barriers to piracy that entertain, rather than offend, noninfringing users. While limited implementation of these approaches has thus far failed to eliminate piracy, each has at least stirred arguments within various pirating forums and elicited fierce anti-piracy responses from commentators.

A. Open Pricing, Self-Determined Models

While the wider entertainment industry has responded to piracy with calls for greater legal penalties, musical artists have experimented with alternate pricing models as a means of coping with the new technological reality. The best-known of these

145. John Walker, *The Wrong Way to Stop Video Game Piracy*, ROCK, PAPER SHOTGUN (Dec. 20, 2011), <http://kotaku.com/5869908/the-wrong-way-to-stop-video-game-piracy>.

models is the voluntary payment system,¹⁴⁶ and the best-known artist to use this system is Radiohead.¹⁴⁷

In October 2007, Radiohead released an album, *In Rainbows*, exclusively through its website.¹⁴⁸ Fans were allowed to set the price they paid, with an option to pay as little as nothing for the album (and only a small service fee).¹⁴⁹ The songs themselves were DRM-free.¹⁵⁰ The band noted that this model allowed them to sidestep corporate middlemen.¹⁵¹ But the model also allowed their fans the freedom to decide the value of the album.¹⁵²

Radiohead did not release specific sales figures related to their voluntary donation model.¹⁵³ According to one study, approximately two-thirds of users paid somewhere in the \$5 - \$15 range, with the other third of users electing to download the music for free.¹⁵⁴ ComScore estimated that only 38% of downloaders paid for the album, and these users only paid \$6 on average.¹⁵⁵ This meant that the average downloader, including the users who elected to download the album for free, paid \$2.26.¹⁵⁶

Spirited debate has ensued over whether the open pricing experiment constituted a success for Radiohead. Indisputably, the pricing model's novelty attracted greater publicity for the album

146. Leah Belsky, Byron Kahr, Max Berkelhammer & Yochai Benkler, *Everything in Its Right Place: Social Cooperation and Artist Compensation*, 17 MICH. TELECOMM. TECH. L. REV. 1, 7 (2010), available at <http://www.mttr.org/volseventeen/belsky.pdf>.

147. *Id.* at 7.

148. *Id.* See also Jeff Leeds, *Radiohead to Let Fans Decide What to Pay for Its New Album*, N.Y. TIMES, Oct. 2, 2007, at E1.

149. Belsky et al., *supra* note 146, at 7.

150. *Id.*

151. *Id.*

152. *Id.*

153. See *Radiohead "In Rainbows" Sales Data Unveiled*, CURRENT (Oct. 20, 2008), http://current.com/entertainment/music/89428205_radiohead-inrainbows-sales-data-unveiled.htm.

154. See Steven Levy, *How Much Is Music Worth?*, NEWSWEEK, Oct. 29, 2007, at 20.

155. *For Radiohead Fans, Does "Free" + "Download" = "Freeload"?*, COMSCORE (Nov. 5, 2007), <http://www.comscore.com/press/release.asp?press=1883>.

156. *Id.*

than it otherwise would have received.¹⁵⁷ Commentators differ, however, as to whether the band would have better profited from a more traditional model.¹⁵⁸

Other artists have used alternate pricing models with more explicitly disappointing results. Trent Reznor, the lead singer of the band Nine Inch Nails, offered a bifurcated pricing structure for his record *The Inevitable Rise and Liberation of Niggy Tardust*: \$5 for a high quality DRM-free album, or a lower quality album for free.¹⁵⁹ Reznor reported that only 18.3% of users elected to pay for the album.¹⁶⁰ The large percentage of non-paying downloaders left Reznor disheartened.¹⁶¹

In the realm of videos games, the best example of the voluntary pricing model is the “Humble Bundle,” which for limited times, bundles licensed, DRM-free downloads of independently published games on a “pay what you want” basis, with a one cent minimum licensing fee.¹⁶² The first bundle offered five games: *World of Goo* by 2D Boy; *Aquaria* by Bit Blot; *Gish* by Cryptic Sea; *Penumbra: Overture* by Frictional Games; and *Lugaru HD* by Wolfire Games.¹⁶³ Customers could divide their payments

157. See, e.g., Eduardo Porter, *Radiohead's Genius?: Making Music Downloading Pay*, N.Y. TIMES BOARD BLOG (Nov. 27, 2007, 11:15 AM), <http://theboard.blogs.nytimes.com/2007/11/27/radioheads-genius-making-music-downloading-pay/>.

158. See, e.g., Sheila Marikar, *Radiohead Lets Fans Set CD Price, Most Say \$0*, ABC NEWS (Nov. 6, 2007), <http://www.abcnews.go.com/Entertainment/story?id=3826638> (noting that 60% of users paid nothing). But see, e.g., Gordon Haff, *People Do Pay for Music*, CNET PERVASIVE DATA CENTER BLOG (Nov. 7, 2007, 5:31 AM), http://www.cnet.com/8301-13556_1-9812667-61.html (reviewing and criticizing mainstream press' labeling of the *In Rainbows* experiment a failure).

159. See Trent Reznor, *Saul Follow-up and Facts*, NINE INCH NAILS—NIN.COM BLOG & MEDIA ARCHIVE (Jan. 3, 2008, 1:04 PM), <http://ninblogs.wordpress.com/2008/01/03/saulfollow-up-and-facts/>.

160. *Id.*

161. *Id.*

162. Dennis Yang, *World Of Goo (This Time With Four Friends) Tries The Pay What You Want Model Once Again*, TECHDIRT (May 5, 2010), <http://www.techdirt.com/blog/entrepreneurs/articles/20100505/0124339304.shtml>.

163. *Id.*

between the game developers and two charities associated with the bundle: the Electronic Frontier Foundation¹⁶⁴ and Child's Play.¹⁶⁵ The stated goal of the sale was to raise \$1 million.¹⁶⁶

The Humble Bundle sales disclose total payments and donations received on the sale homepage. The average price paid is also displayed, as well as the average price by operating systems, Linux, Mac OS X, and Windows.¹⁶⁷ The first Bundle was purchased 138,813 times, with an average price of \$9.18, resulting in gross sales exceeding the \$1 million goal.¹⁶⁸ The average Linux user paid \$14, followed by Mac users \$10, and Windows users \$7.¹⁶⁹ Approximately 31% of funds were directed to the two charities. The participating developers saw sales of approximately \$166,000 each.¹⁷⁰

Despite the apparent financial success of the Bundle's pricing model,¹⁷¹ the Bundle was also widely pirated.¹⁷² "The Humble Indie Bundle was, in many ways, an experiment to see what happens when the excuses for piracy are stripped away and, like it or not, the answer was that piracy continued to take place."¹⁷³ The

164. EFF protects digital rights. *See generally* ELECTRONIC FRONTIER FOUNDATION: DEFENDING YOUR ELECTRONIC RIGHTS, <https://www.eff.org/> (last visited Dec. 1, 2012).

165. Child's Play is a charity that provides sick children with video games.

166. Gus Mastrapa, *More Games, Source Code Join 'Humble Indie Bundle*, WIRE MAGAZINE, May 10, 2010, <http://www.wired.com/gamelif/2010/05/humble-indie-bundle/>.

167. *Linux Users Contribute Twice As Much As Windows Users*, WOLFIRE GAMES (May 2010), <http://blog.wolfire.com/2010/05/Linux-users-contribute-twice-as-much-as-Windows-users>.

168. *Id.*

169. *Id.*

170. Mike Masnick, *Some Final Stats On The Humble Indie Bundle*, TECHDIRT (May 19, 2010), <http://www.techdirt.com/blog/entrepreneurs/articles/20100518/0844299463.shtml>; <http://www.humblebundle.com/>.

171. David Rosen, *Another View of Game Piracy*, WOLFIRE (May 6, 2010), <http://blog.wolfire.com/2010/05/Another-view-of-game-piracy>.

172. Jeffrey Rosen, *Saving a Penny— Pirating the Humble Indie Bundle*, WOLFIRE (May 10, 2010), <http://blog.wolfire.com/2010/05/Saving-a-penny—pirating-the-Humble-Indie-Bundle>.

173. Jonathon Bailey, *Reflections on the Humble Indie Bundle Piracy*, PLAGIARISMTODAY (May 26, 2010), <http://www.plagiarismtoday.com/2010/05/26/reflections-on-the-humble-indie-bundle-piracy>.

Bundle ran counter to most justifications for piracy: it allowed users to set their own price, the games were DRM-free, and all were developed by relatively small, independent game developers.

Jeffery Rosen of Wolfire games, an independent video game studio, noted that approximately 25% of Bundle downloads from the server were not paid for.¹⁷⁴ Traffic from such downloads inflated the cost of Bundle server bandwidth.¹⁷⁵ Rosen's estimation, however, does not include the numerous torrents that exist for each Bundle or links to the Bundle on cyberlockers.¹⁷⁶ Yet Rosen was quick to note that he did not support DRM for the Bundle and that he considered pirates unlikely consumers in any event.¹⁷⁷

In spite of the degree of piracy, the Bundle was widely considered a success, although with varying degrees.¹⁷⁸ Some video game bundles have been criticized for including non-independent games.¹⁷⁹ Today, the brand has expanded to include music and ebook bundles.¹⁸⁰

174. Rosen, *supra* note 172.

175. *Id.*

176. *See, e.g.*, Torrent: Windows Humble Bundle Complete Pack 1, 2, 3 (on file at [http://thepiratebay.se/torrent/6587801/Windows_Humble_Bundle_More_Complete_Pack_\(1_2_F_3\)](http://thepiratebay.se/torrent/6587801/Windows_Humble_Bundle_More_Complete_Pack_(1_2_F_3))).

177. Ben Kuchera, *Humble Bundle Gives Pirates What They Want, Gets Ripped Off*, ARSTECHNICA (May 10, 2010, 12:27 PM), <http://arstechnica.com/gaming/2010/05/humble-bundle-gives-pirates-what-they-want-gets-ripped-off> ("A lot of these people don't just pirate the game, they take pleasure in spreading the pirated links to their friends or anonymous buddies for fun. They just don't care, and if you can't get someone to pay a penny in this case—will they really pay full price for a game?").

178. Chelsea Stark, *Humble Indie Bundle Raises \$2 Million in 24 Hours, Game Makers Celebrate on Reddit*, MASHABLE (June 1, 2012), <http://mashable.com/2012/06/01/humble-indie-bundle-reddit/>.

179. John Walker, *A Humble Interview With The Humble Indie Bundle*, ROCK PAPER SHOTGUN (June 7, 2012), <http://www.rockpapershotgun.com/2012/06/07/a-humble-interview-with-the-humble-indie-bundle/>.

180. The Humble Mumble, *Introducing the Humble Music Bundle*, HUMBLEBUNDLE (July 26, 2012), <http://blog.humblebundle.com/post/28062087940/introducing-the-humble-music-bundle>; The Humble Mumble, *Introducing the Humble eBook Bundle*, HUMBLEBUNDLE (Oct. 9, 2012), <http://blog.humblebundle.com/post/33237485887/introducing-the-humble-ebook-bundle>.

The examples described above reveal that given an opportunity to set their price, significant numbers of users will elect pay more than a zero minimum. Each model also confirms suspicions that many users just want something for nothing, and undermines the sincerity of the pro-piracy doctrine.

However, open pricing may be unattractive to many game developers. While popular bands like Radiohead may make personal connections with their fan base in order to ensure sales within open pricing models, developers rarely have such an opportunity. If personal appeal is required for voluntary pricing models to succeed, the deployment of such models in the games context may be limited to independent developers or well-liked mainstream developers.

Ron Carmel, a member of independent developer 2D Boy, noted that the game *World of Goo* had a 90% piracy rate and that torrents of the game had swarms as large as 500 seeders and 300 leechers. Websites covering the story implicitly recognized the conflict between pirate “pro-indie” positions and the widespread piracy of a popular independent game: “Although Carmel takes it in stride, this is probably a good time for us to reiterate that the charming and fun *World of Goo* was developed by 2D Boy, which consists of Carmel and his design partner, Kyle Gabler. We want more goo, so please support the 2D boys properly.”¹⁸¹ Comments reflected the same dichotomy: “Oh sure you aren’t hurting EA when you pirate Madden, but if you pirate something like *World of Goo*, you are seriously screwing the developer over.”¹⁸²

This sort of logic was employed in numerous stories, including those that had the explicit goal of dissuading piracy: “*World of Goo* is not a game that deserves to be pirated [T]his is a game built with love, not another commercial product extruded

181. Alexander Sliwinski, *World of Goo Has 90% Piracy Rate*, JOYSTIQ (Nov. 13, 2008, 12:45 PM), <http://www.joystiq.com/2008/11/13/world-of-goo-has-90-piracy-rate>.

182. John Walker, *World Of Goo Piracy Rate: “82%”*, ROCK, PAPER SHOTGUN (Nov. 15, 2008, 12:03 PM), <http://www.rockpapershotgun.com/2008/11/15/world-of-goo-piracy-rate-82>.

from the bowels of some faceless Activision-EA corporate game franchise sweatshop.”¹⁸³

The likely thinking of these authors is that smaller developers are more personable and thus will be spared from piracy by those users who can afford the product but would otherwise pirate it.¹⁸⁴ There are natural barriers to charismatic appeals in the gaming community – individual developers rarely build a rapport with users and so it is difficult to make personal requests of pirates. It is possible, but by no means definite, that independent developers will spur greater consumer generosity than major developers. While pirates frequently justify their actions as a sort of protest against large corporation-type developers such as EA, this justification is not born out in piracy rates. Although conventional thinking would support the opposite, it seems clear that independent developers — who are much more sympathetic piracy victims — suffer from piracy at rates comparable to large producers. Independent developers employing open pricing models may need to make special efforts to make personal connections with users.

Professionals in the entertainment industry have emphasized their independent status in personal appeals to stop piracy. Recently, Louis C.K., a popular stand-up comedian, writer, and actor, released a DRM-free comedy special for a mere five dollars. However, the file was almost immediately torrented, with the most popular torrent seeing swarms of approximately 500 seeders.¹⁸⁵ The situation did at least motivate the original seeder to include an apologetic note, which touches on several of the common justifications for piracy:

yea its the new one yea i kinda feel bad putting it here but people like louis ck gotta realize without torrents and the net he wouldnt be anywhere bc honestly louis i know ur [sic] here and i know u

183. Atwood, *supra* note 112.

184. Compare to finding of importance of personal connection in voluntary pricing models for music industry. *See, e.g.*, Belsky et al., *supra* note 146.

185. Ryan Lawler, *Louis C.K. Can't Stop the Pirates*, GIGAOM (Dec. 12, 2011, 9:47 AM), <http://gigaom.com/video/louis-ck-pirate-bay>.

mite [sic] be mad at me but u gotta realize not everyone has paypal , not everyone has credit cards, some people use net lounges, some have barely money for food, art = comedy should be shared with the mass [sic], and Believe me u can judge the popularity more from the torrent downloads then the paypal sales, also if people like it , its easier to buy on there [sic] ipad/ipod or personal/work computers. . .more buzz = more fales [sic]

Hope you understand louie
sorry

[Louie responded with a personal request that pirates refrain from torrenting the file:]

To those who might wish to “torrent” this video: look, I don’t really get the whole “torrent” thing. I don’t know enough about it to judge either way. But I’d just like you to consider this: I made this video extremely easy to use against well-informed advice. I was told that it would be easier to torrent the way I made it, but I chose to do it this way anyway, because I want it to be easy for people to watch and enjoy this video in any way they want without “corporate” restrictions.

Please bear in mind that I am not a company or a corporation. I’m just some guy. I paid for the production and posting of this video with my own money. I would like to be able to post more material to the fans in this way, which makes it cheaper for the buyer and more pleasant for me. So, please help me keep this being a good idea. I can’t stop you from torrenting; all I can do is politely ask you to pay your five little dollars, enjoy

the video, and let other people find it in the same way.¹⁸⁶

This exchange motivated numerous commentators to remind pirates that their actions were punishing C.K. for his innovative release strategy.

1. Open pricing exposes market place morals and undermines piracy justifications

Aforementioned shortfalls aside, games available under open pricing may more effectively combat piracy than traditional DRM by shaping community sentiment over the long term. Already, the open pricing model has been effective where so many anti-piracy measures have backfired, namely in generating public sentiment against piracy. The piracy of the Humble Bundle was met with disgust by most game reviewers. The illegal downloading of an item that could be officially licensed for only one cent laid bare the sense of entitlement of the pirating community.

The comedy site Cracked.com, which frequently comments on gaming culture, pointed to the piracy of the bundle as a reason to hide the fact that you are a game player:

All of the rationale for piracy—high prices, hatred of corporations, annoying DRM—was stripped away The results: The average downloader . . . gave themselves a nice 87 percent discount off the retail price. More than a quarter of the downloaders stole it outright. That’s right. More than a quarter believed that even one penny was too much to offer in return for the hundreds of hours of labor it took to create the games.¹⁸⁷

Jim Sterling, a commentator for the popular gaming site Escapist.com, who has previously noted that piracy is a complex issue without a clear moral answer, opined that unlicensed downloading of the Humble Bundle, as an affordable product

186. See, e.g., Jake Kroeger, *Do Not Steal From Louis C.K.*, NERDIST (Dec. 15, 2011), <http://www.nerdist.com/2011/12/do-not-steal-from-louis-c-k>.

187. David Wong, *5 Reasons It's Still Not Cool to Admit You're a Gamer*, CRACKED.COM (May 24, 2010), http://www.cracked.com/article_18571_5-reasons-its-still-not-cool-to-admit-youre-gamer_p2.html#ixzz2A5AnfwBx.

without invasive DRM, should be called theft rather than piracy: “This isn’t about legal terminology, this is about shame. To call piracy copyright theft makes it appear more complex and less shameful than labeling it as outright dirty, filthy theft.”¹⁸⁸ Sterling suggested that the piracy of DRM-free, cheap, independent developed games be called “pedophile burglary.”¹⁸⁹

Geoffrey Tim, a writer for Lazygamer.net, similarly attacked “Pirate Douchebags [who] Pirate Indie Charity Games,”¹⁹⁰ noting that the normal reasons for pirating did not apply to a voluntary pricing bundle of indie, DRM-free games.¹⁹¹ Instead, Tim concluded that pirates will “pirate just about anything for the simple fact that they can.”¹⁹²

Protests over pirating of the Humble Bundle were not limited to review sites. In fact torrents of the Humble Bundle have engendered debate of piracy norms within the torrent community. For example, the Pirate Bay torrent for Humble Bundle 2¹⁹³ included a plea that leechers please pay for the games before downloading the content.¹⁹⁴ The message specifically noted that

188. Jim Sterling, *When Piracy Becomes Theft*, THE ESCAPIST (Feb. 6, 2012, 11:00 AM), <http://www.escapistmagazine.com/videos/view/jimquisition/5342-When-Piracy-Becomes-Theft>.

189. *Id.*

190. Geoffrey Tim, *Pirate Douchebags Pirate Indie Charity Games*, LAZYGAMER (May 11, 2010, 3:15 PM), <http://www.lazygamer.net/pc-gaming/pirate-douchebags-pirate-indie-charity-games>.

191. *Id.* (“Regular reasons cited by pirates for stealing games are 1) It’s too expensive 2) The DRM is restrictive and 3) The Publishers make too much money anyway. Here we have games that 1) Cost as much or as little as you like, 2) have absolutely no DRM and 3) Are independently published with the money going *directly* to the developers or sick children.” (emphasis in original)). *Id.*

192. *Id.*

193. *Torrent: Humble Indie Bundle 2*. Citation is on file with the Journal and the author.

194. *Id.* (“PLEASE SUPPORT INDIE GAME DEVELOPERS THIS IS ONLY FOR IF YOU ALREADY BOUGHT THE GAME DON’T BE A DICK. IT’S NOT LIKE EA. THEY REALLY CAN’T AFFORD TO GIVE IT AWAY. JUST PAY \$10 FOR THE GAMES THEN DOWNLOAD QUICKLY FROM HERE”).

the developers were independent and would therefore feel the effects of piracy, rather than a massive developer such as EA.

Several users posted to the torrent comments section in response. Some called for the moderators to remove the content, not because it contained copyrighted games, but because it would be immoral for users to download something that could be downloaded for a penny.¹⁹⁵ Users responded by pointing out the hypocrisy of this statement, noting that these sorts of responses are common on torrents for the Humble Bundles.¹⁹⁶

B. Endogenous DRM: Fighting Piracy with Creativity

While exposing the holes in the piracy doctrine through open pricing models and other methods may weaken the appeal of piracy to consumers, developers are loathe to abandon DRM entirely.¹⁹⁷ However, as this Article has demonstrated, intrusive DRM may evoke spirited opposition from game players and game reviewers.¹⁹⁸ In place of traditional DRM, game developers may instead employ endogenous DRM. Endogenous DRM is a piracy deterrence method that uses in-game elements to degrade the

195. *Id.* (“Oh for christ’s sake.. you can buy this for A PENNY! Anyone who downloads this should be fucking ashamed of themselves. Why do you think it was ANONYMOUS that uploaded it? Didn’t want a target painted on his thick fucking skull. I hope the mods have the good taste to remove this, if only for the fact that anyone who downloads this should be going straight to hell anyway.”).

196. *Id.* (“It’s funny how these Indie Bundles suddenly give some of the thieves here a moral backbone. Who the hell are you to dictate to others what’s right or wrong? I can afford to pay for this, and I don’t really want the games, but just to give you the shits, I’m downloading it. Then I’ll be uploading it to all the private sites I’m a member of.”).

197. *File Sharing Business Model Not So Great? DRM a Necessary Evil?*, OPENBYTES (Aug. 8, 2010), <http://openbytes.wordpress.com/2010/08/08/file-sharing-business-model-not-so-great-drm-a-necessary-evil>. See also Timothy Chang, *Football Manager Devs Hire More Staff Thanks to DRM*, THE ESCAPIST (Nov. 9, 2012, 6:18 AM), <http://www.escapistmagazine.com/news/view/120566-Football-Manager-Devs-Hire-More-Staff-Thanks-to-DRM>.

198. See *supra* Part IV.B.3.

experience of users who run unlicensed copies.¹⁹⁹ Developers may shift game mechanics, causing the game to be “buggy,” or introduce enemies that the player is unable to defeat. This approach has several advantages over traditional DRM, the least of which is its initial invisibility: because the DRM is only triggered in game, it may be harder for cracking communities to be confident that all DRM has been disabled.

Several developers have employed endogenous DRM with mixed success. This form of DRM is most successful when it frustrates and embarrasses pirates, often by introducing whimsical²⁰⁰ obstacles that obviously are out of place in the game. These obstacles may serve to make the game extremely difficult or even impossible to play. This subsection outlines several attempts to use endogenous DRM, evaluation of the relative success of these approaches, the reaction of users to this sort of DRM, and the cognitive theory that supports the notion that DRM, and other game elements, may effectively impart messages to users.

1. Examples of Endogenous DRM

Endogenous forms of DRM thus far roughly break down into whimsical obstacles, redacted game elements, and triggering of deliberate crashes.

199. Here, I use endogenous to show a connection between the game itself, the goals of the game, and the DRM used, in much the same way the term “endogenous game” or “endogenous fantasy” has been used in educational game literature. See, e.g., Habgood, M. P. J., Ainsworth, S. E., Benford, S., *Endogenous Fantasy and Learning in Digital Games*, SIMULATION AND GAMING, 36: 483-498 (2005), available at <http://sag.sagepub.com/content/36/4/483.abstract> (subscription required).

200. Richard Cobbett, *All copy protection gets broken eventually*, TECHRADAR (May 9, 2010), <http://www.techradar.com/us/news/software/applications/all-copy-protection-gets-broken-eventually-687644> (describing “more whimsical copy protection methods”).

a. *Whimsical Obstacles*

Whimsical obstacles can be anything that is obviously out of place to the game play experience. Evidently, developers are not without a sense of humor.

Croteam, developer of the *Serious Sam* first person shooter (“FPS”) franchise, inserted such whimsical obstacles into its game *Serious Sam 3: Before First Encounter*.²⁰¹ As Sam “Serious” Stone, the player takes control of a wide arsenal of weapons to fight a variety of monsters. If the game detects an unlicensed copy, it triggers a giant, invincible, pink scorpion armed with two shotguns that relentlessly hunts the player. This enemy appears after the player secures the weakest gun in the game. The player can attempt to run from the giant pink scorpion, but the scorpion can move very quickly and has a ranged attack. Accordingly, the giant pink scorpion severely inhibits the player’s progress. The DRM scheme imparts powerlessness on the player, who inevitably fails to survive. Due to the fact that the DRM is triggered early in the game and is not immediately apparent as traditional DRM, the pirating player will likely repeatedly attempt to escape the scorpion and fail. The developer’s goal, to repeatedly humiliate and frustrate the pirate, is well-realized.

If the player cracks the scorpion DRM or skips it using a level cheat, a pirated copy later triggers a forced spinning perspective:²⁰² the view of the player looks straight up and spins until enemies kill Sam. Pirates also complained that pirated copies crash after five minutes, although it is unclear if the crashing was triggered intended DRM measures or simply bugs introduced in the cracking of the game.

The developer Crytek deployed similar DRM in its first-person shooting game *Crysis Warhead*. A licensed copy of the game

201. John Papadopoulos, *Serious Sam 3: BFE – DRM Introduces Immortal Scorpion*, DARK SIDE OF GAMING (Dec.7, 2011), <http://www.dsogaming.com/news/serious-sam-3-bfe-drm-introduces-immortal-scorpion>.

202. For a video of this spinning DRM, see TirexiHD, *Serious Sam 3 DRM Protection V2 (HD)*, YOUTUBE (Dec. 8, 2011), http://www.youtube.com/watch?v=8SkK_ogovhk&feature=related.

grants the player access to several weapons, including a sniper rifle and machine guns. However, a player running a pirated version of the game finds that guns now shoot chickens instead of bullets.²⁰³ The chickens do no damage, rendering the player helpless.

The developer Bohemia has employed endogenous DRM in several of its games.²⁰⁴ In *Operation Flashpoint: Cold War Crisis*, a tactical shooter, the player uses guns to kill enemies. Players who run unlicensed copies, however, will find that their weapons become less and less accurate. The purpose is to degrade the pirate experience.²⁰⁵ The user may continue playing with ineffective weapons, but the user will later turn into a flock of birds. The game then displays “Good birds do not fly away from this game, you have only yourself to blame.”²⁰⁶

Bohemia also utilized a progressively crippling anti-piracy measure in its game *Take On Helicopters*. In this helicopter game, players must skillfully pilot their craft to film whales, to fly in formation in air shows, and to assist SWAT team officers. Of course, this requires players to accurately observe and navigate a visually complex environment. In unlicensed copies, the visuals blur and degrade during play, creating a hallucinogenic effect, and rendering the game’s missions far more difficult. When a user

203. *inCrysis—Crysis Forums*, INCRYSIS (Sept. 25, 2008), <http://www.incrisis.com/forums/viewtopic.php?pid=401686>. For a video of this DRM, see Toxcity666, *Crysis – WARHEAD Chicken Glitch*, YOUTUBE (Sept. 26, 2008), <http://www.youtube.com/watch?v=YIXgi9qWzu8>.

204. Rachel Deary, *Bohemia Interactive Prefers Degrade DRM Over Online DRM*, GAMELITIST (Nov. 17, 2001), <http://www.gamelitist.com/2011/11/bohemia-interactive-prefers-degrade-drm-over-online-drm>.

205. *Id.* (“Instead of requiring all copies of the game to have a constant internet connection for DRM, their games are made so that a pirate’s experience of gameplay steadily worsens over time until (hopefully) he or she regards the game as unplayable and buys a legitimate copy. This is called degrade DRM.”). See *FADE*, WIKIPEDIA, <http://en.wikipedia.org/wiki/FADE> (last modified Nov. 11, 2012, 3:36 PM).

206. Nathan Grayson, *Interview: Bohemia Interactive’s CEO on Fighting Piracy, Creative DRM*, PC GAMER (Nov. 17, 2011, 1:09 AM), <http://www.pcgamer.com/2011/11/17/interview-bohemia-interactives-ceo-on-fighting-piracy-creative-drm/>.

complained of a blurred graphic problem, he was revealed as a pirate and banned.²⁰⁷

Whimsical obstacles often display a topical sense of humor. In *Michael Jackson: The Experience*, a dancing game released in 2010 featuring the music of the King of Pop, the developer Ubisoft set out to annoy pirates.²⁰⁸ Users with a pirated copy of the game find that the game functions, but with an obnoxious obstacle: vuvuzelas blare over the soundtrack.²⁰⁹ The choice of instrument was almost certainly informed by the 2010 World Cup in South Africa, where fans constantly sounded the plastic horns.²¹⁰

In *LovePlus+*, a very popular dating simulator on the Nintendo DS, a user playing a pirated copy will be unable to successfully woo any of the women in the game.²¹¹ Users noted how distressing this was: “I was dating her normally, but when I next restarted she was pissed at me! I can’t get her to like me, and she’s always annoyed at me . . . it’s the ultimate anti-piracy measure!” and “After 100 days she still won’t let me become her boyfriend. She completely ignores me and won’t send me any mail. The events aren’t happening either - brutal.”²¹²

Perhaps the most famous example of whimsical obstacle DRM was found in *Earthbound*, a role playing game for the Super

207. John Papadopoulos, *Take On Helicopters Features an Amazing Anti-Piracy Protection System*, DARK SIDE OF GAMING (Nov. 7, 2011), <http://www.dsogaming.com/news/take-on-helicopters-features-an-amazing-anti-piracy-protection-system> (“Bohemia Interactive deploys various anti-piracy countermeasures in its titles and the morphed image degradation reported by some users is one of the symptoms of these”).

208. See Kyle Nazario, *6 Hilarious Ways Game Designers Are Screwing With Pirates*, CRACKED.COM (Apr. 22, 2011), http://www.cracked.com/article_19162_6-hilarious-ways-game-designers-are-screwing-with-pirates.html#ixzz29sTUHjJf.

209. *Id.*

210. Owen Gibson, *World Cup Organizer Considers Vuvuzela Ban After TV Complaints*, THE GUARDIAN (June 13, 2010, 1:10 PM), <http://www.guardian.co.uk/football/2010/jun/13/world-cup-vuvuzela-ban-tv-complaints>.

211. John Funk, *Dating Sim Girls Dump Pirates*, THE ESCAPIST (June 28, 2010), <http://www.escapistmagazine.com/news/view/101725-Dating-Sim-Girls-Dump-Pirates>.

212. *Id.*

Nintendo. The game employed five layers of copy-protection.²¹³ Initially, the game detects if the cartridge was being inserted in a licensed device; if not, the game would display, “This game pack is not designed for your Super Famicom or Super Nes.”²¹⁴ The second layer measured the amount of Static random-access Memory (SRAM)²¹⁵ on the cartridge.²¹⁶ If more than 8 kb of SRAM was detected,²¹⁷ the game showed a standard²¹⁸ anti-piracy warning: “It is a serious crime to copy video games”²¹⁹ If the pirate proceeded, the third layer inserted a large number of additional enemies throughout the game.²²⁰ Enemies also appeared in ordinarily safe areas.²²¹ While the game was still playable, it became far less enjoyable.²²² The fourth layer consisted of six more SRAM checks, confirming that the game was pirated.²²³ The fifth and final layer was especially cruel. When the player progressed to the final boss, after tens of hours of gameplay, the game would graphically glitch, force the player to reset, and delete any saved files on the cartridge at this time.²²⁴ This crash

213. *EarthBound's Copy Protection*, EARTHBOUND CENTRAL (May 14, 2011), <http://earthboundcentral.com/2011/05/earthbounds-copy-protection/>.

214. *Id.*

215. SRAM is primarily used for storing video data. *See SRAM*, TECHTERMS, <http://www.techterms.com/definition/sram> (noting that SRAM is typically used for buffers) (last updated Feb. 9, 2007).

216. *EarthBound's Copy Protection*, *supra* note 213.

217. Copy cartridges typically had a much larger amount of SRAM than legitimate cartridges. *How To Prevent Video Game Piracy (If You're Not A Total Pussy)*, WORDFLOW.COM (Sept. 3, 2011, 10:10 PM), <http://wordflow.webs.com/apps/blog/entries/show/8352379-how-to-prevent-video-game-piracy-if-you-re-not-a-total-pussy->.

218. *Compare EarthBound's Copy Protection*, *supra* note 213, with Video: *Don't Copy That Floppy* (Software Publishing Association 1992), available at <http://www.youtube.com/watch?v=up863eQKGUI>.

219. *EarthBound's Copy Protection*, *supra* note 213.

220. *Id.*

221. *Id.*

222. *How To Prevent Video Game Piracy (If You're Not A Total Pussy)*, *supra* note 217; *cf. How To Get Rid Of The Invincible Scorpion In Serious Sam 3*, THE SIXTH AXIS.COM (Aug. 12, 2011, 2:15 PM), <http://www.thesixthaxis.com/2011/12/08/how-to-get-rid-of-the-invincible-scorpion-in-serious-sam-3/>.

223. *EarthBound's Copy Protection*, *supra* note 213.

224. *Id.*

happened immediately after a lackey to the main boss, Pokey, announced that the players would merely be another meal for him,²²⁵ with commentators taking this to mean that the boss has consumed the saved files of pirates.²²⁶

b. Redacted game elements

Some endogenous DRM implementations completely prevent the player from advancing past a certain point by removing a necessary item or move. In unlicensed copies of *Batman Arkham Asylum*, the player, as Batman, is prohibited from using Batman's glider function.²²⁷ Without this function, a player is unable to progress past part of the game that requires gliding over poison gas.²²⁸ Believing the game mechanic failure to be a bug, users

225. *How To Prevent Video Game Piracy (If You're Not A Total Pussy)*, *supra* note 217. The author of this article explains:

It happens exactly after Pokey says, "And you. . . you will be. . . just another meal to him!" And cue game freeze, glitch, crash, save file deletion. And so, if your copy of *Earthbound* is pirated, the implication is that Giygass ate your save [sic] files. You can never finish the game.

Id.

226. This interpretation is not far-fetched as numerous commentators have noted the thoughtfulness of *Earthbound*'s design and the metaphors contained in the game. For example, the final battle in the game is thought by some game-players to represent abortion. Pontifus, *Grasping the True Form of Giygass's Attack*, SUPER FANICOM BS-X (Apr. 15, 2009), <http://superfani.com/2009/04/15/grasping-the-true-form-of-giygass-attack/> (providing an annotated recording of the final battle, analyzing dialogue, game mechanics, and background graphics and noting "it's really no stretch to take some of the things that happen throughout this fight as figuratively evocative of birth and sexuality. I'm just not convinced that *Earthbound*'s final battle is literally an abortion. But I'll leave the fetus theory at that; it's been debated across the internet quite enough already."); *Giygas: A Psychoanalysis of Evil Itself*, DESTRUCTOID (Oct. 18, 2009, 12:00 PM), <http://www.destructoid.com/giygas-a-psychoanalysis-of-evil-itself-151790.phtml>; *You Cannot Grasp The True Form of X*, KNOW YOUR MEME, <http://knowyourmeme.com/memes/you-cannot-grasp-the-true-form-of-x> (last visited Nov. 30, 2012).

227. Nazario, *supra* note 208.

228. *Id.*

asked for patches on help forums.²²⁹ An administrator responded to the user, telling him: “It’s not a bug in the game’s code, it’s a bug in your moral code [punk].”²³⁰

Similarly, in *Mirror’s Edge*, the player must make a running leap from a building to reach another part of the game.²³¹ However, a pirated version prevents the player from running when approaching jumps, ensuring that the pirate’s avatar repeatedly falls to his death.

c. *Triggering deliberate crashes*

Some developers have used endogenous DRM that renders pirated copies buggy, leading to crashes, frame rate issues, and other performance obstacles. While, like whimsical obstacles, this approach makes pirated games less enjoyable to play, it also has a large drawback: feedback from pirates, who may not realize that the bugs are deliberate, can damage a game’s reputation.

For example, the developers of *Titan’s Quest*, a game that utilized DRM bugs, argue that pirate complaints about the game’s stability discouraged legitimate purchases.²³² Similarly, the developers of *Assassin’s Creed I* have filed suit against OEM for allowing the game to be pirated by an employee.²³³ The beta had deliberate errors, which again may have led to negative reviews of the game and depressed sales.²³⁴ The difference in the reception between DRM system crashes and whimsical game obstacles hints at users’ appreciation for well-crafted and considered DRM. When games simply crash, users likely believe that the underlying code is buggy. However, when whimsical DRM is used, players understand that the game can function properly. In this way, it becomes clear that developers have taken efforts to craft a creative piracy deterrent, while treating pirates as game players.

229. *Id.*

230. *Id.*

231. See Jameson Quave, *How Mirror’s Edge Does Piracy Protection*, YOUTUBE (Jan. 17, 2009), http://www.youtube.com/watch?v=_fl6cVBD9Ok.

232. Arendt, *supra* note 72.

233. Sinclair, *supra* note 71.

234. *Id.*

2. Success of endogenous DRM in preventing zero-day piracy

Developers have a practical reason for employing endogenous DRM: it likely takes crackers longer to defeat the DRM, in part because the DRM is not immediately detectable at the start of the game. Endogenous DRM anticipates and allows for a first wave of piracy, in which crackers break an initial layer of traditional DRM; only later do pirating users learn of endogenous DRM. While enterprising pirates will eventually crack the endogenous DRM, the delay can prevent zero-day piracy. A close look at cracking community forums reveals that endogenous DRM can work to prevent zero-day piracy and frustrate pirates.

For example, *Serious Sam 3: Before First Encounter* was released on November 22, 2011.²³⁵ The initial crack was substantially delayed, arriving December 2.²³⁶ In the meantime, users complained that the cracking was taking longer than usual.²³⁷ However, users who downloaded this early crack complained about the giant pink scorpion that appeared shortly after the game began.²³⁸ A debate sparked over whether the immortal scorpion was part of ordinary gameplay or DRM.²³⁹ When the developer

235. Alexander Sliwinski, *Serious Sam 3: BFE Seriously Delayed Until Nov. 22*, JOYSTIQ (Sept. 30, 2011 10:32 AM), <http://www.joystiq.com/2011/09/30/serious-sam-3-bfe-seriously-delayed-until-nov-22/>.

236. Skidrow Games, *Serious Sam 3*, Citation is on file with the Journal and the author.

237. *Id.*

238. GoatJugSoup, Comment to *Forum for Serious Sam 3: BFE*, GAMEFAQS (Dec. 3, 2011 7:13AM), <http://www.gamefaqs.com/boards/623056-serious-sam-3-bfe/61232861> (“How do you kill that rapey [sic] scorpion thing by the first gun? . . . seems unkillable and owns real quick”).

239. Skidrow Games, *Serious Sam 3*, Citation is on file with the Journal and the author (“here is another rumor that is true . . . Those red scorpions that you encounter after picking up the pistol, are actually not part of that level . . . Croteam did something I didn’t [sic] even think was possible in game programming yet . . . They actually made it so if the game had been cracked or circumvented in any way shape or form, it would spawn 3 red scorpions that make the game unplayable from that point . . . Croteam did this as an anti-piracy measure on the game itself . . . So, really, the game itself is fine but once you apply the cracks that are out there, the game somehow detects that it has been circumvented and then once the pistol is picked up, the 3 red scorpions spawn

confirmed that the scorpions were part of the game's copy protection, pirates expressed various opinions as to the likely time of patching this DRM.²⁴⁰

Pirates released a scorpion-free patch on December 7, five days after the initial crack.²⁴¹ Thereafter, users began complaining that on certain levels, the player controlled character became unresponsive and started spinning rapidly.²⁴² By this point, users recognized the forced spinning as an additional layer of DRM.²⁴³ A final crack was released December 21, almost a month after the game's official release.²⁴⁴

and kill you . . . That is one really ridiculous way of making the game uncopyable . . . Hope the sceners can fix that HUGE bug problem when they release the official crack . . .").

240. *Id.* Bamfan5520 stated on December 4, 2011: "if you guys have been paying attention the past week, the sceners are doing the best they can, if you have tried the recent cracks, you will understand why it is taking so long to perfect . . . THE RED SCORPIONS OF DEATH!!! Give it time, it can be cracked . . ." *Id.*

Yyoungpadawan stated on December 4, 2011: "sorry to say it but its [sic] looking more like a buy game than a hacked game. Before you thumbs down me [sic] think about how [many] great games we have had, games companys [sic] need a new protection and I believe coreteam [sic] might have hit the big time, lets [sic] hope they dont [sic] sell there [sic] protection to others." *Id.*

Crysis2006 stated on December 5, 2011: "Croteam really made me laugh with their anti-piracy, especially with the scorpion. I mean an enemy that runs faster than a Bugatti, has fully upgraded reduction of firearms damage straight from Saints Row the Third and is loaded with meta-bullets for ammunition?" *Id.*

241. *Id.*

242. *Id.*

243. John Papadopoulos, *Serious Sam 3 Protection V2 – Look Up in the Sky, is it a Bird, is it a Plane? No, it's DRM Pwnage*, DARK SIDE OF GAMING (Dec. 9, 2011), <http://www.dsogaming.com/news/serious-sam-3-protection-v2-look-up-in-the-sky-is-it-a-bird-is-it-a-plane-no-its-drm-pwnage/>; TehParadox, citation on file with the Journal and the author ("This Crack. Will also spin in the last level. Damm, when proper crack??? Now it spinning 3 places suck." [sic]). To view this DRM in action, see TirexiHD, *Serious Sam 3 DRM Protection V2 (HD)*, YOUTUBE (Dec. 8, 2012), http://www.youtube.com/watch?v=8SkK_ogovhk.

244. Citation on file with the Journal and the author.

3. *Positive reactions to endogenous DRM from the PC gaming community*

The reaction to *Serious Sam 3*'s DRM was overwhelmingly positive, a stunning break from the usual reaction to piracy deterrents. Gaming fan sites,²⁴⁵ legitimate users, the mainstream press, and pirates themselves positively reviewed the giant pink scorpion DRM.²⁴⁶ “Nothing flags up to your friends the fact that you’re too cheap to buy a game like being attacked by a fluffy pink stuffed scorpion with a beaming face and killer claws that *just*

245. John Walker, *Serious Sam's DRM Is A Giant Pink Scorpion*, ROCK PAPER SHOTGUN (Dec. 7, 2011, 4:10 PM) <http://www.rockpapershotgun.com/2011/12/07/serious-sams-drm-is-a-giant-pink-scorpion/> (“Serious Sam 3's DRM is brilliantly cruel, punishing only those who pirated it. By relentlessly pursuing them with a giant invincible armoured scorpion.”); Tom Senior, *Serious Sam 3: BFE DRM hounds pirates with immortal scorpion*, PC GAMER (Dec. 7, 2011, 4:59 PM), <http://www.pcgamer.com/2011/12/07/serious-sam-bfe-drm-hounds-pirates-with-immortal-scorpion/> (“Croteam's ingenious DRM solution for Serious Sam 3: BFE. It's got nothing to do with secure-ROM, or product codes, or online validation. It might well be the most inventive DRM trick since Rocksteady coded Batman to forget how to glide in pirated versions of Arkham Asylum.”); Andrei Dobra, *Serious Sam 3's DRM Spawns Invincible Scorpion Beast to Punish Pirates*, SOFTPEDIA GAMES (Dec. 9, 2011), <http://news.softpedia.com/news/Serious-Sam-3-s-DRM-Spawns-Invincible-Scorpion-Beast-to-Punish-Pirates-239507.shtml> (“[Go s]ee the scorpion in action and let's hope that more and more developers will choose to protect their games by using such great methods, instead of forcing clumsy always-on DRM systems.”); *Serious Sam Pirates Forced to Fight Immortal Scorpion*, TORRENTFREAK (Dec. 7, 2011), <http://torrentfreak.com/serious-sam-pirates-forced-to-fight-immortal-scorpion-111207/> (“Here's how you deal with these pesky game pirates. The developer of Serious Sam 3 came up with some creative DRM. Pirates can play but not for long, as they are up against an invincible scorpion. No mercy, let them bleed to death. . .”).

246. w3ts1ut11, Comment to *Serious Sam Pirates Forced to Fight Immortal Scorpion*, TORRENTFREAK (Dec. 7, 2011), <http://torrentfreak.com/serious-sam-pirates-forced-to-fight-immortal-scorpion-111207/> (“I love this idea, innovative! Croteam, half super serious, half 4 teh lulz [sic] - they actually went out of their way to code in MORE CONTENT for pirates!!!! XD It really seems like a great statement against DRM, as actual DRM tends to sting like a scorpionFalse . . . with assault rifles and ~inf[sic] health.”).

won't die."²⁴⁷ Another review remarked: "Now that's awesome. Of course this will get cracked, eventually, but it's hilarious witnessing pirates complaining about that immortal enemy." Users posted videos of the scorpion attacking the player, receiving numerous views and likes.²⁴⁸ Comments focused on the creativity of the DRM, the humor of inserting an immortal pink scorpion as a means to frustrate pirates,²⁴⁹ and on the low probability that this sort of DRM would inconvenience legitimate purchasers.

247. *DRM gets Creative as Serious Sam Attacks Pirates with Pink Scorpion*, SLASHGEAR (Dec. 8, 2011), <http://www.slashgear.com/drm-gets-creative-as-serious-sam-attacks-pirates-with-pink-scorpion-08200897/> (emphasis in original); Phrish, Comment to *DRM gets Creative as Serious Sam Attacks Pirates with Pink Scorpion*, SLASHGEAR, <http://www.slashgear.com/drm-gets-creative-as-serious-sam-attacks-pirates-with-pink-scorpion-08200897/> (last visited Nov. 30, 2012) ("Oooo, that's a fun and creative way of dealing with douchbagging game thieves. LOL..."); NikAmi, Comment to *DRM gets Creative as Serious Sam Attacks Pirates with Pink Scorpion*, SLASHGEAR, <http://www.slashgear.com/drm-gets-creative-as-serious-sam-attacks-pirates-with-pink-scorpion-08200897/> (last visited Nov. 30, 2012) ("Lol... that's genius. I wonder how long some guy tried to beat that damn scorpion before he found out it was impossible.").

248. There are numerous videos concerning this DRM. For the main video, see Martin, Vida, *Serious Sam 3 BFE - Immortal Fast Scorpion DRM*, YOUTUBE (Dec 4, 2011), <http://www.youtube.com/watch?v=e91q5BtlxK0>. As of Nov. 17, 2012, the video has over 1 million views, with 1,799 likes versus 64 dislikes. *Id.* The video's comment section has over 1,500 posts and has turned into a forum for debating the merits of piracy and the impact of this sort of DRM. See, e.g., Donanjin, Comment to Martin, Vida, *Serious Sam 3 BFE - Immortal Fast Scorpion DRM*, YOUTUBE, <http://www.youtube.com/watch?v=e91q5BtlxK0> (last visited Nov. 30, 2012) ("Because [another user] downloaded the game, that is why it's stealing, because it is, you're taking a product without paying for it, it's like saying a candy company hasn't lost out because you took a candy bar, but hey I couldn't afford to pay for it, so it's fine..."); DanTheRetroNerd, Comment to Martin, Vida, *Serious Sam 3 BFE - Immortal Fast Scorpion DRM*, YOUTUBE, <http://www.youtube.com/watch?v=e91q5BtlxK0> (last visited Nov. 30, 2012) ("If you honestly believe everyone who pirates would buy it if they could, you're a deluded idiot with their heads up their own ass who is justifying taking other peoples hard work.").

249. Pawfalcon, Comment to Jonathan Downin, *Serious Sam 3: BFE Griefts Pirates*, GAMESPOT, <http://www.gamespot.com/news/serious-sam-3-bfe-griefts-pirates-6347404> (last visited Nov. 30, 2012) ("They'll obviously find a way

The positive reaction is not unique to Serious Sam 3. The copy protection of Earthbound is similarly famous within the video game playing community, and is the subject of numerous websites²⁵⁰ and YouTube videos.²⁵¹ The pirated version's increased difficulty attracts some comment, but the great majority of attention focuses on the sheer cruelty of deleting the player's saved files, especially in a role playing game that takes so many hours to beat.²⁵²

However, other endogenous methods have met with mixed results, in part because the anti-piracy intent of the method has been too subtle. While developers may have adopted subtle methods in order to delay detection of the DRM, the potential trade-off of negative reviews from clueless users is simply too great. Yet by merely making the endogenous DRM obvious, this problem could be prevented.

Numerous reasons explain why endogenous DRM would not bring about the same negative feelings as conventional DRM. In

around this but you gotta give them credit, a 'playful'/less insulting version of DRM . . . that's also pretty damn hilarious. Plus, I didn't even know a new Sam was coming out but now I might actually get this. Props"); Andy Chalk, *Serious Sam 3 DRM Will Kill You Bad*, THE ESCAPIST (Dec. 7, 2011), <http://www.escapistmagazine.com/news/view/114580-Serious-Sam-3-DRM-Will-Kill-You-Bad> (stating: "That's right, it cannot be killed and it's way too fast to be evaded for more than a second or two. It will pursue you, it will attack you and sooner or later - probably sooner - it will kill you. It's a hilarious idea and it's even more hilarious to see the thing in action. It's also a lot of fun imagining all the dummies looking for help with the unkillable fast scorpion thing in various *Serious Sam 3* forums.").

250. *Mother 2/EarthBound Anti-Piracy Measures*, STARMEN.NET, <http://starmen.net/mother2/gameinfo/antipiracy/> (giving a code so that legitimate users may experience the pirated version) (last visited Nov. 30, 2012); Spencer, *Earthbound punishes pirates by deleting game saves*, SILICONERA (March 12, 2008), <http://www.siliconera.com/2008/03/12/earthbound-punishes-pirates-by-deleting-game-saves/>.

251. gyiyg996, *The Crashing of Earthbound (checksum failure [sic])*, YOUTUBE (Oct. 13, 2008) <http://www.youtube.com/watch?v=tyhKfJu6okU> (recording various crash results and sounds for Earthbound).

252. *What's the Average Playtime for Earthbound?*, Comment of MG, STARMEN.NET, <http://forum.starmen.net/forum/Games/Mother2/What-s-the-average-playtime-for-first-time-Earthbound> ("it's probably somewhere between 30-60 hours long.").

the context of endogenous DRM, the developer's treatment of pirates is similar to another group that is little loved by most game players: cheaters. Games have long humiliated, segregated,²⁵³ or even destroyed²⁵⁴ the avatars of players using cheat codes.²⁵⁵ Gamers may see the endogenous DRM as just retribution for pirates' "trolling" of developers.

Secondly, endogenous DRM effectively turns the pirated game into a demo, because endogenous DRM typically degrades the user's experience some portion of time into the fully functional game. This undercuts a central part of the piracy doctrine: that pirates merely want to experience the game before deciding whether to purchase it.

Finally, and perhaps most significantly, endogenous DRM treats pirates as gamers rather than as criminals. By addressing pirates as they see themselves, the anti-piracy message is not as easily discounted, and the over-the-top and comical nature of many endogenous DRM implementations may make the message more palatable.

253. R* K, *Taking Aim at Cheaters in Max Payne 3*, ROCKSTAR GAMES (June 12, 2012, 3:24 PM), <http://www.rockstargames.com/newswire/article/35441/taking-aim-at-cheaters-in-max-payne-3.html> (decreeing that cheating users "will be quarantined from all other players into a 'Cheaters Pool', where they'll only be able to compete in multiplayer matches with other confirmed miscreants. In the event we decide to absolve any of these cheaters for their past transgressions they may re-enter play with the general public, however a second offense will result in their indefinite banishment.").

254. shrensh, *Making Lara Croft Explode by Entering the Cheat Code Incorrectly*, YOUTUBE (Nov 14, 2011), <http://www.youtube.com/watch?v=RTZbUXgEzT0>.

255. Perhaps the most extreme example of this was in the game Banjo Kazooie. The player is warned by a witch Grunty, that if the player continues to cheat, his game file will be erased. If the player enters more than two cheats, the game save is erased from the game pack. *Grunty's Code Vengeance*, BANJO KAZOOIE WIKIA, http://banjokazooie.wikia.com/wiki/Grunty's_Code_Vengeance (last visited Nov. 30, 2012); pokemonfan4000, *Banjo Kazooie: Grunty ERASES Your Game Pak!*, YOUTUBE (AUG 17, 2008), <http://www.youtube.com/watch?v=QOBjtDsRHBg>.

4. *The Unique Ability for Endogenous DRM in Video Games to Impart Messages*

While endogenous DRM has been designed to frustrate pirates, developers have not yet focused on using DRM to impart messages to illicit users beyond the basic “Don’t Pirate.” Endogenous DRM, however, is capable of communicating important messages by its integration into game elements. This power to convey messages and channel behavior lies in recent developments in cognitive theory and game play.²⁵⁶ The disconnect between consumers of intellectual property and its creators lies partly in a lack of understanding of piracy’s consequences, as seen in the PC piracy doctrine. With endogenous DRM, developers can demonstrate the inherent unfairness of copyright infringement more effectively than community message boards, personal pleas from independent developers, or public service announcements. The unique ability to internalize this message among its consumers makes endogenous DRM a promising tool, with the ability to go beyond what the law may be able to accomplish in protecting intellectual property rights.

256. Numerous studies have been conducted on the cognitive impact of video game play, especially the impact of violent video games on childhood development. See, e.g., Jodi L. Whitaker & Brad J. Bushman, *A Review of the Effects of Violent Video Games on Children and Adolescents*, 66 WASH. & LEE L. REV. 1033 (2009). Recent cognitive research has focused on mirror neurons and their role in the development of empathy in response to stimuli. See, e.g., Ann Marie Barry, *Mirror Neurons: How We Become What We See*, 16 VISUAL COMMUNICATION QUARTERLY 79 (2009). To summarize briefly, these neurons allow humans to project themselves into the role an observed actor performing actions. See *id.* at 83. That is, an individual performing an action in the same way as another observed individual will empathize and inherently understand the performance. In the context of video games, the direct control of the player over the player character creates a powerful avenue for behavior modification. See, e.g., *Empathy and Conditioning Violence*, GAMESPOT (2012), <http://www.gamespot.com/features/empathy-and-conditioning-violence-6143438/>; Karen Collins, *Making Gamers Cry: Mirror Neurons and Embodied Interaction with Game Sound*, ACADEMIA.COM (2012), http://www.academia.edu/987472/Making_Gamers_Cry_Mirror_Neurons_and_Embodied_Interaction_with_Game_Sound.

Due to their interactive nature, video games have the opportunity to garner attention, engage users and convey messages in a unique and personal way. Previous attempts to change user behavior have centered on production of videos in the “public service announcement” format. These films have been ineffective and widely mocked.²⁵⁷ Instead, if game developers embed the anti-piracy method in the game itself, either by flagging cheating users for communal scorn or by attempting to shame or frustrate pirates with in-game elements, it is possible that this anti-piracy message could solidify into a social norm. It is clear that game developers have more tools at their disposal to alter user behavior in ways that film or music producers simply lack.

Game designers have frequently noted that games have the ability to subtly communicate information and shape player behaviors. For example, Arin Hanson, better known as egoraptor, has explained how game mechanics, level design, and narrative choices in *Mega Man X* convey the goals of the game to the player, inspire empathy, and create a sense of accomplishment and reward.²⁵⁸ These characteristic choices can be easily modified to convey messages to players. Furthermore, players engage in repetitious play, constantly exposing themselves to game messages.

One salient example of a game with modified code to convey a message is *Pokémon Creepy Black*.²⁵⁹ While the game likely started as an urban legend, it has since been created by different mod teams.²⁶⁰ In the official *Pokémon* series, which is marketed to

257. See, e.g., Zervas, *supra* note 31.

258. egoraptor, *Sequelitis: Mega Man Classic vs. Mega Man X*, YOUTUBE (Oct 31, 2011), <http://www.youtube.com/watch?v=8FpigqfcvIM&feature=plcp>.

259. OmegaSpartan08, *Pokémon Black: A Hacked Game Of Death*, GAMEINFORMER (July 30, 2010, 5:58 AM), http://www.gameinformer.com/blogs/members/b/omegaspartan08_blog/archive/2010/07/30/pok-233-mon-black-a-hacked-game-of-death.aspx.

260. *Pokemon Creepy Black*, KNOW YOUR MEME, <http://knowyourmeme.com/memes/pok%C3%A9mon-creepy-black> (last visited Nov. 30, 2012 Nov. 16, 2012) (noting that demo teams have recreated this game); dabrl dg3, *Cursed Black Demo 2: Preview 1*, YouTube (Jun 25, 2011), http://www.youtube.com/watch?feature=player_embedded&v=FMUShagiArk#!.

children, the game player takes on the role of a Pokémon trainer, who trains monsters to do battle with other monsters in a controlled setting. The monsters do not die as a result of these battles. However, *Pokémon Creepy Black* is modified to tell a horror story, and conveys serious messages about the inevitability of death.

In this game, the player's avatar may control a monster Ghost, which has an action called "Curse."²⁶¹ When that move is used, the screen cuts to black and the opposing monster is killed. Later in the game, the player's avatar is an aged man. The Ghost appears and begins to fight the avatar. The player cannot defeat the Ghost and when the player is almost dead, the Ghost uses curse. The game cuts to black and when the game is restarted, the player's saved file is erased.²⁶² This ending has the capacity to deeply move the game player, who may question the meaning of the game, and in turn, the meaning of life. One player described the ending's effect:

It seems [the mod creator] was trying to convey a message; though it seems I am the sole receiver of this message. I'm not entirely sure what it was—the

261. *Pokemon Black*, CREEPYPASTA WIKIA, http://creepypasta.wikia.com/wiki/Pokemon_Black (last visited Nov. 30, 2012). The author states:

Defending Pokémon were unable to attack Ghost—it would only say they were too scared to move. When the move "Curse" was used in battle, the screen would cut to black. The cry of the defending Pokémon would be heard, but it was distorted, played at a much lower pitch than normal. The battle screen would then reappear, and the defending Pokémon would be gone. If used in a battle against a trainer, when the Pokéballs representing their Pokemon would appear in the corner, they would have one fewer Pokéball. The implication was that the Pokémon died.

Id.

262. *Id.* The author states: "[W]hen your HP reached a critical point, Ghost would finally use Curse. The screen cut to black a final time. Regardless of the buttons you pressed, you were permanently stuck in this black screen. At this point, the only thing you could do was turn the Game Boy off. When you played again, "NEW GAME" was the only option—the game had erased the file." *Id.*

inevitability of death? The pointlessness of it? Perhaps he was simply trying to morbidly inject death and darkness into a children's game. Regardless, this children's game has made me think, and it has made me cry.²⁶³

It is possible that endogenous DRM can effectively convey anti-piracy messages. If endogenous DRM were able to show pirates the repercussions of their actions on independent developers, the message "Don't Pirate" would be given some context. This may be conveyed by treating pirates as cheaters, implicitly informing all users that piracy is against the rules of the game. Or more simply, the DRM can embarrass, frustrate, or humiliate players through in-game measures.

This technology is an exciting development in the quest to impart the moral wrongness of piracy. The past success of endogenous DRM in combating piracy and the unique ability of endogenous DRM to communicate ideas can perhaps accomplish what statutory damages could not.

VI. CONCLUSION

PC video game piracy is rampant, and it is coupled with a popular notion that piracy is justified due to corporate greed or incompetence. The legal response has not made game developers or any intellectual property rights-holders seem particularly sympathetic. Traditional DRM, while effective to a degree, can be over-intrusive and impact the experience of even licensed users, leading to negative PR and providing additional rationales for piracy. While voluntary payment models may reveal the emptiness of many of the asserted justifications for piracy, developers are unlikely to abandon DRM entirely.

On the other hand, endogenous DRM, which frustrates pirates using in-game elements, appears to deter piracy without angering licensed users. In fact, games have received positive press for novel DRM techniques, which highlight the creativity of developers and amuse the consumer-base. While further study of

263. *Id.*

specific endogenous DRM interventions is required, case studies of high profile releases utilizing endogenous DRM have shown that such DRM can undermine the confidence of pirates that their copies will actually function, and can do so without significant annoyance to legitimate purchasers. In the long run, it may change consumer attitudes about piracy by making it more enjoyable to mock pirates than to join them.

