IN THE SHADOW OF INNOVATION

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ABSTRACT

We are in the midst of the intellectual property wars. Scholars, judges, legislators, corporations, creators, and inventors disagree about the role of intellectual property rights. Yet, surprisingly everyone agrees about innovation—everyone loves innovation. Innovation appears everywhere: in legal scholarship, case law, legislative hearings, newspapers, and blogs. It is uniformly admired and aspired to—though almost never questioned.

Innovation is often assumed to have historically held a central role in the technology regulating legal regime. This Article presents a study of case law, which demonstrates that contrary to common belief, the celebration of innovation is, in fact, a relatively recent trend originating in the mid-1980s—at the advent of the intellectual property wars.

This Article critically examines this celebration of innovation. It argues that while innovation is promoted as the key to progress and advancement of human welfare, the exclusive status it obtained

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frustrates the very same goals. While innovation draws our attention to the beginning of the technological life cycle, the legal regime dedicates sparse attention and few resources to the cycle's subsequent stage: the diffusion process of new technologies. Yet, the promotion of progress and human welfare is just as dependent on the technology's diffusion—its social adoption process—as it is reliant on its innovation.

To support this argument, this Article presents the case-studies of digital music and genetic testing. It shows that while the legal regime focuses on the effects of copyright enforcement on digital music innovation and the ramifications of gene patents for innovation in the field of genetics, it fails to invest its resources to resolve the social adoption problems of these very same technologies. This Article concludes by proposing ways toward resolving the diffusion delays of genetic testing and digital music technologies.

INTRODUCTION

We adore genius and admire creators. We celebrate the achievements of Thomas Edison,[1] and the extraordinary talent of Wolfgang Amadeus Mozart.[2] We put brilliance, creativity, and innovation up on a pedestal, often tying these qualities to progress and overall improvement in human welfare.[3] Yet, despite our admiration of novelty and creation and the desire to progress and move forward, many of the innovations that eventually transformed our lives have taken decades or even centuries to reach mainstream social adoption. Many technologies we believe are recent innovations are, in fact, older technologies that underwent long social adoption processes. For

1 *See* 4 THE NEW ENCYCLOPÆDIA BRITANNICA 370 (15th ed. 1993) (describing the works of Thomas Edison).

2 *See* 24 *id.* at 445 (describing the achievements of Wolfgang Amadeus Mozart).

3 *See, e.g.*, Andrew Beckerman-Rodau, *Patent Law—Balancing Profit Maximization and Public Access to Technology*, 4 COLUM. SCI. & TECH. L. REV. 1, 2 (2002) (connecting technological innovation to health and well-being); James Boyle, *A Manifesto on WIPO and the Future of Intellectual Property*, 2004 DUKE L. & TECH REV. 9, 15 (referring to the relationship between innovation, international development, and human well-being); Marina Lao, *Unilateral Refusals to Sell or License Intellectual Property and the Antitrust Duty to Deal*, 9 CORNELL J.L. & PUB. POL'Y 193, 211-13 (1999) (referring to the relationship between innovation and economic growth); Ruth Okediji, *Public Welfare and the Role of the WTO: Reconsidering the TRIPS Agreement*, 17 EMORY INT'L L. REV. 819, 836-37, 918 (2003) (referring to the relationship between intellectual property, innovation, and welfare); J.H. Reichman & Paul F. Uhlir, *Database Protection at the Crossroads: Recent Developments and Their Impacts on Science and Technology*, 14 BERKELEY TECH. L.J. 793, 817 (1999) (referring to the relationship between chosen intellectual property regime and progress); Shanker A. Singham, *Competition Policy and the Stimulation of Innovation: TRIPS and the Interface Between Competition and Patent Protection in the Pharmaceutical Industry*, 26 BROOK. J. INT'L L. 363, 375 (2000) (linking technological innovation and growth in public welfare).

example, many consider the email to be a 1990s technology. Yet, the first email was sent from one computer to another in 1971.[4] In 1976, email was used by Jimmy Carter's presidential campaign; Queen Elizabeth II of England sent her first email over the Atlantic that very same year.[5]

This Article explores the law's inconsistent approach to new technologies. This Article argues that the law encourages and intensely pursues technological innovation, motivated by a belief that the promotion of innovation plays a key role in advancing human progress. Yet, the law paradoxically neglects the next stage in the life-cycle of a new technology—its diffusion—its widespread adoption.[6] While admiring the glamorous and the innovative, the law tends to disregard the mundane—the everyday use of existing technologies.[7] Attaining the progress objective, however, requires not just innovation but also an adoption process. Progress can be attained only if people adopt and use the new technology.[8]

To begin, this Article sets the stage of the contemporary celebration of innovation. Particularly, this Article underscores how our current preoccupation with innovation is closely tied to the intellectual property wars and Internet infrastructure and governance disputes. Scholars, judges, legislators, corporations, creators, and inventors

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[4] Ray Tomlinson is credited for inventing email. Specifically, he was the first to send messages to users who did not share the same computer. *See* Dave Crocker, Email History, http://www.livinginternet.com/e/ei.htm (last visited Apr. 5, 2010); Ian Hardy, The Evolution of ARPANET 11 (May 13, 1996) (unpublished thesis, University of California at Berkeley), *available at* http://www.livinginternet.com/References/Ian%20Hardy%20Email%20Thesis.txt; Ian Peter, The History of Email, http://www.nethistory.info/History%20of%20the%20Internet/email.html (last visited Apr. 5, 2010).

[5] *See* KATIE HAFNER & MATTHEW LYON, WHERE WIZARDS STAY UP LATE: THE ORIGINS OF THE INTERNET 212 (1996); Katie Hafner & Matthew Lyon, *Talking Headers*, WASH. POST MAG., Aug. 4, 1996, at 14; Hardy, *supra* note 4, at 33.

[6] The technological life cycle is comprised of three stages: invention—the technical discovery, innovation—the first commercially successful application of the technology, and diffusion—the technology's widespread social adoption. Yet, invention and innovation are used interchangeably by most legal players. Most academics, legislators, and judges refer, in fact, to the act of invention—the technical discovery—when mentioning innovation. This Article, therefore, follows the colloquial use of the term innovation, which often refers to the act of invention. *See* George S. Ford, Thomas M. Koutsky & Lawrence J. Spiwak, *A Valley of Death in the Innovation Sequence: An Economic Investigation* 10 (2007), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1093006 (describing the three stages of the technological cycle); *see also* EVERETT M. ROGERS, DIFFUSION OF INNOVATIONS 11 (5th ed. 2003) (defining diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system); F.M. SCHERER, INNOVATION AND GROWTH: SCHUMPETERIAN PERSPECTIVES 8-21 (1984) (distinguishing between invention and innovation); Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 803, 807 (1988) (discussing the distinction between invention and innovation); *infra* Part I.B (discussing the interchangeability of invention and innovation in innovation rhetoric).

[7] *See* ARNOLD PACEY, THE CULTURE OF TECHNOLOGY 94 (1983) (commenting on the preference for the glamorous and the tendency to accrue prestige to construction and creativity).

[8] *See infra* Part III.

engaged in these debates disagree on the role of intellectual property rights and on the resolution of Internet governance and infrastructure issues. Yet, surprisingly, everyone agrees about the prominent role of innovation. Everybody appears to worship innovation and all parties raise innovation arguments to justify their positions. Innovation rhetoric is present everywhere: in legal scholarship, case law, legislative hearings, newspapers, and blogs.[9]

Innovation occupies a central place in intellectual property legal scholarship. As much as it is relished and pursued, however, it is almost never critically explored.[10] Many scholars refrain from critically scrutinizing the role of innovation, assuming that innovation is and has always been an inherent part of the intellectual property debate.[11]

Surprisingly, this was not always the state of affairs. Although the promotion of innovation may have held a prominent role during earlier historical periods,[12] this Article presents an empirical study of case law, which reveals that innovation has reemerged to the center of the legal debate only during the 1980s.[13]

Once this Article establishes that the prominent role of innovation is, in fact, a recent phenomenon, it uses two case-studies to demonstrate that—while the legal regime focuses and uniformly agrees on the need to promote innovation to advance progress—it paradoxically neglects a crucial part of the technological cycle—its diffusion process. This Article examines the diffusion delays of two new technologies: genetic testing and digital music. Both cases underscore the bias in

9 *See infra* Part I.A.

10 Exceptions are usually writings outside the area of intellectual property, mainly in the areas of health law and environmental law. *See generally* Anna C. Mastroianni, *Liability, Regulation and Policy in Surgical Innovation: The Cutting Edge of Research and Therapy*, 16 HEALTH MATRIX 351 (2006) (undertaking a cautious approach to surgical innovations). For a notable exception among intellectual property scholars, see Frank Pasquale, *Copyright in an Era of Information Overload: Toward the Privileging of Categorizers*, 60 VAND. L. REV. 135 (2007) (discussing the cost of information overload).

11 *See, e.g.*, Tom W. Bell, *Indelicate Balance in Copyright and Patent Law*, *in* COPY FIGHTS: THE FUTURE OF INTELLECTUAL PROPERTY IN THE INFORMATION AGE 1, 3, 5 (Adam Thierer & Clyde Wayne Crews Jr. eds., 2002); Thomas F. Cotter, *Memes and Copyright*, 80 TUL. L. REV. 331, 333 (2005); Lawrence A. Cunningham, *Private Standards in Public Law: Copyright Lawmaking and the Case of Accounting*, 104 MICH. L. REV. 291, 309 (2005); Edwin C. Hettinger, *Justifying Intellectual Property*, 18 (1) PHIL. & PUB. AFF. 31, 47 (1989); Mark A. Lemley, *Romantic Authorship and the Rhetoric of Property*, 75 TEX. L. REV. 873, 888-89 (1997); Maureen A. O'Rourke, *Evaluating Mistakes in Intellectual Property Law: Configuring the System to Account for Imperfection*, 4 J. SMALL & EMERGING BUS. L. 167, 169-70 (2000); Susan Sell, *Intellectual Property and Public Policy in Historical Perspective: Contestation and Settlement*, 38 LOY. L.A. L. REV. 267, 267 (2004) (discussing the prominence of the promotion of innovation—the utilitarian goal—in intellectual property discourse).

12 For an example of innovation rhetoric in early American legal thought, see Letter from Thomas Jefferson to Benjamin Waterhouse (Mar. 3, 1818), *in* 15 THE WRITINGS OF THOMAS JEFFERSON 162 (Richard Holland Johnson ed., Thomas Jefferson Memorial Association of the United States 1903) (discussing the importance of scientific innovation).

13 *See infra* Part II.A.

contemporary intellectual property debate. Namely, attention and resources are focused on the impact of expanding intellectual property rights on innovation, while failing to address the detrimental impact of these rights on the social adoption of these technologies.

First, while the debate regarding gene patents focused on the effect of patents on innovation in biotechnology, gene patents have also had a detrimental impact on the use of genetic testing to identify genetic mutations linked to different diseases.[14] Specifically, empirical data shows that laboratories and doctors, deterred by patent owners' threats and the general atmosphere of uncertainty surrounding DNA patent rights, ceased offering a range of important genetic tests.[15]

Secondly, as the number of copyright lawsuits involving peer-to-peer music file-sharing increased, and digital music-sharing services shut down, many lamented the loss in terms of innovation. The story of digital music was inserted into the accepted narrative of expanding intellectual property inhibiting innovation.[16] Yet, the story of digital music technology is, in fact, not a tale of stifling innovation, but of inhibited diffusion. Copyright enforcement played a role in inhibiting the adoption of digital music technology. It frustrated the consumer's digital music experience and created uncertainty that hindered patently legal uses of digital music technology.

This Article underscores the need to channel attention and resources to overcome diffusion failures. Specifically, it proposes ways to resolve the social adoption failures of genetic testing and digital music technologies.[17]

This Article proceeds as follows: Part I describes the celebration of innovation. Particularly, it shows the extent to which the parties to the intellectual property and the Internet governance and infrastructure debates rely on innovation arguments in scholarship, the legislative and judicial arenas, and the popular debate. It then explores the scope of innovation rhetoric and the meaning that users of innovation rhetoric associate with it. Part II presents the results of an empirical analysis of intellectual property cases decided in 1946-2005, which reveal that it is only since the mid-1980s that innovation has ascended to its prominent status in contemporary intellectual property debate. It then proceeds to explore the reasons for the ascent of innovation during the 1980s. Part III argues that while innovation is hailed to promote progress,

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[14] *See infra* Part IV.A.

[15] *See* Mildred K. Cho et al., *Effects of Patents and Licenses on the Provision of Clinical Genetic Testing Services*, 5(1) J. MOLECULAR DIAGNOSTICS 3 (2003) (discussing the effect of gene patents on the diffusion of twelve available genetic tests); Jon F. Merz et al., *Diagnostic Testing Fails the Test*, 415 NATURE 577 (2002) (discussing the effect of gene patents on the diffusion of the Haemochromatosis genetic test).

[16] *See infra* Part IV.B.

[17] *See infra* Part IV.

diffusion—the subsequent stage of the technological cycle, which is as crucial for the promotion of progress—is neglected. Relatively little attention and few resources are dedicated to the diffusion process of existing technologies. Finally, Part IV presents two recent diffusion problems involving genetic testing and digital music technologies. These case-studies highlight the costs of the legal regime's inattention to the fate of new technologies beyond the initial innovation stage and propose ways of overcoming the diffusion problems.

I. CELEBRATING INNOVATION

A. *The Innovation Dance*

Innovation is in the air. Everyone talks about innovation. This Part will highlight the prominence that innovation has achieved in our discourse and explore its scope. Primarily, this Part will depict two zones in which debates are governed by innovation rhetoric: the intellectual property wars and the Internet governance and infrastructure control controversies. It will show that innovation rhetoric is prevalent across forums, including the judicial, academic, legislative, and popular arenas. Once this Article establishes the prominence of innovation rhetoric, it will seek to explore its scope. Specifically, this Part will examine the terminology included within innovation rhetoric and the meaning intended by its users.

1. The Intellectual Property Wars

The intellectual property wars are on. As the dominant means of production changed from the physical to the intangible, the determination of the appropriate scope of intellectual property rights became more crucial.[18] A group of scholars initiated the intellectual property wars in the 1980s.[19] During the 1980s, the wars focused on the expansion of patentable and copyrightable subject matter. Opponents of expanding intellectual property rights waged war on proponents of strong copyright, patent, and trademark rights.[20]

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[18] *See* Dan Hunter, *Culture War*, 83 TEX. L. REV. 1105, 1106-07 (2005) (discussing the advent of the intellectual property wars).

[19] *See id.*

[20] *See, e.g.*, Feist Publ'ns Inc. v. Rural Tel. Serv. Co., 499 U.S. 340 (1991) (litigating whether the selection, compilation, and arrangement of a white pages directory warrants copyright protection); Diamond v. Chakrabarty, 447 U.S. 303 (1980) (litigating whether genetically engineered bacterium meets the Patent Act's subject matter requirement).

The intellectual property battles escalated during the 1990s.[21] One prominent battleground was the Supreme Court litigation in *Eldred v. Ashcroft*, where litigants challenged the extension of the copyright term by twenty years.[22] A second major combat zone revolved around the fate of peer-to-peer music-sharing systems. The battle reached the Supreme Court in *MGM Studios v. Grokster*[23] and is ongoing as the music industry sues individuals who allegedly infringe the copyright in its music.[24] Also in the copyright arena, the Digital Millennium Copyright Act (DMCA), supported by the content industry (including music and film producers), was a source of controversy since its enactment. The controversy focused on the anti-circumvention provisions.[25] While public attention focuses less on patent disputes than on copyright controversies, one patent battleground involving the price of patented drugs, particularly AIDS drugs in developing countries, reached the popular debate.[26] Drug companies and activists clashed on whether exercising patent monopolies in vital drugs in developing countries is legitimate.[27]

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[21] *See* Hunter, *supra* note 18, at 1105, 1112-13 (describing the acceleration of the intellectual property wars).

[22] Eldred v. Ashcroft, 537 U.S. 186, 193 (2003).

[23] MGM Studios v. Grokster, 545 U.S. 913 (2005).

[24] *See, e.g.*, Warner Bros. Records v. Tallie Stubbs, No. CIV-06-793-M, 2007 U.S. Dist. LEXIS 47958, at *2 (W.D. Okla. July 2, 2007); UMG Recordings, Inc., v. Lindor, No. CV-05-1095 (DGT), 2006 U.S. Dist. LEXIS 83486, at *1-2 (E.D.N.Y. Nov. 9, 2006); BMG Music v. Gonzalez, 430 F.3d 888, 889 (2005).

[25] *See* Circumvention of Copyright Protection Systems, 17 U.S.C.S. § 1201 (2007); Universal City Studios, Inc. v. Corley, 273 F.3d 429, 434-36 (2d Cir. 2001) (challenging the constitutionality of the DMCA under the First Amendment); *Digital Media Consumers' Rights Act of 2002: Hearing on H.R. 107 Before the Subcomm. on Commerce, Trade, and Consumer Protection of the H. Comm. on Energy and Commerce*, 108th Cong. (2004) (statement of Rep. Rick Boucher) (proposing amendments to address the criticism of the DMCA); *Statements on Introduced Bills and Joint Resolutions: Digital Millennium Copyright Act of 1998: Hearing on H.R. 2281 Before the S.*, 105th Cong. (1998) (statement of Sen. Patrick J. Leahy) (supporting the enactment of the DMCA).

[26] *See, e.g.*, Pamela Constable, *Poverty, Prejudice Hinder India's AIDS Fight; Drug Maker Fears "Another Africa,"* WASH. POST, Mar. 7, 2001, at A1 (describing the market for lower priced AIDS drugs in India); Rachel L. Swarns, *Companies Begin Talks with South Africa on Drug Suit*, N.Y. TIMES, Apr. 18, 2001, at 3 (describing negotiations to reduce the prices of patented AIDS drugs in South Africa).

[27] *See generally* Jamie Eisenfeld & François Serres, *African Legal Developments in the United States and Sub-Saharan Africa*, 35 INT'L LAW. 869, 877 (2001) (reporting a lawsuit filed in South Africa by drug companies to challenge a statutory provision allowing the invalidation of certain drug patents); Donald G. McNeil, Jr., *New List of Safe AIDS Drugs, Despite Industry Lobby*, N.Y. TIMES, Mar. 21, 2002, at A3 (reporting the reactions of patent-holding drug companies and generic drug companies to a World Health Organization's list of manufacturers of safe AIDS drugs). Among the organizations combating drug companies' intellectual property monopolies are: the Health Global Access Project, http://www.healthgap.org/ (last visited Apr. 5, 2010); the Consumer Project on Technology, http://www.cptech.org/ (last visited Apr. 5, 2010); and the Bill and Melinda Gates Foundation, http://www.gatesfoundation.org (last visited Apr. 5, 2010).

All these debates are characterized by passion, uncompromising ideologies, and often heated tones.[28] Yet, surprisingly, as each side digs its heels in opposing positions, all share an ideological goal. All parties argue in the name of promoting innovation—all sides worship innovation.[29] The adulation of innovation crosses ideological frontiers and battle zones. It appears in academic articles, legislative battles, the courts, the traditional media, and the blogosphere.

a. The Academic Debate

In academic legal literature, advocates of strong intellectual property rights argue that intellectual property rights are necessary incentives for promoting innovation.[30] For example, intellectual property rights advocates argue that strong patent rights promote innovation in drug development.[31] Similarly, they argue for the need to defend copyright owners to promote innovation in the area of computer software.[32] Academics raise similar arguments in the international trade context. In the General Agreement on Tariffs and Trade (GATT), intellectual property rights advocates explained that "[t]o encourage innovation, facilitate progress and expedite improvement in standards of living around the globe, intellectual property needs to be protected from current widespread piracy. Without the limited periods of market exclusivity afforded by patent, copyright, trademarks and so on, to encourage innovation the wheels of progress would turn far too slowly."[33]

At the same time, opponents of strong intellectual property rights reject the assumption underlying the proprietary model that intellectual

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[28] The temperament of the intellectual property debates is captured in a blog post titled "Don't Write Angry!" In this blog post Bruce Boyden writes "[w]ay too much writing about copyright issues is done by first, [sic] allowing your blood pressure and heart rate to rise as high as possible, and then second doing your entire article (or blog comment) in 'steamed' mode." Posting of Bruce Boyden to Concurring Opinions, Don't Write Angry! (Jul. 19, 2006), http://www.concurringopinions. com/archives/2006/07/dont_write_angr_1.html.

[29] *See* R. Polk Wagner, *Information Wants to Be Free: Intellectual Property and the Mythologies of Control*, 103 COLUM. L. REV. 995, 1001-02 (2003); Tim Wu, *The Broadband Debate, A User's Guide*, 3 J. ON TELECOMM. & HIGH TECH. L. 69, 70, 80 (2004).

[30] *See* Philip J. Weiser, *The Internet, Innovation and Intellectual Property Policy*, 103 COLUM. L. REV. 534, 576-78 (2003) (describing the proprietary control model).

[31] *See, e.g.*, James Langenfeld & Wenqing Li, *Intellectual Property and Agreements to Settle Patent Disputes: The Case of Settlement Agreements with Payments from Branded to Generic Drug Manufacturers*, 70 ANTITRUST L.J. 777 (2003).

[32] *See, e.g.*, Arthur R. Miller, *Copyright Protection for Computer Programs, Databases and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1024 (1993).

[33] Judith H. Bello & Alan F. Holmer, *The Uruguay Round: Where Are We?*, 25 INT'L L. 723 (1991).

property creates incentives for innovation. Instead, they argue that intellectual property protection is not the main catalyst in promoting innovation and that innovation would be achieved without it.[34] Moreover, these scholars posit that intellectual property rights inhibit innovation because they raise the costs of future innovations. They explain that a large public domain is necessary for the promotion of subsequent innovations, as innovations do not rise from scratch but are based on existing creations and inventions. If the public domain shrinks and many of these materials are no longer in the public realm, future innovation will be curtailed.[35]

Some scholars advocating the limitation of intellectual property rights treat innovation as the goal itself while others view it as a means for accomplishing other social goals. Lawrence Lessig is the leading protagonist of innovation as a social goal. Lessig explains that the intellectual property regime does not promote progress—it locks up the resources that spur innovation. According to Lessig, "[t]he commitment of a society open to innovation must be to let the old die young."[36] Other scholars, including Jack Balkin and Yochai Benkler, treat innovation and creativity as means for accomplishing other societal goals such as self-realization, self-fulfillment, autonomy, democracy, critical culture, and justice.[37] However, regardless of whether innovation is treated as a goal or as means to other goals, it plays a pivotal role in the rationale for limiting intellectual property rights.

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[34] *See* Julie E. Cohen, *Copyright, Creativity, Catalogs: Creativity and Culture in Copyright Theory*, 40 U.C. DAVIS L. REV. 1151, 1192-98 (2007) (arguing for decentering creativity); Weiser, *supra* note 30, at 570 (describing the commons model).

[35] *See* Michael A. Heller & Rebecca Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 699 (1998); Jessica Litman, *The Public Domain*, 39 EMORY L.J. 965, 1023 (1990); Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663, 705; Pamela Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 MINN. L. REV. 471, 493 (1985); Wagner, *supra* note 29, at 998, 1020; Weiser, *supra* note 30, at 570. In some writings discussing the importance of the public domain, the ultimate goal of promoting innovation appeared as an unstated assumption. *See* James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 LAW & CONTEMP. PROBS. 33, 37-39 (2003); Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 LAW & CONTEMP. PROBS. 289, 295 (2003); Pamela Samuelson, *Mapping the Digital Public Domain: Threats and Opportunities*, 66 LAW & CONTEMP. PROBS. 147, 155 (2003).

[36] *See* LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD 217 (2001).

[37] *See* YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM 133-355 (2006); Jack M. Balkin, *Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society*, 79 N.Y.U. L. REV. 1, 48-51 (2004).

b. In the Legislative Arena

The debates regarding the relationship between intellectual property rights and innovation extend to the legislative and government arenas.[38] A particularly fierce battle surrounded the legislation of the DMCA and its anti-circumvention provisions. The DMCA's anti-circumvention provisions prohibit use or production of devices that can overcome Digital Rights Management (DRM) systems.[39] DRM consists of technological measures that copyright holders use to control copyrighted materials. For example, a right-holder would encrypt a DVD to prevent copying. In the case of the DVD, decrypting devices that would enable users to make additional copies of the DVD would be illegal under the DMCA's anti-circumvention provisions.[40] Advocates of strong intellectual property rights supported the DMCA. Invoking innovation arguments, they argued that the DMCA would encourage creativity in the content industry.[41] For example, preventing the copying of DVDs would encourage creativity in the film industry. At the same time, opponents of strong intellectual property rights objected to the DMCA anti-circumvention provisions, arguing that these provisions protect content-providers at the cost of curtailing technological innovation. They explained that innovators of new technologies would be inhibited for fear of copyright liability.[42]

[38] In the government arena, some government agencies emphasize the importance of intellectual property rights for the promotion of innovation and consequently for human welfare. *See* Todd Dickinson, *E-Commerce, Business Method Patents, and the USPTO: An Old Debate for a New Economy*, 19 CARDOZO ARTS & ENT. L.J. 389, 390, 398 (2001) (speech by the Director of the United States Patent and Trademark Office describing the importance of intellectual property rights for innovation); U.S. Department of Justice and Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property, § 1.0, 4 TRADE REG. REP. (CCH) ¶ 13, 132 (1995), *available at* http://www.usdoj.gov/atr/public/guidelines/0558.htm ("The intellectual property laws and the antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare."). The Federal Trade Commission, on the other hand, examined whether the current balance between competition and patent law inhibits innovation. *See* FEDERAL TRADE COMMISSION, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 2-18 (2003), *available at* http://www.ftc.gov/os/2003/10/innovationrpt.pdf.

[39] *See* 17 U.S.C.S. § 1201 (2007).

[40] *See, e.g.*, Universal City Studios, Inc. v. Reimerdes, 111 F. Supp. 2d 294, 317-19 (S.D.N.Y. 2000) (holding that the decryption program DeCSS is a circumventing device under the DMCA); *see also* Niva Elkin-Koren, *Making Room for Consumers Under the DMCA*, 22 BERKELEY TECH L.J. 1119 (2007) (describing DRM systems and the effect of the DMCAs anti-circumvention provisions).

[41] *See, e.g.*, *Statements on Introduced Bills and Joint Resolutions*, *supra* note 25.

[42] *See, e.g.*, *WIPO Copyright Treaties Implementation Act: Hearing on H.R. 2281 Before the Subcomm. on Telecommunications, Trade and Consumer Protection*, 105th Cong. 5 (1998) [hereinafter *WIPO Hearing*] (statement of Seth Greenstein, Digital Media Association, representing the interests of music and video Internet start-up companies); *The Online Copyright Limitation Liability Act and the WIPO Copyright Treaties Implementation Act: Hearing on H.R.*

c. In the Courts

The flagship cases of the intellectual property war are saturated with references to innovation made by all parties to the debate. To support their opposing views, both sides repeatedly raise the innovation arguments in judicial forums. For example, in the Supreme Court litigation, *Metro-Goldwyn-Mayer v. Grokster*,[43] both parties' briefs and the amicus briefs repeatedly underscored the innovation theme. The Court was charged with deciding whether the peer-to-peer music file-sharing system, Grokster, was contributorily negligent for the copyright violations committed by its users. Particularly at issue was whether the Supreme Court should overturn the Ninth Circuit decision. The Ninth Circuit applied the *Sony* rule, under which there is no contributory liability for infringement when a technology is also capable of a substantial non-infringing use.[44] The Court held that under the *Sony* rule, Grokster was not liable because it was capable of substantial non-infringing use, such as downloading music that is in the public domain.[45]

In their petitioners' brief, the organizations representing the music and film industry argued that the Ninth Circuit's holding "threatens innovation—not only in artistic creation but also in software design . . . ."[46] Further, the brief charged that classical economic theory demonstrates that encouraging individual effort by personal gain, (i.e., copyright protection), is the best way to advance innovation that will improve public welfare. Without copyright protection they caution, "the powerful engine for creative effort and beneficial innovation is crippled."[47]

Grokster, in its respondents' brief, sounded a similar theme, arguing that the Court should adhere to the *Sony* rule in order to promote innovation. It cautioned that modifying the *Sony* rule would undermine its core policy: "[It] would deter investment in innovation by subjecting innovators to standards that are unpredictable in application and expensive to litigate."[48] Moreover, Grokster explained that the

2180 and H.R. 2281 Before the Subcomm. on Courts and Intellectual Property, 105th Cong. 4 (1997) (statement of Edward J. Black, President, Computer and Communications Industry Association, representing manufacturers and providers of computer information processing and communications-related products and services).

43 MGM Studios Inc. v. Grokster, Ltd., 545 U.S. 913, 918-21 (2005).

44 *Id.*; Sony Corp. v. Universal City Studios, Inc., 464 U.S. 417, 417-18 (1984).

45 *Grokster*, 545 U.S. at 918-21.

46 Brief of Petitioners at 20, *Grokster*, 545 U.S. 913 (No. 04-480).

47 *Id.* at 31-32.

48 Brief of Respondents at 14, 25-26, *Grokster*, 545 U.S. 913 (No. 04-480); *see also* Transcript of Oral Argument at 33, *Grokster*, 545 U.S. 913 (2005) (No. 04-480).

Sony rule protects products irrespective of whether they could be redesigned differently to reduce infringement. The prospect of litigation over possible design changes would "inhibit investment in innovation" and "chil[l] technological innovation."[49]

Interestingly, the use of the innovation theme was criticized in petitioner's reply brief: "[Grokster] avoid[s] discussion of [its] own conduct, purporting instead to champion the interests of innocent 'innovators' in need of sanctuary from the copyright laws . . . ."[50] Finally, the many amicus briefs also echoed the different versions of the innovation argument.[51]

d. The Popular Debate

The intellectual property debates are not confined to the academic, judicial, and legislative arenas. The mass media closely follows the legal intellectual property battles and echoes the innovation overtones. For example, headlines of reports covering the DMCA legislative hearings read: "Proposed Copyright Treaty Bill Could Stifle Innovation,"[52] while other reports cited supporters of the DMCA, stating that "this legislation will help encourage technological innovation and access to that innovation by ensuring scores of creative

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[49] Brief of Respondents, *supra* note 48, at 30-31.

[50] Reply Brief of Songwriter and Music Publisher Petitioners at 1, MGM Studios Inc. v. Grokster Ltd., 545 U.S. 913 (2005) (No. 04-480), 2005 WL 640967, at *1.

[51] For discussions of the innovation theme in amicus briefs, see Brief of Intel Corp. as Amicus Curiae Supporting Affirmance at 3-4, MGM Studios Inc. v. Grokster Ltd., 545 U.S. 913 (2005) (No. 04-480) (stating that the brief was filed to emphasize the chilling effect on innovation of computer, software, consumer electronics, and telecommunications companies that would flow from Petitioners' proposed departure from the *Sony* holding); Brief Amici Curiae of Innovation Scholars & Economists in Support of Affirmance at 2, 5-7, 12-13, 19, 21-22, *Grokster*, 545 U.S. 913 (No. 04-480) (warning against following Petitioner's construction of *Sony* and construing copyright law in a way that would inhibit innovation, which is crucial for economic growth); Brief of Internet Amici Cellular Telecommunications & Internet Ass'n et al. In Support of Affirmance at 1-2, 6-10, *Grokster*, 545 U.S. 913 (No. 04-480) (arguing that Petitioners' proposed modification of the *Sony* rule would inhibit innovation in Internet and communications technologies); Brief of Amici Curiae Emerging Technology Cos. in Support of Respondents at 7-8, 26, *Grokster*, 545 U.S. 913 (No. 04-480) (arguing that Petitioners' proposed modification of the *Sony* rule will inhibit the innovative activity of new "emerging technology companies, which are uniquely vulnerable to increased legal risk"); Brief of Amici Curiae Sixty Intellectual Property & Technology Law Professors et al. in Support of Respondents at 2, 5, 10, 13, 16, *Grokster*, 545 U.S. 913 (No. 04-480) (arguing that the secondary liability test proposed by Petitioners would result in instability and confusion that would substantially inhibit innovation and technological development).

[52] *Proposed Copyright Treaty Bill Could Stifle Innovation—Critics*, NEWSBYTES PM, Sept. 18, 1997, at *1; *see also* George Leopold, *System Vendors: Clause Stifles Innovation—Digital-Copyright Bill Sparks Computing Rift*, ELECTRONIC ENGINEERING TIMES, Aug. 11. 1997, at *1.

Americans that they'll get credit for their work and online pirates will get prosecuted for stealing."[53]

2. The Internet Battlefield

On a related front, commentators, legislators, and advocates are passionately debating the future of the Internet.[54] Specifically, the parties debate Internet governance and control over Internet infrastructure. All parties hail the potential of the Internet for innovation, describing it as the "the greatest innovation catalyst of our age,"[55] or the "innovation commons."[56] All sides believe in promoting the Internet's potential as an innovation platform. Yet, as is the case with the intellectual property wars, the parties are deeply divided regarding the means for achieving the innovation goal.

On one side of the debate are the "Openists."[57] The Openists believe that the Internet's potential for innovation will be maximized by maintaining an open and decentralized Internet infrastructure. They object to standardization that advantages certain devices over others.[58]

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53 *New Coalition Urges Congress to Strengthen the Internet with Legislation Securing Online Copyright with Liability Limits*, PR NEWSWIRE, June 18, 1998, at *2 (quoting Robert Holleyman, President and CEO of the Business Software Alliance).

54 *See generally* Christopher S. Yoo, *Would Mandating Broadband Network Neutrality Help or Hurt Competition? A Comment on the End-to-End Debate*, 3 J. TELECOMM. & HIGH TECH. L. 23 (2004) (criticizing network neutrality proposals); Jeffrey H. Birnbaum, *No Neutral Ground in This Internet Battle*, WASH. POST, June 26, 2006, at D1 ("'What is really a commercial fight [the network neutrality debate] has now become extremely emotional.'" (quoting Robert Pepper, Senior Managing Director of Cisco Systems, Inc.)); Hiawatha Bray, *Senate Fight Looms Over Extra Net Fees*, BOSTON GLOBE, June 10, 2006, at B8 (reporting the defeat of a bill designed to empower the Federal Communications Commission to block premium Internet pricing plans); John Dunbar, *Senators Renew Push for Internet 'Network Neutrality,'* ASSOCIATED PRESS, Jan. 9, 2007, 1/9/07 APDATASTREAM 22:44:14 (Westlaw) (noting that "net neutrality should be named 'net regulation'" and that "lawmakers are 'trying to solve a problem that doesn't exist'" (quoting Peter Davidson, Senior Vice President for Federal Government Relations, Verizon)). Much of the network neutrality debate is taking place in the blogosphere. *See, e.g.*, Dana Blankenhorn, *Moore's Lore: Net Neutrality Will Triumph*, CORANTE, Nov. 1, 2005, http://mooreslore.corante.com/archives/2005/11/01/net_neutrality_will_triumph.php (criticizing comments made by Ed Whiteacre, Chief Executive Officer of Southwestern Bell Corporation against network neutrality and in favor of paid content access); Susan Crawford Blog, Substrate Neutrality, http://scrawford.blogware.com/blog/_archives/2006/3/11/1814852.html (Mar. 11, 2006, 12:48 EST) (arguing against propertization and vertical integration of broadband networks).

55 Wu, *supra* note 29, at 74.

56 LESSIG, *supra* note 36, at 23.

57 This term was coined by Tim Wu. *See* Wu, *supra* note 29, at 69.

58 *See* Susan P. Crawford, *Shortness of Vision: Regulatory Ambition in the Digital Age*, 74 FORDHAM L. REV. 695, 741-43 (2005) (arguing that communities should adopt their own information filters rather than have government imposed filters). For a different take on the openness argument, see Jonathan L. Zittrain, *The Generative Internet*, 119 HARV. L. REV. 1974 (2006).

In the recently heated network neutrality debate, they are arguing against allowing network owners to discriminate between types of contents, providing certain contents with faster Internet transport. They explain that discriminatory broadband transport will give preference to content provided by large corporate content-providers over individual users or smaller entities.[59] Finally, Openists reject centrally controlled Internet governance, promoting instead decentralized Internet control.[60] Openists argue that an open and decentralized Internet will be most effective in supporting innovation. Innovation, according to the Openists, comes from the ends. The Internet's creative users are those who drive innovation through the diversity and richness of human choices. Openists reject the notion that innovation arises from the center of the network—the network owners.[61] Their beliefs regarding the source of innovation guide their choices for Internet infrastructure and governance.

The opposing camp, the "Centralists," advocate central control and propertization of the Internet.[62] In the network neutrality debate they promote a scheme allowing broadband carriers to offer different transport options.[63] Under this scheme, the user would receive the content of some websites faster than that of others. The Centralists argue that maintaining control at the core of the network is imperative for innovation. The innovation that will drive the next communications revolution, according to the Centralists, will emerge not from the ends of the network, but from its center. The network owners, not the users, will be the primary engine for innovation. The network owners are the ones who will develop the technologies that will shape the next Internet generation. [64]

As is the case with the intellectual property battles, the Internet governance and infrastructure debate and its innovation rhetoric spawned legislative hearings,[65] judicial and administrative hearings,[66]

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[59] LESSIG, *supra* note 36, at 156, 161; Susan P. Crawford, *Network Rules*, 70 L. & CONTEM. PROBS. 51, 57 (2007); Wu, *supra* note 29, at 73.

[60] LESSIG, *supra* note 36, at 139-40; Tim Wu, *Intellectual Property Innovation and Decentralized Decisions*, 92 VA. L. REV. 123, 125-26 (2006); Wu, *supra* note 29, at 73-74.

[61] *See* Crawford, *supra* note 58, at 696, 701; Wu, *supra* note 29, at 72-73; *see also* Lawrence B. Solum & Minn Chung, *The Layers Principle: Internet, Architecture and the Law*, 79 NOTRE DAME L. REV. 815, 819-820 (2004) (arguing that regulation which fails to respect layers' architecture threatens Internet transparency, which is crucial for low cost innovation).

[62] *See* Wu, *supra* note 29, at 79.

[63] *See id.* at 73-74.

[64] *See id.*

[65] *See, e.g.*, *Network Neutrality: Hearing Before the S. Comm. on Commerce, Science and Transportation*, 109th Cong. (2006) (statement of Vinton G. Cerf, Vice President and Chief Internet Evangelist, Google, Inc.), *available at* http://commerce.senate.gov/pdf/cerf-020706.pdf (emphasizing the importance of network neutrality for innovation); *Network Neutrality: Competition, Innovation and Nondiscriminatory Access: Hearing before the H. Comm. on the Judiciary, Task Force on Telecom and Antitrust*, 109th Cong. 5 (2006) (statement of Tim Wu,

the popular media,[67] and the blogosphere.[68] The adulation of innovation was again voiced by opposing camps through the different mediums of debate.

B. *The Contours of Innovation Rhetoric*

Doubtless, innovation talk is in the air. Yet, innovation rhetoric has a fuzzy quality to it. Users of innovation rhetoric do not confine themselves to the term innovation. Instead, they often use it interchangeably with related terms, such as creativity, invention, and diversity.

Although the terms included under the innovation rhetoric umbrella are not synonymous, the majority of academics and even more so legal practitioners and the media use them casually and interchangeably. Specifically, some scholars view innovation as distinct from creativity. They define innovation as an invention or creation that is capable of competing in the market, while they conceive of creativity as the making of something new that expresses the individuality of the creator.[69] Yet, most scholars disregard this

Professor, Columbia Law School), *available at* http://commdocs.house.gov/committees/judiciary/hju27225.000/hju27225_0f.htm (arguing that a discriminatory infrastructure would "slow innovation—for it would no longer be the best car than [sic] wins, but the one that signs the best deals and slows down their competitors"); *Network Neutrality: Hearing before the S. Comm. on Commerce, Science and Transportation*, 109th Cong. (2006) (statement of Kyle D. Dixon, Senior Fellow and Director, Federal Institute for Regulatory Law and Economics, The Progress and Freedom Foundation), *available at* http://commerce.senate.gov/pdf/dixon-020706.pdf (arguing that implementation of the network neutrality principle would discourage innovation in broadband networks).

66 *See, e.g.*, Vonage Holding Corp. v. The Minnesota Public Utilities Comm'n, 290 F. Supp. 2d 993, 994 (D. Minn. 2003) (incorporating the innovation theme into litigation arguments regarding regulation of voice over Internet Protocol Services (VoIP) services); FED. COMMC'N COMM'N, IN THE MATTER OF INQUIRY CONCERNING HIGH-SPEED ACCESS TO THE INTERNET OVER CABLE AND OTHER FACILITIES, 15 F.C.C.R. 19287, 19287, 19288, 19293, 19298, 19301 (2000) (raising the innovation theme in a proceeding exploring regulation of the provision of high speed Internet access).

67 *See, e.g.*, Editorial, *The Internet's Future: Congress Should Stay Out of Cyberspace*, WASH. POST, June 12, 2006, at A20 (arguing that the innovation arguments against network neutrality are stronger than the innovation arguments that support network neutrality).

68 Karl Auerbach, *Forgotten Principles of Internet Governance*, CIRCLEID, Oct. 22, 2005, http://www.circleid.com/posts/forgotten_principles_of_internet_governance (arguing that Internet governance should be guided by the principle that Internet innovation originates from the users); Susan Crawford Blog, The Big Idea, http://scrawford.blogware.com/blog/_archives/2005/11/8/1362466.html (Nov. 8, 2005, 16:35 EST) (arguing for local autonomy in lieu of global rules to preserve innovation on the Internet).

69 *See* Brett M. Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917, 1012-13, n.370 (2005); Ruth L. Gana, *Has Creativity Died in the Third World? Some Implications of the Internationalization of Intellectual Property*, 24 DENV. J. INT'L L. POL'Y 109, 116 n.26 (1995). For an in depth analysis of the relationship and distinction between innovation and creativity, see WILLIAM KINGSTON, INNOVATION,

distinction. Some scholars discuss copyright law's creativity goal in conjunction with economic objectives.[70] Furthermore, many academics refer to "innovation and creativity" simultaneously, at times expressly selecting to treat the two as one,[71] but mostly paying no heed to the differences.[72] The academic inclination to treat innovation and creativity as one is reflected in the popular debate.[73]

Users of innovation rhetoric also regularly interchange the terms innovation and invention. The interchangeability of innovation and invention is particularly revealing. It sheds light on the de facto meaning of innovation rhetoric for its speakers. Invention and innovation are, in fact, two distinct stages of the technological cycle. Economists distinguish between invention—the technical discovery—which is the first stage of the technological cycle, and innovation—the first commercially successful application of a new technology—which is the second stage of the technological cycle.[74] The final stage of the cycle is diffusion—the technology's widespread adoption.[75]

Legal scholars generally fail to distinguish appropriately between the invention and innovation stages. Although some legal scholars define innovation as the commercialized application of the invention,[76] others recognize the difference, but explain that they use the term innovation to connote both the invention stage and its commercial application.[77] At the same time, most legal scholars use the term

CREATIVITY AND LAW 1-20, 194-203 (Studies in Industrial Organization Series Vol. 10, 1990).

70 For writings describing competing formulations of creativity, including economic conceptions, see Cohen, *supra* note 34, at 1152; Roberta Rosenthal Kwall, *Inspiration and Innovation: The Intrinsic Dimension of the Artistic Soul*, 81 NOTRE DAME L. REV. 1945, 1980 (2006).

71 LESSIG, *supra* note 36, at 10 (explaining that although innovation is distinguished from creativity and creativity is distinguished from commerce, the Internet enables both forms).

72 *See, e.g.*, Balkin, *supra* note 37, at 33 ("[T]he Internet, taken as a whole, is full of innovation. The tremendous growth of the Internet in a relatively short period of time shows how enormously creative ordinary people can be if given the chance to express themselves.").

73 Interestingly, even dictionaries fail to distinguish between "creativity" and "innovation." Innovation is usually defined as the "introduction of new things or methods." THE RANDOM HOUSE UNABRIDGED DICTIONARY (2006), *available at* http://dictionary.reference.com/browse/innovation. Similarly, creativity is defined as "the ability to transcend traditional ideas, rules, patterns, relationships, or the like, and to create meaningful new ideas, forms, methods, interpretations, etc." THE RANDOM HOUSE UNABRIDGED DICTIONARY (2006), *available at* http://dictionary.reference.com/browse/creativity. Dictionaries generally do not tie innovation to a commercial endeavor. An exception to this is the Oxford English Dictionary, where four definitions of innovation focus on the newness element, while the fifth defines innovation as the "action of introducing a new product into the market." 7 OXFORD ENGLISH DICTIONARY 998 (2d ed. 1989).

74 *See* SCHERER, *supra* note 6; Merges, *supra* note 6.

75 *See* Ford, Koutsky & Spiwak, *supra* note 6; *see also* ROGERS, *supra* note 6; SCHERER, *supra* note 6; Merges, *supra* note 6.

76 *See, e.g.*, Dan L. Burk & Mark A. Lemley, *Biotechnology's Uncertainty Principle*, 54 CASE W. RES. L. REV. 691, 733 (2004); A. Samuel Oddi, *Un-Unified Economic Theories of Patents—The Not-Quite-Holy Grail*, 71 NOTRE DAME L. REV. 267, 270 n.15 (1996).

77 *See, e.g.*, Brett Frischmann, *Innovation and Institutions: Rethinking the Economics of U.S.*

innovation referring mainly to the act of invention and creation.[78] The distinction between innovation and invention becomes even vaguer outside academia, among legislators, judges, and in the public debate.[79] It appears that when using innovation rhetoric, speakers are in fact referring to the previous stage of the technological cycle—to the perceived act of invention.

II. A NOVELTY OR A HISTORICAL HERITAGE?

As innovation is tossed back and forth in the legal arena without critical discussion, many assume the promotion of innovation has always been an integral part of the debate. This belief contributes to the reluctance to critically examine the role of the value of innovation. This Part demonstrates that although the promotion of innovation may have been part of the intellectual property discourse during earlier historical periods, it is only recently that innovation reemerged to attain its current prominence. Establishing that the contemporary celebration of innovation is a recent trend is important for initiating an inquiry into the costs of the legal regime's narrow view of the factors that promote technological progress.

Science and Technology Policy, 24 VT. L. REV. 347, 348-49 (2000); Arti K. Rai, *The Information Revolution Reaches Pharmaceuticals: Balancing Innovation Incentives, Cost, and Access in the Post Genomics Era*, 2001 U. ILL. L. REV. 173, 178 n.17 (2001).

78 S*ee, e.g.*, Bradford L. Smith, *The Third Industrial Revolution: Policymaking for the Internet*, 3 COLUM. SCI & TECH. L. REV. 1, 8-9 (2002) ("Another remarkable feature of these technologies is the degree to which they have fueled further creativity and innovation. This creativity is not limited to new products; it includes innovations in business organization, financial services, and other areas."); Wagner, *supra* note 29, at 1024 ("Just as the quantity of information produced is bounded only by the limits of human imagination, the various uses and (in particular) business models based on innovation and creativity have the potential to be enormously flexible.").

79 *See, e.g.*, QSRSOFT, Inc. v. Rest. Tech., Inc., No. 06 C 2734, 2006 U.S. Dist. LEXIS 76120 at *34-35 (N.D. Ill. Oct. 19, 2006) ("The public is generally interested in upholding intellectual property rights, encouraging innovation and creativity, and rewarding those that take the risk and invest resources in pursuit of such innovation and creativity."); Minerals Techs. Inc. v. Omya AG, 430 F. Supp. 2d 195, 213 (S.D.N.Y. 2006) ("[P]atent doctrines are ultimately designed to validate original invention, to this end conferring a bounty on inventors' creativity and innovation, rewarding their ambition, initiative and diligence, and thereby providing incentives for novel contributions to useful arts."); *WIPO Hearing*, *supra* note 42 (statement of Chris Byrne, Director of Intellectual Property, Silicone Graphics, Inc.; Chairman, Intellectual Property Committee, Information Technology Industry Council) ("Innovation is the engine of the IT industry . . . . While strong intellectual property protection is essential to protect investments in innovation, overprotective intellectual property policies would make it even more difficult to innovate."); Judith H. Dobrzynski, *Silicon Valley Round Table: So, Technology Pros, What Comes After the Fall?*, N.Y. TIMES, July 29, 2001, § 3 (Business), at 1 (reporting excerpts from a Silicon Valley Roundtable) ("'[I]n terms of innovation, having a simple company . . . has now . . . been judged to be a monopoly on that particular technology. I think you are less likely to see innovation.'" (quoting Mitchell E. Kertzman, Chief Executive of Liberate Technologies)).

To support the claim that the contemporary celebration of innovation is, in fact, a recent trend, this Article presents an empirical study of intellectual property case law between 1946 and 2005.[80] The study reveals that innovation started acquiring its current central role only in the mid-1980s, with the advent of the intellectual property wars. The study is comprised of two parts. The first part consists of a quantitative analysis of the case law, which shows a significant increase in the percentage of cases referring to "innovation" since the mid-1980s. The second part consists of a qualitative analysis of the cases, which demonstrates that courts changed the nature of their references to innovation. In earlier years, judges used innovation rhetoric primarily as an after-thought. However, since the mid-1980s and increasingly since the 1990s, a growing number of courts refer to the promotion of innovation extensively, according it a central place in their opinions.

Finally, this Part examines the technological and social changes that advanced innovation to the center of the techno-legal discourse. It explains that although the promotion of innovation has always been a central justification for the granting of intellectual property rights, recent technological and social changes played a role in enhancing its stature by turning it into critical ammunition in the hands of all sides to the intellectual property and Internet debates.

A. *The Empirical Case Law Study*

Historically, three justifications for intellectual property rights dominated the discourse[81]: Locke's labor theory, the reward theory, and the utilitarian justification. According to Locke's natural rights labor theory, individuals are entitled to the fruits of their labor. A person owns her body and, therefore, she owns its labor and what she joins with her labor—the product of her labor.[82] Pursuant to the natural rights' reward theory, a person has a right to the fruit of her labor based on the principle of desert. If an individual has a natural right to something and another takes it away from her, she can rightfully

[80] For researchers interested in replicating the results of the empirical study, an empirical appendix providing further details of the study's methodology is available at http://law.shu.edu/Faculty/Documents/upload/bernstein_appendix_in_the_shadow.pdf. The study and appendix are congruent with the best practices described in Mark A. Hall & Ronald F. Wright, *Systematic Content Analysis of Judicial Opinions*, 96 CAL. L. REV. 63, 100-20 (2008).

[81] While three justifications dominated the field, these justifications are not exclusive. *See, e.g.*, Paul J. Heald, *A Transaction Costs Theory of Patent Law*, 66 OHIO ST. L. J. 473 (2005) (providing a transaction costs theory); II JOSEPH STORY, COMMENTARIES ON THE CONSTITUTION OF THE UNITED STATES: WITH A PRELIMINARY REVIEW OF THE CONSTITUTIONAL HISTORY OF THE COLONIES AND STATES BEFORE THE ADOPTION OF THE CONSTITUTION § 1147 (Little, Brown, and Co. 1891) (1833) (providing a disclosure justification).

[82] Hettinger, *supra* note 11, at 36-37.

demand its return.[83] Finally, the utilitarian justification legitimated the grant of intellectual property rights on the basis of the need to provide incentives for the production of innovation.[84]

Scholars tend to agree that the utilitarian theory—the promotion of innovation—is the prominent justification for intellectual property rights in the United States. They tie the dominance of the utilitarian goal to the instrumental nature of the U.S. Constitution's Intellectual Property Clause, which states that monopolies can be conferred "to promote the progress of science and useful arts."[85]

The reluctance to critically examine our focus on innovation appears to be related to the belief that the promotion of innovation is and has always been an inherent part of the intellectual property debate. Yet, although innovation may have occupied a similar role earlier in American political and legal history,[86] and, furthermore, the utilitarian justification has persisted through the years as the leading justification of the intellectual property system, the case law analysis' findings point to a contemporary elevation of the role of innovation in the intellectual property debate.

1. The Quantitative Analysis

Use of the word innovation dominates innovation rhetoric. Therefore, the quantitative analysis, designed to evaluate the use of the promotion of innovation policy goal in case law, assessed the use of the term "innovation" in intellectual property case law. The analysis focused on uses of the term innovation in the context of references to the promotion of innovation. It measured the number of cases mentioning innovation between 1946 and 2005 out of the total number of intellectual property cases during the same period.[87]

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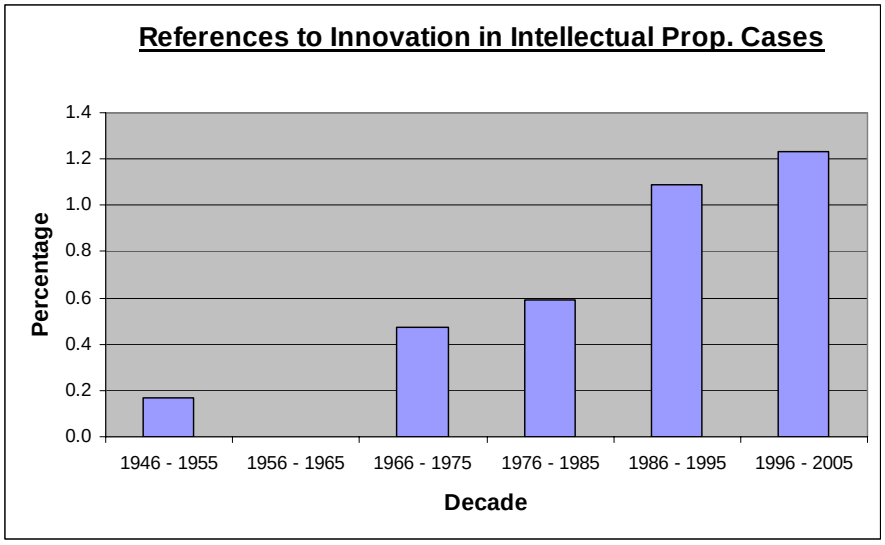
83 *Id.* at 40-41.

84 *Id.* at 47.

85 *See* U.S. CONST. art. I, § 8, cl. 8 ("[Congress shall have the power] [t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries"); Bell, *supra* note 11; Cotter, *supra* note 11; Lawrence A. Cunningham, *Private Standards in Public Law: Copyright, Lawmaking and the Case of Accounting*, 104 MICH. L. REV. 291, 309-10 (2005); Hettinger, *supra* note 11; Lemley, *supra* note 11; O'Rourke, *supra* note 11; Sell, *supra* note 11; *see also* David McGowan, *Copyright Nonconsequentialism*, 69 MO. L. REV. 1, 1 (2004) (criticizing copyright scholars' focus on utilitarian arguments).

86 For an example of innovation rhetoric in early American legal thought, see Letter from Thomas Jefferson to Benjamin Waterhouse, *supra* note 12.

87 The number of intellectual property cases has dramatically increased since 1946. Therefore, a measurement focusing solely on the number of references to innovation in intellectual property cases would not have provided an accurate measure of growth in use of the term innovation; it would have merely reflected the increase in the number of intellectual property cases. By measuring the percentage of references to innovation out of the total of



The chart shows an upward trend in intellectual property cases discussing innovation.[88] Most significantly, the graph shows that the percentage of cases discussing innovation out of the total number of intellectual property cases almost doubled (from 0.6% to 1.1%) between 1976-1985 and 1986-1995.[89]

At first blush, the results of the quantitative analysis indicate mainly a linguistic change. The findings of the study show that courts increasingly utilize the term innovation in opinions dealing with intellectual property cases. Possibly, the increase in use of the term innovation has merely replaced other expressions previously used by courts to express the utilitarian goal, such as creativity.[90] Yet, linguistic

intellectual property cases for each given period, it was possible to isolate the actual growth in references to innovation in intellectual property cases from the increase in the number of intellectual property cases. For further details, see the Empirical Appendix, http://law.shu.edu/Faculty/Documents/upload/bernstein_appendix_in_the_shadow.pdf.

[88] The study included similar searches of the terms creativity and invention. The results of these searches did not manifest an upward trend similar to that of the innovation search. Although, as discussed in section I.B, invention and creativity are sometimes used interchangeably with the term innovation, the results of these searches indicate that use of the term innovation became the central linguistic manifestation of the social preference for promoting innovation.

[89] Although the percentage of cases discussing the promotion of innovation out of the total number of intellectual property cases remains low (just over one percent), this is usually the case where courts refer to policy objectives. Courts often refrain from incorporating policy arguments in their opinions. For that reason it is the increase in the percentage of cases discussing innovation and not their overall percentage that is indicative of the trend.

[90] As indicated, searches of the terms creativity and invention have not shown similar increases as the search of the term innovation. *See supra* note 88. At the same time, the creativity and invention searches have not shown a decline in use of these terms. Such a decline (if it had occurred) could have indicated a mere change in terminology.

changes often reflect deeper social transformations mirroring the consciousness of individual and social institutes, and at the same time reinforce the very same intellectual processes.[91] Consequently, the second part of the case law study comprised of a qualitative study of the case law, designed to evaluate the hypothesis that the increase in references to innovation, in fact, reflects a fundamental change in attitudes toward the role of innovation as a value.

2. The Qualitative Analysis

The qualitative analysis study revealed that innovation was not merely added as a linguistic artifact to the case law. Instead, the courts' treatment of innovation changed significantly over the years. Particularly, it became apparent that the rhetoric of promoting innovation gained prominence in the courts' reasoning since the mid-1980s.[92]

a. Before the Mid-1980s

The study found that between 1946 and the mid-1980s, the promotion of innovation was not central to the courts' reasoning. References in court opinions to innovation fell under three main categories: (i) Standard; (ii) Reward; and (iii) Tepid Utilitarian.

i. Standard

Some court opinions referred to innovation when discussing the standard required for receiving intellectual property protection. These discussions looked at innovation to ascertain whether an individual is entitled to intellectual property protection. In the context of patent law, they inquired whether a patentee's product or process amounted to a

[91] *See* DAVID GREEN, SHAPING POLITICAL CONSCIOUSNESS: THE LANGUAGE OF POLITICS IN AMERICA FROM MCKINLEY TO REAGAN 17 (1987) (referencing Jürgen Habermas); *see also* Lemley, *supra* note 11, at 895-96.

[92] Although the cases included in the qualitative study were those selected through the quantitative analysis, during the qualitative stage these cases were screened more comprehensively. Since innovation rhetoric is not limited to references to the term innovation, the categorization during the qualitative stage was based on the content of the arguments made in the opinions, and not on the specific expressions made. Segments of the opinion became relevant when they discussed notions of promoting progress, promoting innovation, promoting invention, or promoting creativity. A mere citation of the constitutional intellectual property provision did not affect the classification of the opinion. For further details regarding the methodology of the qualitative study, including the coding of the cases, see the Empirical Appendix, *supra* note 87.

substantial enough innovation to meet the patent's non-obviousness requirement in order to qualify for a patent.[93] In these discussions, courts did not focus on the significance of innovation as the goal of the intellectual property system; instead, they treated it as a limiting principle. The opinions explained that innovation is an inherent requisite of the patent system that serves as the standard guarding the scope of the patent monopoly.[94] Occasionally, opinions contained references that applied the standard reasoning to copyright law.[95]

ii. Reward

Some court opinions addressed innovation through the reward justification for intellectual property. Under this justification the goal of intellectual property law is to reward the inventor or creator for his innovation.[96] These discussions justified the enforcement of intellectual property protection by pointing to the need to reward the inventor or the creator and grant him his just desert.[97]

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[93] *See, e.g.*, Carlson & Sullivan, Inc. v. Bigelow & Dowse Co., 202 F.2d 654, 657 (1st Cir. 1953) (stating that the purpose of patent law is not to grant a monopoly for every "shadow of a shade of an idea;" it has to "amount to a substantial enough innovation to amount to an invention.").

[94] *See, e.g.*, Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 5-6 (1966) (stating that under Article I, Section 8, clause 8 of the Constitution, the patent monopoly may not be enlarged without regard to innovation: "Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system . . . . This is the standard expressed in the Constitution."). The Supreme Court's use of innovation as a limiting standard in *Graham* was repeatedly cited by the courts thereafter. *See, e.g.*, Anderson-Black Rock, Inc. v. Pavement Salvage Co., 396 U.S. 57, 61 (1969); Lucerne Products, Inc. v. Cutler-Hammer, Inc., 568 F.2d 784, 799 (6th Cir. 1977) (citing *Graham*); Jeddeloh Bros. Sweed Mills, Inc. v. Coe Mfg. Co., 375 F.2d 85, 88 (9th Cir. 1967); *see also* Dotan Oliar, *Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress's Intellectual Property Power*, 94 GEO. L.J. 1771, 1786-87 (discussing the Supreme Court's limiting approach in *Graham*).

[95] *See* Lee v. Runge, 404 U.S. 887, 889-90 (1971) (Douglas, J., dissenting) (stating that the limitations applied in *Graham* to the patent system should apply to copyright).

[96] *See* Hettinger, *supra* note 11, at 40-41.

[97] Opinions often referred to both the reward justification and the utilitarian justification, stressing the need to offer the inventor a just desert for his innovation while emphasizing the need to encourage the promotion of innovation. Yet, although the reward justification was often mentioned together with the utilitarian justification, in the years that preceded the mid-1980s when courts discussed both justifications in their opinions, they usually accorded them equal weight. *See, e.g.*, Stanfield v. Osborne Indus., Inc., 643 P.2d 1115, 1122 (Kan. Ct. App. 1982) (stating that one of the goals of the patent system is "to foster and reward invention"); Pederson v. Stewart-Warner Corp., 400 F. Supp. 1262, 1269 (N.D. Ill. 1975) (stating that the country "has chosen to allow such monopolies only as a reward and inducement for 'innovation, advancement, or social benefits.'"); Charvat v. Comm'r of Patents, 503 F.2d 138, 147 (D.C. Cir. 1974) ("When an invention has so 'substantially advanced the art,' as we believe appellant's wheel has done, then we must be 'liberal in [our] construction of the patent, to secure the inventor the reward he deserves.'"). The Supreme Court in *Sony v. Universal City Studios*, although writing at the dawn of a new era for innovation rhetoric, explained the connection between the two uses of innovation by the courts: "[t]he immediate effect of our copyright law is to secure a fair return for an

iii. Tepid Utilitarian Goal

Opinions also contained references addressing the utilitarian goal of the intellectual property system—the promotion of innovation. These statements justified intellectual property monopolies by pointing to the need to encourage innovation.[98] The case law reflected the traditional proprietary model. This model, as famously articulated by Schumpeter, holds that intellectual property rights provide incentives to authors and inventors that result in the promotion of innovation. Intellectual property rights advance innovation because any market power created by monopoly rights is temporary and eventually replaced by a new superior technology.[99]

The period between 1945 and the mid-1980s preceded the intellectual property wars. The proprietary view governed during this period. In the absence of significant opposition to the proprietary view, references in opinions to the utilitarian goal merely reiterated the belief that intellectual property rights are necessary to create incentives for innovation.[100] The utilitarian justification was uttered tepidly and appeared to function mainly as an obligatory decoration to the judgment.

'author's' creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good." Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 432 (1984).

98 The following are characteristic judicial references to the utilitarian goal during this period: Eli Lilly & Co. v. Premo Pharm. Labs., Inc., 630 F.2d 120, 137 (3d Cir. 1980) ("Congress recognized that it is necessary to grant temporary monopolies on inventions in order to induce those skilled in the 'useful arts' to expend the time and money necessary to research and develop new products and to induce them 'to bring forth new knowledge.'"); Mastantuono v. Ronconi, 278 F. Supp. 144, 146 (S.D.N.Y. 1967) ("Patent Acts . . . allow . . . an inventor a limited private monopoly in his invention or discovery as an inducement to man's pursuit of knowledge, and stimulate the outgrowth of creative contribution in society."); *In re* Flint, 411 F.2d 1353, 1357 (Cust. Ct. 1969) (Neese, J., concurring) ("So important is the benefit of the genius, meditation and skill of creators and innovators to our national sovereign and its people . . . that our Constitution grants to the Congress the power 'to promote the progress of science and useful arts . . . .'"); Glen Mfg., Inc. v. Perfect Fit Indus., Inc., 299 F. Supp. 278, 282 (S.D.N.Y. 1969) ("To promote scientific innovations and invention, the patent laws grant a monopoly to the patentee for a limited time."); Farmland Irrigation Co. v. Dopplmaier, 48 Cal. 2d 208, 220 (Cal. 1957) ("The purpose in granting a patent monopoly is to promote progress in science and the useful arts by stimulating invention and encouraging disclosure.").

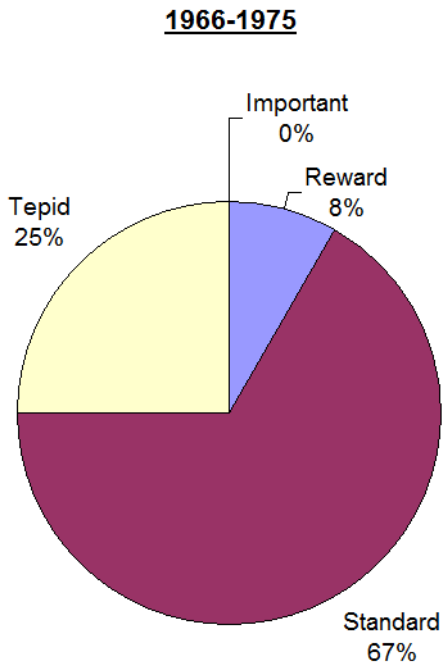
99 JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 81-106 (5th ed. 1976).

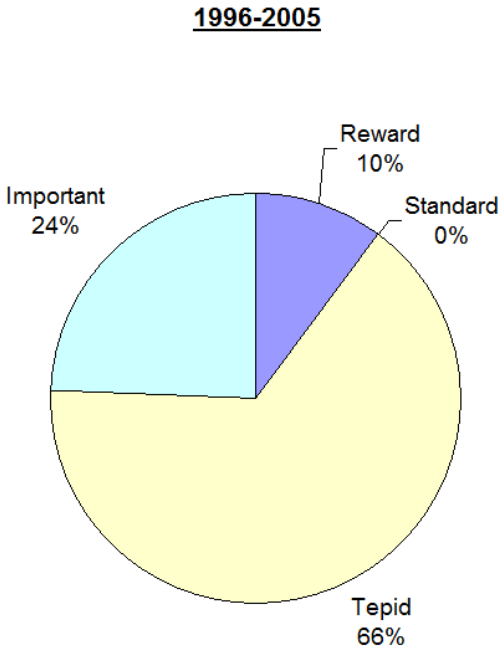
100 Even the Supreme Court, writing as late as 1981, addressed the goal of promoting innovation only briefly when it acknowledged: "'Making clear that patents may be available for inventions in software would unleash important innovative talent. . . . [I]t would enable competition with those companies and provide the needed incentive to stimulate innovation.'" Diamond v. Diehr, 450 U.S. 175, 217 n.42 (1981) (quoting Brief for ADAPSO as Amicus Curiae at 44, Parker v. Flook, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206643).

b. From the Mid-1980s

Since the mid-1980s, a growing number of courts accorded the utilitarian goal of intellectual property—the promotion of innovation—an important role in their opinions. Furthermore, this trend enhanced significantly from the mid-1990s.

The following two pie charts illustrate the historical evolution in the courts' treatment of innovation:





The case law of 1966-1975, which is representative of the pre-1980s era, included references to innovation, which fell under the Reward, Standard, and Tepid Utilitarian categories. Sixty-seven percent of the references to innovation addressed innovation as a standard; eight percent referred to innovation in relation to the reward justification; and twenty-five percent tepidly referred to innovation as a social goal. The comparison of the case law of 1966-1975 to the case law of 1996-2005, which represents the later era, reveals a striking disparity. During 1996-2005, twenty-four percent of the references to innovation in courts' opinions treated the promotion of innovation as an important policy goal and fell into the Important category; sixty-six percent of the references to innovation fell into the Tepid Utilitarian category; and ten percent of the references to innovation in court opinions discussed innovation in relation to the Reward justification. No opinions mentioned innovation as a standard for the grant of an intellectual property monopoly.[101]

A review of the case law reveals that since the mid-1980s, both sides to the intellectual property debates exploited the innovation goal to promote their ends. Plaintiffs' attorneys who argued for intellectual

[101] Since some opinions contained references to innovation, which fell into two categories, the percentages were calculated on the basis of references to innovation and not on the basis of opinions. For further details, see the Empirical Appendix, *supra* note 87.

property protection and defense attorneys who advocated the limitation of intellectual property monopolies each claimed that their goal was the promotion of innovation. Majority, concurring, and dissenting opinions reflected these arguments.[102]

Prior to the mid-1980s, courts justified intellectual property rights by citing the reward theory or tepidly mentioning the promotion of innovation. However, from the mid-1980s, courts that supported intellectual property rights changed their justification. Some courts expressly stated that intellectual property rights are not granted for the purpose of rewarding authors, but rather to advance innovation. They explained that encouraging individual effort by personal gain is a means to the ultimate aim of advancing innovation.[103] Furthermore, courts

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[102] For example, in *Festo v. Shoketsu*, the U.S. Court of Appeals for the Federal Circuit narrowed the scope of the doctrine of equivalents. The majority opinion stated that the court's goal was "to foster technological growth and industrial innovation." Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 572 (Fed. Cir. 2000), *vacated*, 535 U.S. 722 (2002). It added: "Thus . . . technological advances . . . will not go wasted and undeveloped due to fear of litigation. The public will be free to improve on the patented technology and design around it without being inhibited by the threat of a lawsuit . . . . This certainty will stimulate investment in improvements and design-arounds . . . ." *Id.* at 577. Judge Lourie, concurring, stated: "The rule we announce today should encourage innovation, . . . providing patentees with protection commensurate with the disclosed and allowed scope of their inventions." *Id.* at 597. Judge Linn, concurring in part and dissenting in part, explained: "Strong patent protection is key to encouraging innovation, economic growth and American competitiveness. . . . Rather than promote technological growth, the majority's new rigid rule . . . is likely to be a disincentive to early disclosure of new inventions and discoveries." *Id.* at 621, 629. Finally, Judge Newman, concurring in part and dissenting in part, stated:

> The modern industrial economy is driven by technologic innovation. . . .
>
> The encouragement of invention and investment in new ideas and their embodiments is a primary function of patent systems, aimed at the national purpose of development of new industries, improved productivity, increased employment, and overall economic growth as well as technological advance. . . .
>
> . . . .
>
> . . . [T]he assumption that placing new technology in the public domain is always the optimum path to industrial growth is not supported by experience. Empirical studies have [shown] . . . that reduced profit opportunity affects the supply of capital to launch a new technology, and often the creation of the technology itself.

Id. at 639-41 (citations omitted).

[103] Prior to the mid-1980s, while courts often mentioned the reward and utilitarian goals together, alluding that rewarding the author serves to promote innovation, they still treated reward as an independent goal. However, from the mid-1980s, courts increasingly viewed reward as a means for achieving the utilitarian goal of promoting innovation. *See, e.g.*, Golan v. Gonzales, 2005 U.S. Dist. LEXIS 6800, at *7 (D. Colo. Apr. 20, 2005) ("The primary purpose of the IP Clause is not to reward the labor of authors, but to promote the progress of science and the useful arts. The economic philosophy behind the IP Clause 'is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in Science and useful Arts.'" (citations omitted)); Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37, 52 (D. Mass. 1990) ("Copyright monopolies are not granted for the purpose of rewarding authors. Rather, Congress has granted copyright monopolies to serve the public welfare by encouraging authors (broadly defined) to generate new ideas and disclose them to the public . . . .").

replaced tepid statements in support of innovation with strong and extensive declarations.[104]

At the same time, courts in favor of limiting intellectual property rights increasingly developed an alternative form of the innovation

104 While the typical pre-mid 1980s opinion would merely state that "[t]he purpose in granting a patent monopoly is to promote progress in science and the useful arts by stimulating invention and encouraging disclosure," Farmland Irrigation Co. v. Dopplmaier, 48 Cal. 2d 208, 220 (Cal. 1957), from the mid-1980s, courts devoted increasing room to innovation rhetoric. A representative opinion of that era is *Lotus Development Corp. v. Paperback Software International*. In *Lotus*, the Massachusetts District Court engaged in extensive innovation arguments. Although it is impossible to bring forth here the full scope of the court's innovation rhetoric, the following excerpts represent the opinion's three main innovation lines of arguments. First, the court stated:

> Congress has broad though not unlimited authority to grant copyright monopolies as needed to promote progress. If Congress were to determine . . . that copyright protection is unnecessary to 'promote the Progress of' computer programming—because . . . the financial incentives alone of developing new computer programs (without the added benefit of copyright) are enough to encourage innovation, or because incremental innovation might be stifled by expansive copyright protection—then Congress could . . . provide no copyright protection for computer programs. At the other extreme, were Congress to find that strong copyright protection is necessary to promote the progress of computer programming, Congress could provide for expansive copyright protection . . . .

Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37, 46 (D. Mass. 1990). Second, the court stated:

> Defendants' general contention—that 'Progress of Science and useful Arts' cannot occur unless authors and inventors are privileged to build upon earlier progress and earlier innovation—has long been a virtually unchallenged premise in all branches of the law of intellectual property. . . .
>
> . . . [Yet the application of this contention to the field of computer programming] was [not] embraced by Congress . . . in such a way as to override the public interest in conferring upon an author a right to a limited monopoly in the author's 'work.'
>
> The metaphorical 'shoulders of giants' on which successors may legally stand are not as broad as defendants contend. The legally relevant shoulders of programming giants are their ideas—and do not extend to all of their expressions. The encouragement of innovation requires no more. It is sufficient that programmers are privileged to borrow and improve upon previous ideas—such as the ideas for an electronic spreadsheet and a two-line moving cursor menu. Adequate room for innovation remains even though successors are barred from copying earlier authors' particular expressions—such as the particular structure, sequence, and organization of a menu command system.
>
> . . . Where . . . the idea is capable of countless ways of being expressed, only inexpensive cloning, and not innovation, would be advanced by allowing programmers to copy the particular way the ideas have been expressed by others.

Id. at 77-78 (citations omitted). Third, the court rejected defendant's standardization argument, explaining:

> [O]ne object of copyright law is to protect expression in order to encourage innovation. It follows, then, that the more innovative the expression of an idea is, the more important is copyright protection for that expression. By arguing that 1-2-3 was so innovative that it occupied the field and set a *de facto* industry standard, and that, therefore, defendants were free to copy plaintiff's expression, defendants have flipped copyright on its head. Copyright protection would be perverse if it only protected mundane increments while leaving unprotected as part of the public domain those advancements that are more strikingly innovative.

Id. at 79.

argument. These courts stated that overprotection of intellectual property rights stifles innovation. Creators need to build on earlier works in order to create; they have to stand on the shoulders of giants. Consequently, there is a need to limit intellectual property monopolies in order to maintain a rich public domain.[105]

As the parties to the intellectual property controversies enhanced the role of innovation in the debate, discussions of innovation infiltrated many aspects of the judicial opinions. Judges expansively discussed the importance of innovation to the nation. Opinions described in detail the contribution of innovation to the American economy and the role of the intellectual property system in stimulating this innovative activity.[106] A

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[105] For example, in *White v. Samsung Electronics America, Inc.*, Judge Kozinsky in his dissenting opinion stated:

> Private property, including intellectual property, is essential to our way of life. It provides an incentive for investment and innovation; it stimulates the flourishing of our culture . . . . But reducing too much to private property can be bad medicine. . . .
>
> . . . Overprotecting intellectual property is as harmful as underprotecting it. Creativity is impossible without a rich public domain. Nothing today, likely nothing since we tamed fire, is genuinely new: Culture, like science and technology, grows by accretion, each new creator building on the works of those who came before. Overprotection stifles the very creative forces it's supposed to nurture.
>
> . . . .
>
> For better or worse, we are the Court of Appeals for the Hollywood Circuit. Millions of people toil in the shadow of the law we make, and much of their livelihood is made possible by the existence of intellectual property rights. But much of their livelihood—and much of the vibrancy of our culture—also depends on the existence of other intangible rights: The right to draw ideas from a rich and varied public domain, and the right to mock, for profit as well as fun, the cultural icons of our time.

White v. Samsung Elecs. Am., Inc., 989 F.2d 1512, 1513, 1521 (9th Cir. 1993) (Kozinski, J., dissenting) (footnotes omitted).

[106] For example, in *Hilton Davis Chemical Co. v. Warner Jenkinson Co.*, Judge Newman, speaking for the U.S. Court of Appeals for the Federal Circuit, stated:

> Our decision, like every decision of patent principle, affects the national interest in technologic innovation. . . .
>
> . . . .
>
> Technologic innovation has driven the American economy, over the past century, to the exclusion of virtually all other growth factors. Many students of technologic change have explained that innovative activity is fundamental to industrial vigor, developing new markets while enhancing productivity and competitiveness, thereby strengthening and enriching the nation. . . . The technology-user community has always had a practical comprehension of the value of various innovation incentives in particular commercial contexts.
>
> . . . .
>
> . . . However, the patent system is of ever-increasing importance, due to the dependence of industry on technology, the reduced opportunity to rely on trade secrecy because of today's enlarged analytical capability, the ease and speed of imitation and modification once the innovator has shown the way, the harshness of modern competition, and the ever-present need for industrial incentives. These factors weigh on the side of the innovator**,** and thus favor a rule that tempers the rigor of literalness.
>
> . . . However, there is also the major consideration of the progress of technology. How does the existence of a 'doctrine' that transcends the statutory purpose of legal notice of the patent's scope affect that progress? Does the doctrine of equivalents affect the research, development, investment, and commercialization decisions of

growing number of judicial opinions accorded the discussion of innovation a separate section of the opinion under the heading "Public Interest."[107]

In addition, innovation became a key term for everything that is good and desirable. Judges did not limit innovation discussions to direct assessments of policy goals. Rather, they embedded references to innovation in doctrinal and factual arguments.[108] For example, one court stated that "[c]opyrightability of a user interface . . . will frustrate the public interest in allowing programmers to achieve innovation by 'borrowing' and improving ideas of other programmers . . . ."[109] Another court stated that "[defendant] also relies on the purported harm done to the 'market for innovation.'"[110]

Overall, the qualitative analysis of intellectual property case law indicates that innovation rhetoric does not merely represent a linguistic transformation, but a change in the status of the innovation objective in

today's technologic industry, in a way that concerns the national interest?

And if not, what's all the fuss about? . . .

Despite our national dependence on technologic advance, there is a sparseness of practical study of whether and how the doctrine of equivalents affects modern industrial progress and the public welfare. . . .

. . . The principle is today of international force, as the United States seeks to enhance its national strength and international trade with the aid of intellectual property. Indeed, recent economic history illustrates the stagnation of the economy coinciding with periods of diminished industrial investment in technologic advance. . . .

The analytic complexity with respect to the doctrine of equivalents arises because technologic growth benefits not only from the activities of the originators, but also from those who improve, enlarge, and challenge. The larger public interest requires setting the optimum balance between the purpose of supporting the innovator, in the national interest, and the purpose of supporting improvement and competition, also in the national interest. The question that I have sought to explore is how the policy and law of the doctrine of equivalents affects this balance.

. . . .

The patent law is directed to the public purposes of fostering technological progress, investment in research and development, capital formation, entrepreneurship, innovation, national strength, and international competitiveness. Our review of the doctrine of equivalents takes place in this context, not as an abstraction insulated from commercial reality.

Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1529-32, 1536 (Fed. Cir. 1995) (Newman, J., concurring) (citations and footnotes omitted), *rev'd*, 520 U.S. 17 (1997); *see also* Playboy Enters. v. U.S. Customs Serv., 959 F. Supp. 11, 16 (D.D.C. 1997).

107 *See, e.g.*, Smash, L.L.C. v. New England Pottery, Civ. No. 01-601, 2001 U.S. Dist. LEXIS 17803, at *18 (D. Minn. Oct. 15, 2001) (stating under the heading "Public Interest" that "[t]here is a strong public interest in the protection of patent rights" and a "similarly strong public interest in maintaining the proper scope to these rights so that future innovation and invention may be encouraged and pursued"); *see also* Lisle Corp. v. A.J. Mfg. Co., No. 02-C-7024, 2004 U.S. Dist. LEXIS 6024, at *16-17 (N.D. Ill. Aug. 7, 2004).

108 *See, e.g.*, *Warner-Jenkinson*, 62 F.3d at 1531-32; United States v. Thomson Corp., 949 F. Supp. 907, 911 (D.D.C. 1996); *Lotus Dev. Corp.*, 740 F. Supp. at 77.

109 *Lotus Dev. Corp.*, 740 F. Supp. at 77.

110 Sony Elecs. Inc. v. Soundview Techs., Inc., 157 F. Supp. 2d 180, 185 (D. Conn. 2001).

legal discourse. Specifically, it reveals that innovation as a desired value has gained prominence since the mid-1980s.

B. *Behind the Scenes of the Innovation Show*

The empirical case law study demonstrated that the role of innovation as a value has significantly enhanced since the mid-1980s. Why did innovation gain prominence during this period? Two socio-technological trends played a central role in promoting innovation to the center of the debate. The first trigger, as already mentioned, was the eruption of the intellectual property wars. The second instigator was the development of technology that enabled the transformation of the consumer into a creator. [111]

1. The Intellectual Property Wars

The elevation of the role of innovation during the mid-1980s was instigated by the advent of the intellectual property wars during the same period. During the intellectual property wars, legal discourse underwent two transformations. First, the debate escalated. It became more heated and increasingly ideological. Second, the nature of the arguments raised by the parties to intellectual property controversies changed. The case law study findings reflect both trends.

The case law study shows that prior to the mid-1980s, parties seeking to enforce intellectual property rights pointed to the need to promote innovation. References to innovation as a utilitarian goal usually fell into the category defined as "tepid utilitarian." In the absence of any significant opposition, references to the promotion of innovation played an ancillary role in the debate. However, since the

[111] Other factors may have also played a role in the elevation of the role of innovation. One is the advent of the law and economics movement. The modern law and economics movement grew over the 1970s-1980s. It remains to be examined whether its influence and the dominance of the concept of innovation among economists played a role in the rise of innovation rhetoric. *See* SCHERER, *supra* note 6, at 8-21 (discussing economists' literature dealing with the term innovation); Herbert Hovenkamp, *The First Great Law & Economics Movement*, 42 STAN. L. REV. 993, 994-95 (1990) (discussing the rise of the modern law and economics movement). Another factor that remains to be explored is whether the creation of the U.S. Court of Appeals for the Federal Circuit in 1982, primarily to hear patent appeals, influenced the increase in innovation rhetoric. A preliminary investigation did not indicate such an effect. The study included a separate search of the term "innovation" in cases of the Federal Circuit. The results did not indicate a significant difference between the use of the term by the Federal Circuit and that by other courts. *See* Federal Courts Improvements Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (relevant provisions codified as amended in scattered sections of 28 U.S.C) (establishing the Federal Circuit).

advent of the intellectual property wars in the 1980s, the case law study demonstrates that parties who opposed the enforcement of intellectual property rights also developed innovation-based arguments. They frequently warned that intellectual property rights, in fact, inhibit innovation in that they constrict the public domain, which is crucial for the development of future innovations.[112]

In response, supporters of strong intellectual property rights bolstered their utilitarian arguments. Particularly, from the 1990s, intellectual property rights defenders came to believe that digital technologies and cyber-economy strain the ability to control the distribution of their products.[113] In lieu of tepid utilitarian arguments, the qualitative study shows that case law now featured stronger and more detailed arguments about the importance of intellectual property incentives for promoting innovation and the national economy.

Hence, the intellectual property wars played a role in elevating the status of innovation in the legal discourse. Yet, the intellectual property wars are inter-related to another trend that played an important part in the social transformation of the value of innovation—the development of technologies that turned the user into a creator.

2. Turning the User into a Creator

Technological developments created new capabilities that changed users' options of interacting with information products. Commentators described this trend as the transformation of the user into a creator. Traditionally, the technology user was perceived as a passive consumer—a "couch potato."[114] The consumer would passively read a book, watch a movie, or listen to a compact disc (CD).[115] But now, commentators explain, new technologies enable the user to become a creator. Instead of merely consuming a book or a movie in a passive manner, the consumer as a creator reads a book or watches a movie for the purpose of creating new works.[116]

Digital technologies, the proliferation of personal computers, and particularly the Internet all contributed to turning the user into a creator. Digital technologies reduced the costs for individual creation and

112 The arguments raised by litigating parties reflected the scholarly arguments discussed in Part I.A.1.a.

113 *See* Clyde Wayne Crews, Jr. & Adam Thierer, *Introduction* to COPY FIGHTS: THE FUTURE OF INTELLECTUAL PROPERTY IN THE INFORMATION AGE, at xv-xvii (Adam Thierer & Cylde Wayne Crews, Jr. eds., 2002).

114 LESSIG, *supra* note 36, at 9; ERIC VON HIPPEL, DEMOCRATIZING INNOVATION 20 (2005); Joseph P. Liu, *Copyright Law's Theory of the Consumer*, 44 B.C. L. REV. 397, 399, 402 (2003).

115 *See* Liu, *supra* note 114, at 402.

116 *Id.* at 405-06.

distribution. Previously only large entities, such as movie production companies or music studios, could create complicated digital works. However, new software tools have enabled ordinary people to rip (copy), mix (reform), and burn (publish) in order to produce texts, sounds, photographs, or movies. Digital technologies simplified the process and also lowered its costs.[117]

New digital products gave users the tools to create. Nevertheless, it was the Internet that enhanced these capabilities and expanded the scope of the phenomenon. Numerous forms of user creations are available on the Internet. Many Internet users share their creations—such as artwork, photos, stories, or videos—online. Teenagers, artists, and musicians are particularly inclined to place their material online.[118] The blogosphere is expanding as more and more individuals establish professional or personal blogs.[119] Peer production projects, where many individuals cooperate together to produce a product, are abundant on the Internet.[120] Prominent examples are the free software movement[121] and Wikipedia—a collaborative encyclopedia.[122]

The Internet was described as "an amateur information sharing project."[123] Users can easily locate a huge diversity of sources—such as images, sounds, and texts—on the Internet.[124] Further, Internet speech develops through linkage, collage, annotation, and mixture. People program, write comments, and add things.[125] The decentralized nature of the Internet was also crucial in enabling this flurry of activity.[126] For

117 *See* LESSIG, *supra* note 36, at 9; Balkin, *supra* note 37, at 7-8; Boyle, *supra* note 35, at 40; Dan Hunter & F. Gregory Lastowka, *Amateur-to-Amateur*, 46 WM. & MARY L. REV. 951, 978-89 (2004).

118 *See* AMANDA LENHART & MARY MADDEN, PEW INTERNET & AM. LIFE PROJECT, TEEN CONTENT CREATORS AND CONSUMERS, at i (2005), *available at* http://www.pewinternet.org/~/media/Files/Reports/2005/PIP_Teens_Content_Creation.pdf.pdf; MARY MADDEN, PEW INTERNET & AM. LIFE PROJECT, ARTISTS, MUSICIANS AND THE INTERNET, at iii, iv (2004), *available at* http://www.pewinternet.org/~/media//Files/Reports/2004/PIP_Artists.Musicians_Report.pdf.pdf.

119 AMANDA LENHART & SUSANNAH FOX, PEW INTERNET & AM. LIFE PROJECT, BLOGGERS: A PORTRAIT OF THE INTERNET'S NEW STORYTELLERS 1 (2006), *available at* http://www.pewinternet.org/~/media//Files/Reports/2006/PIP%20Bloggers%20Report%20July%2019%202006.pdf.pdf (reporting that eight percent of Internet users—about twelve million American adults—keep a blog).

120 *See* Yochai Benkler, *Coase's Penguin, or, Linux and the Nature of the Firm*, 112 YALE L.J. 369, 377 (2002).

121 *See* Eben Moglen, *Freeing the Mind: Free Software and the Death of Proprietary Culture*, 56 ME. L. REV. 1, 5 (2004) (discussing the free software movement); The Free Software Foundation, http://www.fsf.org (last visited Apr. 5, 2010).

122 Wikipedia, http://en.wikipedia.org/wiki/Main_Page (last visited Apr. 5, 2010).

123 *See* Hunter & Lastowka, *supra* note 117, at 954-56.

124 *See id.* at 978-89.

125 *See* Balkin, *supra* note 37, at 33-34.

126 *See* Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 FED. COMM. L.J. 561 (2000) (describing the contribution of the decentralized nature of the Internet); Hunter & Lastowka,

example, in the traditional mode of distribution, media companies selected works for distribution. This increased costs and reduced available content. Social software tools, such as the Google search engine—which ranks sites based on the number of links—serve as decentralized selection tools. This lowers selection costs and expands the variety of available content.[127]

The Internet created new opportunities for ordinary users. Commentators hailed these new options, expanding the innovation discourse. David Post described the Internet as the greatest outpouring of creative activity in a short span of time.[128] Lawrence Lessig stated that the Internet forms an innovation commons—a space in which architecture and norm creativity can flourish. He explained that the Internet's architecture is crucial for innovation. The Internet's design is not optimized for any specific application. It does not discriminate against new innovations. Any innovator can develop a new application without permission from anyone.[129]

Commentators particularly applauded the transformation of the ordinary person into a creator. Jack Balkin stated that the incredible growth of the Internet demonstrates "how enormously creative ordinary people can be if given the chance to express themselves."[130] Lawrence Lessig emphasized that the Internet gives an opportunity for "anyone" to innovate. It lets many ordinary people become part of the creative process.[131] Beth Noveck and David Johnson pointed to the effectiveness of peer production technologies. They explained that these technologies enable ordinary people to group together and act collaboratively, thus accomplishing more effective solutions.[132] Furthermore, Eric Von Hippel elaborated that users create innovations that differ from those developed by manufacturers. Users have better knowledge of their needs; therefore, they are more likely to develop innovations, not merely improvements.[133]

Technological advances that enable users to create played a central role in the enhancement of the role of innovation. This trend is closely intertwined with the previously described intellectual property wars. The very decentralization that facilitated the transformation of the user weakened the role of copyright. Businesses increasingly objected to

supra note 117, at 975-77 (describing the impact of the Internet on creative activity by users).

127 *See* Hunter & Lastowka, *supra* note 117, at 989-99.

128 David G. Post, *His Napster's Voice*, 20 TEMP. ENVTL. L. & TECH. J. 35, 43 (2001).

129 LESSIG, *supra* note 36.

130 Balkin, *supra* note 37, at 33.

131 LESSIG, *supra* note 36, at 49.

132 Beth S. Noveck & David R. Johnson, *Society's Software*, 74 FORDHAM L. REV. 469, 469-70 (2005).

133 VON HIPPEL *supra* note 114, at 2, 45-76.

what they viewed as "digital piracy."[134] Simultaneously, proponents of active user participation sought to safeguard these new opportunities. This gave rise to a new set of battle zones focusing on Internet governance and control over Internet infrastructure. The parties again crafted innovation arguments to promote their goals.

Proponents of the new user capabilities explained that the architecture of the Internet minimized control and encouraged innovation. They expressed concern that changes in the Internet's architecture would undermine this progress.[135] They objected to centralized Internet governance, arguing that individuals empowered by new technologies are best equipped to make Internet governance decisions.[136] Further, they fought for safeguarding the open standards and non-discriminatory layers of the Internet, which they emphasized are crucial for user innovation.[137] Specifically, they argued for the importance of network neutrality—the availability of nondiscriminatory broadband transport to all comers.[138] Consequently, together with the advent of the intellectual property wars, the transformed capabilities of information technology users played a role in elevating the status of innovation in the legal discourse during the last two decades.

III. ADMIRING THE BRILLIANT; NEGLECTING THE MUNDANE

The case law study demonstrates that the celebration of innovation is a relatively new phenomenon in modern legal history. At first blush, innovation rhetoric and the promotion of innovation as a value seem innocuous. Yet, the focus on innovation shadows other important social goals.[139] Particularly, this Part argues that although both innovation and

134 *See* Balkin, *supra* note 37, at 14-15; Hunter & Lastowka, *supra* note 117, at 1018-29.

135 LESSIG, *supra* note 36, at 99, 140.

136 *See* David R. Johnson, Susan P. Crawford & John G. Palfrey, Jr., *The Accountable Internet: Peer Production of Internet Governance*, 9 VA. J.L. & TECH. 9 (2004).

137 *See id.*

138 Crawford, *supra* note 59, at 57.

139 Some scholars have recently looked at intellectual property beyond the innovation paradigm. *See* Margaret Chon, *Intellectual Property and the Development Divide*, 27 CARDOZO L. REV. 2821, 2832 (2006) (emphasizing the need to focus on distributional effects); Cotter, *supra* note 11, at 334 (arguing that copyright also affects diffusion, diversity, and quality); Frank Pasquale, *Beyond Competition and Innovation: The Need for Qualified Transparency in Internet Intermediaries*, 104 NW. U. L. REV. (forthcoming 2010) (arguing for the need to look beyond innovation to privacy and democratic culture in the regulation of Internet intermediaries); Pasquale, *supra* note 10, at 166-77 (focusing on the cost of information overload); Malla Pollack, *What Is Congress Supposed to Promote?: Defining "Progress" in Article I, Section 8, Clause 8 of the United States Constitution, or Introducing the Progress Clause*, 80 NEB. L. REV. 754 (2001) (arguing that the Intellectual Property Clause's mission to promote progress requires it to promote dissemination); Sara K. Stadler, *Copyright as Trade Regulation*, 155 U. PA. L. REV. 899, 913-27 (2007) (emphasizing the importance of access and the promotion of open and populous

diffusion are necessary for promoting the progress goal, innovation is celebrated while the diffusion stage in the life cycle of new technologies is neglected. The neglect is reflected in the failure to dedicate attention and social resources to the social adoption of new technologies.

While many legal resources are directed mainly at innovation by focusing on the appropriate incentives to induce individuals and corporations to invent new technologies, relatively few are channeled to the subsequent phase of the technological cycle—the diffusion stage. The diffusion stage, which follows the invention and innovation stages, consists of the social adoption process of new technologies.[140] The neglect of the diffusion stage is crucial because the promotion of progress depends not only on fleeting moments of brilliance or even excruciating processes of development; progress is closely tied also to the technology's diffusion process. The goals of promoting innovation can be accomplished only if people adopt and use the new technology.

One need not look far to shed light on the preference for rewarding innovation over investing in diffusion safeguards. Intuitively, we prefer the glamorous. We tend to accrue prestige to construction and creativity.[141] We celebrate the genius of Thomas Edison, who invented the light bulb;[142] the brilliance of Isaac Newton, who unveiled the principles of universal gravitation, thereby laying the ground for classical mechanics;[143] and the extraordinary talent of Wolfgang Amadeus Mozart, one of the greatest composers of classical music, who wrote his first compositions at the age of five.[144]

Unsurprisingly, as designers, inventors, and creators are hailed for their achievements, technical issues are positioned at the center of the stage. At the same time, the context that surrounds a technology—such as personal and social values, maintenance, use, and compatibility with existing laws—receives scant attention. Overall, resources invested in technologies concentrate on the hardware and not on human activity.[145]

markets as goals of copyright law). Authors writing about technologies from the antitrust perspective are more likely to look beyond the innovation paradigm. *See* C. Scott Hemphill, *Paying for Delay: Pharmaceutical Patent Settlement as a Regulatory Design Problem*, 81 N.Y.U. L. REV. 1553 (2006) (discussing an antitrust approach to pharmaceutical patent settlements).

140 *See* ROGERS, *supra* note 6; Nicholas A. Ashford et al., *Using Regulation to Change the Market for Innovation*, 9 HARV. ENVTL. L. REV. 419, 419 n.1 (1985); Natalie M. Derzko, *Using Intellectual Property Law and Regulatory Processes to Foster the Innovation and Diffusion of Environmental Technologies*, 20 HARV. ENVTL. L. REV. 3, 9 (1996); Michael A. Gollin, *Using Intellectual Property to Improve Environmental Protection*, 4 HARV. J.L. & TECH. 193, 197-98 (1991); Kathleen M. Rest & Nicholas A. Ashford, *Regulation and Technological Options: The Case of Occupational Exposure to Formaldehyde*, 1 HARV. J.L. & TECH. 63, 65 (1988) (describing the stages of the technological cycle).

141 *See* PACEY, *supra* note 7.

142 4 THE NEW ENCYCLOPÆDIA BRITANNICA, *supra* note 1, at 370.

143 24 *id.* at 931.

144 24 *id.* at 445.

145 *See* PACEY, *supra* note 7, at 1-15, 24, 48-50.

It is during the diffusion process of new technologies that context and human activity attains a crucial role. To assure that technologies are used effectively or even used at all, there is a need to address issues beyond innovation, design, and construction.[146]

IV. INTELLECTUAL PROPERTY RIGHTS AND DIFFUSION

Many of the controversies that contributed to the ubiquity of innovation rhetoric involved battles regarding the appropriate scope of intellectual property rights. Consequently, to illustrate the relative neglect of the diffusion stage in the life cycle of new technologies, this Part will focus on the controversies involving copyright and digital music and gene patents and genetic testing. In both cases, scholars, legislators, and courts alike have paid abundant attention to the effects on innovation. Yet, this Part will show that while legal attention is focused on the effects of expanding intellectual property rights on genetics and Internet innovation, the very same intellectual property monopolies impose grave social costs that inhibit the adoption of genetic testing and digital music technologies. Further, this Part will propose ways of channeling attention and resources towards the adoption process to resolve the diffusion problems.

A. *Patents and Genetic Testing*

The advent of biotechnology was accompanied by an influx of gene patents. The Supreme Court's 1980 decision, *Diamond v. Chakrabarty*, which held that living organisms could be patented, opened the door to the possibility of patenting genes.[147] At the same

[146] This Article undertakes a broad view of the diffusion process. It does not view the diffusion process as limited to the commercialization of a new technology. This approach is motivated by the important role of the law in diffusion cases in which new technologies clash with embedded socio-legal values. For further discussion of the way in which the diffusion process extends beyond commercialization, see Gaia Bernstein, Disseminating Technology (June 24, 2010) (unpublished manuscript, on file with author). For discussions of the legal role in mediating diffusion process clashes between technologies and values, see generally Gaia Bernstein, *The Paradoxes of Technological Diffusion: Genetic Discrimination and Internet Privacy*, 39 CONN. L. REV. 241 (2006) [hereinafter Bernstein, *Paradoxes*] (discussing clashes between the value of privacy and Internet and genetic testing technologies); and Gaia Bernstein, *Accommodating Technological Innovation: Identity, Genetic Testing and the Internet*, 57 VAND. L. REV. 965 (2004) (discussing the destabilization of the value of identity by Internet and genetic testing technologies).

[147] Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980).

time, the great promise of biotechnology drew to the field a large number of researchers who patented their work product.[148]

Two additional factors contributed significantly to the influx of gene patents. First, the Patent Office granted gene patents not only on commercial DNA applications, such as diagnostic tools or therapies, but also on the field's basic findings. Particularly, the Patent Office granted patents over DNA sequences that are needed as basic research tools for the invention of more advanced applications.[149] Second, the Bayh-Dole Act and the Stevenson Wydler Act, which were enacted in the 1980s,[150] permitted recipients of government research funds to obtain patents on their innovations. Consequently, universities joined the private sector as major players in the biopharmaceutical patenting arena, particularly in filing patents on basic research discoveries, such as DNA sequences.[151]

The large number of gene patents and especially the significant number of patents granted on basic DNA structures instigated a heated debate regarding the effect of these patents on innovation in the biotechnology arena.[152] Scholars developed the anticommons paradigm as the main critique of the detrimental effect of gene patents on innovation. They criticized the flood of gene patents, arguing that patenting upstream discoveries, such as DNA sequencing, impedes downstream innovation, including diagnostic testing and therapeutic proteins.[153] Further, they explained that the grant of a large number of patents creates an anticommons problem that increases the costs of research. Researchers seeking to develop new products need to obtain patent rights from a large number of entities, which significantly raises research expenses.[154] At the same time, other voices in the debate

148 Sara Dastgheib-Vinarov, Comment, *A Higher Nonobviousness Standard for Gene Patents: Protecting Biomedical Research from the Big Chill*, 4 MARQ. INTELL. PROP. L. REV. 143, 164-67 (2000) (providing data showing that the number of biotech patents increased significantly more than other patent categories during the 1990s); Charles E. Van Horn, *Examination of the Patent Applications*, *in* TRENDS IN BIOTECHNOLOGY AND CHEMICAL PATENT LAW 9, 11-42 (PLI Patents, Copyrights, Trademarks & Literary Prop., Course Handbook Series No. 206, 1985) (stating that in the six years following the *Chakrabarty* decision, patent applications in genetic engineering were received at twenty-to-thirty times the previous rate).

149 *See* Burk & Lemley, *supra* note 76, at 731-32.

150 Bayh-Dole Act, Pub. L. No. 96-517, 94 Stat. 3019 (1980) (codified as amended at 35 U.S.C. § 200 (2006)); Stevenson-Wydler Technology Innovation Act of 1980, Pub. L. No. 96-480, 94 Stat. 2318 (codified as amended at 15 U.S.C. § 3710(a) (2006)).

151 See Rai & Eisenberg, *supra* note 35, at 290-91.

152 David E. Adelman, *A Fallacy of the Commons in Biotech Patent Policy*, 20 BERKELEY TECH. L.J. 985, 985 (2005) ("Fears that the recent proliferation of biotech patents is undermining scientific norms and threatening innovation dominate the debate over biotech patent policy.").

153 *See* Heller & Eisenberg, *supra* note 35, at 700.

154 *See* Dan L. Burk, *Biotechnology in the Federal Circuit: A Clockwork Lemon*, 46 ARIZ. L. REV. 441, 448-50 (2004) (arguing that current patent standards generate numerous narrow gene patents); Burk & Lemley, *supra* note 76, at 728, 730 (describing scholars' concerns and academic proposals to resolve the effects of patenting on genetic science innovation); Heller & Eisenberg,

argued that the effect of biotech patents may not be as adverse as believed by the majority of intellectual property scholars.[155]

The debate on the effect of DNA patenting on innovation grew and developed over the last decade, consuming significant public attention. Different views were formulated regarding the effects of DNA patenting on innovation and the potential resolutions.[156] At the same time, as scholars focused on the innovation debate, they did not address an equally disturbing failure that stemmed from the very same source. Gene patents affect not only future innovation in the field of genetics; they also hold back the diffusion of existing genetic testing technology.

An important application of the science of genetics is clinical diagnostic tests that examine whether an individual carries a genetic mutation that makes her more likely to incur the disease for which she is tested. Genetic tests are available for a broad range of diseases, including common diseases such as breast cancer and Alzheimer disease.[157] In some cases, individuals can undertake measures that may prevent the disease. In other instances, the knowledge can improve important life decision-making, such as procreation decisions. For example, if both individuals are carriers of Tay-Sachs disease, they have a twenty-five percent chance of having a child born with the disease.[158] The knowledge of their carrier status could affect their decision to have

supra note 35, at 699-700 (arguing that the large number of patents on upstream products increases the cost of research).

155 *See* David E. Edelman & Katheryn L. DeAngelis, *Patent Metrics: The Mismeasure of Innovation in the Biotech Patent Debate*, 85 TEX. L. REV. 1677, 1680-84 (2007) (arguing that the effect of the growth in biotechnology patenting on innovation is more limited than believed); Robert P. Merges, *A New Dynamism in the Public Domain*, 71 U. CHI. L. REV. 183-91 (pointing out that private actors are working to alleviate the biotech anticommons problem).

156 *See, e.g.*, Rochelle Cooper Dreyfuss, *Varying the Course in Patenting Genetic Material: A Counter-Proposal to Richard Epstein's Steady Course*, *in* PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 195, 204, 208 (F. Scott Kieff ed., 2003) [hereinafter HUMAN GENOME PROJECT] (proposing a researcher exemption from patent infringement suits); Richard A. Epstein, *Steady the Course: Property Rights in Genetic Material*, *in* HUMAN GENOME PROJECT, *supra*, at 153, 181-93 (proposing that all genetic products, excluding expressed sequence tags, should remain under the ordinary patent regime); F. Scott Kieff, *Perusing Property Rights in DNA*, *in* HUMAN GENOME PROJECT, *supra*, at 125 (providing an analysis of the operation of patent rights in the area of biotechnology); David W. Opderbeck, *The Penguin's Genome or Coase and Open Source Biotechnology*, 18 HARV. J.L. & TECH. 167, 216-26 (2004) (discussing the suitability of open source models for resolving the effect of patents on biotechnology innovation); Arti K. Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, 16 BERKELEY TECH. L.J. 813, 822-23 (2001) (discussing the role of patent and antitrust law in encouraging innovation, specifically focusing on upstream research products).

157 Over 1000 genetic tests are now available. The Human Genome Project: Gene Testing, http://www.ornl.gov/sci/techresources/Human_Genome/medicine/genetest.shtml#testsavailable (last visited Apr. 5, 2010).

158 *See* National Institute of Neurological Disorders and Stroke: Tay-Sachs Disease Information Page, http://www.ninds.nih.gov/disorders/taysachs/taysachs.htm (last visited Apr. 5, 2010).

a genetic child or to take precautionary measures of additional prenatal testing through the pregnancy.

Currently, diagnostic genetic testing is the most developed application of clinical genetics.[159] Yet, despite the significant resources and innovative work invested in the development of genetic tests, empirical evidence reveals that gene patents inhibit the diffusion of genetic testing technology. Two studies show that the pressures exerted by gene patent holders and the legal uncertainty resulting from the existence of multiple gene patents inhibit laboratories and physicians from offering genetic tests. While traditionally patents are viewed as a tradeoff between the benefit of encouraging innovation and the cost of limiting access to the resulting innovation,[160] the ramifications of gene patents on genetic testing go beyond the traditional patent tradeoff. The uncertainty regarding the ownership of gene patents hindered diffusion beyond the expected inhibiting effects of the patent monopoly.

The first study, which surveyed laboratory directors, showed that twenty-five percent of the laboratories surveyed ceased performing a genetic test after being contacted by a patent owner or licensee regarding the laboratory's potential infringement of its patent. Overall, these laboratories discontinued performing twelve types of genetic tests. Although the number of actual tests discontinued is not high compared to the number of available genetic tests, these tests have high clinical relevance. They include tests for common genetic mutations, such as the breast cancer genetic mutation.[161]

The second study, which focused on Haemochromatosis, a disease affecting 1 in 200-300 people of northern European descent, revealed similar findings. It found that of the U.S. laboratories that began genetic testing for Haemochromatosis before the patents were awarded, thirty percent reported discontinuing or not developing clinical applications of the test once exclusive patent licenses were issued.[162]

The threat of the cease-and-desist letter was supplemented by the confusion created by the Patent Office's grant of separate patents on gene sequences, gene fragments, the identification of gene functions,

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159 Two additional areas of clinical genetics' applications are gene therapy and pharamacogenetics. Despite years of research and trials, gene therapy has so far attained few successes. *See* National Institute of Neurological Disorders and Stroke: Gene Therapy Page, http://www.ninds.nih.gov/research/parkinsonsweb/gene_therapy.htm (last visited Apr. 5, 2010). Pharmacogenetics is currently a very promising clinical application, but far less developed than genetic diagnostic testing. *See* U.S. FOOD & DRUG ADMIN., GUIDANCE FOR INDUSTRY: PHARMACOGENOMIC DATA SUBMISSIONS (2005), http://www.fda.gov/downloads/RegulatoryInformation/Guidances/ucm126957.pdf (last visited Apr. 5, 2010).

160 *See* Paul E. Schaafsma, *An Economic Overview of Patents*, 79 J. PAT & TRADEMARK OFF. SOC'Y 241, 246-50 (1997) (providing a traditional analysis of the monopoly-access tradeoff).

161 Cho et al., *supra* note 15, at 5-6.

162 Merz et al., *supra* note 15, at 577-78.

and diagnostic tests.[163] Laboratories and physicians could not easily ascertain that by paying licensing fees to one company, they would not remain liable to another entity that also holds rights over the test. Consequently, genetic testing service providers—who often did not have the resources to conduct a search to determine the different right-holders—preferred to avoid offering the test.

In addition, patent holders exercise different practices that hinder accessibility and limit the development of genetic tests. These practices include royalty-based licensing with exorbitant upfront fees and licensing agreements that seek proportions of reimbursements from testing services. Further, patent owners demand that the samples be sent to their licensed laboratories, regardless of the distance or the ability to easily test in a local laboratory.[164]

A prominent player who employed these practices extensively is Myriad Genetics (Myriad), which held patents over the breast cancer genes BRCA1 and BRCA2.[165] Myriad has a broad patent which includes the genetic sequence, diagnostic, and therapeutic uses. Myriad required that the samples undergo full sequencing in its headquarters in Salt Lake City, regardless of the location of the patient in the world.[166] Consequently, laboratories and physicians still offering the test had to charge exorbitant prices.[167] Yet, Myriad was not a lone player; other patent holders repeatedly use these practices,[168] creating a climate of legal threats and uncertainty around the offering of genetic tests.[169]

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163 *See* Cynthia D. Lopez-Beverage, *Should Congress Do Something About Upstream Clogging Caused by the Deficient Utility of Expressed Sequence Tag Patents?*, 10 J. TECH. L. & POL'Y 35, 49-50 (2005); Shanshan Zhang, *Proposing Resolutions to the Insufficient Gene Patent System*, 20 SANTA CLARA COMPUTER & HIGH TECH. L.J. 1139, 1154 (2004).

164 *See generally* Cho et al., *supra* note 15; Press Release, Am. Coll. of Med. Genetics, Position Statement on Gene Patents and Accessibility of Gene Testing (Aug. 2, 1999), http://www.acmg.net/StaticContent/StaticPages/Gene_Patents.pdf.

165 As this Article is going into press, a district court decision invalidated Myriad's BRCA1/2 patents. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 2010 U.S. Dist. LEXIS 35418 (S.D.N.Y. Apr. 5, 2010). Yet, it remains to be seen whether this decision will be upheld on appeal.

166 *See* Bryn Williams-Jones, *History of a Gene Patent: Tracing the Development and Application of Commercial BRCA Testing*, 10 HEALTH L.J. 123, 135-36 (2002); Sylvia Pagan Westphal, *Your Money or Your Life*, NEW SCIENTIST, July, 13, 2002, at 29.

167 The price for testing in the United States tends to vary, depending on ethnicity and whether the mutation has already been identified in the individual's family. Costs often run up to $3000. *See* Associated Press, *Dad Can Pass Down Hidden Breast Cancer Gene*, MSNBC.COM, June 19, 2007, http://www.msnbc.msn.com/id/19313848; National Cancer Institute, BRCA1 and BRCA2: Cancer Risk and Genetic Testing, http://www.cancer.gov/cancertopics/factsheet/Risk/BRCA (last visited Apr. 5, 2010); Reach Global, Questions & Answers, http://www.reachglobal.org/questions.html (last visited Apr. 5, 2010) (containing information on breast cancer, ovarian cancer, and genetic testing).

168 Another example is Athena Neurosciences, Inc., which holds the patent on a gene associated with Alzheimer's Disease. Athena also refused to allow any laboratory except its own to screen for mutations of the gene. Athena refused even though testing could easily be administered with knowledge of the gene sequence, without using the product made by the patent

While few lawsuits were filed against genetic testing service providers and those that were filed were dismissed or settled,[170] the Patent Office's grant of broad gene patents, the described licensing practices, and the cease-and-desist letters created a climate of legal uncertainty, which hindered access to genetic testing beyond the traditional bounds of the patent monopoly.[171]

Unlike the debate over the effect of gene patents on innovation, the implications of gene patents for technological diffusion received scant attention in the public and academic debate. Diffusion failures in the medical arena are usually addressed only in their extreme—that is, mainly in the context of the supply of drugs to third world countries.[172] A prominent example, which received much attention, is the diffusion of AIDS drugs in third world countries.[173] In the case of genetics, while the law focused on innovation, it failed to address the diffusion problems that accompany the use of genetic testing.[174] Despite the

holder. *See* Lori B. Andrews, *Genes and Patent Policy: Rethinking Intellectual Property Rights*, 3 NATURE REVIEWS GENETICS 803, 804 (2002).

169 Compliance with laboratory standard testing regulations does not explain patent owners' reluctance to allow genetic testing in other labs. There is currently little oversight of genetic testing administered by physicians or in laboratories. The laws regulating other medical testing are generally not applied to regulate genetic testing. *See* Gail H. Javitt & Kathy Hudson, *Federal Neglect: Regulation of Genetic Testing*, ISSUES SCI. & TECH., Spring 2006, at 59, 59-62 (explaining that the Clinical Laboratories Improvement Act and the Food and Drug Administration fail to regulate "home brew" genetic tests); Eileen M. Kane, *Patent-Mediated Standards in Genetic Testing*, 2008 UTAH L. REV. 835 (2008) (describing the lacunae in genetic testing oversight); Letter from Kathy Hudson, Dir., Genetics & Pub. Policy Ctr., Sharon Terry, President & CEO, Genetic Alliance, & Peter Lurie, Deputy Dir., Pub. Citizen's Health Research Group, to Mark McClellan, Adm'r, Ctrs. for Medicare & Medicaid Servs. (Sept. 26, 2006), *available at* http://www.dnapolicy.org/resources/Petition_For_Rulemaking_September_2006.pdf (arguing that most labs that administer genetic testing do not engage in the currently voluntary proficiency testing and requesting to implement the Clinical Laboratories Improvement Act by creating a genetic testing specialty and establishing mandatory proficiency testing standards for genetic testing).

170 *See* Christopher M. Holman, *The Impact of Human Gene Patents on Innovation and Access: A Survey of Human Gene Patent Litigation*, 76 UMKC L. REV. 295, 346-51 (2007) (reporting the results of a study, which include only three lawsuits against service providers of disease genetic testing).

171 Christopher Holman in his study of human gene patent litigation demonstrates that few suits have been brought against genetic testing service providers and that none of these suits resulted in a judgment against a service provider. Yet, he acknowledges that access to patented technologies could be restricted due to misperception of risk. *See id.* at 352-61.

172 For a discussion of the balance between patent rights and public health, see generally Cynthia M. Ho, *Current Controversies Concerning Patent Rights and Public Health in a World of International Norms*, *in* PATENT LAW AND THEORY: A HANDBOOK OF CONTEMPORARY RESEARCH 673 (Toshiko Takenaka ed., 2008).

173 *See, e.g.*, Amy Kapczynski, Samantha Chaifetz, Zachary Katz & Yochai Benkler, *Addressing Global Health Inequities: An Open Licensing Approach for University Innovations*, 20 BERKELEY TECH. L.J. 1031, 1033-38 (2005) (discussing price for HIV drug in South Africa); Constable, *supra* note 26 (describing the market for lower priced AIDS drugs in India); Swarns, *supra* note 26 (describing negotiations to reduce the prices of patented AIDS drugs in South Africa).

174 There are a few exceptions. Lori Andrews, writing about gene patents, discussed both the

importance of promoting both innovation in genetics and the dissemination of genetic testing technology to ensure that the field of genetics contributes to progress and human welfare, attention has focused practically exclusively on the innovation issue. Few efforts were made—whether through litigation, legislation, or the academic arena—to combat the inhibiting effects of gene patents on the use of genetic testing.

The absence of efforts to combat the inhibiting effects on genetic tests' diffusion is particularly evident in academia and legislation, where many attempts were made to resolve the effects of gene patents on genetic research. The robust academic debate on the effects of gene patents on innovation produced a broad array of proposals seeking to resolve the negative impact of gene patents on research and innovation. Many legal scholars who were working within the anticommons paradigm advocated restricting gene patents for upstream genetic products, particularly gene sequences.[175] Scholars suggested different measures to achieve this goal. For example, Dan Burk and Mark Lemley, focusing on the requirements for the grant of a patent, proposed to raise the obviousness standard while lowering the disclosure requirement. Burk and Lemley argued that altering the standards would result in a few very powerful patents, instead of the current broad array of narrow gene patents, thus resolving the anticommons problem.[176] Another instance is a proposal by Arti Rai and Rebecca Eisenberg. Rai and Eisenberg suggested that federal grant-making agencies, such as the National Institute of Health, should be empowered to abrogate patent

effects on research and public health. *See, e.g.*, Andrews, *supra* note 168, at 804-05; Lori B. Andrews & Jordan Paradise, *Gene Patents: The Need for Bioethics Scrutiny and Legal Change*, 5 YALE J. HEALTH POL'Y L. & ETHICS 403, 406-11 (2005); *see also* Eileen M. Kane, *Molecules and Conflict: Cancer, Patents and Women's Health*, 15 AM. U. J. GENDER SOC. POL'Y & L. 305, 310-33 (2007). Other articles that examined the effects of gene patents beyond innovation did not focus on diffusion but on other aspects of commercialization, such as FDA drug approval. *See, e.g.*, Michael J. Malinowski & Maureen A. O'Rourke, *A False Start? The Impact of Federal Policy on the Genotechnology Industry*, 13 YALE J. ON REG. 163, 215-23 (1996). Otherwise, the little discussion that did take place in the academic arena about the effects of gene patents on diffusion was confined to student notes and comments. *See, e.g.*, Melissa E. Horn, Note, *DNA Patenting and Access to Healthcare: Achieving the Balance Among Competing Interests*, 50 CLEV. ST. L. REV. 253, 267-72, 276-77 (2002-2003) (discussing the effects of gene patents on the cost and quality of genetic testing); May Mowzoon, Comment, *Access Versus Incentive: Balancing Policies in Genetic Patents*, 35 ARIZ. ST. L.J. 1077, 1093-96 (2003) (noting that high transaction costs of gene patents may hinder use and improvement of life-saving diagnostic tests); Allen C. Nunnally, Note, *Commercialized Genetic Testing: The Role of Corporate Biotechnology in the New Genetic Age*, 8 B.U. J. SCI. & TECH. L. 306, 322 (2002) (discussing effects of breast cancer and Canavan patents on access to genetic tests).

175 *See* Burk & Lemley, *supra* note 76, at 730 (describing scholars' concerns and proposals regarding the effect of patenting on innovation in genetics).

176 *Id.* at 738.

rights when a state of anticommons threatens innovation and research.[177]

While academics vied to resolve the gene patent innovation predicament, few scholars focused on formulating a policy proposal that would directly tackle gene patents' detrimental effect on the diffusion of genetic tests. Proposals that offered a direct solution, such as exempting health care professionals from gene patent infringement suits, did not become part of the mainstream debate.[178]

The prevalent trends in academic scholarship are mirrored in the legislative arena. Over the last couple of years, legislators proposed several bills addressing gene patents. Yet, these bills focused primarily on the effects of genetic patents on research and innovation. For example, a bill entitled the Genomic Research and Accessibility Act proposed to prohibit patents on genetic sequences.[179] The bill's promoters explained that their goal is to counteract the effects of gene patents on innovation and research. Legislators who introduced the bill did not bring up the inhibiting effects on health care providers' use of genetic tests.[180]

Solutions aimed at directly addressing the detrimental effect on the spread of genetic testing were rarely incorporated into bills. An exception was the proposed and long buried Genomic Research and Diagnostic Accessibility Act of 2002 (GRDA). Yet, even in the GRDA, the solution for the diffusion problem was only ancillary to the general scheme, which aimed at resolving the innovation issue. Specifically, the bill included an exemption from patent infringement for health care providers of genetic tests; yet, it provided a similar exemption for scientists who undertake noncommercial genetic research.[181]

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177 Rai & Eisneberg, *supra* note 35, at 310.

178 Such an exemption would extend the statutory health care providers exemption, 35 U.S.C. § 287(c) (2006), from infringement of medical procedures patents to gene patents. *See* Sherizaan Minwalla, *A Modest Proposal to Amend the Patent Code 35 U.S.C. § 287(c) to Allow Health Care Providers to Examine Their Patients' DNA*, 26 S. ILL. U. L.J. 471, 492-98, 503 (2002).

179 The language of the bill is at this point somewhat ambiguous. The bill states that "no patent may be obtained for a nucleotide sequence, or its functions or correlations, or the naturally occurring products it specifies." Genomic Research and Accessibility Act, H.R. 977, 110th Cong. (2007).

180 Xavier Becerra of California, who introduced the bill, focused on the need to tackle the effects of gene patents on innovation. He addressed the effects of gene patents on laboratories' use of genetic testing only in the context of the laboratories' ability to develop and improve the tests. 153 CONG. REC. E315 (daily ed. Feb. 9, 2007) (statement of Rep. Becerra).

181 Genomic Research and Diagnostic Accessibility Act of 2002, H.R. 3967, 107th Cong. (2002). Further, the GRDA was introduced with a companion bill—the Genomic Science and Technology Innovation Act of 2002—which directed the Office of Science and Technology to initiate a study of the effect of federal policies on the discovery and development of genomic technologies. Genomic Science and Technology Innovation Act of 2002, H.R. 3966, 107th Cong. (2002).

Reviewing the treatment of gene patents in the academic and legislative arenas underscores the disparity between the concern regarding the effects of patent enforcement on innovation and the lack of attention to the diffusion problem.[182] Since the legal regime's attention translates into resources, the lack of attention to diffusion effects translates into a dearth of resources to combat the problem. The disparity between the treatment of the effects on innovation and the effects on diffusion is particularly striking in the legislative arena, where despite the flurry of activity focused on gene patents, the resolution of the genetic testing issue repeatedly took a backseat to solving the research and innovation problem. Most often, legislators failed to mention that the inhibition of genetic testing diffusion was another adverse result of abundant gene patenting. This was the case with the bill—the Genomic Research and Accessibility Act—which focused on innovation and restriction of patents on gene sequences. True, some solutions that would resolve the innovation problem would also alleviate the diffusion problem. The restriction on patenting gene sequences would have an effect on patent rights over genetic testing. Yet, these resolutions at best are partial and indirect. Furthermore, even where the effects on genetic testing were addressed and a direct solution—such as an exemption for health care providers—was incorporated into the proposed legislation, the diffusion issue was treated as secondary to the innovation problem.

This Article proposes that attention and legal resources should be targeted directly at the genetic testing diffusion problem. Recently, a change in litigation strategy resulted in a district court's invalidation of Myriad's BRCA1/2 patents. In *Ass'n for Molecular Pathology v. United States Patent & Trademark Office*, the U.S. District Court for the Southern District of New York invalidated the patents on subject matter grounds, holding that since the isolated DNA covered by Myriad's patents is not markedly different from the native DNA as it exists in nature, it is not patentable subject matter.[183] Yet, the court, prompted by plaintiffs' complaint,[184] dedicated a significant part of the opinion to the diffusion issue. The opinion discusses the stories of women who were unable to test to find out whether they carry the BRCA1/2 genes because Myriad would not accept their insurance. It

[182] The litigation arena has not seen much in the way of research litigation or testing provider litigation. *See generally* Holman, *supra* note 170, at 340-51 (reporting the results of an empirical study, which indicated a small number of lawsuits involving gene patents and research and gene patents and testing).

[183] Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 2010 U.S. Dist. LEXIS 35418, at *147 (S.D.N.Y. Apr. 5, 2010).

[184] Complaint, Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 2010 U.S. Dist. LEXIS 35418 (S.D.N.Y. Apr. 5, 2010) (No. 09 Civ. 4515), *available at* http://www.aclu.org/files/images/asset_upload_file939_39568.pdf.

recounts the ordeals of women who could not get definitive answers through Myriad's testing and were precluded from seeking testing elsewhere. It underscores that women were unable to get a second opinion of the test results because tests are conducted only by Myriad. And finally, it discusses the efforts of doctors and laboratories who were willing and able to offer BRCA1/2 testing but were precluded by Myriad from conducting the testing.[185] Although the court's analysis of patentable subject matter is not directly related to the diffusion issue, the detailed discussion of patients' interests shows that these interests played a role in the court's decision.

The result in *Ass'n for Molecular Pathology* suggests that a similar change of strategy could also be effective in the legislative arena. For example, legislative action such as the healthcare provider exemption—which addresses the diffusion issue independently from the innovation problem—would be particularly effective for several reasons. First, a solution targeted directly at the problem is more likely to effectively resolve it in the short-run. A direct resolution would reduce legal uncertainty and encourage health care providers who may be otherwise deterred from offering the test by the threat of a myriad of patents.[186] Second, over the last couple of years, activists and legislators alike witnessed the difficulties of resolving the gene patents innovation problem. As discussed, legislators infrequently addressed the implications of gene patents for the use of genetic testing, and when the issue was brought up, diffusion was presented as a secondary issue incorporated under a scheme designed to resolve the innovation problem. A political solution to the diffusion problem is more likely if legislators and activists present the diffusion issue separately from the innovation problem and focus on a narrow and direct solution for that problem.

B. *Copyrights and Digital Music*

Most people learned about digital music technology through the copyright battles involving peer-to-peer file-sharing networks. The music industry initiated a campaign to enforce its copyrights in order to prevent individuals from using file-sharing networks to gain free access to music. The music industry's campaign consisted of both legal and technical measures. The legal front comprised two types of lawsuits. First, the music industry sued intermediaries who enabled individuals to gain free access to musical works for contributory copyright

185 *Id.* at 7-17, 60-70.

186 *See* Bernstein, *Paradoxes*, *supra* note 146, at 287-88 (discussing the effects of express, clear-cut legal pronouncements on risk perceptions of technology users).

infringement. The lead lawsuits, which gained the most publicity, involved suits against the file-sharing networks themselves. These included lawsuits against Napster,[187] Grokster,[188] and Kazaa.[189] Second, the music industry filed thousands of direct copyright infringement lawsuits against individuals who used the file-sharing networks.[190] On the technological front, companies that sell music online have used DRM systems to limit the ways in which consumers can use their music. Music copyright holders use DRM technology to regulate what users can and cannot do with digital content.[191] For example, copyright holders use DRM to prevent the transfer of music from one listening device to another. They also use DRM to control the number of copies a consumer can make of a music track. Copyright holders' initial goal in using DRM technology was to prevent unauthorized use of copyrighted music over file-sharing systems. [192]

As the number of copyright lawsuits increased and digital music-sharing services closed, many lamented the loss in terms of innovation. Multiple scholars assessed the problem and the potential solutions.[193] And importantly, the story of digital music was inserted into the

187 A&M Records, Inc. v. Napster, Inc., 239 F.3d 1004 (9th Cir. 2001).

188 MGM Studios v. Grokster, 545 U.S. 913 (2005).

189 Universal Music Austl. Pty Ltd. v. Sharman License Holdings Ltd., (2005) 220 A.L.R. 1 (Austl.), *available at* http://www.austlii.edu.au/au/cases/cth/FCA/2005/1242.html; Buma/Kazaa BV, Hoge Raad der Nederlanden [HR] [Supreme Court of the Netherlands], Dec. 19, 2003, 2004 Eur. Copyright & Design Rep. (Street & Maxwell) 16 (Neth.). For a description of the secondary liability lawsuits, see generally Mark A. Lemley & R. Anthony Reese, *Reducing Digital Copyright Infringement Without Restricting Innovation*, 56 STAN. L. REV. 1345, 1354-66 (2004).

190 For a description of the music industry's lawsuits against individuals, see generally Justin Hughes, *On the Logic of Suing One's Customers and the Dilemma of Infringement-Based Business Models*, 22 CARDOZO ARTS & ENT. L.J. 725, 730-49 (2005); and Peter K. Yu, *P2P and the Future of Private Copying*, 76 U. COLO. L. REV. 653, 658-76 (2005).

191 For a discussion of DRM and its effect on fair use, see generally Jacqueline D. Lipton, *Solving the Digital Piracy Puzzle: Disaggregating Fair Use from the DMCA's Anti-Device Provisions*, 19 HARV. J.L. & TECH. 111 (2005).

192 *See* URS GASSER & JOHN PALFREY, CASE STUDY: DRM-PROTECTED MUSIC INTEROPERABILITY AND E-INNOVATION 1 (Berkman Ctr. Publ'n Series No. 2007-9, 2007), *available at* http://dash.harvard.edu/handle/1/2794938.

193 For a summary of the different proposals made by commentators, see Yu, *supra* note 190, at 698-738. For specific discussions, see WILLIAM W. FISHER III, PROMISES TO KEEP: TECHNOLOGY, LAW, AND THE FUTURE OF ENTERTAINMENT 199-258 (2004) (suggesting an administrative compensation system); Ann Bartow, *Arresting Technology*, 1 BUFF. INTELL. PROP. L.J. 95 (2001) (suggesting that copyright owners should develop technological measures to prevent unauthorized copying instead of undertaking legal measures); David W. Opderbeck, *Peer-to-Peer Networks, Technological Evolution, and Intellectual Property Reverse Private Attorney General Litigation*, 20 BERKELEY TECH L.J. 1685 (2005) (describing the failure of the private attorney general litigation method); Lior Jacob Strahilevitz, *Charismatic Code, Social Norms, and the Emergence of Cooperation on the File-Swapping Networks*, 89 VA. L. REV. 505 (2003) (offering a solution to the file-sharing controversy that focuses on social norms); and see also Raymond Shih Ray Ku, *Grokking Grokster*, 2005 WIS. L. REV. 1217 (2005) (providing a general discussion of the file-sharing controversy).

accepted narrative of the inhibiting effect on innovation of expanding intellectual property.

While the parties to the direct copyright infringement lawsuits made infrequent use of innovation arguments,[194] the contributory infringement lawsuits became an additional battlefield governed by the innovation narrative. Academics who opposed the music industry's actions argued that lawsuits against the facilitators of music downloading, such as file-sharing networks, threaten to stifle innovation.[195] Scholars raised different articulations of the innovation argument. Mainly, they argued that enforcement of the music industry's copyrights against file-sharing networks would impede technological innovation. They explained that developers of similar technologies would be deterred from developing new products as a result of fearing copyright lawsuits. Consequently, the invention of technologies for legal uses would be deterred. Further, they cautioned that courts are more likely to prohibit the use of new technologies whose ultimate benefit is unclear as compared to established technologies.[196]

The scholarly arguments regarding inhibition of innovation in new technologies were reflected in litigation. In the Supreme Court litigation *Metro-Goldwyn-Mayer v. Grokster*, defendants' briefs and the amicus briefs in support of the defendants emphasized that modifying the more than twenty-year-old *Sony* contributory infringement copyright doctrine[197] and holding that the file-sharing network Grokster is liable, would chill innovation in new technologies.[198] At the same time, the

194 For a glimpse at the different types of arguments raised by defendants in the individual lawsuits, see for example, BMG Music v. Gonzalez, 430 F.3d 888, 889-90 (7th Cir. 2005) (raising a fair use argument); Sony Pictures Home Entm't v. Charles Lott, 471 F. Supp. 2d 716, 719, 721 (N.D. Tex. 2007) (arguing that defendant was not using the IP address used for file-sharing); and Interscope Records v. Lindsey Duty, No. 05-CV-3744, 2006 U.S. Dist. LEXIS 20214, at *11, *13-14 (D. Ariz. Apr. 14, 2006) (arguing that recording companies are liable for intrusion upon seclusion and abuse of legal process). For examples of innovation arguments raised in individual direct infringement lawsuits, see Brief of Amici Curiae American Ass'n of Law Libraries et al. in Support of Defendant Debbie Foster's Motion for Attorney's Fees at 19, Capitol Records, Inc. v. Foster, 2007 U.S. Dist. LEXIS 97253 (W.D. Okla. July 16, 2007) (No. Civ. 04-1569-W) [hereinafter Brief of Amici Curiae American Ass'n of Law Libraries], *available at* http://www.ilrweb.com/viewILRPDF.asp?filename=capitol_foster_amicus (arguing that failure to impose defendant's attorney's fees on the music industry would chill innovation). In academia, a softer version of the innovation argument addressed individual use of file-sharing networks. Neil Netanel argued that copyright lawsuits suppress peer-to-peer users' speech and creativity. Specifically, he argued that these lawsuits stifle the Internet's potential for empowering users to select, share, compile, and remix. *See* Neil Weinstock Netanel, *Impose a Noncommercial Use Levy to Allow Peer-to-Peer File Sharing*, 17 HARV. J.L. & TECH. 1, 30 (2003).

195 *See* Lemley & Reese, *supra* note 189, at 1349.

196 *See id.* at 1386-90.

197 Sony Corp. v. Universal City Studios, Inc., 464 U.S. 417 (1984).

198 Brief of Respondents at 14, 25-26, MGM Studios Inc. v. Grokster Ltd., 545 U.S. 913 (2005) (No. 04-480); *see also* Transcript of Oral Argument at 33, *Grokster*, 545 U.S. 913 (No.

organizations that represented the music and film industry argued that a finding that Grokster is not contributorily liable would threaten innovation in artistic creation. They explained that copyright enforcement is vital for encouraging innovation in artistic content.[199] The parties' arguments in *Grokster* were not unique. Similar innovation arguments were raised by the parties to other contributory infringement file-sharing cases, such as the litigation resolving the fate of the Napster file-sharing network.[200]

While innovation plays a central role in the music file-sharing debate, a closer look reveals that the innovation narrative is ill-suited to address the impact of expanding copyrights on digital music technology. The main story to be told here is, in fact, not a tale of stifled innovation but of inhibited diffusion.[201] Digital music distribution has significant advantages over the dominant form of music distribution—the CD. It provides immediacy of distribution, the ability to select individual songs and create playlists, and the ability to transfer the music to a convenient medium. Yet, despite these advantages, the adoption of digital music technology was held back. Particularly, the slow adoption of digital music is striking when compared to the adoption rate of the music distribution mechanism that preceded it—the CD.

The CD was invented in 1982 and made its market debut the same year with Billy Joel's album *52nd Street*. In 1985, another famous album, the Dire Straits' *Brothers in Arms*, was released in CD format and had a significant impact on the adoption of CD technology. CD technology diffused rapidly. By 1988, CD sales surpassed those of vinyl records.[202]

04-480). This argument was echoed in many of the amicus briefs that were filed to support defendants. *See supra* note 51.

199 *See* Brief of Petitioners at 20, *Grokster*, 545 U.S. 913 (No. 04-480).

200 The following are some of the briefs that argued that a finding of copyright liability for Napster would impede innovation in new technologies: Amicus Curiae Brief of the Consumer Electronics Ass'n et al. in Support of Reversal at 1-3, A&M Records, Inc. v. Napster, Inc., 239 F.3d 1004 (9th Cir. 2001) (Nos. 00-16401, 00-16403); Brief for Amici Curiae Ass'n of American Physicians & Surgeons, Inc. et al. as Filed in Support of Appellant Napster, Inc. Supporting Reversal at 2, 13-14, *Napster*, 239 F.3d 1004 (Nos. 00-16401, 00-16403); Amended Brief Amicus Curiae of Copyright Law Professors in Support of Reversal at 4-6, *Napster*, 239 F.3d 1004 (Nos. 00-16401, 00-16403).

201 It is important to differentiate between copyright arguments that address the dissemination of knowledge and those that address the diffusion of new technologies. While scholars generally do not address the effect of intellectual property rights on the diffusion and social acceptance of new technologies, they often argue that dissemination of expression is an important goal of copyright law. For example, Jessica Litman argued in the context of digital music that "widespread dissemination is as central to the goals of copyright as initial creation . . . . If sharing is a more effective method of dissemination than selling copies, then prohibiting sharing to protect the market for copy sales is exactly backward." Jessica Litman, *Sharing and Stealing*, 27 HASTINGS COMM. & ENT. L.J. 1, 30-31 (2004).

202 SHUMAN GHOSEMAJUMDER, PHIL BANGAYAN & GISELLE BONET, DIGITAL MUSIC

Digital music, despite its more significant advantages, appears to have suffered a different fate. The technology was invented in the early 1980s. It became ready for market use around 1989, when digital audio could be compressed for transmission over modem speed connections. In 1994, another advance, the MP3 compression standard, further enabled commercialized digital music. In 1999, Napster added an additional distribution advantage. Napster users could connect to a network that allowed them to share files they each stored on their computers.[203] In addition, in 1998, Creative Technologies released a fully functional portable MP3 player—adding the portability advantage. Yet, the diffusion of digital music technology was halted.

Currently, over a decade since digital music distribution entered the marketplace, sales of digital music account for only a small fraction of music sales. Digital music is now legally available for pay through commercial digital music services, such as the iTunes store and Rhapsody. These services became a major source for digital music downloading on the Internet.[204] However, although sales of digital music are rising, in 2008, CD sales still comprised 77.8% of sales in the music market, while digital music sales comprised only 12.8% of total music sales.[205]

This delayed adoption of digital music is perplexing given that the overwhelming relative advantages of digital music distribution over CDs far outweigh those of CDs over vinyl records. One factor that doubtless affected the sales of digital music was downloading from file-sharing networks.[206] Yet, although downloading from file-sharing networks provides a partial explanation for low sales of digital music, it is not the only factor explaining an over-a-decade delay in the adoption of digital music.[207] Copyright enforcement, through both technological

DISTRIBUTION 2 (2002), *available at* http://shumans.com/digital-music.pdf; Kees A. Schouhamer Immink, *The Compact Disc Story*, 46 J. AUDIO ENGINEERING SOC. 458 (1998), *available at* http://www.exp-math.uni-essen.de/~immink/pdf/cdstory.pdf (noting in "Audio Disc Market" graph the diverging sales for CDs and LPs).

203 GHOSEMAJUMDER, BANGAYAN & BONET, *supra* note 202, at 4.

204 In 2005, thirty-four percent of Internet users who downloaded music used commercial services. MARY MADDEN & LEE RAINIE, PEW INTERNET & AM. LIFE PROJECT, MUSIC AND VIDEO DOWNLOADING MOVES BEYOND P2P 7 (2005), http://www.pewinternet.org/~/media//Files/Reports/2005/PIP_Filesharing_March05.pdf.pdf.

205 Recording Indus. Ass'n of Am., 2008 Consumer Profile [hereinafter RIAA 2008 Consumer Profile], http://76.74.24.142/CA052A55-9910-2DAC-925F-27663DCFFFF3.pdf.

206 *See* BRITISH MUSIC RIGHTS & UNIV. OF HERTFORDHSIRE, MUSIC EXPERIENCE AND BEHAVIOUR IN YOUNG PEOPLE: MAIN FINDINGS AND CONCLUSIONS 11 (2008), *available at* http://www.scribd.com/doc/3417953/Music-Experience-And-Behaviour-in-Young-People (reporting that sixty-three percent of British youth aged fourteen and older download music using peer-to-peer file-sharing); Martyn Williams, *Number of File-Sharers in Japan Rises Sharply*, COMPUTERWORLD, July 25, 2006, http://www.computerworld.com/s/article/9001995/Number_of_file_sharers_in_Japan_rises_sharply (reporting an increase of music file-sharing in Japan).

207 Most recent surveys showing an increase in digital music downloading were executed outside the United States. Currently, there is no clear evidence of the level of downloading from

and legal measures, also played a role in inhibiting the diffusion of digital music technology. Furthermore, it produced uncertainty that hindered even patently legal uses of digital music technology.

Primarily, competing DRM measures limited interoperability between competitors' devices and music.[208] For example, Apple—owner of the leading digital music store iTunes and the leading digital music device iPod—refused to license its FairPlay DRM system to competitors. Consequently, music purchased from iTunes and protected by FairPlay could only be played on iPods and other Apple devices, but not on competitors' music devices, such as Microsoft's digital music player Zune.[209] Hence, copyright enforcement prevented interoperability between digital music devices and music tracks.

Surveys found that DRM's effect on interoperability frustrated the consumer's digital music experience. According to a recent U.S. consumer survey, forty-percent of respondents said that a DRM-free business model would increase the number of digital file purchases.[210] Further, over one-third of respondents said that the presence of DRM technology in a product has stopped them from buying a digital music product.[211] Interestingly, music industry executives share the belief that DRM is hurting digital music downloads. A survey of music industry executives (including executives from small record labels, rights' bodies, digital stores, and technology providers) found that sixty-two percent of respondents believed that dropping DRM restrictions would boost the adoption of digital music technology.[212] Industry leaders

file-sharing networks in the United States. Further, in 2004, after the onset of the music industry's legal campaign against individuals in the United States, the reputable Pew Internet and American Life Project executed a U.S.-centered study, which showed a decrease in illegal downloading of music. This decrease was not accompanied by a corresponding increase in music sales. To the contrary, there was a decrease of digital music sales from 2003 to 2004. *See* MADDEN & RAINIE, *supra* note 204 (reporting a decrease in file-sharing network activity in the United States following copyright enforcement lawsuits); RIAA 2008 Consumer Profile, *supra* note 205 (reporting that digital music consisted of 1.3% of music sales in 2003 and 0.9% of music sales in 2004). *But see* Opderbeck, *supra* note 193, at 1714-15 (reporting data showing that use of peer-to-peer systems did not decrease following copyright lawsuits).

208 J. Thomas Rosch, *Keynote Address: A Different Perspective on DRM*, 22 BERKELEY TECH. L.J. 971, 976 (2007). *See generally* Tal Z. Zarsky, *Assessing Alternative Compensation Models for Online Content Consumption*, 84 DENV. U. L. REV. 645 (2006) (discussing DRM systems and proposals for solutions).

209 GASSER & PALFREY, *supra* note 192, at 8-12; *see also* Diane L. Zimmerman, *Living Without Copyright in a Digital World*, 70 ALB. L. REV. 1375, 1380 (2007) (describing the effects of DRM's lack of interoperability).

210 IN-STAT, EXECUTIVE SUMMARY: DIGITAL RIGHTS MANAGEMENT SURVEY 1 (2007), http://www.in-stat.com/panels/pdf/2007/apr07digitalrightsmgmt.pdf. Thirty-five percent of respondents said they were not sure, while only twenty-five percent disagreed that a DRM-free business model would increase the number of digital file downloads. *Id.*

211 *Id.*

212 *See Music Execs Criticise DRM Systems*, BBC NEWS, Feb. 15, 2007, http://news.bbc.co.uk/2/hi/6362069.stm (describing a Jupiter Research study that examined music industry executives' attitudes toward DRM); *see also* Andrew Edgecliffe-Johnson, *Anti-Piracy*

expressed concerns that consumer confusion over incompatible DRM formats affects digital music adoption. Buyers are put off from patently legal downloading because of their uncertainty over which files will work on which machines.[213]

Another potential effect of copyright enforcement was reported by some studies that showed that copyright enforcement lawsuits deterred individuals not only from using peer-to-peer networks, but also from utilizing patently legal distribution mechanisms.[214] A major study found that while in 2002, prior to the music industry copyright lawsuits against individual users, thirty-two percent of Internet users downloaded digital music, by 2005, only twenty-two percent downloaded music from any Internet source.[215] Furthermore, the study revealed that a significant group—eleven percent of Internet users—abandoned the technology. They no longer download digital music from any source. These individuals cited as their main reason the music industry's lawsuits and fearing getting into trouble.[216]

Two additional factors could explain the delay in the diffusion of digital music technology. The technological complexity of downloading music from the Internet could prevent widespread dissemination. Yet, data shows that the average Internet user is becoming increasingly sophisticated.[217] This data, combined with the data pointing to the abandonment of the technology by experienced Internet users, decreases the explanatory power of this factor.

Moves "Hurt Sales," FIN. TIMES (London), Nov. 20, 2007, at 5 (noting that DRM systems are stifling the growth of digital music).

213 John Lister, *Music Retailers Say DRM Hurting Sales*, INFOPACKETS, Nov. 26, 2007, http://www.infopackets.com/news/drm/2007/20071126_music_retailers_say_drm_hurting_sales.htm.

214 The main study on the topic, which was administered by the reputable Pew Internet and American Life project, showed a decrease in file-sharing downloading activity in the United States following the copyright enforcement lawsuits. *See* MADDEN & RAINIE, *supra* note 204. Yet, some other studies did not show such a decrease. *See, e.g.*, Opderbeck, *supra* note 193, at 1714-15.

215 MADDEN & RAINIE, *supra* note 204, at 1-2.

216 *Id.* at 9. Admittedly, results indicating a decrease in the use of file-sharing networks may be biased due to individuals' fear of admitting their use of the networks. Yet, the data that is prone to bias is that of individuals' reporting of non-use of file-sharing networks. In this study, the data reports a decrease in use of both file-sharing networks and legal downloading. The similar trend for both types of activities helps alleviate bias concerns.

217 *See* MARY MADDEN, PEW INTERNET & AM. LIFE PROJECT, ONLINE VIDEO 2 (2007), http://www.pewinternet.org/~/media//Files/Reports/2007/PIP_Online_Video_2007.pdf.pdf (reporting that fifty-seven percent of Internet users have watched video online); LEE RAINIE, PEW INTERNET & AM. LIFE PROJECT, TAGGING PLAY: FORGET DEWEY AND HIS DECIMALS, INTERNET USERS ARE REVOLUTIONIZING THE WAY WE CLASSIFY INFORMATION—AND MAKE SENSE OF IT 1 (2007), http://www.pewinternet.org/~/media//Files/Reports/2007/PIP_Tagging.pdf.pdf; Press Release, Ctr. for the Digital Future, Online World as Important to Internet Users as Real World?, at 2 (Nov. 29, 2006), http://www.digitalcenter.org/pdf/2007-Digital-Future-Report-Press-Release-112906.pdf (describing significant increases in active Internet participation, such as blogging, online communities, and photograph posting).

Additionally, digital music downloading is more effective with a broadband Internet connection. Widespread broadband adoption is a more recent phenomenon. It grew significantly over the last couple of years. In 2007, forty-seven percent of adult Americans had broadband connection from home compared to twenty percent in 2003.[218] Yet, the 2005 music downloading survey shows a decline in digital music downloading even among broadband users. While forty-one percent of broadband users downloaded music in 2003, only twenty-nine percent of broadband users downloaded from any Internet source in 2005.[219] Furthermore, despite the significant rise in broadband access availability, digital music sales are still increasing at a slow rate. While broadband connection was spreading rapidly (in 2006, forty-three percent of Americans already had broadband connection),[220] digital music sales increased by only one percent from the previous year.[221]

It appears that copyright enforcement played a role in inhibiting the diffusion of digital music technology. DRM measures and the threat of copyright lawsuits frustrated the consumer experience of digital music and created extreme legal uncertainty that drove consumers away from patently legal uses of digital music distribution. While small sale rates can be partly explained by file-sharing downloading, copyright enforcement has had a significant impact on the use of digital technology by those inhibited by the illegality of file-sharing downloading. Sales data from 2008 indicates that sales of digital music are currently on the rise. Yet, as indicated, digital music sales are increasing at a slow rate. Moreover, even if eventually digital music supersedes the CD as the main music distribution medium, an over-a-decade delay in the diffusion of an important new music distribution mechanism should warrant our concern.

As in the case of genetic testing and gene patents, while legal discourse focused on innovation, little attention was paid to the diffusion problem in the digital technology context. Potentially, the diffusion of digital technology through file-sharing networks concealed the delay in diffusion of digital technology to large segments of the population who would only use the technology through legal means. The focus on innovation and failure to attend the diffusion problem imposed costs on both sides to the debate. Hence, this Article proposes that channeling attention and resources to the diffusion problem could alter the battle equilibrium and facilitate a resolution of the controversy.

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218 *See* JOHN B. HORRIGAN, PEW INTERNET & AM. LIFE PROJECT, U.S. LAGS BEHIND: WHY IT WILL BE HARD TO CLOSE THE BROADBAND DIVIDE 2 (2007), http://www.pewinternet.org/~/media/Files/Reports/2007/Broadband_Commentary.pdf.pdf.

219 MADDEN & RAINIE, *supra* note 204, at 7.

220 *See* HORRIGAN, *supra* note 218.

221 *See* RIAA 2008 Consumer Profile, *supra* note 205.

First, this Article suggests that a diffusion-centered litigation strategy could enhance the position of the parties that oppose the music industry's copyright enforcement actions. By integrating diffusion arguments into their litigation strategy, these parties could augment their position in a broad range of cases.

In the contributory liability cases, where parties frequently raise innovation arguments and policy considerations have become an integral part of the debate, diffusion arguments could greatly enhance defendants' cases. To this point, the parties that oppose the music industry's copyright enforcement campaign have failed to raise diffusion arguments.[222] Neither defendants' briefs nor the many amicus briefs filed point to the social cost imposed by the delay in the adoption of digital music technology. Inserting diffusion policy considerations into the innovation policy-laden debate could tilt the balance against copyright enforcement and its deterrence of legitimate individual adoption of digital music technology.

The potential utility of diffusion arguments is not confined to the highly conspicuous contributory liability cases. Individuals sued by the music industry could also benefit by incorporating diffusion arguments into their litigation strategy. For example, in *Capitol Records, Inc. v. Foster*,[223] the parties litigated the Recording Industry Association of America's (RIAA) liability for attorney's fees. The American Association of Law Libraries filed an amicus brief, which argued that by indiscriminately suing individuals, the RIAA knowingly sends a distorted message to the public that any account holder is secondarily liable for the actions of anyone who uses her account to download music. Consequently, the brief argued, fearing secondary liability, parents may restrict their children's Internet access, and hotels, public spaces, and businesses may stop providing public Internet access to their patrons. This will result in chilling access to creative works.[224] The argument raised here is not an explicit diffusion problem argument. However, it highlights the way in which individuals sued by the music industry could integrate diffusion arguments into their litigation strategy. Specifically, defendants could argue that the music industry's mass lawsuit campaign goal of intimidating individuals from using file-sharing networks has resulted in deterring individuals from using digital music technology altogether. Individuals now fail to avail themselves of patently legal mechanisms of digital music, such as the iTunes store. Thus, the copyright lawsuits play a major role in the diffusion failure of digital music technology.

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[222] It should be acknowledged that legal diffusion arguments would serve those parties that oppose copyright enforcement but not the music industry.

[223] Capitol Records, Inc. v. Foster, 2007 U.S. Dist. LEXIS 97253 (W.D. Okla. July 16, 2007).

[224] Brief of Amici Curiae American Ass'n of Law Libraries, *supra* note 194.

Second, this Article proposes that the diffusion problem carries costs to both sides to the debate. Therefore, by focusing on eliminating the diffusion problem, the opposing parties can find a common ground that could facilitate the resolution of the file-sharing controversy. Specifically, it suggests that the focus on innovation obstructs the fact that both sides to the debate lose from the diffusion failure of digital music technology. Clearly, individual users miss out on the opportunity to benefit from the immediacy, individualization, and convenience of digital music technology.[225] But the music industry also stands to lose from the diffusion problem. The copyright lawsuits inhibited the sales of digital music technology. As discussed, sales of music through the digital medium account for only 12.8% of total music sales in 2008. The music industry could benefit significantly from a rise in the sale of music through the digital medium. Digital technology enables direct selling. Music providers who use digital technology can, therefore, save on storage and mobilization of physical products. Further, since sale of digital music does not involve physical copies, music providers will not end up with redundant copies of CDs, which they might be unable to sell. Music providers could also benefit from the flexibility of digital technology. By providing consumers with the option to purchase specific songs instead of full albums, they can cater to a broader range of tastes and expand their sales. Finally, digital technology enables instant delivery. Music providers could further expand their sales by profiting from impulse buys.[226] Interestingly, the music industry recently began to realize that its copyright enforcement campaign frustrates its own interests. This realization is manifested in the recent experimentation of key music industry leaders with the elimination or reduction of DRM measures.[227]

Both sides to the digital music debate could benefit from the resolution of the diffusion problem. Yet, the focus on innovation shadows the diffusion issue and prevents the parties from realizing their common ground. While the parties view the digital music controversy

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225 *See* Entm't Media Research, The 2007 Digital Music Survey 52 (2007), http://www.slideshare.net/patsch/emr-digital-music-survey-2007.

226 *See* FISHER, *supra* note 193, at 25 (discussing the flexibility that digital music gives consumers); WILLIAM FISHER, DIGITAL MUSIC: PROBLEMS AND POSSIBILITIES (2000), http://www.law.harvard.edu/faculty/tfisher/Music.html (discussing the convenience and elimination of over-production advantages).

227 *See* Jennifer LeClaire, *Sony Finally Drops DRM, Sort of*, NEWSFACTOR, Jan 7, 2008, http://www.newsfactor.com/news/Sony-Finally-Drops-DRM—Sort-Of/story.xhtml?story_id=123000ECU0T6 (describing changes in Sony's DRM policy); Memorandum from Steve Jobs, CEO, Apple Inc., Thoughts on Music (Feb. 6, 2007), http://www.apple.com/hotnews/thoughtsonmusic/ (renouncing his support of DRM technology). *But see* Nicola F. Sharpe & Olufunmilayo B. Arewa, *Is Apple Playing Fair? Navigating the iPod FairPlay DRM Controversy*, 5 NW. J. TECH. & INTELL. PROP. 332, 333 (2007) (emphasizing the effect of antitrust lawsuits on Apple's decision to sell digital music without DRM).

through the innovation prism, they fail to realize the common cost—namely, the diffusion failure. Further, the parties fail to build upon this common interest to reach a political or business compromise.

CONCLUSION

This Article set out to critically examine our infatuation with innovation. It showed that although the promotion of innovation has always been a justification of the intellectual property system, the celebration of innovation is a recent trend in modern legal history. The promotion of innovation has taken an increasingly central role only since the 1980s.

This Article then argued that while ample attention is focused on innovation, the legal regime fails to attend the diffusion process of new technologies. Since progress is reliant on both the innovation and dissemination of new technologies, this Article showed that, paradoxically, the celebration of innovation harms the very goal it seeks to advance—the promotion of human progress.

Finally, this Article examined two current intellectual property controversies. It showed that in both the case of gene patents and genetic testing and the case of copyright and digital music, the celebration of innovation shadowed major diffusion problems involving these technologies. Further, this Article proposed ways in which channeling the legal regime's attention and resources to the diffusion process could resolve these failures.

In *Eldered v. Ashcroft*, the Supreme Court upheld the constitutionality of the Sonny Bono Copyright Term Extension Act, which extended the copyright term by twenty years.[228] The movement that opposes the expansion of intellectual property rights views *Eldred* as one of its biggest defeats. After the decision came out, Lawrence Lessig, who litigated the case, regretfully wrote: "This case could have been won. . . . I can never escape believing that my own mistake lost it. . . . I had failed to convince [the Court] that the issue here was important . . . . [T]he truth about the harm that this unchecked power will cause could have been made clear to this Court."[229] This Article underscored the harm that academics, legislators, and litigants alike rarely address. The delays and inhibited diffusions of important new technologies is currently seldom part of the legal discourse. A shift by academics, legislators, and litigants toward stressing the harm in terms

[228] Eldred v. Ashcroft, 537 U.S. 186, 193 (2003).

[229] LAWRENCE LESSIG, FREE CULTURE: THE NATURE AND FUTURE OF CREATIVITY 229, 242, 244 (2004).

of diffusion failures and delays may result in fewer defeats, such as the one experienced in *Eldred*.