

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. The 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.

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The 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 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, the 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. The Article concludes by proposing ways toward resolving the diffusion delays of genetic testing and digital music technologies.

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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 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

¹ See 4 THE NEW ENCYCLOPEDIA 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 (2004) (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).

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 Aug. 1, 2008); Ian Hardy, *The Evolution of ARPANET*, 11 (May 13, 1996) (unpublished thesis, University of California at Berkeley) www.ifla.org.sg/documents/internet/hari1.txt; Ian Peter, *The History of Email*, <http://www.nethistory.info> (last visited Aug. 1, 2008).

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

This Article explores the law's inconsistent approach to new technologies. The 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, the Article sets the stage of the contemporary celebration of innovation. Particularly, the 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 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

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 INNOVATION* 11 (Free Press 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 (1989) (distinguishing between invention and innovation); Robert Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 805, 807 (1988) (discussing the distinction between invention and innovation). See also *infra* Part I.B (discussing the interchangeability of invention and innovation in innovation rhetoric).

⁷ See ARNOLD PACEY, *THE CULTURE OF TECHNOLOGY* 95 (1985) (commenting on the preference for the glamorous and the tendency to accrue prestige to construction and creativity).

⁸ See *infra* Part III.

⁹ See *infra* Part I.A.

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 the 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. The Article examines the diffusion delays of two new technologies: genetic testing and digital music. Both cases

¹⁰ Exceptions are usually writings outside the area of intellectual property, mainly in the areas of health law and environmental law. *See, e.g.*, 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 & Wayne Crews 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 In a separate piece the author discusses the cyclical nature of the role of innovation. While innovation dominated legal and political discourse during the formative years of the United States, it appears to have occupied a lesser role in later years, only to re-emerge during the mid-1980s. *See* Gaia Bernstein, *Progress and the Dissemination of New Technologies* (Apr. 1, 2009) (unpublished manuscript, on file with author) (discussing the historical relationship between innovation and diffusion in American legal thought). For an example of innovation rhetoric in early American legal thought, see Letter from Thomas Jefferson to Benjamin Waterhouse (March 3, 1818) in THE WRITINGS OF THOMAS JEFFERSON 34 (Albert Ellery Bergh ed., Thomas Jefferson Memorial Association of the United States 1905) (discussing the importance of scientific innovation).

¹³ *See infra* Part II.A.

underscore the bias in 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.

The 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 reveals 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

¹⁴ See *infra* Part IV.A.

¹⁵ See Mildred K. Cho & Samantha Illangasekare et al., *Effects of Patents and Licenses on the Provision of Clinical Genetic Testing Services*, 5(1) J. MED. DIAGNOSTICS (2003) (discussing the effect of gene patents on the diffusion of twelve available genetic tests); Jon F. Merz, *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.

is hailed to promote progress, 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 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 the 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

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'n 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

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 et al. v. Tallie Stubbs*, No. CIV-06-793-M, 2007 U.S. Dist. LEXIS 47958, at *2 (W.D. Okla. July 1, 2007); *UMG Recordings, Inc. et al., v. Marie 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. Cecelia Gonzalez*, 430 F.3d 888, 888 (2005).

²⁵ See Copyright Protection and Management Systems, 17 U.S.C.S. § 1201 (2007); *Universal City Studios, Inc. v. Eric Corley*, 273 F.3d 429, 434, 436 (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 H.R., 108th Cong.* (2003) (statement of Rep. Rick Boucher, from VA) (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, from VT) (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 Began Talks with South Africa on Drug Suits*, 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 & Francois Ferres, *African Legal Development 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, *New List of Safe AIDS Drugs, Despite Industry Lobby*, N.Y. TIMES, Mar. 21, 2002, at 3 (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/index.html> (last visited Aug. 2, 2008); the Consumer Project on Technology,

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

<http://www.cptech.org/> (last visited on Aug. 2, 2008); and the Bill and Melinda Gates Foundation, <http://www.dndi.org> (last visited on Aug. 2, 2008).

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 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 Work: 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 LAW. 723 (1991).

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

³⁴ See Julie 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 Heller & Rebecca Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research?*, 280 SCI. 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 (1984); Pamela Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Hip 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 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 (2002).

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

plays a pivotal role in the rationale for limiting intellectual property rights.

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 the Digital Rights Management Systems (DRMs).³⁹ DRMs are 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

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) (a speech by the Director of the United States Trademark and Patent 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> (stating that “[t]he 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 Policy* *2-18 (2003), <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 DRMs and the effect of the DMCA's anti-circumvention provisions).

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

innovators of new technologies would be inhibited for fear of copyright liability.⁴²

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*, 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.⁴³ 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

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. 2280 and 2281 Before the Subcomm. on Courts and Intellectual Property*, 105th Cong. 4 (1997) (statement of Edward J. Black, President, Computer & 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, 417-8 (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.

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 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 "chill technological design."⁴⁹

Interestingly, the use of the innovation theme was criticized in petitioner's reply brief: "Grokster ... avoids 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

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).

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

⁵⁰ Reply Brief of Petitioners at 1, *MGM Studios Inc. v. Grokster Ltd.*, 545 U.S. 913 (2005) (No. 04-480).

⁵¹ For discussions of the innovation theme in amicus briefs, see Brief for Intel Corporation as Amici Curiae Supporting Respondents 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 for of Innovation Scholars and Economists as Amici Curiae in Support of Respondents 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 to inhibit innovation, which is crucial for economic growth); Brief for Internet Amici: Cellular Telecommunications & Internet Association et al. as Amici Curiae in Support of Respondents 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 for Emerging Technology Companies as Amici Curiae 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 for Sixty Intellectual Property and Technology Law Professors et al. as Amici Curiae 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).

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 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

⁵² *Proposed Copyright Bill Could Stifle Innovation – Critics*, NEWSBYTES PM, Sep. 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.

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. ON TELECOMM. & HIGH TECH. L. 23 (2004) (criticizing network neutrality proposals); Jeffrey Birnbaum, *No Neutral Ground in the Internet Battle*, WASH. POST., June 26, 2006, at D1 (quoting Robert Pepper, Senior Managing Director at Cisco Systems, on the network neutrality debate: “What is really a commercial fight has now become extremely emotional.”); Hiawatha Bray, *Senate Fight Looms Over Extra Net Fees*, B. 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 Bill*, FOX NEWS.COM, Jan. 10, 2007, http://origin.foxnews.com/printer_friendly_wires/2007Jan10/0,4675,InternetBill,00.html (quoting Peter Davidson, Senior Vice President for Federal Government Relations at Verizon: “... net neutrality should be named ‘net regulation’ and that lawmakers are ‘trying to solve a problem that doesn’t exist.’”) Much of the network neutrality debate is taking place in the blogosphere, see for example, 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 Ed Whiteacre, SBC CEO’s comments, against network neutrality and in favor of paid content access); Posting of Susan Crawford to Susan Crawford Blog, *Substrate Neutrality*, http://scrawford.blogware.com/blog/_archives/2006/3/11/1814852.html (Mar. 11, 2006) (arguing against propertization and vertical integration of broadband networks).

⁵⁵ Wu, *supra* note 29, at 74.

⁵⁶ LESSIG, *supra* note 20, at 23.

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 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 proprietization 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

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

⁵⁸ See Susan 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).

⁵⁹ LESSIG, *supra* note 36, at 156, 161; Susan Crawford, *Network Rules*, 70 *LAW. & CONTEMP. PROBS.* 51, 57 (2007); Wu, *supra* note 29, at 73.

⁶⁰ LESSIG, *supra* note 36, at 31; Tim Wu, *Intellectual Property Innovation and Decentralized Decisions*, 92 *VA. L. REV.* 123, 125–126 (2006); Wu, *supra* note 29, at 73–74.

⁶¹ See Crawford, *supra* note 58, at 696, 701; Wu, *supra* note 29, at 72. See also Lawrence B. Solum & Ming Chuang, *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.

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 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

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, V.P. and Chief Internet Evangelist, Google, Inc.), <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, Professor, Columbia Law School), http://commdocs.house.gov/committees/judiciary/hju27225.000/hju27225_0.HTM (arguing that a discriminatory infrastructure would "... slow innovation – for it would no longer be the best car that 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 Kyles D. Dixon, Senior Fellow and Director, Federal Institute for Regulatory Law & Economics, The Progress & Freedom Foundation), <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 Commission, 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. COMM'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., 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); Posting of Susan Crawford to Susan Crawford Blog, *The Big Idea*, http://scrawford.blogware.com/blog/_archives/2005/11/8/1362466.html (Nov. 8, 2005) (arguing for local autonomy in lieu of global rules to preserve innovation on the Internet).

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 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

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, CREATIVITY AND LAW*, 1–20, 194–203 (1990).

⁷⁰ For writings describing competing formulations of creativity, including economic conceptions, see Cohen, *supra* note 34, at 1152; Roberta Kwall, *Inspiration and Innovation: The Artistic 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 (“... the 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 a 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 (2d ed. 1989).

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 appropriately distinguish 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 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,

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 Burk & Mark Lemley, *Biotechnology’s Uncertainty Principle*, 54 CASE W. RES. L. REV. 691, 733 (2004); 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. Science and Technology Policy*, 24 VT. L. REV. 347, 348–49 (2000); Arti 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 See, e.g., Bradford L. Smith, *The Third Industrial Revolution: Policy Making 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., *QRSOFT, Inc. v. Restaurant Technology*, 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 Technologies Inc. v. Omya AG*, 430 F. Supp. 2d 195, 213 (S.D.N.Y. 2006) (“... patent 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, Silicone Graphics, Inc., Information Technology Industry Council NTM) (“Innovation is the engine of the IT industry . . . While

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. In this Part, the Article 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.

To support the claim that the contemporary celebration of innovation is, in fact, a recent trend, the Article presents an empirical study of intellectual property case law between 1946-2005.⁸⁰ 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

strong intellectual property protection is essential to protect investments in innovation, overprotective intellectual property would make it even more difficult to innovate.”); Judith H. Dobrzynski, *Silicon Valley Roundtable: So Technology Pros, What Comes After the Fall?*, N.Y. TIMES, July 29, 2001, at 3(1) (reporting excerpts from a Silicon Valley Roundtable, quoting Mitchell E. Kertzman, Chief Executive of Liberate technologies, “. . . in terms of innovation, having a simple company with what has now. . . been judged to be a monopoly on that particular technology. I think you are less likely to see innovation.”)

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/fulltime_faculty/bernstga/bernstein.html. 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, 100-120 (2008).

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 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 constitutional 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

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); JOSEPH STORY, COMMENTARIES ON THE CONSTITUTION OF THE UNITED STATES § 1147 (William S. Hein & Co. 1994) (1833) (providing a disclosure justification).

⁸² Hettinger, *supra* note 11, at 36–37.

⁸³ *Id.* at 40–41.

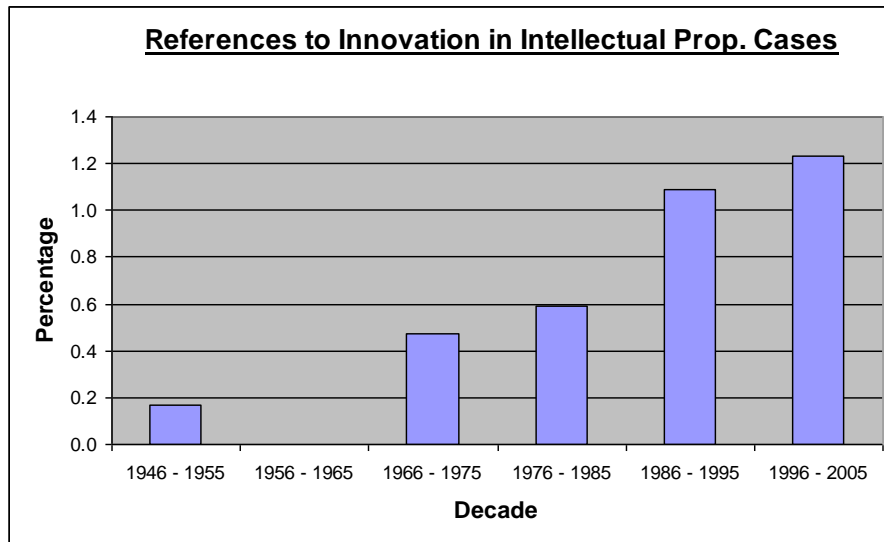
⁸⁴ *Id.* at 47.

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 13; 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 (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).

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



⁸⁶ See Bernstein, *supra* note 12. For an example of innovation rhetoric in early American legal thought, see Jefferson, *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 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 (2008), http://law.shu.edu/faculty/fulltime_faculty/bernstga/bernstein.html.

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 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

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.

⁹¹ *See* DAVID GREEN, SHAPING POLITICAL CONSCIOUSNESS: THE LANGUAGE OF POLITICS IN AMERICA FROM MCKINLEY TO REAGAN 17 (1987) (citing Habermas). *See also* Lemley, *supra* note 11, 895–96.

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 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

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.

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, 383 U.S. 1, 5-6 (1965) (stating that under Article I, § 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 (1966); 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,

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

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

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) (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 Industries, 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. Commissioner of Patents*, 503 F.2d 138, 147 (1974 D.C. Cir.) (“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: “the immediate effect of our copyright law is to secure a fair return for an ‘author’s’ creative labor. But the ultimate aim is that by this incentive to stimulate artistic creativity for the general public good.” *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417, 431 (1984).

⁹⁸ The following are characteristic judicial references to the utilitarian goal during this period: *Eli Lilly & Co. v. Premo Pharmaceutical Laboratories, Inc.*, 630 F.2d

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.

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.

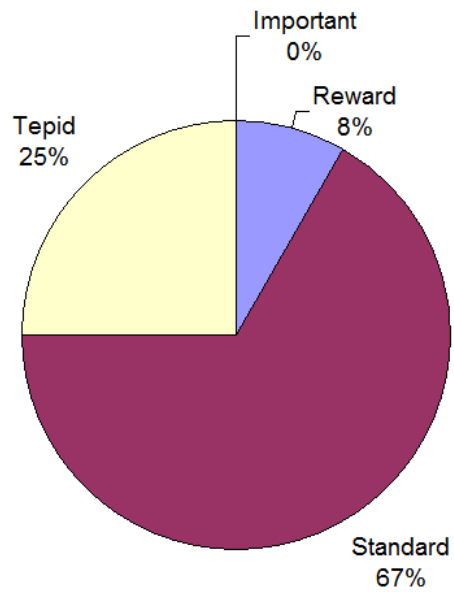
The following two pie charts illustrate the historical evolution in the courts' treatment of innovation:

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.’”); *Steelcase, Inc. v. Delwood Furniture Co.*, 578 F.2d 74, 76 (5th Cir. 1978) (Patent Acts ... allow an inventor a limited private monopoly in his invention and discovery as an inducement to man’s pursuit of knowledge, and stimulate the outgrowth of creative contribution in society.”); *In re Flint*, 56 C.C.P.A. 1300, 1357–58 (Cust. Ct. 1969) (“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 Industries, Inc.*, 299 F. Supp. 278, 282 (S.D.N.Y. 1969) (“To promote scientific innovations and inventions, 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”).

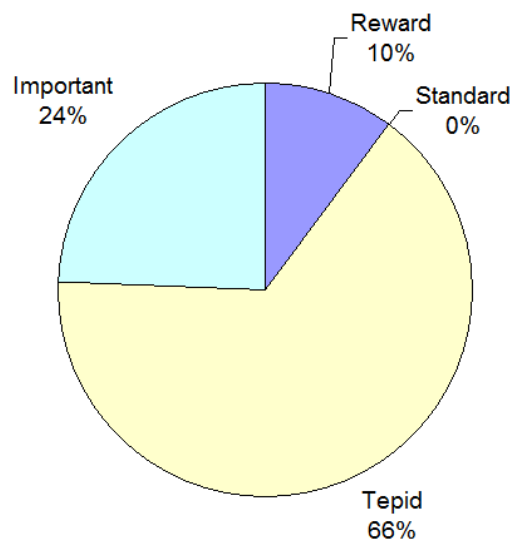
⁹⁹ JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM AND DEMOCRACY* 81–106 (1943).

¹⁰⁰ Even the Supreme Court, writing as late as 1981, addressed the goal of promoting innovation only briefly by stating that: “making clear that patents may be available for inventions in software would unleash important innovative talent... It would enable competition with those companies and provide the needed incentive to stimulate innovation.” *Diamond v. Diehr*, 450 U.S. 175, 184 (1981).

1966-1975



1996-2005



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. 67% of the references to innovation addressed innovation as a standard; 8% referred to innovation in relation to the reward justification; and 25% 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, 24% of the references to innovation in courts' opinions treated the promotion of innovation as an important policy goal and fell into the Important category; 66% of the references to innovation fell into the Tepid Utilitarian category; and 10% 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 arguing for intellectual property protection and defense attorneys advocating the limitation of intellectual property monopolies claimed that their goal was the promotion of innovation. Majority,¹⁰² concurring and dissenting opinions reflected these arguments.

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.

¹⁰² For example, in *Festo v. Shoketsu*, 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*, 234 F.3d 558, 571 (Fed. Cir. 2000) *vacated*, 535 U.S. 722 (2002). It added: "[t]hus ... 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: "[t]he rule we announce today should encourage innovation, ... providing patentees with protection commensurate with the disclosed and allowed scope of their inventions." *Id.* at 571, 597. Judge Rader, concurring and dissenting, explained: "[s]trong 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 620. Finally, Judge Newman, dissenting in part, stated that "[t]he 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

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 supporting intellectual property rights changed their justification. Some courts expressly stated that intellectual property rights are not granted for the purpose of rewarding authors, but in order 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 replaced tepid statements supporting innovation with strong and extensive declarations.¹⁰⁴

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.

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 680074, at *7 (D. Colo. 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.’”); *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...”).

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 Dev., Inc. v. Paperback Software Int’l*. 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 that “... 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 that: “Defendants’ general contention – that ‘progress of

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

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 76-7. Third, the Court rejected defendant's standardization argument explaining that "one 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 78.

¹⁰⁵ For example, in *White v. Samsung*, Judge Kozinsky in his dissenting opinion stated that "[p]rivate 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.*

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 growing number of judicial

Samsung Elec. Am., Inc., 989 F.2d 1512, 1513 (9th Cir. 1993) (Kozinski, J., dissenting).

¹⁰⁶ For example, in *Hilton Davis v. Warner Jenkinson*, the Court of Appeals for the Federal Circuit stated that “[o]ur 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 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 Che. Co. v. Warner Jenkinson*, 62 F.3d

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. 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 “Soundview 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 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

1529, 1529–30, 1558 (Fed. Cir. 1995). *See also* *Playboy Enters. v. United States Customs Serv.*, 959 F. Supp. 11, 16 (D.C. Cir. 1997).

¹⁰⁷ *See, e.g.*, *Smash, L.L.C. v. New England Pottery*, No. 01-601(DWF/SRN), 2001 U.S. Dist. LEXIS 17803, at *18 (D. Minn. Oct. 15, 2001) (Under the heading “Public Interest”, the opinion stated that “[t]here is a strong public interest in the protection of patent rights... Indeed, there is 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.C. Cir. 1996); *Lotus Dev. Corp. v. Paperback Software Int’l*, 740 F. Supp. 37, 77 (D. Mass. 1990).

¹⁰⁹ *Lotus Dev. Corp.*, 740 F. Supp. at 76–77.

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

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 (economics’ literature discussing the term innovation); Herbert

1. The Intellectual Property Wars

The elevation in 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 advent of the intellectual property wars in the 1980s, the case law study demonstrates that parties opposing 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 felt 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.

Hovenkamp, *The First Great Law & Economics Movement*, 42 STAN. L. REV. 993, 994-995 (1990) (discussing the rise of the modern law and economics movement). Another factor, which, remains to be explored, is whether the creation of the 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 use of the term “innovation” in cases of the Court of Appeals for the Federal Circuit. The results did not indicate a significant difference between the use of the term by the Court of Appeals for the Federal Circuit and use by other courts. See Federal Courts Improvements Act, Pub. L. No. 97-164, 96 Stat. 25 (relevant provisions codified as amended in scattered sections of 28 U.S.C) (establishing the Court of Appeals for the Federal Circuit).

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

¹¹³ See Wayne Crews & Adam Thierer, *Introduction: The Great Intellectual Property Debate* in COPY FIGHTS: THE FUTURE OF INTELLECTUAL PROPERTY IN THE INFORMATION AGE, at xi, xvii (Adam Thierer & Wayne Crews eds., 2002).

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 CD.¹¹⁵ But now, commentators explained, 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 distribution. Previously only large entities, such as movie production companies or music studios, could create complicated digital works. However, recently new software tools 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, which 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

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 (2003).

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

¹¹⁶ *Id.* at 405–06.

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 Pew Internet & American Life Project, *Artists, Musicians and the Internet*, Dec. 5, 2004, at iii, iv, http://www.pewinternet.org/pdfs/PIP_Artists_Musicians_Report.pdf; Pew Internet & American Life Project, *Teen Content Creators and Consumers*, Nov. 2, 2005, at i, http://www.pewinternet.org/pdfs/PIP_Teens_Content_Creation.pdf.

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 movement¹²¹ 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 example, in the traditional mode of distribution, media companies selected works for distribution. This increased the 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 where through 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

¹¹⁹ Pew Internet and American Life Project, *Bloggers: A Portrait of the Internet’s New Storytellers*, July 19, 2006, at 2, <http://www.pewinternet.org/pdfs/PIP%20Bloggers%20Report%20July%2019%202006.pdf> (reporting that 8% of Internet users – about 12 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 Website, <http://www.fsf.org> (last visited Aug. 4, 2008).

¹²² Wikipedia, http://en.wikipedia.org/wiki/Main_Page (last visited Aug. 4, 2008).

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*, 53 FED. COMM. L.J. 561 (2000) (describing the contribution of the decentralized nature of the Internet); Hunter & Lastowka, *supra* note 117, at 977 (describing the impact of the Internet on creative activity by users).

¹²⁷ See *id.* 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.

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 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 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

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 136, at 2, 45–76.

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 Crawford & John Palfrey, *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.

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 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 part 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

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); Pasquale, *supra* note 10, at 166–77 (focusing on the cost of information overload); Frank Pasquale, *Beyond Competition and Innovation: The Need for Qualified Transparency in Internet Intermediaries*, *forthcoming* NORTHWESTERN L. REV. (2010) (arguing for the need to look beyond innovation to privacy and democratic culture in the regulation of Internet intermediaries); 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 constitutional 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 markets as goals of copyright law). Authors writing about technologies from the antitrust perspective are more likely to look beyond the innovation paradigm. See 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);

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 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

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 ENCYCLOPEDIA 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.

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, *The User as a Resister of New Technologies*, (Apr. 1, 2009) (an 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); Gaia Bernstein, *Accommodating Technological Innovation: Identity, Genetic Testing and the Internet*, 57 VAND. L. REV. 963 (2004) (discussing the destabilization of the value of identity by Internet and genetic testing technologies).

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 over the last two decades 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 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

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

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); Charles E. Van Horn, *Examination of the Patent Applications*, in PATENTS, COPYRIGHTS, TRADEMARKS AND LITERARY PROPERTY COURSE HANDBOOK SERIES: TRENDS IN BIOTECHNOLOGY AND CHEMICAL PATENT LAW 11-42 (Practicing Law Institute ed., 1985) (stating that in the six years following the *Chakrabarty* decision, patent applications in genetic engineering were received at 20-30 times the previous rate).

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

¹⁵⁰ Bayh-Dole Act, 35 U.S.C. § 200 (1980); Stevenson-Wydler Technology Innovation Act of 1980, 15 U.S.C. § 3710(a) (1980).

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 anti-commons 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 anti-commons 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 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

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 Burk & Lemley, *supra* note 76, at 728, 730 (describing scholars’ concerns and academic proposals to resolve the effects of patenting on genetic science innovation); Dan 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); Heller & Eisenberg, *supra* note 35, at 699–00 (arguing that the large number of patents on upstream products increases the cost of research).

¹⁵⁵ See David Edelman & Kathryn DeAngelis, *Patent Metrics: The Mismeasure of Innovation in the Biotech Patent Debate* 85 TEX. L. REV. 1679, 1680–84 (2007) (arguing that the effect of the growth in biotechnology patenting on innovation is more limited than believed); Robert Merges, *A New Dynamism in the Public Domain*, 71 U. CHI. L. REV. 183, 183–85, 186–91 (pointing out that private actors are acting 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 (Scott Kieff ed., 2003) (proposing a researcher exemption from patent infringement suits); Richard A. Epstein, *Steady the Course: Property Rights in Genetic Material*, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 153, 181–193 (Scott Kieff ed., 2003) (proposing that all genetic products, excluding expressed sequence tags, should remain under the ordinary patent regime); Scott Kieff,

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. Gene patents 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 they have a 1:4 probability of having a child born with Tay-Sachs.¹⁵⁸ The knowledge of their carrier status could affect their decision of whether to have a genetic child or take precautionary measures of additional prenatal testing through the pregnancy.

Currently, diagnostic genetic testing is the most developed clinical genetics' application.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 pressure exerted by gene patent holders and the legal uncertainty resulting from the existence of multiple gene patents inhibit laboratories and

Perusing Property Rights in DNA, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT, 125 (Scott Kieff ed., 2003) (providing an analysis of the operation of patent rights in the area of biotechnology); David 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 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 1,000 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, Aug. 5, 2008).

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 July 19, 2007).

¹⁵⁹ Two additional areas of clinical genetics' applications are gene therapy and pharmacogenetics. Despite years of research and trials, gene therapy has so far attained few successes. See Human Genome Project Information: Gene Therapy, http://www.ninds.nih.gov/funding/research/parkinsonsweb/gene_therapy.htm (last visited Aug. 5, 2008). Pharmacogenetics is currently a very promising clinical application, but is far less developed than genetic diagnostic testing. See U.S. Food and Drug Admin.: Guidance for Industry, Pharmacogenomic Data Submissions, <http://www.fda.gov/cber/gdlns/pharmdtasub.htm> (last visited Aug. 5, 2008).

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 25% 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 their 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, 30% reported discontinuing or not developing clinical applications of the test once exclusive patent licenses were issued.¹⁶²

The threat of the cease-or-desist letter was supplemented by the confusion created by the Patent Office grant of separate patents on gene sequences, gene fragments, the identification of gene functions, and diagnostic tests.¹⁶³ A laboratory or physician 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

¹⁶⁰ See Paul E. Schaafsma, *An Economic Overview of Patents*, 79 J. PAT & TRADEMARK OFF. SOC'Y 241, 246-250 (1997) (providing a traditional analysis of the monopoly-access tradeoff).

¹⁶¹ Cho & Illangasekare, *supra* note 15, at 5-6.

¹⁶² Merz, *supra* note 15, at 577-78.

¹⁶³ See Cynthia D. Lopez-Beverage, *Should Congress Do Something About Upstream Clogging Caused by the Deficient Utility 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).

would 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 employs these practices extensively is Myriad Genetics (“Myriad”), which holds patents over the breast cancer genes BRCA1 and BRCA2. Myriad has a broad patent which, includes the genetic sequence, the diagnostic and therapeutic uses. Myriad requires that the samples undergo full sequencing in its headquarters in Salt Lake City, regardless of the location of the patient in the world.¹⁶⁵ Consequently, laboratories and physicians still offering the test have to charge exorbitant prices.¹⁶⁶ Yet, Myriad is not a lone player. Other patent holders repeatedly used these practices,¹⁶⁷ creating a climate of legal threats and uncertainty around the offering of genetic tests.¹⁶⁸

¹⁶⁴ See Cho & Illangasekare, *supra* note 15; American College of Medical Genetics, *Position Statement on Gene Patents and Accessibility of Gene Testing*, Aug. 2, 1999, http://www.acmg.net/StaticContent/StaticPages/Gene_Patents.pdf.

¹⁶⁵ 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, *Your Money or Your Life*, NEW SCIENTIST, July, 13, 2002, at 2.

¹⁶⁶ 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 \$3,000. See National Cancer Institute, *Genetic Testing for BRCA1 and BRCA2*, <http://www.cancer.gov/cancertopics/factsheet/Risk/BRCA> (last visited Aug. 5, 2008); MSNBC.com, *Dad Can Pass Down Hidden Breast Cancer Gene – Cancer*, July 19, 2007, <http://www.msnbc.msn.com/id/19313848>; Reach Global, *Questions & Answers*, <http://www.reachglobal.org/questions.html> (last visited Aug. 5, 2008) (containing information on breast cancer, ovarian cancer, and genetic testing).

¹⁶⁷ 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 holder. See Lori B. Andrews, *Genes and Patent Policy: Rethinking Intellectual Property Rights*, 3 NATURE REVIEWS GENETICS 803, 804 (2002).

¹⁶⁸ 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 physicians or laboratories. The laws regulating other medical testing are generally not applied to regulate genetic testing. See Gail H. Javitt, *Federal Regulation of Genetic Neglect*, XXII(3) ISSUES IN SCI. & TECH. 59, 59-62 (2006) (explaining that the Clinical Laboratories Improvement Act and Food and Drug Administration fail to regulate genetic “home brew tests”); Eileen M. Kane, *Patent-Mediated Standards in Genetic Testing*, UTAH L. REV. (forthcoming 2008) (manuscript at 7-11) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1113489 (describing the lacunae in genetic testing oversight); Letter from Kathy Hudson, Sharon Terry & Peter Lurie to Mark McClellan, M.D., Ph.D., Administrator for Centers for Medicare and Medicaid Services, (Sept. 26, 2006) available at http://www.dnapolicy.org/resources/Petition_For_Rulemaking_September_2006.pdf

While few lawsuits were filed against genetic testing service providers and those filed were dismissed or settled,¹⁶⁹ 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.¹⁷⁰

Unlike the debate on 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.¹⁷¹ A prominent example, which received much attention, is the diffusion of AIDS drugs in third world countries.¹⁷² In the case of genetics, while the law focused on innovation, it failed to address the diffusion problems accompanying the use of genetic testing.¹⁷³

f (petition arguing that most labs administering 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).

¹⁶⁹ See Christopher Holman, *The Impact of Human Gene Patents on Innovation and Access: A Survey of Human Gene Patent Litigation*, 76 UMKC L. Rev. 295, 346-351 (2007) (reporting the results of a study, which include only three lawsuits against service providers of disease genetic testing).

¹⁷⁰ 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 Holman, *supra* note 169, at 352-361.

¹⁷¹ 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 (Toshiko Takenaka, ed. Forthcoming 2008).

¹⁷² 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).

¹⁷³ There are few exceptions. Lori Andrews, writing about gene patents, discussed both the effects on research and public health. See, e.g., Andrews, *supra* note 167, 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 Conflicts: 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 Michael J. Malinkowski & Maureen A. O'Rourke, *A False Start? The Impact of Federal Policy on Genotechnology Industry*, 13 YALE J. ON REG. 163, 215-23 (1996). Otherwise, the little discussion that did take place in the academic

Despite 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 in 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 working within the anticommons paradigm advocated restricting gene patents for upstream genetic products, particularly gene sequences.¹⁷⁴ 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.¹⁷⁵ 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 (NIH), should be empowered to abrogate patent rights when a state of anticommons threatens innovation and research.¹⁷⁶

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.¹⁷⁷

arena about the effects of gene patents on diffusion was confined to student notes. See, e.g., Melissa E. Horn, *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, *Access Versus Incentive: Balancing Policies in Genetic Patents*, 35 ARIZ. ST. L.J. 1077, 1093–96 (2003) (high transaction costs of gene patents may hinder use and improvement of life-saving diagnostic tests); Allen C. Nunnally, *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).

¹⁷⁴ See Burk & Lemley, *supra* note 76, at 730 (describing scholars' concerns and proposals regarding the effect of patenting on innovation in genetics).

¹⁷⁵ *Id.* at 738.

¹⁷⁶ Rai & Eisenberg, *supra* note 35, at 310.

¹⁷⁷ Such an exemption would extend the statutory health care providers exemption from infringement of medical procedures patents to gene patents. 35 U.S.C.S §

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 current bill entitled Genomic Research and Accessibility Act proposed to prohibit patents on genetic sequences.¹⁷⁸ The Bill's promoters explained that their goal is to counteract the effects of gene patents on innovation and research. Legislators introducing the bill did not bring up the inhibiting effects on health care providers' use of genetic tests.¹⁷⁹

Solutions aiming to directly address 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 ("The Genomic Research and Diagnostic Act"). Yet, even in the Genomic Research and Diagnostic Act, 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 that undertake non-commercial genetic research.¹⁸⁰

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 lack of attention to the diffusion problem.¹⁸¹ Since the legal regime's

287(c)(2) (2007); 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. 571, 492-98, 503 (2002).

¹⁷⁸ The language of the Bill is at this point somewhat ambiguous. The Bill states that ". . . no patent may be obtained for a nucleotide, or its functions or correlations, or the naturally occurring products it specifies." Genomic Research and Accessibility Act, H.R. 977, 110th Cong. (2007).

¹⁷⁹ 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. 25, E315 (2007) (speech of Rep. Becerra on *The Introduction of the Genomic Research and Accessibility Act*).

¹⁸⁰ The Genomic Research and Diagnostic Accessibility Act of 2002, H.R. 3967, 107th Cong. (2002). Further, the Genomic Research and Diagnostic Act was introduced with a companion bill titled 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. The Genomic Science and Technology Innovation Act of 2002, H.R. 3966, 107th Cong. (2002).

¹⁸¹ The litigation arena has not been a central battlefield for either research litigation or testing provider litigation. See generally Holman, *supra* note 169, at 340-351 (reporting the results of an empirical study, which indicated a small number of lawsuits involving gene patents and research and gene patents and testing).

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 is the case in the current bill, Genomic Research and Accessibility Act, which focuses 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 in the proposed legislation, the diffusion issue was treated as secondary to the innovation problem.

The Article proposes that attention and legal resources should be targeted directly at the genetic testing diffusion problem. Specifically, it suggests that promoting legislative action, such as the healthcare provider exemption, that 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.¹⁸² 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 where the issue was brought up, diffusion was presented as a secondary issue incorporated in a scheme designed to resolve the innovation problem. A political solution of 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 and gaining free access to music. The music industry's campaign consisted of both

¹⁸² See Bernstein, *Paradoxes*, *supra* note 146, at 287–88 (discussing the effects of express clear-cut legal pronouncements on risk perceptions' of technology users).

legal and technical measures. The legal front comprised of two types of lawsuits. First, the music industry sued intermediaries who enabled individuals to gain free access to musical works for contributory copyright infringement. The lead lawsuits, which gained most publicity, involved suits against the file sharing networks themselves. These included lawsuits against Napster,¹⁸³ Grokster¹⁸⁴ and Kazaa.¹⁸⁵ Second, the music industry filed thousands of direct copyright infringement lawsuits against individuals who used the file sharing networks.¹⁸⁶ On the technological front, companies selling music online have used DRMs 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.¹⁸⁷ 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.¹⁸⁸

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.¹⁸⁹ And importantly, the story of digital music was inserted

¹⁸³ A & M Records, Inc. v. Napster, Inc., 239 F.3d 1004 (9th Cir. 2001).

¹⁸⁴ MGM Studios v. Grokster, 545 U.S. 913 (2005).

¹⁸⁵ Universal Music Australia Pty Ltd. v. Sharman License Holdings Ltd. (2005) 220 A.L.R. 1 (Austl.); Buma/Stemra v. Kazaa B.V., Hoge Raad der Nederlanden [HR] [Supreme Court of the Netherlands], Dec. 19, 2003, 2004 Europ. Copyright and Design Rep. 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).

¹⁸⁶ 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 Dilemmas of Infringement Based Business Models*, 22 CARDOZO ARTS & ENT. L.J. 725, 730–49 (2005); Peter K. Yu, *P2P and the Future of Private Copying*, 76 U. COLO. L. REV. 653, 658–76 (2005).

¹⁸⁷ For a discussion of DRM and its effect on fair use, see generally, Jacqueline Lipton, *Solving the Digital Piracy Puzzle: Disaggregating Fair Use from the DMCA's Anti-Device Provisions*, 19(1) HARV. J OF L. & TECH. 112 (2005).

¹⁸⁸ See Urs Gasser & John Palfrey, *DRM-Protected Music Interoperability and Innovation*, *Berkman Publication Series*, (2007) at 1, <http://cyber.law.harvard.edu/interop>.

¹⁸⁹ For a summary of the different proposals made by commentators, see Yu, *supra* note 186, at 698–38. For specific discussions, see WILLIAM W. FISHER III, *PROMISES TO KEEP: TECHNOLOGY, LAW AND THE FUTURE OF ENTERTAINMENT* 199–58 (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. Opperbeck, *Peer-to-Peer Networks Technological Evolution and Intellectual Property Reverse Private*

into the accepted narrative of expanding intellectual property inhibiting innovation.

While the parties to the direct copyright infringement lawsuits made infrequent use of innovation arguments,¹⁹⁰ the contributory infringement lawsuits became an additional battlefield governed by the innovation narrative. Academics opposing the music industry's actions argued that lawsuits against the facilitators of music downloading, such as the file-sharing networks, threaten to stifle innovation.¹⁹¹ 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 fearing copyright lawsuits. Consequently, the invention of technologies for legal uses would be deterred. Further, they cautioned that courts are more likely to prohibit use of new technologies whose ultimate benefit is unclear compared to established technologies.¹⁹²

The scholarly inhibition of innovation in new technologies' arguments were reflected in litigation. In the Supreme Court litigation, *Metro-Goldwyn-Mayer v. Grokster*, defendants' briefs and

Attorney General Litigation, 20 BERKELEY TECH L.J. 1685 (2005) (describing the failure of the 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 of the file sharing controversy that focuses on social norms). *See also* Raymond Shih Ray Ku, *Grokking Grokster*, 2005 WIS. L. REV. 1217 (2005) (providing a general discussion of the file sharing controversy).

¹⁹⁰ For a glimpse at the different type of arguments raised by defendants in the individual lawsuits, see for example, *BMG Music v. Gonzales*, 430 F.3d 888, *2 (7th Cir. 2005) (raising a fair use argument); *Sony Pictures Home Entertainment v. Charles Lott*, 471 F. Supp. 2d 716, *6, *12 (N.D. Tex. 2007) (arguing defendant was not using the IP address used for file sharing); *Interscope Records v. Lindsey Duty*, No. 05-CV-3744-PHX-FJM, 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 for American Association of Law Libraries et al. as Amici Curiae Supporting Defendant at 19, *Capital Records, Inc. v. Debbie Foster*, No. Civ-04-1569-W (Aug. 9, 2006), available at http://www.ilrweb.com/viewILRPDF.asp?filename=capitol_foster_amicus (arguing that failure to impose defendant's attorney 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 Netanel, *Impose a Noncommercial Levy to Allow Peer-to-Peer File Sharing*, 17 HARV. J.L. & TECH. 1, 30 (2003).

¹⁹¹ *See* Lemley & Reese, *supra* note 185, at 1349.

¹⁹² *See id.* at 1386-90.

the amicus briefs supporting defendants emphasized that modifying the over twenty year-old Sony contributory infringement copyright doctrine and holding that the file sharing network, Grokster, is liable, would chill innovation in new technologies.¹⁹³ At the same time, the organizations representing 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.¹⁹⁴ 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.¹⁹⁵

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

¹⁹³ 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. 04-480). This argument was echoed in many of the amicus briefs that were filed to support defendants. See Brief for Intel Corporation as Amici Curiae Supporting Respondents at 3–4, *Grokster*, 545 U.S. 913 (No. 04-480) (stating that the brief is 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 for Innovation Scholars and Economists as Amici Curiae Supporting Respondents 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 for Cellular Telecommunications & Internet Association et al. as Amici Curiae Supporting Respondents 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 communication technologies); Brief of for Emerging Technology Companies as Amici Curiae Supporting 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 for Sixty Intellectual Property and Technology Law Professors et al. as Amici Curiae Supporting Respondents at 2, 5, 10, 13, 16, *Grokster*, 545 U.S. 913 (No. 04-480) (arguing that Petitioners' proposed secondary liability test would result in instability and confusion that would substantially inhibit innovation and technological development).

¹⁹⁴ See Brief of Petitioners at 20, *Grokster*, 545 U.S. 913 (No. 04-480).

¹⁹⁵ The following are some of the briefs that argued that a finding of copyright liability for Napster would impede innovation in new technologies: Brief for Consumer Electronics Association et al. as Amici Curiae Supporting Appellants at *1, *Napster, Inc. v. A & M Records et al.*, 239 F.3d 1004 (2000) (No. 00-16401); Brief for Association of American Physicians & Surgeons et al. as Amici Curiae Supporting Appellants at *2, *13–14, *Napster*, 239 F.3d 1004 (No. 00-16401); Brief for Eighteen Law Professors as Amici Curiae Supporting Appellants at *4–6, *Napster*, 239 F.3d 1004 (No. 00-16401).

stifling innovation but of inhibited diffusion.¹⁹⁶ Digital music distribution has significant advantages over the dominant form of music distribution – the compact disc. It provides immediacy of distribution, the ability to select individual songs and create play-lists 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' "Brother in Arms," was released in CD format and had a significant impact on the adoption of CD technology. CD technology diffused rapidly. By 1987 the CD sales surpassed those of vinyl records.¹⁹⁷

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 1998, 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. In addition, in 1998, Creative Technologies released a fully functional portable MP3 player – adding the portability advantage.¹⁹⁸ 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 the Rhapsody. These services became a major source for digital

¹⁹⁶ It is important to differentiate between copyright arguments that address the dissemination of knowledge and an argument that addresses 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 goal 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).

¹⁹⁷ Kees A. Schouhamer Immink, *The CD Story*, 46(5) J. AUDIO. ENG. SOC. 458, *3 (1998), available at <http://www.exp-math.uni-essen.de/~immink/pdf/cdstory.pdf>; Shuman Ghosemajumder, Phil Bangayan & Giselle Bonet, *Digital Music Distribution* *1 (2002), <http://shumans.com/digital-music.pdf>.

¹⁹⁸ Ghosemajumder, Bangayan & Bonet, *supra* note 197, at *4.

music downloading on the Internet.¹⁹⁹ However, although sales of digital music are rising, in 2007, CD sales still comprised 82.6% of sales in the music market, while digital music sales comprised only 11.2% of total music sales.²⁰⁰

This delayed adoption of digital music is perplexing given that the overwhelming relative advantages of digital music distribution over CDs far outweigh the relative advantage of CDs over vinyl records. One factor that doubtless affected the sales of digital music was downloading from file sharing networks.²⁰¹ 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.²⁰² Copyright enforcement, through both technological 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.²⁰³ For example, Apple,

¹⁹⁹ In 2005, 34% of Internet users who downloaded music used commercial services. Pew Internet and American Life Project, *Music and Video Downloading*, Mar. 2005, at 7, http://www.pewinternet.org/pdfs/PIP_Filesharing_March05.pdf.

²⁰⁰ The Recording Industry Association of America, *2007 Consumer Profile* (2008), <http://76.74.24.142/44510E63-7B5E-5F42-DA74-349B51EDCE0F.pdf>.

²⁰¹ See British Music Rights & University of Hertfordshire, *Music Experience and Behavior in Young People Spring 2008* (2008) at 11, <http://www.bmr.org/cms/uploads/files/UoH%20Reseach%202008.pdf> (reporting that 63% of British youth aged 14-24 download music using P2P file sharing); Martyn Williams, *Number of File Sharers in Japan Rises Sharply*, COMPUTERWORLD, July 25, 2006, http://www.infoworld.com/article/06/07/25/HNjapanfilesharers_1.html?P=TO-P (reporting an increase of music file sharing in Japan).

²⁰² Most recent surveys showing an increase in digital music downloading were executed outside the United States. Currently, there is not clear evidence of the level of downloading from file sharing networks in the United States. Further, during 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 music illegal downloading. 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 Pew Internet and American Life Project, *supra* note 199 (reporting a decrease in file sharing networks activity in the United States following copyright enforcement lawsuits); The Recording Industry Association of America, *supra* note 200 (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 189, at 1714-15 (reporting on data showing that use of P2P systems did not decrease following copyright lawsuits).

²⁰³ Commissioner J. Thomas Rich, *A Different Perspective on DRM*, 22 BERKLEY. TECH. L.J. 971, 976 (2007). See generally Tal Z. Zarsky, *Assessing Alternative*

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.²⁰⁴ 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, 40% of respondents said that a DRM-free business model would increase the number of digital file purchases.²⁰⁵ 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.²⁰⁶ 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 62% of respondents believed that dropping DRM restrictions would boost the adoption of digital music technology.²⁰⁷ Industry leaders expressed concerns that consumer confusion over incompatible DRM formats affects digital music adoption. Buyers are put off patently legal downloading because of their uncertainty of which files will work on which machines.²⁰⁸

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

Compensation Models for Online Content Consumption, 84 DENV. U. L. REV. 645 (2006) (discussing DRM systems and proposals for solutions).

²⁰⁴ Gasser & Palfrey, *supra* note 188, 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).

²⁰⁵ In-Stat, *Executive Summary: Digital Rights Management Survey *1* (2007), <http://www.in-stat.com/panels/pdf/2007/apr07digitalrightsmgmt.pdf>. Thirty-three % of respondents said they were not sure, while only 25% disagreed that a DRM-free business model would increase the number of digital file downloads. *Id.* at *1.

²⁰⁶ *Id.*

²⁰⁷ See *Music Execs Criticize DRM Systems*, BBC NEWS, Feb. 15, 2007, <http://news.bbc.co.uk/2/6362069.stm> (describing a Jupiter study that examined music industry executives' attitudes toward DRM). See also Andrew Edgecliffe-Johnson, *Anti-Piracy Moves "Hurt Sales,"* Content Agenda, Nov. 20, 2007, <http://www.contentagenda.com/article/CA6504465.html?q=piracy> (quoting Kim Bayley, Director General of the Entertainment Retailers Association in the United Kingdom, saying that DRM systems are stifling the growth of digital music).

²⁰⁸ John Lister, *Music Retailers Say DRM is Hurting Sales*, Infopackets, Nov. 26, 2007, http://www.infopackets.com/channels/en/windows/gazette/2007/20071126_music_retailers_say_drm_hurting_sales.htm.

also from utilizing patently legal distribution mechanisms.²⁰⁹ A major study found that while in 2002, prior to the music industry copyright lawsuits against individual users, 32% of Internet users downloaded digital music, by 2005 only 22% downloaded music from any Internet source.²¹⁰ Furthermore, the study revealed that a significant group – 11% 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.²¹¹

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 the average Internet user is becoming increasingly sophisticated.²¹² This data, combined with the data pointing to the abandonment of the technology by experienced Internet users, decreases the explanatory power of this factor.

Additionally, digital music downloading is more effective with broadband Internet connection. Widespread broadband adoption is a more recent phenomenon. It grew significantly over the last couple of years. In 2007, 47% of adult Americans had broadband connection from home compared to 20% in 2003.²¹³ Yet, the 2005 music downloading survey shows a decline in digital music downloading even among broadband users. While 41% of broadband users downloaded music in 2003, only 29% of broadband users downloaded in 2005 from any Internet source.²¹⁴ Furthermore, despite the

²⁰⁹ The main study on the topic, which was administered by the reputed Pew Internet and American Life project, showed a decrease in file sharing downloading activity in the United States, following the copyright enforcement lawsuits. See Pew Internet and American Life Project, *supra* note 199. Yet, some other studies did not show such a decrease. See, e.g., See Opperbeck, *supra* note 189, at 1714–15.

²¹⁰ Pew Internet and American Life Project, *supra* note 199, at *1-2.

²¹¹ *Id.* at *9. Admittedly, results indicating a decrease in file sharing networks' use may be biased due to individuals' fear of admitting their use of the networks. Yet, the data, which is prone to bias, is that of individuals reporting non-use of file-sharing network. 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.

²¹² See Center for the Digital Future, *Online World as Important to Internet Users as Real World?*, *2 (2007) <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); Lee Rainie, *Tagging Play*, Pew Research *1, Jan. 31, 2007, <http://pewresearch.org/pubs/402/tagging-play>; Pew Internet & American Life Project, *Online Video*, *1 (2007), http://www.pewinternet.org/pdfs/PIP_Online_Video_2007.pdf (finding that 57% of Internet users have watched video online).

²¹³ See John B. Horrigan, *US Lags Behind: Why Will It Be Hard to Close the Broadband Divide*, Pew Internet & American Life Project, *2 (2008), http://www.pewinternet.org/pdfs/Broadband_Commentary.pdf.

²¹⁴ Pew Internet and American Life Project, *supra* note 199, at 7.

significant rise in broadband access availability, digital music sales are still increasing at slow rate. While broadband connection was spreading rapidly (in 2006 43% of Americans already had broadband connection)²¹⁵ digital music sales increased by only 1% from the previous year.²¹⁶

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 a significant impact on use of digital technology by those inhibited by the illegality of file sharing downloading. Sales data from 2007 indicates that the 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, a delay of over a decade 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. 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, the Article proposes that channeling attention and resources to the diffusion problem could alter the battle equilibrium and facilitate a resolution of the controversy.

First, the Article suggests that a diffusion centered litigation strategy could enhance the position of the parties opposing 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 opposing the music industry's copyright enforcement campaign failed to raise diffusion arguments.²¹⁷ Neither defendants' briefs nor the many amicus briefs filed pointed to the social cost imposed by the delay in the adoption of digital music technology. Inserting diffusion policy considerations

²¹⁵ See Horrigan, *supra* note 237.

²¹⁶ See The Recording Industry Association of America, *supra* note 200; The Recording Industry Association of America, *2006 Consumer Profile*, (2007), <http://76.74.24.142/E795D602-FA50-3F5A-3730-9C8A40B98C46.pdf>.

²¹⁷ It should be acknowledged that legal diffusion arguments would serve parties opposing copyright enforcement but not the music industry.

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 *Capital Records v. Debbie Foster*, the parties litigated the Recording Industry Association of America's (RIAA) liability for attorney 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.²¹⁸ 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 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.

Second, the 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.²¹⁹ 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 11.2% of 2007 total music sales. 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

²¹⁸ Brief for American Association of Law Libraries, *supra* note 190.

²¹⁹ See Entertainment Media Research, *The 2007 Digital Music Survey*, 52, (2007), http://www.olswang.com/dms07/digital_music_survey2007.pdf.

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.²²⁰ 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.²²¹

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 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

The 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.

The 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, the Article showed that, paradoxically, the celebration of innovation harms the very goal it seeks to advance – the promotion of human progress.

²²⁰ See FISHER, *supra* note 189, at 25 (discussing the flexibility that digital music gives consumers); William Fisher, *Digital Music: Problem and Possibilities*, (2000), <http://www.law.harvard.edu/faculty/tfisher/Music.html> (discussing the convenience and elimination of over-production advantages).

²²¹ See Jennifer Leclair, *Sony Finally Drops DRM, Sort of*, NEWSFACTOR.COM, 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); Steve Jobs, *Thoughts on Music*, Feb. 6, 2007, <http://www.apple.com/hotnews/thoughtsonmusic/> (Steve Jobs, Apple's CEO, renounces his support of DRM technology). *But see* Nicola F. Sharpe & Olufunmilayo, *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).

Finally, the 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, the Article proposed ways in which channeling the legal regime's attention and resources to the diffusion process could resolve these failures.

In *Eldred v. Ashcroft*, the Supreme Court upheld the constitutionality of the Sony Pro Bono Copyright term Extension Act, which extended copyright term by twenty years.²²² The movement opposing the expansion of intellectual property right views *Eldred* as one of its biggest defeats. After the decision came out, Lawrence Lessig, who litigated the case, regretfully wrote that “[t]his case could have been won... I can never escape believing that my own mistake lost it... I had failed to convince that the issue here was important.”²²³ He added: “I failed to convince them that the issue was important...the truth about the harm that this unchecked power will cause could have been made clear to this court.”²²⁴ 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 of diffusion failures and delays may result in fewer defeats, such as the defeat experienced in *Eldred*.

²²² *Eldred v. Ashcroft*, 537 U.S. 186, 193 (2003).

²²³ LAWRENCE LESSIG, *FREE CULTURE: THE NATURE AND FUTURE OF CREATIVITY* 242 (2005).

²²⁴ *Id.* at 242, 244.

Empirical Appendix¹ In the Shadow of Innovation

Gaia Bernstein

I. The Quantitative Study

A. Case Selection Criteria

The study encompassed all state and federal cases between 1946 and 2005. The search was run on Lexis on the All Federal and State Cases, Combined file during June and July 2006. The search was designed to test two hypotheses: (i) Use of innovation rhetoric increased during the 1980s with the advent of the intellectual property wars; and (ii) Use of innovation rhetoric increased during the 1990s when the Internet reached mainstream adoption. Consequently, the search was confined to the five decades subsequent to World War II, a period of sufficient length to examine whether such trends have indeed occurred.²

Innovation rhetoric, admittedly, exists beyond the judicial arena. It is, in fact, more common in academia and in legislative debates. In legal cases, innovation rhetoric appears mainly in opinions that address policy. Generally, policy discussions appear in a small percentage of case law. Nevertheless, the availability of a comprehensive body of case law on Lexis made it the best-suited place to examine the timing and the nature of the transformation in use of innovation rhetoric.

B. Assessment Method

Since the body of intellectual property case law grew significantly over the period studied, basing the study on a count of references to innovation would have merely reflected the increase in intellectual property cases not in innovation rhetoric. The study, therefore, measured the increase in percentage of cases containing innovation rhetoric out of all intellectual property cases.

C. Queries

The following query was used to identify the total number of intellectual property cases: `atleast6(patent!) or atleast4(copyright!) or atleast4(trademark!) and CORE-TERMS (patent or copyright or trademark) and date(geq(1/1/1946) and leq(12/31/1955))`

¹ The empirical study and appendix are compliant with the best practices described in Mark A. Hall & Ronald F. Wright, *Systematic Content Analysis of Judicial Opinions*, 96 CAL. L. REV. 63, 100-120 (2008).

² The author is currently exploring the historical relationship between innovation and diffusion beyond 1946 in a separate paper. Gaia Bernstein, *Progress and the Dissemination of New Technologies* (Apr. 1, 2009) (unpublished manuscript, on file with author).

and not patently viol! or patently illeg! and not patent land! and not homestead and not patently unconstitutional.

This query was selected to ascertain that only intellectual property cases are included:

- *Atleast6(patent!)*. This limitation was used because patent is a common word and used in many other contexts. Looking for six iterations of the term gave the most reliable base query without forfeiting patent cases.
- *Atleast4(copyright) or atleast4(trademark)*. Trademark and copyright are not common words in other contexts. Looking for four iterations gave consistently relevant intellectual property cases.
- *and not patently viol! or patently illeg! and not patent land! and not homestead and not patently unconstitutional*. These were the most common recurring uses of patent in a non-intellectual property context.

The following query was used to identify cases, which included innovation rhetoric: (stimulat! or goal or promot! or polic! or encourag! or incentiv! or interest! or advance! or object! or foster! or reward!) /s (innovat!).

Although the policy justification for granting trademarks is not traditionally tied to innovation, these cases were included in the study because a closer review revealed that they contained innovation rhetoric. Trademark opinions usually referred to innovation rhetoric to distinguish the goals of copyright and patent rights from the objectives of the Lanham Act. For example, in *Dastar Corp. v. Twentieth Century Fox Film Corp.*, the Supreme Court stated that: “‘The Lanham Act,’ we have said, ‘does not exist to reward manufacturers for their innovation in creating a particular device; that is the purpose of the patent law and its period of exclusivity.’”⁵

II. The Qualitative Study

A. Case Selection and Scope

The purpose of the qualitative study was to examine whether the increase in innovation rhetoric went beyond a mere linguistic change to an actual transformation in the values embraced by the legal regime.

The qualitative study was performed on the cases that the quantitative study identified as containing innovation rhetoric. Yet, while the quantitative study focused on the linguistic shift, the qualitative study was designed to broaden the quantitative study’s inquiry. The study did not focus only on sentences in the opinions that contained the term innovation, but encompassed all references in the relevant opinions to notions of promoting progress, promoting innovation, promoting invention or promoting creativity. Thus, the opinions were read not for specific terminology but for paragraphs broadly discussing these themes. The rationale for this reading was that users of innovation rhetoric appear to use the terms interchangeably, failing to distinguish between the terms.⁴

³ *Dastar Corp. v. Twentieth Century Fox Film Corp.*, 539 U.S. 23, 34 (2003).

⁴ See Gaia Bernstein, *In the Shadow of Innovation* *forthcoming* CARDOZO L. REV. 17-19 (2009/10) (discussing the scope of innovation rhetoric).

B. Coding

The hypothesis guiding the qualitative study was that courts did not merely increase their use of the term innovation, but engaged in more extensive discussions surrounding this theme.

A research assistant initially screened the cases and confirmed the hypothesis that the nature of innovation rhetoric has changed over the years, becoming more expansive from the mid-1980s. The initial screening resulted in a broad set of categories to classify uses of innovation rhetoric. Subsequently, the author read through all the cases, narrowing the number of categories and coding the cases to the different categories.

The coding categories that crystallized after the author's reading of the cases were as follows:

Standard: References to innovation (or interchangeable terminology) as the standard required for receiving intellectual property rights.

Prototypical examples:

- *Graham v. John Deere*: stating that under Art I, §8, cl. 8 of the United States 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."⁵
- *Carlson & Sullivan v. Bigelow & Dowse Co.*: 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,"⁶

Reward: References stating that the goal of intellectual property law is to reward the inventor or creator for his innovation (or interchangeable terminology) in order to grant him his just desert.

References that were classified under the Reward Category often appeared in opinions that also contained references that were classified under the Tepid Utilitarian category (see below). Courts tended to tie these two types of innovation rhetoric together in their opinions and accord them equal weight as policy justifications.

Prototypical examples:

- *Chavart v. Commissioner of Patents*: "When an invention has so 'substantially advanced the art,' as we believe appellant's wheel has done, then we must be

⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 5-6 (1965).

⁶ *Carlson & Sullivan, Inc. v. Bigelow & Dowse Co.*, 202 F.2d 654, 657 (1st Cir. 1953).

‘liberal in [our] construction of the patent, to secure the inventor the reward he deserves.’”⁷

- *Stanfield v. Osborne Industries, Inc.*: stating that one of the goals of the patent system is “to foster and reward invention.”⁸

Tepid Utilitarian: References to the relationship between intellectual property and the need to encourage innovation (or interchangeable terminology). References classified under this category contained discussions limited to one to two sentences. Only references that went beyond the citation of the intellectual property constitutional provision (referring to the need to “To promote the Progress of Science and Useful Arts”) were included.⁹

Prototypical examples:

- *Farmland Irrigation Co. v. Dopplmaier*: “The purpose in granting a patent monopoly is to promote progress in science and the useful arts by stimulating invention and encouraging disclosure.”¹⁰
- *Eli Lilly & Co. v. Premo Pharmaceutical Laboratories, Inc.*: “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.’”¹¹

Important: Extensive discussions of the relationship between intellectual property rights and the need to encourage innovation (or interchangeable terminology). References included under this category contained discussions that were longer than two sentences. In many cases the opinions included were significantly longer.

Prototypical examples:

- *Lotus Dev., Inc. v. Paperback Software Int’l*: (the following are the main but not complete excerpts of innovation rhetoric included in the opinion):

“... 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

⁷ Charvat v. Commissioner of Patents, 503 F.2d 138, 147 (1974 D.C. Cir.).

⁸ Stanfield v. Osborne Industries, Inc., 643 P.2d 1115, 1122 (Kan. Ct. App. 1982).

⁹ 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”).

¹⁰ Farmland Irrigation Co. v. Dopplmaier, 48 Cal. 2d 208, 220 (Cal. 1957).

¹¹ Eli Lilly & Co. v. Premo Pharmaceutical Laboratories Inc. 639 F.2d 120, 137 (3d Cir. 1980).

that strong copyright protection is necessary to promote the progress of computer programming, Congress could provide for expansive copyright protection.”¹²

“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.”¹³

The Court rejected defendant’s standardization argument explaining that: “one 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.”¹⁴

- *Hilton Davis Che. Co. v. Warner Jenkinson:*

“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

¹² Lotus Dev. Corp. v. Paperback Software Int’l, 740 F. Supp. 37, 46 (D. Mass. 1990).

¹³ *Id.* at 76-7.

¹⁴ *Id.* at 78.

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 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....¹⁵

While some cases were easily categorized into one of the categories, a few were more ambiguous because they contained references that fit into two categories. In most instances, when an opinion contained references that could be classified into two categories, it was for Tepid Utilitarian and Reward. In these cases the opinion was coded for both categories.

A prototypical example is:

- *Pederson v. Stewart-Warner Corp.*: stating that the country “has chosen to allow such monopolies only as a reward and inducement for ‘innovation,’ advancement, or social benefits.”¹⁶

C. Calculation of Qualitative Study Results

Since some opinions contained references to innovation that fit into two categories, the results of the qualitative study are based on types of references to innovation and not on opinions.

For example, if a decade contained six opinions, which included innovation rhetoric. Four opinions contained references that were coded as Tepid Utilitarian, one contained

¹⁵ *Hilton Davis Che. Co. v. Warner Jenkinson*, 62 F.3d 1529, 1529–32, 1558 (Fed. Cir. 1995).

¹⁶ *Pederson v. Stewart-Warner Corp.*, 400 F. Supp. 1262, 1269 (N.D. Ill. 1975).

references that were coded as Standard, and one contained references that were coded as both Trepid Utilitarian and Reward. The last opinion was counted as two innovation references. Thus, to calculate percentages there were seven innovation references in the denominator, while in the numerator there were five innovation references to tepid, one to standard, and one to reward.