

Reimagining WIPO:
A Global Administrative Law Approach to Emerging Innovation Paradigms

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I. Introduction

Since the negotiation of the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) in 1994,¹ the innovative landscape has undergone dramatic changes due to technological advances in fields such as biotechnology, nanotechnology, and digital communications and computation. Notably, the negotiation of TRIPS coincided almost exactly with the rise in importance of the Internet following the invention of the World Wide Web and the introduction of the Mosaic web browser in the early 1990s.² These technological changes have spawned major social changes, which are increasingly felt not only in developed countries, but throughout the world. The resulting changes in the innovative landscape, especially as instantiated in the complex technologies of the information technology industry, have given rise to controversy about the proper contours of intellectual property protection and to upheaval in the political economy of intellectual property lawmaking. This upheaval is reflected, for example, in the split between the pharmaceutical sector and many information technology companies in their positions on patent reform in the United States.³

Even more than by that debate, however, the social role of intellectual property protection is brought into question by an explosion of innovative activity that does not fit into the sales-oriented, proprietary model which underlies intellectual property doctrine. The years since 1994 have seen an increasingly important role for user innovation⁴ and innovation resulting from open and collaborative processes.⁵ Neither of these innovative paradigms is new, but they had been

¹ Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), WTO Agreement, Annex 1C, Legal Instruments-Results of the Uruguay Round, 33 I.L.M. 1197 (1994). *See also* DANIEL J. GERVAIS, *THE TRIPS AGREEMENT: DRAFTING HISTORY AND ANALYSIS* (2d ed. 2003).

² *See, e.g.*, MOSAIC: THE ORIGINAL BROWSER, *available at* <http://www.nsf.gov/about/history/nsf0050/internet/mosaic.htm> (visited on July 16, 2008).

³ *See, e.g.*, Christopher Holman, *Biotechnology's Prescription for Patent Reform* 5 J. MARSHALL REV. INTELL. PROP. L. 317 (2006) for a discussion of these differences.

⁴ For an overview, *see* ERIC VON HIPPEL, *DEMOCRATIZING INNOVATION* (2005)

⁵ *See, e.g.*, YOCHAI BENKLER, *THE WEALTH OF NETWORKS* (2006) for an overview.

pushed into the background by the ascendance of industrial research and development along with a paradigm of mass production. Technological advances, particularly in digital communications, have revitalized these contexts for innovation in surprising ways.

There has been considerable scholarly and public debate about the impact of the TRIPS minimum standards approach to patent law on access to patented technology – particularly in the public-health-related fields of pharmaceuticals and agriculture.⁶ Indeed that debate has led to modifications of the TRIPS agreement as reflected in the Doha Declarations⁷ and to the adoption of a Development Agenda by the World Intellectual Property Organization (WIPO).⁸ The overly cramped interpretations of TRIPS exceptions evident in the handful of relevant WTO dispute resolution decisions have also been criticized as distorting the balance between initial and follow-on innovation even under a mass market seller-based innovation regime.⁹ There has been considerably less discussion, however, about the interplay between the global intellectual property regime and the revitalized practices of user innovation and open and collaborative innovation.

⁶ See, e.g., Margaret Chon, *Intellectual Property and the Development Divide*, 27 CARDOZO L. REV. 2821 (2006); Daniel J. Gervais, *Intellectual Property, Trade & Development: The State of Play*, 74 FORDHAM L. REV. 505 (2005); Peter K. Yu, *TRIPS and Its Discontents*, 10 MARQUETTE INTEL. PROP. REV. 369 (2006); Rochelle C. Dreyfuss, *TRIPS-Round II: Should Users Strike Back?*, 71 U. CHI. L. REV. 21 (2004). See also articles in Graeme B. Dinwoodie, Ed., SYMPOSIUM: INTELLECTUAL PROPERTY, TRADE AND DEVELOPMENT: ACCOMMODATING AND RECONCILING DIFFERENT NATIONAL LEVELS OF PROTECTION, 82 CHI-KENT L. REV. (2007) and articles in SYMPOSIUM: TRADITIONAL KNOWLEDGE, INTELLECTUAL PROPERTY, AND INDIGENOUS CULTURE, 11 CARDOZO J. INT'L & COMP. L. (2003); Thomas W. Pogge, *Human Rights and Global Health: A Research Program*, 36 METAPHILOSOPHY 182 (2005).

⁷ See World Trade Organization, *Ministerial Declaration of 14 November 2001*, WT/MIN(01)/DEC/1, 41 I.L.M. 746 (2002) (Doha Ministerial Declaration); World Trade Organization, *Ministerial Declaration of 20 November 2001*, WT/MIN(01)/DEC/ 2 (Doha Declaration on TRIPS and Public Health).

⁸ See documents available at <http://www.wipo.int/ip-development/en/agenda/>.

⁹ See, e.g., Graeme B. Dinwoodie and Rochelle C. Dreyfuss, *Diversifying Without Discriminating: Complying With the Mandates of the TRIPS Agreement*, 13 MICH. TELECOMM. & TECH. L. REV. 445 (2007); Graeme B. Dinwoodie & Rochelle C. Dreyfuss, *Patenting Science: Protecting the Domain of Accessible Knowledge*, in THE FUTURE OF THE PUBLIC DOMAIN IN INTELLECTUAL PROPERTY (Lucie Guibault & P. Bernt Hugenholtz eds., 2006); Graeme B. Dinwoodie & Rochelle C. Dreyfuss, *TRIPS and the Dynamics of Intellectual Property Lawmaking*, 36 CASE W. RES. J. INT'L L. 95 (2005); Graeme B. Dinwoodie & Rochelle C. Dreyfuss, *WTO Dispute Resolution and the Preservation of the Public Domain of Science Under International Law*, in INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER GLOBALIZED INTELLECTUAL PROPERTY REGIME, (Keith E. Maskus and Jerome H. Reichman eds., 2006).

In this Article, I argue that, over and above previously appreciated problems with regard to access and the traditional IP balance, the trouble with TRIPS – and with the global intellectual property law regime more generally – is that it is ill-designed to cope with changes in the innovative process itself and with the likely heterogeneity of desirable innovation approaches in different global contexts. While it is possible that current TRIPS flexibilities can be interpreted in ways that will better balance the needs of initial innovators against those of users and follow-on innovators, the very structure of the agreement is based on an assumption of mass market, seller-based innovation which may make it difficult to accommodate newer innovation paradigms.

Because not only the subject matter of innovation but the processes by which it occurs are various and changing, it is important, but not sufficient, to focus on making substantive improvements to TRIPS and its interpretations so as to deal with current issues involving such things as access to medicines or agricultural technologies and the increasing importance of information technology with its predominance of cumulative innovation. The experience of the past 15 years should serve as a cautionary tale regarding the wisdom of enshrining substantive rules based on any particular paradigm of innovation in an inflexible international instrument. Thus, along with seeking solutions to the particular problems confronting today's innovators in dealing with the outmoded TRIPS framework, it would be wise to consider how to implement an ongoing process at the global level for navigating the tension between the truly global reach of innovation and the heterogeneous and changing social practice of innovation. The complexity of the innovative environment, in combination with the need for both flexibility and consistency, calls for an administrative-type approach which builds in an expectation of the need for

substantive updating of the global innovation policy governance regime rather than an attempt to lock in substantive standards tailored to today's innovation environment.¹⁰

To that end, I propose a re-envisioning of the World Intellectual Property Organization (“WIPO”) as a more broadly conceived innovation policy organization, which would serve as a center of discourse not only about how intellectual property law should be adapted to changing modes of innovation but also about how to confront new dilemmas raised by evolving innovative practices, which may involve issues beyond intellectual property law, such as competition policy, licensing practices, and the tradeoff between private ordering and the public domain.¹¹

WIPO has historically focused on promoting the intellectual property regime¹² (and indeed has manifested some hostility to the poster child for open and collaborative innovation – open source

¹⁰ For general discussions of the varieties of and issues raised by “agency-like” actors at the global level see Sabino Cassese, *Administrative Law Without the State? The Challenge of Global Regulation*, 37 N.Y.U. J. INT’L L. & POLITICS 663 (2005); Sabino Cassese, *Global Standards for National Administrative Procedure*, 68 L. & CONT. PROBS. 109 (2005); Daniel C. Esty, *Good Governance at the Supranational Scale: Globalizing Administrative Law*, 115 YALE L.J. 1490 (2006); Benedict Kingsbury, Nico Krisch, and Richard Stewart, *The Emergence of Global Administrative Law*, 68 LAW & CONTEMP. PROBS. 15 (2005); Richard B. Stewart, *U.S. Administrative Law: A Model for Global Administrative Law?*, 68 LAW & CONTEMP. PROBS. 63 (2005); Ann-Marie Slaughter and David Zaring, *Networking Goes International: An Update*, 2 ANNU. REV. LAW SOC. SCI. 211 (2006); Scott Burris, Peter Drahos and Clifford Shearing, *Nodal Governance*, 30 AUSTRALIAN J. LEGAL PHIL. 30 (2005).

¹¹ See Graeme B. Dinwoodie, *Private Ordering and the Creation of International Copyright Norms: The Role of Public Structuring*, 160 J. INST. AND THEOR. ECON. 161 (2004), available at <http://ssrn.com/abstract=604161>; Graeme Dinwoodie, *The International Intellectual Property System: Treaties, Norms, National Courts, and Private Ordering*, in INTELLECTUAL PROPERTY, TRADE AND DEVELOPMENT: STRATEGIES TO OPTIMIZE ECONOMIC DEVELOPMENT IN A TRIPS PLUS ERA (D. Gervais, ed., 2007); Niva Elkin-Koren, *What Contracts Cannot Do: The Limits of Private Ordering in Facilitating a Creative Commons*, 74 FORDHAM L. REV. 375 (2005); Severine Dusollier, *The Role of Contracts and Private Initiatives: Sharing Access to Intellectual Property Through Private Ordering*, 82 CHI.-KENT. L. REV. 1391 (2007); Arti K. Rai, “Open Source” and Private Ordering: A Commentary on Dusollier, 82 CHI.-KENT. L. REV. 1439 (2007); Stephen M. McJohn, *The Paradoxes of Free Software*, 9 GEO. MASON L. REV. 25, 42-23 (2000); Ronald J. Mann, *Commercializing Open Source Software: Do Property Rights Still Matter?*, 20 HARV. J. LAW & TECH. 1, 11 (2006).

¹² Article 3, CONVENTION ESTABLISHING THE WORLD INTELLECTUAL PROPERTY ORGANIZATION, July 14, 1967, 21 U.S.T. 1749, 848 U.N.T.S. 3, available at http://www.wipo.int/treaties/en/convention/trtdocs_wo029.html (“The objectives of the Organization are: (i) to promote the protection of intellectual property throughout the world through cooperation among States and, where appropriate, in collaboration with any other international organization, (ii) to ensure administrative cooperation among the Unions.”). See Debora J. Halbert, *The World Intellectual Property Organization: Past, Present, and Future*, 54 J. COPYRIGHT SOC’Y U.S.A. 253 (2007) for a discussion of the history of WIPO and its goals, along with a critique of WIPO governance and a proposal that it take on a broader, more participatory role in the development context.

software¹³). Nonetheless, I argue – building on a related argument by Rochelle Dreyfuss¹⁴ – that WIPO is the most promising home for a broader focus on innovation policy in light of its expertise, its experience with the Development Agenda, and its relationship with the WTO under TRIPS. Indeed, there are encouraging signs in this regard in recent WIPO recognition of the impingement of broader innovation policy issues on the patent system.¹⁵ The thrust of this article is to encourage a more central place for considerations of the full panoply of innovation paradigms in the development of patent policy – and intellectual property more generally.

A broader mandate for WIPO could be implemented in several ways, with varying levels of administrative discretion vested in the re-imagined organization. As a first cut, WIPO might undertake to develop an Innovation Policy Agenda incorporating the concerns of innovative communities of various types, including commercial firms, user innovator communities, scientific researchers, open source proponents and other stakeholders including developing and developed countries and NGOs representing users. The cultivation of an Innovation Policy Agenda would benefit from WIPO's experience with the Development Agenda, which has already taken a peripheral interest in some aspects of open and collaborative innovation and in preservation of the public domain.¹⁶ One of the tasks involved in proposing an Innovation Policy Agenda must be to reconsider current WIPO projects in light of a broader view of the global innovation regime. In particular, WIPO should reconsider its attempt to develop a Substantive

¹³ See, e.g., Jonathan Krim, *The Quiet War Over Open-Source*, WASH. POST at E01 (August 21, 2003) (describing WIPO capitulation to pressure to cancel a meeting to discuss open source software).

¹⁴ Rochelle C. Dreyfuss, *Fostering Dynamic Innovation and Development: International Intellectual Property as a Case Study in Global Administrative Law*, ACTA JURIDICA (forthcoming 2008) [hereinafter, *Fostering Dynamic Innovation*]. See also, for a similar argument with respect to development issues, Halbert, *supra* note 12 at 283-84.

¹⁵ See WIPO Standing Committee on the Law of Patents, Report on the International Patent System, , SCP/12/3 (April 15, 2008), available at http://www.wipo.int/edocs/mdocs/scp/en/scp_12/scp_12_3.pdf; WIPO Standing Committee on the Law of Patents, Summary by the Chair, SCP/12/4 Rev. (June 26, 2008), available at http://www.wipo.int/edocs/mdocs/scp/en/scp_12/scp_12_4_rev.pdf.

¹⁶ See The 45 Adopted Recommendations under the WIPO Development Agenda [“Development Agenda”], Nos. 16, 17, 23, 27, 35, 36, 45, available at <http://www.wipo.int/export/sites/www/ip-development/en/agenda/recommendations.pdf>

Patent Law Treaty in light of a broader innovation mandate, just as it has been urged to do with respect to development and access issues.¹⁷

Dreyfuss has considered in detail various legal mechanisms by which WTO interpretation of TRIPS might incorporate WIPO input, particularly with respect to interpretation of TRIPS flexibilities under Articles 27, 30, and 31 in light of the Policies and Objectives set out in Articles 7 and 8.¹⁸ Building on those proposals, as part of an Innovation Policy Agenda, WIPO should consider adopting procedural mechanisms to vet proposed implementations of TRIPS flexibilities from an innovation policy perspective. If these procedures are designed, in analogy to notice and comment proceedings in domestic administrative law, to provide sufficiently robust transparency and participation,¹⁹ the results of these deliberations might well be given considerable weight in WTO proceedings on purely persuasive grounds, both by WTO dispute resolution panels and by the TRIPS Council in its own deliberations. Alternatively, as also discussed by Dreyfuss,²⁰ the formal role of WIPO in interpreting TRIPS could be expanded either by amending TRIPS to provide for deference to WIPO interpretations or by expanding the joint activities of WIPO and the TRIPS Council as a means of incorporating WIPO views indirectly through the TRIPS Council.

These suggestions for implementing a broader-based innovation policy are constrained, of course, by the language of TRIPS itself. While there is arguably considerable leeway in TRIPS,

¹⁷ Jerome H. Reichman and Rochelle C. Dreyfuss, *Harmonization Without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L. J. 85 (2007); *Proposal by Argentina and Brazil for the Establishment of a Development Agenda for WIPO*, WO/GA/31/11 Annex at (August 27, 2004), available at http://www.wipo.int/documents/en/document/govbody/wo_gb_ga/pdf/wo_ga_31_11.pdf, at 2.

¹⁸ *Fostering Dynamic Innovation*, *supra* note 14 at 25-33

¹⁹ See, e.g., Cassese, 37 N.Y.U. J. INT'L L. & POLITICS, *supra* note 10 at 690-93 (2005); Esty, *supra* note 10 at 1527-37; Kingsbury *et al.*, *supra* note 10 at 37-42; Slaughter and Zaring, *supra* note 10 at 220-24, discussing issues of accountability, transparency, and participation in global governance.

²⁰ *Fostering Dynamic Innovation*, *supra* note 14 at 25-33.

its provisions, with their prohibition on technological “discrimination,”²¹ their case-by-case approach to compulsory licensing,²² their assumption that all exceptions to strong patent rights should be “limited” (Article 30), and their requirement that all patentees be afforded exclusive rights of use,²³ were not designed with user innovation and open and collaborative innovation in mind and may not stretch far enough to accommodate newer innovative paradigms in an optimal manner.

An even more ambitious approach to WIPO involvement would be to amend TRIPS to provide a more open-ended exception provision which would accommodate evolving innovation practices along with a more explicit role for WIPO in vetting potential exceptions in light of innovation policy. For example, one might imagine replacing Article 30 with a broad provision permitting exceptions that are “reasonably calculated to promote innovation” and explicitly providing that Articles 27 and 28 are subject to such exceptions. WIPO evaluations of the reasonableness of particular exceptions could then be given a degree of deference. Such an approach would be desirable only if WIPO’s vetting procedures met minimal standards of transparency and accountability, of course, and there is room for debate as to the proper degree of deference that should be afforded to WIPO determinations.²⁴

Finally, a re-tooled WIPO would also provide a forum for discourse and possible standard-setting regarding issues specifically raised by new modes of innovation that are not covered by TRIPS with its mass market, seller-based focus. In particular, an innovation policy organization would provide a forum for debate about appropriate licensing forms for open and collaborative innovation projects; standards for competition policy in relation to such collaborative projects,

²¹ TRIPS, *supra* note 1, Art. 27

²² TRIPS, *supra* note 1, Art. 31

²³ TRIPS, *supra* note 1, Art. 28

²⁴ See *Fostering Dynamic Innovation*, *supra* note 14 at 26-27 (discussing “the legitimacy of relying on standard generated by WIPO” in interpreting TRIPS)

including, for example patent pools; issues of exhaustion and repair and reconstruction which are of relevance for user innovation; and proposals for navigating the boundaries between collaborative projects and proprietary inventions on the one hand and the public domain on the other.

There are a number of private organizations currently involved in global standard-setting for open and collaborative projects.²⁵ A global innovation policy organization could learn much from such organizations, some of which have adopted rulemaking procedures strikingly similar to those required under domestic administrative law regimes.²⁶ Perhaps such organizations should simply be left to their own devices. However, particularly if the collaborative limited commons paradigm is emulated more broadly, it might be appropriate to consider some limitations or standards to govern the extent to which such organizations should be permitted to fence off the public domain through private, albeit distributed ordering.²⁷

In any event, the point here is not to answer, or even to pose, all of the substantive questions that would fall within the purview of an international innovation policy organization but only to query whether the global governance of innovation would benefit from a more flexible, broadly-based center of innovation expertise. Encouragingly, the WIPO Standing Committee on Patents has recently shown an inclination to consider some of these broader innovation policy questions.²⁸ The proposal here would be to shift the focus of WIPO's portfolio from a secondary focus on innovation policy as it impacts intellectual property to put innovation policy front and center, regarding intellectual property as only one mechanism for innovation.

²⁵ These include, for example, Creative Commons, <http://creativecommons.org>; the Free Software Foundation, www.fsf.org; the Open Source Initiative, www.opensource.org; CAMBIA's BIOS (Biological Open Source) Initiative, www.cambia.org; the Patent Commons Project, www.patentcommons.org.

²⁶ For example, the Free Software Foundation uses a highly structured online public comment procedure for reviewing drafts of its licenses. See <http://gplv3.fsf.org/>.

²⁷ See Dinwoodie, *Private Ordering*, *supra* note 11 at 16-18; Elkin-Koren, *supra* note 11, at 407-20; Dusollier, *supra* note 11 at 1434-35; Rai, *Commentary on Dusollier*, *supra* note 11 (raising similar questions).

²⁸ See Report on the International Patent System, *supra* note 15; Summary by the Chair, *supra* note 15.

In pursuing any of these objectives, it will be important to consider how to provide transparency and accountability. Here WIPO's experience with the Development Agenda should be instructive.²⁹ Because innovative paradigms cross national boundaries and may bring together developing and developed country inventors, it will be important to allow for the participation of a variety of stake holders, including countries, NGOs, user innovators, open and collaborative innovation groups, and the commercial sector, in the discourse. The internet itself opens up more expansive possibilities for voice even beyond increased participation by recognized groups – a global online version of notice and comment is a practical possibility, which would permit the development of innovation policy itself to tap into the same emergent and heterogeneous expertise that drives some these newer innovation paradigms.³⁰

In Part II I begin by describing the emerging paradigms of user innovation and open and collaborative innovation and exploring some of their relevant features. In Part III I discuss in somewhat more detail the shortcomings of the current TRIPS-based regime as a means of promoting global innovation, arguing that the trade paradigm underlying TRIPS distorts innovation policy and discussing how current TRIPS provisions may impede the full realization of the potential of these newer innovation modes. Part IV discusses the proposal for re-imagining WIPO in somewhat more detail.

²⁹ See, e.g., Halbert, *supra* note 12 at 272-76, describing the opening up of WIPO to broader participation during the period leading up to its adoption of the Development Agenda.

³⁰ See, e.g., for related ideas to promote online participation in governance, <http://gplv3.fsf.org> for the discussion process used by the Free Software Foundation in developing its GPL licenses; www.peertopatent.org, for an experimental project inviting online review of patent applications in the United States Patent and Trademark Office; Beth Simone Noveck, "Peer to Patent": *Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J. LAW & TECH. 123 (2006) (proposing the peer-to-patent review process); Beth Simone Noveck, *The Electronic Revolution in Rulemaking*, 53 EMORY L.J. 433 (2004) (discussing the potential, generally, for online public participation in notice-and-comment rulemaking in the United States domestic context); Cynthia M. Ho, *Biopiracy and Beyond: A Consideration of Socio-Cultural Conflicts with Global Patent Policies*, 39 U. MICH. J.L. REFORM 433, 532-40 (2006) (proposing that WIPO host an online forum for commentary and debate about potential biopiracy and other moral and policy issues raised by particular patents).

II. The (Re)-Emergence of User Innovation and Open and Collaborative Creative Production

The twenty-first century has seen an explosion in user innovation and in open and collaborative innovative activity which has very different characteristics from the mass market seller-based innovation which was the model for TRIPS.³¹ These innovative practices are both more global and more local than the mass market paradigm. They rely much less than the traditional paradigm on intellectual property for incentives to invent, disclose, and disseminate;³² make use of dispersed local knowledge to both pose and solve technological problems,³³ and, at least in the case of open and collaborative innovation, are heavily reliant on ongoing contractual or social ordering rather than on isolated arms-length transactions.³⁴

While these practices are unlikely to replace the mass market seller-based innovation paradigm wholesale, they already pose a serious challenge to that paradigm in some arenas – particularly in the production of platform information technology³⁵ – and are likely to increase in importance over time. Moreover, there is no reason to believe that these relatively recent developments represent the end of evolution of global innovation practice. Instead, recent

³¹ See VON HIPPEL, *supra* note 4; Benkler, *supra* note 5 for overviews of these developments.

³² See Katherine J. Strandburg, *Users as Innovators: Implications for Patent Doctrine*, 79 U. COLO. L. REV. 467, 483-90; Yochai Benkler, *Coase's Penguin, or, Linux and The Nature of the Firm*, 112 YALE L.J. 369, 423-40 (2002); STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* (2004); Josh Lerner & Jean Tirole, *The Scope of Open Source Licensing*, 21 J.L. ECON. & ORG. 20 (2005); Dietmar Harhoff, Joachim Henkel & Eric A. von Hippel, *Profiting from Voluntary Information Spillovers: How Users Benefit by Freely Revealing Their Innovations*, 32 RES. POL'Y 1752 (2003); Karim Lakhani & Robert G. Wolf, *Why Hackers Do What They Do: Understanding Motivation and Effort in Free/Open Source Software Projects* (MIT Sloan Sch. of Mgmt., Working Paper No. 4425-03, 2003), available at <http://ssrn.com/abstract=443040>

³³ See, e.g., Benkler, *supra* note 32 at 406-23; Eric von Hippel & Georg von Krogh, *Open Source Software and the Private-Collective Innovation Model: Issues for Organization Science*, 14 ORG. SCI. 209 (2003); Eric von Hippel, "Sticky Information" and the Locus of Problem Solving: *Implications for Innovation*, 40 MGMT. SCI. 429 (1994); Christian Luthje, Cornelius Herstatt & Eric von Hippel, *User-Innovators and "Local" Information: The Case of Mountain Biking*, 34 RES. POL'Y 951 (2005).

³⁴ See sources cited *supra* note 11. See also Arti Rai, *Open and Collaborative Research: A New Model for Biomedicine*, in *INTELLECTUAL PROPERTY RIGHTS IN FRONTIER INDUSTRIES* at 131-158 (Robert W. Hahn ed. 2005); Sapna Kumar & Arti Rai, *Synthetic Biology: The Intellectual Property Puzzle*, 85 TEX. L. REV. 1745 (2007) (discussing the legal challenges posed in devising an open innovation model for synthetic biology); Nikolaus Franke & Sonali Shah, *How Communities Support Innovative Activities: An Exploration of Assistance and Sharing Among End-Users*, 32 RES. POL'Y 157 (2003).

³⁵ See, WEBER, *supra* note 32 at ___ for examples.

history suggests that we would be wise to “expect the unexpected” and anticipate an evolving innovation policy regime.

User innovation and open and collaborative innovation are somewhat overlapping innovation modes, both of which rely heavily on the observation that in many cases innovation is highly contextual -- it depends on sticky information which is distributed heterogeneously in the population and on diverse experiences and knowledge.³⁶ Thus, innovation is not a mere matter of sufficient incentives to overcome the potential for free riding, but can benefit from both highly dispersed and highly specific participation depending on the particular technology involved. So, for example, user innovation often results from customization of a mass market product by lead users, whose needs are heterogeneous and ahead of those of the “average” user.³⁷ On the other hand, open source software succeeds in part because “given enough eyeballs all bugs are shallow”³⁸ – in other words the diversity of uses to which software is put in the “real world” provides a more efficient way of testing and debugging than any single group of developers could devise.

A. User Innovation

A sailplane aficionado develops a rocket-assisted emergency ejection system.³⁹ Steel manufacturers develop improvements on the Bessemer steel process that lead to an eight-fold increase in production in a ten-year period.⁴⁰ Users of printed circuit computer-aided design software modify and develop the software to accommodate increasingly densely-packed circuit

³⁶ See, e.g., Benkler, *supra* note 32 at 406-23; VON HIPPEL, *supra* note 4 at 63-76

³⁷ VON HIPPEL, *supra* note 4 at 22-31.

³⁸ ERIC RAYMOND, THE CATHEDRAL AND THE BAZAAR: MUSINGS ON LINUX AND OPEN SOURCE BY AN ACCIDENTAL REVOLUTIONARY (2001) at 30, available at <http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/>

³⁹ Franke & Shah, *supra* note 34 at 163.

⁴⁰ Peter B. Meyer, *Episodes of Collective Invention* (U.S. Dept. of Labor, Bureau of Labor Statistics, Working Paper No. 368), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=466880.

boards.⁴¹ Surgeons improve and modify medical equipment for their own use.⁴² Builders develop means for routing wiring through commercially available "stressed-skin panels" used to form the outer walls of houses.⁴³ Cyclists interested in off-road cycling invent the original mountain bikes.⁴⁴ Manufacturers develop improved designs for their factories. An operator of an online store develops a method of streamlining the payment process for frequent customers.⁴⁵ A research scientist develops a new instrument for measuring the chemical composition of a surface.⁴⁶

The above are all examples of user innovation. In earlier studies, Eric von Hippel and others demonstrated that “users of products and services—both firms and individual consumers”—have invented many of the products and services they use and “are increasingly able to innovate for themselves” in many fields of technology.⁴⁷

Several recent developments exemplify the increasing importance of user motivations for invention. For example, open source software is significantly driven by user innovation.⁴⁸ Besides providing products with mass appeal, such as Linux, the open source process provides a means to pool inventive resources to obtain customized software products to suit the needs of

⁴¹ Glen L. Urban & Eric von Hippel, *Lead User Analyses for the Development of New Industrial Products*, 34 MGMT. SCI. 569, 571–72 (1988).

⁴² Christian Lüthje, *Customers as Co-Inventors: An Empirical Analysis of the Antecedents of Customer-Driven Innovations in the Field of Medical Equipment*, in PROCEEDINGS OF THE 32ND EMAC CONFERENCE, Glasgow (2003) (on file with author).

⁴³ Sarah Slaughter, *Innovation and Learning During Implementation: A Comparison of User and Manufacturer Innovations*, 22 RES. POL'Y 81, 83–85 (1993).

⁴⁴ See CHRISTIAN PENNING, *BIKE HISTORY* (1998); Guido Buenstorf, *Designing Clunkers: Demand-Side Innovation and the Early History of Mountain Bikes*, in CHANGE, TRANSFORMATION AND DEVELOPMENT 61 (John Stan Metcalfe & Uwe Cantner eds., 2002).

⁴⁵ See, e.g., Saul Hansell, *Injunction Against BarnesandNoble.com is Overturned*, N.Y. TIMES, Feb. 15, 2001, at C3 (discussing patent dispute between Amazon.com and Barnes and Noble over “One-Click” ordering method).

⁴⁶ William Riggs & Eric von Hippel, *Incentives to Innovate and the Sources of Innovation: The Case of Scientific Instruments*, 23 RES. POL'Y 459, 460–64 (1994).

⁴⁷ VON HIPPEL, *supra* note 4 at 1.

⁴⁸ See, e.g., James E. Bessen, *Open Source Software: Free Provision of Complex Public Goods* (July 2005) (unpublished working paper, B.U. Sch. of L.), available at <http://ssrn.com/abstract=588763>; VON HIPPEL, *supra* note 4 at 87; Lakhani & Wolf, *supra* note 32.

dispersed and relatively small groups of users.⁴⁹ The expanding patentability of the tools and products of agriculture, such as genetically modified seeds, brings agricultural firms into conflict with farmers who have a long tradition of innovation for their own use.⁵⁰ The extension of patentable subject matter to encompass business methods in the United States has also been met with skepticism and hostility by those who question whether patents are necessary to produce innovations of this type.⁵¹ Underlying this skepticism may be an implicit recognition that intent to use rather than sell has traditionally motivated the invention of business methods.⁵² Scientific researchers are also user innovators, inventing research tools and methods in the course of their

⁴⁹ Open source software projects are extremely diverse in their participation rates. There is also great diversity in the nature of participation – from proposing to administering to developing to merely commenting on projects. A 2002 empirical study of open source projects on www.sourceforge.net, probably the most popular platform for open source development, showed that the mean number of developers for one hundred mature projects studied was about six. Sandeep Krishnamurthy, *Cave or Community?: An Empirical Examination of 100 Mature Open Source Projects*, FIRST MONDAY (2002), available at http://www.firstmonday.org/Issues/issue7_6/krishnamurthy/.

⁵⁰ See, e.g., Keith Aoki, *Weeds, Seeds, & Deeds: Recent Skirmishes in the Seed Wars*, 11 CARDOZO J. INT'L & COMP. L. 247 (2003); David R. Downes, *The Convention on Biological Diversity: Seeds of Green Trade?*, 8 TUL. ENVTL. L.J. 163, 168 (1994); Cynthia M. Ho, *supra* note 30; Sabrina Safrin, *Chain Reaction: How Property Begets Property in an Interconnected World*, 82 NOTRE DAME L. REV. 1917 (2007); Haley Stein, *Intellectual Property and Genetically Modified Seeds: The United States, Trade, and the Developing World*, 3 NW. J. TECH. & INTELL. PROP. 160 (2005).

⁵¹ See, e.g., Jay Dratler, Jr., *Does Lord Darcy Yet Live? The Case Against Software and Business-Method Patents*, 43 SANTA CLARA L. REV. 823 (2003); Rochelle Cooper Dreyfuss, *Are Business Method Patents Bad for Business?*, 16 SANTA CLARA COMPUTER & HIGH TECH. L.J. 263 (2000); Alan L. Durham, *"Useful Arts" in the Information Age*, 1999 BYU L. REV. 1419, 1488–96 (1999) (similarly arguing that software-embodied business method patents should not be patentable subject matter); Julia Alpert Gladstone, *Why Patenting Information Technology and Business Methods Is Not Sound Policy: Lessons from History and Prophecies for the Future*, 25 HAMLINE L. REV. 217 (2002); Nari Lee, *Patent Eligible Subject Matter Reconfiguration and the Emergence of Proprietary Norms—The Patent Eligibility of Business Methods*, 45 IDEA 321 (2005); Keith E. Maskus & Eina Vivian Wong, *Searching for Economic Balance in Business Method Patents*, 8 WASH. U. J.L. & POL'Y 289 (2002); Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 580–81 (1999); Michael J. Meurer, *Business Method Patents and Patent Floods*, 8 WASH. U. J.L. & POL'Y 309 (2002); Malla Pollack, *The Multiple Unconstitutionality of Business Method Patents: Common Sense, Congressional Consideration, and Constitutional History*, 28 RUTGERS COMPUTER & TECH. L.J. 61 (2002); John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1143–63 (1999). See also *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2921 (2006) (Breyer, J., dissenting from dismissal of cert as improvidently granted); *eBay Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837, 1842 (2006) (Kennedy, J. concurring) (raising questions about business methods patents and the Federal Circuit's standard for patentable subject matter). But see, e.g., John R. Allison & Emerson H. Tiller, *The Business Method Patent Myth*, 18 BERKELEY TECH. L.J. 987 (2003) (arguing that business method patents are indistinguishable from other patents on processes).

⁵² For a more extensive discussion of this case, see Katherine J. Strandburg, *What If There Were a Business Method User Exemption to Patent Infringement?*, 2008 MICH. ST. L. REV. 245.

research,⁵³ but universities are increasingly (and controversially) patenting scientific research tools.⁵⁴

While user innovation has no doubt always been widespread, its significance is growing because of technological changes since the negotiation of TRIPS in 1994. The growing importance of software, as both a tool of innovation and a component of products, means that more and more design and experimentation is feasible with relatively limited capital expenditure.⁵⁵ Computerization of manufacturing and design also decreases the cost of creating custom-designed products.⁵⁶ The Internet also enhances the potential for user innovation by providing mechanisms by which medium-sized groups of users with similar needs for customization can pool their inventive resources, dividing the costs of user innovation among themselves and thereby widening the range of cost-effective user innovations.

User innovation is of greatest importance where users have both unique local information about their needs and the technical capacity to make inventions that fulfill those needs. The comparative advantage of user innovation for a particular technology depends on factors such as the heterogeneity of uses, the presence of lead users, the technical difficulty of invention in a particular field, and the costs of development.⁵⁷ For purposes of the present discussion, the most important features of user innovation are its de-emphasis on the "incentive to invent"

⁵³ See Riggs & von Hippel, *supra* note 46; Strandburg, *supra* note 32.

⁵⁴ See, e.g., Rebecca S. Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1726 (1996) (positing that the patenting of upstream research tools calls into question the appropriateness of public funding to support that research); Katherine J. Strandburg, *The Research Exemption to Patent Infringement: The Delicate Balance Between Current and Future Technical Progress*, in INTELLECTUAL PROPERTY AND INFORMATION WEALTH, (Peter Yu, ed., 2006) (reviewing the longstanding debate about whether there should be an exemption to patent infringement for research use).

⁵⁵ See Benkler, *supra* note 5, at 68-90, 212-33, 277-78; VON HIPPEL, *supra* note 4 at 177.

⁵⁶ Stefan Thomke & Eric von Hippel, *Customers as Innovators: A New Way to Create Value*, HARV. BUS. REV., Apr. 2002, at 74, 74-81.

⁵⁷ See Joachim Henkel & Eric von Hippel, *Welfare Implications of User Innovation*, 30 J. TECH. TRANSFER 73 (2004) (discussing in detail the welfare implications of user innovation in comparison and relationship to manufacturer innovation), VON HIPPEL, *supra* note 4 at 63-76 (discussing circumstances under which users are low-cost innovators).

justification for intellectual property which is paramount in the high protection model embodied in TRIPS; its reliance on heterogeneous and local experience and on tailoring innovation to specific uses, which undercuts the international trade conception of commodity knowledge goods; and its recursive nature, which heightens the importance of questions of control and private ordering between users and manufacturers.

1. User Innovation and the Intellectual Property Incentive Story

In sharp contrast to the standard seller-based view underlying most discussions of the societal justifications for the patent system, user innovators expect to benefit primarily from developing and using an innovation rather than selling it.⁵⁸ Unlike seller innovators, user innovators are motivated primarily by their own use of their inventions and thus patents play a relatively minor role in motivating them to invent.⁵⁹ User innovators may also derive non-pecuniary returns from innovation, such as enjoyment of the process of improving products for their own use, reputational status within a user community, or opportunities to gain skills.⁶⁰

Besides motivating invention, patenting is also generally expected to motivate disclosure and dissemination of inventions. Elsewhere I have discussed in detail the ways in which patenting affects incentives to disseminate and disclose user innovations, concluding that on balance patent incentives tend to be much less important for user innovations than for seller innovations.⁶¹ In part this is because a rather surprising amount of “free revealing” of user innovations takes place.⁶² Presumably, this is because free revealing has significant reputational,

⁵⁸ For discussions of the traditional incentive theories of patenting, *see, e.g.*, Roger D. Blair & Thomas F. Cotter, *Rethinking Patent Damages*, 10 TEX. INTELL. PROP. L.J. 1, 78–80 (2001); Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1024–28 (1989); Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81 (2004).

⁵⁹ Strandburg, *supra* note 32 at 483-85.

⁶⁰ VON HIPPEL, *supra* note 4, at 85–88.

⁶¹ Strandburg, *supra* note 32 at 483-90.

⁶² *See* VON HIPPEL, *supra* note 4, at 77–80; Joachim Henkel, *Selective Revealing in Open Innovation Processes: The Case of Embedded Linux*, 35 RES. POL'Y 953, 954–55, 959–67 (2006)

reciprocal, and other benefits to user innovators.⁶³ This is partly because users often form innovative communities in which they exchange ideas in a collaborative fashion to the mutual advantage of group members.⁶⁴ Free revealing may enable others to improve on a user innovation, thus making that innovation more valuable to the original user innovator. (Indeed, there is significant overlap between user innovation and the open and collaborative innovation described in the next section.) Free revealing occurs even between competitors, who sometimes prefer to share certain kinds of information freely while competing in other ways.⁶⁵

On balance, therefore, the standard patent incentive story used to justify the high protectionist approach of TRIPS is not a good fit for user innovation. In general, patent protection is both less necessary and more socially costly for user innovations than for seller innovations.

2. User Innovation and Heterogeneous and Local Knowledge

User innovation is also mismatched with the mass market seller-based innovation paradigm because it is heterogeneous and relies on distributed local knowledge. Users develop innovations that respond to their specific needs and situations, leveraging their information advantages rather than manufacturers' advantages in large scale production.⁶⁶ Many user innovators are lead users who develop their innovations by customizing or modifying commercial products to satisfy their specific needs which differ from those of the mass of

⁶³ See VON HIPPEL, *supra* note 4 at 77-80; Harhoff *et al.*, *supra* note 32; Eric von Hippel & Georg von Krogh, FREE REVEALING AND THE PRIVATE COLLECTIVE MODEL FOR INNOVATION INCENTIVES, 36 R&D MGMT. 295 (2006).

⁶⁴ VON HIPPEL, *supra* note 4 at 93-106; Franke & Shah, *supra* note 34; Katherine J. Strandburg, *Sharing Research Tools and Materials: Homo Scientificus and User Innovator Community Norms* in WORKING WITHIN THE BOUNDARIES OF INTELLECTUAL PROPERTY (Rochelle C. Dreyfuss, Harry First, and Diane L. Zimmerman, eds. forthcoming 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1136606.

⁶⁵ VON HIPPEL, *supra* note 4 at 10, 87; Henkel, *supra* note 62; Harhoff *et al.*, *supra* note 32; Strandburg, *supra* note 64.

⁶⁶ Sonali K. Shah, *Open Beyond Software*, in OPEN SOURCES 2.0: THE CONTINUING EVOLUTION 338, 341-43 (Chris DiBona *et al.* eds., 2006); Sonali K. Shah, *From Innovation to Firm Formation in the Windsurfing, Skateboarding, and Snowboarding Industries* (Univ. of Ill., Working Paper No. 05-0107, 2006), available at http://research.kauffman.org/cwp/ShowProperty/webCacheRepository/Documents/2006_SonaliShah.pdf at 32-33; VON HIPPEL, *supra* note 4, at 45-61

consumers.⁶⁷ These user innovators often anticipate features for which general consumer demand has not yet developed.⁶⁸ A study of innovations in mountain biking equipment, for example, found that user innovations often depended on information that the inventors had obtained through their own cycling experience, reflecting their own unique circumstances and interests, such as a desire to bike in extreme weather conditions or to perform acrobatic stunts.⁶⁹ Users possess dispersed local knowledge about their specific situations.⁷⁰ Transferring this experiential knowledge to manufacturers can be expensive because of differences in background knowledge, experience, and so forth, making user innovation more efficient, in many cases, than attempting to teach manufacturers what diverse users want.⁷¹

Particularly in the international context, user innovation may be necessary in order for a technology developed in one environment to be useful in another.⁷² It may be extremely difficult and costly for a manufacturer to acquire the degree of local experiential knowledge needed to customize a technology for its best use in circumstances different from those for which it was originally designed. Even an innovation targeted to a foreign market may fall flat without user participation in the design. A study by Douthwaite, Keatinge, and Park, for example, probed the role of user innovation in adoption of agricultural technologies intended to assist development in Asia.⁷³ The researchers concluded that, especially as either the technology or the local agricultural system increased in complexity, the importance of user innovation and interaction

⁶⁷ *Id.* at 22–43

⁶⁸ *Id.* at 20–30.

⁶⁹ *Id.* at 73.

⁷⁰ *Id.* at 8; see Shah, *From Innovation to Firm Formation*, *supra* note 66.

⁷¹ Henkel & von Hippel, *supra* note 57.

⁷² See B. Douthwaite, J.D.H. Keatinge, and J.R. Park, *Why Promising Technologies Fail: The Neglected Role of User Innovation During Adoption*, 30 RES. POL'Y 819 (2001). See also Anil K. Gupta, *From Sink to Source: The Honey Bee Network Documents Indigenous Knowledge and Innovations in India*, 1 INNOVATIONS 49 (2006) (reporting on project attempting to document local innovations and to “forge links” between local innovators and university researchers).

⁷³ Douthwaite *et al.*, *supra* note 72.

between the technology originators and local users increased.⁷⁴ Recognizing this, Anil Gupta and his Honey Bee Network provide a means of documenting and sharing grassroots user innovations in India.⁷⁵ The organization also is engaged in efforts to match grassroots innovators with with scientists and engineers who can perform more traditional research and development and with entrepreneurs in hopes of creating commercial products.⁷⁶

As discussed further in Part III, because user innovation is often heterogeneous and customized to specific local contexts and because the innovative process depends on dispersed local knowledge, the kinds of inventions likely to be produced by user innovation are not well suited to a conventional understanding of the trade paradigm, which is most natural for mass market goods which can be designed and produced in one place and sold in another.

3. User Innovation and the "Permission to Innovate" Culture of Intellectual Property Doctrine

Another feature of user innovation relevant to the present discussion is the extent to which user innovation relies on functional improvements and modifications to previous inventions. While users do make major functional improvements, user innovation often builds on existing technology.⁷⁷ And while users may be large corporate entities, often they are individuals, who are unlikely to engage in ex ante licensing transactions in order to obtain "permission to innovate."⁷⁸ Moreover, because user innovation often occurs as a side effect of use, rather than as a result of a separate program of research and development, even corporate users may not know in advance that they plan to improve on the technologies they are using.

⁷⁴ *Id.* at 834-35.

⁷⁵ Gupta, *supra* note 72.

⁷⁶ *Id.* at 61-64.

⁷⁷ See, e.g., VON HIPPEL, *supra* note 4 at 29-43 (discussing the important role of "lead users" of existing technologies in user innovations); Henkel & von Hippel, *supra* note 57 at 19.

⁷⁸ *Id.*, Viktor Braun & Cornelius Herstatt, *Barriers to User-Innovation: The Paradigm of "Permission to Innovate,"* in 2006 IEEE INTERNATIONAL CONFERENCE ON MANAGEMENT OF INNOVATION AND TECHNOLOGY 176 (2006) (discussing problems posed by a "permission culture").

Because users tend to make heterogeneous functional inventions, while manufacturers tend to make innovations that spring from their expertise in standardization, safety, ease of manufacture, and returns to scale,⁷⁹ user innovation and manufacturer innovation are often recursive, meaning that an ongoing dialogue of innovation is most productive of technological advance.⁸⁰ These characteristics of user innovation mean that the patent law doctrine of repair and reconstruction,⁸¹ the first sale (or patent exhaustion) doctrine,⁸² and the extent to which purchaser's rights to use and modify their purchases may be limited by non-negotiable license and contract terms (such as those involved in recent controversies involving farmer seed-saving practices)⁸³ are important in determining whether there are barriers to user innovation.

4. User Innovation and Development

While user innovation occurs throughout the world, and most studies of user innovation have focused on developed countries, it seems likely that user innovation is of particular importance to developing countries.⁸⁴ The local needs and preferences of citizens of developing countries are less likely to be well understood and accounted for in mass markets because those citizens will be less likely to constitute economically important blocks of consumers and also

⁷⁹ VON HIPPEL, *supra* note 4 at 63-76.

⁸⁰ Henkel & von Hippel, *supra* note 57 at 12-14.

⁸¹ 5 DONALD S. CHISUM, CHISUM ON PATENTS § 16.03[3] (2005). The repair and reconstruction doctrine holds that a purchaser of a patented item may repair it without the permission of the patentee as long as the repairs do not amount to a complete reconstruction of the patented item (essentially making a new item). *See* Aro Mfg. Co. v. Convertible Top Replacement, 365 U.S. 336 (1961).

⁸² *See, e.g.*, Quanta Computer, Inc. v. LG Elecs., Inc., 128 S. Ct. 2109 (2008) (recent Supreme Court reaffirmation of the patent exhaustion doctrine). The first sale doctrine holds that a patentees rights are “exhausted” when a patented product is sold, leaving the purchaser free to do with it as he or she wishes. *See* Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502 (1917); United States v. Univis Lens Co., 316 U.S. 241 (1942).

⁸³ *See, e.g.*, Michael J. Madison, *Legal-Ware: Contract and Copyright in the Digital Age*, 67 FORDHAM L. REV. 1025 (1998) (discussing similar issues in the context of copyright protection); Liam S. O'Melinn, *Software and Shovels: How the Intellectual Property Revolution is Undermining Traditional Concepts of Property*, 76 U. CIN. L. REV. 143, 168-72 (2007); Elizabeth I. Winston, *Why Sell What You Can License? Contracting Around Statutory Protection of Intellectual Property*, 14 GEO. MASON L. REV. 93 (2006) (arguing that “[b]y licensing chattels rather than selling them, intellectual property owners can circumvent public legislation and expand the protection of intellectual property far beyond the scope envisioned by federal and state governments”).

⁸⁴ *See, e.g.*, Gupta, *supra* note 72 at 51-61, discussing local innovations in India.

because mass market goods are likely to be designed in developed countries.⁸⁵ User innovation thus may be an important means of adapting mass market technologies to the specific needs of citizens of developing countries. User innovation building upon a primary technology is also more likely to be within the capacity of some developing country innovators, who may lack sophisticated engineering training and skills but be able to exploit their own local knowledge and expertise in their innovative activities.⁸⁶ Thus, though making space for user innovation in the global intellectual property regime is of general importance, it may be of particular importance to the developing world.

B. Open and Collaborative Innovation

The opening years of the twenty-first century have seen an outpouring of interest in the deployment of open and collaborative processes for innovative endeavors.⁸⁷ The buzzwords "open" and "collaborative" have been used to describe projects ranging from more distributed approaches to innovation by commercial firms in rebellion against the "not invented here" syndrome⁸⁸ to data repositories such as the Human Genome Project,⁸⁹ to works created entirely by online collaborations, such as Wikipedia.⁹⁰ As already mentioned, open and collaborative innovation is common among user communities. Studies have documented the phenomenon

⁸⁵ 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, 1051-57 (2005) (addressing the issue of under-production of goods for developing countries in the context of orphan drugs).

⁸⁶ See, e.g., Gupta, *supra* note 72 at 51-61.

⁸⁷ For a fascinating compendium of relevant articles about many forms of "open" innovation, see Chris DiBona, Mark Stone, and Danese Cooper, eds., *OPEN SOURCES 2.0* (2006). See also, generally, BENKLER, *supra* note 5, for discussion of the issues raised in this section.

⁸⁸ See, e.g., HENRY CHESBROUGH, *OPEN INNOVATION: THE NEW IMPERATIVE FOR CREATING AND PROFITING FROM Technology* (2006)

⁸⁹ See, e.g., Kapczynski et al, *supra* note 85 at 1071.

⁹⁰ www.wikipedia.org.

among users of sports equipment, computers, early automobiles, the eighteenth century iron industry, scientific research tools, and, of course, open source software itself.⁹¹

Open and collaborative innovation encompasses a variety of specific innovative approaches which are organized around a fundamentally different view of the innovative process than the traditional seller-oriented paradigm that motivates high protection intellectual property regimes.⁹² The traditional model assumes that innovation proceeds by relatively large investments in problem-solving projects by "inventors," who then make strides above and beyond the ordinary skill in the art and must be awarded exclusive rights to motivate their investments. In that mode innovation consists in applying money, time, and effort to solving problems.

While it is often undeniably important to engage competent scientists and engineers in innovative projects, a sense of the fungibility of inventive effort underlies the traditional intellectual property model. The basic insight underlying open and collaborative innovation, on the other hand, is that in some situations it is more effective for contributors to an innovative project (who are often current or potential users) to self-select their own tasks based on their own interests, experiences, and expertise rather than for a project manager either to assign tasks to a pre-existing R&D team or to search for and locate individuals with the necessary skills and experience.⁹³ The model also often involves combining large numbers of small contributions, thus undermining the assumption that significant innovation necessarily requires large upfront

⁹¹ See, e.g., Robert P. Merges, *From Medieval Guilds to Open Source Software: Informal Norms, Appropriability Institutions, and Innovation* (Working Paper 2004), available at <http://ssrn.com/abstract=661543>; VON HIPPEL, *supra* note 4; Meyer, *supra* note 40; Shah, *Open Beyond Software*, *supra* note 66; Shah, *From Innovation to Firm Formation*, *supra* note 66; Franke and Shah, *supra* note 34; Fiona Murray, *The Oncomouse That Roared: Resistance and Accommodation to Patenting in Academic Science* 27 (2006) (unpublished manuscript, on file with AMERICAN JOURNAL OF SOCIOLOGY)

⁹² See, e.g., BENKLER, *supra* note 5; Benkler, *supra* note 32; Harhoff *et al*, *supra* note 32; Rai, *Open and Collaborative Research*, *supra* note 34; Strandburg, *supra* note 64; DiBona *et al*, *supra* note 87.

⁹³ See Benkler, *supra* note 32 at 406-23. The formation of innovation "teams" in this manner is only one example of a larger phenomenon of emergent group activity. See, e.g., CLAY SHIRKY, *HERE COMES EVERYBODY* (2008).

investments that must be recouped through market exclusivity. The open and collaborative innovation model thus assumes that individuals are heterogeneous in their insights into and motivations to solve innovation problems and that a large project can be broken up into inventive tasks which are small enough to be parceled out to a variety of contributors.⁹⁴

Because innovation consists largely of applying pre-existing technology to new problems and in new combinations, even substantial investment in an ongoing research and development project may not identify creative solutions that may be quickly evident to an individual who happens to have the “right” background.⁹⁵ This view is the inspiration for projects such as Innocentive, a system through which companies offer bounties over the Internet to anyone who can provide solutions to problems which their research departments have been unable to solve.⁹⁶ So far Innocentive primarily applies this insight to the solution of isolated tough problems, while open and collaborative processes use it as the basis for an ongoing and iterative innovation paradigm.

There is, of course, a Hayekian dispersed information component⁹⁷ to the intellectual property system itself -- patents are intended to elicit investment in projects which will fulfill consumer demand and to encourage inventive activity by those who demonstrate likelihood of success either by their own willingness to put up the money for their R&D efforts or their ability to attract investment from others. The problem with the intellectual property approach is that it

⁹⁴ Benkler, *supra* note 32 at 406-23.

⁹⁵ *Id.*

⁹⁶ See www.innocentive.com. See also Karim R. Lakhani, Lars Bo Jeppesen, Peter A. Lohse, and Jill A. Panetta, *The Value of Openness in Scientific Problem Solving*, HBS Working Paper 07-050 (2007), available at <http://www.hbs.edu/research/pdf/07-050.pdf>; Cornelia, Dean, *If You Have a Problem, Ask Everyone*, N.Y. TIMES at F1 (July 23, 2008).

⁹⁷ See F. A. HAYEK, INDIVIDUALISM AND ECONOMIC ORDER (1948) (“[T]he real problem is rather how it can be brought about that as much of the available knowledge as possible is used. This raises for a competitive society the question, not how we can ‘find’ the people who know best, but rather what institutional arrangements are necessary in order that the unknown persons who have knowledge specially suited to a particular task are most likely to be attracted to the task.”) Hayek himself was skeptical about the effectiveness of intellectual property in producing valuable innovation. F.A. Hayek, *THE FATAL CONCEIT: THE ERRORS OF SOCIALISM* (W.W. Bartley, III ed., 1988) at 37.

does not scale well to innovation that would proceed best by iterative and collaborative input from a large number of diverse inventors performing relatively modular tasks. The pace of obtaining and licensing patents is too slow and the transaction costs are too high for a dispersed collaborative approach to be workable. Firm-based collaborative innovation, on the other hand, requires a high degree of *a priori* top-down management to assemble a team of personnel with the necessary variety of expertise. Firm-based research and development thus unavoidably reproduces some of the difficulties inherent in a command-and-control approach to innovation which are the justification for having a patent system (rather than direct government funding of R&D or a prize system) to begin with. While patent pools can provide means of sharing technology in industries where innovation is performed by large repeat-player firms, patent pools are also too inflexible to permit highly dispersed, heterogeneous collaboration between self-identified participants.

For many innovations produced by open and collaborative methodology, the traditional paradigm is further undermined by the ability to produce a product either digitally or using local custom manufacturing capability. Though community-based innovation involving collaboration and reciprocal sharing is probably as old as human society, the Internet and other digital technology dramatically extend the possible scope of such community-based approaches in several ways including: 1) expanding the sheer number of people who can participate productively in a given project both by giving more people access to the project and by providing mechanisms for structuring tasks and communication that can overcome the high overhead often inherent in attempts to scale up cooperative activities (in the software world this problem is

known as Brooks's Law)⁹⁸; and 2) expanding the diversity of experience and expertise brought to bear on a particular problem because of the technology's ability to match up dispersed sources of problems and solutions.

While the most prominent and well-studied example of open and collaborative production is open source software,⁹⁹ in recent years, the focus has shifted to attempts to bring the power of open and collaborative innovation to bear on problems in agriculture and biotechnology.¹⁰⁰ There are a number of creative forays into this arena, though most are still new enough that it is difficult to assess their potential for the kind of innovation success that has been seen in open source software. Some of these projects revolve around putting together databases for use in bioinformatics research.¹⁰¹ Still others attempt to put together portfolios of technological building blocks and tools and to provide them to participants in a limited commons who agree to constraints on their uses of the tools and obligations to contribute to the growth of the commons.¹⁰² The most recent potential entrant into this field is synthetic biology, which aims eventually to provide a true engineering approach to biological innovation by using a commonly available set of genetic building blocks to produce a variety of customized biological products.¹⁰³

1. Incentives for Open and Collaborative Innovation.

⁹⁸ Fred Brooks coined what became known as Brooks's Law in his book *THE MYTHICAL MAN-MONTH* (1975). Brooks's Law states: "Adding manpower to a late software project makes it later." http://en.wikipedia.org/wiki/The_Mythical_Man-Month.

⁹⁹ See, e.g., WEBER, *supra* note 32.

¹⁰⁰ See, e.g., Rai, *Open and Collaborative Research*, *supra* note 34; Stephen M. Maurer, *Open Source Drug Discovery: Finding A Niche (Or Maybe Several)*, 76 *UMKC L. REV.* 405 (2007); Lee Petherbridge, *Road Map to Revolution? Patent-Based Open Science*, 59 *ME. L. REV.* 339 (2007); Yann Joly, *Open Source Approaches in Biotechnology: Utopia Revisited*, 59 *ME. L. REV.* 385 (2007); Andres Guadamuz Gonzalez, *Open Source Licenses in Scientific Research*, 7 *N.C. J.L. & TECH.* 321 (2006); Rai, *Commentary on Dusollier*, *supra* note 11.

¹⁰¹ See, e.g., The HapMap Project, <http://snp.cshl.org/thehapmap.html.en>

¹⁰² See, e.g., CAMBIA Initiative for Open Innovation, www.cambia.org; Public Intellectual Property Resource for Agriculture, www.pipra.org.

¹⁰³ Kumar & Rai, *Synthetic Biology*, *supra* note 34; Joachim Henkel and Stephen M Maurer, *The Economics of Synthetic Biology*, 3 *MOL. SYS. BIOL.* 117 (2007); Arti Rai A and James Boyle, *Synthetic Biology: Caught Between Property Rights, the Public Domain, and the Commons*, 5 *PLOS BIOL.* e58 (2007)

Open and collaborative innovation regimes all rely, almost by definition, on motives for participation that are not premised on exclusive control of the innovative result by individual participants. While in some cases these motives are purely hedonic, the crucial insight that allows these models to propagate beyond the realm of hackers and hobbyists is that participation in open and collaborative innovation can provide other rewards that are either equal to or better than the rewards of proprietary innovation. These rewards are primarily of four types: inexpensive and flexible use benefits; tailoring of the product to heterogeneous specific needs; benefits related to participation in the project itself (such as enjoyment, skill-building, and reputation enhancement); and complementary benefits (such as the ability to base a business model on the availability of the collaboratively produced innovation or otherwise use the innovation as a platform for some other rewarding purpose).¹⁰⁴ It is also important that the fact that an open and collaborative process allows tasks to be divided among many innovators often reduces the requisite investment in the project by most contributors, making it more likely that these other benefits will be sufficient to incentivize participation.

Many participants in open and collaborative innovation are prospective users of the innovative results.¹⁰⁵ There are a number of reasons why users might choose to participate in an open and collaborative endeavor rather than going it alone, waiting for a commercial product to become available, or attempting to free ride off the open and collaborative projects of others. As discussed above, users of a technology have different and localized information about their needs and experiences than that which manufacturers have. Transferring this information to manufacturers is costly for both users and manufacturers. In many cases, collaborating with other users is very effective, providing a way to develop improvements that manufacturers are

¹⁰⁴ See Benkler, *supra* note 32 423-443; Harhoff *et al.*, *supra* note 32; Eric von Hippel, *Horizontal Innovation Networks – By and for Users*, 16 INDUS. & CORP. CHANGE 293 (2007); Lakhani and Wolf, *supra* note 32.

¹⁰⁵ See, e.g., Harhoff *et al.*, *supra* note 32; von Hippel & von Krogh, *supra* note 63.

not yet ready to adopt and pool user interests and experiences so that each participant gets back a result that is worth more than the cost in time or money of her own contribution.¹⁰⁶

2. Heterogeneity and Reliance on Localized Knowledge

Open and collaborative innovation projects must compete with proprietary means of production which will often benefit from manufacturing expertise, economies of scale, the ability to hire experts, marketing expertise, and so forth. Open and collaborative innovation will be preferable when there are advantages to be gained from a dispersed approach. A dispersed approach seems most likely to succeed where innovation bumps up against heterogeneity -- either in the needs of users of the resulting innovation for customized and adapted products or in the capabilities, experiences, and insights that are necessary to produce the innovation.

Openness is also important to those with heterogeneous needs because it provides them with the "freedom to operate" (sometimes more evocatively called "freedom to tinker"¹⁰⁷) which permits them to adapt technology to those needs.

Because they are based on a different paradigm of innovation, open and collaborative approaches will likely produce different innovative results than a mass market proprietary system. They will tap into varied expertise and experiences and localized knowledge of needs.¹⁰⁸ Importantly, an open and collaborative innovation project leaves users with the ongoing freedom to tinker with, reconfigure, and recombine the resulting innovations.¹⁰⁹ Platform technologies produced in an open and collaborative fashion may combine many of the robustness advantages of mass production with the ability to tailor and build upon the platforms to meet heterogeneous

¹⁰⁶ See Strandburg, *supra* note 64, for a simple model of these tradeoffs.

¹⁰⁷ See, e.g., www.freedom-to-tinker.com

¹⁰⁸ See, e.g., BENKLER, *supra* note 5 at 110-12.

¹⁰⁹ See, e.g., Nikolaus Franke & Eric von Hippel, *Satisfying Heterogeneous User Needs via Innovation Toolkits: The Case of Apache Security Software*, 32 RES. POL'Y 1199 (2003).

needs.¹¹⁰ In the content production arena, Wikipedia provides an example of this combination of global and local character.¹¹¹ Thus, a study of Wikipedia found that it was nearly as accurate on the Encyclopedia Britannica on a number of scientific subjects, illustrating the robustness of a procedure that taps into many diverse sources of knowledge,¹¹² yet Wikipedia presumably contains thousands of entries on topics which are not of sufficiently universal interest to be included in a centralized production process like that of Britannica.¹¹³ Similarly, an open and collaborative innovation process can produce both highly robust products with widespread appeal (such as Linux) and customized products that appeal to heterogeneous needs (such as the many of the small open source software projects on SourceForge). These heterogeneous, “long tail” products may not have the “bells and whistles” or robustness of a mass-produced product, but without the open and collaborative innovation process they would not exist at all.

3. Global Network Organizational Structure

The potential for open and collaborative innovation is, by its nature, constrained by the nature of communication technology. In the past, collaborative enterprises often involved localized face-to-face communities.¹¹⁴ They also employed available communication technologies such as letter correspondence, trade publications and journals.¹¹⁵ While many projects still employ those “old-fashioned” collaborative methods, the Internet has led to an explosion of collaborative potential by reducing the cost and increasing the speed of long

¹¹⁰ See, e.g., Robert P. Merges, *A New Dynamism in the Public Domain*, 71 U. CHI. L. REV. 183, 192-94 (2004) (discussing this point in relation to why commercial companies might contribute to open innovation)

¹¹¹ www.wikipedia.com. See, e.g., BENKLER, *supra* note 5 at 70-74; SHIRKY, *supra* note 93 at 90-122 for descriptions and background.

¹¹² BENKLER, *supra* note 5 at 71-71, citing J. Giles, *Special Report: Internet Encyclopedias Go Head to Head*, NATURE (December 14, 2005), available at <http://www.nature.com/nature/journal/v438/n7070/pdf/438900a.pdf>

¹¹³ The Wikipedia English language version currently contains nearly 2.5 million entries, <http://en.wikipedia.org/wiki/Special:Statistics>. The Encyclopedia Britannica DVD edition contains something over 100,000 articles. See <http://corporate.britannica.com/products.html>.

¹¹⁴ See Meyer, *supra* note 40, for historical examples.

¹¹⁵ *Id.*

distance communications, by permitting the rapid communication of both text and graphics, and by allowing communication at a distance to come close to replicating the many-to-many character of discussions in geographically localized communities. The search capabilities of the Internet also make it possible for dispersed groups of potential innovators to find one another, thus making customized innovation more feasible. Other communication advances, such as the spread of cellular telephone capability, also contribute to the potential for distributed collaboration.

The result of these communication advances is that the open and collaborative innovation paradigm is able not only to find, make use of, and respond to heterogeneous and localized preferences and experience, but also to operate via a global networked organizational structure which is not defined by geographical or political boundaries. The increasing importance of software and other information as products and as tools for producing customized products also means that this global network sometimes can replace not only the research and development capacity of the industrial sector, but also its manufacturing capability.

4. Mechanisms of Governance of Open and Collaborative Innovation

Despite the occasional rhetoric of some enthusiasts, one should not think of open and collaborative approaches to innovation as necessarily "emergent" or "self-organizing" in any strong sense of those terms. Most open and collaborative projects are not centrally organized in the assignment of tasks, or even in the selection of tasks to be accomplished. Nonetheless, most have some coordination of control over decision-making concerning the final product.¹¹⁶ Some codification process is usually necessary. Even the scientific research community, which produces no "product" other than basic scientific information, exercises quality control through the process of peer review of publication.

¹¹⁶ See, e.g., Benkler, *supra* note 32 at 441-43; WEBER, *supra* note 32 at 157-171.

This means that open and collaborative innovation projects generally do have governance mechanisms. And while some open and collaborative innovation is structured almost entirely by unarticulated social norms (such as those of the traditional scientific research community),¹¹⁷ many projects have more formal governance structures which often involve centralized decision-making of some kind and sometimes involve highly centralized control over official versions of the project results.¹¹⁸ One way to look at open and collaborative innovation, then, is as an alternative to the firm which, like a firm, structures transactions so as to internalize and systematize them and thus reduce their costs, but which exploits a market-type information processing system for the assignment of tasks and design of the product.¹¹⁹

Open and collaborative innovation is thus not *unstructured*, but *differently* structured from seller-based innovation methods. The production of open and collaborative innovation is at least as dependent as seller-based innovation on a fairly high degree of private ordering, much of which depends not only on intellectual property law, but also on other legal structures, such as contract and licensing law, the law pertaining to non-profit entities, and so forth, and on social structure such as community norms.¹²⁰

In order to structure and govern their collaborative endeavors, at least some innovation projects, while purporting to eschew proprietary limitations, rely heavily on intellectual property protections as means of controlling the uses which can be made of the results of their efforts and of controlling who has access to them. Thus, collaborative projects are structured around not

¹¹⁷ See, e.g., Arti K. Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77 (1999); Katherine J. Strandburg, *Curiosity-Driven Research and University Technology Transfer*, in *ADVANCES IN THE STUDY OF ENTREPRENEURSHIP, INNOVATION AND ECONOMIC GROWTH: VOLUME 16* at 93 (Gary D. Libecap ed., 2005); Shah, *Open Beyond Software*, *supra* note 66; Emmanuelle Fauchart and Eric von Hippel, *Norms-Based Intellectual Property Systems: The Case of French Chefs*, 19 ORG. SCI. 187 (2008).

¹¹⁸ See, e.g., RAYMOND, *supra* note 38 at 73-87, 99-104; WEBER, *supra* note 32 at 88-93.

¹¹⁹ See, e.g., Benkler, *supra* note 32 at 406-23.

¹²⁰ See, e.g., WEBER, *supra* note 32 at 84-86 (discussing how open source licensing produces social structure); Sapna Kumar, *Enforcing the GNU GPL*, 2006 U. ILL. J.L. TECH. & POL'Y 1, 11-35 (2006) (discussing some issues about the enforceability and legal status of the GPL and citing earlier discussions of these issues).

only the need to organize the efforts of the collaborative process, but also the need to delineate and govern the unavoidable and increasingly important boundaries between open and collaborative innovation and proprietary approaches.¹²¹

These privately ordered “open” regimes often create not untrammelled contributions to the public domain but limited commons environments in which innovators seek to exercise significant hegemony over the uses of their innovations.¹²² The most well-known example of such a regime is the use of the “copyleft” or “viral” clause of the General Public License (GPL) copyright license to control downstream uses of open source software.¹²³ While patent licensing has so far played a much less significant role in open source software projects, the importance of patents in both constructing and obstructing collaborative projects is certain to increase if open innovation practices become more prevalent in areas such as biotechnology where copyright protection is unavailable or does not cover the relevant aspects of the technology.¹²⁴ Finally, as “open source” projects in biology and other arenas begin to center less around software code and more around commonly-held data, trade secrecy is also likely to play a more important role in constructing collaborative projects, as a means to limit access to commonly held data to those who agree to certain rules about use of the resulting innovation.¹²⁵

¹²¹ See, e.g., Siobhan O’Mahony and Beth Bechky, *Boundary Organizations: Enabling Collaboration Among Unexpected Allies*, ADMIN. SCI. Q. (forthcoming 2008).

¹²² See, e.g., Anupam Chander and Madhavi Sunder, *The Romance of the Public Domain*, 92 CALIF. L. REV. 1331, 1357-62 (2004)(discussing this point); Molly S. van Houweling, *The New Servitudes*, 96 GEO. L.J. 885 (2008) and references therein.

¹²³ For an explanation of the basic principles of the GPL, see <http://www.fsf.org/licensing/licenses/quick-guide-gplv3.html>. For the terms of the GPL see <http://www.fsf.org/licensing/licenses/gpl.html>. See also, e.g., Kumar, *supra* note 120 at 8-9 (discussing this feature of the license and critiquing the use of the term “viral” to describe it)

¹²⁴ See, e.g., Rai, *supra* note 34; Kumar and Rai, *supra* note 34; Kapczynski et al, *supra* note 85; Maurer, *supra* note 100; Henkel & Maurer, *supra* note 103; David W. Opderbeck, *The Penguin's Genome, or Coase and Open Source Biotechnology*, 18 HARV. J. LAW & TECH 167 (2004); Rai and Boyle, *supra* note 103; Petherbridge, *supra* note 100; Robin Feldman, *The Open Source Biotechnology Movement: Is It Patent Misuse?*, 6 MINN. J.L. SCI. & TECH. 117 (2004); Guadamuz Gonzalez, *supra* note 100; Dusollier, *supra* note 11 at 1401-05; Rai, *Commentary on Dusollier*, *supra* note 11; Merges, *supra* note 110; Mann, *supra* note 11.

¹²⁵ See, e.g., J. H. Reichman and Paul F. Uhler, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 66 LAW & CONTEMP. PROB. 315, 348-51 (2003).

Thus, even “open and collaborative” projects display a balance of openness and control. In structuring the innovative process, many open and collaborative projects rely rather heavily on reach-through-type and boilerplate licensing practices which are akin to the shrinkwrap and clickwrap licenses which are often criticized when used by proprietary copyright holders.¹²⁶ The GPL is dependent on strong reach-through or “viral” provisions, the enforceability of which is bound to vary among jurisdictions and has rarely been litigated.¹²⁷ The Creative Commons “Share-Alike” copyright license to facilitate open production of creative works is similarly dependent on rather strong interpretations of licensing doctrine.¹²⁸

The issues of contract, licensing, and competition law raised by the governance of open and collaborative innovation practices further demonstrate the inadequacy of a view of innovation based solely on a simplistic seller-based model.

5. Open and Collaborative Innovation and Development

A premise of this Article is that the need for a broader perspective on innovation than that reflected in the TRIPS agreement is a matter of immediate concern to developed and developing countries alike. Nonetheless, there are aspects of open and collaborative innovation that may make it particularly important to the technological advancement of developing countries.¹²⁹

First, of course, is the fact that the fruits of many open and collaborative projects will be cheaply available, either as software products or as blueprints or data which are made available over the

¹²⁶ See, e.g., van Houweling, *supra* note 122 and references therein; Greg R. Vetter, *The Collaborative Integrity of Open-Source Software*, 2004 UTAH L. REV. 563, 644-47 (2004); Mark A. Lemley, *Intellectual Property and Shrinkwrap Licenses*, 68 S. CAL. L. REV. 1239 (1995); Douglas A. Hass, *A Gentlemen's Agreement Assessing the Gnu General Public License and Its Adaptation to Linux*, 6 CHI.-KENT J. INTELL. PROP. 213 (2007)

¹²⁷ See, e.g., Kumar, *supra* note 120.

¹²⁸ See Elkin-Koren, *supra* note 11 at 395, critiquing Creative Commons on this basis.

¹²⁹ See, e.g., Steven Weber, *Open Source Software in Developing Economies* (2003), available at http://www.ssrc.org/programs/itic/publications/ITST_materials/webernote2.pdf; Gilberto Câmara and Frederico T. Fonseca, *Information Policies and Open Source Software in Developing Countries*, 58 J. AMER. SOC'Y INFO.SCI. & TECH. 121 (2007); Gupta, *supra* note 72; Daniel F. Olejko, *Comment: Charming a Snake: Open Source Strategies for Developing Countries Disillusioned with TRIPS*, 25 PENN ST. INT'L L. REV. 855 (2007); Jyh-An Lee, *New Perspectives on Public Goods Production: Policy Implications of Open Source Software*, 9 VAND. J. ENT. & TECH. L. 45 (2006).

Internet. Quite aside from a low initial price, however, as already noted, the incentive structure of these projects means that the results of many open and collaborative projects are likely to be highly customizable platform technologies.¹³⁰ Such innovations may be particularly useful to developing countries, which may not have the resources to develop their own platform technologies, but may have the desire and ability to adapt platform technologies to local conditions, preferences, and needs. Whether they are computer programs, seeds, or some other technology, the products of open and collaborative innovation will tend by their nature to lend themselves to local adaptation. This realization is reflected in initiatives aimed at either adopting open source software as a standard for government use in developing countries or encouraging its use.¹³¹ In South Africa, for example, the government in early 2007 adopted a national policy for open source implementation.¹³² The policy commits the government both to use open source software as a default choice and to encourage its use in the country.¹³³

The open and collaborative innovation process, to the extent that it involves networks of far-flung collaborators in cyberspace, also promises to provide opportunities for education, skill-building, and training for those in developing countries who have a requisite threshold level of education and skills. Because many open and collaborative innovation projects naturally have a global scope, a country can benefit from local participation in such a project without having a local critical mass of technical skills necessary for a stand-alone ground up project. Though a globally dispersed collaborative project is probably most easily conducted in the arena of software or some other intangible product, such as Wikipedia, collaborative innovation in

¹³⁰ See, e.g., Mann, *supra* note 11 at 11.

¹³¹ See, e.g., Elzio Barreto and Carlos Caminada, *Brazil is Extending Microsoft a Challenge; Developing Nations Urged to Use Free Software*, HOUSTON CHRON. at p. 4, Business Section (May 12, 2005); Olejko, *supra* note 129 at 875-81.

¹³² See http://www.oss.gov.za/FOSS_OC_POLICY_2006.pdf.

¹³³ *Id.* at 3.

tangible technology may also be possible through communications among dispersed individuals. Scientists and engineers have collaborated at a distance through journals and letters for centuries. The Internet provides a potential means to scale up such collaboration to a global network of self-identified individuals. While those in locations remote from others with similar technological interests certainly remain at a disadvantage, the Internet, along with other improvements in digital communications, at least provides a means of participation for those with access to it and the necessary technical skills and inclination.¹³⁴

Besides the potential for adopting, adapting, and participating in the recent technology-based revival of open and collective innovation practices, many developing countries are home to indigenous groups which already have longstanding traditional open and collaborative innovation practices. Much of the debate about traditional knowledge focuses either on means to preserve traditional cultural goods or on finding ways to commodify traditional knowledge so that the communities which produced it can be compensated for its use by others.¹³⁵ Because these questions relate to the propertization of knowledge, these discussions are often associated with intellectual property (and are included in WIPO's Development Agenda¹³⁶). Proposals to commodify traditional knowledge make sense in the trade-based context of TRIPS in light of its goal of opening up foreign markets for knowledge goods. Perhaps because the discussion of traditional knowledge in the international arena is motivated largely by a desire to counter the

¹³⁴ Of course, the benefits of open and collaborative innovation are only of use to those who can deploy the resulting products or participate in the innovative process. Professor Chon, *supra* note 6 at 2894-2900, and others are clearly correct that there is a need to balance the importance of promoting innovation -- even as more broadly understood here -- with the provision of the basic human needs such as food, public health and security, and education that are necessary for human beings to flourish in many respects -- including the ability to participate in creative and innovative activity. See also Denis Borges Barbosa, Margaret Chon, and Andrés Moncayo von Hase, *Slouching Towards Development in International Intellectual Property*, 2007 MICH. ST. L. REV. 71.

¹³⁵ See, e.g., Safrin, *supra* note 50; Kal Raustiala, *Density and Conflict in International Intellectual Property Law*, 40 U.C. DAVIS L. REV. 1021, 1032-34 (2007) (discussing and critiquing the move toward propertization of traditional knowledge). But also see Chander and Sunder, *supra* note 122 at 1343-46 (pointing out the inequalities often present in access to the non-propertized "public domain" and in the coverage of intellectual property protection)

¹³⁶ See Development Agenda, *supra* note 16 at No. 18.

trade-based commodification of developed country knowledge, the discussion may not have focused enough on the continuing creative potential of such communities.¹³⁷ One benefit of global attention to the potential benefits of open and collaborative innovation practices might be to recognize and galvanize the innovative potential of indigenous and other more traditional collaborative innovators.

III. The Trouble with TRIPS: Constrained by an Outmoded Innovation Paradigm

As mentioned in the Introduction, much of the criticism of TRIPS, as well as most of the impetus for the progress reflected in the Doha Declarations and the adoption of the WIPO Development Agenda, has focused on TRIPS failure to balance adequately the need to promote future innovation with current needs for access to technology, particularly in the public health arena. Here I leave aside those pressing concerns and focus, in light of the evolving paradigms of innovation explored in Part II, on TRIPS – particularly its patent provisions -- as innovation regulation. TRIPS reflects a particular mass market seller-based view of innovation which tends to evoke a one-size-fits-all high protection intellectual property regime. The high protection baseline of TRIPS reflects, among other things, its primary mission as an instrument of trade rather than innovation and its genesis during a period of manufacturer-based innovation aimed at producing mass market goods.¹³⁸ A trade paradigm based on a concept of static comparative advantage¹³⁹ is best suited to mass market goods which can be effectively designed and produced in one place and shipped off for use in another.

¹³⁷ For notable exceptions to this tendency see Madhavi Sunder, *The Invention of Traditional Knowledge*, 69 LAW & CONTEMP. PROBS. 97, 109-117 (2007); Raustiala *supra* note 135 at 1034 .

¹³⁸ See SUSAN K. SELL, PRIVATE POWER, PUBLIC LAW: THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS (2003) (arguing that TRIPS was molded to protect the markets of particular intellectual property rights holders – notably the major pharmaceutical companies). See also DANIEL GERVAIS, THE TRIPS AGREEMENT: DRAFTING HISTORY AND ANALYSIS (2nd Ed. 2003) for an overview of the history of the TRIPS Agreement.

¹³⁹ See, e.g., Bruce Greenwald and Joseph E. Stiglitz, *Helping Infant Economies Grow: Foundations of Trade Policies for Developing Countries*, 96 AM. ECON. REV. 141 (2006) (arguing for a concept of dynamic comparative advantage which would take into account the potential for evolving economic capacity).

While the pharmaceutical products, off-the-shelf software and, in the copyright context, mass market entertainment products which dominated the context in which TRIPS was negotiated might at least arguably fit this conception, TRIPS locked in a set of minimum standards based on the mass manufacturer model at precisely the wrong moment. As discussed in Part II, the turn of the twenty-first century has seen a virtual explosion in the importance of information technology leading to a surge in software innovation, in more open and dispersed models of innovation by commercial firms, and, especially, in user innovation and collaborative and open models of innovation made possible (and certainly more visible) by the World Wide Web and other digital technologies. A simplistic trade perspective is singularly inapt for these new modes of innovative practice. Indeed, the very concept of “trade” is often inapropos since these innovation practices are simply not well-described as means by which goods invented and produced in one place are sold in another.

The TRIPS “minimum standards” commitment to a mass market seller-based innovation regime is reflected in its requirement of equal treatment of different technological arenas (Article 27), its crabbed approach to enforcement exceptions (Article 30), which reflects an assumption that unauthorized use constitutes free riding which is nearly always undesirable and should be permitted only in closely cabined circumstances; and its stringent restrictions on compulsory licensing (Article 31). The lack of any substantive maxima for intellectual property protection, along with the agreement’s failure to put any limits on restrictive licensing practices or to deal with private ordering more generally, also reflect this myopic focus on one specific innovative model.¹⁴⁰ While it is certainly desirable to read TRIPS flexibilities more expansively than they have often been read in the past, it is nonetheless unlikely that an international intellectual

¹⁴⁰ See, e.g., Dreyfuss, *supra* note 6; Graeme B. Dinwoodie, *The International Intellectual Property Law System: New Actors, New Institutions, New Sources*, 10 MARQ. INTELL. PROP. L. REV. 205, 214 (2006).

property regime so thoroughly grounded in a single mass market model will be optimally suited to a world of diverse innovation paradigms.

This indictment of TRIPS is not intended to suggest that national legislatures have done much better at crafting innovation policy regimes. TRIPS was patterned after high protection national intellectual policies, particularly those of the United States. The United States has been struggling to adapt its own patent law to the changing innovation landscape, a struggle which is reflected in stalemates between the pharmaceutical and information technology industries in attempted legislative revision¹⁴¹ and in Supreme Court intervention to dial back some of the rigid interpretations of patent legislation by the Federal Circuit Court of Appeals.¹⁴² The point, though, is that it is particularly problematic to enshrine a one-size-fits-all approach to innovation in an international agreement both because states are likely to be heterogeneous in their preferred innovative approaches and because, as a practical matter, re-negotiating an international agreement is fraught with difficulty.

That said, the recent history of TRIPS in the access to medicines context does provide some grounds for optimism and a model of how regime-shifting¹⁴³ and what Burris and collaborators have called a nodal approach to governance¹⁴⁴ might lead to incremental

¹⁴¹ See, e.g., Brian Kahin, *Patents and Diversity in Innovation*, 13 Mich. Telecomm. Tech. L. Rev. 389, 389-91 (2007) (discussing the divergent interests of the two sectors).

¹⁴² See, e.g., *Quanta*, supra note 82; *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007); *Microsoft Corp. v. AT&T Corp.*, 127 S. Ct. 1746 (2007); *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118 (2007); *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006); *Merck KGaA v. Integra Lifesciences I, Ltd.*, 545 U.S. 193 (2005).

¹⁴³ See, e.g., Laurence R. Helfer, *Regime Shifting: The TRIPs Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INT'L LAW 1 (2004); Peter K. Yu, *International Enclosure, The Regime Complex, and Intellectual Property Schizophrenia*, 2007 MICH. ST. L. REV. 1 (2007); Susan K. Sell, *Structural, Discursive, and Institutional Dimensions*, 77 TEMP. L. REV. 363 (2004). More generally, on the topic of evolving mechanism of international governance see Scott Burris, Michael Kempa, and Clifford Shearing, *Changes in Governance: A Cross-Disciplinary Review of Current Scholarship*, 41 AKRON L. REV. 1 (2008). See Chon, supra note 6 at 2852-52 for a critique of the effectiveness of regime-shifting in promoting the goals of developing countries.

¹⁴⁴ See, e.g., Burris et al., supra note 10; John Braithwaite, *Methods of Power for Development: Weapons of the Weak, Weapons of the Strong*, 26 MICH. J. INT'L L. 297 (2004); Scott Burris, *Governance Microgovernance and Health*, 77 TEMP. L. REV. 335 (2004); Peter Drahos, *Intellectual Property and Pharmaceutical Markets: A Nodal*

progress.¹⁴⁵ Further, a number of commentators have suggested creative approaches to interpreting TRIPS articles 27 and 30 flexibly, especially in light of the Objectives and Principles outlined in Articles 7 and 8.¹⁴⁶ These attempts are commendable and essential to the promotion of innovation globally. Here I provide only an overview of the substantive challenges to adapting TRIPS to new modes of innovation before focusing on administrative mechanisms for an evolving international innovation policy regime in Part IV.

A. TRIPS as an Instrument of Trade in "Knowledge Goods:" A Poor Fit with Global Networks of Innovation Responsive to Heterogeneous Local Needs

The effectiveness of TRIPS as an innovation regime is undermined by the fact that TRIPS is first and foremost a trade instrument, focused on opening up global markets to an existing pipeline of products, rather than on promoting innovation in any broader sense. It leaves little room for adapting the global intellectual property regime to new and diverse innovative practices. Strong intellectual property protection presents itself as an apparently natural supplement to a free trade regime so as to permit (and encourage) developed countries to exploit a comparative advantage in production of intangible knowledge goods.

Innovation is not a good fit for this comparative advantage model except in the short term. The comparative advantage concept depends on the idea that global welfare will be improved when countries specialize in the types of production they do best. However, the concept of comparative advantage is inappropriately static and simply inapt when applied to

Governance Approach, 77 TEMP. L. REV. 401 (2004). These authors argue that “nodal governance” is a weapon that can be employed by both the weak and the strong. Specifically, Drahos describes the original methods by which the pharmaceutical industry obtained a high protection patent regime as an example of nodal governance, *id.* at 407-19, yet argues that nodal governance provides an opportunity for developing countries with respect to traditional knowledge, *id.* at 419-24. Thus, it remain unclear whether the shift toward a less state-based international governance regime will benefit developing countries in the intellectual property debate in the long run. For general discussions of this issue *see, e.g.*, Burris *et al.*, *supra* note 143; Slaughter and Zaring, *supra* note 10 at 220-24.

¹⁴⁵ *See, e.g.*, Yu, *supra* note 6 at 400-402.

¹⁴⁶ *See, e.g.*, Dinwoodie and Dreyfuss, *Diversifying Without Discriminating*, *supra* note 9; Christopher Garrison, *Exceptions to Patent Rights in Developing Countries*, ICTSD Issue Paper No. 17 (October 2006), available at <http://ictsd.net/i/publications/11716/>; Dreyfuss, *supra* note 6 at 22-24; Barbosa *et al*, *supra* note 134 at 109-12.

innovation.¹⁴⁷ Innovative capacity is essentially a kind of infrastructure, like roads and communication networks, which underlies the ability to develop other capacities. Because innovation is furthered by diverse perspectives, enhancing global welfare may depend on spreading innovative capacity broadly. Since innovative capacity is developed by the practice of copying and building on pre-existing technology, strong intellectual property rights may preclude some countries from ever developing the innovative capacity needed to develop and exploit a comparative advantage in some as-yet-undetermined arena of innovation.¹⁴⁸

Moreover, the focus on trade assumes an unrealistic fungibility between innovations produced in different countries. Because, as discussed in Part II, inventors are heterogeneous, innovation is simultaneously more global and more local than the production of mass market goods. Innovation in many cases builds incrementally on a global pool of previous experience and technology and, as demonstrated by the global scope of open source software projects, the best innovation may combine ideas from individuals in widely dispersed locales. On the other hand, many innovations are responsive to and tailored for local circumstances and needs. Without local input, an imported invention may fall short of its potential to increase welfare.¹⁴⁹ This means that it is in the global interest for every nation to develop the infrastructure and skill set to engage in technical innovation so that it can both contribute to the global pool of ideas and produce goods and services that are desirable in its particular circumstances and culture. Innovation is not something which can simply be "out-sourced" to another country. Just as users play an important and different innovative role from manufacturers because of their ability to tap

¹⁴⁷ See Greenwald and Stiglitz, *supra* note 139.

¹⁴⁸ See, e.g., J.H. Reichman, *From Free Riders to Fair Followers: Global Competition under the TRIPS Agreement*, 29 N.Y.U. J. INT'L L. & POL. 11 (1997)

¹⁴⁹ See, e.g., Douthwaite, *supra* note 72; Gupta, *supra* note 72.

into dispersed local knowledge, local innovators are essential to the development of desirable technologies for local contexts.

The importance of user experience as a spur to innovation also suggests that the balance between first comers and follow-on innovators which is at the forefront of innovation policy, but may be neglected when the focus is on opening up present markets, may be particularly important in the global context. The optimal balance between protecting intellectual property to open markets for consumer goods and to incentivize foreign investment and allowing the "freedom to tinker" as a means of developing local innovative capability and customizing innovation to local needs is likely to vary from one country to the next and from one technology to the next. Even where economic resources would be available in principle to provide a "demand pull" to foreign inventors to provide technology tailored to local circumstances, there is good reason to believe that transferring the knowledge of local circumstances required for such tailored innovation to foreign companies would be expensive and difficult. Even in the United States and Europe, where the capacity of technology companies is high and the market for consumer goods is well-oiled, users are still predominant in producing leading edge functional improvements in many areas.¹⁵⁰ In fact, industry has begun to realize the importance of harnessing user experience as an engine of innovation and firms are experimenting as to the best way to do so.¹⁵¹ The simplistic view of the world as divided into "producers" and passive "consumers" is breaking down in most arenas, yet the TRIPS Agreement's focus on trade and static comparative advantage obscures the dialectical nature of the innovation process.

The trade paradigm is also inappropriate for many platform technologies, which are the locus of much of today's open and collaborative innovative activity. These technologies, such as

¹⁵⁰ See VON HIPPEL, *supra* note 4 at 97.

¹⁵¹ See, e.g., Nikolaus Franke & Franke Piller, *Value Creation by Toolkits for User Innovation and Design: The Case of the Watch Market*, 21 J. PROD. INNOVATION MGMT. 401 (2004); VON HIPPEL, *supra* note 4 at 133-64.

computer software, are foundational to the conduct of commerce and the production of a variety of goods and services. Because of the important role they play in facilitating other aspects of economic activity, there are strong national interests in autonomous control of these technologies.¹⁵² Technical excellence is not the only measure of social benefit in these cases. This is particularly true because of the ongoing relationships between purchasers and manufacturers of these technologies inherent in modern licensing practice and in the need for compatibility between different programs running on different computer hardware. For a country to be entirely dependent on a foreign company for its basic software platforms is comparable not merely to having a foreign company build some of its roads or airports, but to having a foreign company run the tollbooths or air traffic control, maintaining ongoing control of a vital infrastructural resource. At least some software and digital technology is a strategic resource, for which the concept of comparative advantage is at least partly inapplicable.

Moreover, tying innovators globally to a particular innovation model ends up betraying the very tenets of free trade itself. Free traders do not argue that free trade would be advanced by requiring all countries to agree to a particular approach to mining their natural resources regardless of whether geological factors, the labor market, and so forth varied.¹⁵³ Instead, the free trade premise is that each country should use its most efficient means of production and then compete on the price of the goods. A global commitment to a one-size-fits-all innovation model may well have the perverse result of privileging a mode of innovation which may be less efficient in producing a particular technological advance.¹⁵⁴ Because it lacks a sufficiently dynamic and nuanced view of innovation practice TRIPS is a poor vehicle for promoting

¹⁵² See, e.g., Jay P. Kesan and Rajiv C. Shah, *Shaping Code*, 18 HARV. J. LAW & TECH. 319, 371-79 (2005).

¹⁵³ Although, as Greenwald and Stiglitz point out, *supra* note 139, the temptation to view countries' comparative advantages in too static a fashion is one to which free traders too often succumb in general.

¹⁵⁴ See Dinwoodie and Dreyfuss, *Diversifying Without Discriminating*, *supra* note 9 at 456.

innovation broadly and its rigid minimum standards approach is particularly inappropriate in light of developments in the last fifteen years.

B. TRIPS Flexibilities and Evolving Paradigms of Innovation

TRIPS sets out minimum standards of intellectual property protection. For patents, TRIPS specifies various minimum requirements involving patent coverage, term, associated rights, and remedies for infringement.¹⁵⁵ Of particular interest for our purposes are Articles 27 and 28, dealing with patentable subject matter and rights conferred, respectively. With certain exceptions, Article 27 requires countries to make patents available “for any invention . . . in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application,” eliminating the possibility of a nuanced approach to patentable subject matter.¹⁵⁶ Article 27 also requires that patent rights be “enjoyable without discrimination as to . . . the field of technology”¹⁵⁷ Article 28 mandates that patents confer on their owners exclusive rights “to prevent third parties not having the owner’s consent from the acts of: making, using, offering for sale, selling, or importing” their patented inventions.¹⁵⁸ Article 32 adds to the constraints by mandating a patent term of twenty years, which may be badly mismatched with the cumulative and collaborative pace of invention in some areas.¹⁵⁹

The mass market seller-based innovation paradigm is reflected clearly in these basic all-encompassing requirements. In requiring that patents be available without discrimination for all fields of technology, TRIPS reflects the assumption that patents are equally appropriate and effective for promoting innovation in all fields of technology. Similarly, in mandating that patent rights include rights of exclusive making and use, along with exclusive rights of sale,

¹⁵⁵ TRIPS, *supra* note 1.

¹⁵⁶ TRIPS, *supra* note 1 at Art. 27.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* at Art. 28.

¹⁵⁹ *Id.* at Art. 32.

TRIPS reflects an assumption that all of these exclusive rights are needed to promote innovation. User innovation and open and collaborative innovation undermine these basic assumptions. As discussed in Part II, the effectiveness of these alternative innovation approaches varies depending on issues such as the modularity of a particular technology, the extent to which users of a technology are likely to have heterogeneous needs or diverse insights, the extent to which users and other distributed innovators have the technical capacity to improve a technology, the social structure of a particular technical field, and the availability of benefits from innovation other than those obtained by selling it.

The underlying TRIPS paradigm is also reflected in the fact that TRIPS fails to incorporate any standards of maximum intellectual property protection.¹⁶⁰ The lack of substantive maxima again reflects a paradigm of innovation in which follow-on innovation is either unimportant or occurs within an industry structure in which *ex ante* licensing is an effective means to structure it. Such an assumption is inadequate even for traditional innovation, where a robust public domain plays an important role in promoting innovation, but it is particularly detrimental for user and open and collaborative innovation, the distributed and rapidly evolving nature of which undermines the potential for *ex ante* licensing.

One response to concerns about the mismatch between the underlying innovation paradigm embodied in TRIPS and alternative innovation approaches is to point to TRIPS flexibilities. TRIPS itself bolsters the argument for a generous view of its flexibilities in Articles 7 and 8, which set out Objectives and Principles, respectively. Article 7 specifies that:

The protection and enforcement of *intellectual property rights should contribute to the promotion of technological innovation* and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge

¹⁶⁰ See, e.g., Dreyfuss, *supra* note 6; Dinwoodie, *New Actors, New Institutions*, *supra* note 140 at 214.

and in a manner conducive to social and economic welfare, and to a balance of rights and obligations. (Emphasis added.)¹⁶¹

Article 8 states that:

1. Members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and *to promote the public interest in sectors of vital importance to their socio-economic and technological development*, provided that such measures are consistent with the provisions of this Agreement.

2. Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology. (Emphasis added.)¹⁶²

As has been argued with respect to access and with respect to the traditional intellectual property balance, Articles 7 and 8 may provide a persuasive basis for interpreting TRIPS flexibly to encourage and support evolving modes of innovation.¹⁶³ In particular, Article 7 should be read as aspirational (rather than as an affirmation that intellectual property will fulfill these objectives) and its recognition that intellectual property “should contribute” to the goal of innovation might be taken to acknowledge the possibility of other mechanisms for promoting innovation.¹⁶⁴ Article 8’s statement that members may adopt measures “to promote the public interest in sectors of vital importance to their . . . technological development” also provides a possible handle for accommodating alternative innovation approaches in the TRIPS context.¹⁶⁵

Nonetheless, Article 8 permits the adoption of such measures only when they are “consistent with the provisions of this Agreement.”¹⁶⁶ Since the provisions of the Agreement are slanted toward a high protection regime that does not provide any explicit accommodation for

¹⁶¹ TRIPS, *supra* note 1, Art. 7.

¹⁶² TRIPS, *supra* note 1, Art. 8.

¹⁶³ See, e.g., Peter K. Yu, *The International Enclosure Movement*, 82 IND. L.J. 827, 863-66 (2007); Dinwoodie and Dreyfuss, *Diversifying Without Discriminating*, *supra* note 9; Christopher Garrison, *supra* note 146; Dreyfuss, *supra* note 6 at 22-24; Barbosa et al, *supra* note 134 at 109-12. Chon, *supra* note 6 (arguing generally for the use of TRIPS flexibilities in light of Articles 7 and 8 to incorporate a “substantive equality” norm);

¹⁶⁴ TRIPS, *supra* note 1, Art. 7.

¹⁶⁵ TRIPS, *supra* note 1, Art. 8.

¹⁶⁶ *Id.*

evolving innovation paradigms, the question is whether the existing flexibilities are sufficient to permit us to shoehorn new innovation models into what is at bottom a mass market seller-based paradigm.

Certainly it would be possible to make significant progress. Specifically, as argued by Dinwoodie and Dreyfuss, and recognized in a recent overview of TRIPS patent exceptions, there may be wiggle room in the interpretation of Article 27's non-discrimination requirement, allowing for differential treatment of different industries as long as the differential treatment is based upon a legitimate purpose.¹⁶⁷ It is not clear that WTO panels will be inclined to interpret Article 27 with the expansive degree of flexibility envisioned by Dinwoodie and Dreyfuss, however. A WTO panel, in a dispute involving an exception permitting use of a patented invention during the patent term so as to facilitate regulatory review, did interpret Article 27 so as to allow "bona fide exemptions to deal with problems that may exist only in certain product areas."¹⁶⁸ This statement leaves open the question of what makes an exemption "bona fide" (or, in Dinwoodie and Dreyfuss's terms, gives it a legitimate purpose). Particularly in light of Article 7, it would be a colorable argument that a WTO dispute resolution body should deem legitimate a purpose to promote innovation outside of the intellectual property-based paradigm by, for example, providing an exemption from patent infringement for open source software.¹⁶⁹ A considerable amount of ground work might be necessary to make such an argument convincing. It seems likely that WTO panels and the WTO appellate body will take a much more narrow view of Article 27's anti-discrimination mandate unless they are given a road map to a more innovation-friendly approach, a point to which I return in Part IV.

¹⁶⁷ See Dinwoodie and Dreyfuss, *Diversifying Without Discriminating*, *supra* note 9; Garrison, *supra* note 146.

¹⁶⁸ Report of WTO Dispute Settlement Panel, *Canada—Patent Protection of Pharmaceutical Products*, ¶ 7.92., WT/DS114/R (March 17, 2000) ("Canada Pharmaceuticals")

¹⁶⁹ See Garrison, *supra* note 146 at 76 (mentioning the possibility of such an exemption in passing).

With regard to exceptions to TRIPS patent minimum standards, the agreement provides for “limited exceptions” and compulsory licensing under Articles 30 and 31, respectively.

Article 30 states that:

Members may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties.¹⁷⁰

Beyond the exceptions permitted under Article 30, Article 31 provides for ex ante compulsory licensing in certain fairly circumscribed situations. Most importantly for present purposes, compulsory licensing is permitted only on a case-by-case basis and only if “prior to such use, the proposed user has made efforts to obtain authorization from the right holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period.”¹⁷¹ Because of these and other limitations, compulsory licensing under Article 31 is unlikely to play an important role in making room for user innovation and open and collaborative innovation, which simply do not lend themselves to such case-by-case and ex ante licensing, especially if a government procedure is required.

Accommodation to evolving modes of innovative activity under TRIPS will thus have to pass muster under Article 30. The most important interpretive questions for this purpose are probably the meanings of “limited” and “unreasonably” in Article 30.¹⁷² These terms raise crucial questions of baseline. Against what background standard is the magnitude of an exception or its reasonableness to be measured? To make room for alternative modes of innovation, such as user and open and collaborative innovation, these terms would have to be interpreted in light of the impact of the exception on innovation overall. This type of

¹⁷⁰ TRIPS, *supra* note 1, Art. 30.

¹⁷¹ TRIPS, *supra* note 1, Art. 31.

¹⁷² TRIPS, *supra* note 1, Art. 30.

interpretation would be a far cry from what we have seen so far. There has been only one panel interpretation of Article 30, in the *Canada Pharmaceuticals* dispute.¹⁷³ As discussed in more detail by Dreyfuss¹⁷⁴ and by Garrison,¹⁷⁵ the panel interpretation construed the requirement of a limited exception very stringently – based on the extent of impairment of each of the patentee’s exclusive rights, counted individually, and permitting only the most minor impairment of any of the rights.

Garrison has argued that the panel’s interpretation is inconsistent with pre-existing exemptions that were well accepted by TRIPS signatories and has limited precedential value in light of the re-affirmation of the importance of TRIPS objectives and principles after the Doha Declarations.¹⁷⁶ The reaffirmation of Articles 7 and 8 of TRIPS in the Doha Ministerial Declaration, aimed primarily at issues of access to medicine, may provide a hook for efforts to interpret TRIPS flexibilities expansively to account for varying modes of innovation.¹⁷⁷ The Declaration reaffirms the importance of Articles 7 and 8 of TRIPS and emphasizes development goals.

It is thus likely that the interpretation of TRIPS flexibilities in the patent arena will evolve in light of ongoing concerns about the international intellectual property balance. Nonetheless, there is a long way to come from the approach of the *Canada Pharmaceuticals* panel to the breadth of flexibility which might be needed to accommodate evolving modes of innovation which might optimally even replace intellectual-property-inspired innovation in some arenas.

As an example, consider the possibility of exemptions for making and use. TRIPS requires under Article 28 that patent infringement encompass not only unauthorized sales of a patented

¹⁷³ *Supra* note 168.

¹⁷⁴ *Supra* note 14 at 14-18.

¹⁷⁵ *Supra* note 146 at 18-33.

¹⁷⁶ *Id.* at 37, 41-42.

¹⁷⁷ See Doha Ministerial Declaration, *supra* note 7 at ¶ 19.

invention but unauthorized use and making of an invention.¹⁷⁸ As I have detailed in earlier work, exclusive rights to make and use may be counter-productive in some arenas in which user innovation is highly effective.¹⁷⁹ Patent protection is less important as an incentive for user innovation than it is for manufacturer-centered research and development. Moreover, patent licensing is likely to be a costly and ineffective means to coordinate user innovation, which arises mostly not from pre-meditated research and development but as a side effect of use combined with “freedom to tinker.” Thus, user innovation may be best promoted in some technologies by well-tailored use exemptions. Because a use exemption would promote certain kinds of innovation by users, while decreasing incentives for innovation by certain types of sellers (those whose business models involve developing technology that is easily copyable by users) the optimal menu of use exemptions is very likely to vary from place to place and from time to time.

An optimal international innovation regime would leave room for countries to adapt their use exemptions to their innovative strengths. However, it is highly questionable whether use exemptions of this sort would pass muster under Article 30 as either limited or reasonable. While it is true that research exemptions and exemptions for personal and non-commercial use are relatively common among TRIPS signatories (and hence presumably, though not definitely, acceptable under Article 30),¹⁸⁰ those exemptions are generally premised on a lack of significant commercial impact on patent holders. While the effects on *innovation* of a broader use exemption would be salutary if the exemption were well tailored, such an exemption might very well not be deemed “limited” under Article 30 if it had significant commercial ramifications for

¹⁷⁸ TRIPS, *supra* note 1, Art. 28.

¹⁷⁹ See Strandburg, *supra* note 32 at 483-89, 531-41; Strandburg, *supra* note 52.

¹⁸⁰ See Garrison, *supra* note 146 at 44-49 (discussing pre-existing exceptions for non-commercial use and for experimentation).

individual patentees. Article 30 reflects the one-size-fits-all assumption that patenting is generally the best way to go to promote innovation in every technology. It will be difficult to stretch it to accommodate situations in which patent protection is simply not needed or counter-productive.

Even where there are colorable interpretations of TRIPS which might permit a robust response to evolving innovation mechanisms, it seems unlikely, as discussed more fully by Dreyfuss¹⁸¹ and in Part IV of this Article, that such interpretations will be forthcoming from WTO dispute resolution unless groundwork for taking broader innovation policy into account is laid. Part IV discusses the possibility that a WIPO exploration of these evolving innovation modes and their interaction with intellectual property can provide the background for interpretation by WTO dispute resolution bodies and the TRIPS Council.

C. What TRIPS Leaves Out – The Possible Need for International Standards Tailored to User Innovation and Open and Collaborative Innovation

In addition to providing insufficient flexibility with respect to minimum standards, TRIPS also simply does not deal with many issues raised by user innovation and open and collaborative innovation because they do not arise under the proprietary seller-oriented paradigm. In particular, private ordering and institutional governance, ranging from informal norms to complex licensing arrangements such as patent pools, standards, and viral licensing play critical and still under-theorized roles in these newly important modes of innovation.¹⁸² Intellectual property law both constrains and, in some cases, constructs these innovative models.

In retrospect, it is no surprise that those seeking to construct collaborative and commons-like approaches in an innovation landscape organized around the proprietary model will use both the intellectual property regime itself and other means of private ordering to structure their activities.

¹⁸¹ *Fostering Dynamic Innovation*, *supra* note 14 at 14-20.

¹⁸² *See, e.g.*, references *supra* note 11.

Certainly similar intermediate limited commons regimes are plentiful in the real property context.¹⁸³ Nonetheless, there are concerns about potential tensions between these limited commons approaches – which sometimes lead to calls for increased propertization¹⁸⁴ -- and the commitment to the public domain as a resource for innovation. For example, it is very hard to know how and whether programmers would participate in open source software projects without the guarantees facilitated by the automatic copyrighting of their code or even whether the copyright protection of source code produces more or less software innovation on balance. Similarly, questions have been raised as to whether attempts to promote open innovation using the Creative Commons menu of copyright licenses lead to more or less building upon the creative work of others than a regime in which registration is required to obtain copyright protection or even a regime of benign neglect in which most authors never bother to enforce their copyrights.¹⁸⁵ Similar issues arise in the context of university patenting and sharing of research tools within a bounded academic community, where a number of universities have recently advocated licensing approaches that would create a limited commons among university researchers while excluding commercial researchers (or at least making them pay to use the tools).¹⁸⁶ A number of “open biology” projects use (or propose to use) contractually limited access to data to construct a shared resource despite the fact that database protection has been adopted in some places (notably the EU) and not in others (notably the United States).¹⁸⁷ This

¹⁸³ See, e.g., ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990).

¹⁸⁴ See, e.g., references *supra* note 11. Safrin, *supra* note 50.

¹⁸⁵ See, e.g., Elkin-Koren, *supra* note 11 at 407-22.

¹⁸⁶ See, e.g., *In the Public Interest: Nine Points to Consider in Licensing University Technology* (White Paper, March 6, 2007), available at <http://newsservice.stanford.edu/news/2007/march7/gifs/whitepaper.pdf>; See also Strandburg, *supra* note 64.

¹⁸⁷ See, e.g., Guadamuz Gonzalez, *supra* note 100 at 337-39, 346-50 (discussing the available strategies for “open source” scientific databases)

conflict is also evident in debates over the protection of traditional knowledge¹⁸⁸ and is beginning to be evident in the debate about synthetic biology, where some have even suggested extending copyright protection to genomic sequences so that a GPL-type approach can more easily be used.¹⁸⁹

The use of viral licensing in open source software raises other questions as well. The open source software process works in part because licensing is standardized and automated -- it employs what might loosely (if not legally) be considered contracts of adhesion -- and because the licenses reach through in varying degrees to constrain and direct not only the way in which the initial technology is used, but the way in which follow-on creators license their own works. The enforceability of these licenses in jurisdictions around the globe has barely been tested.¹⁹⁰ Moreover, the very kinds of licensing practice that facilitate this open and collaborative innovation mechanism take on a very different normative cast when they are used by proprietary firms to control and limit the ways in which users can engage in tinkering, modification, reverse engineering, and sometimes even criticism of the products they buy. The same genre of contract which smoothes the way for large-scale collaborative projects may also facilitate intrusive and even arguably anti-competitive practices by commercial firms.¹⁹¹

Attempts to deploy open source approaches in realms, such as biology, where patents, which are expensive to obtain and of somewhat indeterminate scope, are the intellectual property

¹⁸⁸ See references cited *supra* note 135.

¹⁸⁹ See, e.g., Rai and Boyle, *supra* note 103 at nn. 27-28 and associated text (discussing the difficulties in trying to evoke copyright to create a synthetic biology commons).

¹⁹⁰ See, e.g., Kumar, *supra* note 120; Daniel B. Ravicher, *Facilitating Collaborative Software Development: The Enforceability of Mass-Market Public Software Licenses*, 5 VA. J.L. & TECH. 11 (2000); Rebecca S. Eisenberg & Arti K. Rai, *Harnessing and Sharing the Benefits of State-Sponsored Research: Intellectual Property Rights and Data Sharing in California's Stem Cell Initiative*, 21 BERKELEY TECH. L.J. 1187, 1209 (2006); Brian W. Carver, *Share and Share Alike: Understanding and Enforcing Open Source and Free Software Licenses*, 20 BERKELEY TECH. L.J. 443 (2005); Dusollier, *supra* note 126 at 1420-25; Jason B. Wacha, *Taking the Case: Is the GPL Enforceable?*, 21 SANTA CLARA COMPUTER & HIGH TECH. L.J. 451 (2005)

¹⁹¹ See, e.g., references *supra* note 126 for discussions of these issues.

of choice raise further questions about how to construct a limited commons for collaborative activity without the automatic protection of copyright law.¹⁹² In the patent context, limitations on use imposed by notice alone are generally unenforceable under the doctrine of patent exhaustion, which was recently reaffirmed in the United States by the Supreme Court.¹⁹³ Nevertheless, there may be very little to constrain the imposition of such use restrictions by contract, at least under United States law.¹⁹⁴ Use restrictions imposed by manufacturers in online contracts are highly controversial, but “clickable” use restrictions no doubt make it easier to extend the viral open source approach to patentable subject matter. Countries may well take different views of these licensing practices, leading to questions about both the normative and legal status of agreements used to create a supposed open and collaborative innovation commons with global extent. Similar issues arise as a result of attempts to facilitate “open source biology” that rely on controlling access to databases using trade secrecy, contract, and technical protection measures.

Thus, attempts by collaborative and supposedly “open” projects to fence off territory in which there is “freedom to operate” shape the innovative environment to a greater and greater degree, raising difficult and important questions that leave a mass-market-based intellectual property regime like TRIPS both overly constraining and too narrowly focused to serve as the focal point of global innovation policy. It may well be that taking into account user and collaborative innovation and its interaction with both the manufacture-innovator paradigm and the public domain would call for broader-based regulation of private ordering or at least for the promulgation of “best practices” or standards for licensing.¹⁹⁵

¹⁹² See, e.g., references *supra* note 124 for discussions of these issues.

¹⁹³ *Quanta*, *supra* note 82.

¹⁹⁴ *Id.* at n. 7.

¹⁹⁵ See references cited *supra* note 11 for discussions of the public interest in private ordering.

TRIPS does virtually nothing to regulate private ordering through restrictive license provisions or to guarantee use rights based on principles of exhaustion or first sale. Probably fortunately, Article 6 specifically excludes the subject of exhaustion from the ambit of TRIPS because of disagreements over how to treat exhaustion on the international stage (though many bilateral TRIPS-plus agreements cabin signatories' ability to implement expansive international exhaustion doctrines).¹⁹⁶ Regulation of licensing practices is limited to a permissive clause in Article 40 allowing members to "specify licensing practices or conditions that may . . . hav[e] an adverse effect on competition in the relevant market."¹⁹⁷

Given its genesis, it is not surprising that TRIPS does not address these issues. Up till now, TRIPS silence in these arenas may have been a blessing -- facilitating the development of an open source regime of software copyright licensing which takes the potential for strong reach-through licensing and turns it into a mechanism for collaboration. Nonetheless, the growing prevalence of user innovation and open and collaborative innovation brings these issues of private ordering and its place in shaping the innovation environment to the fore. User innovation outside of the software context may require a robust exhaustion regime and benefit from limitations on reach-through licensing -- particularly in the patent context where user and collaborative innovators must contend not only with the copyright claims of other members of an open source community, but with the patent rights of outsiders. Moreover, despite the success of open source software, it is not at all clear that an approach to collaboration designed to fit into the interstices of strong copyright protection is workable for user and collaborative innovation more broadly.

¹⁹⁶ TRIPS, *supra* note 1, Art. 6; Regarding TRIPS-Plus agreements and international exhaustion, *See, e.g.*, Cynthia M. Ho, *A New World Order for Addressing Patent Rights and Public Health*, 82 CHI.-KENT. L. REV. 1469, 1501-02 (2007).

¹⁹⁷ TRIPS, *supra* note 1, Art. 40.

The point here is not to propose substantive solutions to the problem of creating a healthier global innovation policy regime and certainly not to suggest that all of these aspects of global innovation practice should be subject to international agreements or standards. On the contrary, the continually evolving nature of innovation practice means that states need flexibility to adapt their legal regimes to the innovative practices that are most appropriate to a particular time and place.¹⁹⁸ Just as it was a mistake to enshrine an industrial manufacturer-based paradigm of innovation as an international norm, it would be a mistake to make an inflexible commitment to a particular collaborative paradigm. At the same time, one must recognize the interests in predictability and lowering trade barriers in a global innovation market. The trick is to balance the need for some international consistency in a global economy with a diversity of innovative paradigms.

IV. Re-Imagining WIPO: Toward An Administrative Approach to Crafting a Healthier Global Innovation Regime

As noted above, there is a broader lesson in the rise of user innovation and open and collaborative innovation practices regarding the unpredictability of innovation and the wisdom of freezing in substantive requirements at the international level. Innovation is unpredictable in both its substance and its process. A rigidly locked in international intellectual property regime, no matter how well tailored at its inception, is unlikely to serve innovation well in the long term. Given this Article's diagnosis of the weaknesses of the present global innovation regime, especially as it relates to the optimum encouragement of user innovation and open and collaborative approaches, what is to be done? There are no easy answers and there is much to learn about these innovative paradigms and others which may emerge in the future as we seek to

¹⁹⁸ One should, in fact, view this contention as an extension of the comparative advantage idea underlying the original trade-based paradigm to the context of innovation. See Dinwoodie and Dreyfuss, *Diversifying Without Discriminating*, *supra* note 9 at 456.

determine how best to achieve the right balance of public domain, proprietary "knowledge goods" and privately ordered, limited commons approaches.

Rather than consider in more detail possible substantive approaches to improving on a narrow reading of TRIPS, this Part discusses possible institutional mechanisms, based on a global administrative law approach,¹⁹⁹ to facilitate ongoing reform and development of global innovation governance. Specifically, I propose re-imagining WIPO and its relationship to TRIPS in light of a broader approach to innovation policy. To this end, I will discuss four potential roles for WIPO in moving toward a more satisfactory global innovation policy regime. At a minimum, WIPO should adopt an Innovation Policy Agenda (in rough analogy to its recently adopted Development Agenda).²⁰⁰ A WIPO Innovation Policy Agenda would provide a focal point for global discourse and debate about issues of evolving innovation approaches ranging from cumulative innovation in the information technology industry through the user innovation and open and collaborative innovation paradigms which are the focus here, to whatever new innovation models may develop in the future. Second, perhaps as an outgrowth of an Innovation Policy Agenda, WIPO should play a greater role in interpreting TRIPS flexibilities and examining potential exceptions for TRIPS compliance. Third, and more ambitiously, consideration should be given to the possibility of amending TRIPS to provide for an exception authorization broader than is available under Articles 27, 30, and 31, coupled with a more explicitly administrative role for WIPO in vetting proposed exceptions. Finally, one might consider expanding WIPO's role as a broad-based forum for innovation policy to consider potential international standard-setting for activities, such as licensing, which are critical for innovation yet not a matter of intellectual property law per se. Any such initiatives would need

¹⁹⁹ See references *supra* note 19 for general discussions of the theory of global administrative law.

²⁰⁰ See Development Agenda documents, *supra* note 8. See also, Halbert, *supra* note 12, for an overview of the history of WIPO with particular attention to development issues.

to balance harmonization with the need to allow for country-specific and evolving innovation practices.

A. Why WIPO?

As Rochelle Dreyfuss points out persuasively, TRIPS suffers from a law-making deficit because of the rarity and non-precedential character of WTO panel decisions.²⁰¹ This law-making deficit is responsible at least in part for the dearth of examples of states and testing the limits of the flexibilities currently available in TRIPS.²⁰² The barriers to states adopting patent laws that test the TRIPS flexibilities are many, including, in many developing countries, the capacity and expertise to engage in cutting edge TRIPS interpretation and implementation and the political, financial, and human capital resources to risk challenges to those interpretations and to pursue disputes before the WTO.²⁰³ This means that some other mechanism is needed to develop interpretations of TRIPS flexibilities that countries will be willing to adopt.

The WTO and the TRIPS Council are probably not the right places to make progress on a broader understanding of innovation policy in the first instance.²⁰⁴ Though they may be capable of implementing a more nuanced approach to the TRIPS flexibilities (particularly with some input from WIPO), an organization steeped in a trade mandate is unlikely to have either the inclination or the expertise to make progress on a broader innovation agenda.

In part because of its recent experience with the Development Agenda, WIPO is probably best placed to provide a forum for dialog about how to use TRIPS flexibilities to accommodate

²⁰¹ *Fostering Dynamic Innovation*, *supra* note 14, at 1-3.

²⁰² *See* Garrison, *supra* note 146, for a detailed study of patent infringement exceptions globally demonstrating their limited scope. *See also* Ho, *supra* note 196, for a discussion of the effects of bilateral Free Trade Agreements on signatories' flexibility.

²⁰³ *See, e.g.*, Dreyfuss, *supra* note 6 at 25-27; Yu, *supra* note 6 at 387 (discussing some of the difficulties developing countries face in implementing aggressive interpretations of TRIPS flexibilities).

²⁰⁴ *See Fostering Dynamic Innovation*, *supra* note 14 at 32-33. But *see* Kal Raustiala, *Compliance and Effectiveness in International Regulatory Cooperation*, 32 CASE W. RES. J. INT'L L. 387, 435-38 (2000) for an argument in favor of an active role for the TRIPS Council as a primary forum for TRIPS interpretations.

concerns with broader innovation policy.²⁰⁵ This is the case despite complex questions, discussed at length by Dreyfuss, about how exactly to incorporate the results of WIPO deliberation into TRIPS interpretation under the WTO dispute settlement process.²⁰⁶ WIPO has a standing committee structure for consideration of intellectual property-related issues, which has already been expanded to include a Committee on Development and Intellectual Property.²⁰⁷ Under the auspices of such committees and otherwise, WIPO sponsors conferences, studies, and other forms of discourse involving scholars, NGOs, stakeholders, and country representatives. By these means, WIPO could conduct an ongoing analysis of how a variety of forms of innovative activity can be allowed to flourish together in a global governance framework.

The relevance of innovation policy is not confined to any single international organization, of course. Indeed, discussion about open and collaborative innovation is beginning in a variety of international forums. For example, the United Nations Conference on Trade and Development (UNCTAD) just released its "Information Economy Report 2007-2008 - Science and Technology for Development: the New Paradigm of ICT,"²⁰⁸ which recognizes that "ICT has also given rise to new models for sharing knowledge and collective production of ideas and innovations, known as 'open access' models, which often bypass the incentive system provided by intellectual property rights"²⁰⁹ and notes that "[a]n innovation policy framework that takes fully into account the changes generated by ICT may give prominence to open approaches to

²⁰⁵ For an argument in favor of WIPO's greater involvement in promoting TRIPS flexibilities *See, e.g., Fostering Dynamic Innovation, supra* note 14, at 21-34. For general arguments in favor of WIPO taking a greater role in promoting a more balanced approach to intellectual property, *See, e.g.,* Halbert, *supra* note 12, at 283-84; James Boyle, *A Manifesto on WIPO and the Future of Intellectual Property*, 2004 DUKE L. & TECH. REV. 9; Geneva Declaration on the Future of the World Intellectual Property Organization, *available at* <http://www.cptech.org/ip/wipo/futureofwipodeclaration.pdf> (discussed in Halbert, *supra* note 12 at 273-76).

²⁰⁶ *Fostering Dynamic Innovation, supra* note 14 at 26-29.

²⁰⁷ <http://www.wipo.int/ip-development/en/agenda/cdip/>

²⁰⁸ *Available at* http://r0.unctad.org/e-commerce/e-commerce_en/ier07_en.htm.

²⁰⁹ *Id.* at 2.

innovation, which could present significant advantages for developing countries."²¹⁰ Promoting a dialogue on these issues in a number of venues will ensure that a variety of perspectives are included. Nonetheless it seems desirable to have a focal point organization around which various stakeholders can coalesce and create coalitions of participation in the debate. WIPO is a natural choice for this role in light of its expertise in intellectual property and its experience with the Development Agenda.

WIPO's efforts in undertaking the Development Agenda demonstrate a growing willingness and capacity to consider ramifications of intellectual property outside of a narrow manufacturer-based paradigm.²¹¹ Building an understanding of and expertise in new and evolving innovation paradigms is within the purview of WIPO in any event because of WIPO's role in developing and administering most intellectual property agreements other than TRIPS.²¹² Crucially, WIPO has been engaged for some time in attempts to develop a Substantive Patent Law Treaty to harmonize further the international patent system.²¹³ Such efforts clearly raise red flags in light of the problems already visible in the substantive harmonization involved in TRIPS minimum standards for patent law. It is very important to ensure that discussions of further harmonization be informed by a broader innovation policy perspective.

Though WIPO has clear institutional advantages as a focus for global innovation policy setting, WIPO has a checkered history with respect to open innovation. Its Convention holds as its primary goal to "promote the protection of intellectual property throughout the world."²¹⁴

²¹⁰ *Id.* at 12.

²¹¹ One should not be too sanguine about this recent openness, of course. WIPO's history is as an organization devoted to the promotion of intellectual property rights which has arguably been brought kicking and screaming to its present openness to development issues. *See, e.g.*, Halbert, *supra* note 12 at 272-76 (discussing this history). Nonetheless, of the available institutions in the international intellectual property regime, WIPO seems the most likely to be both able and willing to pursue a broader innovation policy agenda.

²¹² *See* <http://www.wipo.int/treaties/en/> for a list of WIPO-administered intellectual property treaties,

²¹³ *See* Reichman and Dreyfuss, *supra* note 17, for a discussion of and critique of WIPO's efforts in this regard.

²¹⁴ CONVENTION, *supra* note 12.

Moreover, in 2003 WIPO was pressured by the United States government, reportedly as a result of objections from Microsoft and related corporate interests, to rescind a plan to hold a meeting on open source approaches.²¹⁵ At that time Lois Boland, director of international relations for the U.S. Patent and Trademark Office, reportedly said "that open-source software runs counter to the mission of WIPO, which is to promote intellectual-property rights" and that "[t]o hold a meeting which has as its purpose to disclaim or waive such rights seems to us to be contrary to the goals of WIPO."²¹⁶

Times seem to be changing, though, as a result of efforts from NGOs supportive of open source approaches and along with WIPO's adoption of the Development Agenda. Though a specific reference to open source software was removed from the approved version, the Development Agenda proposals agreed upon in 2007 contain language that is consistent with an important role for user and open and collaborative innovation in development. The approved proposals include calls to ". . . deepen the analysis of the implications and benefits of a rich and accessible public domain," "initiate discussions on how . . . to further facilitate access to knowledge and technology . . .and to foster creativity and innovation . . .," "request WIPO to undertake . . . studies to assess the economic, social and cultural impact of the use of intellectual property systems . . .," and "exchange experiences on open collaborative projects such as the Human Genome Project as well as on IP models."²¹⁷ These proposals provide hooks for consideration of innovation paradigms beyond the intellectual property regime.

WIPO is also a good choice as a locus for a broader innovation policy agenda because TRIPS itself contemplates the possibility that TRIPS interpretation might be influenced by WIPO. Thus, Article 68 contemplates that the TRIPS Council, in its activities in monitoring the

²¹⁵ See, Krim, *supra* note 13.

²¹⁶ *Id.*

²¹⁷ Development Agenda, *supra* note 16.

agreement “may consult with and seek information from any source it deems appropriate. In consultation with WIPO, the Council shall seek to establish, within one year of its first meeting, appropriate arrangements for cooperation with bodies of that Organization.”²¹⁸ Though the metes and bounds of cooperation set out in the subsequently-adopted formal agreement between WIPO and the TRIPS Council are narrow and primarily technical, the language of Article 68 certainly implies that the TRIPS Council may consult with WIPO more broadly.²¹⁹ Though the current relationship between WIPO and TRIPS does not warrant explicit deference to WIPO positions by WTO dispute resolution bodies,²²⁰ it certainly places WIPO in a position to begin a dialogue over TRIPS interpretation. As discussed in Section D of this Part, it might eventually be advisable to amend TRIPS to provide WIPO with a more formal role in TRIPS interpretation.

B. An Innovation Policy Agenda at WIPO?

An important step toward incorporating consideration of evolving innovation paradigms in the global debate about intellectual property law would be for WIPO to develop and adopt an Innovation Policy Agenda, along the lines of the recently-adopted Development Agenda, which would take a wide view of promoting innovation in the long term and would avoid the inaccurate perception that open and collaborative innovation is necessarily averse to business interests. Under the auspices of an Innovation Policy Agenda, WIPO could provide a forum for vetting interpretations of TRIPS flexibilities and proposals for national legislation to accommodate a broader approach to innovation as discussed here. WIPO could also consider a broader range of issues related to user innovation and open and collaborative innovation, such as the questions

²¹⁸ TRIPS, *supra* note 1, Art. 68.

²¹⁹ Agreement Between the World Intellectual Property organization and the World Trade Organization (December 22, 1995), available at http://www.wipo.int/treaties/en/agreement/pdf/trtdocs_wo030.pdf.

²²⁰ *Fostering Dynamic Innovation*, *supra* note 14 at 26.

posed by various licensing and contractual approaches to forming limited commons arrangements for collaborative innovation.

Very recently WIPO has begun to take steps toward recognizing the importance of open and collaborative innovation. For example, a report prepared for the June 2008 meeting of the WIPO Standing Committee on Patents included sections on licensing, patent pools, collaborative research projects (including open source) and a discussion of potential problems caused by patent thickets.²²¹ A list of “issues for further elaboration and discussion” approved at that meeting includes “alternative models for innovation,” “limitations to the rights,” and “research exemption.”²²² At the July 2008 meeting of the WIPO Committee on Development and Intellectual Property the Electronic Frontier Foundation presented a statement in which it suggested that “WIPO could also provide Member States with information about the benefits for education and scientific research of Open Innovation and User Driven Innovation models” and that these “new theories of innovation” “have the potential to radically reshape collaboration and innovation in the developing world.”²²³ All of these recent activities lay groundwork for a more formal WIPO Innovation Policy Agenda.

The development of an Innovation Policy Agenda at WIPO would provide a focal point for various stakeholders with interests in user innovation and open and collaborative innovation, as well as others, such as many information technology firms, which find the one-size-fits-all approach to TRIPS constraining. Thus, participants in user and open and collaborative innovation and those NGOs that support these approaches might make use of the network of connections which link them (particularly those in the open source software community) to

²²¹ Report on the International Patent System, *supra* note 15.

²²² Annex, Summary By the Chair, *supra* note 15.

²²³ EFF Statement to WIPO Committee On Development And Intellectual Property, Second Session, July 7-11, 2008, *available at* <http://lists.essential.org/pipermail/a2k/2008-July/003378.html>

information technology sector stakeholders who are interested in ensuring that any interpretation or amendment of TRIPS adequately accounts for the intellectual property balance required for complex innovation.²²⁴ In this respect, an Innovation Policy Agenda would provide a point of coalescence for these parties to, as suggested by Burris, Drahos, and Shearing in the context of the debate over public health and access, mobilize their resources to create, deploy, and link nodes so as to affect the process of "nodal governance" that will no doubt be involved in the adaptation of TRIPS to the needs of the information technology sector.²²⁵ Over time, these changes are likely to be made both directly, by influencing the development of interpretative machinery at WIPO or the WTO and indirectly, by influencing the evolution of domestic intellectual property law, which will in turn influence the interpretation of TRIPS.

Participants in open and collaborative innovation have a great advantage in seeking to employ a nodal governance approach because of the global network of participants already involved in projects such as open source software, the extent to which the network of participants interpenetrates the network of commercial stakeholders who will be involved in the debate, and the extent to which commercial information technology stakeholders and others are increasingly dependent on the open source community for aspects of their businesses.²²⁶ The political economy already makes it likely that TRIPS "flexibilities" will come to be more widely deployed in recognition of the needs of the information technology industry. By obtaining a voice in the resulting interpretation of those flexibilities, practitioners of user innovation and open and collaborative innovation can try to ensure that their perspective is reflected in resulting interpretations and any eventual TRIPS amendments.

²²⁴ See, e.g., WEBER, *supra* note 32 at ___ (discussing the important interactions between information technology companies and the open source community); O'Mahony and Bechky, *supra* note 121 (same).

²²⁵ See Burris *et al.*, *supra* note 10 at 52-53.

²²⁶ See, e.g., WEBER, *supra* note 32 at ___; O'Mahony and Bechky, *supra* note 121 (same).

Participants in and advocates of open and collaborative innovation can also seek to use their network of connections to influence the increasingly successful attempt to account for development concerns in the global intellectual property regime. Already, the *use* of open source software is seen as a beneficial path for many developing countries.²²⁷ Advocates for user innovation and open and collaborative innovation should deploy their networks of contacts in developing countries and in organizations serving developing countries to emphasize the more direct role that these forms of innovation play and could play in development.²²⁸ There is already progress in this direction with the proposal for exploration of “open collaborative approaches” in the WIPO Development Agenda²²⁹ and the recent discussions of open innovation approaches in the WIPO Committee on Development and Intellectual Property. A WIPO Innovation Policy Agenda would facilitate this involvement.

C. A Notice and Comment Approach to WIPO Interpretations of TRIPS Flexibilities?

Particularly as WIPO develops broader innovation policy expertise pursuant to an Innovation Policy Agenda or otherwise, it might begin to play a more important role in interpreting TRIPS flexibilities and vetting possible exceptions for compliance with TRIPS. As Dreyfuss argues, the WTO Dispute Settlement process is a poor mechanism to provide authoritative interpretations of amorphous terms in the agreement that might be interpreted so as to provide some flexibility, such as "limited", "normal exploitation," "without discrimination" and so forth.²³⁰ This is in part because dispute settlement proceedings are rare and in part because the panels are unqualified to make innovation policy. Dreyfuss argues that an administrative mechanism is needed to give content to these terms in light of the purposes of

²²⁷ See references cited supra note 129.

²²⁸ See, e.g., Douthwaite *et al.*, supra note 72; Gupta, supra note 72.

²²⁹ Supra note 16.

²³⁰ *Id.* at 13-20.

intellectual property in general and of the purposive statements incorporated in TRIPS itself.²³¹ She then suggests ways in which the existing intellectual property administrative bodies -- primarily WIPO and the TRIPS Council -- might undertake such an interpretive task so as to take advantage of WIPO's expertise in intellectual property policy.²³²

My proposal here piggybacks off of her suggestions. Consideration of evolving alternative mechanisms for innovation only reinforces the need for an administrative approach. The infrequent forays into TRIPS interpretation of WTO dispute resolution bodies are a completely ineffective mechanism for considering and vetting TRIPS exceptions under Article 30 once one moves away from the trade-focused seller innovator paradigm under which it is assumed that exceptions to rigorous enforcement of patent protection should be few and far between. If TRIPS flexibilities are to play a positive role in promoting innovation and ensuring that the intellectual property paradigm does not crowd out other innovation models, then it is critical to have an ongoing discussion not only of whether proposed exceptions would pass muster under TRIPS, but also of which exceptions make sense as a matter of innovation policy under a variety of circumstances. A broader view of the goal of TRIPS as promoting innovation (rather than intellectual property protection per se) means that exceptions should be not only tolerated but promoted under certain circumstances.

WIPO is well-placed to provide a forum for vetting potential exceptions that might be implemented in national legislation. Under the current relationship between WIPO and the WTO, especially because WIPO and the WTO have somewhat different membership, WIPO interpretations would not be binding on WTO panels.²³³ Nonetheless, even under the current arrangement, a well-reasoned WIPO analysis would provide persuasive evidence of how a large

²³¹ *Id.* at 20.

²³² *Id.* at 20-34.

²³³ *Fostering Dynamic Innovation*, *supra* note 14 at 26.

number of member states do view the TRIPS provisions and also of the views of an organization with expertise in the area of innovation policy.

If WIPO begins to take a greater role in TRIPS interpretation, either as a persuasive matter or, as discussed in the next section, as part of an amended TRIPS approach to exceptions, it will be important to deal with traditional administrative issues of transparency, legitimacy, and voice.²³⁴ WIPO consideration of potential exceptions should incorporate the views not only of intellectual property stakeholders, developing countries, and potential consumers of new inventions, but also of participants in and advocates for less traditional innovative practices, including the user innovation and open and collaborative innovation discussed in earlier parts of this Article. Historically, WIPO has been very unwilling to permit participation from diverse constituencies.²³⁵ However, its experience with the Development Agenda and, as Halbert argues, with the issue of traditional knowledge appears to be opening it up to more expansive participation.²³⁶

Openness to input from innovators will be critical to the success of an Innovation Policy Agenda. Once one acknowledges the importance of new and evolving models of innovation, it becomes essential to combine the intellectual property and innovation policy expertise of an organization like the re-imagined WIPO with a means of tapping into the global innovation grassroots. An ear to the ground complements intellectual property expertise in informing a flexible and responsive global system.

With this in mind, WIPO should open up its deliberations on a regular basis to representatives of users those involved in user innovation and open and collaborative innovation, as it is doing with indigenous communities in its deliberations regarding traditional

²³⁴ See references *supra* note 10 for general discussions of these issues in the global context.

²³⁵ See Halbert, *supra* note 12 at 271-76.

²³⁶ *Id.* at 271-80.

knowledge.²³⁷ Beyond a more inclusive approach to NGOs, WIPO should consider adopting an accessible and open “notice and comment” approach to vetting potential TRIPS exceptions.²³⁸

The same Internet technology which is responsible for the recent surge in new innovative practices provides a mechanism for implementing a truly global notice and comment procedure.²³⁹ WIPO conceivably could set up an online forum for proposing and discussing TRIPS exceptions.²⁴⁰ Interested parties, including states, industry actors, NGOs, and even individuals could submit comments about specific proposals for exceptions, interpretations of the TRIPS non-discrimination requirement, and so forth. To draw out serious and well thought out proposals, each proposal might be required to include an "innovation impact assessment" -- arguments as to why the proposed exception or interpretation would promote innovation. Online rating or tagging systems could also be considered to weed out spurious proposals and comments or to group similar comments.²⁴¹

An open notice and comment procedure would provide a means to solicit a variety of perspectives which could inform WIPO and give it access to the distributed expertise about innovation which is present at the global grassroots. WIPO could then produce reasoned interpretations of TRIPS in light of a wide range of input. Such reasoned interpretations could be influential at the WTO, as already discussed. Indeed, an open process of notice and comment resulting in a reasoned interpretation of TRIPS might go far to alleviate the legitimacy problems

²³⁷ See Halbert, *supra* note 12 at 276-80.

²³⁸ See Kingsbury *et al.*, *supra* note 10 at 34-36 (discussing the relatively new phenomenon of adoption of notice and comment procedures by international bodies)

²³⁹ Of course, not all members of constituencies importantly affected by innovation policy would have direct access to such an online forum. However, internet access is becoming more and more widespread, civil society NGO's would certainly have access, and, in any event, any procedure using the Internet to permit direct involvement by citizens worldwide in commenting on innovation policy would be vastly more inclusive than anything going on at WIPO at present.

²⁴⁰ This proposal is reminiscent of Noveck's "Peer to Patent" approach to examination being tested at the USPTO, *supra* note 30 or of Cynthia Ho's proposal for a response to biopiracy and patent bioethics issues, *supra* note 30 at 532-40.

²⁴¹ See, e.g., Noveck, *Peer to Patent*, *supra* note 30 at 147-49.

with WTO reliance on WIPO interpretations raised by Dreyfuss.²⁴² TRIPS provides that the TRIPS Council “may consult with and seek information from any source it deems appropriate” in conjunction with its monitoring responsibilities.²⁴³ The more transparently vetted WIPO interpretations of TRIPS are, the more appropriate it would seem to be to rely on them.

Of course, as discussed in Part III, there are limits to the extent to which the provisions of TRIPS, which were, after all, intended to be limiting with regard to patentability exceptions, can be stretched to accommodate the needs of a changing innovation regime. The advantages of having ongoing input and proposals for how states might implement the TRIPS flexibilities in light of an evolving innovation environment would extend beyond providing more informed and well-thought-out interpretations of the current provisions of TRIPS. Proposals which were rejected in the TRIPS/WIPO interpretive process yet were accompanied by persuasive innovation impact assessments would generate suggestions and support for possible amendments to TRIPS in light of changing technology and practice. For example, as discussed in Part III, there may be circumstances in particular technological fields which would make a relatively broad exception to the exclusive right to use an invention socially beneficial. Some such exemptions (for example, the widely adopted research use exemptions) are likely TRIPS-compliant under Article 30. But other potentially beneficial restrictions on the exclusive use right would be valuable to promote user innovation and might not comply with even a flexible reading of TRIPS. An open interpretive forum would provide advocates of user innovation with an opportunity to make the case for amending TRIPS to permit use exemptions to nurture this innovative practice.

The availability of such a global forum for discussion and evaluation of proposed

²⁴² *Fostering Dynamic Innovation*, *supra* note 14 at 26.

²⁴³ TRIPS, *supra* note 1, Art. 68.

TRIPS exceptions and flexibilities would also feed back into debates about exceptions at the national level and would likely be helpful in giving political legitimacy to advocates of more flexible national intellectual property regimes.

D. Amending TRIPS to Provide a More Formal Administrative Role for WIPO?

While the adoption of an Innovation Policy Agenda at WIPO and the establishment of a WIPO forum for vetting TRIPS flexibilities would be steps in the right direction, such an *ad hoc* approach to TRIPS flexibilities may not be enough to make positive room for evolving innovation practices. Because of the complexity and continuing evolution of the innovation environment it is hard to escape the conclusion that this is an arena in which a more explicit administrative regime is needed at the global level.²⁴⁴

Here I propose a more far-reaching change than could be accomplished simply by having WTO dispute resolution bodies take WIPO analysis into account informally in evaluating TRIPS exceptions. The proposal would be to amend the TRIPS agreement to shift more of the burden for assessing the innovative benefits of TRIPS exemptions or of differential treatment of different technologies to an explicitly recognized administrative process which would not require the very difficult step of treaty amendment every time the innovative process evolves. To accomplish this, a general provision permitting exceptions “reasonably intended to promote innovation and not to restrain trade” would be substituted for Article 30.²⁴⁵ The amendment should also clarify that Articles 27 and 28 are subject to such exceptions. As an expert innovation policy agency, WIPO would be given the formal responsibility for vetting exceptions

²⁴⁴ As Dreyfuss notes, *Fostering Dynamic Innovation*, *supra* note 14 at 26, the general framework of WTO reliance on expert international organizations to provide standards is not new. She also notes, however, that such an approach might be risky at the moment since WIPO’s institutional identity is in a period of upheaval. *Id.* at 28. Most likely a change of the sort I advocate here would have to follow a period of experience with more informal input from WIPO under the auspices of an Innovation Policy Agenda.

²⁴⁵ Here I address only the patent provisions of TRIPS. Similar changes to the other sections of TRIPS should also be considered.

to see whether they are “reasonably intended to promote innovation and not to restrain trade.” WTO dispute resolution would then defer, at least to some degree, to WIPO’s evaluations.

Contemplating a more formal role for WIPO in evaluating TRIPS flexibilities raises at least two important issues: First, there is the question of the extent of deference which WTO dispute resolution bodies should give to WIPO interpretations of the proposed “reasonably intended to promote innovation and not to restrain trade” requirement.²⁴⁶ Rather than give even a re-imagined WIPO final authority over the validity of TRIPS exceptions, there are several reasons to prefer an intermediate level of deference. While a re-imagined WIPO would have a broad mandate, including, importantly, the current Development Agenda, there are a number of other international organizations with portfolios that touch on innovation policy. It would be reasonable to permit parties involved in dispute resolution proceedings to bring arguments against WIPO’s interpretations based on the views of organizations with expertise in areas other than innovation that are related to a particular dispute. Indeed, as noted by Dreyfuss, the WTO itself has a trade agenda which will not always align with the promotion of innovation.²⁴⁷ It is only reasonable to leave room for WTO dispute resolution panels to take specifically trade-focused rationales into account.

Second, there are good reasons, particularly in the international context in which the legitimacy of an administrative approach may be questioned, to avoid focusing too much power in one particular international actor (indeed, this is part of the problem with the current configuration of TRIPS). Giving more responsibility for interpreting TRIPS to a re-imagined

²⁴⁶ Stuart Benjamin and Arti Rai have recently considered a similar issue in connection with their proposal for an Innovation Policy Agency in the United States. Stuart Minor Benjamin and Arti K. Rai, *Innovation and Its Reform: A Regulatory Perspective*, 76 GEO. WASH. L. REV. ___ (2008). They propose an Innovation Policy Agency with a mandate to review regulations proposed by other executive agencies in light of their effects on innovation policy. They argue that the Innovation Policy Agency should have the power to send a proposed regulation back for further review, but that the agency with substantive authority in a particular area should have the power to enact the regulation over IPA remand. [Need cite]

²⁴⁷ *Fostering Dynamic Innovation*, *supra* note 14 at 28.

WIPO raises reasonable concerns about agency capture by powerful developed country interests. These concerns are mitigated somewhat in the context of new paradigms of innovation (in contrast to the situation with respect to the Development Agenda, for example) because, as we have seen in the past few years in the disputes between the pharmaceutical industry and much of the information technology industry, the evolution of innovation paradigms can set even powerful developed country interests at odds with one another. Nonetheless, it would be best to avoid concentrating too much power over innovation policy in any one organization so as to avoid creating an overly attractive target for capture. Dividing power facilitates the ability for weaker players to have influence through nodal governance and regime shifting.

There is thus a need to balance the advantages of innovation policy expertise and a reliable institutional framework for vetting proposed exceptions against the disadvantages of concentrated power. An intermediate level of deference, in which WTO dispute resolution panels are required to articulate specific reasons for rejecting any exception which has survived WIPO's vetting procedure, might be appropriate. If a panel were to reject WIPO's determination as to whether a particular exception promotes innovation, the WTO Appellate Body would be empowered to reweigh the WIPO analysis against the panel's reasoning.

WIPO evaluation of proposed exceptions would provide states with a degree of certainty in enacting them even if the dispute resolution procedure retained its role as the finally binding interpreter. Because formal disputes under the WTO are rare and WIPO's analysis would be ongoing, WIPO's interpretations would be likely to be very influential. This would be particularly true if WIPO evaluations paved the way for broad adoption of exceptions by states,

which might then constitute “subsequent practice in the application of the treaty” under Article 31 of the Vienna Convention and hence inform subsequent interpretations.²⁴⁸

E. Governance of Open and Collaborative Innovation

A final role for a re-imagined WIPO under an Innovation Policy Agenda would be as an incubator of potential international initiatives related to the ways in which innovation is structured and governed by licensing law, competition law, and so forth. Such initiatives might range from offering model licensing regimes, to promulgating best practices and standards, to suggesting model national legislation concerning the governance of innovative collaborations (including, for example, patent pools and other limited commons constructions), through to proposing new international agreements about such issues as reach-through licensing.

Of course, existing open and collaborative projects have already wrestled with the question of how to employ intellectual property and licensing in cooperation with formal or informal organizational structure to provide a productive and sustainable innovation process. They have also dealt with procedural issues raised by the need for decision-making within an often widely-dispersed and self-selecting group. Most significant open source software projects, for example, have well-defined governance structures, usually vesting decision-making authority, at least with respect to what goes into the official version of the program, in those who started the project or have demonstrated technical skill.²⁴⁹

The success of open source software is also attributable to the development of a standardized “platform” of legal technology to define and govern the resulting limited commons.²⁵⁰ This legal apparatus supervises the activities of a transnational network of private

²⁴⁸ VIENNA CONVENTION ON THE LAW OF TREATIES, Art. 31(3)(b).

²⁴⁹ See, e.g., WEBER, *supra* note 32 at 88-89, 166-71, 186-89; Steven Weber, *Patterns of Governance in Open Source*, in OPEN SOURCE 2.0 (DiBona, Cooper & Stone, eds. 2006).

²⁵⁰ See, e.g., WEBER, *supra* note 32 at 179-85.

actors (primarily the technologists who actually develop the software) and also serves to mediate between the collaborative enterprise and the rest of society. The legal apparatus consists of a family of intellectual property licenses, based on specific principles, which govern both the iterative development of the software and the uses which to which it can be put.

Over time, the open source software community has also developed governance institutions, including primarily the activities of the Open Source Initiative²⁵¹ and the Free Software Foundation.²⁵² These organizations certify licenses in accordance with agreed-upon principles, which differ somewhat. The Free Software Foundation maintains the widely used, copyleft GPL license, while the Open Source Initiative has certified a number of different licenses,²⁵³ and maintains trademark protection for the “Open Source Initiative Approved” moniker and for the initiative’s symbol. Both organizations also engage in broader policy and advocacy activities.

These organizations, though non-governmental, thus provide models of governance of a widely dispersed and transnational community of developers and users. Perhaps even more than governments, they are sensitive to concerns with legitimacy in the eyes of their constituents, since the option of exit (known in the open source world as “forking”) is much more easily exercised in cyberspace. These legitimacy concerns have given rise to procedures reminiscent of typical administrative law.²⁵⁴ For example, the most recent release of the GPL copyleft license was accompanied by a great deal of controversy.²⁵⁵ In an effort to manage this controversy, Richard Stallman, whose Free Software Foundation “blesses” the license, held an eighteen-

²⁵¹ Open Source Initiative, www.opensource.org

²⁵² Free Software Foundation, www.fsf.org

²⁵³ See, e.g., Dusollier, *supra* note 11 at 1398-1400.

²⁵⁴ Indeed, these procedures are to some extent a model and proof of concept for the Internet-enabled global notice and comment procedure proposed above.

²⁵⁵ See, e.g., Charles Babcock, *The Controversy Over GPL 3*, INF, WEEK (March 17, 2007), available at <http://www.informationweek.com/news/software/linux/showArticle.jhtml?articleID=198001444&pgno=1&queryText=&isPrev=>.

month period of what was essentially public "notice and comment" rulemaking before releasing the finalized version.²⁵⁶

While these governance mechanisms have been highly successful and may remain adequate, as these modes of innovation take on increasing economic and social importance, it also becomes more important to manage the boundaries between these projects and both the proprietary world and the public domain. It is not necessarily clear that the technologists involved in the governance of open and collaborative projects will be sensitive to the possible external impacts of their practices. As legal and organizational models for open and collaborative innovation proliferate, it may become more important to have broader public input into the forms they take. Since many of these collaborations are quintessentially transnational, these governance issues are unavoidably global despite their roots in local contract and licensing law.

It is thus possible that international bodies such as WIPO will be called upon to play a role in helping to shape the landscape in which this private ordering takes place so that the governance of user innovation and open and collaboration innovation takes into account broader public values. The same kinds of issues concerning the balance between harmonization and international diversity that arise in considering TRIPS exceptions are likely to arise in the governance of the products of open and collaborative innovation processes as well. A re-imagined WIPO focused on broad-based consideration of innovation policy would be alert to these issues.

V. Conclusions

We stand at what is probably only the beginning of a flowering of new and emergent innovation practices facilitated by developments in communication technology, yet we confront

²⁵⁶ See <http://gplv3.fsf.org/> for press releases and archives of the process for debating the revised license.

these evolving practices with a rigid and outdated international innovation policy regime. The main message of this Article is that it is high time to consider seriously both how to accommodate the user innovation and open and collaborative innovation practices that are already with us and how to avoid repeating the mistake of institutionalizing any particular approach to innovation in a difficult to change international instrument. In doing so, we must also meet the need for sufficient harmonization to allow us to reap the benefits of globally distributed and diverse innovative practices.

In this Article I suggest that we should seek to deploy an administrative-type approach to cope with emerging innovation paradigms. To that end, I propose that WIPO be re-imagined as a broad-based innovation policy organization, at a minimum through the development and adoption of an Innovation Policy Agenda and perhaps eventually through amendment of TRIPS to permit WIPO to serve as an interpretive “agency” under a more formal administrative approach to intellectual property law exceptions. I also suggest that WIPO provide a forum for considering issues of licensing and competition law raised by the governance of collaborative innovation projects and their boundaries with proprietary models on the one hand and the public domain on the other. Primarily, this Article seeks to encourage an expanded dialogue in global innovation policy which takes into account emerging innovation paradigms.