From Open Source Software to Open Patenting:

What's New in the Realm of Openness?

Mariateresa Maggiolino and Maria Lillà Montagnani*

INTRODUCTION

This paper analyses the emerging *Open Patenting* (OP) phenomenon within the boundaries of Open Source (OS),[1] and against the backdrop of Open Source Software (OSS).[2] We argue that, by leveraging the existing IP rules, OSS and OP face some of the limits that the traditional paradigms used for explaining innovation and managing IPRs bear. Further, we maintain that OP differently from OSS is still a kaleidoscopic phenomenon whose boundaries are unsettled and very much affected by the industry to which the subject matter (or innovation) belongs.

Part I discusses the limits that affect the models traditionally used for explaining innovation and managing both its ownership and the bundle of

---

* Mariateresa Maggiolino, Assistant Professor of Commercial Law, Bocconi University, Department of Law and ASK Research Centre. Maria Lillà Montagnani, Assistant Professor of Commercial Law, Bocconi University, Department of Law and ASK Research Centre. Although this paper is born from a common elaboration, §§ I and III have to be assigned to Mariateresa Maggiolino and § II to Maria Lillà Montagnani.

[1] Indeed, in this paper we argue that the dispersed phenomena of "open exploitation of IPRs" that have been occurring over the last few years have driven toward a cultural and philosophical dimension that we label "Open Source".

[2] With the wording "Open Source Software" we refer to the phenomena also termed "F/OSS", "FLOSS" or "FOSS", that is to say the liberally licensed software that grants to its users the right to use, study, change, and improve its design through the availability of its source code.

rights that it generates. Part II pictures OS and analyzes the OSS features that make it an established and successful cultural, commercial and legal phenomenon. Part III describes some emerging episodes that belong to OP as well as the skepticism that they arise. Part IV concludes by setting the boundaries of OP and discussing an initial definition of it.

I. PARADIGMS FOR EXPLAINING AND MANAGING INNOVATION

IP scholars, when explaining innovation,[3] have traditionally described inventions as the fruit of an ingenious and bizarre persona or, since the advent of industrial research, as the planned outcome of a group of employees that work together for a single company, which can afford huge investments in research and development. Likewise, it has been since the advent of mass markets that IP scholars have associated creativity to major business companies, which can afford to act as intermediaries between imaginative creators and the public. In such "sales-oriented" scenarios, those that "receive" inventions and works of art, that is to say, their "users"

[3] For brevity's sake, in this work the word "innovation" may sometimes address both inventions and works of art.

and "consumers", represent only the passive "end points" of the inventive and creative activities.[4]

Yet, innovation can also result from incremental processes[5] that involve many independent persons, who can play at the same time, and in the same project, both roles of innovators and consumers thereby self-selecting the features of their own innovation by sharing their interests, experiences, and

[4] See, e.g., Johanna Gibson, *Open Access, Open Source, and Free Software: Is There a Copy Left*? 1 and 16 (2009), available at http://ssrn.com/abstract=1446884; and Katherine J. Strandburg, *Evolving Innovation Paradigms and the Global Intellectual Property Regime*, 41 CONNECTICUT LAW REVIEW 861, 864 (2009).

[5] For the distinction between the regime of incremental (or cumulative) innovation, which occurs when new products are introduced in rapid succession, each one as an improvement on the previous product so that the new drives out the old, and the regime of radical innovation, where each innovation represents a clearly displacing factor for the old products, see Thomas M. Jorde & David J. Teece, Introduction, *in* ANTITRUST, INNOVATION, AND COMPETITIVENESS 3, 4-5 (Thomas M. Jorde & David J. Teece eds. 1992). This distinction is rooted in Schumpeter's thinking. See, in particular, BENGT-ÅKE LUNDVALL, NATIONAL SYSTEMS OF INNOVATION: TOWARDS A THEORY OF INNOVATION AND INTERACTIVE LEARNING (1992). For a more detailed picture, see Jan Fagerberg, *Innovation: A Guide to the Literature*, *in* THE OXFORD HANDBOOK OF INNOVATION 1 (2005).

skills.[6] In other words, innovation may also amount to a cumulative, bottom-up, demand-driven phenomenon of sharing and collaboration, where there are no end points.[7]

R&D Networks,[8] in the forms of *Cross-Licensing Agreements*, *Patent Pools*,[9] and *R&D Joint Ventures*,[10] so dear to the traditional off-line

---

[6] See Krishna Ravi Srinivas, *Intellectual Property Rights and Bio-Commons: Open Source and Beyond*, 58 INTERNATIONAL SOCIAL SCIENCE JOURNAL 319 (2006); and Strandburg, *supra* note 4, at 880.

[7] See RISHAB A. GHOSH (ed.), CODE: COLLABORATIVE OWNERSHIP AND THE DIGITAL ECONOMY (2005).

[8] As to the growing importance of off-line R&D networks, see Baoming Dong, Xin Zhao, *International R&D Networks*, 2009, available at www.ssrn.com/abstract=1271877; Michael D. Koning, Stefano Battiston, Mauro Napoletano, Frank Schweitzer, *The Efficiency and Evolution of R&D Networks*, 2008, available at http://spire.sciences-po.fr/hdl:/2441/9933/resources/f397.pdf; and John Hagedoorn, *Inter-firm R&D partnerships: an overview of major trends and patterns since 1960*, 31 RESEARCH POLICY 477 (2002).

[9] The boundaries of these two business experiences cannot be reduced to a list of clauses. Yet, in their 1995 joint antitrust guidelines the U.S. antitrust agencies stated that**,** 'Cross-licensing and pooling arrangements are agreements of two or more owners of different items of intellectual property to license one another or third parties' (see §5.5, U.S. Department of Justice and the Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property, available at http://www.justice.gov/atr/public/guidelines/0558.htm#t55). Similarly, in the EU guidelines about horizontal agreements and tech-transfer, the European Commission stated that, 'the

notion of technology pools covers agreements whereby two or more parties agree to pool their respective technologies and license them as a package' (see Commission Notice, Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements, OJ 2004, C101/43, § 41, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2004:101:0043:0053:EN:PDF).

Among the most famous examples of patent pools we may recall the industrial and electronic technological standards developed for airplanes, radios, MPEG-2 audio and video compression, and DVDs. In general for the beneficial effects of pooling see Jean Tirole, Josh Lerner, *Efficient Patent Pools*, 94 AMERICAN ECONOMIC REVIEW 691 (2004).

[10] Likewise, also the boundaries of this business phenomenon are waving. Yet, in one of its antitrust regulations the European Commission describes R&D joint ventures stating that they may fix the conditions under which two or more firms pursue: '(a) joint research and development of products or processes and joint exploitation of the results of that research and development; (b) joint exploitation of the results of research and development of products or processes jointly carried out pursuant to a prior agreement between the same parties; or (c) joint research and development of products or processes excluding joint exploitation of the results' (see Article 1, Commission Regulation (EC) No 2659/2000 of 29 November 2000 on the application of Article 81(3) of the Treaty to categories of research and development agreements, OJ 2000, L 304/7). Analogously, in the US 1984 National Cooperative Research Act "joint research and development ventures" are qualified as those 'groups of activities, including attempting to make, making, or performing a contract, by two or more persons for the purpose of – (A) theoretical analysis, experimentation, or systematic study of phenomena or observable facts, (B) the development or testing of basic engineering techniques, (C) the extension of investigative findings or theory of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and

innovative activity, are only partial examples of this diverse model of innovation: they show how some innovations may arise from firms collaborating and sharing their efforts, investments, and goals; but they still represent top-down, supply-driven experiences that come up within the business world and not from the initiative of single lay people interested in aggregating their knowledge.

Similarly, when the ownership of innovation is at stake, IP scholars have traditionally believed that IPRs increase the production of intellectual goods, by morphing innovative activities into profitable ventures.[11] Over the

---

testing of models, prototypes, equipment, materials, and processes, (D) the collection, exchange, and analysis of research information, or (E) any combination of the purposes specified in subparagraphs (A), (B), (C), and (D), and may include the establishment and operation of facilities for the conducting of research, the conducting of such venture on a protected and proprietary basis, and the prosecuting of applications for patents and the granting of licenses for the results of such venture, but does not include any activity specified in subsection (b) of this section ' (15 U.S.C. §4301(a)(6) 1984).

[11] Indeed, even traditional property rights can be viewed as serving two main utilitarian purposes: providing incentives for development and preventing depletion of finite resources. See Richard A. Posner, ECONOMIC ANALYSIS OF LAW (2003); C.C. VON WEIZSACKER, BARRIERS TO ENTRY. A THEORETICAL TREATMENT 5-7 (1980); and Bruce A. Ackerman, ECONOMIC FOUNDATIONS OF PROPERTY LAW (1975). In particular, for the argument that property rights limit the creation of uncompensated externalities, see Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347 (1967); and for the

last few decades this right holder-oriented approach has led, not only to "roughly granted" patents,[12] but also to the enlargement of the IP domain.[13]

---

argument that IPRs limit the creation of the uncompensated positive externalities specific of intellectual goods, see, e.g., Janusz A. Ordover, *Economic Foundations and Considerations in Protecting Industrial and Intellectual Property*, 53 ANTITRUST L. J. 503, 505-506 (1985). For empirical papers as to IPRs' power to incentive innovation see, e.g., Mariko Sakakibara, Lee Branstetter, *Do Stronger Patents Induce More Innovation? Evidence from the 1988 Japanese Patent Law Reforms*, 32 RAND JOURNAL OF ECONOMICS 77 (2001); Vincenzo Denicolò, *Patent Races and Optimal Patent Breadth and Length*, 44 JOURNAL OF INDUSTRIAL ECONOMICS 249 (1996); Richard Gilbert and Carl Shapiro, *Optimal Patent Length and Breadth*, 21 RAND JOURNAL OF ECONOMICS 106 (1990); Paul Klemperer, *How Broad Should the Scope of Patent Protection Be?*, 21 RAND JOURNAL OF ECONOMICS 113 (1990); Frederick M Scherer, *Nordhaus's Theory of Optimal Patent Life: A Geometric Reinterpretation*, 62 AM. ECON. REV. 422 (1972); and William D Nordhaus, *Invention, Growth, and Economic Welfare* (1969).

[12] See, James Bessen & Michael J. Meurer, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008). The *Public Patent Foundation* – http://www.pubpat.org/ – can be deemed as an answer to this problem. It aims to protect the public domain by asking the PTO to revoke an issued patent on the grounds that its idea is not new, but is instead nothing more than a reformulation of information that was already public. See, further, Robin C. Feldman, *The Open Source Biotechnology Movement: Is It Patent Misuse?*, 6 MINN. J. L. SCI. & TECH. 117, 126 (2004) (announcing that the *Public Patent Foundation* is planning to create a patent commons that should work as an on-line patent pool). Yet, up to now (August 7 2010), the website does not report this initiative.

Protection has been granted to new subject matters, such as business methods,[14] traditional knowledge,[15] computer programmes,[16] gene sequences,[17] bio and nano technologies;[18] and new rights have been

---

[13] Among the broad literature of those advocating the overgrowth of IP law see, e.g., Lucie M C R Guibault, P Bernt Hugenholtz (eds), THE FUTURE OF PUBLIC DOMAIN (2006).

[14] The patentability of business methods has raised a huge debate. For an overview see, e.g., Peter S. Menell, Michael J.Meurer, *Nonpatentability of Business Methods: Legal and Economic Analysis* (2009), available at http://ssrn.com/abstract=1482022.

[15] See, e.g., Stephen R. Munzer, Kal Raustiala, *The Uneasy Case for Intellectual Property Rights in Traditional Knowledge*, 27 CARDOZO ARTS & ENTERTAINMENT LAW JOURNAL 37 (2009) (arguing that a traditional knowledge should be protected through a modest package of rights under domestic and international law).

[16] The possibility to copyright software was introduced by the Computer Software Copyright Act of 1980 (Pub. L. No. 96-517, 94 Stat. 3015 (1980)) in the U.S. and by the Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs (now replaced by the Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version) OJ 2009, L111/16).

[17] See, e.g., Johanna Gibson, *The Discovery of Invention: Gene Patents and the Question of Patentability*, 12 JOURNAL OF INTELLECTUAL PROPERTY RIGHTS (2007) (identifying the factors, both within the legal framework and in terms of the socio-economic policies underpinning intellectual property, that support a restricted purpose-bound approach to patent protection of gene sequences).

[18] For the story of the Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions (OJ 1998 L213/13) see

introduced, such as the *sui generis* right for databases,[19] plant varieties,[20] and integrated circuits.[21] Further, in order to strengthen IPR holders' ability to collect the economic benefits that flow from their innovations, IP laws expanded IPRs duration[22] and IP scholars supported to strengthen IPR

E. Richard Gold, Alain Gallochat, *The European Biotech Directive: Past as Prologue*, 7 EUROPEAN LAW JOURNAL, 331 (2001). For the protection of biotech inventions in the U.S. see David Beier, Robert H. Benson, *Biotechnology Patent Protection* Act, 68 DENV. U. L. REV. 173 (1991).

[19] In the EU a database right was introduced by Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases (OJ 1996, L 077/20), while in the US the adoption of a similar legislation has been highly controversial. See, e.g., Yochai Benkler, *Constitutional Bounds of Database Protection: The Role of Judicial Review in the Creation and Definition of Private Rights in Information*, 15 BERKELEY TECHNOLOGY LAW JOURNAL (1999) (comparing the two bills that were presented in order to obtain database protection in the US).

[20] See, e.g., Mark Janis, Stephen Smith, *Technological Change and the Design of Plant Variety Protection Regimes*, 82 CHICAGO-KENT LAW REVIEW 1557 (2007).

[21] Protection for integrated circuit designs was introduced by the U.S. 1976 Copyright Act, 17 U.S.C. §§ 101-810. The year after, in Europe Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products was adopted (OJ 1987, L 24/36).

[22] See, e.g., Orrin G Hatch & Thomas R. Lee, *To Promote the Progress of Science: The Copyright Clause and Congress's Power to Extend Copyrights*, 16 HARV. J. L. & TECH. (2002) 1, 20-21 (commenting on the Sonny Bono Copyright Term extension Act by stating that the 20-year extension of copyright protection was needed to incentivize the production

holders' right to control complementary products,[23] follow-on inventions, and derivative works of art.[24]

However, put aside the failures that this profit-oriented logic causes in the pharmaceutical industry,[25] not only the mere existence of IPRs – that is to

---

and dissemination of copies that require intermediaries' investments that otherwise would not have occurred). Similarly, in the EU it has been proposed to amend Directive 2006/116/EC of the European Parliament and of the Council on the term of protection of copyright and related rights in order to improve the social situation of performers, and in particular sessions musicians. – COM/2008/0464 final - COD 2008/0157**.** The proposal has raised huge criticism see, e.g., Christophe Geiger, *The Extension of the Term of Copyright and Certain Neighboring Rights – A Never-Ending Story?***,** 40 IIC 78 (2009).

[23] David J. Teece, *Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy*, 15 RESEARCH POLICY 285 (1986) (arguing that successful exploitation and commercialization of an innovation requires it to be utilized in conjunction with other complementary capabilities and assets).

[24] In particular, see Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON 265, 271-275 (1977) (arguing that granting a patent early in the development process allows the inventor to invest in development without fear that another firm will steal his or her work, thus encouraging the inventor to improve the innovation and to coordinate activities with other firms). Kitch stated that this "prospect function" of patents necessarily implies broad patents in favor of pioneers.

[25] In this regard, the case of the so-called "*neglected diseases*", that is to say, those endemic tropical diseases that torment least developed countries is emblematic. Although their gravity, these diseases do not attract the attention of pharmaceutical companies mainly because their would-be treatments do not hold the promise of big payoff. In other words, in

this case the commercial model underpinning IPRs (and patents, in particular) does not work because of a weak demand. See, in this regard, Leticia Ortí, Rodrigo J. Carbajo, Ursula Pieper, Narayanan Eswar, Stephen M. Maurer, Arti K. Rai, Ginger Taylor, Matthew H. Todd, Antonio Pineda-Lucena, Andrej Sali, Marc A. Marti-Renom, *A Kernel for Open Source Drug Discovery in Tropical Diseases*, 10, 2009, available at http://www.plosntds.org/article/info:doi/10.1371/journal.pntd.0000418. Several initiatives are thus taking place against this phenomenon. For instance, some pharmaceutical companies donated their IPRs to those organizations that nowadays are implementing alternative models to research and develop new drugs for neglected diseases. See, e.g., http://www.policymed.com/2010/02/glaxosmithklines-ceo-andrew-witty-and-his-work-in-developing-nations-unsung-heroes.html. The *Drugs for Neglected Diseases initiative* (*DNDi*) has created one of these unions – http://www.dndi.org/index.php/overview-dndi.html?ids=1. It is a collaborative, patients' needs-driven, non-profit drug *research and development organization* that works in partnership with industry, academia and non governmental organizations, by initiating and coordinating R&D projects built on South-South and North-South networks. In other words, *DNDi* outsources research: it does not have any research facility and does not directly conduct R&D to develop its treatments; rather, it fixes the objectives of the research, identifies the highest potential research opportunities, establishes a development plan, and contracts the appropriate partners for each step. Since *DNDi*'s purpose is to develop safe, effective and affordable new treatments, and to ensure equitable access to them, *DNDi* is intended to ensure that the results of its work are disseminated as widely as possible and made readily available and affordable in developing countries. Therefore, *DNDi* does not accept projects in which IP is obviously going to be an insurmountable barrier to follow-up research on behalf of *DNDi* and/or equitable and affordable access. Yet, it neither puts its results in the public domain, nor grant them via "open licenses". *The Tropical Disease Initiative* (*TDI*) –

say, the ownership upon specific innovations – begs moral and philosophical concerns at least in some industries,[26] such as the industry of

---

http://tropicaldisease.org – amounts to a similar project. In order to facilitate drug discovery, *TDI* is a web-based community of scientists coming from different institutions that have created a Kernel, that is to say a critical mass of pre-existing works about tropical diseases that volunteers can build on incrementally. More clearly than *DNDi*, *TDI* intends not to patent its discoveries. Better, it does not even want to give birth to an "open patenting experience"; rather, it admits its results to fall into the public domain, because it wants to induce a broad and general reduction of patent royalties. See, in this regard, Ortí et. al., *supra*, at 11 (maintaining that, 'the existence of unpatented targets … will give sponsors bargaining power in negotiations with patent owners, if they demand excessive royalties'). This strategy shows that *TDI* does not worry about parasitic patenting: it does not impose a sort of viral clause upon researchers that will use its results thereby allowing third parties to patent follow-on innovations embodying its results and not to share them. To be sure, it undertakes this strategy because it estimates a low risk of free-riding, and it wants to involve the highest number of researcher that is possible. Both *DNDi* and *TDi* receive funds from governments and philanthropies.

[26] For instance, one can wonder whether it is fair to own biological materials and whether such ownership could lead to the misappropriation of genetic resources at the expenses of biodiversity. See, e.g., Sigrid Sterckx, *Can Drug Patents be Morally Justified?*, 11 SCI. & ENGINEERING ETHICS 81, 82 (2005); and F. Scott Kieff, *Perusing Property Rights in DNA*, in PERSPECTIVE ON PROPERTIES OF THE HUMAN 40 GENOME PROJECT 125, 125-151 (F. Scott Kieff ed., 2003).

computer programmes,[27] biotechnologies[28] and nanotechnologies;[29] also, from a business, market-oriented point of view, strong and broad IPRs risk

[27] Yochai Benkler, *Coase's Penguin, or, Linux and the Nature of the Firm*, 112 YALE LAW JOURNAL 369 (2002).

[28] See, e.g., Peter Lee, *Contracting to Preserve Open Science: Consideration-Based Regulation in Patent Law*, 58 EMORY L.J. 889, 918 (2009) (arguing that institutions that control upstream biomedical research tools that are closest to basic scientific findings have a "hook" 'for influencing the behavior of parties further along the research and development chain'); Arti K. Rai, *"Open and Collaborative" Research: A New Model for Biomedicine*, *in* INTELLECTUAL PROPERTY RIGHTS IN FRONTIER INDUSTRIES: BIOTECHNOLOGY AND SOFTWARE 131, 152 (Robert Hahn ed., 2005) (observing that, 'when the data in question are upstream, a significant case can be made in favor of publicly funded, publicly available databases that can be improved on collaboratively.'); David W. Opderbeck, *The Penguin's Genome, or Coase and Open Source Biotechnology*, 18 HARV. J.L. & TECH. 167, 183 (2004) (arguing that, 'It seems clear that . . . gene sequence information must be open if biotechnological development involving genetic engineering is to be open source.'); Ed Levy, Emily Marden, Ben Warren, David Hartell, Isaac Filate, *Patent pools and Genomics: Navigating a Course to Open Science?*, 16 B.U. J. SCI. & TECH. L. 75 (2010); and Donna M. Gitter, *Resolving the Open Source Paradox in Biotechnology: A Proposal for a Revised Open Source Policy for Publicly Funded Genomic Databases* 3 (2007), available at http://ssrn.com/abstract=901994.

[29] See, e.g., Joel Da Silva, *Pools, Thickets and Open Source Nanotechnology*, EIPR 300, 305 (2009) (arguing that, 'issues relating to nanopatents have similarities to biotechnology patents: patenting life, basic building blocks, control and ownership of a fundamental technology and development concerns').

to jeopardize the pace, direction, and transfer of innovation.[30] Respectively, at risk is the success of those seeking to develop and commercialize – in case, with developing countries – new products by building upon earlier works;[31] the chance to exploit dispersed and decentralized innovative ideas

[30] Several empirical papers argue that patent thicket and anti-commons are not real problems. See, e.g., Yann Joly, *Open Source Approaches in Biotechnologyu: Utopia* Revised, 18 and ff (2007) (arguing that, 'the emerging evidence … demonstrates the absence of a generalized anticommons effect in biomedical research'); and John P. Walsh et al., *View from the Bench: Patents and Material Transfers*, 309 SCIENCE 2002, 2002 (2005). Yet, although this is not the place to face this topic, consider Robin Feldman, Kris Nelson, *Open Source, Open Access, and Open Transfer: Market Approaches to Research Bottlenecks*, 7 NORTHWESTERN JOURNAL OF TECHNOLOGY AND INTELLECTUAL PROPERTY 14, 18 (2008) (arguing that, 'one can sometimes indirectly observe effects, even if one cannot directly measure the extent of a phenomenon'. In other words, some phenomena such as Open Source, Open Access and Open Transfer that economic agents – whether communities of innovators, or firms – increasingly endorse, show indirectly the existence of those innovation bottlenecks that empirical papers cannot directly and conclusively prove).

[31] See, e.g., Janet Hope, BIOBAZAAR: THE OPEN SOURCE REVOLUTION AND BIOTECHNOLOGY 47-49 (2008) (arguing that the research tools implemented in agricultural biotechnology combine information 'from many areas of biology, including crop genetics, breeding, agronomy, pest control and agro-ecology', which morph innovation into a cumulative and complementary phenomenon, 'in the sense that each invention builds on previous inventions, and … each invention contains elements derived from more than one source'); Paul Oldham, *An Access and Benefit-Sharing Commons? The Role of*

by binding efforts on the innovative paths and projects that firms' R&D

Commons/Open Source Licenses in the International Regime on Access to Genetic Resources and Benefit Sharing 2009, available at http://ssrn.com/abstract=1438027, (arguing that, '[l]ooking beyond software, members of the science community have been confronting difficulties in gaining access to journals and data, difficulties in obtaining materials under material transfer agreements, and problems in accessing patented research tools and technologies'); Patrick Gaulé, *Towards Patent Pools in Biotechnology?* 4 (2006), available at http://ssrn.com/abstract=1427751 (arguing that, 'in biotech the thesis of anticommons rests on two hypothesis: "(1) that developing commercial biomedical products requires access to many different IPRs and (2) that negotiating access with different patent owners is indeed prohibitively difficult and costly'); Sapna Kumar, Arti Rai, *Synthetic Biology: The Intellectual Property Puzzle*, 85 TEX. L. REV. 1745, 1757-1758 (2006-2007); David Blumenthal et al., *Data withholding in Genetics and the Other Life Sciences: Prevalences and Predictors*, 81 ACADE. MED. 137, 145 (2006); Jon F. Merz et al., *Diagnostic Testing Fails the Test*, 415 NATURE 577 (2002); Mildred K. Cho et al., *Effects of Patents and Licenses on the Provision of Clinical Genetic Testing Services*, 5 J. MOL. DIAGN. 3 (2003); and Gert Matthijs, *Gene Patenting and Licensing on and Beyond the BRCA Case*, 10 EUR. SOC'Y HUM. GENETICS 13, 14 (2004). From a more general perspective see, also, Carl Shapiro, Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting, *in* RESEARCH ON INNOVATION POLICY & THE ECONOMY 1 (AB Jaffe, J Lerner, and S Stern eds., 2000); Michael A. Heller, Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law* 5 J. Econ. Persp. 29, 32 and 35 (1991); and Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 849 (1990).

departments choose to pursue; and free and immediate access (also for developing countries) to essential, basic, upstream knowledge for passive consumption.[32]

In fact, during the last few decades not only communities of innovators, but even firms have tried to cope with this scenario where IPRs are ubiquitous, overlapping and fragmented, by developing different off-line tools, such as *Defensive Publishing*,[33] *Patent Portfolios*,[34] and (again) *Patent Pools*.[35]

---

[32] For the international dimension see, Dominique Foray, *Technology Transfer in the TRIPS Age: the need for new types of partnerships between the least developed and most advanced economies*, 31, 2009, available at http://ictsd.org/i/publications/50415/.

[33] See, e.g., Ed Levy et al., *supra* note 28, at 98 (explaining that 'defensive patenting is common among commercial firms [… because …] it provides a party with a repertoire of patents to prevent other parties from gaining a patent foothold in a technology. In addition, defensive patents can serve as counterclaim weapons if another party asserts patent invalidity. In this sense, such patents are also used as an offensive tool to build up protection around a patent portfolio to strengthen a firm's negotiating position with competitors (e.g., as in cross-licensing)').

[34] As an example of patent portfolios in specific fields, see Thomas M. Mackey, *Nanobiotechnology, Synthetic Biology, and RNAI*: *Patent Portfolios for Maximal Near-Term Commercialization and Commons for Maximal Long-Term Medical Gain*, 13 MARQ. INTELL. PROP. L. REV. 123 (2009).

[35] See also Feldman, *supra* note 12, at 124 (observing that, although this patent thickets can be faced by either inventing around existing patents or ignoring them, the former strategy is costly, while the latter is risky).

The advent of the Internet has been offering new opportunities to solve the issues regarding both the theoretical model for explaining innovation, and the problems related to its ownership and management. The Open Source experiences, such as the already established Open Source Software and the emerging Open Patenting, which have been occurring over the last few years, can show it. Although recalling many features of the off-line tools above mentioned, they present specific elements that derive from their being on-line tools.

II. The Open Source Movement and The Case of Open Source Software

A. The Open Source Movement

Based on the idea that the more a culture embraces knowledge, the more democratic, just, and fair it is, nowadays Open Source can be deemed as a spontaneous and compounded cultural movement that uses the Internet to promote the *aggregation* and *sharing* of contents in order to allow people, not only to take advantage from knowledge, but also to modify it in order to create new, diverse, and improved contents to be aggregated and shared

again. Indeed, although not subjected to a common direction, different open source experiences have been taking place over the last few years.

The first and most famous of these experiences is the *Open Source Software* (OSS), which realizes *Linux* and *Apache*, and which inspired another well-established phenomenon, that is, the *Creative Commons* (CC).[36] Put aside in-depth analyses of the similarities and differences between the two, whereas OSS "opens" the source-code of computer programmes, which are only strings of numbers whether protected by copyright or patent,[37] CC

[36] Creative Commons is a no-profit organization that works to 'increase the amount of creativity (cultural, educational, and scientific content) in "the commons" — the body of work that is available to the public for free and legal sharing, use, repurposing, and remixing.' – see http://creativecommons.org. In other words, the Creative Commons experience, which looks somehow more centralized than the OSS phenomenon, supplies scheme of licenses for music, movies, publications and other media contents that allows their creators to choose the type of rights that they want to associate to their creations. See, e,g,, Niva Elkin-Koren, *What Contracts Can't Do: The Limits of Private Ordering in Facilitating a Creative Commons*, 74 FORDHAM LAW REVIEW 101 (2005) (analyzing the legal strategy of Creative Commons and its potential for enhancing the sharing, distribution and (re)use of creative works); and Michael W. Carroll, *Creative Commons and the New Intermediaries*, 45 MICHIGAN STATE LAW REVIEW, 45 (2006) (arguing that by acting as a dis-intermediating force – because they enable end-to-end transactions in copyrighted works – the Creative Commons licenses have enabled new services and new online communities to form).

[37] Indeed, as section II.F explains, the OP phenomenon originates within the world of software.

"opens" copyright, which is instead a specific IPR that can protect several types of products[38].

Broadly speaking, indeed, the various experiences of "opening" that have been labeled as OS phenomena diverge a lot because of what they aim to "open". For instance, what has been recently "opened" in the domain of bioinformatics, genomics, and synthetic biology are the source-codes of some proprietary software developed to standardize and manage bio-data, whether copyright or patent protect these codes.[39] Differently, the *Fightaids@home* project "opens" computer capacity: in order to facilitate experiments directed to overcoming HIV drug resistance, it lends spare space to who is interested in experimenting and researching.[40] Other bio-projects, which aim to "open" the access to basic, upstream knowledge,

---

[38] See CHRISTOPHER M. KELTY, TWO BITS: THE CULTURAL SIGNIFICANCE OF FREE SOFTWARE 245-247 (2008), available at http://twobits.net/read (describing the migration of the OSS model to other domains as a 'modulating' process).

[39] See Feldman, Nelson, *supra* note 30, at 24 (arguing in connection to BioPerl, BioJava, and BioPython that 'these projects all make their work available under standard Open Source licenses, such as the GNU Lesser General Public License, version 2.1 [… and allow …] the development of quick and useful tools to facilitate the interchange of data amongst laboratories who kept their research in dissimilar formats'). In particular, it is worth to consider that the BioJava license requires that any patent license granted for a version of the original software be consistent with the full freedom of use specified in the license. Then, for a full description of the licensees for biology software see Stephen M. Maurer, *Open Source Drug Discovery: Finding a Niche (or Maybe Several)*, 75 UMKV Law Review 1, 6 (2007).

[40] http://fightaidsathome.scripps.edu/

"open" databases that pull together software tools with genetic materials,[41] or storage genetic data. In particular, the famous *HapMap Project*[42] has created a proprietary database of genotype data,[43] and "has opened" it via a specific licensing contract. The contract establishes that who uses the collected data commit themselves to a twofold clause: an "*open up clause*" not to file patent applications on information derived from the database; and a "*viral clause*" to share information only with others who have agreed to the same conditions.[44]

---

[41] Consider, for instance, the *NCBI Toolkit*, which collects some utilities, like *formatdb* and *blastall*, developed for the production, use, and distribution of some gene-databases, such as *GenBank*, *Entrez*, and *BLAST*.

[42] http://www.hapmap.org/thehapmap.html.en.

[43] As to the importance of having a property right upon the database, see Sara Boettinger, Dan L. Burk, *Open source patenting*, 1 JIBL 221 (2004) (observing that 'some large-scale biotechnology projects … have attempted to deter [others'] proprietary claims by rapidly injecting new discoveries into the public domain in order to frustrate the novelty requirement for patenting […]. However, researchers have become aware that simply relying on publication to place discoveries in the public domain may be insufficient, as it leaves them susceptible to capture in proprietary formats. While the publication of the Human Genome data is a step toward securing public access, it is no guarantee of public access, as publicly developed discoveries can be overlaid with proprietary modifications and improvements').

[44] Indeed, article 2 states that, "You may access and conduct queries of the Genotype Database and copy, extract, distribute or otherwise use copies of the whole or any part of the Genotype Database's data as you receive it, in any medium and for all (including for commercial) purposes, provided always that*: a.* by your actions (whether now or in the future), you shall not restrict the access to, or the use which may be made by others of, the Genotype Database or the data that it contains; b. in particular, but without limitation, i. you shall not file any patent applications that contain claims to any composition of matter of

In effect, some of the different "opening" strategies that have been happening in the realm of science try to cope with the difficulties arising from: (i) gaining free and easy access to journals and data;[45] (ii) obtaining materials under transfer agreements; and (iii) accessing patented research

---

any single nucleotide polymorphism ("SNP"), genotype or haplotype data obtained from the Genotype Database or any SNP, haplotype or haplotype block based on data obtained from the Genotype Database; and ii. you shall not file any patent applications that contain claims to particular uses of any SNP, genotype or haplotype data obtained from the Genotype Database or any SNP, haplotype or haplotype block based on data obtained from, the Genotype Database, unless such claims do not restrict, or are licensed on such terms that that they do not restrict, the ability of others to use at no cost the Genotype Database or the data that it contains for other purposes; and c. you disclose data obtained as a result of your access to and use of the Genotype Database only to other parties who have first confirmed to you in writing that they too are licensees under the terms of the International HapMap Project Public Access License and so are bound by equivalent terms and conditions to those that you have accepted under this License. ..." Yet, Gitter, *supra* note 28, (highlighting that the project is vulnerable to parasitic patenting, because 'source data access policy did not bind third parties who obtained the data through means other than the HapMap website and therefore ran the risk that such third parties can freely violate the terms of the access policy. [Further], the HapMap Project's open source data access policy lacked a clear enforcement mechanism and suitable remedy. The HapMap Consortium would have had to bring suit to enforce the data access agreement, which would strain the financial and administrative resources of this nonprofit project, and the Consortium also would not have been able to calculate with specificity the damages for breach of its contract, in light of the nonprofit nature of the project. Finally, the HapMap Consortium likely would have been unable to enforce its clickwrap data access license internationally, since such agreements are not enforceable worldwide.').

[45] See Melanie Dulong de Rosnay, *Check Your Data Freedom: A Taxonomy to Assess Life Science Database Openness* (2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1531387 (arguing that "technical accessibility should be ensured in order to allow scientists to download data easily and use them in any way, including ways that the initial creators had not considered").

tools and technologies.[46] For instance, referencing to the following sections for the projects aimed to "open" patents, the *Public Library of Science* (PLoS)[47] and the *ArXiv*[48] are born to "open" the off-line gates that prevent the free flow of information by publishing on line scientific articles; analogously, *SourgeForge*[49] is a repository that "opens" access to basic knowledge by enabling quick search, discovering and monitoring a state of the art which is daily updated. Further, in order to guarantee the open transfer of technologies and know how, since the beginning of 2000 several universities have been trying to mitigate the problems connected to the access to research rights by including specific clauses in their tech-transfer agreements. Via these clauses they have been attempting to reserve for themselves and other non-profit organizations the rights upon their innovations, even if the innovations in question have been licensed to commercial entities.[50]

Now, these "different dimensions of openness"[51] – which pivot around the Internet and increasingly powerful technological platforms – are deemed to flourish as an answer to the above mentioned "propertization wave" that has

---

[46] See Oldham, *supra* note 31,at 6.

[47] http://www.plos.org/

[48] http://arxiv.org/

[49] http://sourceforge.net/

[50] See Feldman, Nelson, *supra* note 30, at 20-22.

[51] This expression belongs to Linus Dahalander, David M. Gann, *How open is innovation?*, 39 RESEARCH POLICY 699 (2010).

flooded the IP world. However, to marginalize the diverse streams that converge into the Open Source movement to experiences that unrealistically fight against the "IP world" would be partial and *naïf*.

As evidence of that, the case of the Open Source Software (hereinafter, also "OSS") can help to explain how Open Source initiatives may offer firms with lucrative business strategies[52] – that, in addition, not only satisfy the need of a more "demand friendly" model of innovation, but also represent tools for lawfully employing the existing IPRs without sacrificing the ideals of a society and an economy that place knowledge at their heart.

Indeed, OSS not only amounts to a different regime for licensing copyrighted software, but implements a new idea of innovation, that represents as well a profitable venture and a form of legal innovation.

B. OSS: A Different Regime for Licensing Copyrighted Software

Whereas in traditional 'all rights reserved' licensing models for computer programmes, source codes are kept *secret* and software are available *on charge*, within OSS the licensing regime adopted *discloses* computer

[52] See, i.e., Martin Campbell-Kelly, Daniel D. Garcia-Swartz, *Pragmatism not Ideology: IBM's Love Affair with Open Source Software* (2008), available at http://ssrn.com/abstract=1081613.

program source codes and allows third parties to have access, use, and modify them *for free*.[53]

Because of these two differences, people tend to believe that the computer programmes produced and distributed with OSS belong to the public domain. Instead, they are copyrighted as well as any other computer program that since the 1980s in the US, and the 1990s in EU, meets the required criterion of creativity.[54] Better, the OSS phenomenon is strategically based on parasitic copyright protection for two reasons at least: first, the need to prevent third parties from copyrighting OSS products in place of their first developers;[55] second, the need for a tool, such as copyright licensing agreements, whereby those who enjoy and modify OSS source codes and computer programmes are required to comply with rules that guarantee the survival and proliferation of the OSS phenomenon. For instance, pioneer OSS developers could impose a "*not-challenging clause*",

---

[53] See, e.g., Eblen Moglen, *Freeing the mind: free software and the death of proprietary culture*, 56 MAINE LAW REVIEW 56 (2004); Benkler, *supra* note 27; Magnus Bergquist, Jan. Ljungberg, *The power of gifts: organizing social relationships in open source communities*, 11 INFORMATION SYSTEMS JOURNAL 305 (2001); Justin P. Johnson, *Open Source Software: Private Provision of a Public Good*, 11 JOURNAL OF ECONOMICS AND MANAGEMENT STRATEGY 637 (2002); and Eric S. Raymond, THE CATHEDRAL AND THE BAZAAR: MUSINGS ON LINUX AND OPEN SOURCE BY AN ACCIDENTAL REVOLUTIONARY (1999).

[54] See *supra* note 16.

[55] See Boettinger, Burk, *supra* note 50, at 224.

which obliges following OSS developers not to question the validity of the original copyright on the OSS products,[56] or a "*viral clause*",[57] which requires following OSS developers to make their improved source codes and software available under the same contractual terms that pioneer OSS developers set. For instance, according to the version 3.0 of the *General Public License* (*GPL*),[58] released in June 2007, OSS licensees must have free access to the source code; acquire the right to use the software, modify

[56] This type of clause is also named "patent peace" or "retaliation" clause. It provides that the license will terminate if the licensee initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the programme or a part of it.

[57] Boettinger, Burk, *supra* note 50, at 224; Gitter, *supra* note 28. Actually, some OSS licensing agreements provide the sole "attribution-only" clause, whereby third parties can freely deploy and use the OSS products as long as they attribute them to their originators. In fact, for these communities the shame for appropriating the "paternity" of someone else's creation is a deterrent sufficient to prevent third parties from closing up the OSS products for private gains. See, Greg R. Vetter, *Commercial Free and Open Source Software: Knowledge Production, Hybrid Appropriability, and Patents*, 77 FORDHAM L. REV. 2087 (2009).

[58] This licence – initially written by Stallman (end of '80s) for the GNU project and, afterward, improved by Eblen Moglen for the 3.0 version of 2007 – related to the project of developing a complete OSS operating system. The operating system was actually developed when the GNU project met the kernel written by Linus Torvalds and the result was Linux (or better GNU-Linux).

it, and further distribute it and its improvements as long as they adhere to the terms and conditions set by the GPL (or other OSS license). Indeed, when a *Berkeley Software Distribution* (*BSD*) license was released without the viral clause, Microsoft used parts of a *BSDed* code into XP and some other product and distributed them through the traditional 'all rights reserved' licensing model, the only condition being that it acknowledged that it had used a BSDed product.[59]

C. OSS: a New Model for Explaining Innovation

OSS accomplishes successfully a new idea of innovation that, as said above, the theoretical model traditionally employed to explain the innovative activity does not comprise.

First, OSS is *collaborative* innovation that flourishes within communities of independent people that choose voluntary to cooperate.[60] In each community there are many categories of interested people: those that use the software, those that contribute to it, and those that have the responsibility of the project as such, who authorize new version of the code to be added, and

[59] Even more interesting is the case of Apple, whose whole operating system relies on an OS project that allows to close up the source code (or, better, it does not impose any viral condition). The innovation added by Apple is in the users' interface, where actually Apple does not have competitors.

[60] See Strandburg, *supra* note 4, at 880-881.

who consolidate all the changes into the updated or upgraded version.[61] But for these diverse operational roles, those who take part to the OSS phenomenon do not embody different institutional interests, as for the interests of users/consumers versus the interests of inventors/producers.

Second, OSS represents *bottom-up* innovation, because it does not arise from the ideas of elites of managers that finance and control firms' R&D departments, but from the needs and wants of keen people, who rely on their efforts, skills and projects.

Yet, OSS goes beyond bottom-up innovation presenting features common to not only *User Oriented* innovation,[62] but also *User Generated* innovation,[63]

---

[61] See Eric von Hippel, Georg von Krogh, *Open Source Software and the "Private-Collective" Innovation Model: Issues for Organization Science* 9-10 (2009), available at http://ssrn.com/abstract=1410789

[62] OSS projects have been deemed to integrate customers' needs and wants into product development and marketing. See, e.g., Emanuela Prandelli, Giannmario Verona, Deborah Reccagni, *Diffusion of Web-based product innovation*, 48 CALIFORNIA MANAGEMENT REVIEW 109 (2006) (mapping the web-based mechanism currently supporting collaborative innovation in five different sectors).

[63] Always via the Web, firms have been attempting to leave consumers the option to take part to their innovative activities. Then, the ownership of user generated innovation may, in turn, belong either to the firm, as in the event of *Public Contest*, or – as this paper will further show – to the community of inventors/consumers, as in the case of Open Source. For the case of public contests see https://secure3.verticali.net/pg-connection-portal/ctx/noauth/PortalHome.do. Instead, for the case of open innovations see Eric Von

where those that generally are deemed as the end-points of the innovative activities become their protagonists. Indeed, whether to lessen their insecurities about themselves,[64] or to help others,[65] through OSS participants have begun to change their passive *status* of users/consumers into a more active one, regardless of any monetary rewards coming from their contributions.[66] Outside of professional routines and practices, they have been taking part to inventive and creative activities, on the one hand, by benefitting from someone else's inventions and works of art made freely

---

Hippel, DEMOCRATIZING INNOVATION 1–3 (2006) (discussing user generated innovations); Yochai Benkler, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM 1–2 (2006) (discussing the economic impact of open innovation); and Chris DiBona, Mark Stone, and Danese Cooper (eds.) OPEN SOURCES 2.0, 2006 (depicting open innovation).

[64] See, e.g., Terry Daugherty, Matthew S. Eastin, Laura Bright, *Exploring Consumer Motivations for Creating User-Generated Content*, 8 JOURNAL OF INTERACTIVE ADVERTISING, 2008.

[65] See, e.g., David Zeitlyn, *Gift economies in the development of open source software: Anthropological reflections*, 32 RESEARCH POLICY 1287 (2003).

[66] See,e.g., Jürgen Bitzer, Wolfram Schrettl, Philipp J.H. Schröder, *Intrinsic Motivation versus Signaling in Open Source Software Development* (2006), available at http://ideas.repec.org/e/pbi34.html.

available[67] and, on the other hand, by developing their own innovations, and making them publicly available.[68]

In other words, OSS is a species of innovation that overcomes the boundaries of involved firms which use it to both acquire information about consumers' tastes and involve people other from their employees in the innovative activity.[69]

Finally, OSS implements a new model of innovation that blurs together the "collective action model" – which consists in not establishing a property right upon inventions and works of art, and unconditionally supplying them to a common pool – and the "private investment model" – where innovation follows from a plan of balanced incentives that flow from private parties' property rights upon inventions and works of art.[70]

In sum, OSS embodies what innovation is – or is supposed to be – according to evolutionary economics, since OSS enables dispersed solutions and

---

[67] See, e.g., James Gerlach, Chorng-Guang Wu, Clifford E. Young, *An Empirical Analysis of Open Source Software Developers' Motivations and Continuance Intentions*, 44 INFORMATION & MANAGEMENT 253, 2007.

[68] OECD, *Open Innovation in Global Networks*, 2008.

[69] Joel West, *Policy Challenges of Open, Cumulative, and User Innovation*, 30 WASH. U. J. L. & POL'Y 17 (2009); and Henry Chesbrough, Open Innovation: A New Paradigm for Understanding Industrial Innovation, *in* OPEN INNOVATION: RESEARCHING A NEW PARADIGM 1 (Henry Chesbrough et al. eds. 2006).

[70] See von Hippel, von Krogh, *supra* note 69, at 10.

innovative hints to flourish – in R&D departments, instead, some of them would be cut of because of the limited financial, human, and intellectual resources available – and to be gathered together.[71] Indeed, OSS guarantees a great variety of options and paths to reach different solutions as it makes available a vast amount of codes that, otherwise, would not have come up with innovators of the same skills and thoughts. Moreover, because of these cumulative and collective processes of innovation participants can continuously monitor the state of the art – without being forced to constantly "reinvent the wheel"[72] – and modify the bouquet of solutions available for a specific problem.

Finally, OSS is an *Internet-based* innovation: without the Internet the above-described collaboration actively involving diverse and not-founded people would have not been possible.[73] The Internet, indeed, is not only the

---

[71] See, e.g., Pier P. Saviotti, *Innovation systems and evolutionary theories*, *in* SYSTEMS OF INNOVATION: TECHNOLOGIES, INSTITUTIONS AND ORGANIZATIONS 180-199, (Charles Edquist, 1997).

[72] See Benkler, *supra* note 27, at 376–77 where the Author argues that "[t]ransaction costs associated with property and contract limit the access of people to each other, to resources, and to projects when production is organized on a market or firm model, but not when it is organized on a peer production model."); and Raymond, *supra* note 61.

[73] Indeed, some scholars highlight that, at least in some industries such as agriculture and biotech, innovation has always been open, but in the last few 30-40 years. Not by chance, for illuminists scientific progress meant free and open dissemination of knowledge. See, in

lieu where those people's needs and wants meet, but also the place where the results of their encounters can be organized and aggregated almost for free or by sustaining very low transaction costs.[74]

D. OSS: A Profitable Venture

Since OSS can be freely used by anyone, anywhere, and for any purpose whatsoever, one can wonder whether it is possible to profit from OSS and whether it is an economically sustainable model.[75]

Figures show that OSS does not only produce scientific and social benefits,[76] available also for the good of developing countries – thereby

---

this regard, Keith Aoki, *Free Seeds, Not Free Beer: Participatory Plant Breeding, Open Source Seeds, and Acknowledging User Innovation in Agriculture*, 17 FORDHAM LAW REVIEW 101, 103-113 (2009) and Strandburg, *supra* note 4, at 873. Nevertheless, for a different opinion see Joly, *supra* note 30, at 11-12 (arguing that, 'Open science is said to have prevailed both in the fields of biotechnology and information technology in the pre 1980 era. […Yet,] this popular binary picture of an ideal "open science" period opposed to a grim commercialization period is in some respects naïve and should be contextualized. […] Although the biomedical academic community demonstrated some resistance to patenting in the early part of the 20th century, it remains uncertain that there existed any specific prohibitive norm against seeking intellectual property before the 1980s or after').

[74] Lee, *supra* note 28, at 896-897 and 915; and Aoki, *supra* note 81, at 102.

[75] See, e.g., François Lévêque and Yann Ménière, *Copyright versus Patents: The Open Source Software Legal Battle*, 4 REVIEW OF ECONOMIC RESEARCH ON COPYRIGHT ISSUES 27, 28 (2007).

answering those moral issues that the traditional model for managing innovations urges;[77] it also represents an economically successful enterprise for western world firms.[78] There are companies that make relevant profits,

---

[76] See, e.g., Amit Deshpande, Dirk Riehle, The Total Growth of Open Source, *in* PROCEEDINGS OF THE FOURTH CONFERENCE ON OPEN SOURCE SYSTEMS 197, 2008; Hope, *supra* note 31, at 20; Raymond, *supra* note 61, at 41; Strandburg, *supra* note 4, at 874-875; Joly, *supra* note 30, at 23-36.

[77] Boru Douthwaite et al., *Why Promising Technologies Fail: The Neglected Role of User Innovation During Adoption*, 30 RES. POL'Y 819, 819, 830–32 (2001) (explaining that user innovations improved farming technologies during the Green Revolution in Asia); Anil K. Gupta, *From Sink to Source: The Honey Bee Network Documents Indigenous Knowledge and Innovations in India*, 1 INNOVATIONS 49, 49–50, 65 (2006) (reporting on a project attempting to document local innovations and to "forge links" between local innovators and university researchers); and Strandburg, *supra* note 4, at 878 (arguing that, "User innovation is an important means of adapting mass market technologies to the needs of developing country citizens, because the local needs and preferences of citizens of developing countries are less likely to be accounted for in mass markets both because those citizens will be less likely to constitute economically important blocks of consumers and because mass market goods are likely to be designed in developed 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 but be able to exploit local knowledge and expertise in their innovative activities".

[78] See Sebastian von Engelhardt, Stephen M. Maurer, *The New (Commercial) Open Source: Does It Really Improve Social Welfare*, 2010, available at ssrn.com/abstract=1542180 (discussing whether open source can increase social welfare

such as Red Hat, Caldera, and SUSE (Novel) through the 'distribution' of the Linux operating system.[79]

OSS, indeed, produces several direct business advantages. For instance, on the supply side, OSS minimizes the material costs of innovation and the risk of failures even more than what traditional collaborative innovation can do because, thanks to the Internet, it demolishes administrative expenses and lowers labor costs.[80] Further, as well as other traditional pools, it allows facing the blocking effects that broad IPRs produce. Better, OSS morphs into a positive feature the network externalities and the public good

---

compared to "all rights reserved" approaches and – even more interestingly – noticing that "today's open source is increasingly dominated by business strategies in which firms make proprietary products whose quality depends on a shared OS code base"); and Stephen M. Maurer, Suzanne Scotchmer, *Open Source Software: The New Intellectual Property Paradigm*, 2006, available at www.nber.org/papers/12148 (arguing that each class of incentives connected to OSS produces a different impact on social welfare).

[79] See, e.g., Ronald J. Mann, *The Commercialization of Open Source Software: Do Property Rights Still Matter?*, 20 HARVARD JOURNAL OF LAW & TECHNOLOGY 1 (2006); Sandeep Krishnamurthy, An Analysis of Open Source Business Models, *in* MAKING SENSE OF THE BAZAAR: PERSPECTIVES ON OPEN SOURCE AND FREE SOFTWARE (Joseph Feller, Brian Fitzgerald, Scott Hissam and Karim Lakhani, eds. 2004) available at http://ssrn.com/abstract=650001; Vetter, *supra* note 65.

[80] See Lévêque, Ménière, *supra* note 83, at 35; and Raymond, *supra* note 61.

character of software.[81] On the demand side, OSS allows producing demand-oriented goods that, hence, are better at satisfying customers' tastes than supply-driven products and services.[82] More in general, because of the ideals underpinning them, OSS products enhance firms' reputation and public relations.[83]

OSS generates indirect revenues via its commercial distribution.[84] Once chosen the specific version of the OS product to distribute – a choice that is of the utmost importance – companies, such as IBM, HP, Sun, Red Hat or Canonical, combine it with several services into a compounded package that they sell on charge. Namely, with the OS product, which some of them still

---

[81] Marcus M. Dapp, Thomas Bernauer, *Hot Debate About Chilling Effects: Do Software Patterns Hamper/Free Open Source Software Development?* 12 (2009), available at http://ssrn.com/abstract=1590875. See also Alfonso Gambardella, Brownie Hall, *Proprietary versus public domain licensing of software and research products*, 35 RES. POL'Y 875 (2006) (arguing that OSS is a good designed to be a public good).

[82] Stefan Thomke & Eric von Hippel, *Customers as Innovators: A New Way to Create Value*, HARV. BUS. REV. 74, 74–79 (2002); and Strandburg, *supra* note 4, at 877.

[83] Joachim Henkel, *Selective Revealing in Open Innovation Processes: The Case of Embedded Linux*, 35 RES. POL'Y 953, 955, 960–62 (2006) (noting various industries in which free revealing takes place and explaining its utility); von Hippel & von Krogh, *supra* note 69, at 297–301, and 304.

[84] Besides commercial distribution, OSS projects can be funded via donation and/or advertising. The last revenue model, "advertising supported software", is described in Vetter, *supra* note 65, at 2218.

sell for free, these companies can provide the product on CDs rather than as an online download; services like installing; support and training; upgrading and customizing; and commit to shield the product against IP-related liability.[85] In other words, because of OSS, these companies have developed new business models whose added-value rests on the choice of selecting a specific version of the OS product – since open source products compete on the technical merits – and on the provision of services – from maintenance, to customization, support, and training – that they can offer together with the OSS products.[86]

Such a business, which is really based upon the transfer of knowledge, produces two positive effects that explain for what reasons the commercial distribution of OSS is a profitable enterprise. First, customers are capable of further developing the OSS in order to adapt it to the different needs that may arise – or, at least, to maintain their IT systems independently. Second, clients are free to choose the maintainer that they prefer without being locked-in with the software house that provides and installs the software

[85] This is, for example, the case of the Novell-Microsoft agreement that offers a shield to Novell's customers against the risk of violating Microsoft's IPRs.

[86] Sandeep Krishnamurthy, An Analysis of Open Source Business Models, *in* PERSPECTIVES ON FREE AND OPEN SOURCE SOFTWARE 279 (J. Feller ed., 2005); RON GOLDMAN, RICHARD P. GABRIEL, INNOVATION HAPPENS ELSEWHERE: OPEN SOURCE AS BUSINESS STRATEGY (2005).

(and that is the sole to have access to its source code), as it typically occurs in proprietary distribution.[87]

Besides being an economically successful venture, the development of OSS is also in the agenda of many governments[88] – even outside the European Union[89] – which consider it a crucial resource for transferring knowledge to citizens and for creating a real information society.[90]

---

[87] For the analysis of the lock-in effects that the development of OSS can limit see, e.g., Paul W.J. De Bijl, Michiel J. Bijlsma, and Viktoria Kocsis, *Competition, Innovation and Intellectual Property Rights in Software Markets* (2009), available at http://ssrn.com/abstract=1558903.

[88] See, *e.g.*, STEVEN WEBER, THE SUCCESS OF OPEN SOURCE 94 & ff. (2004) (commenting the evolution and growth of Linux) and PETER WAYNER, FREE FOR ALL: HOW LINUX AND THE FREE SOFTWARE MOVEMENT UNDERCUT THE HIGH-TECH TITANS (2000). See also Stefano Comino, Fabio M. Manenti, *Free/Open Source vs Closed Source Software: Public Policies in the Software Market* (2004), available at http://ssrn.com/abstract=469741 (assessing the impact on social welfare of public policies supporting OSS). For an overview of all political initiative in favor of OSS within the public administration see Robert W. Hahn, *Government Policy Toward Open Source Software* 5-6 (2009), available at http://ssrn.com/abstract=1411617.

[89] This is the case, for example, of Brazil. For details see Todd Benson, *Brazil: Free Software's Biggest and Best Friend*, New York Times, March 29 2005, available at http://googleblog.blogspot.com/2009/07/introducing-google-chrome-os.html. See also, Steve Kingstone, *Brazil Adopts Open-Source Software*, BBC News, 2 June 2005, available at http://news.bbc.co.uk/1/hi/business/4602325.stm. For recent discussion on open source in Brazil see Open source software in Brazil: too many projects to keep up with! Free

E. OSS: a Legal Innovation that Needs Support

The OSS experience shows that innovation may follow paths that are different from those thought by legislators and legal systems. Indeed, whereas traditionally scientific research communities rule over open innovations with unarticulated social norms, OSS introduces a specific private ordering,[91] based upon contracts,[92] in order to manage open

---

Software in Latin America, blog post dated 5 March 2009, http://news.northxsouth.com/2009/03/05/open-source-brazil-update/.

[90] Highly controversial is the role of governments in encouraging the development and the adoption of OSS. See, e.g., Bernard Reddy, David S. Evans, *Government Preferences for Promoting Open-Source Software: A Solution in Search of a Problem* (2002), http://ssrn.com/abstract=313202 (arguing that there is no evidence that the establishment of policy preferences in favor of open-source software on the part of governments would increase consumer welfare). A similar argument is developed by David S. Evans, Politics and Programming: Government Preferences for Promoting Open Source Software, *in* GOVERNMENT POLICY TOWARD OPEN SOURCE HAHN 34 (Robert W. ed. 2002). *Contra* Lawrence Lessig, OPEN SOURCE BASELINES: COMPARED TO WHAT?, *in* ID. 50; Jyh-An Lee, *New Perspectives on Public Goods Production: Policy Implications of Open Source Software* (2006), available at http://ssrn.com/abstract=963491; Brian Fitzgerald, and Nic Suzor, *Legal Issues for the Use of Free and Open Source Software in Government* (2005), available at http://ssrn.com/abstract=1388922.

[91] See, e.g., Raymond, *supra* note 61, at 87–92 (discussing the concept of "ownership" of open source projects); and Weber, *supra* note 96, at 88–93 (using the example of Linux and its creator Linus Torvalds).

innovation. After all, since IPRs are tools that are to be shaped in order to foster innovation, OSS provides an alternative, flexible, and voluntary IP legal tool that can be used to overcome the difficulties inherent to the current IP legislative regimes,[93] without producing any *ex ante*, universal reform of them.[94] From this perspective it can be stated that OSS current licensing system constitutes a "legal innovation".[95]

Yet, the initial approach of the legal system towards the OSS phenomenon has been that of preventing processes that were unknown and not *a priori* decided, and eventually adjusting to them. The early, strong skepticism towards the enforceability of OSS licenses (and all open licenses), although

---

[92] See, Lee, *supra* note 28, at 915 and 970; Emmanuelle Fauchart & Eric von Hippel, *Norms-Based Intellectual Property Systems: The Case of French Chefs*, 19 ORG. SCI. 187 (2008) (describing the social norms that French chefs follow to respect one another's intellectual property); and Lévêque, Ménière, *supra* note 83, at 29.

[93] See Strandburg, *supra* note 4, at 880-881.

[94] Estelle Derclaye, *Not only innovation but also collaboration, funding, goodwill and commitment: which role for patent laws in postcopenhagen Climate change action*, 9 THE JOHN MARSHALL REVIEW OF INTELLECTUAL PROPERTY LAW 161, 167 (2010); and Joly, *supra* note 30, at 2.

[95] For a broader definition of 'legal innovation' see Thomas S. Ulen, Nuno Garoupa, *The Market for Legal Innovation: Law and Economics in Europe and the United States* (2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=972360 (arguing that there has been a large number of innovations in legal scholarship in the U.S. legal academy over the past 25 or so years and very few from legal scholars in other parts of the world).

nowadays almost fully outdone, is the sign of such slowness to adapt to the changes that the Internet generates.

In particular, enforceability issues arise when a GPLed (or otherwise openly licensed) product is used by a licensee outside the scope of the license – i.e. without complying with the terms and conditions set by the licensor – and the licensor seeks to stop such behavior by taking legal action.[96]

The first point to face when dealing with the enforceability issue concerns the ownership of OSS. Given the collective development process, the right holders need to be identified so to have prospective plaintiffs and defendants of any legal action. The Free Software Foundation (FSF)[97] recommends all

[96] Lack of compliance to an OSS licence is manifold. It can occur that the source code is appropriated and 'closed up' (for example merged with new code and released in a proprietary way, such as 'all rights reserved') or is patented by free-riders. Alternatively, the terms of licence can be violated with regard to the distribution of derivative works; most times it is the 'viral clause' to be violated, which produces again a 'closing up' effect. On the other hand, OSS developers can be challenged for having infringed patented software by using and elaborating code that is protected (so called 'opening up' of closed source code).

[97] The Free Software Foundation is a non-profit with a worldwide mission to promote computer user freedom and to defend the rights of all free software users. It promotes the development and use of free software and documentation — particularly the GNU operating system — and by campaigning against threats to computer user freedom like Digital Restrictions Management (information on the campaigns undertaken are available at http://www.fsf.org/compaings/).

OSS developers to assign copyright ownership of their work to the FSF as this can enforce the license better in case of infringement. Another solution adopted is to assign the copyright to the project within which the software is developed.[98] Each project, thus, governs the issue of ownership by assigning it to the FSF or to the project maintainer. Where the ownership is not assigned to the FSF, this can still act on all violations that are reported to it, or at least offer assistance to any copyright holder that wishes to do so.[99]

Secondarily, when facing the issue of validity of OSS licenses, it is worth mentioning that within the OSS movement there is a strong mechanism of 'informal enforcement'. Whenever the non compliance with the OSS licenses occurs between two parties both 'involved' in the OS movement (such as two developers, or an OS project and an OSS distributor), the problem tends to be solved through an informal procedure. This starts with a report that is turned in to a specific office of the FSF in charge of monitoring violations and of receiving complains. Then, the office will

[98] An example of OSS projects are those coordinated by the Apache Software Foundation (ASF) (http://www.apache.org/) that was born as a natural outgrowth of The Apache Group, a group of individuals initially formed in 1995 to develop the Apache HTTP Server. Besides monitoring that its software products are not "abused" by other organizations, the ASF also provides a means for individual volunteers to be sheltered from legal suits directed at the Foundation's projects.

[99] See "Violations of the GNU licenses", at http://www.gnu.org/licenses/gpl-violation.html.

further investigate and contact the alleged infringers who most of the time are pleased to follow advice and correct any mistake they have incurred in.

More controversial are the cases of non compliance with the OSS licenses that involve parties not member of the OSS movement as they raise the issue of enforceability via courts.

Although the already mentioned initial skepticism, current case law tends to affirm the enforceability of OSS licenses (even those more 'restrictive' such as the GPL) under copyright law in terms of copyright infringement.[100]

Two main decisions can be mentioned as they show the general acceptance of the OS licensing although they are given different interpretation as to the legal nature of the violation that took place.

In 2004 the German lower regional court of Munich confirmed a temporary injunction enjoining the distribution of OSS in breach of the GPL's

[100] Despite the fact that few decisions expressly qualify the violation of the OSS licenses as copyright infringement and not breach of contract, still controversial is the issue related to the their legal nature as licenses or contracts. Such difference matters as to the requirements to be enforced – while licences are enforced under copyright law, contracts can be enforced when they are validly concluded – as well as to the penalties available. See Andres Guadamuz-Gonzáles, *The license/contract dichotomy in open licenses: a comparative analysis* (2009), available at http://ssrn.com/abstract=1372040 (arguing that there is not a clear split between civil and common law traditions on whether these open licenses are contracts).

requirements to Weller as the maintainer of the project.[101] The legal action was brought by Harald Welte, founder of the Gpl-violations.org, who instructed few successful cases in front of the German courts.

The defendant, Sitecom, had used OSS code within its products without providing access to the source code, thereby the court prohibited it from distributing them. The GPL license terms were deemed validly agreed between the parties by way of standard license terms and conditions, and that the defendant was held in breach of the license[102].[103]

---

[101] LG München, dated May 19 2004, Az. 21 O 6123/2004 (text in English available at http://www.oii.ox.ac.uk/resources/feedback/OIIFB_GPL2_20040903.pdf)

[102] The court, however, did not take a position on the legal nature of the licenses. Even though the remedy adopted belongs to copyright law, there is not consent on the fact that OSS licenses under Germany law constitute copyright infringement. See, e.g., Guido Westkamp, *The limits of open source: lawful user rights, exhaustion and co-existence with copyright law*, INTELLECTUAL PROPERTY QUARTERLY 14, 19 (2008).

[103] Similar outcomes have been achieved in the following German cases: District Court of Munich I, In re Welte v Sitecom Deutschland GmbH, December 4, 2005, 21 O 7240/05; District Court of Frankfurt am Main, In re Welte v D-Link Deutschland GmbH, September 22, 2006, 2-6 O 224/06; District Court of Berlin, 16 O 134/06, February 21, 2006 In re Wireless LAN Software; District Court of Munich I, 7O5245/07, July 24, 2007, In re Voice over IP Telephone. For comments see Mark Henleya, Richard Kemp, *Open Source Software: An Introduction*, 24 COMPUTER LAW & SECURITY REPORT 77 (2008); Julia Höppner, *The GPL Prevails: an Analysis of the First-ever Court Decision on the Validity and Effectivity of the GPL* (2004), available at http://www.law.ed.ac.uk/ahrc/script-

Differently, in August 2008 the Federal Circuit[104] – the Unites States Court of appeals – vacated and remanded a lower court's decision that held that the violation of a GPL licence was breach of contract. The Federal Circuit held that a breach of conditions of a GPL is rather copyright infringement.[105] The case was significant because up until that point there had been little judicial discussion of the legal operation of open copyright licenses in the US. The decision provided a unique and welcome insight into the legal operation of free and open source software licenses and by analogy Creative Commons styled open content licenses.[106]

---

ed/issue4/GPL-case.asp; for criticism, see Thomas Hoeren, *The First-ever Ruling on the Legal Validity of the GPL: a Critique of the Case* (2004), available at http://www.oii.ox.ac.uk/resources/feedback/OIIFB_GPL3_20040903.pdf.

[104] Jacobsen v. Katzer, 535 F.3d 1373 (Fed. Cir. 2008), vacated, Jacobson v. Katzer, No. C 06-01905 JSW 2007 U.S. Dist. LEXIS 63568 (N.D. Cal. Aug. 17, 2007). For comments see Brian F. Fitzgerald, Rami Olwan, The Legality of Free and Open Source Software Licenses: The Case of Jacobsen v. Katzer, *in* KNOWLEDGE POLICY FOR THE 21ST CENTURY (Mark Perry, Brian F. Fitzgerald eds. 2008).

[105] See Till Jaeger, Julia Gebert, *USA: Open Source Licensing - "Jacobsen v Katzer"*, INTERNATIONAL REVIEW OF INTELLECTUAL PROPERTY AND COMPETITION LAW (IIC) 346 (2009).

[106] For a different point of view see Robert W. Gomulkiewicz, *Conditions and Covenants in License Contracts: Tales from a Test of the Artistic License*, 17 TEXAS INTELLECTUAL PROPERTY LAW JOURNAL 335, (2009) (arguing that the decision, by teaching valuable

More concern emerges in relation to the cases of ”opening up” or patent infringement by OSS developers and OSS distributors, such as in the saga of *SCO v IBM*.[107] The example offered by this case can help to understand what is meant by “opening up” of patented code, which constitutes, at the same time, patent infringement. SCO claimed that it owned part of the UNIX kernel code which is used by IBM on the machines running Linux distributions. It then threatened to sue every corporate Linux-user for copyright infringement, claiming that any Linux user must have purchased a license from it. After years of litigation, that involved also Novel, in 2007, the district court of Utah concluded that the rightful owner of the copyright covering the Unix operating system is Novel, and rejected SCO’s claim.[108]

---

lessons about conditions and covenants in license contract, raises the question whether licensors can manipulate the distinction between covenants and conditions in such a way to fruits from the application of copyright laws).

[107] For an initial comment see Kimmo Nikulainen, *Open Source Software: Why is it Here and Will it Stick Around?*, 1 SCRIPT-ED 136 (2004), available at http://ssrn.com/abstract=1137551. Information on the final part of the saga are available at http://www.groklaw.net/staticpages/index.php?page=20061212211016210

[108] The case was given huge attention from the media. All documents are available at “GrokLaw”, http://www.groklaw.net/staticpages/index.php?page=20041008201501977#scovibm. See also Brian W. Carver, *Share and Share Alike: Understanding and Enforcing Open Source and Free Software Licenses* (2005), available at http://ssrn.com/abstract=1586574.

The case was given massive media attention as it related to the issue of legal implications of software patents for the OSS, which was already raised, from a theoretical perspective in an Open Source Risk Management Report where 283 granted patents were deemed to be potentially used against the Linux kernel.[109]

F. OSS: Moving towards OP

It emerges from the SCO saga that software patents are considered a significant barrier to the development of OSS, as confirmed by the Free Software Foundation's struggle against the so called Computer Implemented Invention Directive (CII Directive).[110]

Since software patents protect not the expression but the functionality of computer programmes, software patents prevent any other computer programmer from independently developing a piece of software with a comparable functionality, even if the regarded stings of code are

---

[109] Press Release, Open Source Risk Management, Results of First-Ever Linux Patent Review Announced, Patent Insurance Offered (Aug. 2, 2004), available at http://www.osriskmanagement.com/press_releases/press_release_080204.pdf.

[110] For the full text of the proposed Directive and for other official documents regarding it, see http://ec.europa.eu/internal_market/indprop/comp/index_en.htm. To be sure, the EU CII Directive does not represent a real novelty: it mainly restates the current EPO's approach.

different.[111] Whenever a string of code is included in a software patent, any other program performing the function of the patented code infringes the patent.

Interestingly enough, ways around to the risk of infringing software patents have already been put into practice, amounting to unilateral or multilateral pledges to not use patents against OSS projects.

Private initiatives have developed to prevent patents from performing their blocking effects and to enable OSS proliferation in a secure environment.

The example of *PatentCommons*[112] is paradigmatic of the strategic use of patents that can be adopted to privately answer to the software patent threat.[113] Supported by the Linux foundation, *PatentCommons* consists in an

---

[111] See, e.g., Marcus M. Dapp, Thomas Bernauer, *Hot Debate About Chilling Effects: Do Software Patterns Hamper/Free Open Source Software Development?* 14 (2009), available at http://ssrn.com/abstract=1590875 (observing that three different empirical phenomena could show whether software patents actually decrease the pace of FOSS innovation : (i) whether FOSS developers have become targets of litigation over infringements on software patents; (ii) whether FOSS innovation is slower or smaller because of the increasing number of software patents; and (iii) whether software patents have been negatively affecting FOSS developers' motivation. The Authors focus on the third phenomenon).

[112] See http://www.patentcommons.org/.

[113] Oliver Alexy, Markus G. Reitzig, *Gaining it by Giving it Away: Capturing Value in "Mixed" Appropriability Regimes* 6 (2010), available at http://ssrn.com/abstract=1430328 (analyzing patent pledges as a strategic reactions to the Open Source Risk Management

on-line collection of software patents that their owners make available to third parties on specific terms and conditions, which as well are available on-line. Therefore, third parties that want to use these patents do not risk infringing them, although they do not engage in those cumbersome negotiations that usually come before licensing agreements. The on-line database of the pledges and covenants associated to each collected patent explains, indeed, how far third parties can push their use of the collected patents, without any necessity of any further individual negotiation. In other words, *PatentCommons* works as a "facilitator" of patent trade: it supplies an easy-to-access description of what third parties can do with the collected patents, because it gathers on-line the self-limitations that each patentee chose to impose to her IPRs.

In effect, by making what *PatenCommons* calls a "commitment", the patentee retains her exclusive right but gives third parties the permission to engage in activities that she could otherwise prevent, or for which she could collect damages or royalties. For example, the patentee can commit herself to allow third parties – the so-called beneficiaries – to use her patents under specified terms and conditions, by identifying the scope of permissible activities and purposes for which the patents can be used without risk. Further, the patentee can provide for a "defensive termination provision",

---

(OSRM) report, published in 2004, which identifies patent as a threat to the existence of OSS-based business models).

which identifies conduct that, if engaged in by a beneficiary, gives the patent holder the right to enforce the patent;[114] or for a "reservation of rights clause", which allows the patent owner to terminate the commitment if a beneficiary fails to comply with the statement of permitted uses or engages in conduct triggering a defensive termination provision.

In sum, *PatentCommons* represents a *web library* of the licensing terms and conditions "attached" to each of the patents registered in this virtual library – a repository that comprises the commitments adopted for about 500 different patents by 16 assignees and that can be searched by patent title, abstract, type of patent, patent number, or assignee.[115] However, since each patent has different licensing terms and conditions, *PatentCommons* does not offer a comprehensive and easy-to-manage defense against software patents, although – as said before – it is an interesting example of how players are facing the issue of software patents using them for their benefit.

---

[114] Similar clauses are very common in Open Patent projects. For instance, under the scheme of the *Eco-Patent Commons*, which today involve eco-friendly patents, if a non-pledger asserts its right against a pledger, this last can terminate its agreement not to sue. In this regard, see Derclaye, *supra* note 91, at 166-67.

[115] As to the connection between "open science" and databases, that is to say, as to the relationship between openness and well-organized, exhaustive, and freely accessible storages of basic (upstream) information, see Stephen M. Maurer, *New Institutions for Doing Science: From Databases to Open Source Biology*, 1999, available at http://gspp.berkeley.edu/iths/MaurerCV.htm.

III. THE CASE OF OPEN PATENTING

A. OP: An Emerging Phenomenon

The strategic use of software patents that firms adopt to foster the development of OSS does not restrain to repositories of covenants and pledges, but extends further to the *use* of acquired and donated software patents.

In order to improve the applications for, and components of, Linux operating system, OSS distributors – such as Red Hat and Novel, which have a clear commercial interest in having Linux unchallenged – and more traditional IT companies – such as IBM, NEC, and Philips, which are interested in promoting themselves as players that support Linux, because consumers perceive Linux as an innovation driver – established the *Open Invention Network* (*OIN*).[116] *OIN* is an *on-line pool* of about 100 patents (donated to, or acquired by, *OIN*)[117] that pivots around *a standard license agreement*, which requires each patentee to grant her software patent

[116] See http://www.openinventionnetwork.com/

[117] Oliver Alexy, Markus G. Reitzig, *Gaining it by Giving it Away: Capturing Value in "Mixed" Appropriability Regimes* 6 (2010), available at http://ssrn.com/abstract=1430328 (arguing that the real strategic use of software patents consists in their continuous acquisition by organizations that want to create a safe environment for the development of OSS).

combined with a "*not-challenging clause*" in exchange for the possibility to use any other of the patents that belong to the *OIN*'s pool. In other words, on the one hand, each software patent owner grants to *OIN* a royalty-free, worldwide, nonexclusive, non-transferable license for making, having made, using, importing, and distributing her patent in relation to any Linux System and commits herself not to assert her patent against the Linux operating system or certain Linux-related applications. On the other hand, *OIN* grants to each patentee and other licensee a royalty-free, worldwide, nonexclusive, non-transferable license to make, have made, use, import, and distribute products or services involving *OIN* patents, included those activities that in absence of the license would be inducement to infringe or contributory infringement (or infringement under any other analogous legal doctrine in the applicable jurisdiction). Further, the *OIN* licenses provide for a sort of "*viral clause*" that establishes that *OIN* patents cannot be assigned or licensed unless the assignment or license is made subject to the terms of the *OIN* license.[118]

[118] See, e.g., Lévêque, Ménière, *supra* note 83, at 42 (speaking about defensive patenting and arguing that, 'many of the patents that could threaten open source software communities are actually owned by members of these communities. It is usual for large hardware and software firms involved in open source projects to file patents systematically, even though they intend to share the patented programs as open source software. They do so to prevent other firms from doing it in their place and in order to accumulate bargaining chips in case of litigation').

In order to facilitate OSS projects and developers, *OIN* does not only create a repository of different pledges and covenants. In the first place, it is a pool of the patents available under a standard licensing agreement that, as such, grants patents that are easier to manage. In the second place, *OIN* serves both to strategically defend OSS against parasitic patenting and to make proselytism via the viral clause that the standard license encompasses.[119]

A similar proactive use of patents is witnessed within the field of biotechnology, where there is a strong move towards an open approach to both research tools and results, to the extent of envisaging "open biotechnology" as a subset of "open science".[120] A successful example is provided by the *BiOS* project,[121] born within CAMBIA,[122] an independent, non-profit research Australian institute, which guarantees open access to some patented and not patented biological materials, research tools and

[119] Feldman, *supra* note 12, at 135 (arguing that, when moving from the context of OSS and Creative Commons to the patent context, 'the patent holder exercises its patent rights by requiring that those who use or modify the research technology agree to maintain the open nature of the core technology and any improvements').

[120] Andrés Guadamuz Gonzáles, *Open Science: Open Source Licenses in Scientific research*, 2005, available at http://ssrn.com/abstract=764064, 11; and Feldman, Nelson, *supra* note 30, at 24-25.

[121] http://www.cambia.org.au/daisy/bios/10/version/live/part/4/data.

[122] For the story of CAMBIA see Guadamuz-Gonzáles, *supra* note 114, at 14.

techniques via specific kinds of licensing agreement, such as the "BiOS Mutual Non-Assertion Agreement" and the "CAMBIA DRAFT PMET BiOS 2.0 agreement".[123] Those who join the *BiOS* "concordance" agree to the same principles of responsible sharing, in order to create a protected commons for enabling technologies, tools and platforms for basic innovation – in a word, for "the tools of innovation"[124]. Namely, (i) they agree not to assert their IPRs against those who use them to do research, or to develop products either for profit or for public good; and (ii) they concur on sharing all the improvements derived through the use of their IPRs that are offered royalty-free for researching or developing products. In other words, in exchange for the right to use the *BiOS* commons, the *BiOS*

[123] http://www.bios.net/daisy/bios/mta/agreement-patented.html, devoted to "promote the development and improvement" of "enabling technologies, tools and platforms for basic innovation" and to "make such developments and improvements freely accessible to both academic and commercial parts" (§§ A and B).

[124] Indeed, the letter C of the above-mentioned agreements establish that, who "owns or controls the rights to certain enabling technologies and associated patents, patent applications, knowhow, and materials … is willing to grant the right to use […them …] to any party, without discrimination as to payment of fees of any kind, that agrees to all the terms of this Agreement." In other words, sharing the principles and the *modus operandi* of BiOS is the *condicio sine qua non* for enjoying BiOS' assets.

licenses include both a "*non-challenging clause*"[125] and a "*grant-back clause on improvements*".[126] Thus, also the *BiOs* participants are involved into a *de facto* online patent pool,[127] which the above-mentioned standard agreements call "a dynamic mutual non-assertion pool". In addition, these agreements introduce a sort of viral clause, by establishing that "it is in the interest of the parties" that sign the *BiOS* agreements "to set their

[125] Indeed, clause no. 1 of the above-mentioned agreements states that, "in return for Steward's royalty-free grant to you of the right to use this IP and Technology and any derivatives without threat of assertion, you agree: a. not to assert any intellectual property rights, including patents, pending patent claims, or bailments, to this IP and Technology and any derivatives, in any way, against any others that have agreed to these conditions; and b. not to accept any license or third party grant of rights conflicting with 1a. Use of this IP and Technology under any conditions not conforming to the conditions above is not permitted."

[126] For instance, clause no. 5 of the above-mentioned agreements states that, "You may also use and distribute any derivatives you make using the IP and Technology that constitute enabling technology, but only if you make them available to others under the terms of this Agreement and at a price not to exceed reasonable cost of production."

[127] See Katherine M. Nolan-Stevaux, *Open Source Biology: A Means to Address the Access & Research Gaps*, 23 SANTA CLARA COMPUTER & HIGH TECH. L. J. 271 (2007); and Levy et al., *supra* note 28, at 88.

[proprietary rights] aside for the benefit of all who agreed to share in the same way".[128]

Another initial attempt to formulate a standard open license for patents is under study within the *GreenXchange* project, launched by Science Commons at the beginning of 2009. If the goal will be achieved, it has been said that a very innovative and open use of patents will be experienced within sectors other than biotechnology. The project – funded by Nike, Best Buy, Yahoo!, Mountain Equipment, Co-Op, IDEO, nGenera, 2Degrees, Salesforce.com, University of Washington, Outdoor Industry Alliance, and coordinated by Creative Commons – aims to stimulate innovation by supplying both the so-called "*License Data Record*" – a repository of the main data regarding the patentees and licensees involved in the *GreenXchange* project[129] – and the so-called "*Public License Offer*" – a public contractual scheme for patent licensing.

---

[128] See, letter E of the above-mentioned agreements. Further, see Graeme O'Neill, *'Open-source biology' stance earns international honour*, Australian Biotechnology News, 2003, http://www.cambia.org/daisy/cambia/159/version/default/part/AttachmentData/data/"Open-source_biology'_stance_earns_international_honour".pdf

[129] All patents conferred in the repository share the same "Research Non-Assertion Pledge", specifically made for the benefit of the researchers and institutions. The pledge is a non-challenging clause whose scope is limited to non-profit institution for non-commercial uses.

The idea behind the project is that of using the Internet as the means to identify all patents that are licensed through the GreenXchange license. Indeed, on the one hand, the *standardized* register would enable not only integration with the major search engines, software systems, and content creation systems, but also the possibility to read a standardized description of both patents and the contractual clauses under which they are offered for licensing. On the other hand, the public license offer would provide a public model of patent license that is primary devoted to make available for other uses, on reasonable and non-discriminatory terms (preferably free of charge and without unnecessary field limitations), patents that are being held either for defensive purposes – i.e. "*paper patents*" – or in other fields of use.[130] By doing this, patents that have been filed just for augmenting the patent portfolios and acquiring bargaining chips can find an industrial use in another field without diminishing their original defensive function.

[130] Michelle LaBrosse, *Trends affecting the workforce*, 36 EMPLOYMENT RELATIONS TODAY 79, 81 (2010) (arguing that "Nike's air-bag patent for cushioning shoes was identified as having environmental benefits in other industries, such as prolonging the useful life of tires. Nike is one of the leaders for the GreenXchange, which encourages collaboration and innovation among businesses in ways that can not only clear hurdles regarding ownership, credit, and patent rights, but also address global problems. Through the GreenXchange, Nike can license the air-bag technology selectively to noncompeting companies.")

As usual, the public nature of this licensing model works as a "facilitator" of the patent trade: it should serve both to publicize patentees' willingness to license their rights on reasonable and non-discriminatory terms, and to encourage would-be licensees to make plans and decisions about patents' technology implementation that, in the absence of the information so disclosed, would be complicated or impossible. Instead – differently from what seen above – the *GreenXchange* licensing model provides not only "a not-challenging clause" but also a path to commercialization, that is to say, a scheme of rules for the payment of royalties. Indeed, firms that grant their patents to *GreenXchange* have the option of charging users a fixed annual licensing fee. Better, in the long terms the project aims at the establishment of a *clearing house* for all the commercial uses.

In sum, nowadays different models co-exist in what has been deemed the raising realm of OP, and they shade one into the other as along a continuum.[131] The following table tries to reproduce this scenario by looking at each of the described experiences from the perspective of the recurrent clauses that the agreements above analyzed comprise.

[131] Jonathan Chambers, *Sharing Ideas: Collaboration Strategies for Intellectual Property in a Warming World* 2010, available at http://www.files.ethz.ch/cepe/Papers2010/11.pdf.

	Not-challenging clauses	Grant-back clauses	Viral clauses	Commercial clauses
OIN	X	X	X	
BioS	X	X	X	
GreenXchange	X			X

Table 1. What clauses do OP licensing schemes share?

It emerges from the above table that, first, all experiences constitute phenomena of patent pooling because the not-challenging clause that they all adopt guarantees participants not to be suited for the use of the patents that they put in common. Second, whereas *OIN* and *BiOS* prevent free riding trough the adoption of grant-back and viral clauses that enable participants' new results to be kept within the common pool and managed upon its rules,[132] *GreenXchange* seems not to care about the free riding issue. It aims to enable patents, including paper patents, to find an industrial application and, hence, a commercial use in sectors other than the one where they have been filed.

[132] Interestingly, although the genetic data collected within the HapMap Project are not patented, but belong to the public domain, the *HapMap*'s licensing agreement establishes similar clauses (a not-challenging and a viral clause) in order to prevent parasitic patenting – see *supra* footnotes 48 and the accompanying text.

As it comes out from the above picture, OP is still a much compounded phenomenon that already raises some critical issues.

B. OP: Current Issues

The open approach that OP envisages for patents has lead to concerns and critiques.[133] Some are specific to the rationale of patent systems; others are inherent to the procedure underpinning the grant of patents; and others regard the licensing scheme adopted to realize OP.

The main skepticism towards OP licenses derives from the assumption that they would be incompatible with patent policy goals, by diminishing the incentives available to innovators and, hence, the overall level of innovation. Indeed, if patents are supposed to be appropriability tools[134] as

---

[133] See, e.g., Wesley M. Cohen, Does Open Source Have Legs?, *in* INTELLECTUAL PROPERTY RIGHTS IN FRONTIER INDUSTRIES (Robert W. Hahn ed., 2005); and Maurer, Rai, Salij, *supra* note 56; and Kenneth N. Cukier, *Open Source Biotech. Can a Non-proprietary Approach to Intellectual Property Work in the Life Sciences?*' (2003), available at http://www.cukier.com/writings/opensourcebiotech.html.

[134] Broadly speaking, the term "appropriability" when referred to goods addresses one's ability to earn their net-value. See, e.g., Jonathan M. Barnett, *Private Protection of Patentable Goods*, 25 CARDOZO L. REV. 1251 (2004); and Richard C. Levin et al., *Appropriating the Returns from Industrial Research and Development*, 3 BROOKINGS PAPERS ON ECONOMIC ACTIVITY 783 (1987) (showing via a survey that patents were

well as incentives to innovate, it can be argued that OP licenses would nullify such functions by diminishing innovators' ability to recoup the efforts and expenses afforded to develop innovations. In other words, OP licenses would decrease the overall level of innovation by discouraging innovators from investing in present and future innovation, because they would reduce the amount of benefits coming from the patented innovations – say, for simplicity's sake, "downstream economic returns".[135]

Actually, in order to argue that the OP phenomenon does not conflict with the goals of patent systems, it is not necessary to confute the idea that it is likely to reduce these downstream economic returns. Rather, by moving away from the idea that individuals innovates just for money,[136] it can be

---

generally rated the least effective of the mechanisms of appropriation. Indeed natural secrecy, lead time and recognition lags, learning curves, first-mover advantages accruing to the innovator, and sale or service efforts, were regarded as substantially more effective than patents, especially in protecting product inventions). Further, see. Frank H. Easterbrook, *Foreword: The Court and the Economic System in The Supreme Court 1983 Term*, 98 HARV. L. REV. 4, 21-29 (1984) (naming the Supreme Court's utilitarian and instrumental approach to IPRs as the "*ex ante* perspective on intellectual property"). Further, see Mariateresa Maggiolino, INTELLECTUAL PROPERTY AND ANTITRUST: A COMPARATIVE ECONOMIC ANALYSIS OF US AND EU LAW 2010, ch 1.

[135] Feldman, *supra* note 12, at 120.

[136] In other words, if it is assumed that inventors who apply for patents would still make and publish discoveries if intellectual property incentives did not exist, the total level of

maintained that OP does not diminish the overall amount of innovative incentives, because it guarantees more prestige and social acceptance (non-economic incentives) in lieu of lost profits. Second, by looking at the above-mentioned projects, it can be asserted that OP does not reduce the overall level of innovation because it solves some of the blocking problems created by the present patent system, as the *OIN* and *BiOS* pools exemplify, and it gives the opportunity to exploit patents that, otherwise, would remain useless, as the *GreenXchange* initiative shows.[137]

More in general, indeed, OP could be devoted to all those innovations that do not attract the interest of the business world, either because they – such as the drugs for neglected diseases[138] – produce low profits, or because the likely profits that they could produce are not envisaged by their patentees, as it happens in the case of paper patents.

Further, OP may entail less downstream economic returns but it entails, as well, less costs and risks.[139] Although it is true that research and

---

innovation cannot diminish just for some restrictions to patent scope. See, in this regard, Gambardella, Hall, *supra* note 89.

[137] Feldman, *supra* note 12, at 120-121 (arguing that, "the overall effect of the open source system is to increase the supply of innovation and the speed at which such innovation is available for the public benefit").

[138] See, *supra* note 25, although the initiatives there described are not OP projects.

[139] Maurer, Rai, Sali, *supra* note 56; and Foray, *supra* note 32, at 139-140 (arguing that OP reduces the "total life cycle cost required to get the job done" and increases "the

development are costly because of the risk of failure, and because of the human, physical and financial resources that they require – especially in those sectors that ask impressive infrastructure, expensive specialized equipment, laboratory space, or clinical trials, such as the industries of pharmaceuticals,[140] nanotechnologies,[141] and biotechnologies[142] – OP contributes to lower these costs. As pools, OP licenses reduce the material costs of research and development by aggregating the efforts and the intermediate results achieved because of the joint research. Likewise, by sharing "trials and errors" paths OP licenses reduce the risk of failure, not only allowing researchers to know the existing blind alleys and the failures already occurred, but also leading to inventions that will be likely to be appreciated by the public.

In sum, OP has two merits, at least: (i) it makes innovation cheaper, because it requires lower downstream economic returns in order to recoup the expenses that it entails; and (ii) it frees those innovative paths that, nowadays, are not followed.

---

expected productivity of [the] projects, which in turn is related to rich spillovers that are created de facto in an open source environment").

[140] Marden, *supra* note 46, at 251-253, and Maurer, *supra* note 38, at 2-3.

[141] Da Silva, *supra* note 29, at 306.

[142] Srinivas, *supra* note 6.

Second, if patents are granted in order to avoid that innovations are kept secret thereby assuring that, via disclosure, technical information are spread, OP licenses would appear useless.[143] In other words, the idea that OP would increase the level of knowledge available within the whole society is ill-founded. However, there is a great difference between knowledge that can be derived from the reading of patent claims and knowledge that follows from the real use of registered patents. Although such "real use of registered patents" could be achieved via the so-called "research exemption", nowadays this has been seriously compromised.[144] Besides, given that currently patent offices admit claimants to comply with the "written description requirement" proper of any patent system by depositing the innovation itself, rather than by fully depicting it, it is unlikely that the reading of patent descriptions will supply better knowledge than the use of

[143] See Boettinger, Burk, *supra* note 50, at 224.

[144] See, e.g., CRAIG NARD, THE LAW OF PATENTS 732-746 (2008) (arguing for the extinguishing of the experimental use exemption under common law). See, also, Janice M. Mueller, *The Evanescent Experimental Use Exemption from United States Patent Infringement Liability: Implications for University and Nonprofit Research and Development* 2004, available at http://ssrn.com/abstract=691424. In EU, since the 1989 Agreement relating to Community Patents is not yet in force, there in no general rule. However, the great majority of EU member states' legislations establish that patents shall not extend to acts done for experimental purposes relating to the subject matter of the patented invention.

the related innovations. On the other hand, OP would be likely to provide standardized on-line search tools and patent descriptions that would increase the ease-of-use and, hence, reduce would-be licensees' search costs.

Moving to the critiques arising from the analysis of the procedure underpinning the grant of patents, patents are acquired via registration. In the OP realm sharing innovation without facing free-riding would require that patents are registered so to openly license them[145]. However, such procedure can be costly – especially for small medium size enterprises and individual researchers – and it can augment the issue of patent quality to which the currently strategic use of patents contributes. To be sure, the issue of patent quality that patent race raises is at the top of all patent offices' agenda[146] and needs to be faced within an overall reform of current patent

[145] See Guadamuz-Gonzalés, *supra* note 114, at 19.

[146] See JAMES BESSEN, MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008) (arguing "while the patent system is said to create "property" rights, the boundaries of intellectual property are often very poorly delineated, giving non-holders inadequate timely information about when they might be committing a trespass; this serves as a major deterrent to invention", and then adding that several patents, particularly those regarding software and business methods, have been granted despite vague and abstract claims that, hence, can be construed very broadly). For an innovative approach to the issue see Beth Simone Noveck, *Peer to Patent:*

systems. However, would paper patents become – as in the case of the *GreenXchange* project – available for use in other fields, the number of patents uselessly filed decreased, and so did the lack of quality. Therefore, it should not be taken for granted that OP increases the number of useless patents that flood patent offices. On the contrary, some OP projects could contribute to assign a real industrial meaning to those patents that exert a mere defensive function.

A third stream of concerns relates to the license agreements as such. Scholars highlight that the current open patent licenses are poorly written and sometimes ambiguous,[147] as well as not surely enforceable. Moreover, OP licenses lack standardization and there is a proliferation of contractual schemes that creates uncertainty within the already shaking boundaries of "Open Science" as well as it raises barriers to entry. However, given the early stage of OP licenses such criticism, which has been raised to OSS and CC licenses as well,[148] seems to be hurried and neglects the current

---

Collective Intelligence and Intellectual Property Reform, 20 HARVARD JOURNAL OF LAW AND TECHNOLOGY 123 (2006).

[147] See Boettinger, Burk, *supra* note 50, at 226.

[148] See, e.g., Elkin-Koren, Niva, Creative Commons: A Skeptical View of a Worthy Pursuit. THE FUTURE OF THE PUBLIC DOMAIN, P. Bernt Hugenholtz & Lucie Guibault, eds., Kluwer Law International, 2006, available at http://ssrn.com/abstract=885466, 16 ff; as to the OSS, Robert W. Gomulkiewicz, *Open*

processes of standardization that projects such as *OIN*, *BiOS*, and *GreenXchange* are undertaking in comparison to *PatentCommons*. Further, to date the ease-of-use of current repositories guarantees would-be licensees to read in advance the terms and conditions associated with the patents in which they are interested. Moreover, the lack of standardization does not necessarily derive from a lack of awareness of the meaning of each clause,[149] and does not entail necessarily a lack of certainty, especially when OP is likely to regard different industries that may require different contractual schemes to be applied. In such a complex scenario a forced standardization would, indeed, jeopardize the effectiveness of such agreements.

Finally, a question arises as to the enforceability of these various OP licenses. Although to date no license has been texted in court, the same remarks above elaborated for OSS licenses should hold for OP contractual schemes, since OP licenses root in the patent system as well as OSS licenses root in the copyright system.[150] Moreover, this stream of concerns will be

---

Source License Proliferation: Helpful Diversity or Hopeless Confusion? (2008), available at http://ssrn.com/abstract=1280593 (discussing the role of OSI in limiting the number of OSS licenses).

[149] See *infra* footnotes 164 and ff and the accompanying text.

[150] See *supra* note 52 and accompanying text.

easily managed when the legal system becomes more proactive in promoting the legal innovation that flows from the private initiative instead of slowing down such processes.

IV. An Initial Definition of OP

In this paper we have discussed the limits that affect the models traditionally used for explaining innovation and managing both its ownership and the bundle of rights it generates. We have showed that a way to overcome such issues can be found in the advent of the Internet. Indeed, the OSS experience that we have described seems to amount to a paradigmatic example of how the Internet enables a successfully accomplished cultural, business, and legal model of innovation – a paradigmatic example that we have tried to test in connection to another experience, that of Open Patenting, although it is still an emerging phenomenon whose boundaries are waving and unsettled.

From this analysis it arises that OSS and OP share several similarities within the embracing backdrop of the Open Source movement. Thanks to the Internet, they both can stand at the crossroad between the theoretical path that guides to a new conception of innovation and the business path that

leads to a different way for solving the issues regarding both the ownership of innovation and the bundle of rights arising from it (as Figure 1 shows).

Along the theoretical path, OP allows producing *collaborative* innovation like R&D Joint Ventures, Cross-licensing agreements and Patent Pools permit to do. Yet, better than these off-line tools, OP reduces the costs and risks connected to innovation, because the Internet almost nullifies all the transaction costs connected to the organization and management of joint ventures, agreements, and pools. Further, more than these off-line enterprises, OP involves not only firms' R&D departments but also single independent researchers, who seldom work on hire, that choose to take part to the creative initiative. From this perspective, OP leads to *bottom-up*, *demand-driven* innovation that can successfully enter the market by being more user-friendly than supply-driven innovation. From this perspective, not only OP accomplishes successfully the need for a new model of innovation, but also may represent a profitable business venture because, on the one hand, it is less expensive than other off-line experiences and, on the other hand, it is more likely to succeed among customers.

Along the business path, OP represents a way for managing IPRs that is well-suited to overcome both the moral issues that patents covering specific inventions trigger, and the blocking effects that broad and strong patents are deemed to determine in cumulative-knowledge industries and for tech-

transfer.[151] Indeed, the "collective ownership"[152] proper of OP – whether assigned and managed by an individual or an organization – eliminates the concerns connected to the private individual ownership of biological materials and nanotechnologies, as well as the risk of a possible misappropriation of genetic resources at the expenses of biodiversity and poor communities. Further, since OP constitutes on line pooling, it is likely that, even in the light of strong IP regimes upon biotechnologies and would-be ubiquitous nanotechnologies, no blocking effects should arise in detriment of spread of knowledge, advent of follow-on innovation, and tech-transfer in favor of poorer communities.

[151] Foray, *supra* note 32, at 39.

[152] See, e.g., Oldham, *supra* note 31, at 4; and James Boyle, *Foreword: The Opposite of Property?*, 66 LAW & CONTEMP. PROBS. 1, Winter/Spring 2003, at 30–31 (arguing that, whereas the term "public domain" is generally used to refer to material that is unprotected by IPRs, with "the commons" IP scholars address to material that is not subject to individual but to collective control).

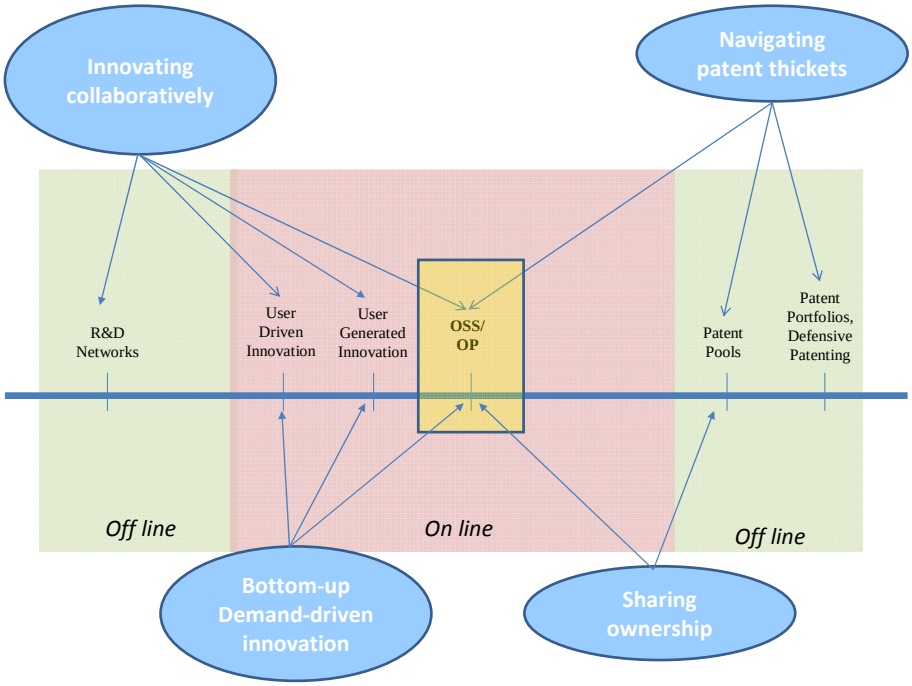

Figure 1. Facing some IP issues.

However, from the above analyses it arises also that OP differs from OSS. It is a much more kaleidoscopic phenomenon, as its unsettled boundaries show, because it involves several different subject matters. For example, several experiences that we have mentioned appear connected to the OP phenomenon - such as the *Patent Public Foundation*,[153] the *FD Initiative*,[154] and the *Hap Map Project*[155] – yet do not entail the "opening" of patents. Even if they (i) fulfill the same aims of OP, because they intend to ensure

[153] See footnote 12.

[154] See footnote 25.

[155] See footnote 49.

Open Access and Open Transfer of basic, upstream knowledge so to increase downstream innovation, and (ii) use contractual clauses that also OP licenses may employ, they either do not involve any kind of licensing, as in the case of the Public Patent Foundation, or do not involve patents at all, as in the cases of *TDI* and *HapMap*.

A hypothetical definition of OP would require, thus, (i) patented innovations, which patentees decide to (ii) license following a scheme different from the traditional "all rights reserved" model. However, even once these two requirements have been fixed, it is difficult to establish how far such a new licensing scheme should go in order to be labeled Open Patenting. And, given that innovation is a wide concept across several industrial sectors,[156] a process of setting the terms of an OP licenses (in other words, standardizing the contract) will, if ever done, not only require a much more cumbersome process than the one undertaken to explain what licenses fall within the OSS realm;[157] but it will also turn out to be inappropriate.

---

[156] In connection to the variety of inventions that can be patented, Maurer, *supra* note 123, (arguing that, "In general, no single institution is likely to be optimal for every type of R&D that society needs. Not all science should be open and not all should be patent-driven").

[157] The Open Source Initiative ("OSI") has certified over seventy licenses as conforming to the Open Source Definition, whose criteria to meet are available at http://www.opensource.org/docs/osd. Notwithstanding the OSI activity OSS licenses

This is confirmed by the fact that today under the umbrella "Open Patenting" we witness to two different phenomena mirroring two different dimensions of openness. On the one hand, we elicit from the analyzed projects – with the exception of mere repositories such as *PatentCommons* – a threshold definition of OP license according to which something more than a not-challenge clause and a grant-back provision are required to fall within a "strict definition" of OP. Indeed, in order to collaborate online – as well as off-line – pools require participants to grant each other the permission to safely exploit the patents put in common and to confer back to the pool any improvement that they achieve. In order to openly/cumulative innovate a viral clause is the necessary tool to keep innovation open and to avoid those free riding actions that would close innovation up and, further, prevent any possible commercial use of it. At least, this is what the *OIN* and *BiOS* experiences show.

On the other hand – and to show that this "strict definition" does not encompass all experiences that are perceived as "OP phenomena" – the license under study within the *GreenXchange* project is likely to resemble general terms and conditions that aim at providing paper patents under an easy-to-use standard public license. However, this contractual scheme does not encompass a viral clause, or a grant-back provision, but it limits itself to

---

proliferate. See Gomulkiewicz, *supra* note 160 (discussing the role of OSI in limiting the number of OSS licenses).

allowing the commercial exploitation of the granted patents in non-competitive fields. Therefore, in case a licensee develops follow-on innovation in the assigned field,[158] he will need a further license in order to exploit it. In this way, *GreenXchange* seems to be intended to face the free-riding issue very traditionally, that is to say, by bringing an infringement action.[159]

Contrasting the hypothetical threshold definition above set with the manifold OP phenomenon, the debate turns around the necessity of a viral clause to make a contract fall within the scope of OP. In

Indeed, scholars[160] debate about the necessity of these clauses or, *rectius*, about the probability of parasitic patenting[161], but this is by and large an issue of facts, which rests with the features of the regarded innovation.[162] For instance, whereas open source-codes can be easily captured by and

[158] This further license, instead, is unlikely to be required for the use of the paper-patent in a field for which it has not been filed, even if from this use a follow-on innovation arises.

[159] Is not to be ruled out the idea that the more a project is distant from the business world, the more the open approach is welcomed. At least, this could be a way for "reading" the relationship between upstream "open science" and downstream "all rights reserved" drugs. In this regard, see Maurer, *supra* note 123, at 5.

[160] See scholars quoted in the following footnotes.

[161] Rebecca S. Eisenberg, *Genomics in the Public Domain: Strategy and Policy*, 1 Nature Review Genetics 70, 73 (2000).

[162] Not by chance, this is one of the reasons why the above-mentioned standardization phenomenon could be inappropriate.

within their improvements, so that putting them in the public domain would not protect them from subsequent (mis)appropriations, other inventions, such as those belonging to the BIO realm, may be less prone to be captured by and within their improvements and, hence, the public domain solution could work for keeping them open.[163] Further, the public domain alternative gives consumers the opportunity to pay less for the non-improved product and, thus, represents a competitive constraint – whether weak or strong depends on how much consumers appreciated the differences between the original and the improved product – that keeps the price of the improved product low. Moreover, as noticed before, whereas software represents a profitable product, some scientific basic knowledge, such as that needed to develop drugs for neglected diseases, as well as some segments of the drug discovery pipeline,[164] do not guarantee high payoffs. Therefore, their opportunistic misappropriation could be unprofitable for third parties. In

[163] Dan Burk, *Open Source Genomics*, 8 B. U. J. Sci. & Tech. L. 254 (2002).

[164] See, in particular, Emily Marden, *Health Care & Pharmaceuticals: Open Source Drug Development: A Path to More Accessible Drugs and Diagnostics?*, 11 Minn. J.L. Sci. & Tech. 217, 222 (2010) (arguing that, 'it is likely that in the drug discovery context and in very early development stages open source could succeed at keeping certain underlying intellectual property open and available for further innovation. … However, it is not clear that full-scale open source drug development can yeld less costly and more accessible drugs. … the legal and regulatory requirements of drug development make the process expensive and resource-heavy, whether or not open source plays a part in the process').

effect this, together with the interest in involving as many researchers as possible, is one of the reasons why the *Hap Map* project does not impose a viral clause.[165]

Nevertheless, if viral clauses are not necessary to "open" a patent, and if grant-back clauses are specific of pools, we run the risk to marginalize the OP phenomenon to on-line standardized patent licenses.

As a matter of fact, to date it is pointless to state *a priori* what falls under the umbrella "Open Patenting": such a phenomenon is not to be restricted into a category in reasons of its recent advent and limited application. What is worth mentioning is that an experience that amounts to cultural, business and legal innovation deserves support that can be provided through a twofold means: first, a legal obligation to adopt open patent licenses to share and spread the results of research that has been publicly funded,[166] also when it comes to public-private partnerships between rich and poor countries;[167] second, a recommendation to remove those legal obstacles that

[165] Maurer et at., *supra* note 25, at 11; Maurer, *supra* note 38, at 11-12 (2007); Maurer, Scotchmer, *supra* note 86.

[166] See *supra* note 88.

[167] Foray, *supra* note 32.

would prevent the "animal spirits of entrepreneurs"[168] from exploiting OP licenses and their commercial uses. The adoption of OSS licenses for the commercial distribution of OSS products shows, indeed, that innovation in all its dimensions can never be forecasted.

[168] "Animal spirits" is the wording adopted by John M. Keynes, THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY (1936), to describe emotion or affect which influences human behavior and can be measured in terms of confidence. In the case of entrepreneurs such animal spirits are a particular sort of confidence that could amount to "naive optimism".