

THE LAW AND MANAGEMENT OF INTELLECTUAL PROPERTY IN OPEN INNOVATION ECOSYSTEMS

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ABSTRACT

Intellectual property (IP) protection is important for the success of open innovation. The strategies of IP licensing and acquisition are the legal channels through which open innovation can occur. Yet, these strategies are subject to a complicated IP law framework the understanding of which by open innovation firms is essential to prevent any negative impact on their ability to protect their IP and avoid liability. Further, the decision to engage in an open innovation process should be driven not only by the strategic objectives of the firms but also by their current situation with respect to IP ownership. Listing their portfolio of assets and assessing their value are critical steps that firms should undertake to evaluate the complementarities and expected benefits of an open innovation strategy.

This chapter is based on the preprint "The Role and Management of Intellectual Property in Open Innovation" in Bing Ran, ed, *The Dark Side of Technological Innovation* (Charlotte, NC: Information Age Publishing, 2013).

Prerequisite	Open innovation ecosystems.
Objectives of the lecture	This lecture aims at providing practical examples of the intellectual property law challenges associated with open innovation activities, such as intellectual property acquisition and licensing.
Workload	2h teaching; 6h homework
Learning outcomes	<p>LO #15: To make responsible decisions under uncertainty.</p> <p>LO #18: To assess risks and challenges related to growth of businesses.</p> <p>LO #31: To explain the benefits derived from managing knowledge.</p> <p>LO #46: To recognize and exploit aspects related to open innovation.</p> <p>LO #53: To understand the role, benefits and threats connected with IP in a process of innovation. To learn forms and process of protecting intellectual property (incl. patents and trademarks) in a national and international context (EU and USA). To characterize the instruments of intellectual property rights (patents and licences). To be able to manage intellectual property within OI environment, including identifying IP, licensing policy, IP economic valuation and utilization (internally and/or externally). To understand links between IP and company strategy, in particular in OI context. To know how to manage strategically IP.</p> <p>LO# 53: To be able to manage risks.</p> <p>Knowledge Basics of OI</p> <p>Skills Analytical thinking, logical reasoning and problem-solving</p> <p>Competences Case evaluation</p>
Reading List	Intellectual property and licensing strategies in open collaborative innovation (Bogers, Bekkers, & Granstrand, 2012).

	<p>The logic of open innovation: managing intellectual property (Chesbrough, 2003).</p> <p>The economic structure of intellectual property law (Posner; & Landes, 2009).</p> <p>Intellectual property and open innovation: an empirical analysis (Lichtenthaler, 2010).</p> <p>Intellectual Property and Legal Issues in Open Innovation in Services (Vallat, 2009).</p>
European Qualifications Framework (EQF) Level	Level 5.

INTRODUCTION

The Oslo Manual (2005, p. 46) defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.” Accordingly, innovation may take a number of forms, namely product and service innovation, process innovation, marketing innovation, and organizational innovation (OECD, 2007). Firms innovate to serve two main purposes: to better serve the needs of their customers and to win a competitive advantage over their business rivals. The definition of innovation, its forms and the purposes it aims to achieve are relevant to intellectual property (IP), defined by the World Intellectual Property Organization (WIPO) as “creations of the mind: inventions, literary and artistic works, and symbols, names, images, and designs used in commerce.”¹

Classified according to its subject matter, IP includes industrial property and copyright. Industrial property covers inventions, industrial designs, integrated circuit topographies, trademarks and geographical indications. And, copyright covers literary, dramatic musical and artistic works. IP innovation covers a wide spectrum of innovations including drugs, machines, processes, business methods, software, maps, designs, computer chips, etc.

One of the distinguishing features of IP is its characteristic as a public good (Posner, 2005). It is non-rivalrous, non-exhaustible and non-excludable. One’s use of IP does not (and cannot) prevent another from using it concurrently, and one’s use of it does not deteriorate the quality of its use by another. These traits render it susceptible to “free riding” (Lemley, 2005), a circumstance

¹ WIPO, “What is Intellectual Property?” <<http://www.wipo.int/about-ip/en/>>.

that leads to “market failure” (Dutfield & Suthersanen, 2008). To overcome knowledge market failure, law provides IP with artificial scarcity through granting its owners a bundle of temporary exclusive rights— IP rights—enforced by law (Sherman & Bently, 1999). The importance of IP and its protection increased over the time and States realized the importance of protecting their citizens’ IP rights not only within their territories but also abroad. As a result, States concluded multilateral IP law instruments establishing an international minimum level of IP protection.²

The digital revolution in the last decade of the twentieth century contributed to the creation of the knowledge economy in which IP is the main asset. Therefore, the protection of IP was one of the main topics negotiated in the Uruguay Round that reformed the international trading system and resulted in the creation of the World Trade Organization (WTO) along with a number of international trade agreements including the Agreement on Trade Related Aspects of Intellectual Property (TRIPS).³ TRIPS has globalized IP protection. All WTO Member States are obliged to implement its minimum levels of IP protection and enforcement.⁴ And, a Member State that does not comply with its TRIPS obligations may be complained against by another Member State and, consequently, face international trade sanctions through the WTO dispute settlement procedures.⁵

The special importance given to the national and international protection of IP is based on the premise that IP protection is an important stimulus of innovation that is a key driver of competitiveness, economic growth and welfare (Griffith et al., 2006; Lööf & Heshmati, 2002; Crépon et al., 1998; Schumpeter, 1934). However, the open innovation paradigm—“a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology” (Chesbrough, 2003a, p. xxiv)—has triggered the question of whether or not IP as a monopoly is suitable for open innovation environments and, if it is, how IP should be managed to foster open innovation. This chapter contributes to the answer of this question by identifying and analysing the IP law challenges that could be associated with some aspects of inbound and outbound open innovation specifically IP assignment (or acquisition) and IP licensing.

For this purpose, the chapter is divided into five parts. Following this part, Part II discusses the relationship between IP law protection and innovation in general. Part III discusses the relationship

² See e.g. *Paris Convention for the Protection of Industrial Property of 1883*, as last revised at the Stockholm Revision Conference, July 14, 1967, 21 U.S.T. 1583; 828 U.N.T.S. 303; *Berne Convention for the Protection of Literary and Artistic Works*, Sept. 9, 1886, as revised at Paris on July 24, 1971 and amended in 1979, S.Treaty Doc. No. 99-27 (1986).

³ *Agreement on Trade-Related Aspects of Intellectual Property Rights*, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299; 33 I.L.M. 1197 (1994) [TRIPS].

⁴ See TRIPS, *supra* note 3, art.1 (1).

⁵ See TRIPS, *supra* note 3, art. 64 (1) - (2). See also *Understanding on Rules and Procedures Governing the Settlement of Disputes*, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, The Legal Texts: The Results Of The Uruguay Round Of Multilateral Trade Negotiations 354 (1999), 1869 U.N.T.S. 401, 33 I.L.M. 1226 (1994) [hereinafter DSU].

between IP law protection and open innovation. Part IV analyses IP assignment/acquisition and licensing as the main channels for inbound and outbound innovation and highlights their legal challenges that should influence decision making in open innovation firms. Finally, Part V concludes the chapter with a summary and recommendations.

IP LAW PROTECTION AND INNOVATION

The issue of justifying the protection of IP has engaged legislators, courts and philosophers for centuries (Drahos, 1996; Hughes, 1988). The first category of arguments justifying IP is based on natural law that is influenced by the thoughts of John Locke, Immanuel Kant and Georg Wilhelm Friedrich Hegel. The Lockean argument justifying IP provides that creators of intellectual works are entitled to property rights over the outcome resulting from mixing their intellectual labour with an un-owned or held in common object (Hughes, 1988). Labour is the corner stone of all the interpretations given to Locke's theory of property when applied to IP (Hughes, 1988). Hence, IP is a reward to and a stimulus of labour (Hughes, 1988). On the other hand, the natural law justification IP based on Hegel's and Kant's thoughts frames intellectual works as embodiments of their creators' (e.g. authors and inventors) personalities (Hughes, 1988).

The natural law argument has mainly influenced copyright—specifically moral rights. However, the utilitarian justification of IP is more prevalent. IP law stimulates innovation (Posner, 2005; Takalo, 2001; Nordhaus, 1969). Arrow (1962) contends that since research and development (R&D) is an inherently risky activity and because appropriating its results is limited, it is expected that the free market economy will underinvest in it. Without IP protection further innovation will be inhibited since innovators would be less tempted to invest money and efforts to produce (or improve) inventions and, if they did, they would be inclined to keep their innovation in a box of secrecy to protect it against imitation (Friedman, Landes & Posner, 1991). IP protection deters unauthorized imitation of innovation and, by the same token, allows the legitimate appropriation of innovation results. Therefore, it can help States overcome underinvestment in research activities and encourage disclosure of innovations (Kanwar & Evenson, 2003; Arrow, 1962).

The argument that IP, such as patent and copyright, stimulates innovation has empirical support. Etro (2007) and Carpentier & Kultti (2006) show that the patent system stimulates further innovation in the cumulative innovation industry (e.g. the software industry). Ginarte & Park (1997) examine the index of patents in 110 countries for the period 1960-1990 to determine the factors influencing the level of patent protection that a given economy provides. They find evidence that patent protection stimulates innovation and this impact is one of the factors that influences the policymakers' choice with respect to the level of patent protection they establish in the patent system. Moreover, the Organisation for Economic Co-operation and Development (OECD) (2004)

and the U.S. International Trade Commission (2008) conclude that patenting fosters innovation and economic performance generally and encourages innovation in the biotechnology sector specifically. Furthermore, Mansfield (1986) finds evidence that patents have a positive influence in the pharmaceutical industry. With respect to the important role of copyright in the economy in general, a study on the economics of copyright in the United Kingdom (PwC, 2011, p.27) concludes that “free riding (consuming goods without paying) may threaten the sustainability of copyright dependent industries without some form of framework in place to maintain incentives to produce creative content.”

Research has also highlighted the positive impact of IP protection on service innovation. Several scholars identify a positive correlation between allowing patenting in a certain domain of inventions, such as business methods, and the number of patents granted in the system (Lerner, 2002; Gallini, 2002; Hall, 2009). Lerner (2006, p. 228) acknowledges that some theoretical research has argued that even without patents banks will have enough incentives to develop new financial innovation, but argues that the absence of patent protection “would shape the incentives to innovate”. Kumar and Turnbull (2008) argue that patenting is not optimal for all forms of financial innovation but identify three categories of financial innovation for which patenting is optimal. Under these categories a business method may be relevant to the performance of some administrative tasks of a financial firm, may be intended to facilitate some of the services provided to the financial firm’s customers, or may resemble an improvement of an existing process to perform a certain function (Ibid.). The rationality of patenting here is that these forms of innovation may be vulnerable to imitation by competitors (Ibid.). On the other hand, they argue that some forms of financial innovation do not need patenting: this includes forms of financial innovation that need the help of market makers to develop their market (Ibid.). The rational for not patenting here is the claim that patents will hinder the involvement of market makers (Ibid.).

The drafters of the Constitution of the United States recognised the utilitarian role of IP protection in the Copyright and Patent Clause, which gives the Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”⁶ IP law protects both innovators and the public. It protects innovators by giving them a bundle of exclusive rights, such as the exclusive right to make, sell, and export their innovation for a temporary period (e.g. 20 years protection to patented innovation). And, it protects the public by ensuring that innovations are disclosed and ultimately part of the public domain once the term of protection expires (Posner, 2005). As Mr. Justice Binnie, a former puisne justice of the Supreme Court of Canada, explained in the context of patent law:

⁶ The United States Constitution, art. I, § 8, cl. 8. <http://constitutionus.com/>.

“A patent, as has been said many times, is not intended as an accolade or civic award for ingenuity. It is a method by which inventive solutions to practical problems are coaxed into the public domain by the promise of a limited monopoly for a limited time. Disclosure is the quid pro quo for valuable proprietary rights to exclusivity which are entirely the statutory creature of the Patent Act [...]”.⁷

On the other hand, several scholars have doubted the role of IP in fostering innovation. For example, Jaffe & Lerner (2004) argue that patenting stifles innovation. Bessen & Maskin (2000) show that in dynamic industries such as software and computer chips industries, in which innovation is both sequential and complementary, patenting could decrease innovation. Merges and Nelson (1990) argue that patenting stifled innovation in the automobile and airplane manufacturing industries. Moser (2005) finds no evidence that patents stimulate more innovation but shows that without patent protection innovation seems to reside in industrial sectors where knowledge can be kept secret (e.g. chemical industry) and disappear in industries where knowledge cannot be kept secret (e.g. machine manufacturing industry). Moreover, Arrow (1962) acknowledges that the enforcement of patent rights will ultimately decrease the amount of appropriable information available to others and, thus, the “incentive” to carry out R&D may decrease. Hall (2009) notes that little empirical research has been conducted on the impact of patenting on financial innovation but believes that since financial innovation is of incremental nature, it is unlikely that patenting is beneficial. Other scholars (Lanjouw, Pakes, & Putnam 1998; Gallini, 2002) contend that the number of patents in a given sector does not accurately indicate the impact of patenting on innovation in that sector. Hunt (2010) is also not optimistic about the impact of patenting on financial innovation. He argues that since the financial sector heavily relies on information and telecommunication technologies, the impact of patents on financial innovation could be analogous to the impact of patenting on the ICT: it will be complex and tend to involve litigations (Ibid.).

Nonetheless, IP law is here to stay; the debate on its impact on innovation will certainly shape its future reform but will never abolish it. Yet, although IP protection is necessary for stimulating innovation, excessive protection can be counterproductive. As Landes & Posner (2003, p.74) explain:

“Some copyright protection is necessary to generate incentives to incur the costs of creating easily copied works. But too much protection can raise the costs of creation to a point at which current authors cannot cover their costs even though they have complete copyright protection for their own originality”.

This echoes the vision of Jefferson (1807) who believed that ideas should move freely between people and their originators should receive some reward that did not jeopardize the rights of those who wish to improve on them (cited by Dodgson, Gann & Salter 2008).

⁷ *Apotex Inc. v. Wellcome Foundation Ltd.*, [2002] 4 S.C.R. 153.

It is worth noting that although there is a strong overlap between the subject matter of innovation in general and the subject matter of IP, not every form of innovation will necessarily enjoy IP protection. Copyright law protects literary and artistic innovation (e.g. music, maps and software). Patent law protects new, useful and non-obvious inventions (e.g. drugs and machines). Trade-secrets law protects secret industrial formulas and process. Industrial design law protects the original design of a useful article. And, trademarks law protects the marks or logos of innovation businesses used to distinguish their goods and services. The advancement of technological innovation has required IP law to provide new types of IP protection, such as the protection provided to digital databases or computer chips. A form of innovation, therefore, needs to satisfy the protection requirements under the relevant IP law. For example, a form of innovation seeking copyright protection must satisfy the subject matter requirement of copyright (e.g. literary and artistic works), must be original and, in most of the cases, must be fixed in material format. Further, a form of innovation seeking patent protection must be new, useful and nonobvious patentable subject matter. Notably, the level of originality of creativity required under patent law is much higher than its counterpart under copyright law. With regard to trademarks law, it has a number of requirements that the mark must satisfy in order to receive protection and to continue enjoying it. Generally, the logo, sign, symbol or word used to distinguish the goods or services of a business using it must satisfy the definition of a "mark" for the purpose of trademarks law, must be distinctive and, in varying stages depending on the specific jurisdiction, must satisfy the "use" requirement.

Furthermore, some categories of IP protection are easier to get than other categories due to the difference in their protection requirements. For example, copyright in most jurisdictions is automatic. The creator of the copyrighted work does not need to register the copyright over the work in the national IP office to enjoy protection. On the other hand, patent protection is not automatic since it involves complex procedures involving, among other procedures, an application, examination, publication, and registration.

Generally, IP law protects knowledge-based innovation through monopolies. Copyright and patent give the right holder a bundle of temporary exclusive rights over their copyrighted and patented innovations. Trade secrets, however, can enjoy trade secrets law protection as long as they remain "secret." The protection of trademarks can also last indefinitely upon satisfying certain conditions provided by the relevant law, such as the payment of maintenance fees.

Traditionally, IP law has played a key role in protecting innovation in the era of "closed innovation," a framework under which firms rely on their own resources to develop and market innovation (Huizingh, 2011). In recent years, however, open innovation emerged as a new innovation model that depends on "the use of purposive inflows and out flows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively" (Chesbrough et al., 2006, p. 1).

Over time, the innovation process has increasingly been depicted as interactive, non-linear, incorporating feedback processes both within and between firms and is now usually categorized into five generations (Rothwell, 1992). The innovation literature originally conceptualized the innovation process in a linear and sequential manner, starting with a scientific discovery and ending with the introduction of a new product into the market. Accordingly, the model was known as research-push. The demand-pull model, or the second-generation model, emerged in the mid-1960s and reflected the growing awareness granted to customers and their perceived needs. Integrating both research-push and demand pull, the coupling model introduced the concept of feedback loops and the interactive nature of the innovation process. The fourth generation stressed the role of external linkages and alliances, whereas the fifth generation innovation process further emphasizes the strategic and technological integration with customers, suppliers, communities and networks, which is facilitated by information technologies (Ibid.). Innovation has thus long been depicted as a "multi-player game" (Bessant & Tidd, 2011, p.339). After being coined by Chesbrough in 2003, the concept of open innovation drastically gained in popularity. Besides stressing the fact that firms do not innovate in isolation, it suggests that understanding and profiting from innovation requires "a more externally focused perspective, involving the actions of multiple actors in a far more distributed environment" (Chesbrough, Vanhaverbeke and West, 2006, p.11). Chesbrough (2003) lists several distinctive features of the open-innovation model that distinguish it from the traditional closed innovation model. First, many talented people who would provide valuable inputs into the innovation process work outside the firm. Second, external R&D can create value from which the firm can benefit, provided that it keeps an acceptable level of internal R&D so as to be able to absorb this externally generated knowledge (Cohen & Levinthal, 1990). Third, the firm does not need to originate research internally in order to profit from it, provided that it has the proper connections. Fourth, first-mover advantage is not the only option. Elaborating a business model centred on the exploitation of external ideas can turn out to be more effective. Finally, open innovators not only use IP as a control mechanism to protect their valuable knowledge and ideas but also exploit others' IP to advance their business objectives. All these features converge towards the idea that the locus of knowledge generation can be decoupled from both the locus of innovation and the locus of commercialization (Gassmann & Enkel, 2004).

Accordingly, three open innovation approaches can be defined: outside-in, inside-out and coupled. Firms may seek knowledge outside its boundaries, so as to enrich its own knowledge base and innovate internally. This approach relates to the outside-in or inbound open innovation and has been widely investigated in innovation literature, thanks amongst other sources, to the harmonized innovation surveys based on the Oslo Manual, which gather information on information sourcing and co-operation practices of innovative firms. Latest figures for EU-27 confirm the role of co-operation with a variety of partners for innovation, as more than a third of innovative firms rely on co-operative agreements for their technological innovations (Community Innovation Survey 2008, Eurostat).

Firms may choose to let other firms commercially disseminate and exploit the knowledge and ideas they have developed. In doing so, they use external channels to commercialize their IP. This approach is referred to as inside-out or outbound open innovation (Gassmann & Enkel, 2004). A final option is the coupled process, which links inside-out and outside-in processes, and requires the setting up of cooperative arrangements so as to allow firms to benefit from each other's complementarities. Unfortunately, current harmonized surveys neglect these two perspectives of open innovation, as they concentrate on innovation occurring inside the focal firm, i.e. the firm responding to the survey.

Co-operation is considered as an innovation stimulus and is expected to bring benefits such as achieving economies of scale and of scope, reducing uncertainty, gaining access to new markets or accessing complementary knowledge (Miotti & Sachwald, 2003; Becker & Peters, 1998; Hagedoorn, 1993).

The governance of co-operation for innovation relies, to a good extent, on IP rights, protected by the so-called formal mechanism of IP protection (Hall et al., 2011), such as patents, copyrights, trade-secrets and trademarks. Thus, the following section focuses on the relationship between the legal protection of IP rights and open innovation. It evaluates the extent to which IP law protection will play a role in promoting or discouraging this business model.

THE RELATIONSHIP BETWEEN IP PROTECTION AND OPEN INNOVATION

As discussed earlier, the impact of IP protection on innovation generally is controversial but it is arguable that the best approach to enable IP law to stimulate innovation is to design it in such a way that strikes the right balance between the interests of innovators against other socio-economic interests of the public at large. Yet, the impact of IP law on open innovation is more ambiguous. The monopolistic nature of IP rights entices the internal creation and utilization of innovation. Attracted by the bundle of exclusive rights that IP laws provide to innovators, a firm may direct all its internal resources to develop innovations that generate IP rights in order to gain a competitive advantage against competitors. It is worth noting that different IP provide different levels of exclusion and, consequently, some categories of IP may encourage firms to opt for closed innovation models more than other categories.

More specifically, patented innovations are more likely to influence the firm's decision to adopt closed innovation models. Patent protection is the strongest amongst all the categories of IP. Patents protect both the idea and its industrial application. Therefore, even if a firm independently develops a form of innovation that is similar to a patented innovation of another firm, it will be infringing the rights of the firm that already holds the patent rights over the invention. Generally, during the term of patent protection, usually 20 years from the date on which the patent application was

filed,⁸ the patent holder is entitled to prevent anyone from making, using, selling, importing and/or exporting the patented invention. This high level of control over the patented innovation enables the firm to exclude competitors and, thus, encourages closed innovation models. This is apparent in the pharmaceutical industry, for example. Nevertheless, the duration of patent protection is shorter than the term of protection provided to other categories of IP. This is not surprising given the difference in the scope of protection - control - given to patent holders compared to the rights given to the right holders in other IP categories.

The second category of IP providing right holders with a high level of control over their innovation is trademarks. A trademark enables the right holders to exclude others from using their trademarks in association with the others' goods or services. Therefore, it protects the economic interests of the owner of the trademark by preventing others from misappropriating the reputation associated with the trademark. Further, it protects the public by indicating to them the source of the goods and services they are receiving, which is an important indication of quality.⁹ An advantage of trademarks is that the owner can renew them indefinitely. Therefore, registering a trademark with goods and services may guarantee a long lasting market advantage. Notably, trademarks are not limited to words, logos or distinguishing guises, but sometimes extend to cover unconventional marks, such as smell, sound, or touch marks. For example, trademarks have been sought and registered in association with scents and sounds.

The third category is copyright. It provides right holders with control over their literary, artistic musical and dramatic works. Copyright is important for innovation in the information technology sector. Computer programs per se are excluded from patent protection in some jurisdictions but they are copyright subject matter - literary works. Copyright provides a long duration of protection that must not go below the life of the author of the work plus 50 years after her/his death.¹⁰ This term of protection is the minimum that States must provide to be compliant with international copyright law, but in practice many jurisdictions provide longer durations, such as in the United States and Europe where the term of protection is the life of the author plus 70 years. Despite the long duration of copyright protection, copyright protects expressions, not ideas. Therefore, for instance, it is possible that two firms independently develop an identical piece of software without infringing each other's copyright. In other words, the ambit of protection under copyright law is narrower than it is under patent law.

The fourth category of IP is industrial designs. The protection of industrial designs covers the original and aesthetic features added to a useful article. Famous examples of industrial designs include

⁸ See TRIPS, *supra* note 3, art. 33.

⁹ *Qualitex Co. v. Jacobson Products Co.* (93-1577), 514 U.S. 159 (1995); *Mattel, Inc. v. 3894207 Canada Inc.*, [2006] 1 S.C.R. 772.

¹⁰ TRIPS, *supra* note 2, art. 12.

Apple's iPod and iPhone. By registering the industrial design the firm can exclude competitors from making similar articles having the same design throughout the term of protection. Accordingly, for instance, phone producers are not allowed to produce phones that have the exact design of Apple's iPhone during the term of protection. The duration of protection for industrial designs is usually shorter than the duration of patent, trademarks or copyright; industrial designs are usually protected for a term ranging between 5–25 years, depending on the jurisdiction. The protection of an industrial design covers only the aesthetic features of a useful article and does not extend to cover the function of the article.

Trade secrets are the only form of IP that requires strictly closed innovation environment to enjoy legal protection. No registration is required to protect a trade secret and the protection will last so long as the innovation remains secret. The disadvantage of trade secrets is that they lose their protection when they become known. They also do not provide protection against independent creation or reverse engineering. The secret formula of Coca Cola is an example of trade secrets. In short, IP protection provides an incentive to firms to follow a closed innovation model. However, the level of enticement varies depending on the category of IP protecting the firms' innovation. Trade secrets and patents play the highest role in influencing firms' choice to follow a closed rather than open innovation model.

IP protection may have a negative impact on open innovation (Vallat, 2009; West, 2006) but it is still capable of playing its traditional role of rewarding and stimulating innovation even in an open innovation environment (West, 2009; Gallini, 2002). Open innovation is new as a label but old as a notion (Huizingh, 2011; Christensen, 2005) and IP has always functioned in innovation environments in which firms use external knowledge to support internal research and to market its outcomes externally (West, 2009). In this context, IP is a fellow not a rival to open innovation, albeit under different disguises.

The starting point of illustrating the value of IP protection for open innovation is to imagine the situation where IP is not provided to protect innovation. In this situation, it is likely that firms will resort to, *inter alia*, absolute secrecy to avoid free ridings. On the other hand, a firm that has patent rights over its innovation, for example a machine, will be more open toward licensing this innovation to other firms, because this firm is sure that any uses of the innovation that go beyond the uses allowed under the license will be infringing under patent law. Licensing IP, in other words, solves the tension between knowledge protection and knowledge sharing (Bogers, 2011). After surveying over 154 industrial firms, Lichtenthaler (2010) concludes that the size of the firm's IP portfolio plays an important role in encouraging the firm to move toward the open innovation paradigm.

Looking at the issue from the side of the firms that are users of innovation, IP protection can be seen as an incentive to engage in open innovation. A firm that can copy other firms' innovations will

have no motive to acquire or license in IP. It is true that closed innovation is still the more prevailing model for creating and exploiting IP and that managing IP in open innovation paradigms is not an easy task (Luoma, Paasi & Valkokari, 2010), but it is equally true that firms are gradually shifting into the open innovation paradigm (Lee, Nystén-Haarala, & Huhtilainen, 2010). For example, IBM, which is one of the largest holders of IP rights in the world, has noticeably become an active actor in open innovation. In 2006, it launched Open Collaborative Research (OCR), a program designed to foster the collaboration between IBM and universities in the domain of open source software.¹¹ Furthermore, Horacio Gutierrez, who was Microsoft Vice President and Deputy General Counsel for IP and Licensing, describes IP as a “bridge” that has enabled Microsoft to collaborate with other firms.¹² For Philips Research, open innovation is a key for success: “Through ‘outside-in’ innovation, we draw on the capacities of individuals, organizations, and even small start-ups from around the globe. By providing a broader window on the world of health and well-being, these strategic partners help us gain new insights and access to new technologies.”¹³

IP management is essential for the success of open innovation (Bekkers & Granstrand, 2011; Alexy, Criscuolo & Salter, 2009; Bogers, Chesbrough, 2003b) and its main tools are IP acquisition/assignment and licensing. The easier are these tools to use, the more successful is open innovation (Gallini & Scotchmer, 2002). The following sections explain them and discuss the IP law challenges associated with them.

IP ASSIGNMENT/ACQUISITION AND LICENSING AS THE MAIN CHANNELS FOR INBOUND AND OUTBOUND INNOVATION

Utilizing IP in open innovation environments can mainly take the forms of IP assignment/acquisition and licensing. Both forms are legal acts that may have negative implications for the legal protection of the IP of the firms engaged in open innovation if they are not practiced carefully.

IP ASSIGNMENT AND ACQUISITION

Firms may not be able to produce IP because this usually requires strong R&D investment and when this investment is available, the results of the R&D may fail to attract IP law protection. For example, a pharmaceutical company may invest for years in developing a certain drug, but a publication of a research paper on its effective ingredients by anyone else renders the outcome

¹¹ IBM, “Collaborative Research Initiatives” <<https://www.ibm.com/developerworks/university/collaborativeresearch/ocr.html>>.

¹² Horacio Gutierrez, “Microsoft’s Collaboration Imperative” (2008) <<http://www.microsoft.com/Presspass/ofnote/04-01-08GutierrezIAMAArticle.aspx>>.

¹³ Philips Research, “Open Innovation” <<http://www.research.philips.com/open-innovation/index.html>>.

of the pharmaceutical company's research obvious and, as a result, not patentable. Furthermore, a firm may already have a form of innovation that is missing some technological components to be ready for the market. In this situation, waiting for the R&D team to develop this technology may take some time during which the firm may lose the first mover advantage. To overcome these issues, firms can acquire IP instead of producing it. An assignment of IP is the transfer of the bundle, or some, of the exclusive rights of the owner of the IP (the assignor) to another person (the assignee). Right holders can transfer wholly or partially their IP rights over inventions, copyrighted works, trademarks or other categories of IP based innovations. For example, a publishing house can assign all the copyright it has over one of its publications or it can assign only the translation right over this publication. Further, the assignment of IP rights can be limited to one or more geographical areas. For instance, an American pharmaceutical company may assign its patent rights over one of its drugs patented in Japan while continue enjoying its patent rights over the same drug in other jurisdictions where it enjoys protection. It should be noted that in most jurisdictions the assignment of IP rights must satisfy some formalities prescribed by the relevant legislation, such as the requirements of writing and registration.

A firm may assign its IP to another firm to generate income (Bogers, Bekkers & Granstrand, 2011), which it can use to strengthen its downstream capabilities to exploit its other IP in producing and marketing products. Looked at from the side of the firm receiving the assignment, the assignment of IP rights is IP acquisition. In other words, for a firm involving in open innovation, its outbound innovation may take the form of assignments of IP rights and its inbound innovation may take the form of IP acquisition. Most of the time, an open innovation firm is involved in both assignment and acquisition of IP.

IP acquisition creates a wall around the firm's field of innovation that ultimately prevents the entry of other competitors to the market (Bogers, Bekkers, & Granstrand, 2011; Yoffie, 2005). This importance is practically illustrated in the frequency of IP acquisition deals. For example, many giant companies were in a fierce competition to acquire the IP of Nortel, which filed for bankruptcy in 2009. A consortium of Apple, EMC, Ericsson, Microsoft, Research In Motion (RIM), and Sony managed to outbid Google and purchased almost 6000 patents of Nortel for \$ 4.5 billion. On the other hand, soon after, Google acquired Motorola Mobility for \$12.5 billion to make its patent portfolio stronger and, consequently, protect its famous operating system - Android - from the competition it is facing from Apple and Microsoft. Larry Page, Google's co-founder, explained that the acquisition "will increase competition by strengthening Google's patent portfolio, which will enable [Google] to better protect Android from anticompetitive threats from Microsoft, Apple and other companies."¹⁴

¹⁴ Larry Page, "Supercharging Android: Google to Acquire Motorola Mobility" (2011) <<http://googleblog.blogspot.com/2011/08/supercharging-android-google-to-acquire.html>>.

Acquiring IP is not limited to organizations specialized in information and communications technologies; it is important for other industrial sectors as well. In 2008, several pharmaceutical companies merged to strengthen their patent portfolios. The sum of the deals reached that year amounted to \$ 70 billion.¹⁵

In addition to IP acquisition focusing on copyright and patent rights, trademarks are also an important IP asset that has been subject to a number of acquisition deals. Firms buy famous trademarks to capture the market reputation associated with products or services sold or provided in association with these trademarks. For example, Acella Pharmaceuticals acquired the PRENATE®, a family of trademarks, from Avion Pharmaceuticals to benefit from its reputation associated with pregnancy and prenatal vitamins.¹⁶

Failing to produce or acquire IP may open the door for competitors to arrive into the firm's innovation domain. For example, Eastman Chemical did not obtain enough patents over "polyethylene terephthalate," a polyester material used in producing plastic bottles. As a result, Dow Chemical managed to capture IP rights that facilitated its entry into the business sector of soft-drink bottles (Yoffie, 2005; Rivette & Kline, 2000).

IP LICENSING

A licence of IP is a permission given by the right holder (licensor) to another person (licensee) to exercise some or all of the rights of the licensor in exchange for an agreed payment. For instance, a firm that owns a patented machine can license another firm the right to sell the machine, which is only one right of the bundle of the patent exclusive rights. Also, the firm can license more of its patent rights or all of them. An IP license can be limited to one or more geographical areas. In the aforementioned example, the firm may decide to license its right to sell the patented machine in one geographical area only but maintain this right in other geographical areas.

IP licensing can be divided into three categories. The first category is exclusive licensing under which the licensee will exclusively practice the rights licensed under the exclusive license; neither the licensor nor anyone else can practice any of the rights licensed during the term of the exclusive license. Usually, the licensing of patented pharmaceuticals takes this form of licensing. The second category is non-exclusive licensing under which the licensor can practice the same rights licensed and can grant other non-exclusive licenses to other licensees during the term of the license.

¹⁵ Big Pharma Looks to Generic and Biotech for Growth (2008) <<http://www.managingip.com/Article/2004484/Big-pharma-looks-to-generics-and-biotech-for-growth.html>>.

¹⁶ "Acella Pharmaceuticals, LLC Announces Its Acquisition of the PRENATE® Family of Trademarks and Associated Intellectual Property" (2012) <<http://www.reuters.com/article/2012/01/05/idUS185968+05-Jan-2012+PRN20120105>>.

And, the third category is sole licensing under which both the licensor and licensee can practice the same rights licensed during the term of the license. However, the licensor cannot licence the same rights to other licensees.

Licensing is an important open innovation channel that contributes to firms' competitiveness. A firm that has no immediate capabilities of developing its IP into market products can license it out to generate income that can help develop it later into marketable products (Lichtenthaler & Ernst, 2007; Lichtenthaler, 2005). Licensing out is also a source of important income for firms specialized in R&D. Similarly important, licensing out activities could help firms create de facto standards in the industry. For example, Apple's reluctance to license out its Mac operating system denied it the opportunity to become a standard in the industry (Yoffie, 2005). On the other hand, Microsoft was more flexible in licensing out its windows operating system, a fact that made it dominate the market of personal computers. Moreover, a firm that licenses in IP will have faster entry to the market, especially when the firm does not have the capacity for developing its own. For instance, Procter & Gamble's "SpinBrush" is an innovative product that relied on licensing in IP from four other firms (Yoffie, 2005).

Notably, firms may be reluctant to license out their IP when licensing out would generate competition costs that outweigh the royalties gained from licensing (Yoffie, 2005). In contrast, firms usually license out IP that is not directly beneficial for their main business activities (Yoffie, 2005). Cross-licensing is another form of licensing that occurs when firms agree to cross-license IP rights to each other. A famous cross licensing deal was the \$ 16 billion deal struck between Dell and IBM. Cross-licensing, and licensing in general, especially with regard to patents saves firms from engaging in patent litigations (Bogers, Bekkers & Granstrand, 2011; Granstrand, 2004) that may eventually lead to invalidating some of the patents of each firm. Cross-licensing also helps firms use each other's knowledge to produce collaborative innovation in a more effective, simple and inexpensive manner (Bogers, Bekkers, & Granstrand, 2011).

A very relevant concept to cross-licensing is "patent pools" where two or more firms agree to cross-license their patents to each other. Patent pools play a major role in the development of innovation since patent litigations suppress incremental innovation to a large extent. Further, patent pools specifically and IP pooling generally serve both consumers and producers of innovation, because they facilitates interoperable innovation (Bogers, Bekkers, & Granstrand, 2011). For example, in 2005, a consortium of 20 companies agreed to establish a patent pool of their patents relating to Radio Frequency Identification (RFID) (Michael Blakeney, 2009). Without this consortium, IP infringement litigations would have hindered much of the RFID innovation.

THE CHALLENGES FACING IP ASSIGNMENT/ACQUISITION AND LICENSING IN OPEN INNOVATION ENVIRONMENTS

IP acquisition is complex and involves a number of challenges. Foremost, the firm should ensure that the IP to be acquired enjoys legal protection by one of the IP categories recognized by law. This requires the firm to carefully study the legal validity of the patent, copyright or trademark protecting this IP. In patent law some subject matter, such as business methods, is inherently weak to attract patent protection and even when it receives protection, it usually a result of lengthy and costly litigations. For example, Amazon.com received patent protection for its famous one-click purchasing system in the United States in the late 1990s, it obtained the patent protection in Canada in 2011 after a series of litigations,¹⁷ and never received protection in Europe.¹⁸ This type of subject matter, when patented, is vulnerable to invalidity in the future, especially when new case law questions its patentability. For example, upon a request from an interested party in 2006, the United States Patent and Trademark Office (USPTO) ordered a re-examination of the “One-Click” patent and invalidated some of its claims, which required Amzon.com to revise its patent claims (Orozco, 2012). Notably, the rejection of the test for patenting business methods originally developed in *State Street Bank & Trust Co. v. Signature Financial Group*¹⁹ by the Supreme Court in *Bilski v. Kappos*²⁰ has shed some doubts on the validity of a large number of patents granted under the old test. Similarly, in trademarks law some marks are also inherently weak, such as the “common words” in contrast to the “invented words” (Fox, 1972).

The importance of ensuring the validity of the copyright, patent and/or trademark protecting the IP that the firm is going to acquire lies in the fact that when the firm wants to enforce its IP rights against an alleged infringer, the invalidity of the patent, copyright or trademark is usually a defence. This is always the case in patent and trademark infringement cases. It is used also in copyright infringement cases, but it is used to a lesser extent since the validity conditions for copyright protection are generally less stringent than the conditions in the laws of patent and trademarks.

Secondly, a company acquiring another company’s patent, copyright and trademark portfolio should be aware of the strength of this portfolio by considering other important factors, such as the

¹⁷ Canada (Attorney General) v. Amazon.com, Inc., 2011 FCA 328.

¹⁸ See Boards of Appeal of the European Patent Office, Case No.T 1244/07 - 3.5.01 (27 January 2011).

¹⁹ *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368 (C.A. Fed. Mass. 1998). In this case the United States (U.S.) Court of Appeals for the Federal Circuit (CAFC) upheld the validity of a patent over a “data processing system for hub and spoke financial services configuration.” The CAFC reached this conclusion based on the test it formulated for the patentability of business methods and which provides that a business method is patentable subject matter if it “produces a useful, concrete, and tangible result.” This flexible test opened the door wide for the United States Patent and Trademark Office (USPTO) to issue patents over computer based business methods (Hall, 2009).

²⁰ *Bilski v. Kappos*, 130 S.Ct., 3218 (2010).

remaining term of patent and copyright protection and the broadness of the claims of each patent since the scope of the patent claims determines the scope of its monopoly power. With respect to trademarks, the firm should carefully examine the scope of the categories of goods and/or services with which the trademark is associated as well as the overall reputation of the trademark. When the trademark is registered in association with a large number of goods and services, the firm will be able to enjoy the reputation associated with the trademark in more business sectors and/or benefit from licensing it to businesses interested in using it in such sectors. For example, the trademark “Jaguar” is registered in association with a wide variety of goods and services, such as clothing, watches, shoes, hand-bags and cars. As a result, the owner of the “Jaguar” trademark can license it to a company interested in making bags, if the owner is not interested in making bags.

Thirdly, a firm that acquires the copyright of another company over computer software should ensure that its proprietary software exploitation will not be hindered if the acquired software comprises open-source software. The terms and conditions of an open-source license under which the open-source software was obtained will impact the nature of the further distribution or exploitation of the software. The United States Court of Appeals for the Federal Circuit affirmed in *Robert Jacobsen v. Matthew Katzer*²¹ the enforceability of an open-source license. In this case, Robert Jacobsen, a developer of open-source software, sued Matthew Katzer, a developer of proprietary software, for using some of Jacobsen's open-source code in the proprietary software without including a proper notice required by the open-source license indicating the origin of the software and the part of which that has been modified. Therefore, Jacobsen argued that Katzer infringed his copyright and therefore sought both damages and an injunction preventing Katzer from distributing the software. The district court held that Katzer did not infringe the copyright of Jacobsen. However, the United States Court of Appeals for the Federal Circuit reversed the decision holding that Jacobsen has enforceable copyright and since Katzer did not abide by the terms of the open-source license, he infringed Jacobsen's copyright. It further confirmed that “[o]pen source licensing has become a widely used method of creative collaboration that serves to advance the arts and sciences in a manner and at a pace that few could have imagined just a few decades ago.”²² The United States Court of Appeals for the Federal Circuit returned the case to the district court for re-examination, but the case was finally settled out of court in 2010. Nonetheless, this case remains as a leading case for the enforceability of open-source licenses.

In 2003, Cisco Systems acquired Linksys, a company that was producing networking products. Some of the products that Linksys produced incorporated open-source software licensed from the Free Software Foundation (FSF). Later on, Cisco Systems started distributing some of Linksys'

²¹ Robert Jacobsen v. Matthew Katzer and Kamind Associates, Inc. (August 13, 2008) <http://wiki.creativecommons.org/images/9/98/Jacobson_v_katzer_fed_cir_ct_of_appeals_decision.pdf>.

²² *Ibid.*

products without disclosing the source code associated with the software incorporated in these products as required by the terms of the open-source licenses. The Free Software Foundation sued Cisco Systems for copyright infringement and sought both an injunction preventing Cisco from further distributing products that includes firmware incorporating open-source software and recovery of profits that had already resulted from previous distribution. Courts did not decide on this case, because Cisco systems agreed to make the source code of the software at issue available on its website, to donate an undisclosed amount to the FSF and to appoint a person responsible for ensuring that Linksys products are compliant with the FSF's license.²³

Fourthly, a firm buying a trademark should also make sure that the trademark is not about to lose its distinctive character. In trademarks law, "distinctiveness" is the ability of the mark to distinguish the goods and services of one business from the goods and services of another business. The distinctiveness character of the mark is a condition that a mark needs to satisfy in order to be registrable, and this character has to continue existing as a condition for the mark to continue receiving protection (Gervais and Judge, 2011). Once distinctiveness is lost, the mark will become "generic" or "descriptive" since it will be perceived by the public as a word that refers to a given good or service rather than a word that differentiates the goods and services of one business from those of another business. For example, "Vaseline" is a mark that has lost its distinctiveness and become generic or descriptive (Shpetner, 1998). This word is now perceived as a petroleum jelly used as a lubricant rather than a trademark distinguishing the petroleum jelly of one producer from that of another.

In addition to the law challenges associated with IP assignment/acquisitions, licensing activities may raise some challenges. For examples, a firm licensing its trademark to another firm should ensure that the licensee will use the trademark in association with goods and services that have the same level of quality of the goods and services with which the trademark is originally associated. Otherwise, the trademark will lose its distinctiveness and thus could be vulnerable to expungement (Gervais and Judge, 2011). As explained earlier, customers always develop a link between a given trademark and the quality of the goods and services with which it is associated; therefore, when a trademark becomes associated with goods or services of a lower quality, the public interest requires the expungement of this trademark (Gervais and Judge, 2011).

In *Heintzman v. 751056 Ontario Ltd.*,²⁴ the trademark owner was a producer of high quality pianos, but it decided to sell its business along with its trademarks. The purchasing business outsourced the production of the pianos to another company that produced pianos with lower quality. The Court found that the trademark lost its distinctiveness because the public was not informed about the

²³ "FSF Settles Suit Against Cisco", (2009) <<http://www.fsf.org/news/2009-05-cisco-settlement.html>>.

²⁴ *Heintzman v. 751056 Ontario Ltd.* (1990), 34 C.P.R. (3d) 1.

change of the source of the goods with which they associated the trademark. In this case, the fact that the quality of the pianos after the trademark assignment was lower was important to find that the trademark lost its distinctiveness.

Licensing a trademark may also pose a threat to the protection of the trademark if the licensor does not practice direct or indirect control over the quality or nature of the goods or services of the licensee with which the trademark is associated (Gervais and Judge, 2011). In most jurisdictions, the “use” of the trademark is one of the requirements for maintaining its registration. Thus, when it is not used for a period of time prescribed by law, its registration could be expunged upon the request of an interested party. If the licensor is no longer using the trademark, the use of it by the licensee will not satisfy the requirement of “use” under trademarks law unless the licensor continues maintaining a direct or indirect control over the quality or nature of the goods and services associated with the trademark (Gervais and Judge, 2011).

CONCLUSION

For centuries, the relationship between IP and innovation has been prominent and this relationship will continue in the era of open innovation. While strong IP protection stifles open innovation, its absence may lead firms to resort to secrecy to protect their innovation, a situation that not merely hinders open innovation but abolishes it. IP law provides innovators, whether firms or individuals, with the ability to control their innovation. However, it leaves it to the innovators to decide how much of this control they actually want to exercise. It is also up to innovators to decide how to exercise this control. They may follow closed innovation models or opt for open innovation paradigms, which require clear and detailed IP management strategies. The legal implications that may result from incautious IP strategies could be serious. Licensing out, licensing in, and cross-licensing strategies as well as the strategy of IP acquisition are based on a complicated IP law framework the understanding of which by open innovation firms is essential to prevent any negative implications on their ability to protect their IP and avoid liability.

Further, the decision to engage in an open innovation process should be driven not only by the strategic objectives of the firms but also by their current situation with respect to IP ownership. Listing their portfolio of assets and assessing their value are critical steps that firms should undertake to evaluate the complementarities and expected benefits of an open innovation strategy. At a more tactical level, managers should also consider the organizational readiness towards open innovation and the ability of its innovators to overcome the “not invented here” and “not sold here” syndromes. Adopting an open innovation approach also requires the development of proper competences, which have been described as absorptive, multiplicative and relational by Gassmann & Enkel (2004). Nurturing these competences may be costly; therefore, managers

should also consider the coordination and transactions costs that are associated with an open innovation strategy. In line with the debate on the concept of absorptive capacity, firms should also maintain a suitable level of R&D and innovation capabilities and avoid becoming over reliant on external partners.

KEY TAKE-AWAYS

- Intellectual property protection is a driver of innovation.
- Intellectual property acquisition and licensing enable open innovation.
- A firm should consult with intellectual property law experts about its open innovation activities in order to avoid liability and to ensure the continuous protection of its intellectual property.

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