

Open Innovation for Sustainability: Lessons from the GreenXchange Experience

Programme on Innovation, Technology and Intellectual Property

By **Roya Ghafele and Robert D. O'Brien**

Oxford Limited & Oxford University

Introduction

Open innovation, a term coined by Henry Chesbrough in 2003, has been the subject of increased interest in policy debates and academic studies. A Google search of the term yields nearly 600 million results. In recent years, open innovation has also been raised in a number of international fora. For example, the World Intellectual Property Organization's Development Agenda (WIPO DA), an initiative aimed at mainstreaming the development dimension in all of WIPO's activities, has sought to bring greater attention to the concept. Indeed, one of the 2007 WIPO DA recommendations calls for "exchanging experiences on open collaborative projects such as the Human Genome Project as well as on intellectual property models."¹ However, despite its growing popularity, open innovation has received relatively limited attention in discussions about promoting 'green' innovation, an issue of particular relevance within the context of the Rio+20 summit in Brazil (20-22 June).

The GreenXchange (GX), which was launched in 2010 by Nike along with nine other organizations, is an interesting exception to this trend. The GX, a web-based marketplace for intellectual property (IP), was founded on the "belief that the best way to stimulate sustainable innovation is through open innovation" (Tapscott 2010).

Two years after its launch, it seems that the GX has not lived up entirely to its original expectations. Other than Nike, only one other company - Best Buy - has agreed to place its IP assets on the GX, and the vast majority of the posted IP cannot be used in the creation of commercial products. These results prompt a number of questions: in what ways does the GX exemplify both the usefulness and limitations of open innovation for sustainability? what lessons can be drawn from the GX experience in terms of the broader thinking on innovation, intellectual property and sustainability? and, in what way can such initiatives be made to function better?

¹ <http://www.wipo.int/ip-development/en/agenda/recommendations.html>. In 2010, a WIPO DA project was adopted with the aim to "map/examine existing paradigmatic open collaborative initiatives and their relations with IP models through a taxonomy-analytical study."

See David Gann, Linus Dahlander, Gerry George, Ali Jazairy, Sacha Wunsch-Vincent, "Taxonomy-Analytical Study for the Project on Open Collaborative Projects and IP-Based Models," Development Agenda Recommendation 36, CDIP/8/INF/7 REV, (WIPO, Geneva, 2012) at http://www.wipo.int/edocs/mdocs/mdocs/en/cdip_8/cdip_8_inf_7_rev.pdf



In order to answer these questions, a review of the existing literature on the GX was completed and a number of stakeholders in the GX were interviewed. The findings are presented as follows: First, the mechanisms underpinning the GreenXchange are introduced and examined. Second, the GX will be discussed within the broader context of 'green' open innovation. Third, the development of the exchange will be detailed and challenges to its success will be identified. Finally, recommendations will be offered on how to ensure that initiatives such as the GX function better.

Ultimately, although the GX has had a limited success in catapulting open innovation to a place of prominence in efforts to achieve greater sustainability, its development represents tentative first steps in the right direction. The story of its evolution is indicative of the fact that organisations, be they governments, non-profits, or private enterprises, can improve GX-like efforts through: a) further education on the benefit of IP exchanges; b) an increase in resources dedicated to these exchanges; and c) a move away from simply focusing on the legal exchange of patents and towards increased collaboration between innovators.

Using Sustainability to Open Up Intellectual Property: Can it work?

The idea for the GX was first conceived in 2009, when some of its founders realised that sustainability was becoming a more fundamental issue to businesses. In some cases, this development was the result of new regulations requiring companies to change their operations so as to be more environmentally friendly, and, in other cases, the advent of limitations on access to resources used in production. Motivated by this, the GX's founders discussed the best way to create an interactive platform to promote open exchange of best practices on issues related to sustainability. The essential idea that emerged was the creation of a system in which tested solutions - existing patents related to sustainability held by corporations and universities - could be shared using the open source community model for licensing pioneered by Creative Commons (Interview, GX consultant 2012).

The GreenXchange, then, was born out of a wish to solve larger problems related to sustainable business

practices, with IP licensing in an online exchange chosen as the vehicle by which such problems could be addressed. It is within this broader context that its development should be assessed.

On January 27, 2010, Nike, along with nine other organisations - Yahoo!, Best Buy, Creative Commons, IDEO, Mountain Equipment Co-op, nGenera, Outdoor Industry Association, salesforce.com, and 2degrees - unveiled the GX at the annual World Economic Forum (WEF) in Davos. In order to kick-start the platform's development, Nike President and CEO Mark Porter pledged to place more than 400 of the company's patents on GX (Tapscott 2010).

In the documents on the GX distributed at Davos, Nike stated that "[they] know it can work, because it already has." Here, Nike is referencing its archetypal case of successful IP licensing in the name of sustainability - the use of its 'environmentally preferred rubber' (EPR) in the production of bicycle tyre inner-tubes manufactured by Mountain Equipment Co-op. The deal between the two companies is simple - Mountain Equipment Co-op pays Nike a licensing fee and, in return, receives the rights to use Nike's EPR, which contains 96 percent fewer toxins than the company's original footwear rubber formulation (Tapscott 2010). The result is a win-win situation, with Nike earning money off its patent and Mountain Co-op reducing its carbon emissions, improving factory conditions, and delivering a greener product to its customers (The GreenXchange 2010).

The GreenXchange: "Our model is open innovation, our methods are those of the digital commons"

Announcing the creation of the GX, Creative Commons stated that "our model is open innovation, our methods are those of the digital commons." Dan Tapscott, who helped set up the platform, later noted that "the exchange is a web-based marketplace where companies can collaborate and share intellectual property, which can lead to new sustainability business models and innovation" (Tapscott 2010). But how exactly does the GX work?

In short, the exchange combines technology and the Creative Commons licensing structure to provide a platform for companies to both issue licenses to use their patents and acquire the rights

to use the patents of others (Mazur 2009). The mechanism devised for this sharing of intellectual property is known as the “GX semi-structured public license.” Based on the Creative Commons philosophy of “some rights reserved,” it allows the owners of the IP to control what aspects of their patents are accessed while offering those who are interested in the patent the opportunity to acquire the rights to use it in their own research. The founders of the exchange state that it will “anticipate common transactions and lower the transaction costs for those rights that a patent owner may want to put into play, while reserving others” (The GreenXchange 2010).

Those wishing to post IP on the GX can choose to classify it under three different licensing structures: a standard option, a standard PLUS option, and a research non-exempt option.

The standard option offers GX users the chance to obtain a royalty-free license under which they can commercially use the patented technology. In other words, the owner of the IP is willing to give it away and the users can utilise it however they wish. The standard PLUS option, the most complicated of the three structures, gives GX users the opportunity to acquire a license that requires a payment and/or features restrictions (Greenxchange.cc). For example, the University of California at Berkeley posted a patent related to healthcare on GX using the standard PLUS option, indicating that it could only be used in creating a marketable product by persons from developing countries (Interview, GX consultant). The research non-exempt option provides non-profits the opportunity to conduct research on the posted patented technology, improve and adapt it, and then patent these improvements and adaptations for non-commercial use. This option allows companies to post assets without fear of them being used later in products produced by competitors. At the same time, it provides non-profit institutions such as universities the opportunity to access existing patents, improve them, and patent those improvements (Greenxchange.cc).

In creating this licensing protocol, GX developers hoped to mitigate the concerns of IP holders regarding patent protection while simultaneously encouraging them to license it out. It was their hope

that the protocol would make possible the type of web-based platform that stimulates innovation in sustainability. By using Creative Commons to develop the protocol, GX’s founders established the licensing structure as a public good available for use by anyone regardless of whether they work with the GX or not (Interview, GX consultant).

Open and Green Innovation, Intellectual Property and the GreenXchange²

Open innovation is a term that has been used rather loosely to cover a range of practices and approaches. For some, it may mean the absence of IPRs; for others, it means pro-actively leveraging IP through a more open approach towards knowledge management (Chesbrough 2006; Lord, Mandel and Wager 2002). This is the original meaning used by Chesbrough when he coined the term ‘open innovation’. From this perspective, IP is not limited to internal development; it can also be sold, licensed, or even given away for free (Christensen, Olesen and Kjær 2005; de Jong, Kalvet and Vanhaverbeke 2010).

Firms also have the opportunity to nurture their own innovation by acquiring IP from others. Licensing is an important means of opening up the innovation process itself and support technology transfer. Under an open innovation paradigm, companies should license in technology that supplements their business model and license out IP that they do not deem necessary for corporate performance. An open innovation approach towards IP thus stands in contrast to a ‘Cold War’ IP paradigm, where patents are essentially held as ‘weapons of mass destruction’ and as a means to attack, counter-attack and defend the company from third party aggression. An open innovation approach towards IP proposes a more ‘peaceful’ leverage of IP; one that is rooted in the logic of profit, growth rates and market shares.

An open innovation approach of IP contrasts with the established view of IP as a defensive right that serves to keep competitors at bay through litigation or the threat of litigation. There is, however, a new school of thought emerging where the value proposition of IP is modeled through an ‘intangible assets’ lens, and patents are seen as a key variable to increase the efficacy of technology use, as well

2 This section draws upon: Roya Ghafele, James Malackowski & Benjamin Gibert. Emerging IP Monetization Techniques. The Institutionalization of an Intellectual Property Exchange. *International Journal of Intellectual Property Management*, accepted 15. 5. 2011 (forthcoming).

as a vital enabler for the flourishing of secondary technology markets (Chesbrough 2006, p.148).

A different understanding of the value proposition of IP paves the way for different institutions, such as Nike's GreenXchange. While bilateral licensing negotiation has been the traditional mechanism for the transfer of patent rights in the past (Caves et al 1983; Teece 1986; Arora 1995), new intermediaries are emerging that facilitate the transfer of technology. US Internal Revenue Service data shows that technology licensing payments increased from \$33 billion to \$157 billion between 1994 and 2007 (Par 2007).

While this growth in licensing revenue can be seen as an indicator of enhanced efficiency in technology utilisation, the traditional bilateral licensing model may lack the necessary ubiquity and standardisation to promote transparent, active and liquid IP markets. It requires enormous amounts of often redundant due diligence, is time consuming and can be highly skewed according to the bargaining power of participants. Usually operating in a private and sequential bargaining context, it offers significant flexibility for both parties, but the transaction costs of transferring technology can occasionally be so high as to offset the value generated (Teece 1988). Traditional channels for licensing are simply not sufficient to sustain the influx and transparency needed of a working market for intangible asset rights trading (McClure 2008).

There are no standards for licensing, and bilateral negotiations effectively constitute a private market for IP valuation. This is partly so because parties do not want increased transparency; lack of transparency in the IPR market may drive prices higher than if there is full disclosure. But at what cost? Says O'Brien: "The value of intangible assets is becoming too large to trade in a clandestine market." (O'Brien 2007). Against this background, the question arises how markets can be better organised and what can be done to move from a clandestine bilateral licensing model to one where IP is traded in a transparent manner. An electronic platform that allows trading by multiple partners seems a way to overcome this dilemma.

It enables the monetisation of non- or under-utilised patents via mechanisms other than bilateral licensing or litigation, as well as encourages investment in the development of patentable inventions. An IPRs exchange may be compared to a marketplace that aggregates buyers and sellers where the commodity in question goes to the highest bidder able to draw on knowledge of the historical pricing of similar commodities. It could thus be a route to remedy many of the shortcomings associated with the traditional bilateral licensing model, fostering transparency and promoting technology transfer. IPR exchanges should reduce volatility and costs of capital for innovative firms.

The Development of the GreenXchange: Challenges and adjustments

When it was launched in 2010, the GX was presented as an innovative new approach to knowledge-sharing aimed at promoting more sustainable business practices. Two years later, the GX is home to just 463 patents: 444 of those were posted by Nike soon after it launched the exchange, 15 were subsequently posted by Best Buy, and four were posted by the University of California at Berkeley (Greenxchange.cc). These numbers make clear that since the platform's unveiling, its founders have encountered several challenges. These have led Nike to reconceptualise its short-term goals for the GX, although the company remains committed to its long-term objective of serving as a widely-used web-based marketplace for IP transactions that promote sustainability.

Three challenges in particular stand out in efforts to develop the GX:

- the strength of the prevailing paradigm on IP protection and management;
- the realisation that patents in and of themselves are not necessarily the most integral part of open innovation-inspired attempts to promote sustainability business models; and
- limited resources given the scope and scale of the project.

The first challenge was a general lack of consensus amongst patent holders regarding the safety and

utility of IP licensing and exchanges (Interview, Nike employee 2012). This is not a problem unique to the GX. Efforts to establish a secondary market for IP have been made before and exchanges such as Yet2com have failed to achieve success.³ As one individual familiar with the development of the GX noted, the idea behind the exchange, and indeed all such IP transaction platforms, runs completely contrary to the conception of IP held by most patent owners, including businesses and universities. They look at patents as a means to assure ‘freedom to operate’, allowing them to block competitors in a given market segment, as well as mitigate risk. According to this view, patents contain both the secret to managing competitive threats and act as insurance. The dominance of this perspective has presented a major impediment to the GX’s ability to promote participation and accrue assets (Interview, GX consultant 2012). With corporate patent attorneys, and not sustainability experts, typically making the final decision on whether a company would commit its IP to the GX, its development has suffered (Greenxchange.cc).

One of the ways that the founders of the GX attempted to address this challenge was by targeting universities as potential contributors to and beneficiaries of the exchange (Interview, GX consultant 2012; interview, Nike employee 2012). Universities hold large numbers of patents, but, unlike larger corporations, they often lack the resources to create economic value out of their patent holdings. The GX, then, would seem to be the perfect platform by which they could find a means to turn their dormant and under-utilised patents into the seeds of successful inventions. Through the GX, they could both license existing IP that would allow them to further enhance their own innovative projects and license out stocks of their unused or underused IP. The GX would also offer them the opportunity to identify potential partners in research and development, whether other universities or large corporations, such as Nike, with the revenue flow to finance further R&D efforts.

To encourage universities to make use of the platform, the GX’s developers reached out to number of major institutions of higher learning, including UC-Berkeley, the University of Washington, the

University of Arizona and the University of Oregon. They found some success with Berkeley, which committed four patents to the GX. In general, however, interactions with these universities led GX employees to realise that in order for the exchange to be of true value to major research institutions, it would need to maintain a very large number of patents. Universities are typically looking for very particular patents to access, not just acquiring and offloading IP of potential interest. Thus, an exchange with only a small number of patents is not likely to be particularly useful to them (Interview, GX consultant 2012). The GX, then, faced a classic dilemma - it needed a large number of patents to interest universities and it needed universities to contribute IP to realise a high volume of patents. A solution to this problem is yet to be found.

The second challenge encountered by the developers of the GX was the realisation that their initial focus on the tangible exchange of patents may have been misplaced. Through their interactions with both businesses and universities, the founders discovered that there was more interest in gaining access to the knowledge behind the creation of the patents than there was in simply obtaining the patents themselves. Businesses and universities, it seemed, viewed the patent more as a gateway to the inventor(s) than as an asset with its own inherent value. This realisation led to a radical reconceptualisation of GX’s trajectory, away from a focus on accruing assets on a web-based platform and toward an emphasis on building relationships between parties with mutual interests and mutually beneficial knowledge regarding sustainability (Interview, GX consultant 2012; interview, Nike employee 2012).

That the original conception of the GX might not facilitate the attainment of the goals set out by Nike and the GX’s founders is illustrated by Nike’s efforts to license out the use of its environmentally preferred rubber. The company had already been successful once in this enterprise, providing the patent to Mountain Co-op for use in the production of bicycle tyre inner-tubes. GX employees attempted to replicate this success by offering Nike’s EPR to a number of other companies, including competitors in the

³ Another newly established platform for trading IP, IPXI, has recently received US\$10 million from Philips, the Chicago-based options exchange and a third investor who prefers to remain anonymous. It remains to be seen to what extent IPXI will break the spell over IP exchanges.

footwear industry. Nike structured the license for its EPR as a “standard PLUS,” requiring those who wished to use its product to register how they used it. Nike also required access to any improvements made on the EPR by other organisations (Interview, GX consultant 2012).

During the process of offering Nike’s EPR for license, GX developers quickly discovered that the other footwear companies were more interested in access to the people behind the patent than they were in the patent itself. The patent still served a purpose - it regulated the relationship between Nike innovation specialists and those in other footwear companies in order to make interaction and collaboration safe - but it was not the focus of the exchange. This new dimension of the GX also seemed to yield additional benefits: once the two sides were talking, relationships were built and conversations naturally and organically broadened to include potential new areas of collaboration (Interview, GX consultant 2012). On January 11, 2011, the GX held an in-person collaboratory with representatives of various athletic footwear companies, non-profits, universities and government agencies. The session focused on technical assistance for companies licensing Nike’s EPR through the GX, but the conversation later broadened to include discussion of collective action designed to solve sustainability challenges related to packaging, product recycling, water-based adhesives, ‘green leather’ and manufacturing facilities’ energy efficiency (GreenXchange: Partners Collaboratory 2011).

As a result, the short-term focus of the GX’s developers was changed from emphasising asset accrual to an effort to build relationships around the assets already posted to the platform. Second, the entire project became even more ‘Nike-centric’, with the company taking the view that if it could figure out how exactly the GX should be used, it could later serve as a model for the adoption of the GX by other firms. In short, while the long-term vision for the GX as a web-based platform for IP exchanges and, more generally, the importance of IP licensing to promote sustainability in business practices, has not been modified, the path to achieving the goal has shifted (Interview, Nike employee 2012; interview, GX consultant 2012).

Throughout its development, the GX has faced a third challenge: general resource limitations. The platform set out to challenge a dominant paradigm in conceptualising IP, hoping to leverage the combination of open innovation and the Creative Commons licensing structure to promote patent exchanges. Needless to say, the achievement of such aspirations requires significant resources. However, combining the percentage of work dedicated to the platform by different employees and founders, roughly a total of two people were committed to the development of the GX full-time (Interview, GX consultant 2012) This seems to have posed problems both before and after the reconceptualisation of the GX.

Initially, when the GX was focused on developing a web-platform and accruing assets, website development advanced extremely slowly. The exchange has already been housed on two different web platforms and, as of 20 May 2012, the latest iteration offers only limited information on the assets. While users can see how many patents are on the GX, the distribution of license structures, who contributed the patents, and what general category they fall under, they cannot access any information providing an overview of the content of the assets. Neither can users acquire or post assets without going through a GX employee (Greenxchange.cc).

Since the developers of the GX understood that it should be more focused on relationship-building around assets, the venture has become arguably even more work-intensive. After all, it requires more effort to nurture and regulate relationships between two or more parties than it does to moderate a website.

Those acquainted with the GX’s founders and operations praise the commitments made by companies to its success and development (Interview, GX consultant 2012). Nevertheless, given the ambitious mission set out by the consortium and the slow pace at which the platform has developed, it is evident that the amount of resources dedicated to the GX has been insufficient.

The GreenXchange represents a novel attempt to solve pressing issues related to sustainability in business practices. Considering the way it was presented to the world in January 2010, the GX has

been unsuccessful to a certain extent. However, the avant-garde nature of its work and the story of its development offer valuable insights to those looking to utilise open innovation in promoting sustainability business models.

Conclusion: Using open innovation to achieve sustainability

The GreenXchange was introduced at a time when a consensus amongst academics and innovation experts was beginning to form around the idea that by reducing privileged access to technology and the need for complementary assets, a liquid marketplace for patents should engender a more productive division of labour that results in a more efficient commercialisation of new technologies and promotes sustainability. Yet, the GX story is indicative of the chasm that remains between scientific thought and real-world practice when it comes to IP management. This prompts the question of what can be done to close that gap. Here, the challenges faced by both the GX and other IP exchanges are instructive, suggesting three clear paths forward:

1) Increasing education on the benefits of open innovation-inspired IP exchanges

The developers of the GX encountered a familiar problem - a century old paradigm which holds that IP is not a readily tradable asset. At the centre of this paradigm stands the conservative, legal perspective on the utility of intellectual property. It will take time to change these established patterns of thought, but efforts to educate the business world about the benefits of IP exchanges such as the GX will yield results. Since much of the innovative thinking in this realm emanates from academics, they will likely lead the way in shaping the views of tomorrow's business leaders on intellectual property. Ultimately, though, GX staff will be charged with educating potential users on the benefits of the platform they created. This reality leads to this brief's second major finding.

2) Significant resources will be needed to change the dominant IP paradigm

In order to replace the existing view of IP with one that is more in line with the open innovation-inspired model advanced by the GX, significant

resources will be required in terms of both manpower and financial assets. Governments may play a role here. Those wishing to support efforts to promote innovation via IP licensing, particularly when it is aimed at achieving greater sustainability in business practices, can do so in several ways. First, they can devise a tax credit for businesses who place their IP on exchanges such as the GX. This would provide an extra incentive for these businesses to both manage their IP in a more efficient manner and open up access to patents they hold which are not integral to their business model, but that may be helpful in promoting innovation elsewhere. Governments could also play a role in a public-private-partnership (PPP), whereby they provide resources, in the form of funding or manpower, while private enterprises such as Nike provide expertise in their field, their connections, as well as a business perspective on why IP licensing stands to benefit the corporate world.

3) Connecting people is just as important, if not more so, than exchanging patents

Perhaps the most important lesson from the GX's development is the fact that connecting the innovators behind patents is viewed by many enterprises as of greater importance than simply acquiring the legal rights to use a patent. With this in mind, IP exchanges need to place more emphasis on relationship-building aimed at collaboration between companies. Nike's efforts to accomplish this task using its own store of patents is notable and seems to be yielding results, even if they have been only modest thus far. Building on Nike's findings, IP exchanges need to broaden their focus to include convening conferences, setting up seminars, and sponsoring other forms of physical interaction. While web-based platforms are one important aspect of these exchanges, they do not appear to be a panacea to the problems that exchanges such as the GX have faced. Here, again, resources are key, and a PPP would serve these efforts well.

When interviewed by *The Financial Times* in late 2010, eleven months after the launch of the GX, Hannah Jones, vice president of sustainable innovation at Nike, noted that "all of this is nascent," going on to promise that

“we shall embrace the failures and experiment wholeheartedly” (Broughton 2010). By all accounts, Nike and its partners have backed up Jones’ comments with action. For its part, although the GX has not quite lived up to its billing, it has built a strong foundation from which the effort to change the dominant intellectual property paradigm in order to advance greener innovation can be pursued. The story of the GX’s development and the lessons it yields are particularly relevant within the context of the Rio+20 summit, and the policy debate about how to best leverage innovation for sustainability.

There is no silver bullet that will turn past IP exchanges’ failures into future successes overnight. It is important to also underline that it is ultimately for each to company to determine the innovation strategy that best suits its business needs. Yet, by focusing on increased education about the benefits of IP licensing and exchanges for innovation, forming partnerships so as to accumulate more resources for these exchanges, and broadening the emphasis to include efforts to connect the innovative people behind the patents, initiatives such as the GX can pave the way to a brighter, greener and more innovative future.

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Roya Ghafele is the Director of Oxfirst Limited, a boutique consulting firm specialising in the economics of innovation. Within the University of Oxford she holds Fellowships with the Said Business School's Novak Druce Centre for Professional Service Firms, the Oxford Intellectual Property Research Centre and St. Cross College. She can be reached at roya.ghafele@oxfirst.com

Robert D. O'Brien is currently pursuing a M.Sc. in Global Governance and Diplomacy at Oxford University and works as a Research Assistant for U.C. Berkeley. He joined Oxford after graduating with distinction from the Eliott School of International Affairs, George Washington University.

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