

CATCH THE GROWTH WAVE OF INNOVATION

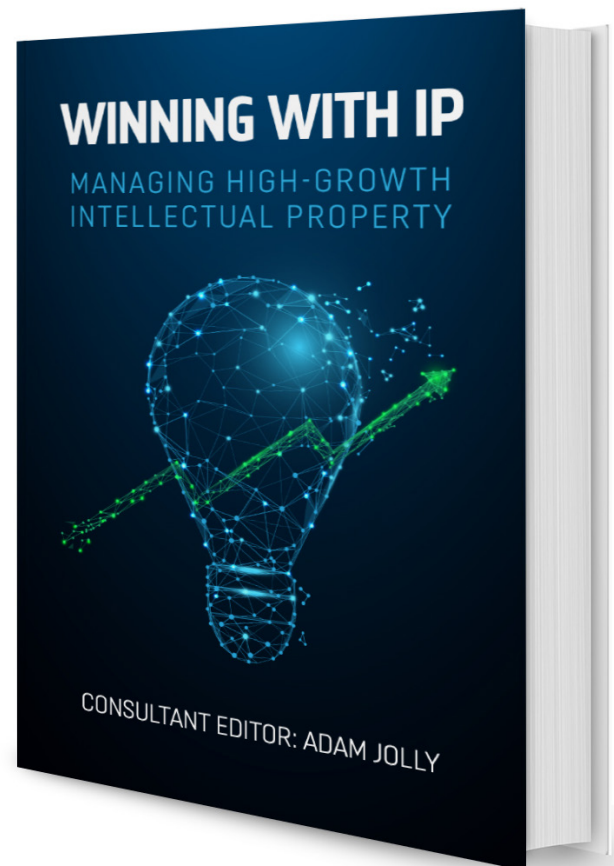
BOWMAN HEIDEN AND RUUD PETERS

In a book inspired by the EPO's and LESI's High Growth Enterprise Taskforce, Bowman Heiden and Ruud Peters discuss the challenges of technology push, market pull and open innovation

Our emerging connected, digital economy has resulted in the introduction of new products, services and business models with ever-increasing complexity, speed and geography. Over the last 20 years, the amount of money invested in research and development has tripled, with China having passed the European Union and now almost on parity with the United States.¹ Not only the amount of money that is put into R&D globally is increasing, but also the nature of innovation has changed. More discrete technological innovations, such as steam engines, telegraphs, light bulbs and the telephone and automobile, have given way to convergent, multi-technology products with both increased complexity and speed to market. Technology adoption cycles that used to take 40 to 50 years or longer now are in the range of one to two years.² Firms that miss the window of opportunity and enter the market late are already on the cost down-curve. The combination of increased R&D costs and quick reduction in pricing makes it more challenging to achieve a proper return on investment through innovation.

The increased complexity and speed to market has rendered the traditional closed innovation models obsolete. For convergent hardware products, such as smartphones, healthcare equipment and modern, connected vehicles, firms don't have the time, resources and often capabilities to develop all necessary technologies in-house. So, they are more or less forced to look to external actors to help them to speed up their own innovation to remain competitive. This process is often referred to as open innovation, in particular, from the perspective of technology development.³

To meet this challenge, firms are interacting with a broader ecosystem of actors to enhance both the



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Growth is ever more centred on IP. Drawing on the knowledge and experience of 20 top-level IP performers, including the innovation team at the European Patent Office, this book gives a series of insights and lessons into how IP inspires and fuels growth of 10 percent, 20 percent, 50 percent and more, not just this year, but next year and into the future. It discusses how entrepreneurs, innovators and executives can source the right ideas, how they can create intellectual assets that their users value and how they can be ready to negotiate high-level deals.

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development of technology and its commercialization. They are looking beyond traditional sources of innovation and traditional market segments, transforming themselves from a closed to an open innovation actor.

Technology push v market pull

One traditional perspective on innovation is the model of technology push versus market pull. In this model, a firm either starts with the development of a technology-based product or service and introduces it to the market (ie, push), or it starts with an articulated need from the market and develops or identifies a technology to meet demand (ie, pull). History is littered with failed visionary attempts at technology push even by vaunted innovators as in the case of the Apple Newton or Google Glass.

Market pull would seem less risky except for the inconvenient truth that customers often are unable to articulate what they really want.⁴ Usually, their real needs are latent and only known once products and services are launched. Again, history is populated with failed attempts to address market needs that only hypothetical customers wanted.⁵

IP, technology push and open innovation

When a firm moves from a closed to an open model of innovation, it seeks to commercialize its technology beyond its initial intention, its traditional market or its business model.⁶ For industrial firms, it typically includes licensing-out, spinning off new firms, and creating joint ventures. For universities, the transfer of research to the market is the model for fulfilling their third mission, the facilitation of innovation.

Technology push doesn't mean that there is no understanding of the market. It is just about a different starting point. Obviously, research conducted on diabetes or graphene, for example, is done with an understanding of potential applications. Still, it's most likely that these research programmes will not have started with a particular market application or commercialization strategy in mind. In the case of digital services, the use of minimal viable products (MVPs) allows developers to iterate quickly between technology push and pull, promptly releasing new versions based on customer feedback. It's a great business model for digital products, but less practical for other technologies, such as drug development.

In technology push, the traditional starting point for

licensing is that a firm has accumulated a portfolio of patents that it is not effectively monetizing. In themselves, however, patents have no value at all. In open innovation, their worth depends on how others, such as potential licensees, view them, raising a series of questions:

- Is your technology useful for others? If you've created technology for your own purpose and you can't put it to use, why would it be useful for others?
- Do your patents actually cover valuable technology features? Often, patents are drafted with one particular application for one specific business in mind. However, over time, the technology may become more relevant to other applications in the same business or in adjacent or completely different businesses, resulting in patents that don't anticipate that evolution.
- Do others want to pay for your patents? The answer to that is typically no, not for the patent only. If there is no added value such as getting access to a new technical solution, they won't pay if they don't have to. In today's patent climate in several industries, one has to create quality patents and have an IP strategy, including commitment, to enforce to be taken seriously.⁷

Technology assets within business models

When talking to technology innovators, they will often say: 'we have a lot of knowledge, but it's like a cloud. It's rather diffuse. It's not really defined.' So we encourage them to consider a full range of categories for their technology assets: what data, observations and correlations, do you have? what are all the different pieces of the puzzle



that make a technology unique? what are the building blocks that could find their place in a business model canvas? Frameworks, technical solutions, visualizations, instructions and software all have value. Typically, we'll find between 10 to 40 technology assets that contribute to answering the question of what is valuable, what is unique and what is controllable.

IP, market pull and open innovation

Open innovation, in the concept of collaborative technology development, requires a change in mindset. From an R&D perspective, firms must overcome the need to try to create everything in-house. Thus market pull is not only about understanding the customer on the product market, but also potential suppliers on the technology market. From an innovation perspective, firms must realize that all successful collaboration activities with external actors result in IP transactions. In essence, open innovation is another name for advanced IP management.

So how is it put into practice? How do you know what to look for? First of all, you review your long-term business strategy, in particular, defining what technologies you may need within a time frame of five to ten years, based on potential business cases and scenarios. Your IP strategy will reflect these priorities and challenges, in particular, defining the IP that is required to support these technologies and their business cases.

For tomorrow's technology leaders, IP management becomes a proactive process, shaping the firm's R&D strategy as well as technology acquisition. The goal is not to simply patent what results from the R&D process, but to develop technologies that are protectable so as to create future control points in the market. One can see IP management in this model as a control perspective on innovation to ensure that the technologies created can be leveraged to create a sustainable benefit for the businesses so that they can grow faster or can become more profitable.

The key is to manage IP as both a key input to steer the direction of the business and the technology development process, as well as an output that results in a viable control position. The latter will typically require a portfolio of control mechanisms, including various IP rights. Experience has shown that we still have a long way to go before business leaders and IP talk together and drive each other's strategy.

Assuming that the business strategy and the IP strategy are aligned, then the question becomes: what technology portfolio and IP position is required five to ten years

down the line? Once all clear, you have an overview of the existing IP, the technology portfolio and future business strategy, then you can determine the gaps that represents your innovation needs.

In determining how to fill these innovation needs, firms need to look at all possible pathways, employing creativity both in internal and co-operative R&D activities, but also in external technology acquisition. A variety of external sources of innovation can be deployed to manage the increased convergence, complexity and speed required to compete in today's market.

In all these collaborations of whatever kind, IP plays a vital role. Without its effective management, you will always have a problem after the collaboration regarding who owns what, and who may use which IP that has been generated within the collaboration and for what purpose.

Collaboration with third parties

There are many different forms of third-party collaboration. Various options include pre-competitive joint research and collaboration programmes, such as the European framework programmes; co-creation of new products and services together with other firms; open innovation platforms; and collaborative development together with suppliers and customers. Below are some examples of these different options:

Co-creation of new products and services

This is where two or more firms with complementary assets agree to collaborate to create novel products and services.



The Senseo coffee machine is an example of one such collaboration between Philips and Sara Lee.⁸ At the time, it was a completely new concept in the marketplace, focused on coffee making for a smaller number of people instead of the traditional drip filter. The two firms had different corporate cultures as well as different IP cultures that needed to be managed in order to merge the two separate, but complementary, business models. From Philips's side, they had the sale of the coffee-making machines, which is a one-time sale for one-time return. However, from the Sara Lee side, there are the coffee pods that are the consumables that you sell over and over again to create a continuous recurring revenue. Thus, the creation of the new system requires the collaboration of both parties. Still, the different business models had to be considered in order to find a way to share the revenues so that both parties are incentivized to participate. This includes not only sharing the business models, but also making alignments to the introduction of these products, as ramping up production for coffee machines and coffee pods have different challenges in different markets.

Standardization

This activity is a traditional but well-known pre-competitive collaboration effort, which has a strong track record of success. Examples include cellular standards such as 3G/4G/5G, wi-fi and other connectivity standards. Patents essential to these standards have to be managed properly from both a commercial and risk management perspective. Increased technology convergence and digitalization will mean that IP management includes standardization strategies as part of its core activities, not only in ICT, but all firms, particularly those affected by Industry 4.0 and IoT (the internet of things).

Supplier-customer collaboration

This activity ranges from joint development to sole development by suppliers on the basis of requirement specifications. The supplier interface is an essential source of innovation; in particular, the use of suppliers in new product development, although there is a risk for customers to be marginalized to the basic role of an assembler of products. This risk can be reduced by gaining control over the supplier through strategic IP positions.

European framework programmes

Research programmes, such as Horizon 2020 (followed by Horizon Europe) or the Innovative Medicine Initiative (IMI), set guidelines regarding the background and foreground IP as part of the contractual arrangement of the different parties involved in the collaboration. Sono, a drug developed by Philips with a number of research institutes and universities, is an example of such a projects, which focused on increasing the effectiveness of treatment through targeted delivery of medicine using ultrasonic waves.

Universities and research institutes

There are various forms of collaboration when working with universities:

- **Joint research:** parties have to set clear rules with respect to the ownership and use of the IP generated during the joint research activities to avoid possible conflicts later on during the commercialization, as well as publication of results.
- **Contract research:** this is where you give the problem to the university and let them work on the issue. In essence, you contract it out, and you hope to get back the research results you need.
- **IP/technology licence:** this is where a university has developed a specific technology and transfers it to a commercial company that's going to use it. From experience, the main challenge with this model is the different expectations of the parties regarding the value of the technology/IP, especially regarding upfront



payments, as opposed to the sharing of risk through downstream royalties for what are often early-stage research results that need significant investments for further development and still bear considerable financial risks for the commercial company.

Licensing-in and acquisition

Another option to acquire IP/technology is to license-in specific assets or to acquire entire firms. For example, today's major platform firms, such as Google, Apple, Microsoft, Amazon and Facebook, make use of strategic acquisitions to get access to crucial IP/technology assets and complementary capabilities required for their future businesses. In essence, they buy their way into the future. They are acquiring innovation options to secure their future sustainability. In particular, when these firms know they're going to enter a particular market where they have no IP portfolio or a limited one, a specific acquisition can be made to bolster their IP portfolios just for defensive purposes, so that in case they are faced with patent assertions and litigations, they can defend themselves. To speed up innovation, special know-how or creative R&D teams might be acquired but is not always the case.

However, not all firms have as deep pockets as these platforms, so they need to strategically acquire IP/technology both effectively and efficiently. Below are several IP/technology acquisition tactics that firms can deploy to address their innovation needs:

- Employ technology scouts based on identified needs.
- Build a network of relationships with universities/SMEs active in fields of interest.
- Engage a network of IP brokers as intermediaries to facilitate IP identification and transactions.
- Seek to acquire or in-license relevant IP/technology early when the price is within a pre-determined range.

It should be understood that IP scouting and acquisition is a difficult activity, comparable to panning for gold, where not all shiny objects actually turn out to be valuable. Fundamental questions to consider include:

- Do you know what IP/technology you are buying?
- What is the quality of the IP/technology?
- What is the fair price that you have to pay to enable a win-win outcome?

Especially in the current IP climate, where many patents are challenged when actively used, few companies are willing to spend millions on acquiring patent portfolios just to see their key patents invalidated down the road. So, obtaining quality patents that survive due diligence assessments are at the core of advanced IP management.

• *The full version of this article first appeared in the June 2020 edition of les Nouvelles, the journal of the Licensing Executives Society under the title "IP and open innovation: Managing technology push and pull" and is available at: <https://www.epo.org/learning/materials/sme/high-growth-technology-businesses/ip-professionals.html>.*





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Notes

- ¹ <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>.
- ² <https://hbr.org/2013/11/the-pace-of-technology-adoption-is-speeding-up>.
- ³ *Open Innovation: Researching a New Paradigm*, Chesbrough H, Vanhaverbeke W & West J, Oxford University Press, 2006.
- ⁴ <https://hbr.org/2018/09/why-design-thinking-works>.
- ⁵ *What customers want*, Ulwick A, McGraw-Hill Professional Publishing, 2005
- ⁶ <https://www.mentalfloss.com/article/57861/11-successful-products-originally-invented-something-else>.
- ⁷ FRACTUS Snowflake Pattern Precipitates New Application For Antennae, EPO SME Case Studies, 2017, ISBN 978- 3-89605-175-2, www.epo.org/sme.
- ⁸ https://www.usa.philips.com/a-w/about/news/archive/standard/news/press/2012/20120126_SaraLee_partnership.html.

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