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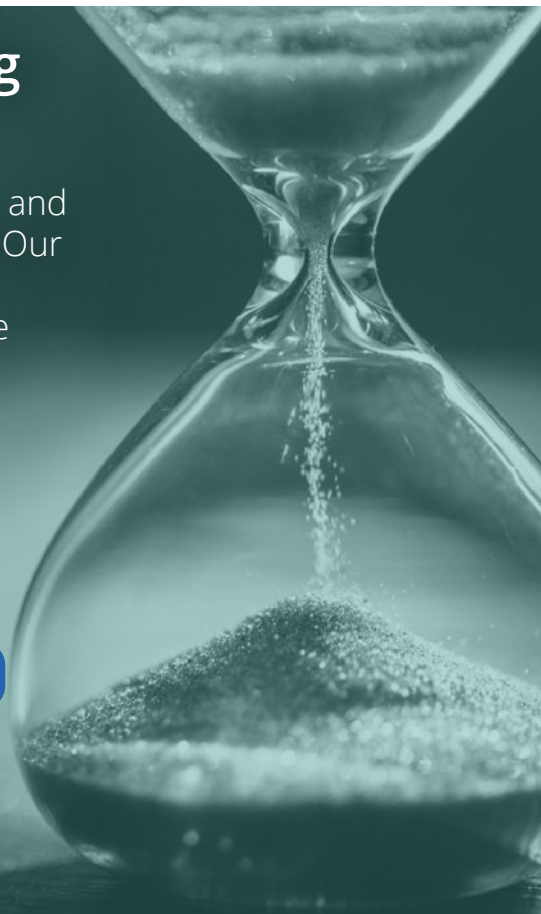
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Foreword

Small and medium-sized enterprises are key users of the European IP system, creating new technologies, jobs and growth. This special issue of *les Nouvelles* demonstrates how SMEs are using patents and other IPRs to commercialize their inventions with increasingly innovative IP strategies. It offers valuable insights into the innovation ecosystem and highlights the crucial role played by patents in promoting new technologies. Past experience shows that investing in R&D and patent protection helps SMEs and industry to emerge from crises faster and stronger. Faced with an uncertain economic outlook, it is essential that we help SMEs to harness IP's tremendous untapped potential and drive positive growth.

António Campinos, President, European Patent Office

In times of crisis, innovation is more important than before, as new solutions will be needed to solve the problems the world faces. Many of these innovations are created by SMEs. It is therefore important to ensure that SMEs understand how to use intellectual property to facilitate commercialization of often essential technologies and innovations, and to attract partners and investment to scale up their businesses rapidly.

For this reason, I laud the publication of this special issue of *les Nouvelles* in cooperation with the European Patent Office focusing on the strategic use of IP by SMEs for commercialization of their innovations and technologies.

Audrey Yap, President, LES International

**In Cooperation With
The European
Patent Office**

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Guest Editors' Note:

High-growth Technology Business—Special Issue

By Thomas Bereuter, Yann Ménière and Ilja Rudyk*

High-growth technology businesses are typically small-and medium-sized enterprises and start-ups that succeed in bringing innovation, employment and productivity into traditional and new industry sectors. These small enterprises are a major driver of Europe's economic growth and a key to addressing its current challenges, from digital transformation to health and sustainable development. Patents and other intellectual property rights help them to foster innovative solutions by encouraging and rewarding investment in new products and services.

This special issue provides a collection of articles shedding light on the different views and selected challenges that these businesses face when commercializing their technologies and scaling up in Europe and beyond. In addition, they are geared towards actionable advice and are complemented by referrals to further sources of relevant material in support of commercialisation efforts.

If the full potential of IP is to be unleashed by these risk-taking businesses, it requires a thorough understanding of the roles played by internal business decision makers, IP professionals and external stakeholders of their innovation ecosystem.

Topics Key to Business Decision Makers

- People as Enablers: The Role of the Human Factor in Intellectual Asset Management of Technology.
- Transactions Powered by Intellectual Assets: A Decision Maker's Perspective.
- IP Enforcement Strategies for SMEs.
- Why Technology Start-ups Should Be Paying More Attention to Patents.

- From Spin-out to International Player: A Case Study
- The Virtual Reality and Hard Data of Successful University Start-ups That May Succeed....or Not!

Topics Key to IP Professionals

- IP and Open Innovation: Managing Technology Push and Pull.
- Integration of IP into the "Classical" Stage-Gate Model.
- Succeeding with Market Facilitators: How Buyers and Sellers Meet.
- How to Market and License Your Technology.

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- Market Success and Challenges of European SMEs: Results from EPO's Patent Commercialization Scoreboard.
- Partnering for Succeeding at Technology Commercialization: A Negotiation Master Class Case Study.
- The Making of the High-growth Technology Business Conference 2019: Re-engineering Conference Delivery to Maximize Impact. ■

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Topic Recommendations		
Business Decision Makers	IP Professionals	Ecosystem Stakeholders
<ul style="list-style-type: none"> • People as Enablers • Transactions Powered by Intellectual Assets • IP Enforcement Strategies • Technology Start-Ups Paying Attention to Patents • From Spin-Out to International Player • The Virtual Reality And Hard Data Of Successful University Start-Ups That May Succeed...Or Not! 	<ul style="list-style-type: none"> • IP and Open Innovation • IP in the "Classical" Stage-Gate Model • Succeeding with Market Facilitators • How to Market and License Technology 	<ul style="list-style-type: none"> • EPO's Patent Commercialization Scoreboard • Negotiation Master Class • High-Growth Technology Business Conference

*authors in alphabetical order

People As Enablers:

The Role Of The Human Factor In Intellectual Asset Management Of Technology

By Thomas Bereuter, Adéla Dvořáková, Juergen Graner, Bowman Heiden and Ruud Peters*

Abstract

The potential value of technology and intellectual property (IP) assets can be fully realized only if it is accompanied by a people-centric perspective. For an efficient intellectual asset management of technology, a number of key players inside and outside an organization must be considered, as well as cultural factors. To achieve ultimate success, the views and roles of business decision-makers and IP managers must support and complement each other in an integrated, IP-driven environment throughout all phases of the intellectual asset (IA) value chain.

*In phase 1, when IAs are created, the focus is on the work done by IP managers, while decision-makers provide the frameworks for success. The three key recommendations during this phase are to employ a **pro-active IA management approach** that supports creativity, **practice open innovation** by allowing external influences on the process, and create a working environment to **attract and keep talent**.*

*In phase 2, when the technology created is assessed and protected, IP managers play a leading role, while decision-makers provide oversight and guidance, with the common goal of having a product or service that can be monetized in the final phase. The three key recommendations during this phase are to **integrate key business functions** to ensure alignment, implement **milestone-based management** that allows for repeated stop-or-go decisions for expenditure/opportunity optimization, and create an incentive system with the aim of achieving **alignment through success-related incentives**.*

*In the last phase, phase 3, business decision-makers take the lead to realize the value created during the previous phases by selling related products and services or strategic transactions (alliances, licensing, spin-offs, acquisitions and divestments), while IP managers move into a support role. The three key recommendations in this phase, with its focus on high value-generating strategic transactions, are to **ensure management continuity** throughout all stages of a strategic transaction, plan ahead to be strategy-driven rather than opportunity-driven, and **align through success-related payments** with transaction partners to optimize financial returns.*

*All phases of IA management require a high level of knowledge of IP on the part of everyone involved. The three key recommendations to enhance IP know-how are to **provide appropriate training** for executives and R&D personnel, **become part of the IP/business community** through attending conferences and other events, and **learn from best practices** by means of training events and publications.*

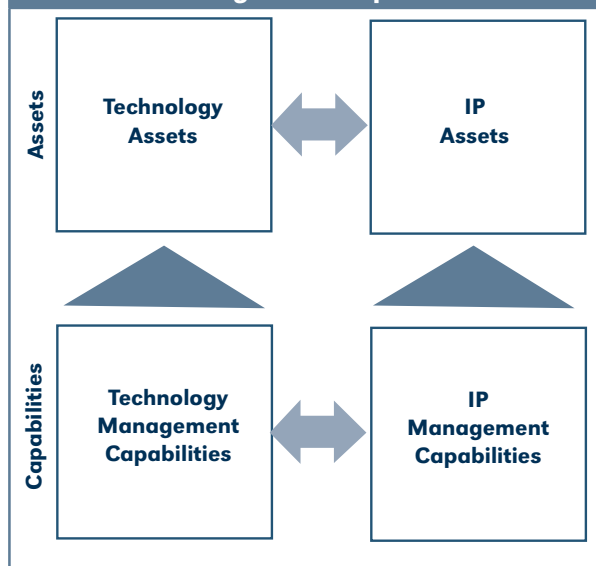
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1. Introduction

Value realization through business transactions is the ultimate goal of decision-makers in technology companies. This article is based on the understanding that to untap the potential value of technology, attention must be focused on the people that work with research and development (R&D) and intellectual property (IP) and their ability to manage technology and IP from a strategic business perspective to create value. Thus, innovation capacity should be measured not only by the quantity of R&D investment and number of patents, but also by the quality of these activities measured in terms of business impact. It is important to understand that the value of both technology and IP assets fundamentally depends on the quality of the people involved in their creation, management and commercialization. For a company, neither technology nor IP has a value in and of itself (see Figure 1).

This article focuses on intellectual assets (IA) and intellectual asset management capabilities from a technology perspective. Intellectual assets in the technological context include both technology assets (e.g., inventions, know-how, software, designs, etc.) and intellectual property assets (i.e., patents, copyrights, industrial design rights and trade secrets), which are the most important legal tools for protecting and controlling tech-

Figure 1. Relationship Between Technology/ IP Assets And Technology/ IP Management Capabilities



nology assets.¹ Intellectual asset management includes the organizational processes and human capital to create, manage, and commercialize technology and IP assets. Figure 1 provides an overview of the relationship between technology/IP assets and technology/IP management capabilities, the latter being the specific focus of this article.

2. Status of Intellectual Asset Management of Technology

2.1 Technology and Intellectual Property Assets

This article builds on the observation that the potential value of technology/IP assets can only be fully realized if it is accompanied by a people-centric approach. For that purpose, the concept of technology and IP assets comprises not only technical knowledge and IP rights but also the people that created them (see Figure 2).²

The importance of recognizing and identifying know-how as a separate asset to be distinguished from other technology assets³ is based on the fact that its consider-

able share is tacit,⁴ *i.e.*, not possible to imitate or transmit, and thus held by people rather than the company.⁵ Empirical research shows that individual human capital relates positively to firm (innovation) performance.⁶ In addition, and the reason why the team and not just the individual's know-how should be recognized, the literature suggests that while knowledge is held at the individual level, its value can only be fully utilized when it is shared.⁷ Thus, it is the

4. Also known as *Polanyi's paradox*: People know more than what they can explain. Polanyi, Michael & Amartya Sen. 2009. "The Tacit Dimension: With a New Foreword of Amartya Sen. Chicago," London: *The University of Chicago Press*. 3-25.

5. Kogut, Bruce & Udo Zander. 1992. "Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology." *Organization Science* 3, no. 3 (August): 383-390.

It is also important to note that codified technology is always an incomplete subset of the total knowledge carried in people's brains, which means that inventors carry important knowledge beyond the description of their inventions.

6. Liu, Tong; Yifei Mao & Xuan Tian. 2017. "The Role of Human Capital: Evidence from Patent Generation." *Cornell University, School of Hotel Administration*. P. 29-30. Accessed 16.03. 2020. scholarship.sha.cornell.edu/workingpapers/37.

In the SME context: McDowell, William C.; Whitney O. Peake, LeAnne Coder & Michael L. Harris. 2018. "Building Small Firm Performance Through Intellectual Capital Development: Exploring Innovation as the "Black Box." *Journal of Business Research* 88: 324-326.

7. According to Subramaniam & Youndt, individual expertise on its own is not conducive to radical innovation. On the contrary, it only contributes to a company's innovative capabilities when it is shared and channeled through relationships.

Subramaniam, Mohan & Mark A. Youndt. 2005. "The Influence of Intellectual Capital on the Types of Innovative Capabilities." *The Academy of Management Journal* 48, no. 3 (June): 457-459.

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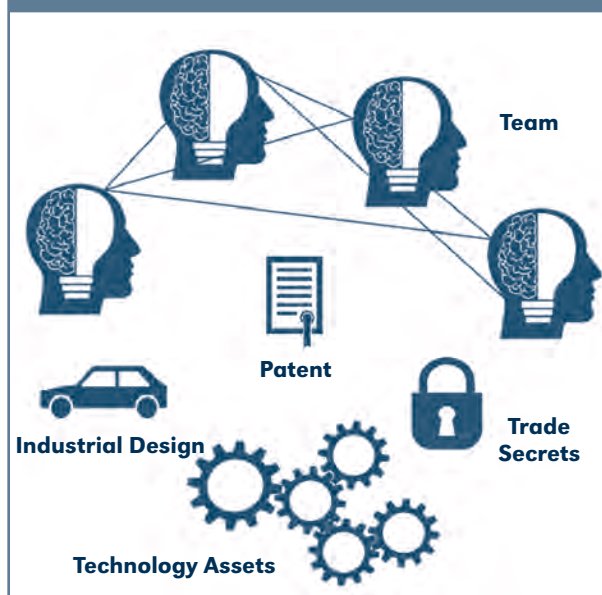
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Figure 2. Technology And IP Assets



1. There are other mechanisms that businesses can use to control their technology assets, but this article will focus on intellectual property rights.

2. Ocean Tomo. n.d. "Intangible Asset Market Value Study." Accessed 16.03.2020. ocean_tomo.com/intangible-asset-market-value-study/.

3. See also Gibson & DeMarino highlighting the importance of know-how in the inventory of intellectual assets and sharing best practices for its expansion. Gibson, David J. & Nicholas J. DeMarino. 2009. "A Best Practices for Developing, Expanding and Renewing Your Inventory of Licensable Technologies." *les Nouvelles* 44, no. 1 (March): 18-20.

team-specific knowledge that makes the biggest contribution to a company's competitive advantage.⁸

2.2 Perspectives on the Intellectual Asset Value Chain

In business practice, views on IA management may differ depending on whether it is seen from the decision-maker or IP manager perspective.

The common **decision-maker** view tends to focus on the achievement of business objectives, with the main goal being to capture value from technology assets by way of business transactions (ranging from simple transactions where a product is sold all the way to strategic transactions, like alliances, licensing, spin-offs, acquisitions and divestments). The creation and management of IA based on a proper business-driven IP strategy is merely a necessary prerequisite for achieving that ultimate goal.

The traditional **IP manager** view is based on the classic four pillars of IP management: creation in the sense of development of the technology, assessment of its potential, decision on protection and, to a lesser extent, value creation as the enabler but not the driver.⁹ IP managers tend to focus more on the phases that precede the ultimate value creation and place great emphasis on the details of IP strategy implementation, starting with the efficient creation of an IP portfolio, as well as the assessment and protection of technology assets.

Figure 3 depicts the main phases of the IA management value chain from the perspectives of decision-makers and IP managers, highlighting the phases where they focus most of their efforts.¹⁰ The different parts of that value chain do not necessarily happen in a linear pattern. In many cases this is an iterative process, where managers jump back and forth between the different phases along their pathway to value generation.

Phase 1: Creation

In the creation of technology, the **decision-maker's** main role is to give direction by defining the business case

and deriving a supportive IP strategy. Depending on the size and maturity of the company, top management is typically not involved in detailed operational activities of IA.

IP managers traditionally work on the details of this phase by providing tools, processes, guidance, support and feedback to the R&D teams. This includes awareness-raising activities and training, establishing practical invention disclosure procedures, supporting patent searches and making appropriate recommendations as to which technologies and inventions to focus on as a result of broader assessments.

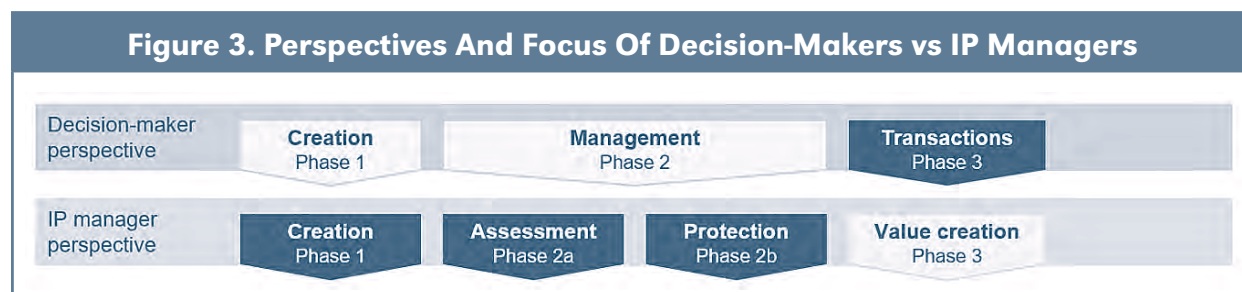
Phase 2: Management & Assessment and Protection

Throughout the entire process of building a proper IA portfolio, the **decision-maker's** role is to focus on giving direction to the team, managing external collaborations and providing resources. Generally speaking, decision-makers regard the building of an IA portfolio as an integrative IA management task that secures proper alignment throughout the company and supports the availability of the required external know-how. Ultimately, when it comes to decisions on patenting or other forms of IP protection, decision-makers rely on the IP management team (which can be internal or external).

IP managers on the other hand focus their attention on assessing technologies and the corresponding invention disclosures, making decisions on protection and searching for synergies among the teams. They identify inventions and concentrate their efforts on creating an appropriate IP portfolio while keeping expenditure to a minimum.

Phase 3: Transactions & Value Creation

Once a created technology is properly protected against the competition by a meaningful IP portfolio, the focus switches to value realization, which is the focal point for **decision-makers**. This is the phase when the company



8. See also Jaravel et al., who find that the premature death of an inventor leads to a decline in their co-inventors' earnings and innovation performance, which is largely attributable to team-specific knowledge, which gains in value over time.

Jaravel, Xavier; Neviana Petkova & Alex Bell. 2018. "Team-Specific Capital and Innovation." *American Economic Review* 108, no. 4-5: 1034-1073.

9. European Patent Office. 2016. "IP Teaching Kit: IP Management." P. 14-17. Accessed 16.03.2020. epo.org/teaching-kit.

10. It presents a conventional IA management approach with a typical separation of tasks of IA management/value creation through building an IA portfolio between the decision-maker and IP manager.

receives a return on its investment. In order to realize value for a company, some kind of transaction needs to take place. From a business decision-maker perspective, business transactions make the value measurable in financial terms, and this value ends up in the financial statements. From a shareholder perspective this might be the payment of dividends or the sale of equity.

The conventional transaction form to derive value from technology is the sale of related products and services. However, **strategic transactions**, like **alliances, licensing, spin-offs, acquisitions and divestments**, have the potential for high value generation on a different time axis than product or service sales agreements, with the added benefit of internal operational risk reduction. For intellectual assets in particular, the value realization through strategic transactions can be substantial.¹¹ For the purpose of this article the focal point of section 3.3 related to the transaction phase is on strategic transactions.

IP managers usually refer to the last phase of IA management as the value creation phase (see Figure 3), although value is created all along the way. While IP managers have a more pro-active role during the preceding phases, during the value creation phase they fulfill more of a support function. Their importance for strategic transactions must not be underestimated though. They often “prepare the ground” for transaction success by providing expertise for negotiations and due diligence¹² processes as required.

2.3 Key Players in the Intellectual Asset Management of Technology

Figure 4. Key Players For IA Management From A Technology Perspective



In each of the phases of the IA value chain described, different key players are involved, both internally as well as externally.

11. See also Graner, Juergen. 2020. “Transactions Powered by Intellectual Assets: A Decision-Maker’s Perspective.” *les Nouvelles* 55, no. 2 (June): p. 108.

12. European IP Helpdesk. 2015. “Fact Sheet. IP Due Diligence: Assessing Value and Risks of Intangibles.” Accessed 16.03.2020. iprhelphdesk.eu/Fact-Sheet-IP-Due-Diligence.

Innovation starts with ideas from individuals, and these individuals are part of a team. The core team, therefore, plays a vital role, as it possesses the knowledge necessary to create innovation output and in doing so, to create value. The recurring pattern in most companies is that innovation output is unequally distributed among individual inventors in such a way that the main number of patents is attributable to just a small fraction of talented individuals.¹³ In addition, research suggests that such prolific individuals have a positive influence on the performance of their collaborators.¹⁴ For a technology company, it is therefore important to recognize the importance of prolific inventors to the creation of value for the organization.

Depending on the type of company and maturity of its IP management, the use of external advisors is absolutely key, in the assessment and protection phase in particular. IP is a very complex subject that needs a lot of specialized expertise that may not be available within a company. Advisors also have the advantage that they can input their experience from working with various companies on similar issues—a networking benefit every client can receive. The involvement of advisors, including lawyers, consultants and IP professionals, is also important in strategic transactions. However, external advisors will typically not have the in-depth knowledge of the business and its competitive environment. Therefore, the final decision has to be made internally, and is only supported by the external advice. There is no alternative to establish the required in-house know-how and experience for growth-oriented technology companies.

The relevance of the other external stakeholders is often forgotten. Customers are important for shaping a business and its IP strategy. Collecting feedback from the market helps to discover market needs that a company may be able to satisfy with their inventions (market

13. Le Bas, Christian; Alexandre Cabagnols & Richard Bouk-lia-Hassane. 2010. “Prolific Inventors: Who They Are and Where Do They Locate? Evidence from a Five Countries U.S. Patenting Data Set.” *International Centre for Economic Research*. Working Paper no. 14/2010. P. 11-12. Accessed 16.03. 2020. [dx.doi.org/10.2139/ssrn.1625743](https://doi.org/10.2139/ssrn.1625743).

Blomkvist, Katarina; Philip Kappen & Ivo Zander. 2014. “Superstar Inventors—Towards a People-Centric Perspective on the Geography of Technological Renewal in the Multinational Corporation.” *Research Policy* 43, no. 4: 674.

See also Gambardella et al., who suggest that individual characteristics of inventors are an important determinant of the value of the patents created: Gambardella, Alfonso; Dietmar Harhoff & Bart Verspagen. 2005. “The Value of Patents.” Accessed 16.03.2020. zinc.zew.de/pub/zew-docs/veranstaltungen/inno_patenting_conf/GambardellaHarhoffVerspagen.pdf.

14. Zhang, Gupeng; Xiaofeng Lv & Hongbo Duan. 2014. “How do Prolific Inventors Impact Firm Innovation in ICT: Implications from Patent Co-Inventing Network.” *Technology Analysis and Strategic Management* 26, no. 9: 1107-1108.

pull versus technology push).¹⁵ To complete the picture of the principles of open innovation, collaborators and business intelligence about competitors need to be considered in a thorough technology management process.

2.4 Cultural Factors for Intellectual Asset Management of Technology

Figure 5. Cultural Factors For IA Management From A Technology Perspective



Cultural factors are an additional important aspect that must be considered for the efficient management of intellectual assets. There is no “one-size-fits-all” approach. The organizational size and stage of a company are fundamental, as strategy and management differ depending on whether it is a three-person operation, a global corporation with 10,000 employees, a start-up or a company that has been around for 10 years.

When it comes to finding the right collaborators and assessing competitors, the specifics of the target region and target industry need to be taken into account. It makes a difference if a company is located in China, Germany or the United States. The region influences how an entity operates and functions. Also, the industry sector in which the business operates may have a significant influence. The business environment in the information and communication technology (ICT) area is very different from that in other areas such as pharma or the paper industry. Different product life cycles, product development costs, margins and the like require different IP strategies and IA management practices. What could be true in one industry could be wrong in another. In addition, a company’s approach to IA management may differ also within regions and industries, depending not only on its size and organizational stage, but also on its position in the market. The strategy is typically different based on whether the company is positioned as a market leader, follower, challenger or pioneer.

Last but not least, the individual personalities of the people involved play a crucial role. When dealing with collaborators or competitors, the personality, background and experience of the other side’s decision-makers and IP managers is just as important as those within your own organization. The personality factor of individuals, especially decision-makers and other team members, does have an impact on the shaping of a company’s business and IP strategy. Research suggests, for example, that founder CEOs may show a higher propensity to risk-taking when it comes to decisions on patenting¹⁶ or that their hands-on experience in the technology field in which the company operates may lead to increased patent filing and higher-quality innovation produced by the company.¹⁷ The CEO’s personality may at the same time influence the selection, motivation and performance of the core innovation team.¹⁸

In relation to inventors, practice shows, for instance, that they differ in respect of their views on technology and the market and in their “business spirit.”¹⁹ Such individual characteristics may influence their tendency to prefer some projects over others and influence their motivation in terms of collaboration and engagement.

Thus, the key people are important in the context of the overall culture and business environment, and in creating a comprehensive management strategy for intellectual assets that may lead to high value realization.

3. Key Recommendations for Intellectual Asset Management of Technology

In the words of Mark Zuckerberg: “*There are different ways to do innovation. You can plant a lot of seeds, not be committed to any particular one of them, and just see what grows.*”... “*We go mission-first, then fo-*

16. See Lee et al. who find that firms managed by founder CEOs tend to have higher innovation performance. At the same time, however, they are likely to produce patents on both tails of the innovation quality distribution, which can be explained by the fact that founder CEOs pursue riskier innovation projects than professional CEOs.

Lee, Joon Mahn; Jongsoo Kim & Joonhyung Bae. 2020. “Founder CEOs and Innovation: Evidence from CEO Sudden Deaths in Public Firms.” *Research Policy* 49, no. 1: 12.

17. Islam, Emdad & Jason Zein. 2020. “Inventor CEOs.” *Journal of Financial Economics* 135, no. 2: 505-527.

18. Lee et al. also suggest that founder-CEO replacement by a professional CEO is likely to lead to employee inventors’ departure, suggesting that founder CEOs are better at retaining innovative minds. In addition, patents invented by leaving inventors are more likely to belong to the extreme tails in the innovation quality distribution compared with those invented by those who stay.

Lee et al., *Founder CEOs and Innovation*, 12.

19. Livesay, Howard C.; David S. Lux & Marilyn A. Brown. 1996. “Human Factors and the Innovation Process.” *Technovation* 16, no. 4: 181-182.

15. Heiden, Bowman & Ruud Peters. 2020. “IP and Open Innovation: Managing Technology Push and Pull.” *les Nouvelles* 55, no. 2 (June): p. 138.

*cus on the pieces we need and go deep on them and be committed to them.*²⁰

A fundamental prerequisite in any approach is the alignment of the IP strategy with the business strategy²¹ and consequently aligning the operational IP management activities with the overall vision and direction taken. For that, it is crucial that the views and roles of decision-makers and IP managers support and complement each other to achieve success in an integrated, business-driven IP environment.

3.1 Phase 1: Creation

Key Recommendations For Creation

Employ a Pro-Active IA Management Approach

Practice Open Innovation

Attract and Keep Talent

A. Employ a Pro-active IA Management Approach

In the IA creation phase, management focus should be on creating an enabling environment that encourages individual and team performance, thereby enhancing creativity. This can be achieved by **employing a pro-active approach** aimed at supporting innovation activities and making sure they are going in the right direction.

When it comes to IA creation, R&D staff and inventors must be directed towards the fulfilment of the business's strategic objectives. This should be done by motivating and enabling them to deliver the right solutions. Therefore, **strategic thinkers need to be involved** to make sure that people are engaged, and resources invested in R&D efforts are constantly readjusted to focus on those projects that potentially create the highest value.

IP managers are responsible for **creating awareness** among R&D staff to ensure that they understand the strategic focus as well as for regularly reminding them about it. When creating IP awareness, inventors need to be made aware of the importance of capturing value from IP and how that contributes to the performance of the business. These practices can significantly increase the number of inventors that contribute to the IP portfolio. In addition, R&D staff need to be given support in the form of appropriate **training, tools and processes**, as this will contribute to activating the individual potential that will advance the innovation output of the company as a whole.

One way that IP managers can enhance innovative-

20. McCracken, Harry. 2015. "Inside Mark Zuckerberg's Bold Plan for the Future of Facebook." *Fast Company*. Accessed 16.03.2020. [fastcompany.com/3052885/mark-zuckerberg-facebook](https://www.fastcompany.com/3052885/mark-zuckerberg-facebook).

21. Germeraad, Paul; Suzanne Harrison & Carl Lucas. 2003. "IP Tactics in Support of the Business Strategy." *les Nouvelles* 38, no. 3 (September): 120-121.

ness is to regularly examine R&D outputs with the aim of identifying new opportunities for their use. It is often the case that an invention is created as a side-product of another one, or that a potentially valuable discovery is overlooked. In-house technology sourcing is a way of identifying such cases and assessing whether they could be useful for the company's own use or out-licensed to other entities.²² Responsibility for **detecting undisclosed inventions** lies with both IP managers and R&D departments. It should be made clear to inventors that their duty is to submit information about the existence of any such potentially valuable inventions to their IP professionals. IP managers' crucial role then is to create an enabling environment by raising awareness among the R&D departments, putting in place tools and processes to encourage inventors to do so, and providing guidance on how to proceed in each case. In addition, as a safeguard against avoiding missed opportunities, IP professionals involved must proactively seek any undiscovered inventions in the pool of R&D results. Attention should also be paid to tools created within the company (such as software or other instruments developed with the primary goal of using them in-house), as companies often overlook the value they could potentially create if they were brought to the market.

B. Practice Open Innovation

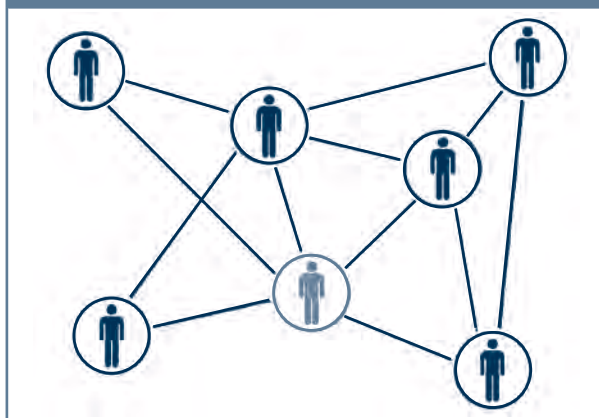
Companies should also consider **engaging external collaborators** as a means of increasing efficiency in IP creation. Collaborative R&D with other SMEs or research organizations as part of an **open innovation approach** can contribute to innovativeness by creating synergies to speed up time to market. In-licensing and out-licensing can be used to diversify the portfolio instead of focusing on internal R&D capacities only. It is in a company's interest to develop a whole "toolbox" where different technology sources complement each other.

To obtain the best possible results from external collaborations and to maximize efficiency, the **expectations of all involved must be clearly communicated** and their motivations aligned (see Figure 6). Only by doing this can companies mitigate the risk of failure due to misalignment of the individual objectives of the actors involved.

The challenge that many SMEs face when engaging with collaborators is to establish the contractual basis for cooperation. Exact terms must be agreed upon before the start to avoid future disputes regarding the rights to inventions. However, especially for smaller companies with limited experience and resources, this may represent a significant barrier to entering into collaboration agreements. Companies facing these difficulties can make use of a range of recommendations

22. European Patent Office. 2016. "IP Teaching Kit: IP Management." P. 14-17. Accessed 16.03.2020. [epo.org/teaching-kit](https://www.epo.org/teaching-kit).

Figure 6. Collaborative Agreements



and guidelines, such as the WIPO review about free model contracts.²³

C. Attract and Keep Talent

To build a solid basis for innovation activity, decision-makers and IP managers should work together on **attracting talented individuals** that are able to deliver results. Jointly they can create an environment that **motivates prolific inventors to stay** and further advance within the company. The individual personalities and motivations of the core innovation team members should be taken into account by managers and decision-makers alike, as commercial success typically requires a certain degree of overlap between the business objective and the inventor's own creativity and perception of success. As a consequence, R&D resources should be directed preferably to inventor teams and individuals, ensuring that their motivation is in line with the business strategy and thus have the highest potential to contribute to value creation (bottom-up approach). In addition, incentives should be designed to support **aligning inventor motivation with business and IP strategy** (top-down approach).

The role of motivation is two-fold. Sound motivation not only makes people stay with a company, thus preventing the loss of valuable know-how. It also contributes to innovative performance.²⁴ A common way of enhancing motivation is through financial rewards. When designing a system of incentives, attention should be paid to the kind of metrics used, as it could backfire if done in an unbalanced way. Generally speaking, it is regarded as positive to reward inventors (and in many legal systems it is a requirement to do so). It is not enough, however, for a reward system merely to be perceived as fair. Incentive systems that do not reward individual effort appropriately or do not take into account the value of the invention may

not have the desired effect.²⁵ Furthermore, metrics need to put quality before quantity in order to meet business needs (simply rewarding the number of patents filed is not enough).

A common situation in teams is that performance and motivation are hindered by a small number of individuals. Experience shows that there is a high statistical probability that in teams there will be 10 percent who are not fit for the job,²⁶ and whose repositioning would be beneficial for overall team performance. These individuals should be spotted as early as possible to understand the challenges of the team and whether they can be resolved.²⁷ Some companies, especially larger ones, employ dedicated strategies to ensure that **only delivering individuals are on board**. Forced ranking is a rather controversial workforce planning approach, but some companies apply an interesting alternative under which employees are regularly offered the possibility to receive a lump sum payment to walk out the door.²⁸ In this way, unhappy employees are spotted more easily and encouraged to leave before they can transmit their frustration to other team members.

24. Zwick, Thomas; Katharina Frosch, Karin Hoisl & Dietmar Harhoff. 2015. "The Power of Individual-Level Drivers of Inventive Performance." ZEW—Centre for European Economic Research. Discussion Paper no. 15-080. P. 22-24. Accessed 16.03.2020. doi.org/10.1016/j.respol.2016.10.007.

25. See for example Giarratana et al. who suggest that wrong setting of financial incentives can lead to "false positives," i.e., rewarding low-value inventions, which may cause some groups of inventors to withdraw from R&D projects and interaction with their peers.

Giarratana, Marco S; Myriam Mariani & Ingo Weller. 2018. "Rewards for Patents and Inventor Behaviors in Industrial Research and Development." *Academy of Management Journal* 61, no. 1: 285.

Financial incentives may also lead to motivation of inventors to focus on less explorative research: Onishi, Koichiro; Hideo Owan & Sadao Nagoka. 2017. "How do Inventors Respond to Financial Incentives?—Evidence from the 2001 Court Decision on Employee Inventions in Japan." P. 30. Available at SSRN. Accessed 16.03.2020. dx.doi.org/10.2139/ssrn.3025512.

26. See for example Craig, describing the known 20-70-10 rule, according to which on average about 20% of the team are high performers who focus on advancement, 70% perform decently and 10% are low performers who should move on: Craig, Randall M. 2008. *Personal Balance Sheet: A Practical Career Planning Guide*. Toronto: Knowledge to Action Press. P. 22.

27. Capretto, Lisa. 2017. "One Of The Biggest Mistakes A Manager Can Make, According To LinkedIn's CEO." *HuffPost*. Accessed 16.03.2020. bit.ly/huffpost-one-of-the-biggest-mistakes.

28. Semuels, Alana. 2018. "Why Amazon Pays Some Workers to Quit." *The Atlantic*. Accessed 16.03.2020. theatlantic.com/business/archive/2018/02/amazon-offer-pay-quit/553202/.

23. WIPO. Bereuter, Thomas L.; David Jerolitsch & Peter G. Heimerl. 2016. "Models of Intellectual Property (IP) Related Contracts for Universities and Publically-Funded Research Institutions." P. 71. Accessed 30.03.2020. wipo.int/meetings/en/doc_details.jsp?doc_id=331856.

Financial incentives for inventors need to go hand in hand with other kinds of enticements that focus on the intrinsic motivations of individuals and on enhancing cooperation within and between teams in order to contribute to knowledge diversity.²⁹ Inventors are typically not motivated by monetary rewards alone; other factors contribute to their performance, including recognition of their achievements, a “deserved” high level of autonomy and intellectual challenge.³⁰ Such motivational factors are often more important than the financial incentives. Therefore, initiatives elaborating more on **reward and recognition**, such as inventor days, innovation awards, dinner with the CEO or other forms of recognition of the achievements of inventors by senior management can help enhance intrinsic motivation.

Empowerment is a critical factor in motivation, summing up several factors mentioned, and is therefore a contributor to the performance of a company.³¹ As Steve Jobs said: “*It does not make sense to hire smart people to tell them what to do.*”³² Once talent is attracted, management should focus on how to leverage their skills to convert their competencies into value for the company. This can be done through establishing a creative and collaborative environment, promoting initiative and engagement through a higher level of autonomy, delegating part of the decision-making authority to the people in charge and enhancing communication between upper- and lower-level management. An interesting example of fostering creativity by affording a larger degree of autonomy is the “20 Percent Project” policy made popular by Google, which allows employees to spend 20 percent of their time on projects and initiatives they think would most benefit the company.³³ This inclusive approach, when offered as an option to high achievers, might contribute to an even higher level of motivation, allow them to develop their full potential and create new opportunities for innovation. However, measures like this may not be sensible or feasible in a small company setting.

29. Lazaric, Nathalie & Alain Raybaut. 2014. “Do Incentive Systems Spur Work Motivations of Inventors in High-Tech Firms: A Group-Based Perspective.” *Journal of Evolutionary Economics* 24, no. 1 (January): 135-157.

Lazaric & Raybaut also suggest that drastic changes to incentive systems entail a risk as they may not be fully absorbed by employees. The design of incentive systems should build upon the past experience and culture in the company.

30. Sauermann, Henry & Wesley M. Cohen. 2010. “What Makes Them Tick? Employee Motives and Firm Innovation.” *Management Science* 56, no. 12 (December): 2149-2151.

3.2 Phase 2: Management Assessment and Protection

Key Recommendations For Management Assessment And Protection

Integrate Key Business Functions

Implement Milestone-Based Management

Align IP Strategy With Business Strategy

A. Integrate Key Business Functions

In most companies, the R&D, business and IP legal departments are separated from each other without proper alignment. IP management duties are often the responsibility of the in-house legal department, largely working in separation from the other departments, thereby creating silos (see Figure 7). In smaller entities, external IP lawyers often take on that role. Due to cost optimization by small businesses, they are usually not well connected to the whole strategy of the business, which leads to a similar situation of misalignment. In general, lawyers are by definition more focused on managing risks than managing value creation.

Semi-aligned companies have integrated the R&D department with business and IP, but the IP department is still not properly integrated with the business unit.

In contrast, technology-driven companies close that last gap, bringing together all relevant actors from the business, marketing, technical, R&D and IP departments. This *top-down* integrative approach with intentional overlapping responsibilities is important for achieving unambiguous business goals (see Figure 7) as it secures an internal organization that supports informed decision-making in each phase of the IA management process. Therefore, for efficient IA management, **all key business functions need to be integrated** in order to get all the information required to make good decisions under the leadership of decision-makers. This integration has to happen not only within the company’s internal team, but also with the advisors and collaborators who play an important role during this phase (see also section 2.3). Since this is about teamwork within an organization and outside, cultural factors are crucial, especially if collaborators are located in different geographic regions.

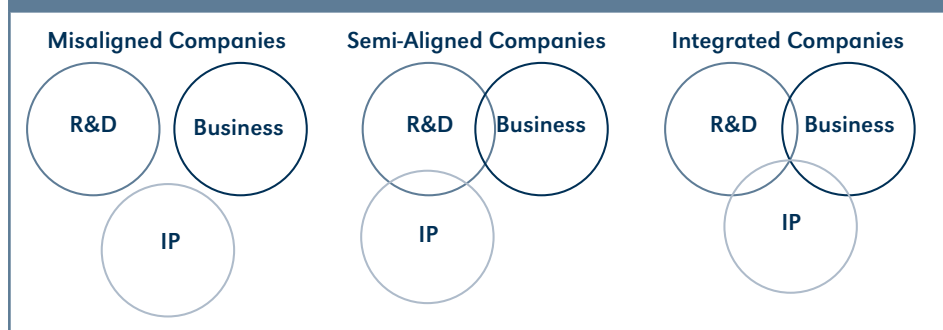
31. Birdi, Kamal et al. “The Impact of Human Resource and Operational Management Practices on Company Productivity: A Longitudinal Study.” *Personnel Psychology* 61, no. 3: 490-492.

32. Schwantes, Marcel. 2017. “Steve Jobs Once Gave Some Brilliant Management Advice on Hiring top People. Here It Is in 2 Sentences.” *Inc.* Accessed 16.03.2020. bit.ly/inc-com_steve-jobs.

33. Robinson, Adam. 2018. “Want to Boost Your Bottom Line? Encourage Your Employees to Work on Side Projects.” *Inc.* Accessed 30.03.2020. bit.ly/inc-com_google-20.

Several other large tech companies have implemented their own versions of “20% time,” including 3M, Philips, Facebook, LinkedIn and Apple.

Figure 7. IP Strategy Should Integrate Key Business Functions



a standardized way and stored in a shared system that allows other IP professionals to access it anytime. This practice ensures that with every repetition of the assessment potential, stop-or-go decisions will be based on more complete and reliable information and will contribute to informed decision-making on further investments in the technology, the scope of

B. Implement Milestone-based Management

Managers should keep in mind that it is a long way from creating technology to getting IP protection and finally realizing value. However, the **milestones**—priority filing, lapse of the priority year, lapse of 30/31-month period for internationalization, and so on—are generally quite clearly defined by the patent system. These milestones must be recognized and the invention thoroughly assessed at each transition point to ensure that funds are invested in the right projects and the expected return on investment is materialized. Decision-makers³⁴ overseeing the available financial resources must insist on these **assessments**, although the actual work is usually carried out by IP managers. A typical assessment usually consists of about 40 questions in five main areas: (i) technology, (ii) legal, (iii) market, (iv) finance and (v) strategic fit.³⁵ When a product is developed, experience shows that the same set of questions must be asked about 15-20 times on average in an iterative process until the products or services are put on the market or a strategic transaction is entered into.³⁶

Since the questions relate to different fields (see Figure 8), the relevant information is typically held by different individuals and departments. To make sure that the questions are properly answered, IP managers should adopt a cooperative approach in order to involve the relevant actors in all five areas, brief them upfront, and **collect their input** before each assessment. This will also increase their commitment and buy-in to the outcomes of the assessment. IP managers should also **document and keep a record of past assessments**, adding new relevant information at each milestone. In addition, the information should be structured in

the legal protection and ultimately the selection of relevant markets and partners.

When selecting the countries where IP protection is to be sought, consideration is typically given to the characteristics of the market (especially its size), location of main competitors, options for enforcement in the different countries and, recently to a lesser extent, location of production facilities. As a rule of thumb, companies aim to select the 20 percent of the countries that cover 80 percent of the market (applying the 80/20 rule, commonly used in business resource allocation decisions).

It is also recommended to put in place practices that allow management to **learn from past experiences** and establish a system with continuous improvement. This has already been recognized and applied in many businesses as the backbone of any Total Quality Management initiative. For example, when assessing invention disclosures prior to filing, the inventor should receive feedback to enable them to understand the reasons why their invention was rejected/accepted for IP protection and further commercialization. One useful practice is to document all assessments at the different stages and

Figure 8. Key Areas Of Technology Assessment



34. If there is good alignment and interaction between the business and the IP department, an IP manager can also be held responsible for that.

35. See the qualitative assessment part of the IPscore tool: European Patent Office. n.d. "IPscore." Last updated 18.07.2018. Accessed 16.03.2020. epo.org/ipscore.

36. See also the stage-gate model described in Hackl, Christian & Sandrine Guillermin. 2020. "Role of IP in the Stage-Gate Model." *les Nouvelles* 55, no. 2 (June): p. 143.

then review them after a reasonable period of time to reflect on whether the decision to proceed with the invention was the right one. This could be expanded to a long-term feedback loop aimed at revision of the IP portfolio and comparing it against the actual value created. Such practices also allow companies to spot the advancement options for future assessments and continuously improve internal decision-making to learn from both successes and failures.

When seeking protection for technology, companies should also consider **using IP bundles** that allow them to protect different aspects of their products or services by different, complementary IP forms over and above patents. These may include trade secrets, designs and copyrights in particular. Even in patent-intensive industries, trade secrets are often an effective way to protect process innovations in cases where infringement detection or patent enforcement might be a challenge, for example.³⁷ As a consequence, IP managers are also responsible for putting in place internal processes to ensure that every effort is made to keep trade secrets secret, and that all requirements to successfully take legal action against misappropriation of their trade secrets are met.

C. Align IP Strategy with Business Strategy

Where there are no adequate selection processes, IP protection and overall IP management can become costly. Managers should therefore avoid seeing IP as an expensive form of insurance and instead invest in technologies and IP protection within the framework of an IP strategy that supports business strategy in a clearly defined way. While in many companies the IP portfolio is created first and then the decision-makers start to think about how to actually make use of it, the proactive approach would be the exact opposite: **define the business strategy first and then align the IP strategy accordingly**, with the clearly defined purpose of creating technologies and seeking IP protection. In formulating the business strategy, input from the IP managers about the IP position of their company in relative comparison to their competitors is essential, as well as other relevant IP-related information.

Both business and IP strategies must be clearly communicated to all involved in their implementation to make sure that everyone is heading in the same direction. To achieve that, the **IP strategy must be translated into operational plans with clearly defined targets** for everyone involved in the process. The plans should be agreed upon with the relevant business units, and acknowledged and deployed **throughout the business**,

R&D and IP departments. If orchestrated in this way, each team will understand where to focus their efforts and how to avoid spending time on technologies and IP that are ultimately not put forward. In addition, by analogy to what has been said about inventors in section 3.1, individual **incentives** must be based on the same aim: only those efforts that are **in line with IP strategy and corresponding operational plans** should be rewarded.

3.3 Phase 3: Strategic Transactions and Value Creation

Key Recommendations For Strategic Transactions And Value Creation

Ensure Management Continuity

Plan Ahead

Align Through Success-Related Incentives

A. Ensure Management Continuity

Decision-makers must ensure **management continuity** throughout all the phases of a strategic transaction (see Figure 9). The development phase includes the creation and management phase from an IA management perspective (see Figure 3), and the transaction phase of IA management is split here into the actual transaction phase and the implementation phase.

IA do not just appear; they need to be developed by a dedicated team. This initial **development phase** generally provides the highest value for a transaction. It takes years of dedicated work by the R&D team together with IP managers to provide the foundation for a successful strategic transaction. Since from a transaction perspective the development phase includes the creation, assessment and protection phases (see Figure 3), the internal team and IP managers are the main drivers of value generation, often in collaboration with other entities such as co-development or in-licensing partners. Ideally, **customers and competitors should always be considered** when developing IA for strategic transactions in order to gain a sound understanding of the market.

When a strategic transaction enters the actual **transaction phase**, contracts are negotiated. Depending on the type of transaction, the number of parties involved and potential options, this can be a lengthy process. An alliance for example with one potential party might be able to be negotiated in a matter of weeks. On the other hand, the divestment of an entire company (also known as an “exit”) with several parties targeted and extensive

37. EU Observatory on Infringement of IP Rights. 2017. “Protecting Innovation Through Trade Secrets and Patents: Determination for European Union Firms.” P. 48-52. Accessed 16.03.2020. euipo.europa.eu/ohimportal/en/web/observatory/observatory-publications.

Figure 9. Phases Of Strategic Transactions That Most Alliances, Licensing Deals, Spin-Offs, Acquisitions And Divestments Go Through

Development Phase

Transaction Phase

Implementation Phase

due diligence periods might take many months. During the transaction phase, it is vital to **engage internal and/or external advisors**, especially IP professionals, lawyers and specialist advisors. Depending on the type of transaction, these might include, for example, business development consultants for alliance transactions, licensing specialists for licensing transactions, strategy consultants for spin-off transactions, and M&A (mergers and acquisitions) advisors for acquisitions and divestments. In this phase the foundation is laid to realize value later on. However, if contracts are poorly structured because they do not consider implementation hurdles, value already created is at risk.

Once the contracts have been signed, strategic transactions enter the final **implementation phase**, where both parties need to “live the deal.” Most alliances, licensing deals, spin-offs, acquisitions and even divestments have the potential to create significant value during this phase, provided the implementation is prepared and managed well. The internal teams of both transaction parties play a key role here, as they will need to figure out a way to implement what was negotiated during the transaction phase. Engaging specialist advisors can provide a lot of value as well. Specialist advisors are similar to those engaged in the transaction phase (see previous paragraph); for acquisitions and divestments, however, M&A advisors are replaced by integration consultants.

As described above, there are many players from both inside and outside a company that are involved in the different phases of a strategic transaction. In many cases, their role is limited in time and ends with the termination of the phase concerned. For that reason, decision-makers need to make sure that there is management continuity throughout all phases, and that the ball is not dropped during the transition from one phase to the next. Ideally, companies should create a dedicated position within their organization that is in charge of growth with strategic transactions directly working under and with the CEO. This can be achieved through a dedicated business development position or an active board member. The main responsibility of this transaction driver is to keep a constant strategic oversight of each phase from development all the way to implementation.

B. Plan Ahead

Most strategic transactions underdeliver in business practice. One problem is that there is often no continuous strategic management throughout all phases (see 3.3.A.). Another issue is that transactions are often opportunity-driven and not based on solid strategic planning. Opportunities should not drive a business, but decision-makers should drive opportunities. Businesses should only enter into strategic transactions that support their core strategy. The business strategy may be adjusted, but only after a thorough evaluation of the mid- to long-term effects.

Although it is the right foundation, having a strategy and executing it accordingly is only one factor when it comes to transactions. Companies often fail to **plan ahead** of a strategic transaction. Planning should ideally

be part of the development phase, and definitely part of the transaction phase. What is essential is a thorough understanding of the other transaction party. As mentioned in 3.3.A above, the implementation phase is a high value generator for most strategic transactions. However, it is also the phase where things are most likely to go wrong. During the implementation phase, where two different organizations need to interact with each other, cultural factors (see section 2.4) play an important role. Both sides will have to learn how to deal with the “other side.” Finally, for most transactions, at the end of the day, there will be a number of individual personalities on each side that, without any previous experience of each other, will now have to work together.

Only solid planning by team members on both sides before the deal is signed will prevent likely implementation problems. Advisors often get in the way of this since they are mostly focused on the task for which they were hired: the completion of the transaction phase. They are generally not hired to ensure success after the deal has been signed—it simply is not their job. Therefore, the strategic oversight needs to be under the control of the decision-makers, who should always have the whole picture in mind.

C. Align Through Success-Related Incentives

Generally speaking, if executed correctly, **success-related incentives** can align both parties to a strategic transaction, allowing value to be realized during the important implementation phase. Negotiators should therefore be very careful about deal terms. A so-called “great deal” where the “other side” loses might actually turn into a loss for the “winning party.” For example, a licensing deal that provides the licensor with an unusually high percentage of royalty payments might result in the licensee not being economically motivated to employ sufficient resources, since it would not create a sound payback for them. On the other hand, owners do not want to provide IA at deal terms that do not give them sufficient financial incentive to develop the next generation of products. Striking the right balance is actually not necessarily a negotiation but a partnering task and requires a thorough understanding of the business environment.

In addition, during deal negotiations in the transaction phase, advisors need to be made aware of cultural factors on the side of the transaction partner. Lawyers, for example, are often not informed about business decision factors as they relate to the implementation of a transaction, because the focus is on keeping legal costs down. However, **aligning your advisors with your business** is time and money spent wisely. They can only help if they are filled in on the whole business picture.

4. Support for Businesses

Key Recommendations To Gain Support

Ensure Appropriate Training

Become Part Of The IP/Business Community

Share Best Practices

During all phases of IA management, the level of IP knowledge of everyone involved is a crucial success factor. Not only the IP department, but all actors involved in the creation, management and commercialization of the technology must have a corresponding understanding of IP. The same is true for the transaction partners. All involved should “speak the same language,” and this can only be achieved by **appropriate training**. There are many possibilities to enhance the skills of executives and R&D staff of SMEs as well as large enterprises. The European Patent Academy offers classroom and online training on IP strategy and IP management, including value creation/commercialization. The focus is on supporting partners acting as intermediaries, such as the national patent offices, the Licensing Executives Society and the IP Helpdesk, in the form of train-the-trainer activities, including the provision of training material free of charge.³⁸

IP conferences are also an effective way of improving IP knowledge and skills, keeping track of the competitive environment, identifying business opportunities and finding business partners for collaborative research or IP commercialization. Data from a recent study by the European Patent Office (EPO) show that one of the challenges that SMEs face when commercializing their technology is the difficulty of finding the right business partner. Results indicate that, of the inventions held by SMEs in the study that have not been exploited to date, about 19 percent have not been exploited for lack of skills or contacts. Finding the right partner was identified by them as the biggest challenge for collaborative exploitation.³⁹ Attending conferences on intellectual property AND related

business aspects offers a great opportunity for IP managers and decision-makers to **become part of the community of IP business professionals**.⁴⁰

Sharing best practices is especially important for small companies and start-ups that might not have the necessary experience or resources to be able to rely on professional advice only. The EPO also provides support and guidance to SMEs in the form of training and publications on disseminating best practices and recommendations for IP management.⁴¹

5. Conclusion

In order to maximize the value of a company’s intellectual assets, the perspectives of decision-makers and IP managers must be aligned along an IA-driven business strategy. The decision-makers’ strategic focus can provide guidance to IP managers, who in return provide support through their expertise and day-to-day IP management.

At the core of IA management are people who have the know-how and skills to make success happen. As shown in Figure 10, it is crucial that all relevant key players be involved in the process, starting with the core innovation team, and including advisors and, where appropriate, external players such as partners, customers and competitors. A company’s value-creation strategy should take account of cultural factors: the size of the company, its current organizational stage, its location, the industry it is part of and the individual personalities of all involved.

The main success factors in IA management of technology can be summarized as follows:

Alignment throughout the company is a key enabler of success. The business strategy should always be the starting point that shapes the IP strategy. IP input into the process of formulating the business strategy is crucial. All of the key people the company has on board, whether they are internal or external, should share the same vision and pursue objectives that lead to the fulfilment of the business case through the realization of the IA strategy.

Figure 10. Landscape Of Intellectual Assets Management Of Technology



38. See services provided by the European Patent Academy: European Patent Office. n.d. “European Patent Academy.” Last updated 02.11.2017. Accessed 16.03.2020. epo.org/academy.

39. European Patent Office. 2019. “Market success for inventions. Patent commercialization scoreboard: European SMEs.” P. 31. Accessed 16.03.2020. epo.org/scoreboard-smesl.

40. Bereuter, Thomas; Yu Sarn Chiew, Juergen Graner & Ilja Rudyk. 2020. “The Making of the High-growth Technology Business Conference 2019: Re-engineering Conference Delivery to Maximize Impact”. *les Nouvelles* 55, no. 2 (June): p. 169.

41. See for example: European Patent Office. Bereuter, Thomas; Yann Ménière & Ilja Rudyk (eds.), 2017. “Unlocking untapped value, EPO SME case studies on IP strategy and IP management.” Accessed 16.03.2020. epo.org/sme.

Larger companies in particular may find it harder to achieve full alignment due to specialization and lack of cooperation between departments. Organizational structure should therefore integrate all key business functions in an efficient, IA-driven environment. In addition, IP managers should actively seek information from all relevant players to ensure informed decision-making. **Pro-active communication** within companies, with advisors and with potential strategic transaction partners should be encouraged. Regular exchanges within and between departments should be promoted, reminding all involved of the business case and where the company is heading.

The perception of success of each of the key players should be in line with the perception of success of the company. For that, continuous **expectation management** taking account of the individual personality of all the stakeholders involved is key. This means, above all, that after engaging talented individuals and establishing win-win relationships with collaborators, managers should focus on setting the incentives in such a way that they allow the overlap between their individual motivations and the company's strategic goals to be enhanced.

IA are one of the main drivers of value within a company.⁴² But what decision-makers and IP managers should always keep in mind is that the key enablers of success with IA are the people involved. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3582079>.

Disclaimer: Any opinions expressed in this article are those of the authors and not necessarily those of the European Patent Office.

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42. The IA management landscape would not be complete without reference to brands as a key factor in market success and operational excellence. (See also Graner, Juergen. 2020. "Transactions Powered by Intellectual Assets: A Decision-Maker's Perspective." *les Nouvelles* 55, no. 2 (June): p. 108.)

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Transactions Powered By Intellectual Assets: A Decision-Maker's Perspective

By Juergen Graner

Abstract

Decision-makers in technology companies who embark on a high-growth strategy for their company will likely engage in one or more of the following five strategic transaction types to optimize shareholder value: alliances, licensing, spin-offs, acquisitions and divestments.

Full utilization of key intellectual assets (technology, brand and operational excellence) as core drivers for strategic transactions ensures best results when executed properly. The common success enabler for any intellectual asset is the human factor. Technology intellectual property based on patents and trade secrets needs to be enabled with team know-how. Brand intellectual property based on trademarks needs to be enabled with customer mindshare. Operational excellence intellectual property based on operational systems needs to be enabled with implementation skills.

Moreover, in order to make strategic transactions successful, decision-makers need to implement a continuous management process throughout all transaction phases. Solid preparation during the initial development phase and the proper management of the final implementation phase after a deal has been signed secure the ultimate value of a transaction.

1. Introduction

When business decision-makers enter into strategic transactions, such as alliances, licensing, spin-offs, acquisitions and divestments, the overall goal is to generate the highest value possible. Any transaction is done based on a fundamental asset or a group of assets controlled by the source company. The goal of a strategic transaction is to increase the intrinsic financial value by adding a strategic value component, which comes from combining the asset package from the source company with an asset package controlled by the transaction partner. For example, a company that has developed a new product (source asset package) would see a tremendous value increase by combining this with another company that has an established global market access to the intended customer base (transaction partner asset package).

In most strategic transactions the ultimate drivers of strategic value are intellectual assets. The key for creating value with intellectual assets is to combine intellectual property with the human factor, as this article explores in more detail.

2. Key Intellectual Assets

The following three intellectual assets have been proven to be the ultimate value generators in business practice: technology intellectual assets, brand intellectual assets and operational excellence intellectual assets.

2.1 Technology Intellectual Assets

Figure 1. Technology Intellectual Asset



Especially for technology based companies, it is very important to generate intellectual property rights that are owned by the entity. Therefore, a lot of money is spent on the creation and protection of patents, trade secrets and related intellectual properties, which provide the foundation for a technology intellectual asset. However, unless an organization is able to create an environment where its engineers and scientists can flourish and are motivated to continuously invent and create, the underlying technology will either not reach its full potential or eventually become obsolete (Figure 1 shows that technology intellectual property only becomes a technology intellectual asset if combined with team know-how). Once the complexity of a transaction partner is added, in many cases, the challenge to manage ongoing innovation increases exponentially.

2.2 Brand Intellectual Assets

Figure 2. Brand Intellectual Asset



The brand is almost always an important factor in any type of company. Most decision makers understand that in order for a brand to be strong, it needs to be protected through a trademark in the jurisdictions where business is conducted. Similar to a technology intellectual property, the brand intellectual property needs to be combined with the human factor in order to become a brand intellectual asset. Different from technology though, the human factor is not within the control of the company. A brand is basically the ownership of customer mindshare, which is a manifestation within the customer's mind, created through their own experience with associated products and/or services, combined with information absorbed from others and from perceived marketing messages (Figure 2 shows that brand intellectual property only becomes a brand intellectual asset if combined with customer mindshare). A brand intellectual asset is very

fragile since it takes a long time to build, but, especially in today's interconnected world, it can easily be destroyed. The association of the brand of the source company with the brand of the target company after a transaction needs to be managed proactively, since it has an important impact on both brand intellectual assets.

2.3 Operational Excellence Intellectual Assets

Figure 3. Operational Excellence Intellectual Asset



One of the most undervalued intellectual assets for transaction value generation is operational excellence. A business has operational excellence if it is able to do something better and/or more efficiently than others on a continuous basis, with the ability to adjust to changing environments. This could be related to any part of the value chain within the organization. Examples include a company that may have the best way to manufacture certain products, the best way to develop new products or the best way to provide certain services. The ability to have operational excellence in a company as an intellectual asset is strongly linked to its employees and the culture that has been created within. Many businesses write down the ways operational processes are conducted in manuals and standard operating procedures to create operational systems that form the intellectual property base. However, the real value of those systems actually comes from the implementation skills embedded in the team (Figure 3 shows that operational excellence intellectual property only becomes an operational excellence intellectual asset if combined with the implementation skills of the team). Generally, those team skills are enabled by the culture of the organization. They are difficult to transfer and need to be managed diligently after a transaction has been completed, since they may be lost if certain key employees leave.

3. Transactions Powered by Intellectual Assets Done Right

The three key intellectual assets explored in the previous section can be used to power the five most important strategic transactions: alliances, licensing, spin-offs, acquisitions and divestments. When engaging in any of these transactions, the following three phases have to be managed diligently, with a special focus on seamless management continuity from one phase to the next (see Figure 4).

During the initial development phase, the source business is developing the assets that are required for a poten-

tial transaction. Generally, the highest value generation takes place during the development phase. Unfortunately most companies handle transactions in an opportunistic manner, without the proper strategic focus, planning and development before they enter into a transaction.

The actual transaction phase is there to properly prepare the deal and enter into a legal contract. Although this is usually the phase with the lowest value generation, a lot can be lost if parties are not able to agree to the right terms and fail to consider the actual implementation phase in those terms. While it is highly recommended to engage a lawyer to help with the legal aspects, the general consensus amongst decision makers is not having lawyers drive the deal. As a general rule, whoever will lead the implementation phase should also lead the transaction phase.

Once the deal is signed, the transaction enters the implementation phase where both parties will need to “live with the deal” that they have just made. This is normally the phase with the second highest value generation potential. Unfortunately most companies do not have a continuous management function for the deal in place from the development phase all the way into the implementation phase, and therefore often struggle with the implementation of their transaction.

3.1 Alliances Driven by Intellectual Assets

An alliance, also often called a strategic partnership, is formed if each party has assets that complement each other. Both parties commit resources for the duration of the alliance and each party remains independent (Figure 5 shows that both the source party A, as well as the target party B, have a gap that can be filled by the other party. Once the transaction phase has completed, both parties are able to fill the gap and enter into a longer-term relationship). There are many different types of alliances (*e.g.*, R&D, manufacturing, procurement, servicing, co-branding, co-promotion, referrals, sustainability). This article elaborates on an outbound distribution alliance as an example, which is something almost any company that expands internationally will embark on at some point in its life. For an outbound distribution alliance, the most important intellectual asset is usually the brand, provided that the products and/or services are to be distributed in the new target territory under the source company's brand. The target alliance

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Figure 4. Three Phases That Manage The Five Strategic Transactions

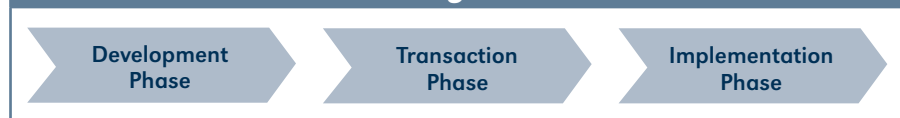
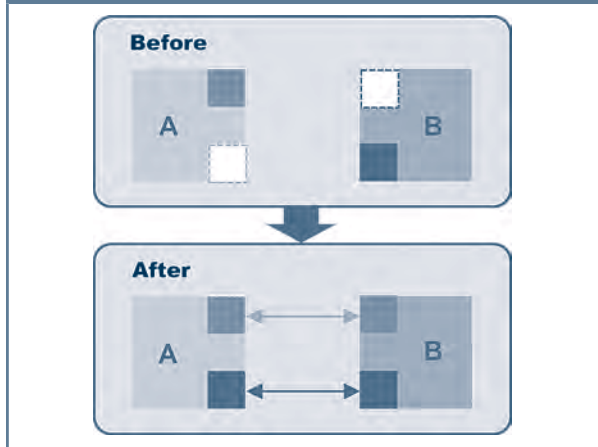


Figure 5. Alliances



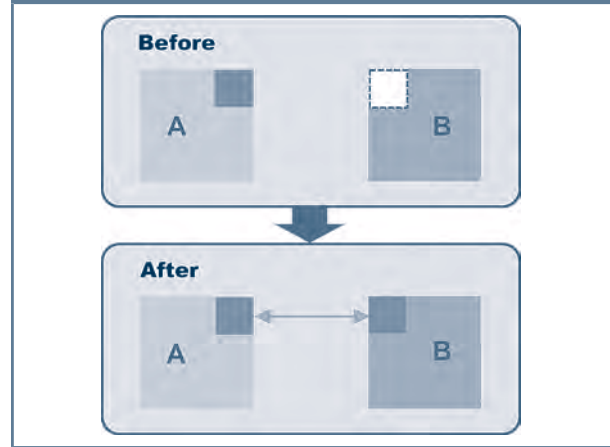
partner has the responsibility to build and expand the brand in the new market.

The key challenge in an outbound distribution alliance is that there is often an inherent misalignment of incentives between both parties that neither party is addressing with the other proactively. The distribution partner generally is only motivated for “good enough” performance. If the performance is bad, then the distribution partner knows that it will be replaced by someone else. If the performance is excellent on the other hand, then the distribution partner knows that it may be replaced by the source party establishing its own footprint in the target market. The most viable solution is to tackle this problem head on, communicating with the alliance partner already in the development phase about that issue and coming to a joint solution that works for both sides. If the intent is to eventually take over the new target market, the source party could offer the distribution partner a more significant financial upside tied to the success after the handover or find some other alignment solution. This openness and understanding of the target party’s concerns, combined with a rather proactive management of the relationship during the implementation phase once the agreement has been signed, is very important to not only grow the source company’s brand intellectual asset, but also to protect it. In today’s globally connected world, any damage that a potential distribution partner might cause to the source party brand in the new market could have a detrimental impact on other territories. Accordingly, decision-makers need to make sure to manage the process well.

3.2 Licensing Driven by Intellectual Assets

A licensing transaction is usually formed if at least one party has a protected brand or technology asset that can be useful to the other party. The target party generally intends to commit significant resources for the duration of the license, and each party remains independent (Figure 6 shows that the target party B has a gap that can be filled by the other source party A. Once the transaction phase has completed, party B is able to fill the gap, and both parties continue a longer term relationship with each other). Such

Figure 6. Licensing



a licensing transaction may be incoming (in-licensing), outgoing (out-licensing—see Figure 6) or bi-directional (cross-licensing).

If the licensing transaction is based on a brand, the most important intellectual asset is the brand, which hopefully has been protected through trademark registrations in the target regions. Such brand licensing transactions are often entered into to capture new markets with new product categories building on a certain, already well-established brand positioning in the target market.

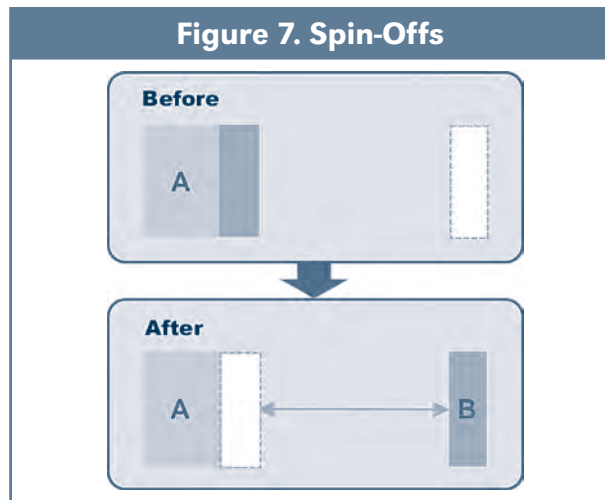
The key challenge in a licensing transaction driven by brand intellectual assets is closely related to the challenges faced by an outbound distribution alliance (see previous section). Allowing another party to utilize a company’s brand seems to be an easy way to make more money without increasing operational challenges. However, if the transaction partner does not manage the customer mindshare carefully during the implementation phase, any backlash on the brand in the transaction partners’ hands could have a dramatic impact on the brand in the source market.

If the licensing transaction is based on a technology, the most important intellectual asset is the technology, which hopefully has been protected by patents, trade secrets and related intellectual properties. Generally, a technology licensing relationship is entered into if the target party has the ability to use the technology in an area that the source party cannot execute in to the fullest possible extent.

The key challenge in a licensing transaction driven by technology intellectual assets is often not so much the transfer of the technology and the related know-how, but ensuring that the transaction partner will really do their very best during the implementation phase, turning that technology into something that can and will be sold in the market at a peak performance level. While a solid, well-negotiated contract during the transaction phase might provide the source party with some steering elements (*e.g.*, minimum royalties) to ensure market success, the only true success formula is a functioning and stable relationship with the partner for the entire life of the licensing relationship. It is therefore advis-

able to take sufficient time during the development phase in selecting the right partners and early on establish a long-term relationship that is built to last.

3.3 Spin-Offs Driven by Intellectual Assets



A spin-off is usually done if either the potential of a certain technology intellectual asset could benefit from a separate entity (spin-off venture) or if a business unit no longer fits the current business strategy and could evolve better as a separate entity (unit spin-off). A spin-off venture is mostly based on technology intellectual property, whereas a unit spin-off generally includes a whole team. In either case, a separate entity is created, but a strategic relationship between the two entities remains (Figure 7 shows that source party A has an asset that could be suitable for a spin-off. Once the transaction phase has completed, a new target party B is created, and both parties continue a longer term strategic relationship with each other). In many cases spin-offs are created together with one or more other partners to form a joint venture.

When a technology-driven spin-off venture is created, usually a new team is formed around some core technology intellectual asset that has either been transferred or licensed to the spin-off (in the latter case, this would be a combination of a licensing and a spin-off-transaction). Often separate funding is raised for such an endeavor, and the new team in the new entity starts building its own technology intellectual assets and its own operational excellence intellectual assets around the technology provided.

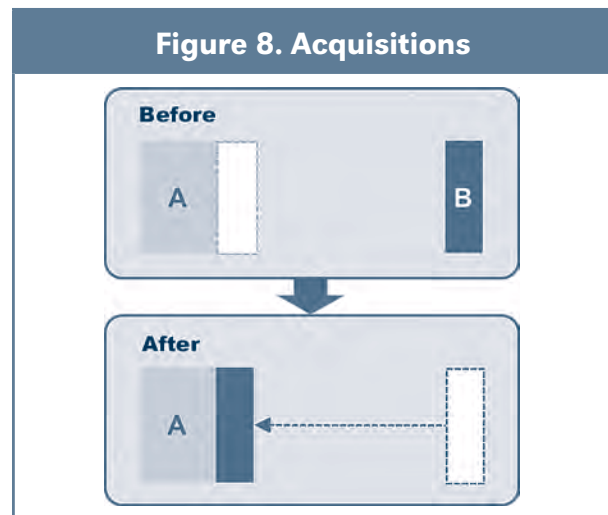
The key challenge in spin-off ventures is what to do when the spin-off team finds out after the transaction has closed that additional technological capabilities are needed from the source business. This is especially difficult if there is a joint venture partner that has provided the technology foundation for the new entity and now sees a chance for renegotiating the transaction terms. In order to avoid such a scenario, significant effort needs to be put into the development phase, creating a very detailed and realistic operational business plan (not to be confused with a sales-pitch-driven business plan for inves-

tors) ahead of time. It would also be advisable to negotiate a long-term alliance relationship between the source company and the spin-off to be able to close any potential future technology gaps early on with clearly defined parameters. Although as a sole owner, this problem is likely easier to resolve, it is still advisable to be just as careful in the development phase as if a joint venture partner was part of the transaction; otherwise any change in plans at a later point might still result in an unexpected interruption of the source business as well as in the spin-off.

When a unit spin-off is created, a whole existing team from the source business serves as the foundation for the new entity, generally combined with some technology intellectual asset. By definition, the source party loses some of its technological capabilities and sometimes also certain commercial capabilities. Also in this case, the transaction might be accompanied by including external investors. A unit spin-off is not to be confused with a management buy-out (MBO) of a part of the business. An MBO would be considered a divestment from the selling party perspective, since generally no strategic relationship remains between the two transaction parties after the transaction.

The key challenge in unit spin-offs is often the exact opposite of the one in spin-off ventures. In this case the source business might discover at some later stage that certain technological or commercial capabilities that are needed have been lost to the spin-off. This gets very tricky in the case of a joint venture, where one source business joint venture partner suddenly asks the spin-off to spend valuable resources to provide help. It also becomes a problem with investors that are very unlikely to support slowing down the spin-off to help the source party. The solution is the very same as with spin-off ventures: ensuring a very thorough development phase with the establishment of a detailed and realistic operational business plan.

3.4 Acquisitions Driven by Intellectual Assets



An acquisition happens if a selling party is interested in monetizing its entire business (equity deal) or certain assets (asset deal), and a buying party has an interest in

acquiring those. The buying party takes ownership of the business or the assets, and the seller generally ceases to exist (Figure 8 shows that buying party A has a gap that can be filled by the selling party B. Once the transaction has completed, party B no longer exists). Also, a management buy-out or a management buy-in would be considered a special kind of acquisition from the buying party perspective, since they also result in a change of ownership, although in this case the complexity of merging two entities does not apply. While in some cases an acquisition transaction might be referred to as a merger with the intention to communicate an equality aspect, this usually is only lip service and does not reflect reality, since one party generally has the lead.

Depending on the target company, an acquisition can be brand-driven, technology-driven, operational-excellence-driven or a combination thereof. Generally, technology driven and operational excellence driven acquisitions are much more difficult to get right than brand driven acquisitions.

In a brand-driven acquisition, where the key intellectual asset is the brand, the focus during the development and transaction phase is to understand how the brand was built and how it can be stretched or expanded. The advantage is that, since a brand intellectual asset generally does not rely on the internal team of an entity, but on existing customer mindshare, the implementation phase is less dependent on the employees staying on board and being motivated to support the new owners. It gets slightly more complicated when the owner is personally part of the brand. If that is the case, the owner needs to stay on board for a considerable time to allow for a transition period, where the brand can transfer to become disassociated from the owner.

The key challenge for brand-driven acquisitions is for the new marketing team to have a clear brand strategy and implementation plan early on during the implementation phase. Fortunately, the buying party generally has some time to get this right.

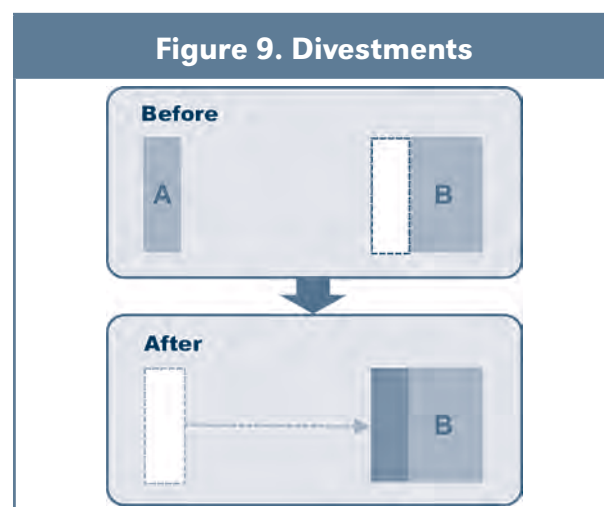
A technology-driven acquisition or an operational-excellence-driven acquisition is much more fragile from a management perspective. A technology intellectual asset usually consists of patent-protected technology paired with the scientific and technical know-how from the team on the execution side. Similarly, operational excellence intellectual assets consist of hopefully well-documented operational systems coupled with the implementation skills of the team. Unless the technology is acquired simply to establish a freedom to operate position, and the buyer already has all the required capabilities in house, the focus here is on securing and motivating those key employees that provide the buyer with a continuous flow of innovation and consistent operational excellence.

The key challenge in technology-driven acquisitions is that the “human factor” is difficult to judge during the transaction phase, since it is almost impossible to get access to the full scientific or engineering team in a setting where their motivation and capabilities can really be judged within a conventional due diligence process. There-

fore, the focus has to be on the implementation phase, during which one of the key tasks is to secure and motivate that scientific and technical team from the very beginning. Once traction with the team is lost in the process, there is a high risk of losing some of the best scientists and engineers. In the high-tech field, many companies intend to acquire capabilities (and often also pay a premium for that) but end up having purchased merely products.

The key challenge in operational-excellence-driven acquisitions is very similar to the one with technology-driven ones. One difference here though is that the goal is not to ensure a continuous flow of innovation but rather to continue the *status quo* of that operational excellence. Since operational excellence is strongly influenced by the culture of a company, it is very difficult to transfer that to another entity during the implementation phase (especially in a different country).

3.5 Divestments Driven by Intellectual Assets



A divestment, also considered an exit, is essentially the other side of an acquisition. Everything mentioned above for acquisitions still holds true, but in this case the source business is on the other side of the transaction (Figure 8 shows that buying party B has a gap that can be filled by the selling party A. Once the transaction phase has completed, party A no longer exists). An exit does not necessarily mean that the entire business is sold. In some cases a partial exit might be desired, where the seller only sells a certain business unit (similar to a unit spin-off, with the difference being that no continuous strategic relationship remains with the sold entity) or certain assets. Moreover, several deals might be structured around a platform technology where different parts of a selling entity might be able to serve distinctly different markets with different products, in which case, a number of serial exits could be completed over time.

Generally, the biggest mistake owners make in selling their business is to consider it an end in itself during the development phase. It may be somehow counter-intuitive to consider a full divestment of a company a growth strate-

gy, especially when it is driven by intellectual assets. However, this is exactly what is needed in order to create the ultimate value for the owners of the selling party.

Most owners are torn and believe that there is a trade off between the highest possible sales price of a business and the future of their employees. However, especially for technology businesses, this does not have to be the case if the business is built around strong operational excellence and technology intellectual assets. With a well-executed long-term build-to-sell strategy, starting at least two to three years before the intended sale, the focus is on how the potential future buyer of the business will be able to utilize the underlying assets in a synergistic or symbiotic way. If the key assets are based only on technology intellectual property without the team know-how (see Figure 1), then there is no additional strategic value for a potential buyer to keep the team in place, and the future value is limited. As described earlier in this article, an intellectual technology asset consists of intellectual property paired with people that can execute and build on it to create even more innovation in the future. If that is combined as well with operational excellence, which has been established in a way that someone else can also execute on, then the seller will not only reap the ultimate exit value, but also be in a good position to secure the future of their employees. So actually securing the future of the employees in a business to be sold can increase the exit value significantly. This does not always work, but there is no downside in trying to make money from securing the future of employees—a real win-win situation.

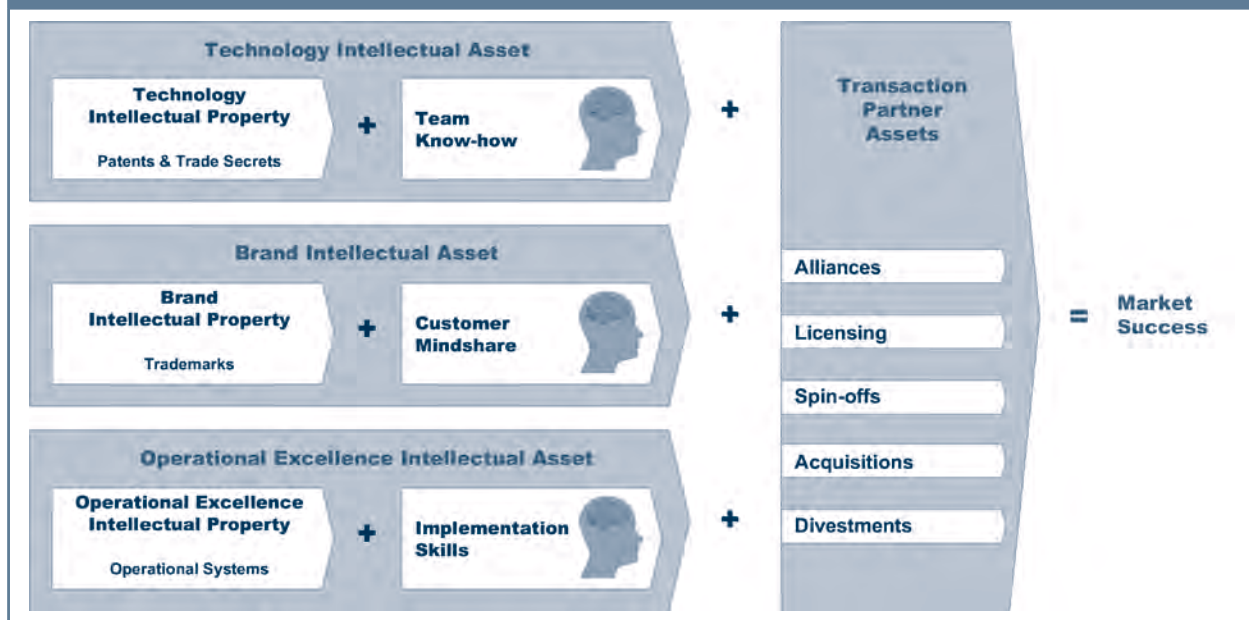
4. Conclusion

Most strategic transactions, no matter if they are alliances, licensing, spin-offs, acquisitions or divestments, create the best possible value if decision makers use key intellectual assets (technology, brand, and/or operational excellence) as the core drivers for value generation. Ensuring management continuity from the development phase all the way to the implementation phase is one of the key success factors.

Successful decision makers understand that intellectual property rights, such as patents, trade secrets, trademarks and operational systems, serve as qualifiers, without which a company will not even be able to participate in ultimate value generation from strategic transactions. However, the actual order winner that ensures long-term success is the human factor that needs to be in sync with the intellectual property. The level of market success depends on the people within an organization (team know-how, implementation skills) or outside in the marketplace (customer mindshare), combined with assets from the transaction partner (see Figure 10). Unfortunately in today's business reality, transaction management focuses too much on pure financial valuation, underestimating the people factor. This does not mean that valuations are not important, but the difference between a worst-case scenario, base-case scenario and best-case scenario is in the people. People make the numbers and not the other way around, which is especially true for transactions powered by intellectual assets. ■

Available at Social Science Research Network (SSRN):
<https://ssrn.com/abstract=3582891>.

Figure 10. Market Success



IP Enforcement Strategies For SMEs

By Bruno Vandermeulen

Abstract¹

Patent disputes present specific issues for SMEs. This is true regardless of whether the SME is a patent owner who wishes to assert a patent or a defendant who is sued for patent infringement and wishes to invalidate a patent. Litigation tactics for SMEs can vary depending on the motivation of the opponent, to what industry sector the parties belong, whether litigation costs and fees must be borne by the losing party in the jurisdiction where the dispute takes place, and what the value of the dispute is. All these specific issues are dealt with in greater detail here, summarising 30 years of practical experience with SMEs at various courts in Europe and the United States.²

Introduction

Before talking about patent litigation and enforcement strategies, it is useful to consider the options for avoiding litigation. Since litigation is expensive and burdensome for the management of SMEs, parties can and should make use of the various ways to avoid a formal court dispute. One popular method is to include an “escalation clause” in relevant agreements, obligating the parties to meet with each other in person in various steps, each time higher up the chain of command in each organization, before a court case can be launched. Another way to avoid disputes is mediation. Many court systems provide for optional or even mandatory mediation, and most lawyers are now obligated to draw their clients’ attention to the possibility of mediation.

When litigation proves to be unavoidable, one important piece of advice is to stay in the driver’s seat and to take the initiative. The party who takes the initiative to start a court dispute will have several advantages, such as choosing the venue, the court, the language of proceedings, the timing, the cost reimbursement system, etc. “Drawing first blood” is an important strategic decision

that can sometimes conflict with the desire to reach an amicable settlement.

This article will focus on SMEs because, in multi-jurisdictional patent disputes, they are confronted with a couple of typical issues that are worth examining, as there are also ways to avoid or better cope with these issues.

Particular Issues for SMEs

At the end of this article, a few strategy points will be analyzed that apply to all types of companies, regardless of whether they are SMEs or part of a multinational corporation. This section will cover topics that are particular to SMEs, certainly when the SME is caught in a patent dispute conducted in several countries at the same time. See Figure 1.

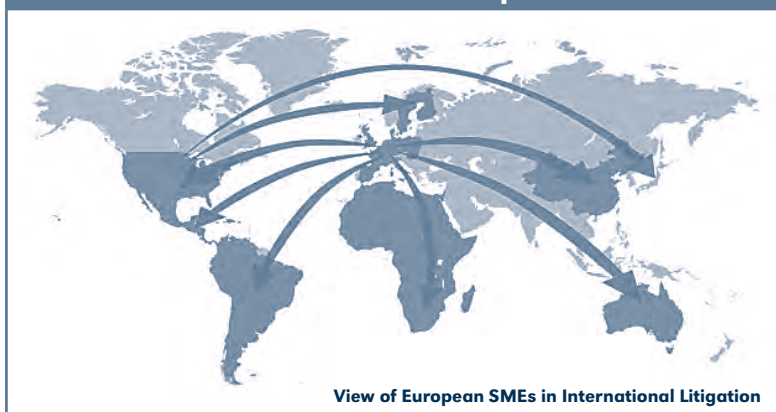
1. The Key Role of SME Counsel in Cross-Border Patent Disputes

The role of counsel in an international patent dispute is very different from the perspective of an SME than from the perspective of a multinational company, as SMEs typically have no dedicated legal counsel available for this type of work. The work will therefore need to be picked up either by dedicated in-house counsel acting as a go-between for the SME’s management and outside counsel, or by outside counsel who will co-ordinate the work between the SME and the lawyers in the various jurisdictions. This can give rise to specific issues.

1.1 Managing Management’s Time

An international patent dispute can become extremely time-consuming for SME managers and em-

Figure 1. Enforcement Strategies Have An International Perspective



1. The content of this article was subject to a presentation at the High-growth Technology Business Conference 2019 in Dublin (epo.org/business-success). The author has summarized key takeaways in a short video, to be found on: epo.org/sme-takeaways.

2. If the Unitary Patent with the Unified Patent Court were in place many aspects addressed in this article would become simplified.

ployees. This is especially true when the dispute is brought before a common law jurisdiction, such as the United States, Canada or the United Kingdom, where the role of witness evidence, testimonials and discovery add extra layers of complexity to the litigation. Activities such as taking discovery, organizing disclosure, and preparing and attending depositions are unknown in the civil law litigation that predominates in continental Europe, and they put a heavy burden on the management of an SME.

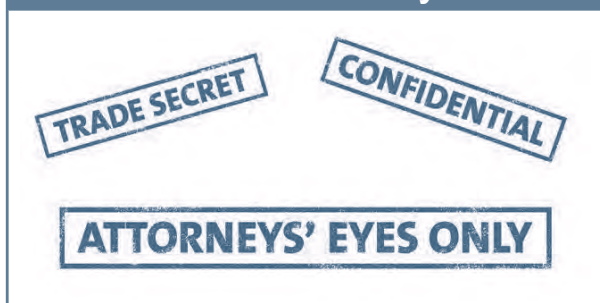
In the early stages of a patent dispute, SME management will typically be very enthusiastic and committed to co-operating. As they feel personally affected by the dispute, they put their personal money into it and they are eager to help. But litigation is not a 300-meter sprint, it is a marathon, and after a year, and certainly after more than a year, that spirit of co-operation will gradually diminish and ultimately be exhausted. Managers have their own daily tasks, and managing a legal dispute is not amongst them. Therefore, as counsel, it is important to avoid such exhaustion and to keep the team engaged and moving forward, but at a slower, steadier pace so they can still remain focused on the goal even after a few years.

1.2 Acting as a Multi-Functional Filter by Separating Information That is Either Confidential, Legally Privileged or “For Attorneys’ Eyes Only”

When the dispute is litigated in several countries at the same time, requiring the SME to hire several outside lawyers to represent it in each country, co-ordination between all these outside lawyers is extremely important. See Figure 2.

The most important role of co-ordinating counsel then becomes acting as a filter between the various levels of information that needs to be exchanged, on the one hand with the opposing side, and on the other with foreign counsel representing the SME. These levels of information are determined based on several criteria that give each communication or item of information a particular label, such as “confidential” or “privileged” or “for attorneys’ eyes only,” etc.

Figure 2. Different Levels Of Confidentiality



Lawyers who have been trained only in continental Europe are less familiar with these concepts. In addition, the rules are becoming more and more complex—particularly in Europe, where two very different sets of European legislation were introduced at more or less the same time: the General Data Protection Regulation (GDPR) and the European Trade Secret Directive (TSD). These two sets of rules serve very different purposes, but they came on top of already existing national regulations regarding legal privilege, confidentiality and bar rules, and they may confuse those who are not acquainted with any of these.

For staff working in smaller companies with no legal department, all these rules look similar and can be easily confused. A typical example is a non-disclosure agreement: once this has been signed, one might easily think that several other issues are also covered. This is understandable, because trade secret protection and privacy, for instance, have rules about the non-sharing of data in common. However, each set of rules has its own specific purpose and is enforceable only between distinct categories of actors that play a role in a patent dispute, which is why there is very often confusion.

When an SME manager needs to cross the Atlantic because he is facing a patent dispute in the United States, he quickly learns about discovery and must disclose to the opposing side a lot of information and e-mails that in Europe may be covered by privacy rules. On the other hand, he learns that his own lawyer receives information from the opposing side that is labelled “for attorneys’ eyes only” that he himself cannot access. This rule is intended to protect the confidentiality and interests of the opposing party. The SME manager typically confuses this rule with another one that protects his own interests from that same opposing party, *i.e.*, legal privilege. What, exactly, is the difference? And where do the new rules regarding privacy and trade secret protection come into play?

These are issues that legal counsel is experiencing more and more and that become increasingly complex in cross-border disputes. SMEs need to do their homework to better understand these issues, but they usually cannot rely on internal expertise to deal with all these rules. They need a single point of contact who can manage these issues.

It is fair to say that SMEs rarely have good experiences with patent enforcement, and that they like to stay out of it. Although there are many exceptions to this claim, there are typical mistakes that SMEs make that cause this disarray with patent disputes. But these mistakes are not that difficult to avoid, which is why this article offers some recommendations.

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Common “Mistakes” of SMEs When Confronted With an International Patent Dispute and Some Solutions

- “Personalizing” a dispute
 - Keep distance
 - Build a team
 - Delegate tasks
 - Inventor/CEO as only witness?
- Voicing frustrations via non-confidential and non-privileged e-mails
 - Manage internal communication
 - Avoid paranoid attitudes
 - Putting the right value on a dispute

1.3 Avoid Personalizing a Dispute

An SME manager who becomes involved in a patent dispute can sometimes take the dispute very personally. This prevents a business-oriented approach to the challenge. A typical situation is as follows: An inventor working as head of a scientific department at a university makes an invention, files an invention disclosure with the technology licensing office and supports filing a patent. Since the technology is promising, the university and the inventor decide to spin it off by setting up a company. The inventor also manages to find funding for the new venture, including his own savings. Since he has certain management skills, he becomes the first CEO of this company. When the company then gets sued to challenge the patent’s validity or to stop its products from being sold, the CEO/inventor/investor will take such a legal attack very personally. Despite his function as a CEO representing the company, he will take the legal dispute as a personal matter between himself and the opposing party. What then typically happens is that the CEO exercises control over every argument, witness and document that is used in the dispute. The dispute becomes so time-consuming that he has no time to manage or to delegate other tasks. Soon the dispute revolves exclusively around the person of the CEO himself fighting against the competitor.

After a while, this starts to affect the quality of management and the time that can be devoted to management, and leads to demotivation among other members of the company, who are excluded from the issue. A proactive counsel is needed to help in depersonalizing the dispute by (i) encouraging the delegation of tasks early on and (ii) forming a litigation team instead of a “one-man army.”

It should also be ensured that more than one person is able to serve as a possible witness in a dispute.

1.4 Deal With Reluctance to Disclose Sensitive Business Information

Another related issue that frequently arises is that SMEs are typically reluctant to comply with a request for discovery (known as disclosure in the UK). As the SME

is often quite young, its activities may revolve around a single product or service that is considered to be highly innovative and unique. The company’s manager is most often the author or originator of all the information that is requested for discovery. Therefore all requests for discovery or disclosure are perceived as excessively invasive and personal.

The SME manager will take such requests for disclosure as an invasion of their privacy—an attack on their private business life—because they have to disclose their business plans, their economic data and many other things they would never have to hand over if they had been sued only in a court in continental Europe.

Anticipating such fears and dealing with them as they arise is part of counsel’s job, regardless of whether they are in-house or external. This reluctance must be prevented from becoming such a nuisance that the SME is willing to pay anything just to get rid of the dispute. Patent disputes are often settled for sums that are considered a “nuisance value.” It is this reluctance to cooperate in discovery that accounts for the largest part of the nuisance value that motivates an SME to seek a deal rather than fight until better terms can be achieved, or the court renders a decision. Keeping this nuisance value down becomes an important part of counsel’s mission.

1.5 Put a Value on any Dispute

A very useful tool that counsel can use to solve—or at least mitigate—the challenge described above is to ask questions at regular intervals about the value of the dispute. In most continental European countries, with the exception of Germany, outside counsel is not supposed to know what the financial stakes of the dispute are, as this is not considered to be part of his role. Nevertheless, it can be a key factor for putting a case into perspective and reaching a solution. Germany is an example of a jurisdiction with a very mature patent litigation system where this is handled differently. Parties who want to open a case before a German court must determine the *Streitwert* (dispute value) at the outset, so that the entry fees for the procedure and the fees that the losing party might need to pay to the winning party can be calculated in advance. This figure is not something the parties can decide freely; it is regulated, and the court itself will increase the *Streitwert* if it believes that the stakes are higher than presented.

Such a system has an advantage for the parties as it forces them to calculate their risks and financial exposure with greater care. It can therefore help to reach a settlement earlier. Especially for SMEs whose litigation budgets are limited, this is something that should be kept in mind.

In any case, counsel should ask management what the dispute is worth to them, what the value of the technology and its products or services at stake might be, and whether it would cost more or less to avoid infringement or to settle.

This estimated value is purely business-driven and

should not be confused with the nuisance value described above, which is more an emotionally driven figure that should be disregarded. It is easier for outside counsel to distinguish between these two values than for the management of the SME to do so.

2. Financing Litigation

Budget Management

- IP litigation lawyers: such an expensive experience—never again
 - Benefit from “bifurcating” a patent dispute
 - Request quarterly budgets over a long period
 - Keep a say about the teams
 - Improve recovery of fees: determining the “*Streitwert*” of a dispute
- “No cure, no pay”: a good solution?
- Litigation funding: an alternative?

2.1 Budget Your Own Litigation Costs Regularly and for Longer Periods

Litigation lawyers don’t like to come up with budgets or make estimates about their costs in a legal dispute as it is challenging to predict the actions of opponents and the time and effort it may take to counter them. Nevertheless, budgets and fee estimates are essential for SMEs to decide whether or not a patent dispute is worth pursuing.

Contrary to the United States, in Europe it is not possible to conclude a fee agreement with a litigation lawyer on a “no cure, no pay” basis. Ethical and professional rules do not allow a pure contingency model, as it might compromise the legally required independency of a lawyer. However, many jurisdictions do allow agreements that stipulate a markup or a success bonus for counsel upon successful conclusion of the litigation. Nevertheless, experience teaches that even these solutions require attention in order to avoid another type of dispute between companies and their legal representatives.

2.2 The Alternative Solution: Litigation Funding

A good alternative to negotiating success fees with your counsel is to seek litigation funding from a specialized company. Such companies act like investors who evaluate the risk of winning or losing, similar to any other investment company. By advancing the legal fees, they do not invest in the company’s stock or technology, but in the chance that a company will successfully defend its case and get an award out of it. Only if an award is collected do they take a share of that award in return for the risk of their investment. Such business models exist and are becoming more and more popular in Europe.

2.3 Be Aware of the Variety of Cost Recovery Procedures

Although the cost recovery procedure is rarely a decisive factor in a party’s choice of jurisdiction, it is important for SMEs to know which jurisdictions have cost

recovery procedures and which do not. This can help to determine when the time is right to make settlement attempts, and it may also help to prevent parties from behaving unreasonably during the dispute. For instance, opponents focusing on litigation profits (*e.g.*, when the opponent is not practicing the patent) typically avoid jurisdictions where they run the risk of cost reimbursement, because this means higher financial exposure.

In the United States, the lawyer’s fees of a prevailing party can only be recovered from the losing party in a so-called exceptional case, *e.g.*, when a patentee attacks a party with clearly bad intentions, meaning that there is not the slightest ground for alleging infringement. The disadvantage of never recovering your lawyer’s costs is only compensated by the comparatively large damages awards in the United States, which often make the costs of litigation affordable in the event of a win.

In Europe, cost recovery by the prevailing party against the losing party is, in principle, mandatory under a 2004 European Directive. However, practice shows that this directive is applied very differently from one country to another. The determination of the value of the dispute is an important factor in determining how much the prevailing party can recover from the losing party. In Germany, recoverable fees are predictable and can be calculated with some precision, but they are hardly ever sufficient to cover all costs. In the United Kingdom, in contrast, recoverable costs can be unpredictable, as they depend on how the dispute evolves. Instead, UK courts have discretion to award a small or large portion of the legal fees sustained by the prevailing party against the losing party. In the Netherlands, the losing party frequently has to pay all the legal fees of the prevailing party, and the amount is not known until shortly before the court hearing.

It is important that counsel inform the SME, in a timely and complete manner, of the amounts that it may have to pay, both for the requested legal services and for those of the other side if the litigation does not end in the way they expect.

3. Patent Enforcement Strategies are Sector-Dependent

Generally speaking for businesses of any size, patent enforcement disputes can vary widely according to the sector the parties belong to. As long as the business is facing an opponent that is a direct or potential competitor and needs to protect its own commercial activities, there are many options for negotiation, and each party can then determine where their interests lie.³ Cross-licensing with market allocation (if permitted by antitrust law) and other mechanisms are then available to help the parties to find common ground.

Three sectors are of particular relevance. The first is the life sciences sector, where a distinction must be

3. When the opponent is not practicing the patent, the focus usually is on financial terms.

made between the pharmaceutical sector, the medical devices sector and the biotechnology and biosimilars sector. The second is the electronics sector. And the third is the chemical sector. See Figure 3.

3.1 Life Sciences

In Europe, drug patent litigation by and against pharmaceutical companies is characterized by a country-by-country approach. Drug patents must be enforced (or challenged, as the case may be) in each country separately, and not all countries are worth instituting litigation. There are two reasons for this. The first is because patents are still strictly territorial in nature: a win in France has no legal effect in Germany and *vice versa*. But the second and more important reason is that each country has its own social security system, with its own rules of reimbursement. There may therefore be countries where it is worth fighting for the market of a particular drug, and other countries where this market is not interesting enough. Companies that would like to launch a generic or competing drug on a national market must consider not only the size of the market, but also the gains to be made for that particular product via the social security system.

This explains why, for instance, in a small country like Belgium, with a relatively small consumer market, there are as many drug patent disputes as in other, larger jurisdictions, such as Germany and France. Belgium has a rather generous social security system that makes it worthwhile for pharmaceutical companies to litigate their patents there, too.

Medical devices, although part of the broader life sciences sector, are sold and distributed in a very different market. As they are not pharmaceutical products, they are not subject to attractive reimbursement rules. On the other hand, they are heavily regulated, *e.g.*, by technical standards, traceability rules, compliance and storage rules, and rely on a complex and carefully designed distribution mechanism. Such products cannot easily be re-routed or

hidden from patent attacks. To knock out a competitor in Europe, it is often sufficient to successfully stop them in one or two countries so that their further supply or distribution throughout Europe is compromised. That often suffices to succeed for the rest of Europe.

Biotech products and biosimilars are again a different and also challenging area. There are only a few courts in Europe that are specialized enough to handle the more complex subject matter. In addition, the manufacturing facilities for such products are concentrated in a small number of jurisdictions. Consequently, pan-European litigation for such products is not necessary, contrary to drug litigation. Disputes in this sector will mostly be concentrated in just one or two key countries.

3.2 Electronics

Patents in the electronics sector, particularly those relating to telecommunications or entertainment equipment covered by international standards, are typically enforced in jurisdictions where the products are imported from outside Europe, *e.g.*, the Netherlands. This makes it possible to block importation of such products for the entire European region in a single blast.

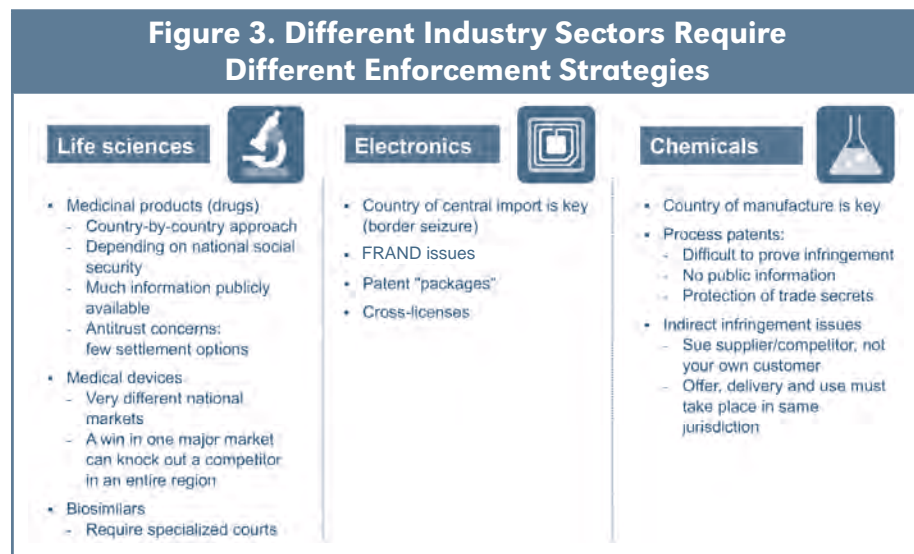
There are specific legal issues encountered with patents in the electronics sector, such as FRAND (fair, reasonable and non-discriminatory licensing conditions), because most often the dispute involves the enforcement of standard essential patents, or SEPs. This is a specific area of law that is not encountered when enforcing patents for biosimilars or drugs, but that is very typical for electronics.

Another typical feature of enforcing patents in the electronics sector is that many disputes are settled via cross-licenses. This is because the parties involved in an electronics dispute both own patents that are relevant to the other party's products and that both parties can benefit from. This means there are a lot of opportunities for cross-licensing. In the drug sector, in contrast, licensing opportunities are much less available: it is mostly a legal

issue between generics and innovators, and cross-licensing opportunities are close to nil.

3.3 Chemicals

In the chemicals sector, companies sell compounds and materials that very often are no longer protected by patent—only their manufacturing processes are. Chemical patents often protect improved manufacturing methods that reduce the cost of either manufacturing or the equipment and machinery for their manufacture, or that improve the products incrementally via their composition and efficacy. For this type of patent enforcement, it



is very common and even necessary to sue in the country of manufacture.

First, this is because process patents are most efficiently asserted in the place where the infringing manufacturing process takes place. When such an action is successful, the worldwide distribution originating from that manufacturing site is blocked. Second, because the manufacturing site is—certainly for non-regulated chemicals—the only place where proof of the infringing manufacturing method can be obtained.

Chemical companies do not like risks because their installations require heavy investments that take years to build and many more years to amortize. A patent infringement risk will often be avoided “at all costs,” often via cross-licensing or other alternative dispute mechanisms. Patent disputes in this sector are most often conducted at another level.

The level where few disputes arise is where competitors are on the same level of the production and distribution chain. But there is another level where competition can be fierce and where patents are asserted: those who supply the manufacturers with raw materials and additives. To sue those suppliers, patent owners will want to rely on indirect infringement actions rather than direct infringement. Direct infringement would require them to attack their own customers, which is challenging. Instead, a patent attack based on indirect infringement

allows them to sue the customer’s supplier, who most often is the direct competitor of the patent owner. In this way, they can sue parties who are higher up in the supply chain and avoid the chemical plants and industries themselves, which are very risk averse.

Takeaways

- Get your enforcement strategy right in line with market and sector needs.
- Stay in the driver’s seat in a patent dispute by taking the initiative in time, regardless of whether you are the patentee or the alleged infringer, as it is the best way to make use of all the options.
- Don’t let the dispute become personal. Allow counsel to step in and take the heat so that the SME’s management has the freedom to think about the company’s best interests.
- Use counsel as a filter and a communication coordinator. Beyond developing the necessary legal arguments, counsel can be someone who thinks strategically, increasing the chances of winning and freeing up considerable management time.
- Discuss litigation budgets with outside counsel early on, considering the costs of the opposing side as well. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3582892>.

Why Technology Start-Ups Should Be Paying More Attention To Patents

By Willem Bulthuis

Abstract

Technology start-ups are key drivers of innovation. However, patents are often not their priority, especially in Europe. Key reasons for this are their strong focus on rather short-term objectives like winning paying customers and raising money from investors. Other complicating factors are the very divergent time-frames involved in the patent business and in growing a technology start-up with its regular strategy adjustments (pivots).

The best lever to motivate technology start-ups to invest in patent portfolios is through their investors. Therefore, more awareness and insights should be created among venture capital firms on the value of patents for their portfolio companies.

Introduction

In today's world, technology start-ups and (later-stage) scale-ups play a crucial role in innovating many industries, either by bringing breakthrough products or services to market or by helping established companies substantially improve their products or processes. Technology start-ups that drive innovation contribute strongly to productivity and economic and job growth. According to the 2017 report by the Center for Economic Studies at the U.S. Census Bureau,¹ "high growth output firms are disproportionately young and make disproportionate contributions to output and productivity growth." As technology start-ups are so important for innovation, to what extent should they be concerned with patents and combining them with other intellectual property (IP) rights?

Technology Start-ups Have Other Priorities

Start-ups are usually still very small organizations with founders who have to take care of all aspects of the business, with limited time and especially with (very) limited budgets. So they have to set priorities on a day-to-day basis. Their main priorities are usually paying customers and investors who provide the capital they need to survive the coming months. Thus, it is not surprising that many technology start-ups are not prioritizing the development of an optimal patent portfolio since this requires time and money and may not bring any additional revenue in the short term.

What Arguments Can Convince Technology Start-ups to Pay More Attention to Patents?

Of course, the first consideration has to be whether

er patents or other IP rights could be relevant for the products and business of the technology start-up. For high-tech companies, the answer to this is usually "yes." According to the 2019 study "High-growth firms and intellectual property rights" by the European Patent Office and the EU Intellectual Property Office,² high-tech SMEs that filed European patents are 10 percent more likely to experience high growth (over 20 percent revenue growth for at least three consecutive years). Therefore, there are several reasons why technology start-ups should pay serious attention to their patent portfolios. For SMEs, a well-developed patent portfolio can:

- Support obtaining freedom to operate, *i.e.*, an SME can run its business without the risk of being confronted by patent infringements;
- Protect their inventions from copycats, which gives them a sustainable competitive advantage;
- Improve their negotiation position when licensing technology to B2B customers;
- Strengthen their negotiation position in standards development or cooperation projects;
- Generally improve their reputation;
- Allow using patents as collateral for securing loans; and,
- Increase their attractiveness for investors (which we come back to below).

For a more extensive overview of the reasons to patent and several concrete case studies, please refer to "4 Reasons to Patent" by the 4iP Council.³ The motives for filing and maintaining patents by SMEs (a much broader group than just start-ups) can be found in the Patent Commercialization Scoreboard of the European Patent Office.⁴

However, each technology start-up is unique, and the importance of IP protection may differ in each case. If the start-up is targeting B2C business development, trademark and design rights might be more important than patents, which are generally more relevant for B2B businesses. The business model also plays a crucial role. To generate revenue from licensing the technologies, hav-

1. John Haltiwanger, *et al*, "High Growth Young Firms: Contribution to Job, Output and Productivity Growth, CARRA Working Paper Series," Working Paper 2017-03, *Center for Economic Studies at the U.S. Census Bureau*, February 2017.

2. "High-Growth Firms and Intellectual Property Rights," European Patent Office and EU Intellectual Property Office, May 2019, epo.org/high-growth (accessed 01.04.2020)

3. "4 Reasons to Patent," 4iP Council, 4ipcouncil.com/4smes/4-reasons-patent (accessed 01.04.2020).

4. Patent Commercialization Scoreboard European SMEs, in Market success for inventions, European Patent Office, 2019, epo.org/scoreboard-smes (accessed 01.04.2020).

ing patents can substantially increase negotiation power, while for selling complete products it might be more important to fend off copycats through patents in combination with trademarks. In very fast-moving industries where speed is crucial, such as the software industry, patent protection might be less suitable than in industries with longer technology cycles, such as pharma. Also, if the business relies on technology standards, freedom to operate is key, and a strong patent portfolio could help influence standard-setting. Last but not least, items such as the ambitions and financial situation of the company, any plans for regional or international expansion, and especially any exit scenarios that are foreseen may also have a significant impact on the creation of the optimal intellectual property rights (IPR) portfolio.

What Interest Do Customers of Technology Start-ups Have in Patents?

The freedom-to-operate issue is important for potential customers in the B2B space, as they need some certainty that they will not face indemnity issues *vis-a-vis* third parties. Also, they need certainty that the technology start-up will be able to continue its operations, which is in all cases a big question for young technology start-ups. However, technology start-ups often tend to avoid the issue, especially as a comprehensive prior art search can be time consuming and expensive, while not giving 100 percent certainty.

The current patent and other components of the IPR portfolio of a technology start-up might be of interest to potential customers for a very different, less noble reason: to assess whether they could develop a similar product or service themselves, having all the resources and know-how of an established company, and thereby avoid making themselves dependent on a small technology start-up. Unfortunately, this is not just a hypothetical scenario, although most large companies have come to realize that they are probably too slow for this strategy and would be better served by getting the solution from a fast technology start-up.

Why Should Investors Care about Patents?

From an investor perspective, freedom to operate is important to enable successful growth potential for the company. Beyond that, the start-up's patent and IPR portfolio are also relevant for investors for several reasons:

- Defensive use: having a potential negotiation position in case of infringement by potential customers or competitors. However, the power of a very small portfolio is usually limited.
- Offensive use: preventing other companies from offering a similar product or service. This is a more realistic scenario.

- Negotiation position with customers, partners and standardization efforts.
- Flexibility to pivot to other business models (e.g., from selling products to licensing technology).
- Exit value: a strong patent and other IPR portfolio can increase the ultimate sale price of a technology start-up at exit (sale to a large corporation or private equity).
- As a security asset for the investor: a patent portfolio could generate some financial return if the start-up does not survive, thus somewhat reducing the loss or providing a second chance for a restart in a new setup. See Table 1.

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So, Why and When Should Technology Start-ups Invest Resources in Patents?

The response to this question seems to be rather diverse across the globe. While some technology start-ups in Silicon Valley file patents on a wide range of ideas at the start of their company, of which they will only implement a few in the end (or none at all due to their regular “pivoting”), many European technology start-ups consider patent filing too expensive and distracting from their short-term focus on obtaining paying customers.⁵ They also often take the position that they can only decide what to patent once they have sufficient customer feedback—which is generally too late from a patent applica-

Table 1. Summary Of Patent Relevance For Key Stake Holders

	Relevance For Investors	Relevance For Start-Ups	Relevance For Customers
Freedom To Operate	High	High	High
Preventing Imitation	High	High	Low
Negotiation Position	High	High	Low
Standards Contribution	Medium	High	Medium
Increased Reputation	Medium	High	Medium
Collateral For Loans	Low	High	Low
Attractiveness For VCs	Low	High	Low
Security Asset At Insolvency	High	Low	Low
Company Exit Valuation	High	High	Low

5. Costly and time-consuming procedures were the main difficulties reported by SMEs when registering IPRs in the Intellectual Property SME Scoreboard 2019, EU Intellectual Property Office, November 2019, oami.europa.eu/ohimportal/da/web/observatory/sme-scoreboard (accessed 10.04.2020).

tion perspective. The situation is often different for spin-outs from universities, where first patents have usually already been filed by the university. Here the challenge for start-ups in some countries is to get those patents transferred or licensed (exclusively) to the start-up.⁶

An often complicating factor relates to the rather different time frames between the long-term focus of patent business and running a typical technology start-up with its rapid pivoting.

One option is to indeed file a broad range of high-quality patent applications internationally early on and “clean up” the portfolio once it is clear which technologies have been successfully implemented and accepted by the market. This approach requires rather deep pockets to finance the initial patent generation and application, unusual for European early-stage start-ups. Furthermore, “cleaning up” the portfolio in a profitable way requires either a great network (from the investors) or effective market facilitators.⁷

Another, more prevalent option is to work on a trade secret basis until the solution is somewhat validated in the market, after which more specific patents are filed. Of course, this approach complicates the validation process for investors or customers (as inventive details of the technical solution cannot be shared) and carries considerable risks of either information being leaked or third parties patenting similar inventions before the start-up does.

A third example, observed among several start-ups, is to file a number of provisional patent applications in the U.S.,⁸ thereby potentially securing priority for patent applications or utility model filings in Europe, and combine that within the priority year with the EP and or PCT route for internationalization. This can save cost at the beginning and “buy” about 30 months’ time for businesses with limited funding, whose technology is still in the development phase. This strategy will secure an early priority date, enabling later improvement of the patent applications, once more insights about the technology and/or market feedback have been received, and potentially additional budget becomes available. It is a kind of cost-delaying strategy that can be combined with cost savings achieved by efficient engagement of patent attorneys and IP renewals service providers.⁹

6. For real examples of how universities can support IP transfer to start-ups and build the foundation for their success, see EPO SME case studies, “Orcan Energy, Recycling Waste Heat to Cool Down the Planet and Lithoz, 3D Printing Opens A New Chapter For Ceramics,” European Patent Office, 2017, epo.org/sme (accessed 01.04.2020).

7. For more insights see the article in this issue by Bastian July and Ilja Rudyk, “Succeeding with Market Facilitators—How Buyers and Sellers Meet,” *les Nouvelles* 55, no. 2 (June): p. 148.

8. For an introduction to the notion of provisional patent applications in the USA, see Gene Quinn, “The Benefits of a Provisional Patent Application,” 2017, ipwatchdog.com/2017/05/13/benefits-provisional-patent-application/ (accessed 09.04.2020).

In this context, a valid question from technology start-ups is whether to focus more on patents or trade secrets to protect their business. The trade secret approach has the advantage of saving time and money and of nothing being published, which often seems attractive to small technology start-ups that could not realistically defend their patent against big corporations. However, from an investor perspective, trade secrets are not as strong and liquid of intangible assets as patents, and are to some extent tied to the founders—who might leave the company.¹⁰

Once technology start-ups decide to file patent applications, they often start with only one, as this can already cost substantial time and money. However, one patent does not make a portfolio, and without a solid patent portfolio strategy, the ultimate value might be rather limited. It is therefore important to explicitly decide the intent and budget allocated for building a patent portfolio, agreed with among shareholders, which can range from focusing on trade secrets and trademarks to a fully fledged patent portfolio.¹¹ Most technology start-ups will need external support to develop and implement a sound patent strategy, which can be a big step toward creating real value for the technology start-up and its investors.¹²

How Can Start-ups Protect their IP While Acquiring Investors, Partners and Customers?

Start-ups often face a big dilemma in early engagements with potential investors, partners or customers. They need to provide sufficient information about their technology to demonstrate its unique value, without disclosing important details of their inventions prior to having secured IP protection.

During initial discussions, it is often sufficient to focus on the customer problem the start-up is addressing and what their solution roughly looks like.¹³ However, potential investors will soon raise questions on how exactly the solution works and how it differentiates from competition and substitutes. At this stage, start-ups have to be very careful about the level of details they disclose, especially if IP protection has not yet been secured.

9. Ian Johnson, “What makes a good IP renewals provider?,” 2016, ipwatchdog.com/2016/10/23/ip-renewals-provider/id=73600/ (accessed 10.04.2020).

10. For further material about patents and trade secrets, see “IP Teaching Kit,” European Patent Office, 2010, epo.org/learning-events/materials/kit.html (accessed 01.04.2020).

11. For an example of a strategic approach to patent portfolio development, see Martin A. Bader, “Strategic Management of Patent Portfolios,” *les Nouvelles*, 2007, brainguide.de/upload/publication/40/keuk/1ccb2dfb6036a9e6f3dc0e0ad791e020_1311535413.pdf (accessed 01.04.2020).

12. For further material on this topic, see “IP Teaching Kit,” European Patent Office, 2010, epo.org/learning-events/materials/kit.html (accessed 01.04.2020).

13. For more insights, see the article in this issue by Thomas Bereuter, Bastian July and Gene Quinn, “How to Market and License Your Technology,” *les Nouvelles* 55, no. 2 (June): p. 152.

The default legal approach is to ask for a Non-Disclosure Agreement (NDA) to be signed by all parties prior to exchange of critical information. However, most investors might not accept this before a true due diligence phase has been reached. It also would be very hard to prove which potential investor has leaked confidential information about an invention, as usually numerous potential investors are being approached before finding the right match.

Furthermore, it should be clearly understood that pitching events and the distribution of (teaser) pitch decks to potential investors are generally not covered by any formal confidentiality agreements and, from a risk management perspective, should be considered as public disclosures.¹⁴

In summary, start-ups should decide before engaging with investors, partners or customers which explicit parts of the IP are really valuable and cannot be disclosed at all before IP rights have been secured. In concrete assessment stages, like a full due diligence process by a potential investor, IP needs to be protected by a water-tight NDA, which goes along with proper documentation of exchanged confidential information. However, reaching this stage can be difficult if even basics about technical solutions cannot be communicated. Therefore, early investments in IP protection can be crucial for successful fund raising and customer acquisition.

Who Should Convince Technology Start-ups to Invest in a Patent Strategy and IP Portfolio?

Investors provide capital to start-ups based on a clear agreement on the “use of funds,” *i.e.*, what the capital will be used for. They can also be key advisers to start-ups, often with seats on the board, and bring in substantial experience in growing a business, deal making and exits—all situations where IPR portfolios often play a key role. Therefore, investors are in the best position to discuss the importance of patents with technology start-ups and convince them to invest time and money in developing a patent strategy and building an IPR portfolio.

An initial discussion between an investor and the start-up about existing patents and patent strategy should take place before the investment is complete, and be part of any due diligence process, which normally takes place under an NDA. The “use of funds” discussion and regular reviews of product, strategy and budget provide good opportunities to align on patent strategy and budget.

However, anecdotal evidence suggests that, in Europe, there is still insufficient awareness and focus on patents among early-stage investors. This is partially due to a focus on software technology start-ups, which can grow fast with little capital, in combination with a general belief that software technology start-ups are not able to patent their technology.¹⁵

14. It can even become important to document what has been disclosed publicly, to help defend the start-up in case freedom to operate is at risk, as related IP protection might have been achieved by third parties.

Several studies report that having patents helps start-ups to secure funding, often even faster.¹⁶ However, there are also indications¹⁷ that venture capital investors look for patent portfolios when selecting companies for investment, but then ask these companies to focus on exploiting the existing patents rather than on extending their patent portfolio.

Recommendations for Awareness Raising

As discussed in this article, venture capitalists have an important role to play in respect to patent use by start-ups. Therefore, efforts should be increased to raise the awareness of European venture capitalists on the importance of patents and other IPRs for their portfolio companies, not only to select the most promising start-ups, but also to create long-term value drivers. This could be achieved, for instance, through an increased focus on investors as a target group for IPR conferences, as well as focused IPR sessions during regularly scheduled match-making events for venture capitalists or angel investors and start-ups across Europe. Once investors fully appreciate the value-creation potential of patent portfolios, the companies they invest in will increase their focus on implementing solid IP strategies.

Recommendations for Technology Start-Ups¹⁸

- Clarify why IPRs are valuable for your business
- Define your strategy for making money from your IPRs
- Determine where in the value chain you are best positioned with your IPRs
- Get your stakeholders aligned for supporting your IP strategy
- Define your budget for your IPR portfolio. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3583013>.

15. On the patentability of computer-implemented inventions, see “EPO Guidelines for Examination,” epo.org/law-practice/legal-texts/html/guidelines/e/j.htm and for a discussion, Giovanni Zelioli, “Securing Software Patents Through the EPO,” 11 April 2019, iam-media.com/securing-software-patents-through-epo (accessed 01.04.2020).

16. In the specific field of biotech, it was demonstrated that start-ups with at least one patent received their first venture capital investment 76 percent faster, see Carolin Haeussler, Dietmar Harhoff, Elisabeth Mueller, “To Be Financed or Not...—The Role of Patents for Venture Capital Financing,” *Center for European Economic Research*, January 2009, [ftp://ftp.zew.de/pub/zew-docs/dp/dp09003.pdf](http://ftp.zew.de/pub/zew-docs/dp/dp09003.pdf) (accessed 09.04.2020).

17. Henry Lahr and Andrea Mina, “Venture capital and the technological performance of portfolio firms, in Research Policy,” Elsevier, February 2016, sciencedirect.com/science/article/pii/S0048733315001481.

18. These recommendations were provided by the expert panel on “Making Money from Technology” at the High-growth Technology Business Conference in Dublin, organized in November 2019 by the European Patent Office and Licensing Executives Society International, epo.org/business-success (accessed 01.04.2020).

From A Spin-Out To International Player: A Case Study¹

By Christian Hackl and Thomas Bereuter

Abstract

Intellectual property has a powerful impact on growth for technology start-ups that integrate it into their business model evolution. Orcan Energy AG is a great example for the role that IP played in the dynamic growth of an innovator in generating power from waste heat when creating a joint venture to access the Asian markets.

Introduction

Renewable energy company Orcan Energy AG² is a former university spin-out that commercializes innovative waste heat power generators consisting of components and designed for a broad range of applications. Due to market entry barriers, the company had to make an early pivot from a technology provider to a business model oriented towards product sales, taking the arduous path of developing and installing stand-alone³ products by themselves. The focus moved to fully integrating Orcan's products into the installations of large players. Sales developed dynamically, resulting in solid growth rates, although many generators in Europe still had to be sold one by one, limiting growth rates. As its technology has a much larger market potential, Orcan decided to enter the Asian market. After about three years, Orcan managed to set up a joint venture with a Chinese partner and investment fund. Large-volume sales were triggered, initiating the dynamic growth Orcan was intent on achieving to help reduce CO₂ emissions and fight global warming. Its patent portfolio, acquired from TUM (Technical University of Munich in Germany) and then dynamically

expanded, has proved crucial at all stages of the evolving business model, in particular when:

- Obtaining funding;
- Communicating the company's technical advantage and innovation skills in order to build up its trademark;
- Partnering with suppliers and R&D partners;
- Keeping copycats at bay;
- Maintaining freedom to operate; and,
- Founding a joint venture to enter Asian markets.

Orcan uses standard industry components to design and construct power generators that recycle waste heat by converting it into electricity, using the Organic Rankine Cycle (ORC), a process similar to that used in steam engines. Having started as a spin-out from TUM in 2008, Orcan now has 60 employees. Patents are important, particularly because Orcan's use of standard components means its power generators are at high risk of being copied. Eight early patents filed by TUM were subsequently acquired by Orcan. Ownership of these patents was vital in attracting funding.

Technology

The ORC is similar to a conventional steam power plant, in which the energy of heat (in the form of steam) is converted into electrical energy. However, as the name implies, it uses an organic fluid instead of water as the working fluid in the cycle. Due to the higher vapor pressure of the organic fluid the engine can be operated at a lower temperature than with water.

The organic fluid (or water in the case of a conventional steam power plant) is pumped to a boiler, where it evaporates. The resulting vapor powers a turbine (the expander), where the rotational energy is converted into mechanical and then electrical energy. The vapor then passes through a condenser (heat exchanger) and is converted back into the original fluid, which is then pumped to the beginning of the cycle, where it absorbs the heat from the heat source, and the whole cycle starts over again.

Business Case Development

Neither the ORC concept nor its application in recovering energy from waste heat sources is new as such. However, Orcan has changed the ORC business in several respects:

- It has moved away from a commissioned installa-

1. This article was published in November 2019 as a chapter of "Winning with IP: Managing Intellectual Property Today," ISBN 978-1-9998329-6-4, A. Jolly (editor), *Novaro Publishing*.

The book reports on how IP is being used to create tech solutions, pick up the latest thinking, take a competitive lead, negotiate the best deal, knock back any challengers and open up a path to breakthrough growth. Further details at <https://novaropublishing.com/managing-intellectual-property-today/>.

2. "Orcan Energy: recycling waste heat to cool down the planet," Unlocking untapped value, EPO SME case studies on IP strategy and IP management, Christian Hackl (author), Thomas Bereuter, Yann Ménière and Ilja Rudyk (editors), *EPO 2017*, Munich, Germany, epo.org/sme, ISBN 978-3-89605-188-2.

3. "Challenges for a start-up company when commercializing a new technology and extending its business model," Christian Hackl, *les Nouvelles*, *The Journal of the Licensing Executives Society*, Dec. 2017.

tion service to a standardized product business, thereby eliminating the high engineering workload for each individual installation and the associated high cost.

- It uses standard industrial components, thereby reducing the cost and complexity, improving reliability and allowing for easier maintenance.
- It offers an operator model for customers who choose not to be involved in the technical operation or maintenance of their installations.

Developing a standardized product business means that instead of unique customization of each installation (with the necessary high engineering workload) there is a defined standard product: in Orcan's case, it is the efficiency PACK eP 20.30 (Figure 1), which produces up to 30 kWe (kilowatt electric). If the customer has a higher waste energy load, stacks of two or more efficiency PACKs will be combined in a modular approach. For much higher waste energy loads, the efficiency PACK eP 50.100 offers electrical power up to 100 kWe.

There are many advantages to using standard industrial components versus tailor-made components, but the three main ones are:

- Standard components use a proven technology with high reliability (they have been thoroughly tested and have a known life expectancy, which is important for their longevity), whereas indi-

vidual components need to be thoroughly tested for life expectancy with a higher associated cost.

- The lower cost of standard components is due to a higher volume of sales compared to individually manufactured parts.
- Spare parts are widely available all around the world.

Technology Improvement

The use of standard industrial components used in other applications sounds rather trivial. However, a lot of R&D was required to redesign the process and its control. One challenge was to avoid cavitation, which occurs when liquid suddenly evaporates and collapses again while in the inlet of a pump, where the pressure declines and becomes lower than the saturation pressure of the liquid.

Cavitation can cause two problems: the vapor created blocks the pumping effect; and the rotor can be damaged by extremely high local temperatures and pressures that can arise due to sudden condensation of vapor.

These two problems are well known, but the solutions usually applied to prevent them (*e.g.*, large head height or subcooling) are disproportionate in terms of cost and complexity if applied in a small installation such as Orcan's.

Orcan managed to solve these problems by adding a precise amount of a special non-condensing auxiliary gas (like nitrogen) to the liquid working fluid. Its partial pressure increases that of the system, so helping to eliminate cavitation. The related invention is protected by EP 2499343 B1 and other international patents.

Patent Protection

The company has its origins in a research project at TUM resulting in core patents for the basic technologies, *e.g.*, for avoiding cavitation and some others for protecting more specific aspects. The project results demonstrated that the use of standard industrial components is possible for the specific challenges faced by the ORC. In total, eight patent families resulted from the research work while the founders were still working at the university. Orcan acquired the patents from the university to bring its investors on board. Since then Orcan has invested heavily in further R&D, in-

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Figure 1. Efficiency PACK eP 20.30 (20 To 30 kW), Which Is Also Protected By A Registered Design Right.



creasing its portfolio to 27 patent families. Using the EP and PCT systems, around 180 patent applications have been filed (including validations) and approximately 130 were granted.

The geographical scope of the patent protection depends on the importance of the invention to the company: for key patents covering the basic technology, broader geographical protection is sought than for more incremental patents covering detailed aspects of an already patented application. Countries are also ranked in terms of where most customers and competitors' production sites are located.

IP at the Different Stages of Company Development

Founding

At the founding stage, it was important for Orcan to quickly acquire the patents held by the university. That early-stage technology companies own patents is a crucial aspect for venture capitalists wishing to invest in them. Owning them rather than just exclusively licensing them has certain advantages. Firstly, the company can minimize complexity and reduce costs by managing patent issues related to their key assets directly. If a university were to act as the middleman in dealings with patent attorneys and litigators, there is the risk that decision-making will be delayed and deadlines at patent offices and courts missed, that instructions will be misinterpreted, that the company will lose full cost control and that changes at the university will adversely affect its ability to offer professional patent management. Avoiding such risks was especially important for Orcan's investors. Secondly, patents enable backers to create a return on their investments even if the young company initially fails, and a turnaround or a trade sale is required. This would be extremely difficult if the patents were just licensed. Last but not least, the fact that a technology-driven start-up has its own patent portfolio is good for its reputation, as it helps to communicate its technical advantage and innovation skills. Patent rights underline that the invention is not just the crazy idea of some inventors, but that the technology has been thoroughly scrutinized in the search and examination process prior to grant of a high-quality patent, resulting in a lasting competitive advantage.

Partnering

As Orcan does not produce the pump or other main components, but instead uses standard industrial components, partnering with a large and well-established manufacturer of such components was required. In order to convince this potential partner of the technical feasibility, some know-how had to be transferred. It was important to obtain its operating consent for the use of its components in a new setting. Moreover, the partner had to agree to start with relatively small

production numbers, but at the same time commit to producing larger volumes if successful, which meant taking a risk. In this set-up, patents helped the young start-up to meet the challenge of convincing the big player that something totally new and unexpected could lead to success. IP rights can abolish the small firm's typical dependency on the large firm and facilitate the establishment of a partnership on fair terms that results in a win-win relationship.

Scaling

Patents were especially important for Orcan as a means of preserving exclusivity at the scaling stage, given that it was entering the market without a secured position in the form of owning relevant market shares or production of essential parts. Orcan is instead combining standard industrial components, which facilitates re-engineering by copycats. This underlines that Orcan requires a strong patent base to position itself sustainably on the market. In addition, patenting incremental improvements leaves fewer chances for competitors to obtain patent protection and potentially limit Orcan's freedom to operate.

Integrated Business Model

Orcan considered two basic options for marketing their products:

- The first option was to position stand-alone products for long-lasting installations with waste heat that can be used for electricity production. Applications are based on retrofitting of existing installations, *e.g.*, biogas plants. In order to scale with this approach, a huge sales force is required, since the owner of every relevant source of waste heat has to be contacted and convinced on an individual basis.
- The second option was a full integration of Orcan's products into a newly produced combustion engine (as used, for example, on ships), a genset (equipment converting heat capacity into mechanical energy and then into electrical energy) or a co-generation unit (combination of engine and generator, producing both heat and electrical power). In order to realize this approach, Orcan had to cooperate with partners who were willing and able to integrate its ORC into their powertrain. The big advantage for Orcan is the reduced dependency on a large sales force, as the main responsibility for sales lies with the genset producer who has an established presence in the market.

The second approach has proved to be by far the more successful one, as more and larger installations are being requested.

Although strong IP protection is an advantage for both approaches, it is even more essential for the second one, as know-how transfer is inevitable. In addition, alignment of the combined products may give rise to new IP of mutual benefit.

One such example is the cooler. When the ORC is integrated into a genset, it would be beneficial if the cooler of the genset could also be used for the ORC instead of installing a second cooler for the ORC. The challenge here was the different temperature levels needed for cooling the genset (75°C–90°C) and the ORC (35°C–40°C). Orcan was able to modify the cooler in such a way that it can be used for shared cooling of the genset and the ORC. Orcan achieved this by a typical start-up way of thinking: it started its own R&D project, modifying the cooler at its own risk and expense (since the established genset manufacturer was reluctant to become involved in such a project). The result was a new technical solution for shared usage of cooling devices, for which Orcan was granted a patent (EP 3163036B1).

International Activities

As mentioned above, sales resources are the limiting factor for Orcan's growth in both business models. Reaching out to international markets was particularly challenging or almost impossible through Orcan's own sales force, especially in the context of the first business model. The second business model offers significant advantages in this respect.

For Orcan, it was important to develop a strategy for accessing the main international markets efficiently. The dynamic markets in the United States were less attractive due to low energy prices and low regulatory incentives for buyers to invest in green technology.

China looked challenging too for cultural and legal reasons, but at the same time highly rewarding. China is a huge and dynamically growing market with high dedication to triggering dynamic changes to tackle its huge environmental challenges and limit the dependency on oil imports.

In addition, Asia is an attractive market for Orcan's product, particularly as it is a perfect fit for the many generators running on diesel or natural gas used there for electricity production. In Germany, this market is almost non-existent. Although there are diesel generators installed as back-up in case of power failures, it would not make sense to install an ORC due to the limited operating hours.

At first, it seemed nearly impossible for a European small company with no track record in Asia to start doing business in China. Orcan had to develop a strategy for dealing with the Chinese market, which included teaming up with an experienced partner in China. Some European companies are reluctant to work with Chinese partners, fearing that, because they will have to provide them with technology and know-how, they risk diminishing or even losing their competitive advantage. Orcan therefore carefully evaluated the possible countermeasures, as well as the pros and cons

of various cooperation options, such as licensing to an existing player, a share deal or starting a joint venture with a partner who had existing access to relevant markets. Delaying market entry was not an option, since time to market is an important factor for a location that is evolving so rapidly.

In the end, Orcan decided to enter into a joint venture with a Chinese partner with a strong track record of doing business in Asia. The joint venture obtained a license for production, sales and operation for the product (including product parts). For the time being, these product parts will not include core technology, as these are still produced and supplied by Orcan in Germany. However, it is planned that in the long run, the joint venture will purchase more and more components and build more complex ones itself. In addition, the license is limited to China, all other Asian countries and Africa, reflecting the partner's strong presence in those markets.

According to the literature,⁴ various market approach strategies are possible for a Western company wishing to sell its products in China:

1. Exporting to China through an agent or a distributor;
2. Exporting to China via online sales;
3. Exporting to China via franchise or licensing;
4. Investment via a representative office;
5. Investment via a joint venture with a Chinese partner;
6. Investment via a wholly-foreign-owned enterprise.

As mentioned above, Orcan needed a local partner with good connections in the market, as well as a partner who could add local content to its core product, which is initially produced in Germany and then shipped to China. In the case of options 1 and 4, the partner (agent/distributor or representative office) would not have been able to provide local content, so a second entity would be needed (*e.g.*, a contract manufacturer), making such a solution unattractive. Option 2 (online sales) would not be feasible either, since qualified experts would be needed to develop a concept for a potential customer and to install the final product; the same applies to option 6 (own company), which would not have had any connections with the local market. That's why Orcan decided to go for a joint venture with a Chinese partner in combination with a licensing deal (options 3 and 5).

Selection of Partner

Identifying and selecting a suitable partner is challenging. Orcan participated in an economic delegation

4. <http://invest-export.brussels/documents/16349/1682518/China-2017-ENG.pdf/d4565d97-0a9e-4131-9443-819057786ee7>.

to China organized by the German government, which enabled it to make valuable contacts. In addition, it teamed up with a consultant who specializes in facilitating German-Chinese business relationships.⁵

Once initial contacts with several possible partners had been made, there was a phase of individual visits to China and return visits to Germany. This helped generally to build up trust through closer personal relationships. In particular, visits to potential installation sites helped to create a better understanding of the technology and market needs. The time such a phase can take is well invested. Visits included invitations to dinners, at which business might not be discussed, and also to other things, such as sports events.⁶

The partner finally selected by Orcan is in the rental business for electricity production, offering the whole range of services including financing, building and operating these installations. It took roughly three years from the first contact to the signing of the contract with the selected partner, which might seem long, but was necessary and worthwhile. Orcan did not have the required power range in its product portfolio at the beginning of the partnering process, for example, and it developed the required installations, such as a 100-kW-efficiency PACK, in parallel to the discussions.

Cooperation Model

In all, three legal entities are involved in the cooperation: the Chinese partner, Tamar VPower Energy Fund I, the newly founded joint venture, and Orcan itself.

Tamar VPower Energy Fund I was set up and is managed jointly by CITIC Pacific and VPower Group. It targets high-growth investment opportunities in the energy sector. Both stakeholders are well established players in the energy business.

The joint effort to deploy an installation shared as follows:

- The Chinese partner in charge of planning, producing and installing a generator will do all the necessary groundwork, including all pipes and tubes, the hydraulic module, control unit, safety features and so on, as well as providing the interface with the ORC.
- The ORC, as such, is put into operation and tested on site by the joint venture.

- The core module of the ORC itself is manufactured, assembled and tested by Orcan in Germany, then shipped to Asia.
- Some additional, less critical components of the ORC are provided by the joint venture.
- The ORC is fully assembled and tested for faults, such as leaks, by the joint venture (after thorough training and supervision by Orcan) on-site in Asia to ensure it meets the quality standards essential to pass the factory acceptance test.
- The completed and tested ORC is shipped from the joint venture to the customer site, where it is installed by the Chinese partner.

This work-sharing allows for both efficiency and risk mitigation. For example, it has the advantage that the local partner is familiar with and can manage any specific local requirements, such as feeding electrical energy into the local or national grid.

At the beginning, there was also the idea that Orcan could provide the Chinese partner with design drawings, and all manufacturing would take place in China, making use of the cheap labor force. It would have meant a complete transfer of know-how to the joint venture and the Chinese partner, as well as some delays due to the training required. As it turned out, it was not feasible for quality assurance and risk management reasons.

The opposite option would have been for Orcan to build the entire ORC (including the container) and then ship it to Asia. It would have resulted in a non-competitive price for the overall installation. So the final hybrid solution was found to be the ideal compromise between competitive pricing, quality assurance and long-term risk management. The co-operation with the established Chinese partner ensures that a high enough number of units are sold for economies of scale to contribute to the competitive pricing.

As mentioned, Orcan provided an exclusive license for the manufacturing, marketing, sales and maintenance of the patent-protected products in Asia and Africa. Consequently, Orcan is not allowed to sell its products to customers in either of these regions directly. However, in line with its pre-existing business model, Orcan's products can still be sold in Asia or Africa if a third party purchases Orcan's products to combine it with their own products (e.g., diesel generators) and sells the resulting combinations in these regions. Therefore, Orcan can still build new strategic partnerships, for example, with manufacturers of engines.

Both partners contributed valuable and essential assets to the joint venture: the Chinese partner invested money, while Orcan provided the access to the innovative technology. The joint venture purchases the core components from Orcan (made in Germany), organiz-

5. "The role of culture in business transactions and protection of intellectual property rights within Asian countries such as China and Japan," *les Nouvelles*, The Journal of the Licensing Executives Society, Part 1: <https://www.lesi.org/les-nouvelles/les-nouvelles-article-of-the-month/les-nouvelles-article-of-the-month-archives/les-nouvelles-article-of-the-month-september-2012>.

6. <https://www.forbes.com/sites/insead/2012/03/06/the-ten-principles-for-doing-business-in-china>.

es the addition of the local content, including the parts additionally manufactured in China, and sells the final product in Asia. Transparency in the joint venture is mainly achieved by the price at which it buys from Orcan and sells to the customer in Asia, providing a sales margin and, in certain cases, an additional license fee for Orcan. The joint venture also yields a margin for the value-added contributions to the sold installation.

The joint venture's profits are distributed among the partners according to their shares, but will be reinvested in the company for the initial years. During this investment period, Orcan is not receiving dividends, but the intrinsic value of its share in the joint venture will increase by the reinvested profits.

Efficiency Gains for Electricity Production

Having announced the formation of the joint venture with the Chinese partner in October 2018, Orcan was able to place over 80 orders for its efficiency PACKs within just a few weeks,⁷ which is more in sales volume than the biggest European countries achieve in a year. But how were these initial results achieved so fast?

Orcan's technology and products make use of waste heat as an energy source for producing electricity. This electricity may be a by-product of a different basic process, such as chemical production, or it may add to that generated by a main electricity production process. If the waste heat comes from a (diesel or natural gas) generator, it raises the overall efficiency of its electricity generation of the generator by six to nine percent. In both cases, the value of the additional energy produced over an acceptable amortization period is higher than the cost of Orcan's product. For each installation, there will be a business case calculating the possible income from electricity generation out of waste heat, versus the cost for the installation. If the time span needed to break even is short enough, the operator or investor will spend the money on Orcan's product. The payback period for typical installations is between two to four years, making Orcan's products highly attractive to potential buyers in both Europe and Asia.

Soon after the joint venture was launched, several business cases were drawn up for several possible sites. A special case was the tender for a large installation of natural gas generators for electricity production in Myanmar. The special feature of this tender was that, in addition to the usual parameters such as speed of realization and price, the generators' overall

efficiency was also specified as an essential criterion. So, the additional efficiency generated by Orcan was suddenly no longer just a nice-to-have optimization; with the award decision being based on the calculated amortization period, it became a must-have for awarding the contract. Typical diesel or natural gas generators thus had a hard time competing with the overall efficiency offered by the joint venture. If other tenders follow this example of setting the overall efficiency as a strict award criterion, it will open a huge market for Orcan and its partners.

The joint venture and the resulting project for Myanmar has developed quite quickly:

- Spring 2018: the joint venture in China was established.
- April 2018: only a pre-series of relevant products existed.
- April to September 2018: ramping up production capacity to 70 units.
- October 2018: shipment of containers to Myanmar.
- November 2018: start of installation in Myanmar.
- January 2019: start of initial operation.
- February 2019: trial run.
- March 2019: inauguration of the power generation installation.

This Myanmar installation comprises 70 gas engines producing 90 Megawatts (MW) of electricity from natural gas. The heat of the exhaust gas (approx. 400°C) is transferred to an intermediate water circuit (150°C), which then goes into the ORC (indirect system). Orcan's generators can produce an additional 5 MW, saving eight to nine million cubic meters of natural gas per year and contributing to emission-free electricity for around 120,000 people. See Figures 2 and 3.

It was quite a journey for Orcan from the small early efficiency PACK (20 to 30kW), individually sold and installed on single sites, to these large energy parks that have a significant economic and ecological impact.

Conclusions

Home markets are often important test markets. If they lack the dynamics of other markets, growth-oriented companies need to start considering accessing those more dynamic markets at an early stage of their development. For that, they need to show some foresight to ensure sound IP protection for the main technologies and derived products that covers the right countries and regions for their customers and competitors. Developing a sound IP protection strategy, therefore, means thinking about the development of the business in the medium and long term.

7. <https://www.orcan-energy.com/en/details/orcan-energy-secures-market-entry-into-asia-and-africa-with-joint-venture-for-energy-efficient-solutions.html>.

Figure 2. Aerial View Of The Installation In Myanmar

90 MW Electricity produced by 70 gas engines, each combined with an ORC from Orcan.



Figure 3. Close Up Of The Installation In Myanmar

Each of the units consists of a 1.5-MW gas engine (right-hand side with six cooling funnels on top.) The tall cylinder in the middle is the heat exchanger, which transfers heat from the exhaust of the gas engine to the ORC on the left-hand side.



Searching for a partner that has the know-how and the network to access the relevant target markets is a critical process which needs sound preparation and considerable resources. The company needs to define the framework for a possible win-win co-operation. On the one hand, this means identifying which intellectual assets it is willing to provide to its partners and which it wants to keep, *e.g.*, by providing self-produced components. On the other hand, it also means identifying what is needed from the partner to ensure the synergy results in corresponding technical and/or economic advantages.

If it comes to actual negotiations, it is essential to keep the co-operation as a whole in mind so as not to reach a deadlock over details while remaining realistic as to what is needed and what are merely desirables. It is important to be well prepared for the negotiations and seek professional support, such as market experts, lawyers and patent attorneys, and, last but not least, to keep all decision makers, such as the company's own supervisory board, in a position to make decisions quickly whenever required.

Disclaimer: Any opinions expressed in this article are those of the authors or the company and not necessarily those of the European Patent Office. ■

Available at Social Science Research Network (SSRN):

<https://ssrn.com/abstract=3583019>.

The Virtual Reality And Hard Data Of Successful University Start-Ups That May Succeed...Or Not!

By Madelein M. Kleyn

Abstract

University technology start-up companies have the advantage of kick-starting their business with valuable intellectual property assets, a privilege very few start-ups have.

In all other aspects, university start-ups are faced with the same challenges any start-up would have, and probably have the additional disadvantage that very few professors are born business experts.

It is important for any start-up to have at least two essential strategies in its management portfolio: (1) a risk management plan that considers scenarios of liability, both financial and potential legal consequences for the business, especially in the early stages, and (2) an IP strategy ensuring ownership, proper exploitation and management of the valuable assets, whether they are trade secrets, know-how, copyright or any of the registered IP rights.

Introduction

Technology transfer is the process whereby innovation and research from an organization are developed into potentially patentable and licensable products or services for the marketplace, either through licensing to an industry partner or through a start-up company. The scope of this article is the technology transfer out of universities. There the aim of technology transfer is dual: assisting with funding of the next generation of research and innovation, and/or spinning out and growing a start-up into a successful business.

As most university inventions are very early stage and require a lot of further research and development, the university technology transfer model is based on identifying a willing, although often not the most suitable, commercial partner as licensee or as an equity investor partner in a university start-up.

The licensing model is based on the requirement that the licensee must make significant investments such as time, effort and money to commercialize the technology, product or service. Licensees are often required to carry cost for prosecuting and maintaining the underlying patent portfolio, while ownership often remains with the university licensor. A license would typically include certain milestones that are to be met over a defined period of time, which could entail investment support such as further research product development funding, manpower and funding for technical trials required for regulatory approvals, or sales and marketing support.

Generally, universities attract high-achieving students with multidisciplinary backgrounds, providing a well-rounded team of individuals for early stage start-ups. The challenge in the case of a university start-up, despite entrepreneurship programs and ample government grant funding, is that most university researchers do not understand what running a business entails and consequently fail to make a sustainable impact with their ideas in the market. Mobilizing start-up initiatives that achieve measurable success is not always an easy task. Business and IP strategy, as well as related development plans, evolve and change over time as the company grows. Challenges facing start-ups include lack of manpower, lack of skills, high technology development requirements, lack of adequate IP protection, lack of market potential and funding needs.

What remains unique and special about university technologies is that the innovation ranges from life-saving medical devices to new, ground-breaking AI-powered analyzers and sensors, a range that provides attractive opportunities for venture capitalists who seek to invest in new sources of value and profit.

The IP Strategy Model

A university start-up is formed when the researcher-founders spin out a company based on some form of research that appears to have business potential. A university start-up has the advantage that it generally has access to an IP base, as most university technologies with commercial potential get protected by intellectual property rights such as patents, utility models, plant breeder's rights, copyright, design rights, trademarks and know-how.

Intellectual property rights are valuable assets, and in the case of a university start-up, often the only assets a start-up has access to. Patents are oftentimes the most expensive registered intellectual property right to obtain, but they provide the best scope of protection for university IP, as it secures the right for a proprietor to exclude competitors from making, using, selling or even offering a patented invention. Having an IP portfolio can drive consumer demand and/or distinguish one's product or service from that of competitors. An IP portfolio can

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become very valuable, especially considering its ability to attract investors, since IP rights serve as a barrier to entry by competitors. IP rights can also help the finances of a business by providing an opportunity to generate revenue from licensing. As such, it makes sense for the start-up to have a defined IP strategy that clearly supports the business model and can be communicated to the team, as well as to the stakeholders.

Intellectual property strategy for a start-up is not limited to protection of its technology and brand through registrable rights. There are many other potential problems that need to be addressed. As the business grows and projects are outsourced to consultants, or there are other fluctuations of staff, the challenges increase for the IP management. In early stages for the start-up, obtaining its own intellectual property is essential. This may be the result of improvements on the university-licensed IP or through new developments such as brand building. Start-ups should also ensure that proper mechanisms are in place. These include appropriate agreements for IP assignment from employees and consultants,¹ confidentiality undertakings from staff, contractors, consultants and potential investors (that set out the confidentiality terms applicable to the scope of disclosure, specific rights to the limited use of information² and the duration of confidentiality), and registering trademarks³ and domain names early.

Legal Pitfalls

Among the most important legal documents for a start-up are the shareholders' agreement and the memorandum of incorporation. These are the foundation documents for any start-up, as they set out the structure of the company, as well as regulate the rights and obligations of the parties. These may include such things as how decisions are made (voting rights) and procedures for handling eventualities such as shareholder exits, sales of shares to a third party, rights of first refusal for remaining founding shareholders, etc.

Beware the "do-it-yourself" approach on any form of agreement. This is a problem that plagues most start-ups. All too often, start-up companies are busy establishing the business and chasing funds, so they think that any standard *pro-forma* agreement will do, and the start-up gives little or no consideration to the potential legal consequences of these agreements. Sometimes negotiations

of contracts start with good intentions but, as the business continues without a contract actually being signed,⁴ conduct and behavior may end up being different from the provisions intended to be agreed in the contract, which poses a risk of legal consequences the start-up did not intend. Master agreements as such rarely work, and this is an area where qualified legal counsel initially, and at least for final checking, is absolutely necessary.

The last thing a start-up company needs is litigation that could have been avoided by implementing (and enforcing) reasonable legal controls. Litigation is a costly and long-lasting process, and it can usually be avoided if some diligence procedures are in place.

Why Do Some Start-ups Fail and Others Do Not?

A Google® search for the phrase "why do start-ups fail" tells us 130 million stories in 0.52 seconds. Yet new start-ups arise every day. See Figure 1.



Forbes statistics in 2019⁵ show that mentored start-ups grow much faster and raise more money than those start-ups who don't have access to mentorship programs. The statistics also show that technology-based start-ups (which is where university start-ups qualify), are less likely to be successful than non-technical start-ups. Interestingly, over 70 percent of start-up founders eventually realize that their initial intellectual property is not a competitive advantage,⁶ generally because many innovations have a long development time.⁷ Selecting the wrong idea to innovate represents 32 percent of innovation failures.⁸

4. Beware the contracting by email—some courts have found that contracting by email is completely legally binding, even in the absence of a signed contract, see for example *Forcelli vs Gelco* (New York, USA): nycourts.gov/reporter/3dseries/2013/2013_05437.htm; www.upcounsel.com/is-an-email-legally-binding; hg.org/legal/articles/at-what-point-does-an-email-become-a-binding-contract-46423 (accessed 08.04.2020) Rather seek expert advice in your country, but best, DO NOT contract via email.

5. forbes.com/sites/abdoriani/2019/10/24/11-surprising-and-insightful-statistics-about-startups/#50e3a0c46120 (accessed 08.04.2020).

6. gallery.mailchimp.com/8c534f3b5ad611c0ff8aecd5/files/Startup_Genome_Report_Extra_Premature_Scaling_version_2.1.pdf (accessed 08.04.2020)

7. bcg.com/publications/2015/growth-lean-manufacturing-rising-need-for-innovation-speed.aspx (accessed 08.04.2020).

8. forbes.com/sites/abdoriani/2019/10/24/11-surprising-and-insightful-statistics-about-startups/#50e3a0c46120 (accessed 08.04.2020).

1. Where work products are requested from external contractors or consultants, written assignment of ownership to IP must be obtained. Often start-ups are unaware that the mere receiving of a deliverable work product is not assignment and transfer of IP ownership underlying such deliverable.

2. Specific care should be taken to avoid any implied license for IP under the non-disclosure agreements (NDA).

3. Trademark availability searches should be conducted before use of any trademark or branding. This is to avoid potential risk where a third party may already own the trademark.

Based on the experience at Stellenbosch University, which incidentally reflects these results, university technology transfer offices with incubators⁹ and accelerators that incorporate mentorship programs are more likely to produce successful start-up businesses that are sustainable¹⁰ and grow over time. It is often not the technology transfer model as such that fails, but rather the challenge of getting the right people involved in the team.

According to a 2019 OECD report, “start-ups founded by researchers introduce innovations that are more radical compared to other start-ups. While start-ups founded by undergraduate students receive less VC funding and are less likely to exit via IPO or acquisition, those created by researchers are as successful as their non-academic counterparts.”¹¹

As such the challenge doesn’t seem to be the university professor’s lack of skills or knowledge but rather whether the start-up business knows how to prioritize and guide improved performance, value, and sustainable growth.

It is essential for a start-up business to have the ability to immediately recognize opportunities and challenges and to design the strategic imperatives necessary to maximize chances while overcoming difficult times and thriving despite them. CBInsights analyzed the reasons for start-up failure of 110 enterprises and published the results.¹² Of the top 20 reasons why start-ups fail, many are obvious. These may include an inability to reach the market (no demand, time to market too slow), limited funds, or not having the right people in place. See Figure 2.

A successful start-up has a product or service that meets a burning need, pays attention to all the finer details of implementation (including IPRs), serves its customers, has the right balance between quality and quantity, as well as complementarity of work force, has the potential, ability and motivation to grow fast to acquire relevant market shares and sustain growth, and the ability to recover from the inevitable problems every start-up faces.¹³

In this paper, two case studies illustrate many of these aspects. The start-ups are at different phases of growth and are both operating in fast-growing industries, *i.e.*, data security management and virtual reality.

9. Such as LaunchLab at the Stellenbosch University *innovus.co.za/launchlab-1.html* (accessed 08.04.2020)

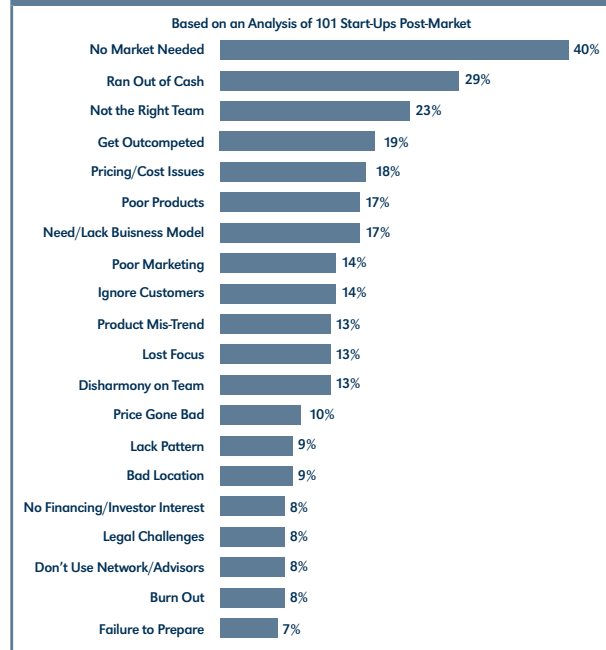
10. *innovus.co.za/spin-out-companies.html* illustrating some start-up businesses spun out from Stellenbosch University (accessed 08.04.2020).

11. Report on Public research and innovative entrepreneurship *oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/CIIE(2018)13/FINAL&docLanguage=En* (accessed 08.04.2020).

12. *s3-us-west-2.amazonaws.com/cbi-content/research-reports/The-20-Reasons-Startups-Fail.pdf* (accessed 08.04.2020).

13. *forbes.com/sites/neilpatel/2015/01/16/90-of-startups-will-fail-heres-what-you-need-to-know-about-the-10/#154da9cf6679* (Neil Patel—Entrepreneur) (accessed 08.04.2020).

Figure 2. Top 20 Reasons Start-Ups Fail



CUSTOS

The need for data security management is increasing. Arguably, 90 percent of all data in the world has been produced in the last two years. Everything is measured, logged and documented. Statistics on just about everything is available within seconds. Data is a valuable asset if it is available in real-time and accessible anywhere, any time. The world’s volume of data has been growing exponentially year after year, enabling progress in artificial intelligence, but also creating opportunities for cyber criminals. *Forbes* reports data breaches that exposed 4.1 billion records in the first six months of 2019.¹⁴ According to IBM and the Ponemon Institute’s annual Cost of Data Breach report, data breaches cost companies in 2019 approximately U.S. \$150 per record.¹⁵

For many businesses, a data breach can be a disaster. The compromising of secure customer information and internal business data, such as inventory lists, transaction history, confidential document leakage, and the loss of other privileged information through cyber fraud can cripple a business’s operations.

To understand why data breaches are still an issue in an industry that spends billions on protection, one needs to understand the three components of data infrastructure: storage, distribution, and human factors. A complete data security solution must address each of

14. *forbes.com/sites/daveywinder/2019/08/20/data-breaches-expose-41-billion-records-in-first-six-months-of-2019/#19f03d93bd54* (accessed 08.04.2020).

15. *ibm.com/security/data-breach* (accessed 08.04.2020).

these components. Encryption secures storage. Access control secures distribution.

In 2013 in a prestigious MIH Media Lab at Stellenbosch University, South Africa, CUSTOS¹⁶ was born.

Custos Media Technologies¹⁷ was spun out as a university technology start-up by an experienced cross-disciplinary team specializing in signal processing, distribution systems, cryptocurrency, machine learning and media and behavioral economics. Since then the team has grown to include various experts in the fields of watermarking technology.

The founders have developed a system and method for monitoring third-party access to a restricted item, such as a document, a film, music, or similar electronic media. The technology is based on cryptography, whereby key data is embedded in the restricted item, the key data being associated with a store of value and usable to conduct a transaction against the store of value. A record of such a transaction becomes visible in a transaction ledger. The transaction ledger is monitored to determine whether a transaction against the store of value has occurred, in which case the restricted item is designated as having been accessed by a third party.

In simple terms, the technology is based on cryptocurrency, like bitcoin, a medium of exchange that relies on cryptography to secure financial transactions and control availability. The system embeds a unique code into each media file that unlocks a cryptocurrency deposit. Whenever a user illegally shares a file to which that user has been granted access, the code in the file can be found and the copy tracked. The innovation was protected by patent,¹⁸ and the intellectual property initially licensed to the start-up.

The business's most important assets were its intellectual property. The IP strategy of the business was to exploit intellectual capital through the skills and know-how of the multidisciplinary team comprising CUSTOS's management team, register trademarks for the business and the products it developed, build a strong brand, and negotiate an assignment of the patents and patent applications from the university. The business model included forming a separate IP holding company (CMT RESEARCH (PTY) LTD), wherein the IP is housed to safeguard it from risk in the event the operating entity were to experience financial difficulty or completely fail. This would enable the university to regain control over the IP assets in the event of failure.

In early 2016, CUSTOS launched its product, Screener Copy, as a demonstration of the working of CUSTOS's block chain tracking technology. The first version of Screener Copy had very basic functionality: users could upload their movies, CUSTOS would then watermark it

with the proprietary tracking technology, and then send out the copies to the intended recipients. Since then, CUSTOS has developed a full stack of modular products that can be combined to meet the needs of a range of media customers in different markets and regions.

CUSTOS is a great example of how the South African start-up ecosystem has been leveraged to advance SME growth. The R&D spin-out received seed funding from the South African Technology Innovation Agency with the support¹⁹ of Innovus Technology Transfer Office, was elected as a winner of select start-up competitions at the Stellenbosch University Incubator LaunchLab, participated in the Grindstone Accelerator program, and ultimately received local angel investment and international VC funding. CUSTOS raised U.S. \$265,000 in their second round of seed funding, part of which came from a local angel investor and the rest from New-York-based Digital Currency Group. CUSTOS partnered with other leading experts that complemented their service offering.

CUSTOS provides industry-leading encryption and hyper-granular access control via block chain technology to secure the human element of data infrastructure. This technology enables media companies to dissuade consumers from illegally sharing media they've purchased through various product offerings.²⁰

In reference to CUSTOS, Ventureburn reported in 2017, "(w)ith Hollywood always looking to fight movie piracy, this is one start-up you're bound to hear more of."²¹

The business grew very fast and attracted more investors. A non-binding agreement was signed between CUSTOS and the venture capital firm HAVAIC²² in March 2019. Part of the conditions of the non-binding agreement was that, beyond investing in the round, the VC would act in an advisory capacity for the upcoming round, for which it would be remunerated a fee of 3.95 percent on the investment amount of each investor committing to the round.

In April 2019, one of the VC's partners sent the start-up's founders a written offer of purchase. A dispute arose and the parties could not come to agreement. In early 2020 HAVAIC sued both the start-up and its IP holding entity.

It is reported on Ventureburn that the VC argues that the investment was accepted and, on this premise, money was sourced from private investors.²³ CUSTOS argues

16. CUSTOS is latin for guard, according to the Merriam-Webster dictionary.

17. *custostech.com* (accessed 08.04.2020).

18. Patented (US9595034) and patent pending for other national validations from WO2015059669/EP3061057A1.

19. IP support, company secretarial support, corporate management skills and legal advice.

20. *custostech.com/technology/* (accessed 08.04.2020).

21. *ventureburn.com/2017/02/south-african-startups-2017-digital-all-stars/* (accessed 08.04.2020).

22. HAVAIC is a Cape Town based investment company that invests in early-stage, high-growth technology businesses, offering access to local investments with global prospects (*havaic.com*, accessed 08.04.2020).

23. The first official press release on the matter *ventureburn.com/2020/04/sas-custostech-lays-off-staff-after-vc-sues-startup-for-4-5m/* (accessed 08.04.2020).

that the agreement was negotiated but never signed.

As a consequence of the litigation, CUSTOS has been forced to lay off most its staff.²⁴

A combination of amazing technology, successful business, strong valid IP rights, funding in place, right blend of skillful people, big contracts...what could possibly go wrong?

This is the classic story of an investor versus inexperienced management of the start-up. Accordingly, appropriate governance and sound legal advice from experts is essential for any start-up, especially in the early stages. Lawyers, accountants and tax advisors are expensive, but they are necessary. Of course, costs for advice and support need to be managed properly, but start-ups have to be very careful about activities and conduct that potentially expose the start-up to legal liability that could easily have been avoided by seeking professional advice early enough.

Was that the end of CUSTOS? Hopefully not. Trial has not yet started, and the matter may still be settled. CUSTOS has all the ingredients to be able to regroup. The technology is in high demand; in just the short time of operation, they have safeguarded films from piracy and have helped successfully protect approximately 600 film titles and over one million copies.

AxioVR

Virtual Reality (VR) is the computer-generated representation of a three-dimensional image or environment, usually in combination with hardware, such as a headset, that gives the user a fully immersive “real” experience.²⁵

What makes VR powerful is that users can be fully immersed in a paradigm and experience that closely resembles being exposed to a similar real-world scenario. Research has shown that VR increases users’ retention of information and also has a larger impact on learning than using a two-dimensional media source.²⁶

VR is a key technology of the 21st century, attracting substantial interest from a wide range of disciplines that will see tremendous growth.²⁷ It is opportune that this is taking place at the same time as mass acceptance of 5G and the expectation of lower broad-band costs. The reason for this exponential growth is recognition of the value of VR’s application fields, such as aerospace and defense, commerce, industry and medicine. By 2025, the dominant part of this market will likely be the software segment. It’s a bit like music and streaming. Hardware costs will go down and the possibilities for software will become endless.

VR can place any world within your reach; a world with no boundaries, where anything can be brought to life. It

is applied in the gaming, film and education industries with great success. This is where AxioVR makes a difference. AxioVR is a university spin-out company from Stellenbosch University that was established in 2019.²⁸ AxioVR focuses on designing unique, tailor-made optimal paradigms for various industries. Their slogan is “We can really change the world, your world! One virtual experience at a time.”²⁹

As one of the founders is a medical doctor and clinical researcher based at the Department of Psychiatry, the business aim, initially, was to assist patients with mental illness such as schizophrenia. The treatment was to take place through an experience true to real life, but yet safe to step out of the treatment experience at any time. At the heart of AxioVR is the dream of “science meeting art.”

As with most start-ups, funding was initially a challenge. Attracting funding requires feasible technology, a brand, and a proven product that interests and attracts investors.

Being a new business, brand building was essential. Initial projects aimed at assisting clients with brand experience advertising in an immersive VR experience. Clients included Heineken,³⁰ which designed a tour through a typical Heineken brewery, and Stimorol,³¹ expressing a taste experience.

The branding experiences developed for commercial clients helped AxioVR better understand the requirements of clients with prior VR experience. It also assisted them in implementing the logic of the scenes that drive the experience. This was accomplished by incorporating lessons learned in eliciting emotions in a broad audience into a scientific product solution, which allowed for the study of fear and the treatment of anxiety disorders, and helped refine the experience and ease of use for client patients.

AxioVR’s latest venture is to address a need in the research and education sector. 3D VR teaching allows visualization of concepts, which makes it easier to understand. While using VR as a training or research tool, another key metric is biofeedback and data generated from user experiences. With AxioVR’s scientific approach, customers can get unbiased feedback on the user experience, including data records generated during the VR session. The next-generation product is interactive learning, training and marketing platforms that are scalable and applicable to real world problems.

As hardware sales increase, high-end content development is not limited to the initial projects for which it was developed. AxioVR was born out of the need to fill the content gap in the market. With success in various projects and a circular model of reusing content, AxioVR has increased mar-

24. HAVAÍC sued the startup for US\$4.45-million.

25. [merriam-webster.com/dictionary/virtual](https://www.merriam-webster.com/dictionary/virtual) percent20reality (accessed 08.04.2020).

26. link.springer.com/article/10.1007/s11042-019-08348-9 (accessed 08.04.2020).

27. tractica.omnia.com (accessed 08.04.2020).

28. www.axiovr.co.za (accessed 08.04.2020).

29. www.axiovr.co.za (accessed 08.04.2020).

30. Beer brand.

31. facebook.com/StimorolSA/videos/378945845979705/ (accessed 08.04.2020).

gins and grown revenue organically. They offer a unique VR combination between business, science and art.

The AxioVR team is an interesting combination: a businessman with experience in the selling of cutting-edge scientific and medical equipment, a researcher in the rapidly growing field of neuropsychiatry, and a 3D designer with an artistic eye and unwavering pursuit of graphic perfection.

The various challenges and lessons learned were similar to those of most early start-ups' experience: overcoming a lack of funding and maintaining sufficient experienced staff to facilitate high-growth.

AxioVR realized that investors want a polished product that is scientifically sophisticated, but user-friendly, elegant and artistic at the same time.

Their response to this was the advancement of their business strategy to better focus on strengths and minimize weaknesses. The products of AxioVR are mostly copyright works. Sustainability of the business entails the appointment of specialized consultants, rather than permanent staff. This demands good contract management, confidentiality and data privacy undertakings (as many of the clients are patients), and copyright assignment of the various works required as deliverables in each stage.

The AxioVR IP strategy is to protect source code as trade secrets and ensure that the business retains the IP ownership in the deliverables. The client owns the experience, not the IP. This strategy allows AxioVR to reuse the software that created a specific paradigm in one project for other clients, including the ability to build the paradigms into the flagship product AxioAcademy.

A quite important asset for AxioVR is the ability to leverage its networks in academia. Understanding the teaching and research-based environment, understanding the customer's needs during numerous consultations, and producing pilot VR software are all critical aspects of this. AxioVR remains flexible to customer needs, but also remains brand-aware and maintains core company values: to develop a product that not only adheres to strict scientific principles, but also meets modern production standards.

The refined scientific products used in the study of fear and the treatment of anxiety of patients resulted in the flagship product, "AxioAcademy." AxioAcademy is a new VR software platform in the development phase that enables the presentation of complex study material to undergraduate students in an immersive environment. This includes the study of neurophysiology, anatomy and clinical training. AxioAcademy will adhere to both the strict academic requirements of detail and precision, while also delivering an immersive and polished experience.

The ability to adapt strategy to remain relevant and competitive is commendable.

A fully developed AxioAcademy will allow students to experience education in 3D. For example, medical stu-

dents will be able to physically interact with the red blood cells in the body. They will see exactly how cancer cells divide relentlessly, thereby forming tumors. Students will be able to operate in a virtual operating theater to learn skills and test their abilities under realistic conditions, all while in a controlled environment.

An inspirational future and a start-up with much potential!

Conclusion

There are many lessons learned from start-up failures and successes. CBInsights shared insights from many start-ups over a broad range of industries.³² There are many that fail, but there are also many that succeed and make a difference by solving relevant problems.

There is no "one-size-fits-all" strategy. You may fail, and chances are that you will, but what matters is that you get up and try again.

Experiences and lessons learned from other start-ups should be distilled to some key aspects from which other start-ups can learn or get inspiration.

Very informative sites include Failury,³³ Ventureburn³⁴ and Hackernoon,³⁵ all of which share stories of many different start-ups, the lessons learned, and how to regroup and try again. One post-mortem analysis that is highly inspiring is that of MozSEO.³⁶ It highlights the impact of scaling too quickly,³⁷ the risk of accepting venture capital funding, and the increased pressure that often comes with it. Perhaps more importantly, it points to the value of recognizing when matters have gone too far, necessitating a regrouping and restrategizing while there is still cash, and ultimately scaling back significantly to ensure survival.

Choose founding members wisely both in number and quality. People are the most crucial and least predictable element of any business. The right combination of skills, experience, networks, and temperament among the founding members can vastly increase the odds of success.

Ensure your agreements are watertight with proper indemnity provisions and risk management for breaching clauses related to breakaway founding members or mismatched angel investors. Split-ups happen all the time, so be prepared for that as well. Do not work on a handshake; instead have an "antenuptial contract" for a potential

32. [cbinsights.com/research/startup-failure-post-mortem/#2020update1](https://www.cbinsights.com/research/startup-failure-post-mortem/#2020update1) (accessed 08.04.2020).

33. failory.com/blog/startup-post-mortem (accessed 08.04.2020).

34. ventureburn.com/ (accessed 08.04.2020).

35. hackernoon.com/ (accessed 08.04.2020).

36. sparktoro.com/blog/moz-returns-to-seo/ (accessed 08.04.2020).

37. Eric G. Flamholtz, Yvonne Randle, "Growing Pains: Transitioning from an Entrepreneurship to a Professionally Managed Firm," 4th Edition. *Jossey-Bass* (April 20, 2007).

breakup. This can be crucial business protection. Consider legal risk mitigation provisions in your agreements for the unlikely event of an investor instituting litigation.

Find mentors to coach the team and participate in proven accelerator programs if accessible. Choose investors that participate, not only in seed funding phases, but also in additional funding rounds. Manage funds properly, meaning keep your burn rate under control; it is necessary to show investors value for their money.

Have an adaptable, agile business strategy supported by a corresponding IP strategy. Have a wise financial strategy. Consider overheads and the value of money, don't employ too many people too soon. Failure to recruit, motivate, and retain the right staff can spell doom. Have a proper marketing plan, accept that there may be substitutes, and know who your competitors are and how to outsmart them.

Always safeguard your reputation, not just by building a brand for your business that will also attract investors,

but also with regards to governance and compliance with legal and regulatory obligations. This will protect you from unnecessary and costly litigation.

Ensure that your business has a risk management plan and strategy. This entails understanding what the risks are, quantifying the impact and qualifying the management thereof in order to minimize the consequences of risk. Consider risk management strategies for cybercrime, reputational damage and potential litigation, but also economic crisis that can lead to loss of business or even bankruptcy. A well designed, thought-out active and agile risk management strategy anticipates problems that have yet to arise, which clears the path for growth and long-term business success.

A final word of caution: when concrete expert advice is advisable, seek it! Don't do it yourself! ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3583021>.

IP And Open Innovation: Managing Technology Push And Pull

By Bowman Heiden and Ruud Peters

Abstract

Growing technology convergence and speed to market drives the need for a broader set of accessible technologies and IP. This creates market opportunities for increased technology collaboration, as some firms and organizations can find expanded uses for their existing technology portfolios (i.e., technology push), whereas other firms look to resolve innovation gaps from sources outside of their own in-house operations (i.e., technology or market pull). Firms need to generate a sophisticated understanding of their future innovation needs based on an integrated approach that combines business, technology and IP strategy. All technology driven firms are pushed to move from a closed to an open approach to innovation to remain competitive. To succeed, they need to consider all possible sources of innovation, both for development and commercialization. Fundamentally, open innovation is a strategic IP management approach that needs to be governed explicitly, not implicitly.

Introduction

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 R&D has tripled, with China having passed the EU and now almost on parity with the U.S.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, whether push or pull, 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 need to interact with a broader ecosystem of actors to enhance both technology development and commercialization (i.e., both input and output). This includes looking beyond traditional sources of innovation and traditional market segments, transforming the firm from a closed to an open innovation actor. In this article we will discuss this transformation from a technology push versus (market) pull perspective, highlighting key issues and insights from the context of open innovation, which is fundamentally an intellectual property management (IPM) capability.

Technology Push vs. Pull

One traditional perspective on innovation is the model of technology push versus pull, the latter also called market pull. In this model, a firm either starts with the development of a technology-based product or service and introduces it on the market (i.e., push), or it starts with an articulated need from the market and develops or identifies a technology to address the market demand (i.e., pull). As an example of the former, Henry Ford is purported to have said with respect to the development of the automobile "if I'd asked people what they wanted, they would have said a faster horse." Ford's subsequent failed launch of the Edsel has become synonymous with the potential downside of predicting market needs.⁴ History is littered with failed visionary attempts at technology push even by some of our most successful firms and entrepreneurs.⁵ To put it succinctly, technology push is a hypothesis that needs to be tested on the market.

Technology (or market) pull, on the other hand, would seem to be the apparent model, except for the inconvenient truth that customers often are unable to articulate

3. Chesbrough, H., Vanhaverbeke, W., & West, J. (Eds.). (2006). "Open Innovation: Researching a New Paradigm." Oxford University Press. Defines open innovation from an industrial context as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology."

4. Bonsall, Thomas E. (2002). "Disaster in Dearborn: The Story of the Edsel." Stanford University Press.

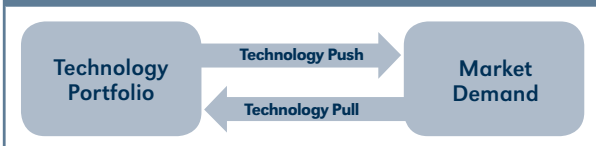
5. For example, the Apple Newton and Google Glass.

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>.

what they really want.⁶ Usually, their real needs are latent and only known once products and services are launched on the market. Again, history is populated with failed attempts to address market needs that only hypothetical customers wanted, not real customers.⁷ A simple illustration of the technology push and pull model is shown in Figure 1.

Figure 1. Technology Push Versus Pull



From IP-Supported Technology Push to Open Innovation

From a technology push perspective, when a firm moves from a closed innovation to an open innovation model, it seeks to find new ways to commercialize its technology outside of its initial intention when created,⁸ traditional market or business model. For industrial firms, this typically includes licensing-out, spinning off new firms, and creating joint ventures. For university technology transfer offices (TTOs), taking technology that emanates from academic research and pushing it out on the market is the primary business model for 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 practical applicability. Still, it's most likely that these research programs will not have started with a particular market application or commercialization strategy in mind. For the case of digital services/platforms, the use of minimally viable products (MVPs) allows developers to iterate quickly between technology push and pull and promptly release new versions based on customer feedback. It is great for digital products but it's a little challenging to do this for drug development (*i.e.*, minimally viable cancer drugs). Thus, different technology sectors have different applicable technology-based business models.

Applying technology push from an IP licensing perspective requires us to understand the nature of the IP and the type of transaction. The traditional starting point is that a firm has accumulated a portfolio of patents that it is not effectively monetizing. This situation was the premise of the seminal book on the topic titled, *Rembrandts*

in the Attic by Kevin Rivette, which was first published in 2000.⁹ However, it is not evident that patented technology created from a push perspective has any value at all. In other words, patents don't have a value in themselves. From an open innovation perspective, this means that the value of your patents is dependent on how others (*e.g.*, licensees) view them. This raises a few basic 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? Oftentimes, patents are drafted with one particular application of the technology to 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 losing their value.
- 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 due, they won't pay if they don't have to. In today's patent climate in several industries, one has to litigate to be taken seriously.¹⁰

The last bullet above brings up an interesting point about the difference between *technology vs patent licensing*. If you're pushing a new technology towards specific market actors who don't fully understand the technology but agree that it would create value (*i.e.*, technology licensing), then collaboration will likely be welcome. However, if they already understand and deploy the technology, and all you're trying to do is license them the patents (*i.e.*, avoid infringement), that will typically be an uphill battle, as market actors will always try to avoid paying for something that they already understand and use. This will, of course, vary depending on the strength of the patent jurisdiction.

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6. <https://hbr.org/2018/09/why-design-thinking-works>.

7. See Ulwick, A. (2005). "What customers want." McGraw-Hill Professional Publishing.

8. <https://www.mentalfloss.com/article/57861/11-successful-products-originally-invented-something-else>.

9. Rivette, K. G., & Kline, D. (2000). "Rembrandts in the Attic: Unlocking the Hidden Value of Patents," Harvard Business School Press. Boston, Massachusetts.

10. EPO SME Case Studies, "FRACTUS Snowflake Pattern Precipitates New Application For Antennae," 2017, ISBN 978-3-89605-175-2, epo.org/sme.

This means that, in practice, technology push is entrepreneurship. One does not merely hold up technology, and people come running. It requires real business development effort that is not easy to accomplish as a side activity in the patent department. On the other hand, patent push is different than technology push—it's litigation. Patent licensing will invariably be met with two statements, (1) "No, we don't infringe," and (2) "your patents are invalid." If a patent holder lowers their price, the incentive to challenge the patent by the user also lowers. For example, no licensee has ever questioned the validity of a patent in a royalty-free license. Therefore, it is actually how you plan to use your patents practically on the market that determines agreement on their validity, and any "excessive" price would lead the user to try to challenge the patent's validity. So, it's this game that you need to understand when you want to monetize your patents outside of a broader technology collaboration.

From IP-Supported Technology Pull to 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 (*i.e.*, not-invented-here syndrome). Thus, technology pull (also called 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 collaboration activities with external actors are an intellectual property issue. In essence, open innovation is another name for advanced intellectual property management (IPM).

So how is this done in practice? How do you know what to look for? First of all, firms need to determine their long-term business strategy; in particular, they need to define what technologies they may need as a consequence over a five-to 10-year time frame based on potential business cases and scenarios. And, of course, once they have defined their business strategy, that should also be reflected in their IP strategy (in particular, defining what IP they will need to support these technologies and their business cases). IPM, in this context, is a proactive process that, when informed by business strategy, creates a strategic input to 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 IPM 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 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 IPRs, to achieve. Experience has shown that we still have a long way to go before businesspeople and IP people talk together and drive each other's strategy.

As shown in Figure 2, assuming that the business strategy and the IP strategy are aligned, then the question becomes—what future technology portfolio and IP positions do the firm need five to 10 years down the line? By having a clear understanding of one's own existing IP/technology portfolio and future business strategy, firms can then determine the gaps in their portfolio, which represents their innovation needs.

External Sources of Innovation

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, as illustrated in Figure 3. In all these collaborations of whatever kind, IP plays a vital role. Without effective IPM, 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.

Below are short descriptions of external sources of innovation, including examples, that technology firms can deploy to manage the increased convergence, complexity, and speed required to compete in today's market.

Collaboration with Third Parties

There are many different forms of third-party collaboration. Various options include pre-competitive joint research and collaboration programs, such as the European framework programs; 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:

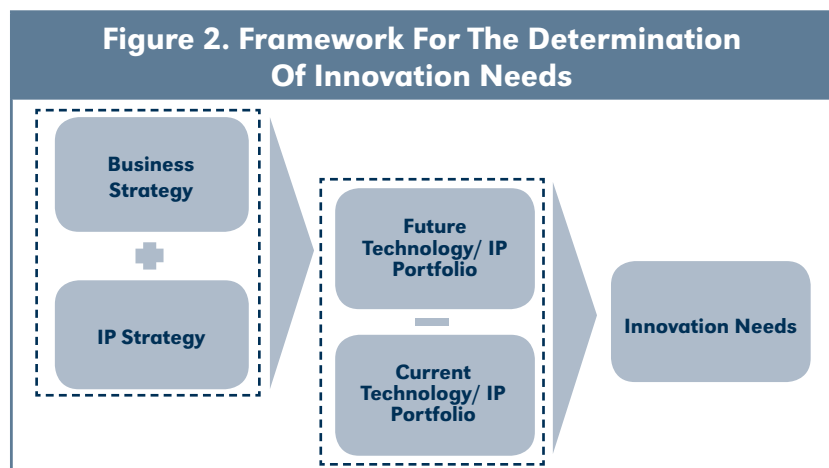
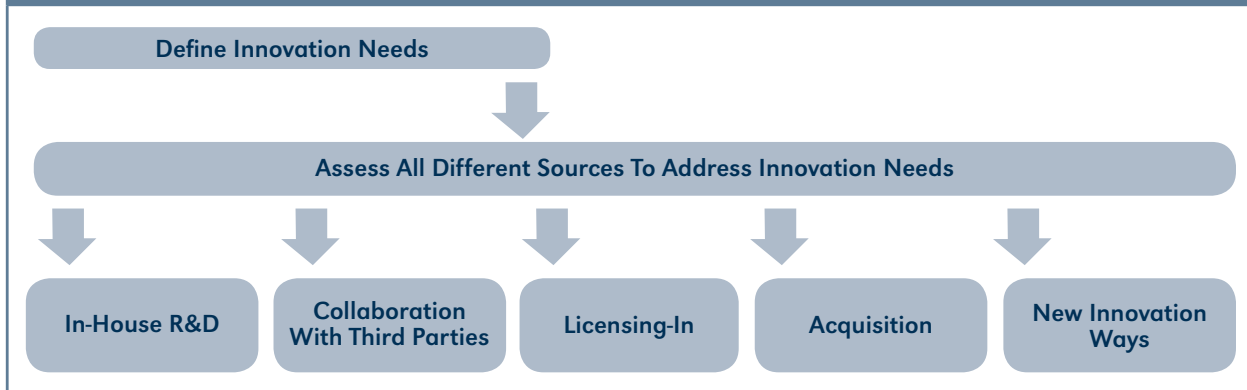


Figure 3. Sources To Address Innovation Needs



- **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.¹¹ 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 coffee. 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 required for success. 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 need 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 in the various markets, as ramping up production for coffee machines and coffee pods have different challenges in different markets.
- **Standardization**—This activity is a very 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.¹² 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 IPM will increasingly need to include stand-

ardization strategies as part of their core activities, not only firms in the ICT sector, but firms across all industry sectors, in particular, the various IoT verticals.

- **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 Programs**—This includes programs such as Horizon 2020 (followed by Horizon Europe) or the Innovative Medicine Initiative (IMI), where guidelines regarding the background and foreground IP are set as part of the contractual arrangement of the different parties involved in the collaborative R&D.^{13,14} The Sono Drug is an example of a European collaboration project that Philips did in the past with a number of other research institutes and universities. The project focused on increasing the effectiveness of treatment through targeted delivery of medicine using ultrasonic waves.¹⁵
- **Collaborating with 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

11. https://www.usa.philips.com/a-w/about/news/archive/standard/news/press/2012/20120126_SaraLee_partnership.html.

12. For more information on standards development, see <https://www.3gpp.org> and <https://www.ieee.org>.

13. See, for example, <https://www.imi.europa.eu/apply-funding/general-overview/intellectual-property>.

14. Collaboration of Publicly Funded Research Organizations (PROs) with Businesses, https://www.wipo.int/edocs/mdocs/mdocs/en/cdip_17/cdip_17_inf_3.pdf.

15. <https://cordis.europa.eu/project/id/213706/reporting>.

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 License—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 (*e.g.*, 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. This can complement or support acquisition of special know-how and creative R&D teams to speed up innovation, but this is not always the case.

However, not all firms have as deep pockets as these top platform companies, 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 the network of IP brokers as intermediaries to facilitate IP identification and transactions
- Seek to acquire or in-license relevant technology/IP 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 technology/IP you are buying?
- What is the quality of the technology/IP?
- 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 core, which needs to be the focus of an advanced IPM process. ■

Available at Social Science Research Network (SSRN):
<https://ssrn.com/abstract=3583024>.

Integration Of IP Into The “Classical” Stage-Gate Model

By Christian Hackl and Sandrine Guillermin

Abstract

The Stage-Gate¹ Model is a widely used method for structuring the innovation process into defined phases, separated by distinctive gates. However, in its “classical” form, the model typically does not include any aspects of Intellectual Property (IP) as part of the process. Since a thorough IP process is needed for any successful innovation project, key elements of the IP protection have been integrated into the “classical” Stage-Gate Model. The company Transitions Optical is using such a well-developed new model and provides an effective case study for this process.

Introduction

Transitions Optical is a tech-based company founded in 1990 as a joint venture of two companies. It produces photochromic eyewear lenses. These lenses have a layer of photosensitive chemicals so that they darken when exposed to ultraviolet light, but are completely clear when not exposed, *e.g.*, indoors. Thus, they eliminate the need for changing between clear glasses and sunglasses when entering or exiting a building or domicile. In addition, they protect the eye against harmful UVA and UVB rays.

The company has been the leader in this field for many years and wants to keep this position as innovation leader. Therefore, creating and securing the competitive advantage is key. The company’s innovation projects are all high-tech and high-performance, and take several years of intense R&D efforts. Securing this investment in R&D and the innovative position has been a key element from the very beginning, resulting in a portfolio of around 1,400 patents and patent applications.

The Stage-Gate Process

Just the sheer number of patents indicates the importance of IP, but it also creates the need to have a very clear and stringent process in place, not only for securing IP, but also for seamless integration of IP topics into the process of product development. The Stage-Gate Tool or Stage-Gate Process² is used for this purpose. It breaks down the innovation process from idea creation to launch of the product on the market into several phases, with distinct gates between the various phases. Passing each gate requires a definite go/no-go decision based on clearly defined information/answers to questions, which are

specific to each of the gates, and specific to each of the defined stakeholders.

The advantage of this approach is that it provides a tool for a very systematic and clear process with clearly defined actions and deliverables for every phase and all involved parties (*e.g.*, R&D, marketing, sales, IP and legal). It also makes sure that all important aspects of the whole process and business environment are covered and taken into account when the decision to move on to the next phase is taken. This covers the process all the way from the initial idea to the market launch of the corresponding product. Therefore, this approach helps assess and mitigate risks by ensuring that all significant aspects are covered, giving confidence that the full picture has been accounted for when making important business decisions.

Changing from Start-Up Mode to a Structured Approach

The process itself looks quite cumbersome and involves a lot of data, some of which can be difficult and time-consuming to acquire. However, in its early years, Transitions Optical was in a start-up mode, having a more agile footing with sometimes fast decision making. Even though agile processes are in vogue these days, they bear the risk of overlooking important details and not taking relevant aspects—including risks—seriously enough, which can ultimately lead to failures (*e.g.*, market failure or IP litigation, which can lead, in a worst-case scenario, to a complete loss of significant investment). The company had unfortunately learned of these difficulties through direct experience with some of their products, so today its management is convinced that the Stage-Gate Process is time and effort well invested.

This change from the start-up approach to the clear process model not only reflects the growth of the company, it also mirrors the change in the business environment to one that acknowledges the increasing importance of making sound business decisions that are based on a thorough analysis of the various aspects of the Stage-Gate Model during the development of a new product.

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1. Stage-Gate® is a registered trademark of Stage-Gate Inc.

2. Developed by Cooper, Robert (1986): “Winning at new products.” Addison-Wesley.

“Classical” Stage-Gate Model

The Individual Phases of the Stage-Gate Model

As mentioned before, the Stage-Gate Model divides the innovation process into several phases with clearly defined gates between the various phases. In order to pass a gate a clear go/no-go decision is required, based on information that is specific to each of the gates.

There are some variations to the Stage-Gate Model and some companies or industries use their own adaptations, but in most of the cases there are five main phases with four important gates (sometimes, as in our case, there is a phase six for support, once the product has been launched). See Figure 1. The main focus at the beginning (Gate 1: “Idea Screening”) is to have a strict filter for the many early ideas, between the phases of discovery/ideation and scoping. Ideally, the most promising ideas will be selected and brought into the next phase (scoping), and all other ideas will be sorted out. This will ensure that the valuable resources of the company will be spent on the most promising ideas only. To give some idea of the narrowing-down process, typically less than 50 percent of ideas will make it to the second phase, and only 5 percent of the time (spent in all phases on one idea/project) is spent on the first phase. The main questions to be answered in order to pass the first gate are the potential benefit for the customer and the identification of a customer need to be fulfilled or a technical opportunity (market pull versus technology push). This is a rather basic question to start with. In general, the level of detail in the answers necessary to pass each gate significantly increases with each step.

Gate 2 separates the scoping phase (realizing proof of concept, start of narrowing the product definition) from

the “building the business case” phase, which means investing significant resources to finalize the concept development and perform a thorough analysis.

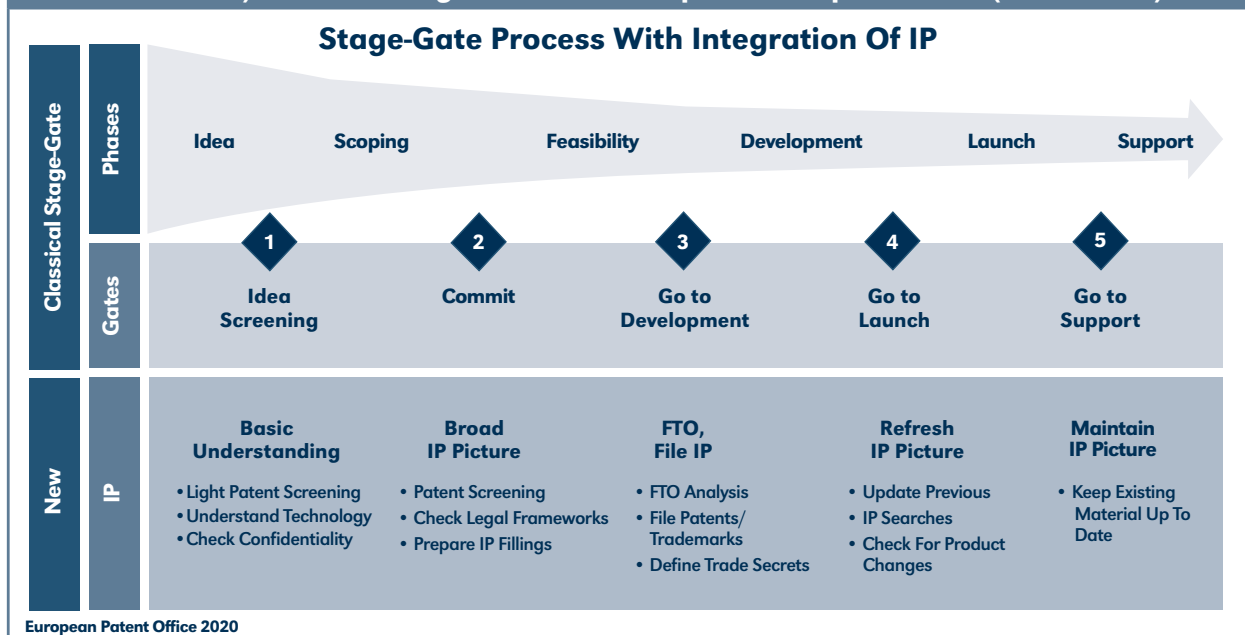
A large portion of the necessary due diligence is performed at Gate 3, since it is the hurdle prior to entering product development, where lots of resources are required. As a result, it is critical that, if an idea passes Gate 3 and goes into development, it is based on a sound decision that utilizes high-quality data. In addition, if a project passes Gate 3, it should be apparent that it will also pass Gate 4 (which is the gate for launching the product on the market). When implementing the Stage-Gate Process, the success rate of market launches is 40 percent higher on average, so it certainly brings benefits!

Integration of IP into the “Classical” Stage-Gate Model

Along the lines of the Stage-Gate Process, each stakeholder has to come up with a plan of actions to be followed through each stage and deliverables to be provided for each gate. The Stage-Gate Model defines phases and gates for the innovation process, however—in its “classical” form—it typically does not include the topic of IP. Since a thorough IP process should be put in place to ensure safe management of each project, key elements of the IP protection have been added to the “classical” Stage-Gate Model. The main IP-related questions to be addressed along with each of the phases and gates are generally as follows:

- For the first gate there will be a first light patent screening to understand the picture around the technology, as well as a check of confidentiality, to know who was involved in the idea inside and outside of

Figure 1. The “Classical” Stage-Gate Model (Upper Part, Consisting Of Phases And Gates) And The Integration Of The Important Aspects Of IP (Lower Part)



the company, and who is authorized to access the information pertaining to the project. In case of highly confidential or key projects, even employees might be subjected to a specific NDA in order to clearly state the sensitivity of the information, as well as identify and protect associated know-how.

- For the second gate, there will be a screening for patents from other parties in order to get a broad IP picture around the planned product (the planned product at this stage should be more specific than the initial idea) to evaluate the patent landscape and raise any potential patent risk. There should also be a thorough check of the legal frameworks in place or in need for the project. At this point, if patent/trademarks filings are envisaged, they should be identified clearly with a filing date target.
- For the third gate, a Freedom-To-Operate (FTO) analysis is conducted in order to make sure there are no valid third-party patent rights that could constitute a risk of infringement for the planned product. As an FTO analysis is a legal opinion, it should be performed in each country (taking into account national laws) considered key for the business. A similar analysis should be conducted for any trademarks intended to be used. This gate is the most critical one to pass for all stakeholders and dimensions, including the IP dimensions, so in order to have a valuable IP assessment, the product should already be defined very precisely, and in its final or close to final version. In addition to the FTO analysis, identified patents/trademarks should also be filed, or on their way to completion. Know-how involved in the project should be identified as well in order to put in place appropriate trade secrets measures to protect it.
- Gate 4 consists only of a refreshment on the IP situation. It is basically an update of the previous searches to check if any new IP rights have come up since the last searches. It is also wise to check if there was any change made to the product specifications during the development stage, as this may have an impact on the FTO opinion, or may necessitate new patent filings.
- Gate 5 is a less important gate for IP in the Stage-Gate Process, as other aspects related to the technology and market dominate. It is mainly about an additional check (or update, if needed) of the existing material and information about the IP rights collected thus far.

How It Finally Works

As mentioned before, the Stage-Gate Model allows for a clear and transparent structure for the whole innovation process. Every party involved knows what information is needed at what stage.³ In practice it works as follows:

3. A free tool for the analysis and evaluation of an invention, making sure no important aspect is missed, is IPscore. It can be downloaded from the website of the EPO (www.epo.org/ipscore).

- Every party involved (*e.g.*, R&D, sales, marketing, IP, legal, etc.) creates its own template for the specific needs at each phase. It can feature standardized documents where specific information is added at each phase so that, at the end, the whole document is completed with all necessary information (*e.g.*, broad IP landscape at the beginning, detailed patent FTO/trademark clearance at the end) or it can have individual documents for each gate.
- The project manager has the central role in this process. Each department provides the specific information for each gate in a structured form to the project manager so that he/she has all the relevant information at hand.
- Decisions regarding go/no-go at the various gates will be made by a specific group, involving top management in regular and formal meetings. The task of the project manager is to compile all information and bring it all together in summary slides, which present the full picture.
- In these meetings the status of each project will be reviewed, and decisions regarding gate crossings (go/no-go) will be made based on the supplied information. Sometimes a decision will be deferred to the next meeting if additional information is deemed necessary or technical problems need more time to be addressed.
- For each project, there is a high-level project plan at the beginning, specifying the expected duration of each of the different stages and when each gate is expected to be crossed.

Some Points of Focus

• Patentability/Freedom to Operate (FTO)

As mentioned above, Gate 3 is the most important gate, especially with respect to IP. It involves the topics of FTO and patentability. One tries to collect a complete picture of relevant IP in this field.

Concerning patentability, since a formal prior art search can be very costly, one option is to do a quick search in-house on the free Espacenet.⁴ If nothing conclusively obstructive is found, a patent application is filed, which will likely uncover additional prior art, since the search is performed by the EPO. These prior art search results are typically received within nine months from filing.⁵

Concerning FTO, a formal search for relevant patents and their legal status should be conducted since a sound risk assessment is key. A close cooperation with the project manager is very important during this process, in particular to understand the business strategy (bigger volumes mean

4. worldwide.espacenet.com, see also epo.org/best-of-search-matters.

5. Mean average for receiving a search report from the EPO in 2019 was 5.5 months. See www.epo.org/about-us/annual-reports-statistics/statistics/2019/statistics/quality-indicators.html.

bigger risks) and the geographical scope of the launch (having a significant impact on the FTO strategy).

FTO can be done internally or externally depending on the nature of the invention/product. If the product is one with very specific topics of which the company already has sound knowledge, it is best to perform the FTO internally (since the experts will be in-house). In contrast, if the new product is cross-functional or in other fields, *i.e.*, ones that are not the core business of the company, the FTO should be executed with the support of external counsel.

Also, if some patents are found to constitute a potential risk, invalidity opinions of such patents might be conducted in order to understand the real level of the risk and establish strategies to mitigate it.

• Consideration of Legal Aspects

Another very essential aspect of making a project successful, and which is often cross-linked with the IP aspect, is the legal side. This may consist of co-operation contracts, confidentiality and collaboration. One has to know what rights will be used in the project, and one has to make sure that all these rights are available to the company (either because it has ownership, or because it has obtained said right by agreement, license, etc.). This is especially important if the project is realized within a collaboration/joint development, or if the idea for this project is the result of a cooperation. It is important to make the project manager aware of topics that he/she has to be careful about: for example, sometimes special materials are used during the R&D work which may have special IP-protection or be bound to special legal restrictions.

• From Preliminary Assessment to Protection to Exploitation

The overall goal of these activities is to get a complete picture and, based on this information, be able to say with confidence “I am safe to use this invention.” This breaks down into three essential parts:

1. **Legal rights:** Check the legal framework, identify key players, both internally and externally.
2. **Obtaining rights:** Obtain relevant IP rights, re-check the status of this throughout all gates, with a particular focus on Gate 3. Constantly think about which inventions can be patented, but don't forget the other forms of IP, such as trademarks, copyrights and trade secrets.
3. **Exploitation:** Make sure you don't violate any third-party rights. If you identify third-party rights that may be an issue, in particular patents, check other options proactively such as obtaining a license, designing around or evaluating the strengths/weaknesses of the patent to measure its enforceability.

• Marketing Statements

Marketing statements are separate topics that need careful attention since they are legally based as well. For example, product claims of superior performance or uniqueness of technology (“New product twice as effi-

cient as any other product on the market,” “x patents filed on this new technology”) must be analyzed and validated. Most of the time there are not only patents involved in these claims, but other forms of IP as well. The phase before Gate 3 is the specific gate where the sound legal basis of these marketing statements should also be secured.

• Risk Mitigation

Risk mitigation is an important topic during the whole process. However, there is a different focus in earlier versus later phases. During the earlier stages the focus is on identifying and analyzing the main risks. This is achieved by building IP landscapes and highlighting areas where there are red flags, for example. The later phases are more about mitigating the risk. For example, Gate 3 is about how to deal with the identified risks and how to find solutions, *e.g.*, through in-licensing or other negotiations with third parties.

In general, the level of investment is lighter in the first two phases and much heavier in the third and fourth phases.

Best Practices

- Do not think only about patents, there are other forms of IP that are highly relevant as well (especially in combination with patents).
- Define a clear IP topic owner (usually from the IP department) as soon as the project is initiated: it should be one dedicated person responsible for the whole project from beginning to end.
- Establish regular transversal meetings involving the IP owner, the project manager and the other designated stakeholders to facilitate alignment and ensure key questions are properly answered. Cross-functional interaction and information sharing is highly important. It is sometimes difficult and time-consuming, but it is all interlocked at the end, so almost every bit of information has implications for the other parties involved.
- The Stage-Gate Model allows for a clear and transparent structure for the whole innovation process. Every party involved knows what information is needed at what stage.
- Deliverable templates can be tailored to each company model and the type of project handled, but in any case should be clear and concise, so as to facilitate comprehension without adding too much complexity.

Some Considerations at the End

- This is not a one-size-fits-all approach: Every innovation project is different and has its own particularities, so it is essential to be able to adapt to the inevitable challenges. There are likely as many different Stage-Gate Models as there are different companies, even if they are all based on the same principles. Each specific Stage-Gate Model reflects the uniqueness of each company and also shows that, in order for it to work, it has to be tailored to the business. The Stage-

“Classical” Stage-Gate Model

Gate Model is made to help the management of projects, make the overall process more sustainable and less risky, and all without creating more issues or complexity. It is vital to spend the right amount of time initially to think about your business and create a process that will be effective for it.

- The creation of such a process can also include some adaptations to move from a very strict (“one-size-fits-all” process, as the Stage-Gate Process was sometimes seen at the beginning) to a more flexible and adaptive model that takes into account more recent requirements regarding the innovation process, such as being more adaptive and/or agile. Such modifications can include the building of multiple spirals or iterations of development that allow for experimentation among users. Each of these spirals would consist of four items: build, test, feedback, revise.
- There is a risk that, due to the strict gates, a promising idea might be killed early on. This is especially true for some disruptive ideas or ideas in need of more resources or knowledge than the company may have at that juncture. These promising yet challenging ideas might be dismissed pretty quickly at early stages. It means that the business needs are not yet

aligned to push the product on the market, but it does not mean that the idea should be forgotten. Usually, such “premature” ideas are documented (for traceability reasons) and reviewed regularly (at least twice a year) to evaluate if the context has changed (maybe at some point, the market will be ready for such a new product, or maybe the right partnership will be found and allow things to move forward). Project management is all about the right timing!

- Finally, a company should consider the various options with respect to Open Innovation at this point, such as cooperation with a partner, to further develop such promising, but challenging ideas. An alternative approach would be out-licensing such technologies to a third party once it has been decided that the technology itself is promising, but is not aligned with the company’s current strategy. Another opportunity for out-licensing would exist if the technology bears the potential for several distinct applications and the current company only wants to pursue one or a few of them. The other(s) can be out-licensed to a third party. ■

Available at Social Science Research Network (SSRN):
<https://ssrn.com/abstract=3583063>

Succeeding With Market Facilitators: How Buyers And Sellers Meet

By Bastian July and Ilja Rudyk

Abstract

Market facilitators play an important role in facilitating IP (intellectual property) transfers. This article reviews the advantages and limitations of the different types of market facilitators and provides guidance on how and when to involve them.

Market Facilitators and Their Roles

Most technology companies are keen on implementing patent strategies that can help them release the untapped value of their IP. One way to do so is to license or sell their patent portfolio to other companies. However, many companies miss this opportunity. According to Forrester Research, U.S. firms alone “annually waste one trillion dollars in underused intellectual property assets by failing to extract the full value of that property through partnerships.”¹ Even major research powerhouses do not fare much better. After 45 years and 10,000 invention disclosures by faculty and students at Stanford University, just three have generated multimillion-dollar licenses. Another 77, which is less than one percent of all disclosures, have generated one-million-dollar license agreements.²

However, because of the rapid pace of digitization, countless companies in all industries now need to close technology gaps to compete. For instance, automotive companies have started to invest heavily in mobile communication, software and the electrification of cars due to rapid changes in the industry. Therefore, technology transfer is on the rise. Cross-border licensing of IP increased from \$27 billion in 1990 to approximately \$180 billion in 2009, which corresponds to an annual growth rate of approximately 10 percent for this trend continuing through the last decade.³

How Do Buyers and Sellers Meet?

A successful transaction requires three steps: (1) evaluating the technology assets, (2) identifying potential partners and (3) approaching and negotiating the cooperation with one or more potential partners: See Figure 1.

Therefore, technology is always at the heart of the transaction. There is a company or a research institution that owns it. At the same time, there could be one or several potential buyers that could take out a license on the technology, develop it or commercialize it in partnership with the seller. The difficulty often lies in how to bridge the gap between the buyer(s) and the seller. In the ideal case, the technology seller knows who its customers and potential partners are. The seller might meet them at a conference, or maybe the potential partners approach the seller.

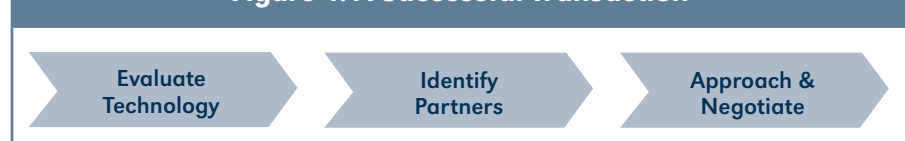
However, often the technology seller does not have the network or the possibility to contact potential buyers directly. This is when market facilitators or intermediaries can bridge the gap and facilitate transactions.

According to the EPO's Patent Commercialization Scoreboard (2019), one of the biggest challenges that technology-focused small and medium-sized enterprises (SMEs) face when commercializing their patented inventions is how to identify potential partners and evaluate if they are the “right” ones.⁴ Identifying the right partners and the cost and complexity of negotiations were reported as the biggest challenges by European companies interested in licensing transactions.⁵

Landscape of Market Facilitators

There are different types of market facilitators, according to their role in the interaction between buyers and sellers, as can be seen in Table 1. Some facilitators provide personal relationships, i.e., facilitate human-to-human interactions. These include brokers, lawyers, patent attorneys and IP consultants. Their main strength is often their personal networks. But this can also be their weakness if they do not have the right contacts in the industry in question or in potentially interested companies.

Figure 1. A Successful Transaction



1. Daniel Fisher, “The Real Patent Crisis Is Stifling Innovation,” 2014, forbes.com/sites/daniefisher/2014/06/18/13633/#17ae1c96f1c0 (accessed 01.04.2020).

2. Dave Merrill, Blacki Migliozi & Susan Decker, “Billions at Stake in University Patent Fights,” 2016, bloomberg.com/graphics/2016-university-patents/ (accessed 01.04.2020).

3. WIPO, World Intellectual Property Report, “The Changing Face of Innovation,” 2011.

4. EPO, Patent commercialization scoreboard: European SMEs, November 2019, [documents.epo.org/projects/babylon/eponet.nsf/0/981A954C6D692D4DC125849A0054C147/\\$File/Patent_commercialization_scoreboard_European_SMEs_2019_en.pdf](https://documents.epo.org/projects/babylon/eponet.nsf/0/981A954C6D692D4DC125849A0054C147/$File/Patent_commercialization_scoreboard_European_SMEs_2019_en.pdf) (accessed 01.04.2020).

5. European Commission, Survey on patent licensing activities by patenting firms, 2013, ec.europa.eu/research/innovation-union/pdf/patlice-survey.pdf (accessed 01.04.2020).

Table 1. Landscape Of Market Facilitators

Personal	Digital	Hybrid
Brokers	Web Marketplaces	Digital Marketing
Lawyers & Patent Attorneys	Matching Platforms	Auctions
IP Strategists & Consultants	Patent Databases	Patent Pools
IP Scouts	Open Innovation Websites	Technology Transfer Offices

Then there are the digital facilitators. In this case, buyers and sellers do not interact through a person but rather on web marketplaces or matching platforms that try to attract technology sellers and buyers to a platform and create a match through an algorithm or otherwise. A digital facilitator's main strength is its objectivity. In contrast to a personal facilitator, no fee (or only a small fee) or evaluation is necessary to list a technology on a web marketplace. But this can also be its greatest weakness. If potentially interested companies do not visit the web marketplace, the technology will not get the necessary attention.

And, of course, there are hybrid market facilitators. These try to combine digital solutions with more personal and direct solutions, such as digital marketing, auctions or patent pools. This combination of technology evaluation, networks and digital marketing taps into the advantages of both personal and digital facilitators. Technology transfer offices that take care of innovations from universities and government-funded research centers are also often associated with this type of market facilitator. Examples of market facilitators:⁶

- In-part: www.in-part.com (university technologies).
- KTI: www.knowledgetransferireland.com (research partners in Ireland).
- Innoget: www.innoget.com (open innovation).
- Ipnexus: www.ipnexus.com (start-ups, patents & technologies).
- IAM market: www.iam-market.com (patents of large corporations).
- Patent auction: www.patentauction.com (independent inventors).
- Patent auction: <https://www.oceantomo.com/services/intellectual-property-auctions/> (patents from corporations).

6. This non-exhaustive list was created for the EPO-LESI "High-growth Technology Business Conference," 2019 in Dublin to give the audience examples of currently active market facilitators and does not imply an endorsement of the facilitators mentioned.

- IP marketplace: www.ip-marketplace.org (independent inventors).
- GoodIP: www.goodip.io (platform powered by digital marketing).
- Overviews: www.greyb.com/marketplaces-buy-sell-patents.7
- Enterprise Europe Network: een.ec.europa.eu/content/international-partnerships-0.

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Case study

GoodIP is an example of a hybrid market facilitator. The company helped a German university to promote its proof of concept for a self-learning sensor network. During this project GoodIP's business team evaluated the business case of the technology. Its expert team, together with the inventors, reviewed the technology readiness level as well. GoodIP organized workshops with its community network to identify the most promising market applications for the self-learning sensor network. Supported by this additional knowledge, GoodIP used digital channels and personal networks to introduce the technology to the most likely buyers. These efforts paid off and the technology is now set to be acquired by a company specialized in Internet of Things applications.

When to Use Market Facilitators?

According to EPO's Patent Commercialization Scoreboard (2019), European SMEs prefer to use their personal networks, such as prior business partners, or find potential partners through business fairs and conferences. Only in about one-fifth of the cases were market facilitators actually involved.⁸

However, since increasing numbers of SMEs are now trying to engage partners outside of their local market, the use of market facilitators should be considered as ear-

7. Additional lists of IP brokers and marketplaces can be found in the study on a collaboration system for commercialization of intellectual property in the EU, European Commission, final report 15 October 2019, op.europa.eu/es/publication-detail/-/publication/4aebf66a-05c7-11ea-8c1f-01aa75ed71a1/language-en/format-PDF/source-108734297 (accessed 01.04.2020).

8. EPO, "Patent commercialization scoreboard: European SMEs," November 2019, [documents.epo.org/projects/babylon/eponet.nsf/0/981A954C6D692D4DC125849A0054C147/\\$File/Patent_commercialization_scoreboard_European_SMEs_2019_en.pdf](https://documents.epo.org/projects/babylon/eponet.nsf/0/981A954C6D692D4DC125849A0054C147/$File/Patent_commercialization_scoreboard_European_SMEs_2019_en.pdf) (accessed 01.04.2020).

How Buyers And Sellers Meet

ly as possible to achieve this goal. Right after technology development, a market facilitator can help to evaluate the commercialization potential of the technology and identify potential partners.

The main advantage of personal market facilitators is their ability to give technology sellers access to a very specific detailed network in a particular industry or country. What a technology seller looks for in a personal market facilitator is, obviously, somebody who understands the market very well. The intermediary should have a network in the relevant market. The intermediary should also know the right people in the market and inside relevant organizations.

Another option, which should always be considered as complementary, is to reach outside the networks of the technology seller and the personal network of a broker. This is where digital marketing comes in.

Why is digital marketing so important? First, it is cost-effective. It is not like an expensive trade fair at which there are no guarantees anybody will visit your booth.

Second, it is easily scalable. It reaches far outside existing networks and unearths unexpected interest.

Third, it is instructive. You learn very quickly what works and what does not. For example, using A/B testing, two versions (A and B) can be sent out through digital channels such as LinkedIn, WeChat and YouTube. Both versions are identical, except for one variation that might affect a recipient's behavior. Through a quick digital marketing campaign, you can learn which of the two variants is more effective for engaging the target audience of potential technology buyers. Nowadays, you have less than 30 seconds to get someone's attention, generate interest and make them want to learn more.

To sum up, digital marketing works best when you want to reach outside personal networks and effectively get

feedback from the market. Digital facilitators may not be best if you need to reach very specific people. Using hybrid solutions that combine personal networks and digital marketing can be a technology seller's best choice to tap into personal networks while also casting a wide net outside personal networks. See Figure 2.

How to Work with Market Facilitators

If you want to work with a market facilitator to sell or license out a technology, first consider all types of market facilitators, as there is an entire landscape of them, and each has their advantages and disadvantages (see the examples above).

Second, think carefully about what you want to accomplish, because this will inform the type of market facilitators you should use.

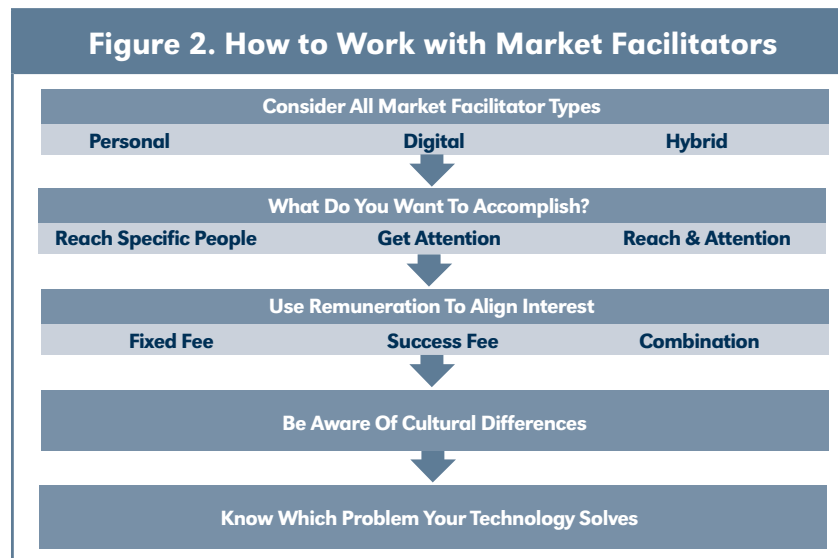
Third, use remuneration to align interest because this is an important lever to make sure that your goals are also reached. You can propose a fixed-fee rate basis, a success fee payment scheme or a combination of the two. This way you can provide incentives to succeed in your project and manage costs.

Fourth, beware of cultural differences and language issues. Every country or industry has its specialties, and market facilitators can help you navigate through them.

Last but not least, prepare before engaging market facilitators. You need to understand what problem your technology solves for customers. Is the technology contributing to the bottom line? Is it saving significant costs? Is the technology helping to comply with new regulatory requirements?

You also have to know how the technology is unique, what differentiates it from competing technologies and what its technology readiness level is. It makes a lot of sense to prepare an "elevator pitch."⁹ As you would pitch a start-up, you should also be able to pitch the unique selling proposition of a technology.

Figure 2. How to Work with Market Facilitators



How to Connect with the Research Base

If you want to connect with universities or research centers to acquire innovative technologies, there are often national technology transfer platforms or offices set up to make it much easier to navigate.

9. For more information on elevator pitches: Elizabeth Schulze, "6 Tips For Putting Together The Perfect Elevator Pitch," 2017, [cnbc.com/2017/12/05/six-tips-for-perfecting-the-elevator-pitch.html](https://www.cnbc.com/2017/12/05/six-tips-for-perfecting-the-elevator-pitch.html) (accessed 01.04.2020) or Amy Saunders, "11 elevator pitch examples for entrepreneurs," 2020, [keap.com/business-success-blog/marketing/networking/11-elevator-pitch-examples-for-entrepreneurs](https://www.keap.com/business-success-blog/marketing/networking/11-elevator-pitch-examples-for-entrepreneurs) (accessed 01.04.2020).

This is helpful, as public research systems can be quite fragmented.¹⁰ These national contact points aim to make it easy and simple for industry, investors and entrepreneurs to find what they need and, most importantly, to find who to talk to as quickly as possible.

Some of these contact points have published guidelines that help companies and investors understand what will happen when they are looking to engage with higher education and state-funded research, and oftentimes provide templates for putting agreements in place.^{11, 12}

It is also important to think beyond just the buying and selling experience. Understand the value that each party can bring and be open to what else might be

available to you: resources, access to funding, etc.

As always, you need to know what it is that you want to achieve and be able to explain it. You also need to be flexible and realistic because you need to understand the context in which you are going to operate. And you may need to be a little bit flexible in how you craft the solution that you are putting together.

Disclaimer: Any opinions expressed in this article are those of the authors and not necessarily those of the European Patent Office. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3583066>

10. For example in France: *francebrevets.com* or in Germany: *transferallianz.de* (accessed 01.04.2020).

11. For guidance on what to expect when engaging with the research base, for example, in Ireland: *knowledgetransferireland.com/ManagingIP/National-IP-Protocol/Ip-protocol-made-simple.pdf* (accessed 01.04.2020).

To access template contracts to speed up negotiation and understand the clauses, for example, in Ireland: *knowledgetransferireland.com/Model-Agreements/* (accessed 01.04.2020).

12. T. Bereuter, D. Jerolitsch and P. Heimerl, "Models of Intellectual Property (IP) Related Contracts for Universities and Publicly-Funded Research Institutions." WIPO, 2016 *wipo.int/meetings/en/doc_details.jsp?doc_id=331856* (accessed 01.04.2020).

How To Market And License Your Technology

By Thomas Bereuter, Bastian July and Gene Quinn^{1*}

Abstract

Best practices and expert insights from social media are combined to shed more light on the needs of licensees or buyers to improve technology offers and the marketing approaches of licensors and sellers to foster technology transfer.

What Makes You Attractive as a Licensor

Douglas C. Engelbart, best known for inventing the computer mouse, famously said:

“Stanford Research Institute patented the mouse, but they really had no idea of its value. Some years later I learned that they had licensed it to Apple for something like \$40,000.”²

Technology alone does not make you an attractive licensor. The first step is to attract interest from a potential licensee. To attract interest, the technology must provide a solution to a relevant customer problem, like the computer mouse did to solve the problem of interaction between human and computer. The more significant the consumer problem, the more attractive you are as a licensor, provided, of course, that the technology delivers a solution, and that consumers can see the advantage of the solution and believe it is worth paying for.

In the same vein, Geoff Nicholson, the “Father of Post-it Notes” remarked:

“It was because of the real-world feedback. The first customers were the 3M employees in the lab, and the reality was that we couldn’t keep up with their demand.”³

When that happens, you know you are on to something big, but note that this goes beyond the value drivers of any patent. Certainly, patents are important, but many other things matter too, such as know-how and proof of consumer demand. These value drivers that go beyond patents are an essential part of becoming attractive as a licensor. A patent application can protect your invention. But only a technology that will be valuable to a potential partner can get you through the door. It is your job as the licensor to understand the value drivers and be able to convey it to the potential licensee quickly and coherently so they can appreciate the value proposition.

The Licensee’s View

Conducting interviews with technology companies

*authors in alphabetical order

1. Gene Quinn summarized key takeaways in a video, see epo.org/sme-takeaways.

2. Andrew Maisel, “Doug Engelbart: Father of the Mouse, SuperKids,” superkids.com/aweb/pages/features/mouse/mouse.html.

3. Alvin Soon, Geoff Nicholson, the “Father of Post-it Notes,” on 3M & Innovation, *HardwareZone*, 2013, hardwarezone.com.sg/feature-dr-geoff-nicholson-father-post-it-notes-3m-innovation.

helps to better understand the expectations these companies have of technology offers. A multinational telecommunications company said:

“It’s important that you can explain to people within two minutes what it’s about, who the key persons are, what you’ve protected, what is the status of your patent. Most of the time all the data is there, but very confusing.”

Likewise, a U.S. professional services company commented:

“But it is very difficult, if even as a technology owner, you do not know how it can be used and to what extent. It is difficult to negotiate properly at this stage.”

A car maker said:

“I look at which technologies will come into our products in the foreseeable future, only then will I discuss about in-licensing.”

And a French investment bank replied:

“The tight corset of a patent description must be enriched by experts, swarm intelligence and described more broadly with new target solutions and application cases.”

Looking at the market, a technology scout pointed out:

“What is often missing, however, is the market side. That people have no idea about the market. That they don’t know what their competitors and competing products are.”

To sum up, licensees are looking for the business and market component. How can your technology help them solve their customers’ problems? You need to be prepared to deliver an answer to this question quickly, directly, and with facts and figures to back up your analysis. There is no substitute for really knowing your value proposition and being able to distinguish yourself from the competition and alternatives.

Improving Your Technology Offer

The key points in your marketing materials or technology offers should be:

- What are you offering?
- What are the “pain points” that the technology is solving for the paying customer?
- What is the unique selling point (USP) of the technology?
- What are the overall benefits of the technology? This requires translating the technical features of your technology into benefits that fulfill customer needs.
- Why is the technology better than a competing or substituting technology?
- How large is the market for the solution? Even more important, how fast is it growing?

From these key points, you can drill down on the technology aspect, while remembering that when you discuss the benefits of solved problems instead of the technical solution, you should not disclose confidential information:

- What readiness level has the technology achieved?⁴
- Do you have a prototype, a compelling demo or even a minimum viable product (MVP)?
- What are you offering: know-how, patents, design rights, etc., as well as cooperation?
- From a patent enforcement perspective, will you be able to find out or detect if somebody is engaging in an unauthorized use of your technology?

You should also refine the market aspect:

- Is there significant customer interest? How do you know this to be true?
- How large are the addressable and serviceable markets?
- Is the market ready for the technology, or does the market need to be developed?
- Is standard-setting a possibility? Is your technology related to an existing standard?
- Is there regulatory pressure to adopt your technology?

You should distill the value and cost aspects of your technology.

- What is the solution worth to customers?
- Is the solution better, but also cheaper than the customers' current solution?
- Do the licensee and its customers have the budget for your solution?

Be easy to contact. Who are the key people?

- Identify the first point of contact who will deliver the elevator pitch when contacted by a potential licensee.
- Consider engaging the inventors for technology transfer and check if there is potential for co-operative further development of the technology.

Lastly, there are many mistakes that you can make, mostly out of hubris. To be taken seriously, you need to appreciate realities of business. To avoid making a grave misstep of this nature:

- Be aware of the existing sunk costs of potential customers because of the technology they are currently using.
- Be mindful that there will be switching costs that go beyond additional fees for acquiring your technology solution, *e.g.*, employees may require training, during which they will be less productive.
- Don't fool yourself into believing there are no substitutes, there is always a subset of customers who will elect alternative inferior, cheaper solutions.

- Expect the "not-invented-here" syndrome, even if the potential licensee's management might give you the impression that they are living open innovation.

To fill gaps, search for information. You can get additional support from crowd experts on websites such as *guru.com*, *freelancer.com*, *upworks.com*, etc.

How to Find Killer Applications and Interested Partners

Start by researching the patents of related technologies and competitors. These can be a source of inspiration for potential alternative applications you might not have had in mind when developing the technology.

You can also use Google Marketfinder and Google Trends to find potential applications and interest for a solution around the world.

Design thinking,⁵ which is usually used to identify solutions for a newly identified customer problem, can also be a great tool for finding new market applications for an existing technology. First you observe and understand potential customer

problems that the technology could solve. Next you ideate and synthesize the ways the technology could solve the customer problem. Lastly, you create a simple prototype, *e.g.*, on paper, and test it with potential licensees. You can refine this process using feedback received from potential licensees and their customers. See Figure 1.

Internet searches and searches on company profile databases, market research databases and patent databases like Espacenet can also be great for identifying potentially interested partners.

How to Market Your Technology Successfully

As a technology owner, you have several avenues for approaching potential licensees or commercialization partners. The goal is to have a sound marketing mix that may entail:

- Your own network combined with online searches (get your inventors engaged)
- Published patent applications (18 months after filing) and scientific or technical publications (guided by the patent attorney, publication could be soon after priority filing)

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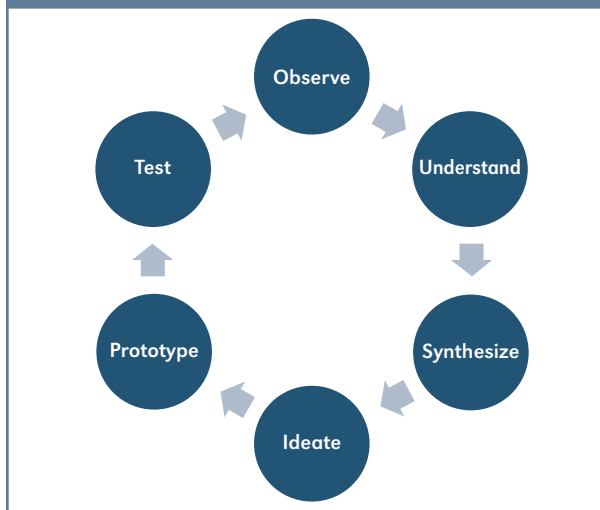
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4. en.wikipedia.org/wiki/Technology_readiness_level.

5. You can find methods and tools on rework.withgoogle.com.

Figure 1. Design Thinking Process



- Trade fairs, conferences and partnering events⁶
- Direct and digital marketing
- Market facilitators and marketplaces
- Getting found through media publications

The focus here is on the most mysterious of these avenues—getting the attention of the media and bloggers.

Think of the Media as Overworked and Underpaid.

Most media outlets are not going to perform an in-depth gathering of facts and a hard core reporting of news. There isn't time, and it is very expensive. Bloggers and 24/7 media have transformed journalism. Journalists and bloggers need to turn things around very quickly, sometimes multiple articles a day. This means no blogger or journalist will be able to dig into your newsworthy story.

What are the Facts?

A technology owner can flood the marketplace with facts. Facts and information, in particular in the form of infographics, are king. But facts alone are not going to be enough. You need a story that can easily be understood and retold. Stories transform facts into something real, interesting and compelling. When giving facts, spoon feed them in press releases. Bullet points are particularly useful. Remember that journalists and readers are unlikely to be technically sophisticated. Anticipate questions that will arise in the mind of the reader and answer them in advance. This is what good journalists do and what a good press release or information brochure must do.

What is the Story?

Give thought to what will make people think positively or be curious about your technology. As difficult as it may be for company executives to accept, this might not be the story of the “great and worthy super-genius” inventor

or company founder. Of course, it would be preferable if the technology has the potential to save lives or contribute to coping with climate change. Or it might be something more mundane, like the fact that the company has hired people who were out of work for many months and is breathing new life into a community. It might be that someone's life has been changed or improved in some dramatic way. It might be that the inventor, technology or innovation has won some recognition or award. It might be some milestone has been achieved. With niche media and bloggers, it could be all of the above. This is why the most sophisticated companies actively push out press releases for all good news and aggressively use social media.

Be Honest, Don't Over Sell and Don't Look Stubborn

Journalists and bloggers are trained to ask critical questions. When dealing with technology, high-tech companies are often working on things that touch upon the improbable. Initial reactions will range from excitement to disbelief, but wherever they begin, the spectrum of excitement to disbelief is a range.

What is the Purpose?

If the goal is to drive interest and tout a positive development, the press release should give a patent number, explain the challenge solved via the technology, explain why the technology is exciting, and explain how it is at the cutting edge of its industry. Be concrete and specific! Vague doesn't get picked up. No one wants to read something vague, which comes across as merely self-congratulating and salesy.

What is Unique?

If you are discussing a technological advance and you do not have an explanation in the press release about why this is a breakthrough and unique compared to other solutions, you have failed. Don't say it is important or a breakthrough, tell how and why! A good example is:

This is a major breakthrough compared with other solutions that have sought to X, using Y and Z. The ABC developed by the team at D is more E, F and G in that H, J and K. This leads to L, M and N, which is significant because [insert brief generally understandable technical discussion]. This will be of benefit to P and R because it enables T, U and V.

“Our Patent Pending...”

Yes, the contents of a patent application are confidential until the application is published or the patent is issued, whichever comes first, but if you won't talk about what is in the patent application and what at its core makes the invention unique, what is the journalist supposed to write about? You have to find the sweet spot, as you can't expect any serious journalist to simply parrot a self-serving, back-slapping, congratulatory press release written by the marketing department. Since you need a balanced secrecy strategy, have your patent attorney draft a summary you can safely use for media/marketing.

Should You have Your Own Blog or Publication?

Publishing is not what a technology owner specializes in. If you do have your own “blog,” it should be a means

6. Partnering events like Bio-Europe facilitate matchmaking in the life science area.

to publish “naked” press releases and quotes from company officials, inventors and other information you wish to push out to journalists and other media.

What is a “Naked” Press Release?

You do not want to publish an article pre-written as a news or magazine article. That will make journalists less likely to pick your news story up because you have beaten them to publication. Publishing something short and sweet with facts, bullet points and easy ways for journalists to make contact for more information is a good strategy. Don't forget that the internet is a visual medium. Include copyright-cleared photographs that journalists and bloggers can download and use along with their stories. Providing copyright-cleared media that journalists and bloggers can use addresses a substantial burden many face: eliminating a hurdle for them to cover your news.

Be Prepared with Additional Quotes

Press releases are great, but when a blogger writes a story from a press release, she always wants to be able to include something original that is not in the press release, so it doesn't look like they merely relied on a press release. But remember that time is of the essence in the 24/7 media cycle. Just because there is interest right now doesn't mean it will still be there if you get back to an inquiry in a day or two. More pressing matters may have captured the attention of the journalist or blogger, and by the time they can return to your news, it may be stale. So be prepared to immediately provide some additional quotes from key figures to journalists who ask for more information.

Have a User-Friendly Website

Everything discussed so far for generating free interest in your technology is the type of information that partners, investors and prospective licensees will want to know about your company, company officials, key inventors and technology. Having a friendly, easy-to-use website is critical in the digital age.

What technologies are available? If the patent(s) have been issued, you can provide access to them. If they have been published but not issued, you may want to provide access. If neither has occurred, a safe summary can do the trick. Don't forget to invite partners, investors and prospective licensees to engage and sign an NDA (non-disclosure agreement) as well as an MTA (material transfer agreement), if applicable. As this will come when you successfully generate interest, prepare your drafts early on.

Social Media

In recent years, it has become abundantly clear that the most important social media platform for professionals is LinkedIn. This doesn't mean you need to ignore other platforms, but it does mean that you might want to use LinkedIn professionally.

Managing Contacts

Having a sound marketing mix will result in many contacts, follow-up duties, staged information flows, management of signed NDAs and MTAs, etc. Properly managing all this requires a very structured approach that has to be supported by tools. Use of customer relationship software could make sense in particular if teams are formed to maximize the outreach.

Key Takeaways for Marketing Your Technology

- Define your target group (of potential licensees and the customers they are serving).
- Identify the customer problem, technology benefits, technology readiness, and market size and growth.
- Invest time and effort in tailoring marketing materials.
- Use all marketing channels, including social media.
- Get found through your publications.

Marketing Materials Checklist

Checklist for preparing and testing your marketing materials:

- Prepare a short headline (that covers what and why)
- Focus on the solution to a customer problem (less is more).
- Focus on improvements, not cost reduction only.
- Illustrate (non-confidential) technology benefits.
- Describe the technology readiness level without revealing confidential information.
- List patents and associated IP like trade secrets, prototypes, materials, etc.
- Communicate openness for research or commercialization cooperation.
- Research and specify market size and growth.
- Include call(s) to action.
- Identify key people and note your contact details.
- Run A/B tests with target groups. ■

Available at Social Science Research Network (SSRN):
<https://ssrn.com/abstract=3583068>

Disclaimer: Any opinions expressed in this article are those of the authors and not necessarily those of the European Patent Office.

Market Success And Challenges Facing European SMEs: Results From EPO's Patent Commercialization Scoreboard

By Thomas Bereuter, Yann Ménière and Ilja Rudyk*

Abstract

Small and medium-sized technology-driven enterprises are important to the European economy and patents are important to them as a means of securing sustainable high growth. A recent survey investigated how small and medium-sized enterprises filing European patents succeed in commercializing those of their inventions with the highest business potential. These technologies usually find their way to the market, frequently involving partnerships in Europe and beyond. However, some challenges still persist for SMEs wishing to commercialize their technology, including difficulties finding partners and managing complex negotiations. These challenges need to be addressed. Sharing good practices, knowledge, and expertise in IP management and IP strategy can help, as can access to networking platforms.

1. Introduction

Intellectual property rights (IPRs) are important to the European economy. The latest joint EPO-EUIPO study clearly shows that IPR-intensive industries account for 45 percent of the EU's GDP and up to 39 percent of employment.¹ The higher contribution to GDP than to employment implies that employees in these industries are more productive and, as a result, are also better paid. These industries are the true engine of the European economy.

These industries are not only represented by large multinational corporations. They also include a vibrant ecosystem of small and medium-sized businesses (SMEs) and co-operating universities and other research institutions. The EPO's statistics of patent applications show that SMEs and individual inventors represent up to 20 percent of patent applications filed by European applicants at the EPO² and approximately 50 percent of all applicants together. This statistic shall be considered as a lower bound for the total contribution of smaller businesses to innovation in Europe: European SMEs usually file patents in their main market first and then continue with the EPO if they expect to grow their business beyond that. Therefore, their share at national patent offices is likely to be even higher.

*authors in alphabetical order

1. European Patent Office and European Union Intellectual Property Office, Intellectual property rights intensive industries and economic performance in the European Union, September 2019, www.epo.org/iprintensiveindustries (accessed 05.04.2020).

2. See EPO's Patent Index 2019 on www.epo.org/statistics (accessed 05.04.2020).

Patents help SMEs to protect their inventions, bring them to market and protect their sales. They can also be a major asset in setting up licensing or co-operation agreements that enable SMEs to move into new markets with their patented inventions. A recent analysis revealed that European SMEs that have taken steps to protect their intellectual property rights are 21 percent more likely to experience a growth period afterwards and are 10 percent more likely to become high-growth firms—defined as companies whose turnover increases annually by 20 percent or more within a period of three years.³ These statistics confirm that IPR activity is indeed an indicator for innovation, and therefore an early signal of future growth potential. The chances of high growth or growth in general increase even further when SMEs make use of European patents, trade marks and designs. The prior use of European IP rights signals that these SMEs are not only innovative, but are also geared towards growth on an international scale. The broad geographical scope of the protection conferred by European patents⁴ is of particular importance to companies aiming to grow rapidly in international markets. This applies most especially to typical SMEs or start-ups which, due to their small size, are even more dependent on licensing agreements or co-operations with partners in other countries to commercialize their inventions internationally and at scale. It is therefore important to better understand how these SMEs make use of their intellectual property as a leverage for growth and how successful technology commercialization can be sustained and supported.

2. Patent Commercialization Scoreboard: What We Know about European SMEs

The EPO conducted a survey of 1,500 European SMEs who filed European patent applications with the EPO between 2009 and 2018, asking them about patent commercialization practices.⁵ By analyzing how SMEs com-

3. European Patent Office and European Union Intellectual Property Office, High-growth firms and intellectual property rights—IPR profile of high-potential SMEs in Europe, May 2019, www.epo.org/high-growth (accessed 05.04.2020).

4. The EPO provides a single uniform grant procedure for Europe, enabling owners of European patents to exercise their rights in over 40 countries. European patents can also be validated in four additional countries: Morocco, the Republic of Moldova, Tunisia and Cambodia.

5. European Patent Office. 2019. Market success for inventions. Patent commercialization scoreboard: European SMEs. epo.org/scoreboard-smes (accessed 16.03.2020).

mercially exploit their European patents, with a focus on collaborative forms of exploitation like licensing or cooperation, insights can be gained that foster a deeper understanding of how European SMEs can be helped to harness the business potential of their IP rights. This provides policy makers with valuable insights into the challenges they have to deal with.

The key findings of the study are as follows:

2.1. Importance of SMEs' Patented Inventions to Their Industries

A large majority of the SMEs surveyed consider the inventions for which they have filed a European patent application as important compared with other inventions in their industry. Over 80 percent of respondents consider their inventions to be ranked in the top half of all inventions in their industry, and up to 39 percent perceive their inventions as being ranked in the top 10 percent of technical developments in their industry. Only 17 percent perceive their inventions to be ranked in the bottom half of all inventions in their industry. See Figure 1.

2.2. Motives for Maintaining a Patent

"Preventing imitation" was cited by 83 percent of SMEs as an important or highly important motive for maintain-

ing their European patents, followed by "improving the SME's reputation" (69 percent) and "helping to obtain freedom to operate (FTO)" (59 percent).⁶

Roughly half of the SMEs surveyed also rated motives related to the use of patents in technology transactions as important. These motives include "facilitating commercial contracts" (53 percent) and "licensing" (46 percent). "Using European patent applications to secure financing" is regarded by more than one-third (35 percent) of SMEs as an important or highly important motive for maintaining their patent. See Figure 2.

2.3. Use of Trade Marks, Design Rights or Additional Patents in Relation to the Invention

When asked to identify complementary IP rights that are also relevant for the commercial exploitation of their patented inventions, 48 percent of SMEs stated that they were using or planning to use additional patents. A similarly high percentage (45 percent) of SMEs use trade marks as part of their IP strategy, whereas design rights

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Figure 1. Importance Of SMEs' Patented Inventions To Their Industries

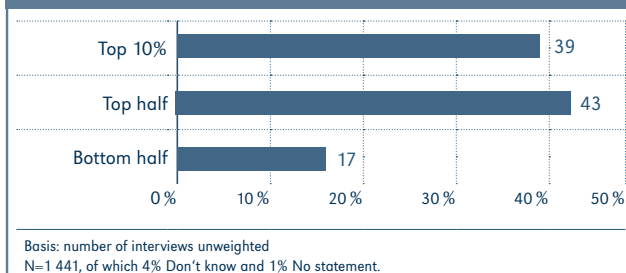


Figure 2. Motives For Maintaining Patents

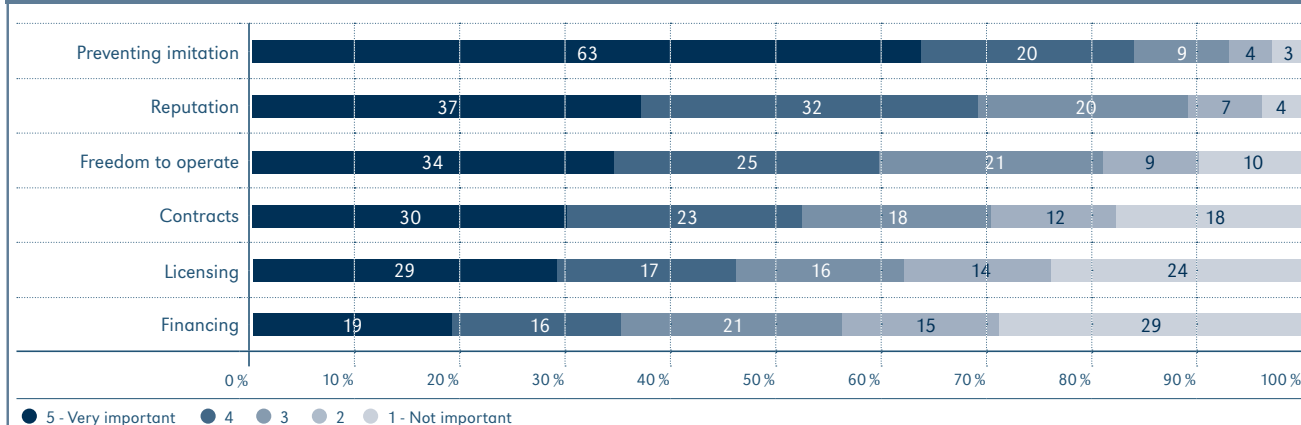
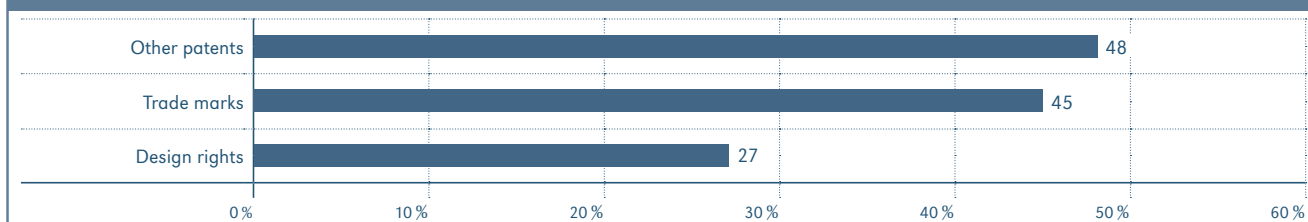


Figure 3. Use Of Trade Marks, Design Rights Or Additional Patents In Relation To The Invention



Basis: number of interviews unweighted N=1 440, of which 3%-4% Don't know and 2% No statement.

are used to a lesser extent (27 percent). See Figure 3.

2.4. Commercial Exploitation

Roughly two-thirds (67 percent) of the inventions for which SMEs file a patent application with the EPO are exploited for commercial purposes.⁷ Analyzed in more detail, 34 percent are exploited exclusively by the SME, whereas 33 percent of these inventions are commercialized in collaboration with external partners via technology transfer or cooperation agreements. In other words, half of all patented inventions that reach the market are exploited via a partnership. See Figure 4.

2.5. Motives for Not Exploiting Inventions

Some patented inventions are not commercially exploited. According to the SMEs surveyed, this is mainly because these inventions are either still at the development stage (67 percent), or potential commercial opportunities are still being explored (64 percent). Other reasons given include a lack of resources (32 percent) or

skills and contacts (19 percent) to pursue further development and commercialization. Insufficient commercial potential (14 percent of unexploited inventions to date), a lack of IP protection (8 percent) and insufficient freedom to operate (5 percent) were cited less frequently. See Figure 5, p. 159.

2.6. Forms of Collaborative Exploitation

Licensing is the most frequent (62 percent) form of collaborative exploitation used by SMEs. Almost half of joint commercialization cases also involve a broader form of co-operation. Nearly one-third of the surveyed SMEs involved in collaborative exploitation create spin-offs based on their patented inventions, while over 21 percent co-operate via cross-licensing.⁸ See Figure 6, p. 159.

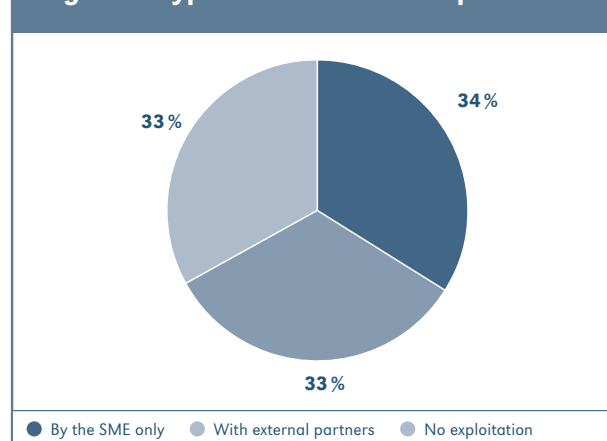
2.7. Motives for Collaborative Exploitation

Jointly exploiting patented inventions with external partners enables SMEs to leverage their partners' resources and accelerate IP commercialization. SMEs that are involved in partnerships identify "increasing revenue" (85 percent) and "market access" (73 percent) as the main motives for collaborative exploitation. Over half (56 percent) of them also cite "joint innovation" as a motive, followed by "outsourcing manufacturing" (42 percent) and "settling infringements" (32 percent). See Figure 7, p. 159.

2.8. Potential for Collaborative Exploitation

Over one-third of SMEs (39 percent) that filed European patent applications said that they had plans for future collaborative exploitation. The vast majority (80 percent) of these planned ventures concern inventions that have not yet been exploited with external partners. The remaining share consists of patented inventions that are already being jointly exploited but may potentially lead to further partnerships. These statistics show that SMEs perceive collaborative exploitation as a relevant mode of commercialization for up to two-thirds of the inventions

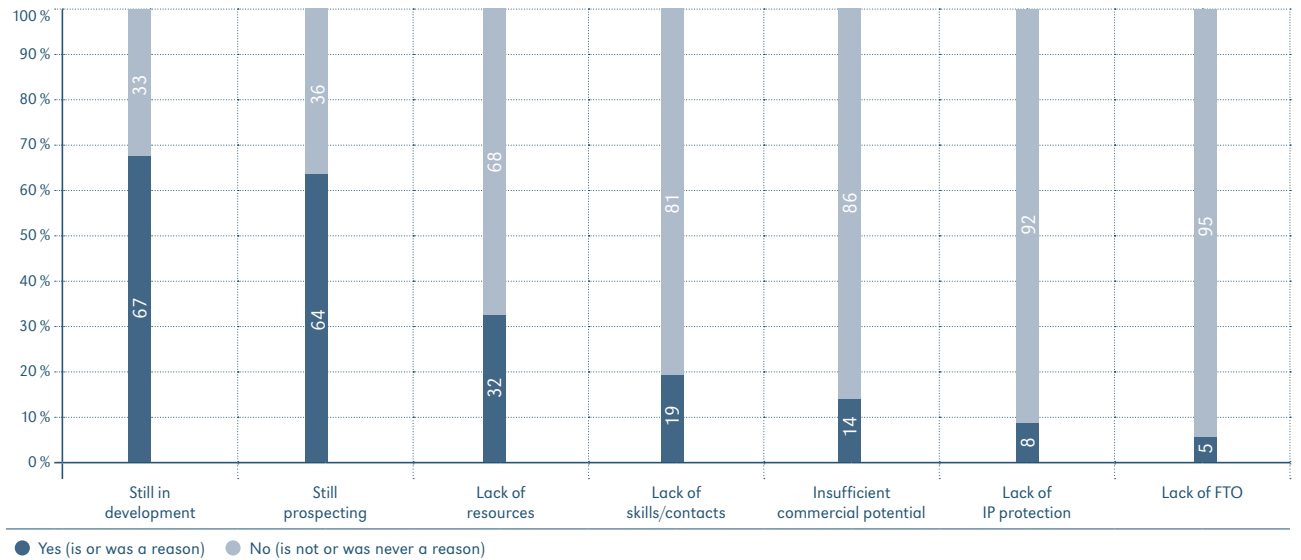
Figure 4. Type Of Commercial Exploitation



7. The commercialization rate of 67 percent is a conservative estimate based on the number of granted and pending patent applications at the time of the survey. Some patent applications were still being examined and can be expected to result in commercialization of the product once the examiners have communicated which claims have the potential to be granted.

8. Cross-licensing is often regarded as a means to secure freedom to operate, but can also be the basis of forward-looking alliances that encourage knowledge flow and spur post-licensing innovations.

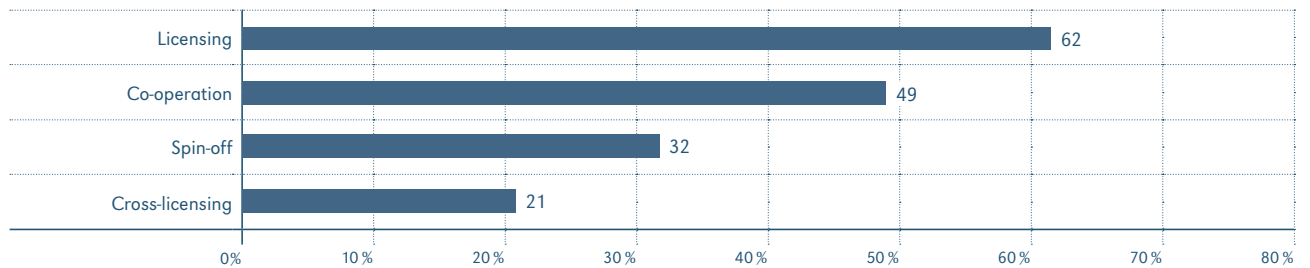
Figure 5. Reasons For Not Exploiting Inventions



Basis: number of interviews unweighted N=469, of which 1%-3% Don't know and 3%-4% No statement.

Note: Respondents were allowed to provide multiple answers.

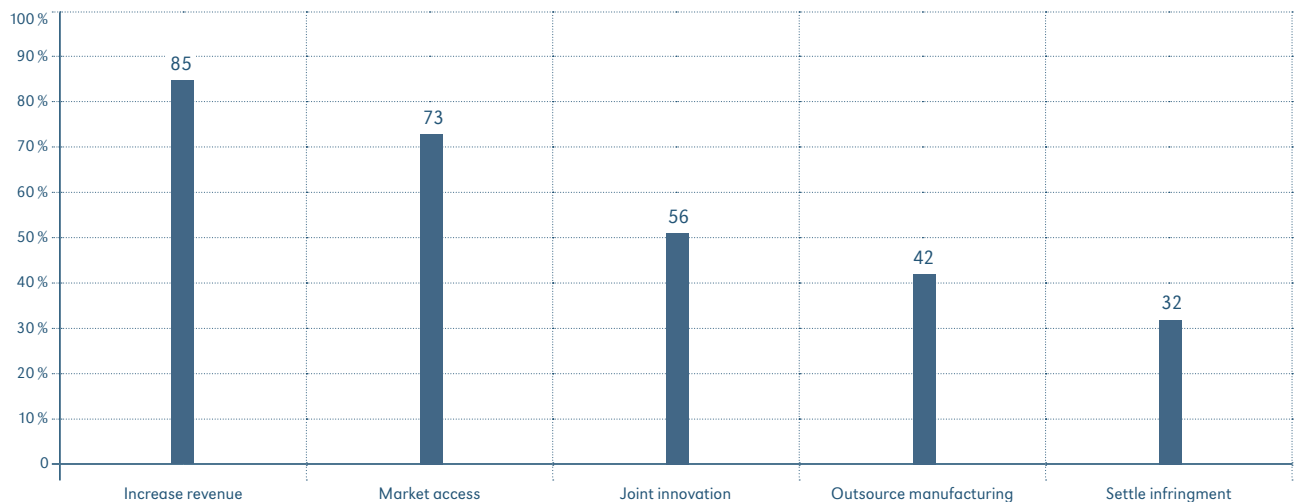
Figure 6. Forms Of Collaborative Exploitation



Basis: number of interviews unweighted N=356.

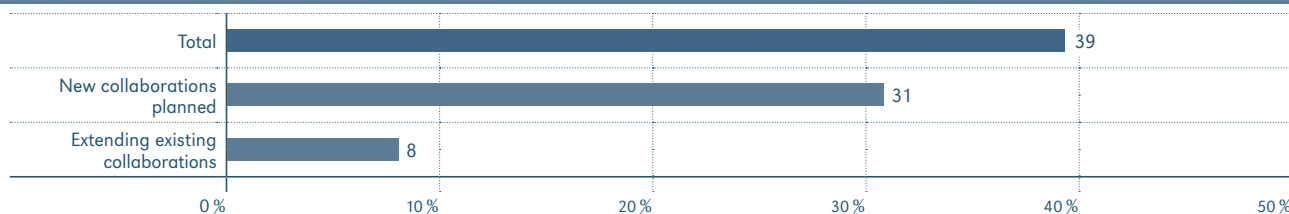
Note: Respondents were allowed to provide multiple answers.

Figure 7. Motives For Collaborative Exploitation



Basis: number of interviews unweighted N=285, of which <1%-2% Don't know and 1% No statement. Note: Respondents were allowed to provide multiple answers.

Figure 8. Potential For Collaborative Exploitation



Basis: number of interviews unweighted N=1 441, of which 1%-3% Don't know and 1%-2% No statement.

for which they have filed a European patent application. See Figure 8, p. 160.

2.9. Business Profile of Partners

SMEs seeking to exploit patented inventions most frequently partner up with existing clients (59 percent) or existing suppliers (26 percent). Around one-fifth (19 percent) of these inventions are also jointly exploited with a university or other publicly funded research organization. Partnerships with competitors are less frequent (15 percent), but are often cited by SMEs (22 percent) as potential options. See Figures 9 and 10, pages 160 and 161.

2.10. Geographical Location of Partners

European SMEs most frequently engage in collaborative IP exploitation with partners located in other European countries (56 percent) or in their own country (53 percent). SMEs commercializing inventions outside of Europe tend to choose partners located in North America (26 percent) or Asia (21 percent). But in general they prefer to choose partners located in another EU member state (68 percent of the surveyed SMEs). See Figures 11 and 12, p. 161.

2.11. Challenges in Collaborative Exploitation

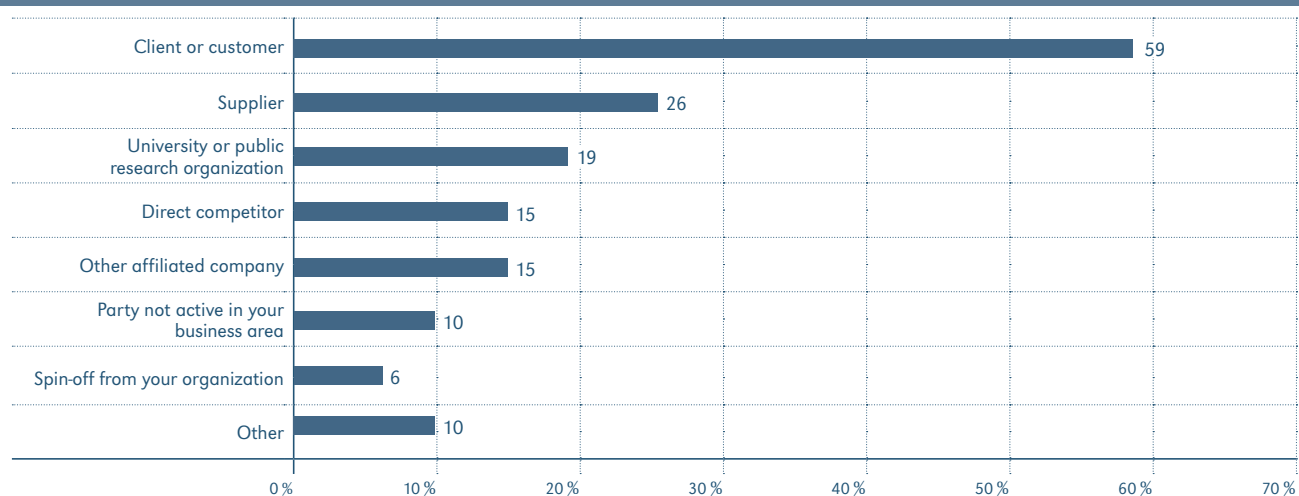
European SMEs involved in collaborative exploitation see identifying the right partners or the cost and com-

plexity of negotiations as the biggest challenge. Approximately one-quarter of respondents cited reasons such as the poor availability of competent advice, the need to disclose critical information and the accompanying risk of creating a competitor as the most important challenges. Unsatisfactory IP protection and the lack of interest from potential partners were cited as major stumbling blocks by just 13 percent of companies wishing to exploit their patents via collaboration. See Figure 13, p. 162.

2.12. Channels Used to Find Partners

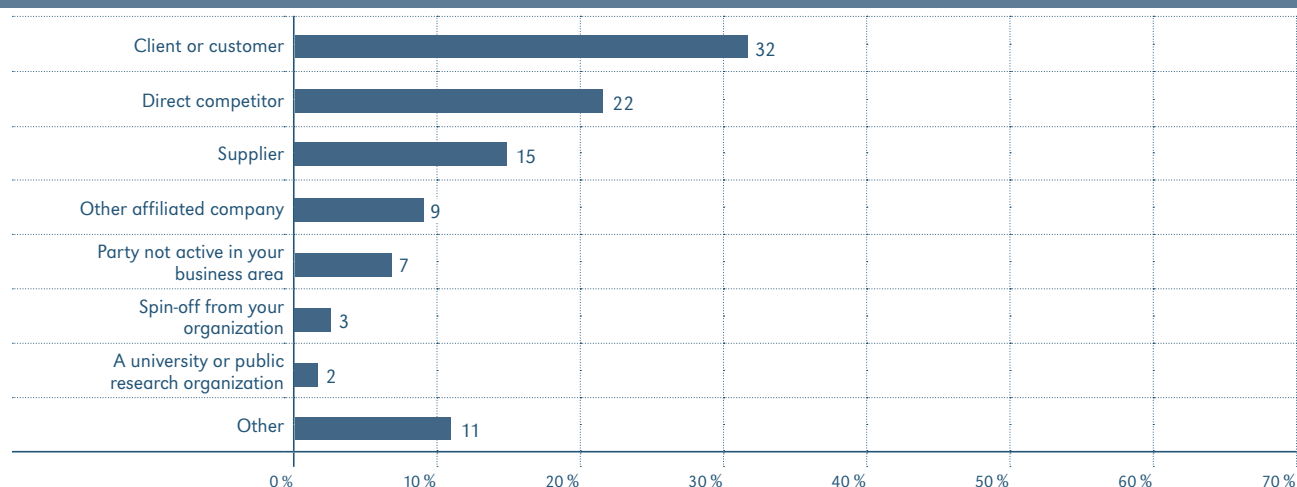
Analysis of the channels used by SMEs to find partners confirms that identifying the right contacts for setting up collaborations across Europe is a very difficult challenge. Up to 60 percent of partnerships involving SME patents or patent applications are actually initiated by their partners. SMEs' own efforts to find partners are mainly based on direct contacts and they seldom use available intermediary channels. SMEs cite personal contacts (77 percent) and business partners (67 percent) as by far the most important channels for collaborative exploitation, along with trade fairs or conferences (49 percent). They use brokers (17 percent), patent attorneys (20 percent), internet platforms (16 percent) and patent information tools (14 percent) far less frequently. See Figure 14, p. 162.

Figure 9. Current Partner Profile



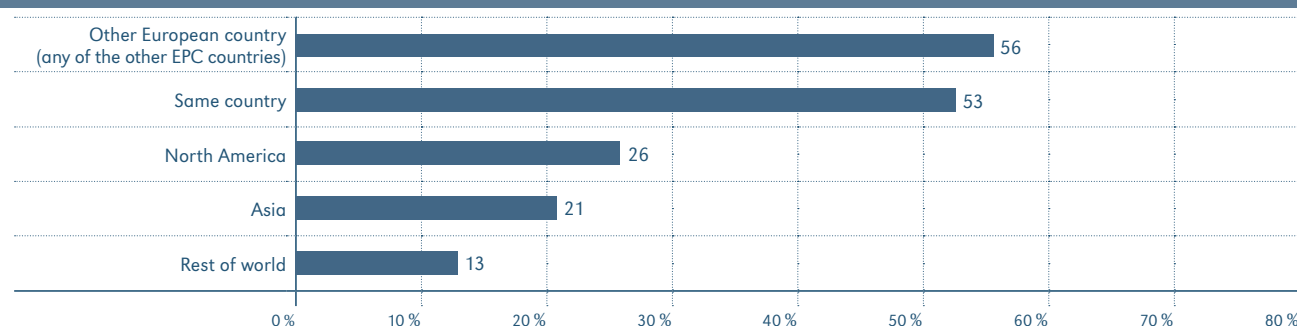
Basis: Number of interviews unweighted N=285, of which 1% Don't know and 1% No statement. Note: Respondents were allowed to provide multiple answers.

Figure 10. Planned Partner Profile



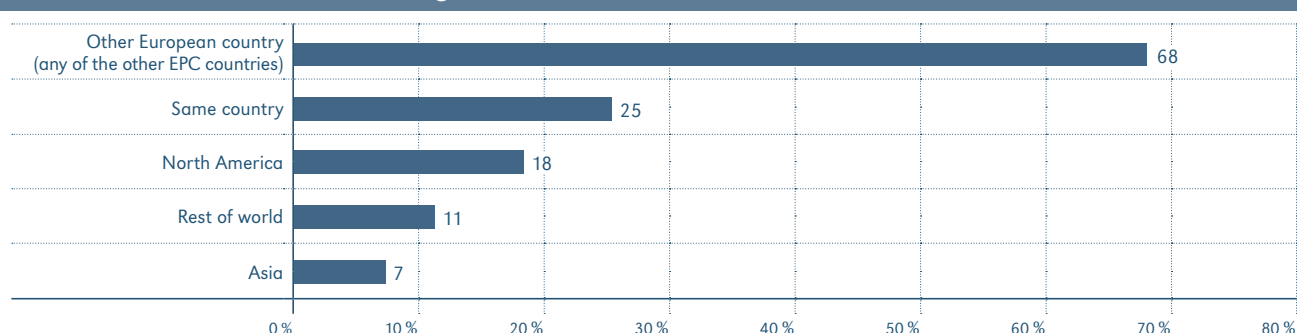
Basis: number of interviews unweighted N=453, of which 2% Don't know and 5% No statement. Note: Respondents were allowed to provide multiple answers.

Figure 11. Location Of Current Partners



Basis: Number of interviews unweighted N=285, of which 2% Don't know and 5% No statement. Note: Respondents were allowed to provide multiple answers.

Figure 12. Preferred Partner Location



Basis: number of interviews unweighted N=452, of which 9% Don't know and 4% No statement. Note: Respondents were allowed to provide multiple answers.

3. Strategic Approach to Challenges in Technology Commercialization

The findings of the survey clearly demonstrate the importance of European patents for successful technology commercialization in Europe. But they also highlight persisting challenges pertaining to finding business partners across borders, as well as the complexity of conducting negotiations to set up technology transfer agreements.

To a large extent, the key to successfully addressing these challenges lies in the ability of the SMEs to acquire the required skills and implement best practices. One of the major prerequisites for successful exploitation of new technologies is having a targeted IP strategy that supports the creation of customer benefits realized by products and services, or through business transactions and collaboration. In this context, intellectual property rights are a business asset that can add, create or preserve value for the SME.

Figure 13. Challenges In Collaborative Exploitation

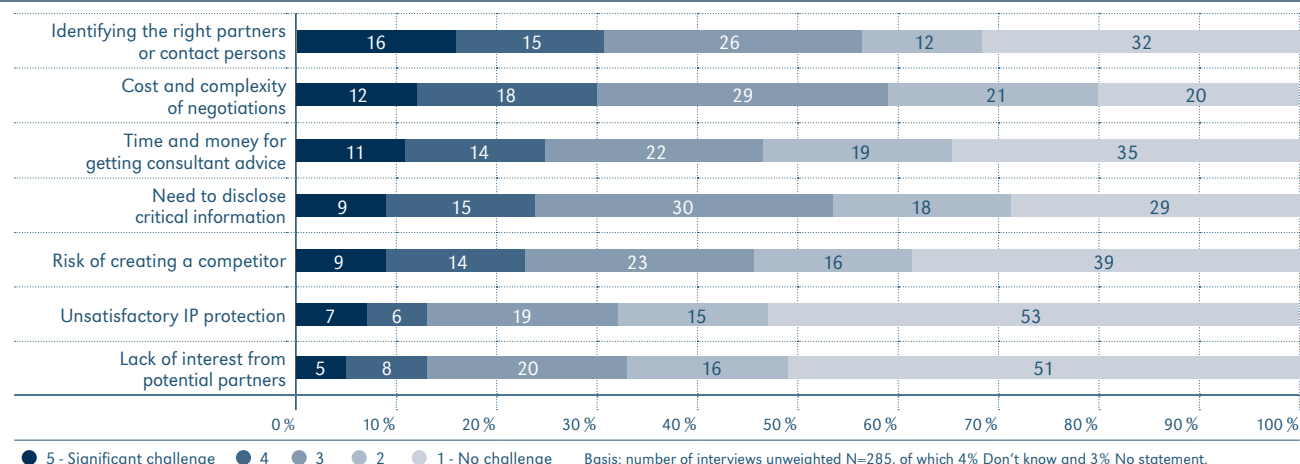
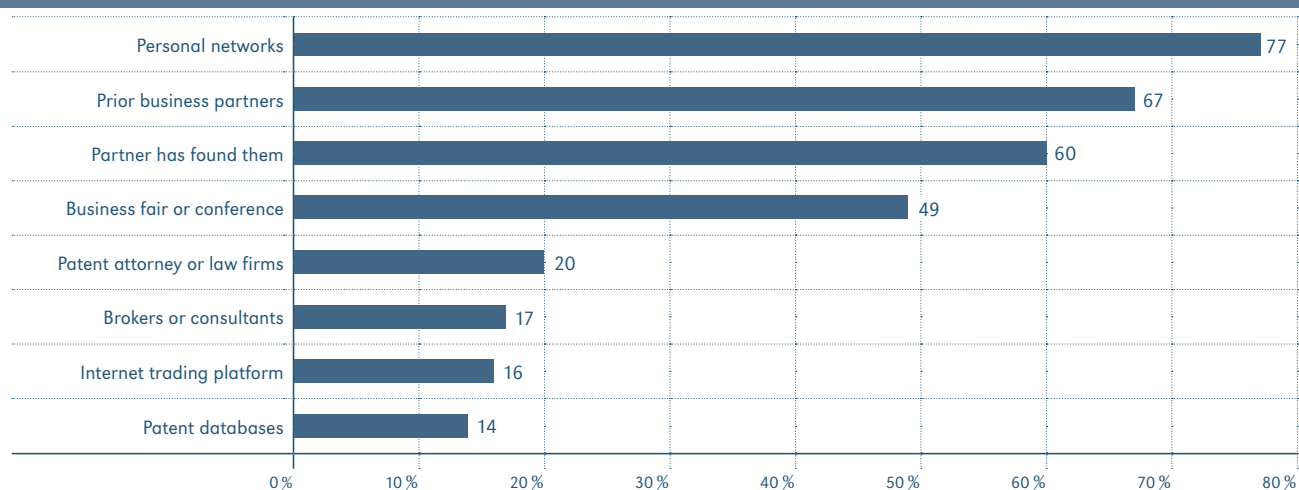


Figure 14. Channels Used To Find Partners



Basis: number of interviews unweighted N=285, of which 1%-2% Don't know and 1%-2% No statement. Note: Respondents were allowed to provide multiple answers.

3.1. IP Strategy Supporting the Business

The SME survey revealed that SMEs' IPR activities are mainly motivated (see Figure 2) by the wish to protect their inventions against copying, to build up a sound reputation or to achieve freedom to operate. At the same time, one of the root causes for the challenges observed is that SMEs lack a well-defined and communicated IP strategy and a goal-oriented IP management system for implementation, with the consequence being that their teams may not really know what goals their company aims to achieve or how to reach them.

These observations are based on feedback from participants of specialized training courses for SMEs, and is supported by the findings of the survey, although with some variation across Europe:

The frequency of IP activity reporting to the company's top management is a direct indicator of the importance given by SMEs to IP business matters and an indirect indicator of progress in the course of an IP strategy implementation. SMEs based in the United Kingdom and Germany

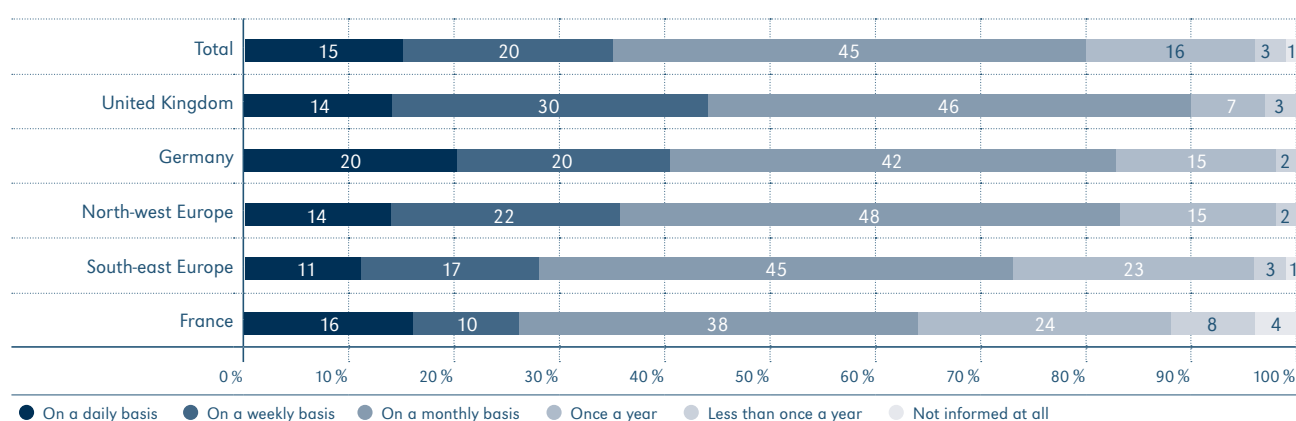
have a relatively high rate of IP reporting on a daily or weekly basis in 44 percent and 40 percent of cases, respectively. By contrast, SMEs in France and in south-east Europe lag behind, with a reporting frequency of 26 percent and 28 percent, respectively. See Figure 15, p. 163.

Having a dedicated IP department can be seen as an indicator for having an IP management system in place. SMEs in Europe report having a dedicated IP department in 25 percent of cases. This percentage is much higher in Germany (41 percent) and slightly higher in France (32 percent). By contrast, the fact that only 12 percent of UK-based SMEs report having a dedicated IP department suggests that they may rely more heavily on external IP consultants. Interestingly, no significant differences were observed at the sector level. See Figure 16, p. 163.

3.2. Overcoming the Challenges

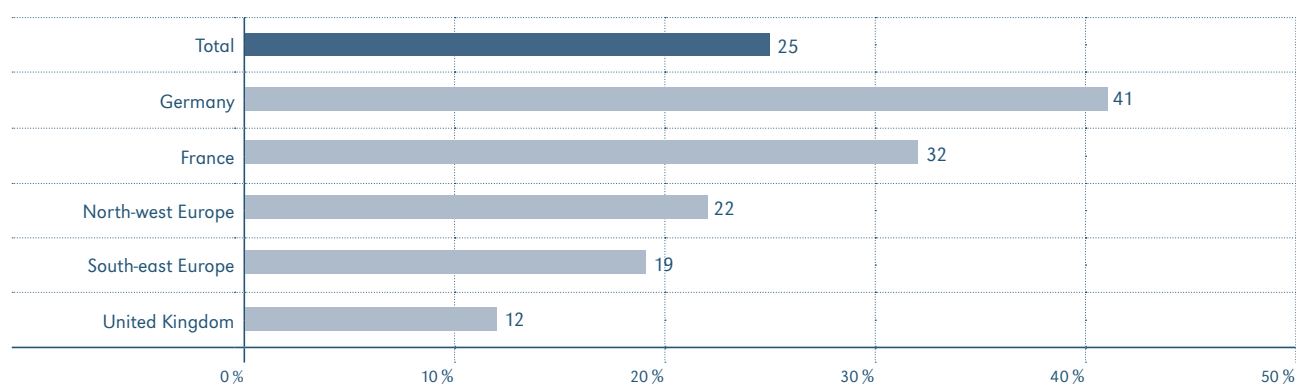
Creating awareness for the importance of IP strategy and IP management is important but not sufficient. Even businesses with some IP experience might struggle with changing requirements during company development, as

Figure 15. IP Activity Reporting



Basis: number of interviews unweighted N=1 441, of which 3% Don't know and 4% No statement.

Figure 16. Dedicated IP Personnel



Basis: number of interviews unweighted N=1 441, of which <1% Don't know and <1% No statement.

well as those caused by market dynamics. Therefore, businesses require training that will prepare them to cope with the challenges they are facing, as well as answers to their imperative questions. It is one of the tasks of the European Patent Network of national IP offices and their PATLIB centers, as well as the European Patent Academy, the external training arm of the EPO, to help them in this endeavor.

IP management practices—even in very different business environments—have many commonalities and tend to follow basic principles. Acquiring a sound understanding of best practices in IP management requires dedication, but it is rather straightforward when making use of the available publications,⁹ tools¹⁰ and training offers from these sources.¹¹ In addition, IP management is facilitated by the availability of external IP experts that can be engaged to fill potential gaps or help during periods of peak demand.¹²

More challenging is the development and advancement of a company's IP strategy. There is a huge diversity of IP strategies in place. As per definition they are very diverse, being tailored to the variety of business cases, growth stages and field of industry of the

companies that deploy them. In addition, IP strategies can evolve over time, which makes for a moving target. Training typically addresses such topics by either oversimplifying the topic or by demonstrating the full complexity. As a result, the topic is not always presented in a way that can be easily assimilated and implemented by SMEs.

One way to overcome this challenge is to improve communication between SMEs, for instance through case studies in which one SME informs another how IP can be leveraged for initial business success, as well

9. Examples can be found on epo.org/learning-events/materials.html, on www.iprhelpdesk.eu/Library or on www.4ipcouncil.com/4smes.

10. EPO's IPscore is a free-to-use tool to evaluate patents, technologies and research projects, epo.org/ipscore; Espacenet provides free access to over 100 million patent documents, worldwide.espacenet.com (accessed 07.04.2020); a collection of more tools can be found on innovaccess.eu/ip-toolbox/.

11. Examples can be found on epo.org/learning-events.html and euipo.europa.eu/knowledge/mod/page/view.php?id=78779.

12. Not-for profit services are offered by advisors of EEN, een.ec.europa.eu, and PATLIB, www.epo.org/patlib-centres.

as how the use of IP should evolve with a scaling business to ensure continued success. The EPO SME case studies¹³ are an example of such peer-to-peer communication, covering different regions, diverse technology sectors and underlying business models and companies at different stages of maturity. They highlight the experiences gained by the companies covered by the case stud-

ies. Each case study is designed for self-paced learning, and the presented takeaways enable SMEs to better understand how to use IP to their advantage. In addition, the case study material has been integrated in different training events, such as the IPforbusiness roadshow,¹⁴ which was successfully held in many European cities in co-operation with the European IP Helpdesk.

Matching Business Goals to IP Goals— A Practical Framework

For training decision makers and IP professionals in growth-oriented businesses, the EPO together with LESI have developed a two-day advanced training format titled “Succeeding at Technology Commercialization & Negotiation,” for which a practical framework has been developed that can be applied to different business cases and industry sectors. See Figure 17.

Step 1: Define Generic Business Goals

What are Generic Business Goals?

All organizations have up to five main needs or business goals,¹⁵ which are illustrated in Figure 17.

1. No surprises to current business, meaning a predictable business environment;
2. A Sustained and advantaged market position over competitors and copycats;
3. Full exploitation of all company assets;
4. Speed up of R&D and product development; and
5. Significant influence on industry adoption of new technology and business models.

Successfully implementing these five goals means achieving the company’s full potential and eventually becoming a “game changer.”

The order of the business needs reflects the situation for at least the majority of for-profit operating companies, although the order of level 3 and 4 can also be observed inverted or combined. Otherwise, it is important to note that, in general, the first levels have to be reached before an organization can work on the next higher level.

Step 2: Translate the Generic Business Goals Into IP Goals IP Strategies to Support Generic Business Goals

There are five main IP goals corresponding to and supporting the described business goals:

1. As a basic requirement, if an organization doesn’t have freedom to operate (FTO), it sooner or later perishes. For every mature or high-growth-oriented company this can be seen as a must-have.¹⁶
2. An organization has to manage its IP portfolio to maintain a leading market position by preventing competitors from copying their most profitable products and services, and to lower their costs as far as possible.

3. In order to maximize the rate of corporate growth, and optimize not only costs but also revenues, most for-profit organizations engage in out-licensing programs for greater market penetration as well as for general licensing out of non-core IPRs.

4. The next level needed for successful business performance is to rapidly develop new desirable products and services. This is enhanced by in-licensing or purchasing new technologies or businesses.^{17, 18}

Levels 3 and 4 may also be inverted, or combined in an approach known as Open Innovation;

5. Lastly, at the highest level, intellectual property rights can be used to shape the direction of the industry by (i) setting new regulatory and technical standards, which are based on business and technical pre-competitive collaborations, or (ii) establishing disruptive business models to create new markets.

Applying this systematic approach facilitates deriving an IP strategy that is based on what the business already has achieved, but also defines beyond that how they get where the business wants to be in the mid- and long-term. With a well-defined IP strategy, the company’s management can much better communicate to the team and their business partners the direction the company is heading. That is the prerequisite for an effective and efficient implementation. The right IP strategy refocuses the organization’s IP efforts on filling performance gaps at the current level before reaching the next level.

Figure 17. Aligned Business And IP Goals

Business Goals	IP Goals
• No Surprises	• Freedom to Operate
• Advantaged Position	• Portfolio Management
• Full Exploitation	• Out-Licensing
• Speed Up R & D	• In-Licensing
• Influence Industry	• Regulatory, Standards & Business Model Disruption

Disclaimer: Any opinions expressed in this article are those of the authors and not necessarily those of the European Patent Office. ■

Available at Social Science Research Network (SSRN):
<https://ssrn.com/abstract=3583071>

13. European Patent Office. Bereuter, Thomas; Yann Ménière & Ilya Rudyk (eds.), 2017. Unlocking untapped value, EPO SME case studies on IP strategy and IP management, *epo.org/sme* (accessed 16.03.2020).

14. *iprhelphdesk.eu/training/IPforBusiness_Roadshow* (accessed 07.04.2020).

15. Germeraad, Paul. 2017. “Chapter 8: Strategic IP Planning.” *Germeraad Group Inc.* Accessed 16.03.2020. *germeraadgroup.com/table-of-contents/*.

16. As an example, companies will see it as a top priority to minimize the risk that their products or services are stopped from being sold due to a potential preliminary injunction based on an alleged infringement of third-party rights.

17. Heiden, Bowman and Ruud Peters. 2020. “IP and Open Innovation: Managing Technology Push and Pull.” *les Nouvelles* 55, no. 2 (June): p. 138.

18. B. Weibel and R. Freytag, “Why Digitalization Needs Value-Driven Intellectual Property Strategies,” *les Nouvelles*, December 2019, *ssrn.com/abstract=3470192* (accessed 05.04.2020).

Partnering For Succeeding At Technology Commercialization: A Negotiation Master Class Case Study

By Thomas Bereuter, William Bird and Martin Schneider*

Abstract

Cooperations in which know-how and resources are synergistically combined increase the chances for effective commercialization of new technologies in international markets. Negotiations are necessary for partnering and are a kind of collaborative problem solving. This requires soft and hard skills, as well as proper preparation. Mock negotiations are a praxis proven way to train and empower both aspiring and experienced negotiators. LESI and the European Patent Office (EPO) have jointly developed an advanced training format combining training on IP strategy and IP management with a three party negotiation case study about innovation management and patent transactions. Participants join negotiation teams and, in a “safe” environment, apply what they have learned and hence advance their soft skills. The three-party negotiation is about marketing a medical technology with an Industry 4.0 ICU console that requires a combined approach of IP, AI, GDPR, telemedicine, block chain, control of big data, patient specific customized therapy, re-use of consumables and many more current aspects.

Introduction

Small and medium-sized enterprises (SMEs) are eager to commercialize their technologies in collaboration, but are usually challenged with finding business partners across borders and by the complexity of conducting negotiations to set up technology transfer agreements.¹ To a large extent, the key to successfully addressing these challenges lies in the ability of the businesses to acquire good negotiation skills. Therefore, business management that is better equipped to utilize, enhance and exploit its IP assets can more effectively implement good IP management tactics and strategies.

For that reason, the EPO's European Patent Academy and the Licensing Executives Society International (LESI) joined forces to fill the gap with corresponding training offers.² Their experts developed the new two-day advanced training course *Succeeding at technology commercialization and negotiation—Connecting the dots between*

*IP and business.*³ The course is based on the experience of various courses that had been organized and run for many years.⁴ It is designed for entrepreneurs, intrapreneurs and intellectual capital and business development managers from SMEs, start-ups, spin-offs, emerging enterprises, multinational corporations (MNCs), technology transfer and research organizations.

Training Goals and Course Design

The *Succeeding at technology commercialization and negotiation* course provides a comprehensive set of tools and techniques to help firms benefit from their IP and put it at the heart of their business strategy. It covers the following topics:

- Refining the IP strategy to align with the business
- IP management and opportunity creation
- IP assessment: Which IP should be pursued?
- Scrutinizing the invention and patent filing tactics
- Licensing best practices with examples from life science
- Negotiation and post-contract issues
- IP valuation and royalty rates

These interactive classroom trainings last one-and-a-half days and include a speed networking session. The IP

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1. European Patent Office. 2019. “Market success for inventions. Patent commercialization scoreboard: European SMEs,” epo.org/scoreboard-smes (accessed 16.03.2020).

2. Following the execution of the Memorandum of Understanding between Licensing Executives Society International (LESI) and EPO in Miami on 26 January 2019, LESI and EPO launched in June 2019 the new training course series.

3. The first trainings were held in Basel (June 2019) and Istanbul (October 2019) engaging the national chapters LES Switzerland and LES Turkey, respectively.

4. The negotiation masterclass is particularly based on the experience with negotiation case studies that has been used in licensing courses of LES Benelux for approximately 15 years.

negotiation masterclass training lasts the remaining half day and shows in practice how to come to a commercial deal by negotiating and agreeing on terms with commercial partners. It also covers the process of managing the deal once contracts are signed.

Participants prepare for that part of the course before it begins by studying the general information about the case, which is provided electronically. The actual negotiation takes place during the afternoon in a compressed and efficient version, focusing on essential aspects of the potential deal.

The aim of the negotiation lesson is to give participants an opportunity to try out whatever negotiation skills they possess and acquire in a supportive atmosphere. It attempts to be as close as possible to reality in terms of the parties involved and the IP, technology and content issues that are being negotiated. Of course, the short time given for conducting the negotiations means that some typical aspects of negotiations must be compressed or even eliminated to better fit the time restrictions.

Based on experience in other environments or due to simple misconceptions many inexperienced people have regarding negotiation, it is oftentimes thought to be either something like an art that they can't learn or a battle between opponents over resources that need to be shared.

Ultimately, in the context of technology commercialization, people negotiate with each other because they have a shared interest in solving a problem or reaching agreement. For that to happen, they need to feel that their issues and interests have been heard, understood and addressed. Consequently, negotiation is not about applying tricks or playing games or being the most effective liar. Those strategies tend to ruin what could turn out to be long-term professional relationships. Instead it should be emphasized that negotiation is focused on collaborative problem-solving. With technology commercialization, the best outcome is to build long-term trusting and mutually beneficial relationships, and these combative and outdated approaches to negotiation arguably have no place.

Negotiation Scenario

The subject matter of the negotiation course is an industry 4.0 Intensive Care Console (ICU) for “smart health.”

The negotiation study is fictitious, but is based on a variety of real events and cases. Although the topic fits in well with current global events, it was actually developed before the recent outbreak of SARS-CoV-2/COVID-19. It is relevant to the problems facing health care providers fighting highly contagious pandemics where remote monitoring (tele ICU) is one promising approach. In the lesson, key components of the technology are owned or created by three separate companies. The negotiation

study suggests that, if negotiating teams can reach agreement, the three parties could together develop such an ICU console, which would then be capable of monitoring and even partially treating patients without jeopardizing the safety of some of the care providers, who with this technology can be located well away from the patients. In addition, the reuse of consumables is a foreseen option. This is not only an environment and cost factor, but also has relevance when supply chains don't function. The negotiation study demonstrates that cooperation, including licensing of patented devices and facilitated therapies, can not only be essential to solving customer problems, but also enhance health system outcomes during difficult times.

The Organization of the Negotiation

In advance, each participant receives background information about the three fictional parties in the negotiation case study. As in a real-life negotiation, participants have to study this material diligently in preparation of the actual negotiation.⁵ On the day of the course, each participant is assigned to one of the three companies. The participants then work in teams, each team representing one of the three companies. Specific confidential instructions, each designed for the team representing one of the companies, are distributed on the day of the course.

- The aim of the exercise is to learn about innovation management by co-operating. The participants have to analyze these specific instructions to solve technical, financial and licensing issues, as well as arrive at an agreement of how to define the overall business case for the Industry 4.0 ICU console for “smart health.” In doing so, participants are confronted with issues relating to:
- IPRs such as patents, know-how, trade secrets, etc.
- Artificial intelligence and machine learning
- Patient-doctor confidentiality
- Control of big data and General Data Protection Regulation (GDPR)
- Remote monitoring and telemedicine supported by block chain technology
- Increased efficiency for patient-specific customized therapy
- The importance of being first to market
- Cost containment leadership
- The importance of product differentiation
- Life cycle management, including *recycling plastics vs. re-use of plastics*
- Product liability concerns
- Non-disclosure agreements
- The importance of setting milestones.

Asymmetric Information

A key component of the mock negotiation is that none of the three teams possesses a comprehensive set of important information or abilities. One of the three com-

5. Participants should receive background course materials about three weeks prior to the event to allow them to study the material comprehensively beforehand.

panies is an SME, one is a large multinational conglomerate and a third is a specialized medical equipment manufacturer. This allows the teams to explore specific issues of how innovative SMEs can work with more powerful multinationals during the training. A large multinational company may be reluctant to integrate vital equipment supplied by an SME and may, for example, demand a second source. These issues can be dealt with through suitable milestones that guide behavior in the future. The difference in size of the companies can result in asymmetry of information, which means that the teams must endeavor to communicate properly. For example, they need to share the information that only they possess, so that synergies can be spotted and common ground can be defined.

Complexity of Multiparty Negotiations

A vital aspect of advanced negotiations is the ability to form coalitions. The complexity of such a negotiation increases rapidly as the number of parties increases.

One of the important goals in the three-party negotiation is to achieve “balance,” *i.e.*, the aspect that all participants are actively involved in a balanced way. This requirement can conflict with the need for coalitions as these oftentimes exclude one party. Even though the norm is that one party is excluded from discussions about an alliance between other parties, the negotiation in this lesson is designed in a way so that all three parties continue to be involved right up to the end of the negotiation. This means that any coalition must not isolate a party completely as the aim should be a “winning coalition” that includes all parties. Indeed, the distribution of the technical information in the lesson is devised so that all three parties are required for a successful deal. See Figure 1.

Figure 1. A Well-Balanced Negotiation Approach Will Keep All Parties Busy At All Times In Order To Achieve An Overall Agreement In Time



Layers of Difficulty

Providing a training course for professionals differs significantly from teaching pupils and students in that each professional brings along a combination of experience and knowledge. Hence, participants are automatically in a position to raise or lower the bar based on their existing skills and experience. However, the difficulty of supporting participants with potentially great differences in experience and knowledge remains. This potential problem is best addressed by having a team of trainers, preferably with different backgrounds, act as facilitators.⁶

The negotiation makes use of layers of difficulty in accordance with what is known as “subjective difficulty” in video games. That means participants can start at a kind of entry level or go to advanced levels. All the layers of difficulty are presented to the participants at the same time. However, some layers are obvious and some more covert. The covert layers do not disturb or confuse the participants with less knowledge as they do not necessarily identify the covert layers that go beyond their knowledge. On the other hand, the experienced participants have an opportunity to make an extra contribution with their identification and analysis of the covert layers.

Decision Rules

In real negotiations, decision rules among negotiation teams are defined in advance to speed up achieving an agreement with other parties and to prevent individuals from blocking or delaying the negotiation team in its decision taking.

For the mock negotiation, no rules are specified, and each team may select whatever scheme they prefer. Participants are also free to decide upon the number and scope of required meetings.

No restrictions are applied as to achieving intermediate results. The only result that is of any importance is the achievement of an agreement which allows the product to be successfully launched in the marketplace.

Relevance of the Stakes

The technical content of the EPO—LESI negotiation is based on real events and facts. The reason for being meticulously careful to base the negotiation on real events is that the participants can deal with subject matter of the kind they may meet in real life. Although the participants were given as much freedom as possible, they were required to accept

6. Based on the experience with past courses, two trainers are recommended as a minimum. Up to 50 participants can be effectively supported with three facilitators.

the facts of the case presented to them as being true. The technical content has been made consistent with modern concepts of industrial organization. Important issues of ecology have also been included. See Figure 2.

Figure 2. The Technology Relates To Mechanical Ventilation Of Patients Who Cannot Breathe On Their Own⁷



Further Training Aspects:

• IP Audit

It would be conventional to have an IP audit in the course of a real-life negotiation. For efficiency reasons, the case described is focused on a few relevant IP rights, such as patent applications, granted patents, know-how and copyright. The participants should be in a position to analyze the IP situation in a rather short time.

• Marketing

One of the learning goals is to better understand innovation management, of which licensing of IP is only one part. Accordingly, teams must conceive a marketing strategy beyond IP, such as how being first to market can be a good strategy even without patent protection.

The case study includes the option to license patent applications and not just granted patents. It is also relevant

to work on the challenges of synchronizing the patent protection with the requirements of the market.

• On-site Support

In order to help teams move forward and to address any stumbling blocks, supervisors were available to monitor negotiation activity and to solve observed challenges. Experienced course supervisors have to assist with and resolve any difficulties encountered by the teams. For example, the supervisors should be able to assist in pointing out areas of agreement among teams and providing other helpful advice.

• Team Size

The size of teams is ideally set at six members, with a typical range being between four and eight. The maximum number of participants who are split into groups to carry out negotiations in parallel thus far has been approximately 150, although 36 to 48 is more usual and easier to manage.

• Debriefing

The negotiation teams present their results and reflect on their experiences so that participants can learn from other negotiations as well, not just the negotiation in which they were involved. This final presentation is moderated by the trainers. A significant part of the lessons learned is covered by this exercise. In any case, the wrap up can be combined with a debriefing to fill potential gaps and layers that might have been overlooked by the participants.

Outlook

The current EPO—LESI two-day licensing course is made accessible by the Education committee of LESI and the European Patent Academy. While it does have elements that are life-science specific, in the future, variations of the course for information and communication technology areas, as well as one dedicated for scale-ups, is foreseen. The technical and legal details of the negotiation study will need to be adapted to specific legal and/or technical issues. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3583075>

7. The publication about Aerogen inspired the drafting of the negotiation case study. For more information see: Thomas Bereuter, Yann Ménière & Ilja Rudyk (eds.), 2017, “Unlocking Untapped Value, EPO SME Case Studies On Ip Strategy And Ip Management, epo.org/sme (accessed 16.03.2020).

The Making Of The High-Growth Technology Business Conference 2019:

Reengineering Conference Delivery To Maximize Impact

By Thomas Bereuter, Yu Sarn Chiew, Juergen Graner and Ilja Rudyk*

Abstract

Conferences are a very traditional way to stay up to date in a certain field or industry, but are less popular for smaller and younger enterprises and their management. The huge success of the High-Growth Technology Business Conference 2019, organized by LESI and the EPO, was based on an extensive re-engineering of how conferences ought to be delivered.

The key goals of the re-engineering were inclusion (attract IP professionals as well as high-growth business decision makers), efficiency (minimize the time at a conference but maximize the outcome), learning (provide original content from top speakers and trainers), implementation (ensure learnings can be applied in the organizations of participants) and networking (enable networking also for those not so networking savvy).

The tools used to achieve the key goals were a dual track system (one track for IP and one for business), conference and training day combination (only one day of conference followed by one day of in-depth training sessions), short and crisp sessions (shorter presentations focusing on key messages), meet-the-speaker opportunities for participants, summary slides (one summary slide at the end of each session), summary videos (short, two-to three-minute summary videos of selected speakers for recall at home), speed networking (structured get-together), and IP Clinics (IP specialists providing one-on-one input for participants).

1. Introduction

Small and medium-sized enterprises (SMEs) represent 99 percent of all businesses in the European Union (EU) and contribute 57 percent of the EU's gross domestic product. SMEs are also very important in other economies. A large proportion of the value generated by SMEs comes from a small number of high-growth businesses,¹ which are often very innovative.

Research on Europe shows that SMEs that have filed at least one IP right are 21 percent more likely to experience growth afterwards and 10 percent more likely to become a high-growth business than enterprises with no patent applications. SMEs that go beyond national protection and file for European patents have an even greater likelihood

(17 percent) of becoming a high-growth business. Research found that in high-tech industries, SMEs that have filed a European patent are 110 percent more likely to experience high growth; in low-tech industries, the figure is 172 percent. The chances of an SME becoming a high-growth business increase by 33 percent if it uses “bundles” of trade marks, patents and designs instead of one single IP right category.²

Effective use of the IP system is increasingly viewed by governments, international organizations and businesses as key to the success of economies. Due to its tremendous impact on growth and job creation, more attention is paid to potential high-growth businesses to unleash the full power of patents and technology. Providing IP expertise, training resources and contacts to support the commercialization activities of numerous businesses is a demanding mission that can only be achieved through joint effort that leverages the resources of committed organizations.

1.1 The LESI-EPO Collaboration

In 2018, LESI and the EPO took their cooperation to the next level by signing a memorandum of understanding. One joint endeavor was the creation of a new conference format with the goal of getting more business decision makers from SMEs engaged with IP-related topics. The

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*authors in alphabetical order

1. High-growth firms are defined as those that have had an average growth rate greater than 20 percent per year over three consecutive years and that had at least 10 employees at the beginning of the growth period.

2. High-growth firms and intellectual property rights—IPR profile of high-potential SMEs in Europe, EUIPO and EPO, May 2019, ISBN 978-3-89605-228-5, also available at epo.org/high-growth.

overall challenge identified was that most business decision makers in SMEs across Europe leave IP to specialists (lawyers, licensing professionals and consultants), instead of seeing it as a top priority in their strategy making and execution. This is regarded as a major obstacle to unlocking the hidden value of IP.

1.2 The LESI Perspective

LESI originated in the U.S.A. It focuses on facilitating IP transactions between enterprises by providing support to executives in the IP rights licensing field to reduce the risk of these entities blocking or attacking each other through costly litigation. Education and capacity building, peer support and establishing standard practices, tools and techniques became the basic pillars of LESI, which currently has 33 national and regional member societies around the world with members from more than 90 countries.

On a global scale, LESI has been very successful at establishing a sound understanding and capacity building for numerous enterprises. For decades the strongest growth in members was in the U.S., but lately growth has shifted to chapters in Europe and Asia. In Germany the main drivers for this growth have been the engagement of members from businesses, whereas in Asia the drivers have been rapid economic development and an increasing awareness of IP as an important factor in the next phase of economic growth. The trends indicate that LESI has contributed to a sustainable situation for industry in the U.S. and Europe. However, there is still huge potential for LESI to serve smaller high-growth technology businesses in a similar way in many other economies.

Interactions within the LESI universe currently take place mostly between IP lawyers, consultants and practitioners in larger enterprises and research organizations. For some time, members of LESI have expressed a desire to expand the network of LESI to include business decision makers of SMEs. This would help put IP on the strategic business agenda within growth-oriented SMEs. The new conference format jointly developed by the EPO and LESI was intended to be the first step in this direction.

1.3 The EPO Perspective

As the external training arm of the European Patent Office, the European Patent Academy (Academy) provides training for patent professionals, judges, national offices, academia and, last but not least, businesses contributing to the ecosystem of innovation in Europe. For businesses—the current and future users of the patent system—the Innovation Support program area of the Academy offers training and training support on IP strategy and management to facilitate the effective use of the patent system by businesses for value creation.

A cornerstone target group are SMEs, especially in the tech and high-growth sectors. Academy training is tailored to the needs of SME executives and staff involved in IP management. To reach innovators effectively and leverage available resources, Innovation Support cooperates internally with the Chief Economist unit and externally with intermediaries (e.g., LESI, IP Helpdesk

of the European Commission), national intellectual property offices, EUIPO and multipliers (e.g., business and IP advisers, patent information centers/PATLIBS, chambers of commerce, incubators and clusters).

The Academy engages in a variety of training activities, including online offers, conferences, workshops and seminars. It also provides support for trainers of intermediaries and multipliers in the form of training material and tools. Like LESI, the EPO is highly motivated to increase its impact by not only supporting IP specialists, but also business decision makers from high-growth tech businesses across Europe to move the IP agenda to the business strategy level.

1.4 The High-Growth Technology Business Conference 2019

To set a cornerstone for engaging decision makers of SMEs across Europe with IP, a scoping workshop was held in Dublin in November 2018. This workshop brought together stakeholders like the Center for Intellectual Property (CIP), European IP Helpdesk, the Irish Patents Office, EUIPO and other external advisers with representatives of the EPO and LESI, who were the organizers. The goal was to develop an innovative conference model with the potential to attract the whole stakeholder group around SMEs, with business decision makers at the core of this group. See Figure 1.

In addition, that scoping workshop determined that this conference should become a benchmark for the conference organizers in general, who may also be interested in attracting different audience target groups and providing value to all of them in the most efficient way. The

Figure 1: Stake Holder Groups Around SMEs That Are Important For A Well-Functioning Innovation Ecosystem



3. epo.org/business-success (accessed 01.04.2020).

scoping workshop laid the foundation for the first High-Growth Technology Business Conference,³ held in Dublin in November 2019.

Figure 2 outlines the most significant goals and tools that were the result of the scoping workshop, which became the foundation for 2019.

This article outlines the key goals of the conference framework—(1) inclusion, (2) efficiency, (3) learning, (4) practicability and (5) networking—as well as the innovative tools developed to achieve the best possible outcome for conference participants.

2. Key Conference Goals

Goal 1–Inclusion

In many SMEs, intellectual property topics are often delegated to specialists too soon, and therefore regularly fail to become part of the core strategy of the organization. It is clear that, to support technology-driven SMEs in their quest to generate more value from their IP, it is important to attract IP professionals. Feedback from the market and findings from LESI and the EPO (see 1.2 and 1.3) also suggest that it is crucial to engage business decision makers. Only by broadening the audience to include decision makers within SMEs can the IP message make a sustainable impact on businesses.

In addition, the whole ecosystem must be engaged. This is required for successful technology commercialization. Therefore, representatives of large enterprises, technology market facilitators, strategy and IP advisers, research institutions, and investors with SME interfaces need to be attracted as well (see also Figure 1 under 1.4).

Goal 2–Efficiency

While efficient content delivery is important for any audience, this applies even more when business decision makers are being targeted. IP is not necessarily their top priority. Therefore, the chances of getting them to come to such a conference are greater if their time is used efficiently and the topic of IP is embedded in content of stra-

tegic importance to their business and combined with actionable advice.

Goal 3–Learning

Acquiring new knowledge about an area of importance is probably the number one reason people come to conferences. Therefore, the creation of original, up-to-date content from top-notch speakers that provides new aspects or a different view on topics relevant for the audience in an accessible way is an important factor. Content must be provided for each group of the targeted audience (see also Goal 1).

Goal 4–Implementation

As mentioned above, attracting business decision makers is a prerequisite, but the key to the success of the conference is to ensure that the knowledge provided at the conference is packaged so it can be easily shared within and across organizations after the event. Therefore, the conference was intended to not only attract and engage practitioners from different parts of the IP ecosystem (see also Goal 1), but also to make sure that the knowledge and best-practices presented were relevant and practical so that they could be implemented in their organizations by the attendees.

Goal 5–Networking

Since networking is a standard and important element of any conference, the aim was to ensure that the networking possibilities did not suffer from the measures taken to foster the efficiency of the event. A special focus for the conference was to facilitate networking with peers, but also between IP specialists and business decision makers. Thus, it became important to create and test new options for networking not usually seen at conferences.

3. Key Conference Tools and Their Impact

Tool 1–Dual track

If the intention is to cater to sufficiently different audiences in one conference, the best solution is to establish parallel tracks.

Figure 2: Matching Of Goals And Tools Creating The Foundation For The Conference

GOALS	Inclusion	Efficiency	Learning	Implementation	Networking
TOOLS					
Tracks	✓		✓		✓
Conference & training day	✓	✓	✓		
Short & crisp sessions		✓	✓	✓	
Meet the speakers		✓	✓	✓	✓
Summary slides		✓		✓	
Summary videos		✓		✓	
Speed networking	✓	✓			✓
IP Clinics			✓	✓	

3. ipo.euroipa.org/business-success (accessed 01.04.2020).

The conference combined a business and an IP track. Since SME business decision makers generally do not put IP at the core of their strategy and usually outsource it to lawyers and IP specialists, it was necessary to have a business track that would target their needs, but also be attractive to other audience groups as well.

From a topic perspective, the IP track was very straightforward, since many of the speakers were used to speaking to this audience.

The business track was much more challenging from a topic and speaker perspective, however. To attract business decision makers, it was important to present topics from a business-strategy and people-management perspective while at the same time demonstrate the role of IP in generating value from day-to-day management all the way to strategic transactions, including alliances, licensing, spin-offs and divestments.

Results:

The two tracks (business and IP) worked well for all target groups. The mix of switching between general plenary sessions and individual track offerings, and the possibility for participants to pick and choose on a session-by-session basis allowed participants to get the most out of the conference.

The two tracks helped with the inclusion and learning goals of the conference. In addition, they also had a positive impact on the networking goal when individuals switched between the tracks and, in doing so, interacted with different audiences.

The IP track was chosen by 55 percent of participants, while the business track was chosen by 45 percent. The initial target to attract at least 20 percent from SMEs was achieved, since around 25 percent of all participants had an SME background. Of the SME participants, 60 percent were business decision makers, as the following breakdown of SME participants shows. See Figures 3 and 4.

Key Challenge:

Encouraging business decision makers and IP specialists to mix and match among both tracks and not get stuck in the track that naturally suits them requires thorough planning, structure and effective implementation of the conference.

Tool 2—Conference and Training Day

Combining a one-day conference (several topics in larger groups but fewer interactions with the audience) with one day of training (fewer topics in smaller groups, but more audience participation) allows for a highly efficient learning experience that participants can take back to their organizations and implement to help them succeed in their work environment.

In 2019, the one-day conference was followed by a day of training. The training day

was also divided into two tracks (business and IP) to cater to decision makers and IP specialists. Participants were able to choose either half-day or full-day training courses in the respective tracks. Since the training courses were offered by speakers from the conference day, there was a direct continuation of the topics covered in the conference, providing participants with a truly immersive experience.

Results:

Most participants took advantage of the training day to deepen their knowledge in certain areas. Surprisingly, many decision makers, who were expected to only go to the conference, also decided to take part in some of the training offerings on the second day. Training sessions were split into two full-day training courses and four half-day training courses. The training turned out to be very important for attracting the target audiences to the event.

The conference and training day format helped with the inclusion, efficiency and learning goals of the conference.

Figure 3. Share Of Chief Officers (CXOs), Directors And Founders

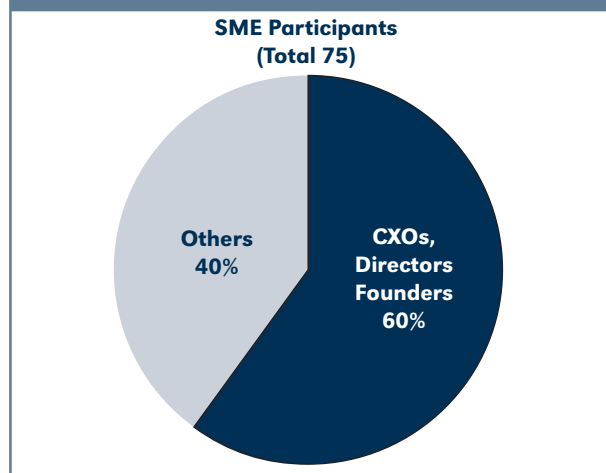
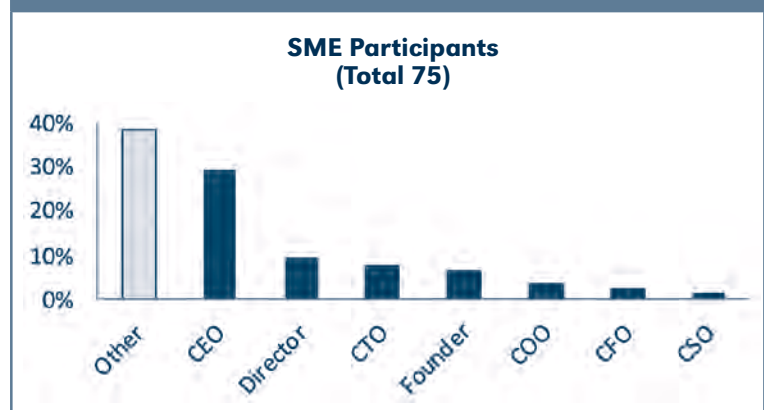


Figure 4. Detailed Breakdown Of Business Decision Makers Of SMEs



Key Challenge:

Offering enough training sessions (focused on smaller groups) for all conference participants is difficult to achieve when scaling this conference format up to more than 500 participants. This is important to maintain, since training sessions are intended for a smaller audience.

Tool 3–Short and Crisp Sessions

Standard two-day conference formats allow for relatively lengthy presentations with a limited number of keynote lectures. For 2019, five keynote speeches were scheduled for the conference day (two back-to-back keynote lectures to start the morning, two back-to-back keynote lectures to start the afternoon and one keynote before dinner). This was made possible by reducing each keynote lecture to 20 minutes. Reducing the duration of sessions requires speakers to focus on the delivery of key points for the audience. This not only helped to condense a two-day format into one day, it also ensured that participants would not struggle to find the key points in the presentations, since they were delivered in an efficient and straightforward manner.

The mini-plenary and breakout sessions, which followed the keynote lecture blocks, were also trimmed for the sake of efficiency, providing a 50-minute time-slot for mini-plenaries and a 40-minute time-slot for breakouts, with three to five speakers each. The whole conference was streamlined, based on short and crisp sessions that provided implementable key messages for participants. Since providing key messages in a short time format is not something conference speakers are used to, an extensive pre-conference review process during the preparation phase with the speakers was implemented.

Results:

Audience feedback regarding the delivery of key messages was overwhelmingly positive. While the speakers enjoyed the outcome of being forced to focus on key messages, many of them stated it was more difficult to prepare for a shorter session than a longer one. However, both speakers and the audience agreed that the results paid off.

The short and crisp sessions helped with the efficiency, learning and implementation goals of the conference.

Key Challenge:

It is not easy to get speakers to compress their key messages into shorter sessions and make sure that none of the main takeaways get lost, all while adhering to the assigned time-slots. Maintaining this discipline requires pre-conference alignment and a well-structured review process.

Tool 4–Meet the speakers

Q&A time at the end of conference sessions (especially keynotes) are often hijacked by participants who want to market themselves. Also, many questions can be irrelevant for the majority of the audience, as they are too specific. Substituting Q&A with meet-the-speaker sessions during the break following the presentations and throughout the conference helped to overcome these problems.

At the conference, Q&A sessions were eliminated from keynote lectures and mini-plenary sessions. Instead, speakers made themselves available for further questions during the next break at specific “meet-the-speaker corners” for interested audience members. Part of the speaker engagement was a requirement to be available throughout the whole conference day for participants and their questions. Furthermore, the moderator repeatedly instructed the audience to interact with the speakers during the breaks.

Results:

Although not everyone who attended the presentation stayed to meet the speakers, the questions asked were very specific to the individual needs of participants. Due to the availability of speakers throughout the day, many more participants were able to ask follow-up questions. Also, the networking aspect of the event, especially between the audience and speakers, was greatly enhanced.

The meet-the-speaker offering helped with the efficiency, learning, implementation and networking goals of the conference.

Key Challenge:

It is important to provide prominent and dedicated spots close to the general audience for participants to meet the speakers. Moreover, participants need to be continuously reminded to make use of these opportunities as this is not usually done at conferences.

Tool 5–Summary slides

The problem for anyone who goes to a great conference is determining which key messages they should try to implement from the hundreds of slides they saw. The requirement for each speaker to provide a single summary slide that contains the implementable take-home messages for the audience is one solution to this problem.

For the conference, speakers were required to provide a one-page take-home slide for the audience with actionable advice. The conference organizing team carefully worked with speakers to make sure that each session would end with this slide. The summary slides were also provided to the participants in a shareable electronic format after the conference.

Results:

The feedback received from the audience was that these summary slides were very useful and enabled them to take these key messages back to their companies and share them with peers. Even individuals that did not attend the session were able to benefit from the summary slides.

The summary slides helped with the efficiency and implementation goals of the conference.

Key Challenge:

It is not easy to get all speakers to provide a summary slide of implementable takeaways. It requires a lot of intervention from the conference organizers. However, this can be partially outsourced to pre-assigned session chairs if there is more than one speaker in a presentation.

Tool 6—Summary Videos

People do not usually want to see the recording of a lengthy presentation. By recording a short, two-to-three-minute summary video of key presentations, the content is more likely to be viewed not only by anyone interested that could not attend, but also by attendees once they are back at their organizations.

For the conference, a select number of speakers were chosen to record a two-to three-minute summary video of their presentation ahead of or during the conference. Answers to likely follow-up questions of interest were also recorded, adding more value to the video.

Results:

Summary videos were produced, published online and shared with attendees. An ongoing publication of summary videos can help to keep the community alive and be easily promoted on social media. Moreover, the feedback from participants has been that they would go back to those summary videos for some of their perceived key sessions to get input relevant to some of their day-to-day challenges.

The summary videos helped with the efficiency and implementation goals of the conference.

Key Challenge:

Speaking in front of an audience and recording a crisp, two-minute summary with a camera team are different experiences. Great speakers are not necessarily great in front of a camera. Good preparation, training and patience are needed. A script and Q&A outline prepared by the speakers before the recordings can facilitate the process. Another option is to make a video after the conference. This allows speakers to take on board feedback obtained at the conference and prepare separately for the video.

Tool 7—Speed Networking

Networking is an important part of any conference. However, networking is rarely very efficient, and only a limited number of people can be met. Moreover, some people are better at networking than others. A structured speed networking event where participants meet many people in a short space of time can help.

At HTBC 2019, at the end of the program for day one, attendees could join a speed networking routine. Stand-up tables were set up in a room and two participants were put on opposing sides of each table. When a bell was rung, participants had two minutes to introduce themselves and maybe exchange business cards or social media links. At the end of the two minutes the bell rang again, signaling the participants to move to the next table (like a merry-go-round). Conference participants not at the speed networking could network at their own pace in another room.

Results:

The speed networking had 40 participants meeting each other around 20 stand-up tables. Many used the op-

portunity to get to know a larger number of participants. It also gave them a foundation for further networking later. Participants provided very positive feedback, including that they had some fun as well.

The speed networking helped with the networking and efficiency goals. It also supported the inclusion goal, since it further encouraged IP specialists to mingle with business decision makers.

Key Challenge:

For logistical reasons, speed networking can only be run for a limited number of participants. To avoid a last-minute rush for the limited spaces provided, it is advisable to have participants sign up for this activity, either during the conference registration procedure or early during the conference day.

Tool 8—IP Clinics

Conferences usually provide a great pool of general know-how and experiences, but getting specific, individual questions answered is very unusual. Adding a training day with smaller group sessions on specific topics and providing meet-the-speaker sessions open for anyone interested can alleviate much of the problem. Providing IP Clinics (one-on-one sessions), where participants and experts meet one-on-one in 30-minute time-slots can add further value for participants.

At HTBC 2019, half-hour time-slots for participants were provided for booking a one-on-one IP Clinic session with an IP expert during the training day. This let participants pose questions on current issues in a more individualized environment and have in-depth conversations on these issues.

Results:

Around 20 percent of conference participants made use of these informal one-on-one meetings with IP experts. Receiving questions from IP Clinic participants ahead of time allowed the special IP Clinics committee to match the participant with the right expert. Also, experts were provided with the questions ahead of time so they could prepare and give useful advice.

The IP Clinics helped with the learning and implementation goals of the conference.

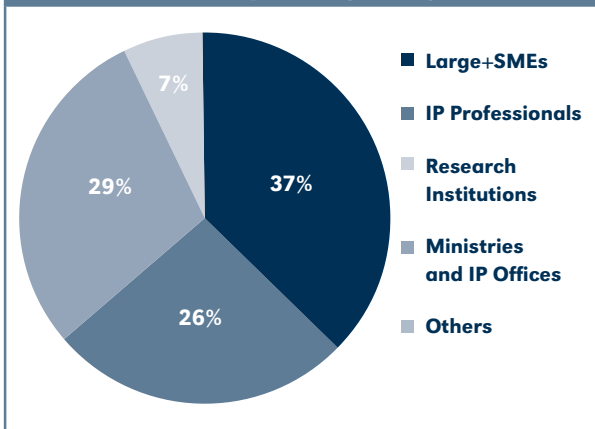
Key Challenge:

The proper matching of participants and experts is important and time-consuming. Also, coordinating 30-minute slots with other activities that a participant might have booked is an organizational and resource-intensive challenge. A digital tool for directly matching participants and experts would be a valuable next step in the process.

4. Conclusion

The EPO-LESI High-growth Technology Business Conference 2019 was a great success on all accounts. The conference attracted about 300 participants from over 30 nations and representatives from all intended audience groups. See Figure 5.

Figure 5. Distribution Of Total Participants By Entity



The presence of excellent speakers from three continents was used to produce additional material for post-conference use:

- Shortly after the conference, 26 presentations were shared with all participants, each of them containing a summary slide that outlined the takeaway messages of the session.
- Twelve speakers were selected for videos published on the event's website. These videos provide summaries of the topics, key takeaways and the Q&As.⁴
- The conference content also attracted significant attention on social media.⁵ It had over 37,000 views on Twitter with many retweets. On LinkedIn, the content has been seen more than 33,000 times to date and is still being shared. The videos are also online on YouTube and have currently been watched more than 2,500 times.

The intention to create a unique, innovative user experience with the five predetermined goals of inclusion, efficiency, learning, implementation and networking was met in all respects. The feedback from participants was overwhelmingly positive, with quite a few frequent conference-goers stating that "this was one of the best conferences I have attended."

Figure 6. Combination Of Conference With Content Platform And Co-Operation Of Several Organizers



5. Outlook

After such a great success, what is next?

The next step is the development of an online platform that combines the conference content, including the follow-up videos and articles, with other closely related material for dissemination not only to participants, but also other SMEs. See Figure 6.

The organizers are currently evaluating if the conference will be continued as a regular event in the EPO's offering. Moreover, there has already been interest by the EPO's conference partner, LESI, to share the content created by this conference through other channels and establish, for instance, a conference spin-off in Asia in the years to come. Whatever path the conference takes, the innovations tested in the conference can serve to help other conference organizers to experience similar success.

LESI and the EPO have jointly established a standing working group to evaluate support measures for high-growth businesses in general so that, in addition to the conference and post-conference publications, accompanying measures can be developed.

Disclaimer: Any opinions expressed in this article are those of the authors and not necessarily those of the European Patent Office. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3584444>.

4. epo.org/sme-takeaways (accessed 02.04.2020).

5. Data were extracted 30.03.2020.

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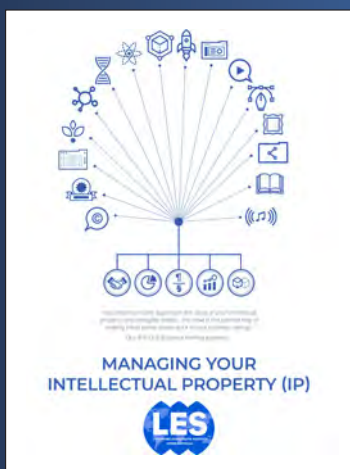
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LESI has developed three business briefings for the IP Licensing community and for high-growth, innovative business that offer practical advice to businesses looking to monetize their intellectual property. Written by LESI members and experts from around the world, the three briefings are available for download below.

Even as intangible assets grow ever-more important to businesses, research has revealed that almost 50% of small and medium enterprises (SMEs) do not consider IP to be a valuable investment. With COVID-19 throwing the value of IP into sharp relief, typified by the growing number of businesses pivoting to quickly apply their expertise to developing ventilators, the Briefings fill a crucial gap in the market—to advise high-growth businesses on critical IP considerations to protect their business as they strive to meet new business needs.

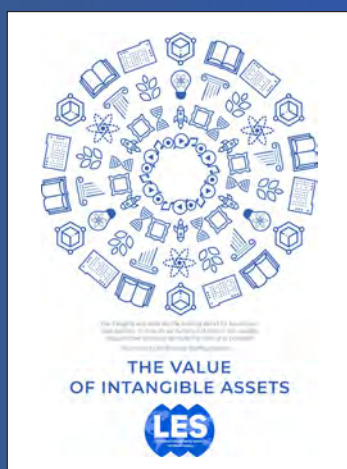
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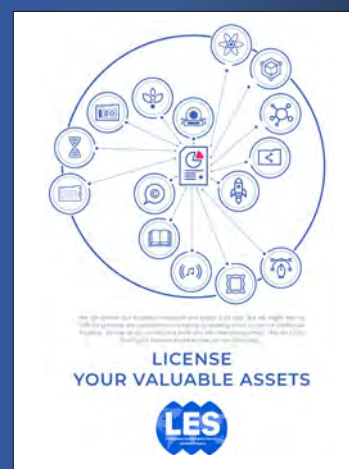
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* As of the date of this publication, the 2020 LES Annual Meeting is still scheduled for October 18-20, 2020 in Philadelphia, PA. We continue to monitor the COVID-19 situation carefully and will take appropriate measures as needed. Watch our website and social media channels for updates.

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