

Leveraging Innovation Through Collaboration: IP Challenges And Opportunities For SMEs In The Context Of EU-Funded Collaborative Research Projects

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Abstract

European Research & Innovation (R&I) funding programmes, in particular Horizon Europe, offer great opportunities for start-ups and small and medium-sized enterprises (SMEs) to leverage external knowledge through collaboration. There is a multitude of reasons why small businesses participate in EU funding programmes. Besides seeking grants to finance Research & Development personnel, SMEs consider collaborative R&I projects an ideal “Open Innovation” (OI) environment to jointly develop new technologies, products, or services. However, such multi-partner collaborations bring together very different partners from academia, research, and industry with varying motivations and interests. Collaborative R&I projects showcase a mix of plans and pathways to use project outcomes beyond the project, thus resulting in a higher complexity for Intellectual Property (IP) management strategies and good practices to meet the needs and expectations of all partners involved.

This article provides an overview on the IP strategy framework and related rules, procedures, and best practices in European R&I funding programmes.

In particular, the article underlines key IP challenges that typically occur in SMEs in pre-competitive collaborative R&I projects (typically up to Technology Readiness Level 6), thus stimulating and improving the effectiveness of collaborative innovation. To this end, the article presents first observations and results from a pilot IP support service provided by the European Commission specifically designed to help European SMEs to efficiently manage and valorise IP in EU-funded collaborative R&I efforts: the so-called “Horizon IP Scan.”

This article provides insights to support partners, especially SMEs, to design and effectively manage IP assets in multi-partner R&I collaborations.

1. IP Strategy Framework

1.1 Overall IP Management and Exploitation Strategies in a Collaborative Research & Innovation (R&I) Project Funded Under Horizon Europe.¹

Collaborative projects bring together partners with

different company cultures, business mindsets, interests, and strategic objectives. Different partners also bring different background knowledge and IP for use during the project and, if needed for commercial exploitation, after the project ends under agreed terms and conditions. Results from collaborative projects are often built on the combined knowledge of several partners, so are jointly created and jointly owned; therefore, it is important for the partners to agree on appropriate and shared strategies for their management, protection, and exploitation. Beneficiaries in a collaborative Horizon R&I project must make best use of all relevant knowledge and IP to maximise the benefits from the collaboration and to develop and successfully commercialise innovations that enhance competitiveness and growth. This includes, of course, the outputs from the collaborative project itself, their own existing knowledge and IP, and potentially also that of the other partners, and third parties.

Effective management of all of these intellectual assets is crucial; particularly those results which are developed collaboratively, and jointly owned. Equally important is the need to consider the strategic value of protecting these results in order to support their commercial exploitation, potentially by several partners. Participating in collaborative work requires acceptance of the need to share, and may require a cultural shift in the collaborating organisations to achieve this. But collaborating is about more than just sharing. The nature of collaboration means there are also interdependencies between partners, and long-standing ties can be built between the partners and other stakeholders. These interdependencies and new relationships may lead to other benefits, such as future commercial collaborations, and access to new markets or fields of use.

1.2 Challenges of Collaborative IP Management— with a Particular Focus on SMEs

A key challenge in Horizon collaboration projects comes from the different alignments of different part-

1. Horizon Europe is the EU’s key funding programme for research and innovation with a budget of €95.5 billion. The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting, and implementing EU policies while tackling global challenges.

ners' cultures, business objectives, and approaches. In collaboration projects, all the partners have various interests, spanning from research to commercial exploitation. This is particularly the case for universities and research organisations who are driven and rewarded by publishing their findings, compared to SMEs and industry who are driven by increasing their competitiveness and growth, and where publishing too soon, before adequate protection has been secured, could have adverse consequences for them.

Open approaches for sharing knowledge and obtaining knowledge from others can stimulate the development of innovations. It is the basis of collaboration and should be embraced, especially since no one has a monopoly on invention. Whilst consortium partners are a good source of knowledge and ideas, the increased focus on Open Innovation and Open Science practices in EU-funded collaborative projects, which involve multiple actors, introduces major challenges in addressing appropriate and systematic management of the knowledge flows between partners, and the protection of the IP to support individual and shared business strategies.

However, defining an appropriate framework to organise and manage these collaborative innovation activities, whilst at the same time maintaining control over the dissemination and commercial use of the knowledge, can be very challenging for SMEs. SMEs must, therefore, fully understand the potential contributions from the consortium partners; and vice-versa, to be clear about what they bring to the project and how they can benefit themselves. Knowing and matching expectations among consortium partners is a pre-requisite for developing the trust and credibility necessary for the exploitation of collaborative project results. Expectations, needs, contributions, benefits, risks, etc., need to be discussed and understood alongside a clear collective purpose, vision, and a concrete picture concerning expected outcomes.

Joint ownership is a particular challenge when addressing management, dissemination, protection, transfer/licensing, and exploitation of research results. It is important that these issues are appropriately addressed, taking into account the different interests and objectives of all partners, whilst ensuring the commercial objectives of the SMEs are also met. Even in case of exclusive ownership, with one partner acquiring the full ownership of the project results to be exploited through exclusive licenses or assignment, specific provisions need to be put in place in order to ensure access rights to results for other parties, and appropriate remuneration for the exploitation of the acquired project results in order to safeguard all interests of the parties involved in the project. Any assignment or exclusive licence requires the permission of all partners

and will need to sort out cost/revenue sharing, reversion rights, etc.

1.3 The IP Framework: IP-Related Rules, Requirements and Options for IP Management in Horizon Europe Projects

The European Commission has established rules concerning ownership, protection, access rights, dissemination, and exploitation of project results, which establish guiding principles for IP management in Horizon Europe. IP rules are mainly defined in the Grant Agreement (GA)² and the Consortium Agreement (CA). The Grant Agreement contains “default rules” applicable to IP management, which will be further specified by project consortia in the CA, while the GA takes precedence.

Beneficiaries in Horizon Europe projects need to comply with specific IP provisions laid down in the Grant Agreement,³ such as:

Obligation to protect:

Each beneficiary must examine the possibility of protecting its results and must adequately protect them, for an appropriate period and with appropriate territorial coverage, if a) the results can reasonably be expected to be commercially or industrially exploited, and b) protecting them is possible, reasonable, and justified (given the circumstances). When deciding on protection, the beneficiary must consider its own legitimate interests and the legitimate interests (especially commercial ones) of the other beneficiaries.

Obligation to disseminate: Horizon follows the “Open Science” approach that focuses on spreading

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2. The General Model Grant Agreement aims to ensure coherence and simplification among all funding programmes under the EC's Multiannual Financial Framework (MFF) 2021-2027.

3. For further information on the IP framework in EU-funding programmes, see “Your Guide to IP in Horizon 2020” and the guide on “Successful Valorisation of Knowledge and Research Results in Horizon Europe,” both published by the *European IP Helpdesk*.

knowledge as soon as it is available using digital and collaborative technology. That is why beneficiaries are requested to make their scientific publications available as Open Access publications, and grant access to their data as open as possible and as closed as necessary. It should be noted that Open Access in Horizon Europe does not interfere with the protection of research results, as it is common practice that the GA/CA specifies notification rules for any planned publication as well as rules and procedures with regard to the right to object.

Obligation to exploit: All beneficiaries in Horizon projects should be fully aware that they must, up to four years after project completion, take measures aiming to ensure exploitation of its results (either directly or indirectly; in particular, through transfer or licensing), by: a) using them in further research activities (outside the action); b) developing, creating, or marketing a product or process; c) creating and providing a service; d) using them in standardisation activities or other use scenarios such as to inform policy or for educational purposes. Hence, exploitation is by no means limited to commercial exploitation.

Rules and procedures related to ownership/joint ownership: In collaborative projects, particular emphasis should be given to establish rules and procedures for ownership (and the management of ownership—including protection strategies) of key project results. The GA states that results are owned by the beneficiary that generates them. However, due to the strong collaborative work, two or more partners may jointly contribute to an individual result of IP. In these cases, the IP is jointly owned. The joint owners should therefore agree on the terms of the joint ownership through a Joint Ownership Agreement. Moreover, consortia are requested to prepare a “Results Ownership List” to clarify ownership of project results and to help improve the process for exploitation of these by project partners and, where relevant, third parties. As a minimum, the list should include details of whether the result has single or joint ownership, the name of the owner(s), the country of establishment of the owner(s), and whether the results will be exploited by the owner(s).

Rules related to access rights with regard to

background and results: The implementation of any collaborative project requires the use of pre-existing IP (background) resulting from work carried out prior to the project, and belonging to one of the partners. Thus, within the CA (the agreement between the partners) project partners need to create a list of background IP that they will bring to the project, as well as specific IP they wish to exclude access to. Moreover, in order to avoid any IP infringements and guarantee a proper technological project implementation, project partners have to warrant the ownership of their background IP and formally agree that other parties can access it for the purposes of the project. The CA further specifies that consortium partners have access to the background/results of other partners in case they need this knowledge (IP) to implement their own project tasks or to exploit their own results. Table 1 provides an overview on the access rights regime in Horizon Europe.

1.4 Drafting the Consortium Agreement

Although not exhaustive, the following essential IP-relevant points should have been discussed when drafting the CA: confidentiality, background selection, use of IP generated parallel to the project (sideground), ownership/joint ownership of results, legal protection of results (IPR), access rights, and procedures for dissemination of results. The CA provides the legal framework for IP management, including a detailed section with specific innovation-related clauses on ownership, access rights, decision making procedures, publications, and IP-related workflows and responsibilities (e.g., assessing, capturing, monitoring of IP) within the project. Besides multilaterally agreed rules governing the rights and obligations of the collaboration within the consortium, the agreement should include reference documents for Material Transfer Agreements and background IP of all consortium partners. If necessary, this document should be amended and updated throughout the project.

The basic principle to follow when drafting these IP provisions should be to provide a flexible and efficient mechanism to support the cooperation between partners to ensure appropriate protection and maximum use of results, as well as their timely dissemination.

Table 1. The Access Rights Regime In Horizon Europe

Purpose	Access to Background	Access to Results
Implementation of the project	Royalty-free, unless otherwise agreed by participants before their accession to the GA	Royalty-free
Exploitation of project results	Subject to agreement, access rights shall be granted under fair and reasonable conditions (which can be royalty-free)	

Usually, in Horizon 2020/Europe projects, the CA is drafted on the basis of existing model agreements such as the DESCA⁴ model agreement template.

1.5 Overall IP Management Approach in Collaborative Horizon Europe Projects

In order to comply with the mandatory Open Science requirements of Horizon Europe, whilst safeguarding the rights of the consortium partners to protect their IP to support the effective commercial exploitation of the project's results, an appropriate IP strategy should be defined.

IP and innovation management measures should ensure that exploitable results will be captured, assessed, and appropriately protected, in order to support their commercial exploitation, whether at the individual partner level, as a group of partners, or collectively for the consortium as a whole. In order to achieve the impacts of the project most efficiently, exploitation activities combine established work processes for anticipatory innovation planning to capture, protect, and assess Key Exploitable Results (KERs), including strategic support and very concrete measures to support “Go-To-Market” strategies. The selection of measures ideally matches the level of maturity of results, paving the way to a quick introduction of products and services to the market. A systematic follow-up of impact pathways for KERs should be implemented to maximise the understanding of specific IP topics relevant to the consortium; develop concrete exploitation plans based on the IP status, legal, and other issues; as well as plan concrete steps towards market-oriented exploitation.

At each stage of a project, the IP issues that need to be addressed are different. For example, at

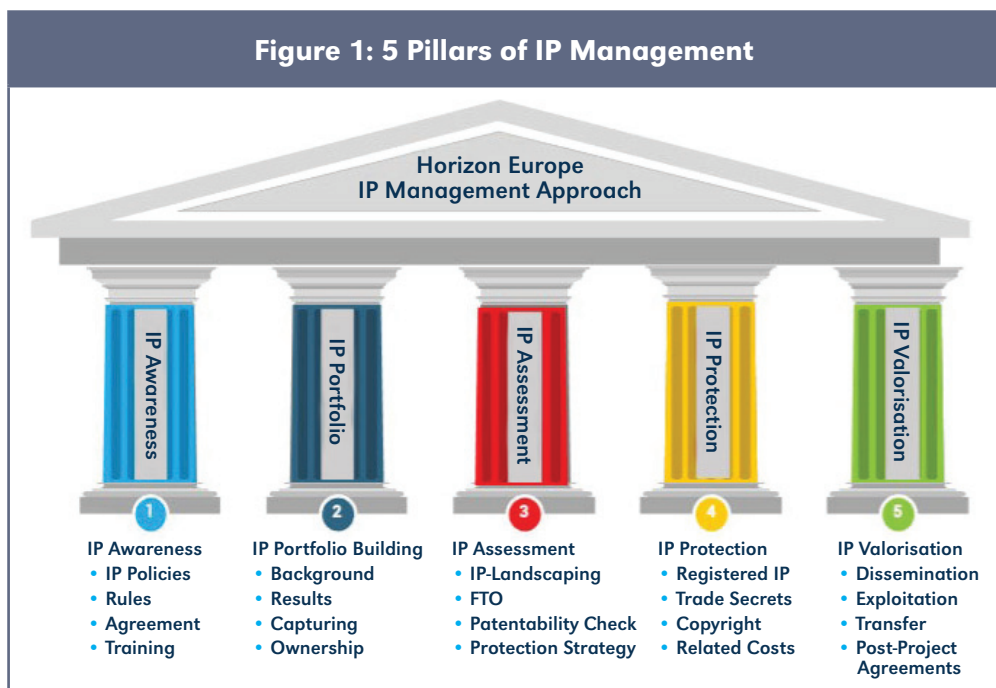
4. DESCA (Development of a Simplified Consortium Agreement) is a comprehensive Model Consortium Agreement that offers a reliable frame of reference for project consortia. DESCA enjoys broad support within the EU framework programme community.

the start of a project it is important to agree on which existing knowledge is to be shared and under what terms and conditions, both for use during the project and after it ends. As the project progresses and results are produced, the results need to be captured and assessed before decisions can be made about ownership, management, and protection. Only then can dissemination and exploitation begin. Towards the end of the project, as all the expected results become available, planning the future exploitation pathways becomes even more important, since in collaborative projects the main exploitable outputs usually consist of a bundle of results, each developed by the partners individually or jointly. These “bundles” of IP, their management, and their protection may be different for different territories or fields of use. For SMEs, whose objective is commercial exploitation of the results to build or grow their business, the ongoing management and protection of the IP they need must continue beyond the end of the project. This is illustrated by the so-called “5 Pillars of IP Management” as shown in Figure 1, which reflect the different stages of a collaborative project and at which different challenges related to IP management may arise.

2. Horizon IP Scan—a New Support Service for SMEs Involved in EU-Funded Collaborative R&I Projects

2.1 Rationale Behind the Horizon IP Scan Service

The Horizon IP Scan service⁵ is a new (pilot) service



provided by the European Commission and managed by the European Innovation Council and SME Executive Agency (EISMEA) launched in March 2021. The service helps European SMEs involved in EU-funded collaborative research projects to efficiently develop and implement strategies to manage and valorise IP in collaborative R&I activities. This should in turn facilitate the exploitation of jointly developed innovations. The advice and recommendations provided by local IP experts are intended to help the SMEs to develop a co-operative way to manage intellectual property created in collaborations.

The service follows the general principle of IP pre-diagnosis and covers different steps such as preparation work, a visit (or online-meeting), and the provision of a report. The service may either be provided for a single SME or, preferably, a group of SMEs involved in a collaborative research project. All SMEs requesting the service will receive an individual IP review by an individual expert—resulting in an individual report. In addition, if applicable, the service will conclude in a joint discussion with all SMEs within the collaboration that requested the service.

In general, IP pre-diagnosis services aim to support SMEs in identifying intangible and intellectual assets and to make an objective assessment whether protection—and if so what type of protection—would support commercialisation activities, taking into account the business strategy of the company. It may also be most appropriate to make the asset open (deliberately put in the public domain), and grow the business through added-value products or services.

IP pre-diagnosis allows a firm to gain a clear picture of its IP assets, to ensure that it is able to manage its own IP, and develop an effective management plan or strategy to run and grow

the business. As a common principle, IP pre-diagnosis is expected to take a holistic view on the SME's IP awareness and practices (“the big picture”) and follow a capacity-building approach. The service aims to raise general awareness of IP-related issues and identify areas for improvement with respect to IP strategy development and management.

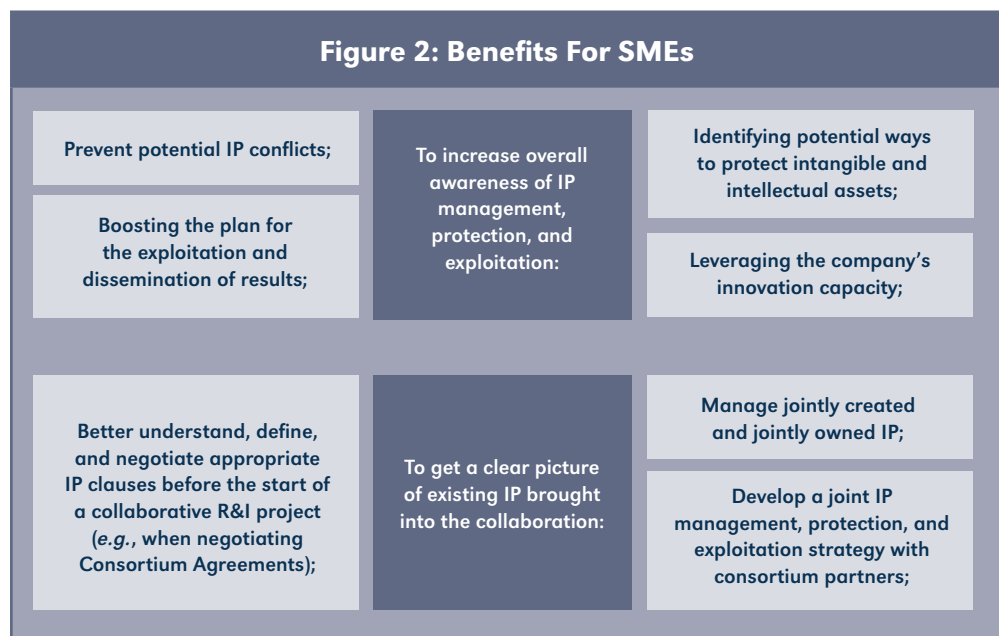
Horizon IP Scan follows an adapted IP pre-diagnosis approach tailored to the needs and challenges of SMEs involved in collaborative R&I projects. The service is aimed at improving the valorisation of research and innovation results by enabling the smooth cooperation of various project participants with shared and (potentially) jointly developed and jointly exploited intellectual property. Another particularity is the grouping of several SMEs from a given project to receive a joint report and de-briefing session, addressing findings and recommendations regarding collaborative IP management.

Horizon IP Scan is implemented at the early stage of the project implementation and is not only about how an SME survives in a collaborative project and avoids losing their intellectual assets or their competitive position; it is much more about developing new value propositions and enhancing their competitiveness and growth. The Horizon IP Scan service can help SMEs involved in collaborative projects to identify and address the key issues related to strategies and methods for company and collaborative IP management, protection, and exploitation, ensuring these are aligned to the company's own business objectives and those of their collaboration partners—maximising the impact and benefits of the collaboration for all parties involved! The benefits for SMEs are outlined in Figure 2.

The brief analysis reflects on IP expert reports as

5. The primary objective of Horizon IP Scan is to facilitate the exploitation of jointly developed innovations. For this purpose, the service will support SMEs in defining strategies and appropriate measures to a) give access to existing IP, b) to protect, c) to share, and d) to exploit IP created during research and innovation collaborations. For further information, please visit www.horizon-ipscan.eu.

Figure 2: Benefits For SMEs



well as the self-assessment questionnaires and satisfaction surveys collected from the SME applicants. It covers the main challenges faced and recommendations made by the experts.

2.2 SME Applicant's Profile

As the Horizon IP Scan service is still in its ramp-up phase, the survey considers service provisions for a first wave of 104 SMEs applying from 28 different European countries. Over 90 percent of the applications have been received from micro-sized (0-9 employees) and small sized (10-49 employees) companies. Health- and biotech-related applications count for 34 percent of total applications, followed by applications from the ICT sector with a share of 26 percent. Together these three technology fields accounted for 60 percent of all service requests. Other technical fields are energy, physics, chemistry, engineering, and materials. Besides the “expected” deep-tech sectors, the Horizon IP Scan service has also proven to be very attractive to SMEs in the field of business consultancy. See Figure 3.

2.3 Main Motivation for SMEs to Apply and Key IP Issues Addressed

The aspects listed below are not in priority order, but reflect the main motivations to call for the IP advisory service:

- Applicants need support in the identification and management of different types of IP ownership. In joint ownership situations, SMEs would like to have a clear overview on how to agree: (a) the relative contributions to the IP generated; (b) the allocation of IP management responsibilities; and (c) fair and reasonable shares of costs and revenues. SMEs asked for strategic advice regarding the management of access rights beyond the project duration.
- SMEs would like to be aware of the best ways to protect and manage the intellectual assets generated, while understanding the full range of protection options—including secrecy. They want to

ensure all the IP rights linked to the project are correctly addressed and that potential risks associated to IP are minimised.

- SME beneficiaries have a high interest in understanding the rationale and benefits of various IP protection strategies, particularly in different territories.
- Applicants request feedback on their existing IP management, decision-making hierarchies, and organisational roadmaps. Additionally, they want to be more informed about IP/knowledge management systems and their use. This includes best practices how to deal with publication strategies in line with the individual interests of the consortium partners.
- Applicants seek to learn more about the relevance of background IP shared among the consortium partners for the project and how it can add value to follow-up IP valorisation strategies and exploitation pathways in accordance with the technology readiness level and the maturity of the sector.
- SME beneficiaries have a high interest in assessing the economic value of IP protection to support commercial activities.

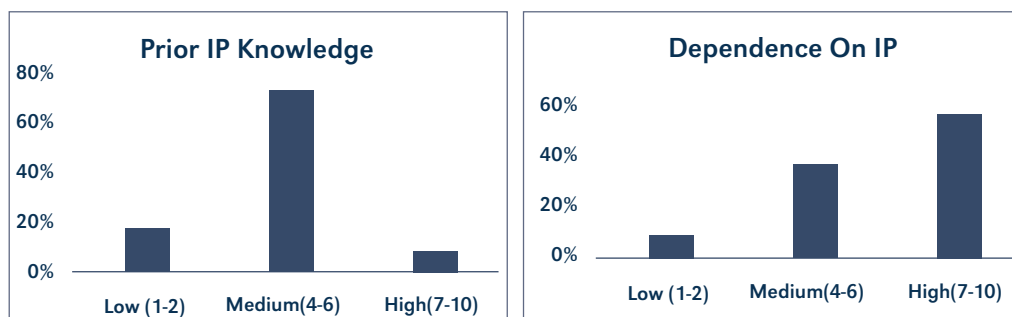
2.4 Main Weaknesses of IP Management Capabilities Identified

- Knowledge and intellectual assets brought into the collaboration (“background”) are not well defined or sufficiently protected.
- Responsibilities for IP management are usually not efficiently shared. Segmenting those responsibilities between too many partners usually causes inconvenience and complications.
- There is a lack of knowledge concerning Horizon IP rules (*e.g.*, regarding ownership of the results and obligations regarding IP dissemination, protection, and exploitation).
- Possibilities to shape IP provisions in the CA according to the

specificities of the collaborative project (and in line with the overall framework provided by the GA) are not being fully explored.

- Appropriate systems and processes for managing knowledge flows between partners and related

Figure 3: Level Of Intellectual Property Awareness/ Dependence Of Company Activities On IP



mutually agreed strategies for protection and exploitation of project outputs are missing.

- There are no clear guidelines on open science approach (*e.g.*, pre-publication procedures) on the one hand and its relationship with IP protection on the other hand (*e.g.*, the requirement to retain ownership of copyright in scientific publications).
- The full scope of IP protection measures and strategies is not grasped (*e.g.*, usually only patent filing is foreseen). The strategic use of other protection measures is rarely considered; for example, formal IP rights, trade secrets, or contractual agreements.
- The importance of confidentiality is not well understood. The partners do not always pay sufficient attention to maintaining the secrecy of important data or confidential information when dealing with third parties.
- A thorough understanding of the different types of IP and the rationale for their use is lacking, including a lack of understanding of the value of IP management tools and databases (*i.e.*, Espacenet, TM view, etc.).
- Beneficiaries have a misperception of the open innovation concept. SMEs tend to consider it as a knowledge leakage with a detrimental effect on their business. Potential business opportunities offered through collaborative innovation processes are not sufficiently exploited.

3. Conclusions

The authors fully underline—from their own experience and studies—the results of a recent EC study⁶ considering the question whether IP is an enabler or a barrier to collaborative R&I projects. This article clearly highlights that intangible and intellectual assets in many forms are key enablers of collaboration. SMEs seek to share and gain access to different forms of IP through collaboration in order to pursue their business goals. While the forms of IP may differ, there is no evidence that it acts as a barrier to collaboration.

First insights gained from the Horizon IP Scan service delivery demonstrate a lack of capabilities, best practices, and adequate tools to leverage the benefits of collaborative IP management mechanisms.

Major deficits are linked to poor valorisation strategies specifically within the collaborative setting, resulting in missed opportunities with regard to successful and impactful exploitation of project outcomes.

However, SMEs show an increasing interest in gaining a better understanding of using IP management strategies and practices within R&I collaborations to help their businesses grow and remain competitive. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=4120501>

6. EC Study, 2021: Building stronger intellectual property strategy capabilities; Supporting SMEs to succeed with open innovation.