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Title:

Open Innovation Readiness for SMEs: assessment methodology

Summary:

Key performance indicators (KPIs) for SMEs have been often overlooked by the Open Innovation (OI) literature. This study aims to fill this gap by developing an **open innovation readiness assessment tool** with a set of KPIs, to help SMEs evaluate their current OI capabilities in order to identify areas of improvement. The KPIs identified in this study are based on best practices and critical issues found in 120 case studies across 6 European regions: Eastern Europe, France and Germany, Scandinavia, Small Developed Countries, Southern Europe, and UK & Ireland. These KPIs have been used to create an assessment tool that will allow SMEs to determine where and how they can develop strategic collaborations to strengthen their competitive advantage.

Track: 9 Innovation

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Open Innovation Readiness for SMEs: assessment methodology

1. Introduction

While a number of studies have examined Open Innovation (OI) in Small to Medium Enterprises (SMEs) (e.g. van de Vrande et al, 2009), most have not yet addressed critical issues regarding its management, either because they lack the empirical evidence or because they adopt an industrial lens (Wynarczyk et al, 2013). Most importantly, Ebersberger et al (2012) found that, when compared to large enterprises, SMEs are less likely to engage in open innovation but stand to benefit more from it. This therefore points to the importance of being able to understand and identify the ways in which SMEs can benefit from OI, but most importantly, whether they are ready to do so.

Questions like the mixture of internal and external innovation activities, required capabilities, and most importantly, the key performance indicators (KPIs), have therefore often been overlooked. This study therefore aims to fill this gap by developing an open innovation readiness assessment tool with a set of KPIs, to help SMEs evaluate their current OI capabilities in order to identify areas of improvement.

1.1 Methodology

The innovation readiness tool was developed as one of the work packages of the INSPIRE project¹, a Coordination and Support Action funded by the European Commission under the Horizon 2020 work programme, aiming to understand and support open innovation management in Europe's SMEs.

The analysis for this study was carried out in two sequential stages, the first stage focused on identifying general practices among SMEs, and the second consisted of a detailed analysis of good practices, including a literature review. For the first stage of the analysis, this study utilised 120 case studies of SMEs engaging in Open Innovation activities across 6 European regions: Eastern Europe, France and Germany, Scandinavia, Small Developed Countries, Southern Europe, and UK & Ireland. From the 120 cases, 75 were identified as having the greatest learning potential for the researchers and the practitioners of OI in SMEs, and were utilized in the second stage of the analysis.

The second stage focused on understanding better the issues involved in the OI process, namely the crucial challenges, the good practices and the critical enablers that would inform the KPIs. This analysis aimed to go deeper than the first stage of analysis while still referring to the overall process of OI, rather than the individual stages.

While reviewing each case, the research team collectively formulated a list of statements that could inform the creation of KPIs, where it was possible. From a brainstorm session with the consortium partners, the 75 good practice cases resulted in 62 statements, which were then classified and merged to create 48 statements to inform the creation of the KPIs. In order to accomplish that, 3 consortium meetings, 2 rounds of validation of the tool with external organizations (SMEs and intermediary) and several discussions of the team responsible for the indicators were carried out from June/018 to Jan/2019. The statements were group into the categories following the framework of the INSPIRE project (figure 1).

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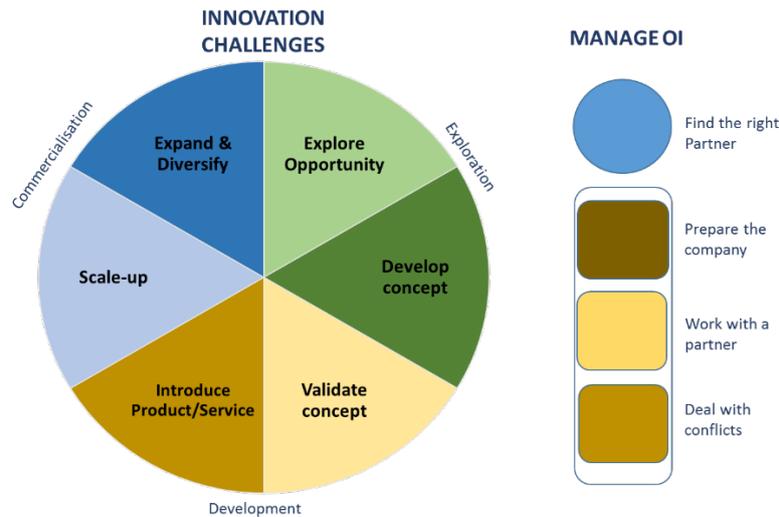


Figure 1 – Inspire project framework including Innovation Challenges and Manage OI

2. Literature Review

This section presents a selected literature review on OI KPIs. The literature has been divided into three clusters in order to focus on the different levels, including the firm, the partnership, and exploitation.

2.1 Firm level

At the firm level, key indicators focus primarily on a firm’s absorptive capacity. Cohen & Levinthal (1990) describe absorptive capacity as being a firm’s ability to recognise external information, then assimilate and apply it for commercialisation purposes. To this end, the literature discusses an a firm’s ability to manage change and adapt to the changing environment in terms of either shifting technologies, demands, or other external issues (Gassmann & Enkel, 2004). Additionally, the ability to engage with intermediaries may allow firms to broaden their search (Rohrbeck, 2010). Finally, a key indicator is a firm’s ability to strategically use of OI, where various forms of partners may be needed at different stages of the innovation process (West & Bogers, 2014).

2.2 Partnership level

Related indicators include the creation of new intellectual property and non-pecuniary value creation, such as product performance (Lau *et al.*, 2010) and rate of new product releases (Boudreau, 2010). In addition, capabilities and skills learnt as a direct result of partnerships (West & Bogers, 2014). This includes those that focus on developing competences leading to more effective OI development, such as project management skills (Du Chatenier *et al.*, 2010) or integrative competences (Christensen, 2006). the literature discusses the skills required to create and maintain a network of collaborators, such as improving the potential of the partnership (Emden *et al.*, 2006) as well as the internal assessment of the value of the partnerships (Witzeman *et al.*, 2006). Finally, a firm must have the ability to monitor a partner’s performance in order to assess the value of the partnership (Laursen & Salter, 2006).

2.3 Exploitation level

At the exploitation level, there are three main types of indicators identified from the literature review. The first types of indicators focus on the SME's ability to adapt to the changing market (Van de Vrande *et al.*, 2009), as well as the speed of accessing new markets (Chesbrough & Appleyard, 2007). The second type of indicators focus on the direct increase in revenue or speed of return on R&D investment as a result of OI activities (Grimpe & Sofka, 2009). The final type of indicators focus on non-pecuniary value capture, such as the ability to increase brand awareness through open innovation partnerships (Füller *et al.*, 2008). This was most evident in the literature focusing on open innovation projects where lead-users and user communities were involved (Chu & Chang, 2009; Dahlander & Gann, 2010).

3. Innovation Readiness tool

The 48 statements elaborated for the innovation readiness tool are classified into two categories covering the innovation challenges (using the innovation journey as basis) and management of OI activities, following the logic of the Inspire project framework.

Each category of indicators will be assessed through a set of statements, to which the respondents will have to score from 1 to 5 to evaluate "To what extent are the following statements true for your company":

1. Little to no extent;
2. Slight Extent;
3. Moderate Extent;
4. Great Extent;
5. A very great extent.

The statements, as well a brief explanation of each of the stages, are presented below. For each of the Innovation Challenge stages, the first two questions are about internal innovation activities.

3.1 Innovation Challenges

3.1.1 Exploration

The exploration set of questions focuses on the first stage of the 'innovation journey' which is then broken down into two stages: Explore Opportunity and Develop Concept. This stage is concerned with the ideation part of the journey prior to turning that idea into development.

3.1.1.1 Explore opportunity

This subsection aims at identifying how well an SME is able to search and find new ideas. The statements in this subsection cover internal competences as well as Open Innovation activities such as multiple forms of partnerships to find new ideas, potential collaborators, monitoring market trends, and public sector initiatives.

3.1.1.2 Develop Concept

Following from the *Explore Opportunity* stage, the *Develop Concept* stage focuses on further enhancing and clarifying an existing idea. This stage is one step closer to development, with its statements being focused on further improving the idea through internal activities, finding relevant IP, using partnerships, and establishing OI routines.

Table 1 presents the statements for the Exploration phase.

1	We have internal processes for searching good ideas for new products, services or processes
2	We have experience in thoroughly evaluating such ideas

3	We know how to use intermediaries and support organisations to help us find new ideas for products, services or processes
4	We have experience searching for ideas and collaborators through networking events, conferences, or social networks
5	We regularly monitor changes in regulation, technology and market trends in our field to identify opportunities and potential collaborators
6	We have used government initiatives and programs to identify potential collaborators and new opportunities
7	We have internal processes for selecting good ideas for new products, services or processes
8	We have pathways to advance internal ideas into new products, services or processes
9	We have experience identifying and using valuable intellectual property generated by others
10	We have experience collaborating with others to define the concept of a new product, service or process
11	We are confident in assessing where and when we require an external partner when developing a new idea
12	We routinely stay in touch with previous collaborators for future opportunities

Table 1 – Statements of the Exploration phase

3.1.2 Development

Following from the *Explore Opportunity* stage, the *Develop Concept* stage focuses on further enhancing and clarifying an existing idea. This stage is one step closer to development, with its statements being focused on further improving the idea through internal activities, finding relevant IP, using partnerships, and establishing OI routines.

3.1.2.1 Validate concept

The validation stage focuses on being able to determine whether or not the idea has any commercial value and whether or not the firms possesses the skills and resources to enter into the development stage.

3.1.2.2 Introduce product/service

The introduction stage focuses on the SMEs ability to successfully deliver a product utilising internal and open innovation activities. In this section, therefore, the statements focus on any previous experience, internally to the company or in partnerships, the SME might have in delivering prototypes, understanding their commercial value, and obtaining further information for future development of ideas.

Table 2 presents the statements for the Development phase.

13	We have the internal structures to develop a prototype for a new product, service or process
14	We are able to develop the value proposition of our offerings within our company
15	We know how to use our ideas/technologies to raise external funding to advance their development
16	We have experience in defining the skills and resources we require from our partners for the development process
17	We know how to manage the pace of activities with our collaborators
18	We have extensive experience combining our knowledge, skills, and technology with that of others during the development process
19	We have the internal competences to identify the initial market for our offerings
20	We have experience in introducing new offerings into their initial market
21	We know how to search for complementary skills and resources for our development needs

22	We have been successful in delivering a good outcome from previous collaborations, such as a prototype or a finished product
23	We have previously collaborated with others to understand the readiness of our products for the market
24	We know how to use information from potential customers in order to shape the value proposition of our offering

Table 2 – Statements of the Development phase

3.1.3 Commercialisation

This phase focuses on identifying an SME’s ability to commercialise their product or service through internal and open innovation activities. The commercialisation stage constitutes of two different stages, the first being the scale-up by either increasing sales or production. The second stage then deals specifically with expand and diversify, which is when the SME goes on to a new market.

3.1.3.1 Scale-up

This stage focuses on generating revenue from innovation. This includes sales, production, and IP revenue. In addition, this section includes understanding the environment to identify opportunities or threats for commercialisation.

3.1.3.2 Expand & Diversify

The final section of the Innovation Challenge looks at the expansion and diversification. This stage focuses primarily on utilising a variety of internal activities and Open Innovation partnerships to access new markets.

Table 3 presents the statements for the Commercialization phase.

25	We are able to scale-up production of our offerings using internal resources
26	We have internal capabilities to scale-up sales
27	We know how to develop close collaborations with our suppliers to enable the scaling-up of our business
28	We have experience in generating revenue from the intellectual property arising from our projects
29	We have experience negotiating shared revenue agreements with our collaborators
30	We have used successfully our customers to create new market opportunities
31	We have experience in finding new applications for our products and services using our own teams
32	We are able to expand distribution channels by ourselves when entering new markets and industries
33	We have a good understanding of how the regulations affect the commercialisation of our products or services
34	We have previously used our collaborators to further develop and distribute our products or services
35	We have experience using collaborators in order to enter a new geographical market or industry
36	We have experience in showcasing our previous collaborations to attract new customers

Table 3 – Statements of the Commercialization phase

3.2 Manage Open Innovation

This set of statements aims at identifying how ready the SME is for embarking in open innovation activities, creating the background and capabilities required and the changes both internally and externally. The statements cover a variety of points attempting to understand the level of experience and internal capabilities that the SME already possesses in direct relation to open innovation. These include routines that enable the assessment of OI partnerships, organisational restructuring, IP management, and relationship management. Table 4 presents the statements for the category.

37	We have experience in mapping an ecosystem to identify potential partners for the competences we need
38	We know how to evaluate potential partners and select the more adequate one
39	We are experienced in accessing intermediaries that can connect us to the right partners
40	We are good at understanding the agenda and the expectations of partners in collaborative projects
41	We have experience of evaluating our collaborations' actual outcomes against their intended outcome
42	We have previously made internal changes to improve the way we work with others
43	We are comfortable working with different types of collaborators, such as universities, individuals, small and large companies
44	We are experienced in creating an environment of trust and team integration with partners
45	We can communicate to our partners whether the collaboration is delivering the intended outcome
46	We are experienced in negotiating terms and conditions with different kinds of partners
47	We are able to deal with conflicts in partnerships
48	We have experience in identifying and protecting valuable intellectual property generated from our collaborative projects

Table 4 – Statements of the Manage OI category

3.3 Displaying the results

The results will be displayed in their entirety to be able to determine and allow the user to see where it is they need improvement. Presenting the entire result will provide an overview of the full innovation challenge and management journey with several different areas in which they are able to see what is taking place.

The set of indicators of Innovation Challenges also evaluates internal activities, offering the SMEs their competitive position and recommendations for each of the six stages.

The results will be presented graphically and in tables to the users. Figure 2, tables 5 and 6 presents an example of how the results will be displayed.

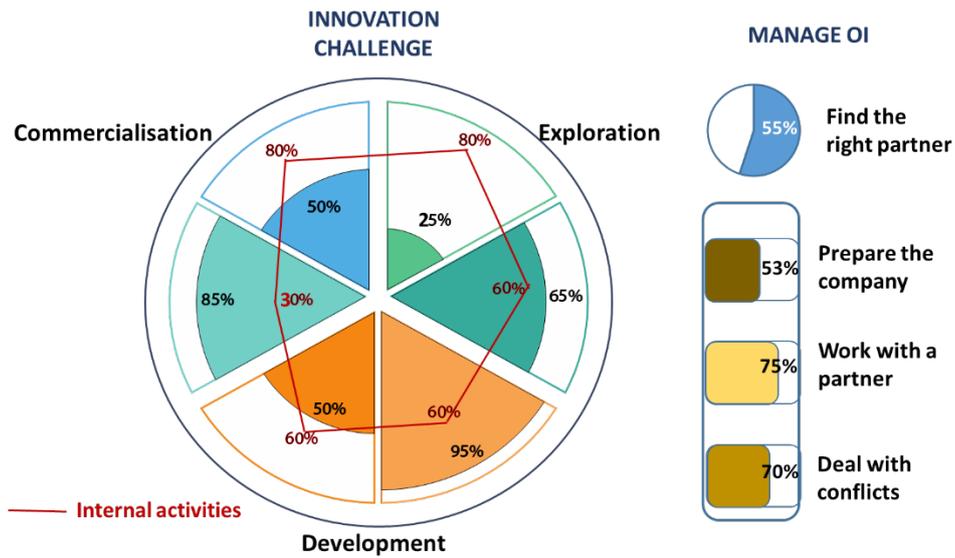


Figure 2 – Example of how the results are graphically displayed

Innovation Challenge		Competence Level		Competitive Position
		Internal activities	OI activities	
Exploration	Explore opportunity	High	Low	Comfortable position
	Develop concept	Medium	Medium	Room for improvement
Development	Validate Concept	Medium	High	Strength position
	Introduce product/service	Medium	Medium	Room for improvement
Commercialisation	Scale-up	Low	High	Comfortable position
	Expand and diversify	High	Medium	Strength position

Table 5 – Results for the Innovation Challenge

MANAGE Open Innovation	
Find the right partner	55%
Prepare the company for collaboration	53%
Work together with a partner	75%
Deal with conflicts	70%

Table 6 – Results for Manage OI

The framework of analysis of Innovation Readiness competitive position and recommendations are presented in table 7.

		Open Innovation Capability		
		Low	Medium	High
Internal Innovation Capability	Low	<p>This is a critical weakness for your company</p> <p>You need to develop either your internal activities or your OI partnerships or a portfolio of both.</p>	<p>This is a weakness for your company</p> <p>You need to enhance your OI activities or invest significantly in internal activities.</p>	<p>Your company is at a comfortable position</p> <p>You need to sustain and pay attention to the management of OI activities.</p> <p>Your company's position may become weak, if your OI activities are weakened and your internal activities have not grown meanwhile.</p>
	Medium	<p>This is a weakness for your company</p> <p>You need to enhance your internal activities or invest significantly in OI activities.</p>	<p>Your company has room for improvement</p> <p>You need to enhance your internal activities and/or your OI activities.</p> <p>Your company's position may become weak, if your internal activities and/or your OI activities are weakened and none of them have grown meanwhile.</p>	<p>This is a strength for your company</p> <p>You need to sustain and manage your OI activities and also enhance the internal activities.</p> <p>Your company's position may become stronger through a strategic decision on which activities are worth to carry internally and which ones could be done through partnerships</p>
	High	<p>Your company is at a comfortable position</p> <p>You need to sustain the internal activities and pay attention to the management of internal activities.</p> <p>Your company's position may become weak, if your internal activities are weakened and your OI activities have not grown meanwhile.</p> <p>Potential to increase OI activities.</p>	<p>This is a strength for your company</p> <p>You need to sustain and manage your internal activities and also enhance the OI activities.</p> <p>Your company's position may become stronger through a strategic decision on which activities are worth to carry internally and which ones could be done through partnerships</p>	<p>This is a strategic strength for your company</p> <p>You need to sustain and manage your internal and OI activities.</p> <p>Your company's position may become stronger through a strategic decision on which activities are worth to carry internally and which ones could be done through partnerships</p>

Table 7 - Framework of analysis of Innovation Readiness

As this tool will be part of the INSPIRE web platform, the user can choose any stage of the innovation journey or any of the generic activities of Manage OI to work on, which will guide him/her to find specific tools and cases in the INSPIRE portal. The user registered in the online platform will be able to save their results. By saving the score and allowing users to take the assessment several times and compare their score, they may be able to assess their progress.

4. Final considerations

The Innovation Readiness tool will go through a final pilot test with 40 SMEs and intermediaries until May/2019, which may lead to some amendments. Following this validation, a series of contributions to the literature will be identified, and a more refined set of tools will be presented.

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