Managing business-to-business open innovation: A project-level approach

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ABSTRACT

Embracing business-to-business open innovation (B2B OI) can enable firms to remain competitive in an increasingly saturated business environment. Whilst B2B OI is generally undertaken to serve the needs of a specific innovation project, previous research has mainly studied it from the firm-level perspective. Accordingly, the number of project-level studies on B2B OI, especially empirical, remains limited, resulting in an incomplete understanding of B2B OI management. In this editorial, we briefly review the B2B OI literature, discuss the importance of studying B2B OI at project level, and describe how each of the six articles included in our special issue contributes to this field. Moreover, we suggest future research opportunities with regard to issues and topics that remain largely under-investigated in project-level B2B OI, but which also open up to a multilevel perspective.

1. Why this special issue?

Collaborating with business partners is likely to help organizations boost their innovation capabilities (e.g., Ind, Iglesias, & Markovic, 2017; Markovic, 2016; Markovic et al., 2020a; Najafi-Tavani, Najafi-Tavani, Naudé, Oghazi, & Zeynaloo, 2018). That is why firms are increasingly embracing business-to-business open innovation (B2B OI) (e.g., Bagherzadeh, Markovic, Cheng, & Vanhaverbeke, 2020; Katsikis, Lang, & Debrezcnyn, 2016). B2B OI can be defined as a distributed, structured innovation process comprising manifold inbound and outbound knowledge flows derived from purposeful interactions with business partners (Chesbrough & Bogers, 2014; Markovic, Bagherzadeh, Dubiel, Cheng, & Vanhaverbeke, 2020b). The quest for B2B OI is such that, according to a recent study by Majchrzak, Bagherzadeh and Brunswicker (2016), more than 80% of the surveyed American firms engage in B2B OI to serve the needs of specific innovation projects (e.g., Bagherzadeh, Gurca, & Brunswicker, 2019; Bagherzadeh, Markovic, & Bogers, 2021), such as the development of drugs (Brunswicker, Bagherzadeh, Lamb, Narsalay, & Jing, 2016), automobiles (Gurca & Ravishankar, 2016), or aircraft (Norris & Wagner, 2009). This is because, even within the same firm, innovation projects often differ in manifold aspects (e.g., complexity), and therefore should be managed differently (Du, Leten, & Vanhaverbeke, 2014). Such variances among innovation projects point to the importance of considering project-level heterogeneity when studying (B2B) OI, which cannot be captured by using firm-level data (e.g., Bagherzadeh, Markovic, & Bogers, 2021; Dahlander, Gann, & Wallin, 2021).

The relative dearth of attention to project-level heterogeneity may be the reason why previous studies at firm level have obtained mixed results (i.e., positive, negative, or non-significant) concerning the impact of (B2B) OI on innovation performance (e.g., Du et al., 2014; Kobarg, Stumpf-Wollersheim, & Welpe, 2019). Accordingly, Vanhaverbeke, Du, Leten, and Aalders (2014, p. 116) argue that “one straightforward reason [for such mixed results] is that most studies aggregate different project level practices to general concepts at the firm level that are then linked to firm level performance indicators. As such, the firm has long been treated as a ‘black box’ possibly leading to a number of seemingly contradictory findings on the effect of open innovation.” Building on this observation, there are actually several factors in the ‘black box’ that can influence the firm’s innovation performance, regardless of the B2B OI level that a company embraces. For instance, an innovation project may fail due to an inappropriate business model configuration, even if the firm is widely open to collaborating with business partners and manages such collaborations properly. This is just an example of the manifold
project-level contingencies that can create ‘noise’ in the influence of B2B OI on innovation performance, and thus mislead our understanding of the effects of B2B OI.

On this background, we argue that capturing project-level contingencies is essential to better understand B2B OI management, and call for a downward shift in the level of analysis from the firm to the project level. However, despite the practical and theoretical relevance of studying B2B OI at the project level (e.g., Felin & Zenger, 2014; Lee, Fong, Barney, & Hawk, 2019; Lopez-Vega, Tell, & Vanhaverbeke, 2016; Rouyre & Fernandez, 2019; Salge, Farchi, Barrett, & Dopson, 2013), such studies remain limited and, in particular, empirical studies (see Bagherzadeh et al., 2019 and Bagherzadeh et al., 2021 for an overview). Therefore, our motivation to guest edit this special issue in Industrial Marketing Management was to stimulate (empirical) research that addresses the relative lack of project-level insights on B2B OI.

In the remainder of this editorial, we first discuss in more detail why studying B2B OI at the project level is important. Thereafter, we summarize the articles that are included in the special issue, and present their contribution to the project-level B2B OI literature. Finally, we discuss what has not been addressed yet, and suggest future research opportunities accordingly.

2. Why a project-level approach?

As argued above, the project-level perspective is critical to enriching our understanding of B2B OI management. This is because, an organization’s innovation activities are mainly managed through a set of innovation projects (Hobday, 2000). Innovation projects are increasingly considered an important organizational unit to contribute to innovation performance (Kobarg et al., 2019). An innovation project consists of “elements, choices and knowledge sets that must be creatively recombined to compose valuable solutions” (Felin & Zenger, 2014, p. 916). In practice, firms make decisions regarding different aspects of openness to business partners (e.g., openness level or business partner selection) at project level, rather than at firm level, based on each project’s needs (e.g., Lee et al., 2019; Majchrzak, Jarvenpaa, & Bagherzadeh, 2015). Accordingly, Kim, Kim, & Lee (2015, p. 412) argue that “openness at the company level is determined by the openness of individual R&D projects, which justifies the necessity of studying openness at the project level.” Thus, to obtain a complete understanding of B2B OI management, we should learn how B2B OI functions in innovation projects, which is where it mostly takes place.

In addition, innovation projects may differ in many aspects, such as strategic importance, team composition, leadership, complexity, innovation level (radical vs. incremental), type of required knowledge (e.g., basic, novel), and market situation (e.g., Cassiman, Di Guardo, & Valentini, 2010; Kim et al., 2015; Lee et al., 2019; Vanhaverbeke et al., 2014). In light of the problem-solving perspective, innovation projects with different characteristics call for different ways of finding solutions, and thus for a B2B OI process that can support the appropriate form of solution search (Nickerson & Zenger, 2004). Therefore, innovation projects with different characteristics demand different openness levels, external partners, and governance mechanisms (Bagherzadeh et al., 2021). This emphasizes the need to open the firm-level ‘black box’ and examine each innovation project separately. This would enable us to control for the heterogeneity of innovation projects when studying B2B OI, and thus to reach more stable and robust explanations than those at firm level.

Finally, it is important to note that, due to project heterogeneity, the aggregation of data at the firm level is likely to result in a loss of valuable information. Accordingly, Dahlander et al. (2021, p. 10) argue that “research at the organizational level masks important differences within companies.” For instance, a firm where most innovation projects have a low openness level may still have a high overall performance due to a few innovation projects that are highly open. Thus, if we aggregate the data at firm level, we might conclude that a low overall openness level is beneficial for firms, which could be inaccurate, as the high overall performance might be driven by the relatively lower number of a firm’s innovation projects that are highly open to business partners. This shows how relying only on aggregated data at the firm level can mislead our understanding of effective B2B OI management, and emphasizes the idea that firm-level studies are generally unable to capture differences in openness level and performance among different innovation projects taking place in a single firm (Bagherzadeh Niri, 2016; Kim et al., 2015).

3. What key factors for successful business-to-business open innovation management are covered in this special issue?

Following the above-discussed importance of B2B OI at project level, and aiming to address the relative dearth of research on the topic, especially empirical, this special issue includes six articles that have successfully completed a rigorous review process that started from a pool of 22 initial full-paper submissions. Below, we summarize these six articles and point out how they build on the literature on B2B OI management at project level. To do so, and based on their content, we classify these articles into three groups according to the key factors for successful B2B OI management that they address: business partner selection (with whom to collaborate?); B2B OI process (how to collaborate?); and B2B OI outcomes (why to collaborate?).

3.1. Business partner selection

As different business partners have different characteristics (e.g., different knowledge sets, access to different resources), choosing the right partner(s) to collaborate with on innovation projects becomes essential for project success (Bagherzadeh et al., 2021). Accordingly, the article by Steils, Hanine, Rochdane, & Hamdani (2021), entitled “Urban crowdsourcing: stakeholder selection and dynamic knowledge flows in high and low complexity projects,” looks into the heterogeneity and selection of external partners in urban crowdsourcing, using a qualitative approach with experts involved in the Casablanca Smart City project. The authors find that external partner choice is contingent upon two factors: innovation project complexity and project stages (i.e., ideation, selection, development and implementation, evaluation). Based on the complexity, they find two groups of stakeholders: primary (i.e., citizens, public authorities, and private and public firms) and secondary (i.e., NGOs, universities, consulting companies). They show that, as complexity increases, more secondary stakeholders are included in the crowdsourcing project. Moreover, they find that: citizens are included in the ideation, selection and evaluation stages; private and public firms, in the selection and development stages; and public authorities, in the selection stage. Their paper contributes to the literature by emphasizing that the selection of the right partners to collaborate with, is contingent on project attributes (e.g., complexity) and the different stages of the innovation project.

3.2. Business-to-business open innovation process

Given that different innovation projects have different attributes (e.g., complexity, strategic importance, team composition), their process cannot always be managed in the same way. This is because different innovation projects are likely to pose different process-related challenges. Accordingly, this special issue includes three articles studying some critical B2B OI process-related challenges: value creation vs. value capture; knowledge sharing vs. knowledge protection; and system integration.

First, the paper by Barbic, Jolnik, Niesten, & Hidalgo (2021), entitled “Opening and closing open innovation projects: a contractual perspective,” examines the challenges of value creation and value capture when engaging in B2B OI, and how such challenges influence project openness level. Based on a case study, the authors find that perceived threats to value creation and value capture initiate different types of openness.
dynamics (i.e., from open to close, or from close to open) over time. More specifically, they show that perceived threats to value creation foster open innovation, whilst perceived threats to value capture push toward closed innovation. They explain these different impacts based on different interpretations of the contract at firm level resulting from perceived threats at project level. Their study contributes to the literature by showing that considering both project- and firm-level factors at the same time is relevant for successful B2B OI management, which emphasizes the importance of multilevel design for studying how to manage the B2B OI process.

Second, the paper by Du (2021), entitled “The up- and downside of collaboration in core and non-core technologies - Selective, contingent, and orchestrated openness in R&D collaborations,” studies how different types of openness (i.e., selective, contingent, and orchestrated) can help to manage the knowledge sharing-protecting challenge. Using a large-scale, longitudinal, project-level dataset spanning 10 years, she finds that selective openness based on the firm’s technological fields (i.e., core, related non-core, and distant) positively influences innovation performance. However, innovation performance is best improved via R&D collaborations in the firm’s related non-core technologies. Similarly, she shows that orchestrated openness (i.e., managing openness across projects in the same knowledge portfolio) positively influences innovation performance. When analyzing contingent openness comprising market-based and science-based partners, she finds that these partners do not contribute differently to innovation performance. The findings of her paper contribute to the literature by showing that selective and orchestrated openness are effective ways to manage knowledge sharing-protecting tensions.

Finally, the paper by Gurca, Bagherzadeh, Markovic, & Koporcic (2020), entitled “Managing the challenges of business-to-business open innovation in complex projects: A multi-stage process model,” studies two major challenges posed by opening complex innovation projects to external partners – knowledge sharing and system integration. More specifically, the authors explore the micro-foundations that underpin corporate capabilities to address such challenges. Based on a qualitative case study, they show how these corporate capabilities develop and evolve. In so doing, they contribute to the literature by breaking down such capabilities into specific actions, practices and principles for the management of complex projects, emphasizing the importance of the internal preparedness of companies for managing the process of B2B OI.

3.3. Business-to-business open innovation outcomes

As B2B OI processes vary, their outcomes (e.g., project performance) also do so. Accordingly, articles included in this special issue have examined how B2B OI influences project performance, considering two critical project-level factors: (1) team diversity; and (2) capabilities (i.e., resource allocation and opportunity discovery).

First, the paper by Tang, Fisher, & Qualls (2021), entitled “The effects of inbound open innovation, outbound open innovation, and team role diversity on open source software project performance,” studies how project team role diversity influences the trade-off effects of inbound and outbound OI strategies on the performance of open source software projects. Based on a large sample of such projects, the authors find that low team role diversity, together with high inbound and high outbound OI strategies, are likely to boost technical project performance. Conversely, high team role diversity, in combination with an inbound OI strategy, is likely to enhance market project performance. The findings of their paper contribute to the literature by showing the contingency effect of team role diversity on the link between openness and performance, thereby underscoring the need for considering project-level attributes.

Second, the article by Cheah & Ho (2021), entitled “Commercialization performance of outbound open innovation projects in Public Research Organizations: the roles of innovation potential and organizational capabilities,” examines the influence of two critical project-level capabilities (i.e., resource allocation and opportunity discovery) on the relationship between innovation potential and commercialization performance in outbound OI projects. Based on a number of outbound OI projects between firms and public research organizations, the authors find that projects involving technologies with high innovation potential are likely to generate a high commercialization performance. This positive impact becomes stronger for projects that have a high resource allocation quality. Moreover, the positive impact is only in place for projects with high opportunity discovery via networks. Their paper contributes to the literature by showing the contingency role of project-level capabilities in the impact of innovation potential on commercialization performance.

4. What is the way forward?

Considering the above-presented empirical insights and contributions, in this section we provide some suggestions for future research on B2B OI management, considering project attributes, stages, portfolios and, finally, the importance of multilevel studies.

4.1. Project attributes

Although project complexity, which is a key project attribute (e.g., Bagherzadeh et al., 2021; Felin & Zenger, 2014; Lee et al., 2019), has been considered directly in the papers by Gurca et al. (2020) and Steils et al. (2021), as well as indirectly (i.e., using project size as a proxy) in the articles by Du (2021) and Tang et al. (2021), future research should examine other project attributes and their relative importance for B2B OI management. In addition, as project attributes may impact each other (e.g., an increase in project complexity can boost project uncertainty), future studies should investigate the interaction effects between them, and how such interactions influence B2B OI management. In this line, as some recent empirical studies have shown, project attributes not only impact (B2B) OI in isolation, but also through their interaction (Bagherzadeh et al., 2019; Bagherzadeh et al., 2021; Lee et al., 2019). Thus, studying each project attribute separately, without considering their interactions, may limit our understanding of how project attributes affect the management of the B2B OI process.

4.2. Project stages

As emphasized in the paper by Steils et al. (2021), different project stages require collaboration with different types of external partners, since the goals, needs and activities of each stage differ. Thus, considering different stages (e.g., ideation, development, launch) when studying openness is critical to successful B2B OI management (Vanhaverbeke et al., 2014). The same applies to external partners, as they have different characteristics (e.g., different knowledge sets, access to different resources). Subsequently, it would be relevant to investigate how openness level and external partner type are related to the different stages of an innovation project. Another future research area comprises the combination of B2B OI mechanisms (e.g., licensing, crowdsourcing, partnerships) and innovation stages. This is an important area for future studies as the processes of knowledge exploration and exploitation may vary based on the idiosyncrasies of each innovation stage. Therefore, taking a dynamic view to study B2B OI at the project level could be helpful for understanding how B2B OI management (i.e., business partner selection, B2B OI process, and B2B OI outcomes) evolves across the different stages of the innovation project (see Majchrzak et al., 2015).

4.3. Project portfolios

As highlighted in the paper by Du (2021), the knowledge of some projects can be used to enhance other projects within the same firm. The value of each project depends on its position within an organization’s
project portfolio, and thus firms often coordinate and integrate internal and external knowledge across the different projects that constitute the portfolio (Vanhaverbeke et al., 2014). Subsequently, it is relevant to look, not only at individual projects, but also at project portfolios to attain a more complete understanding of B2B OI management. As interconnecting projects with different attributes can raise cross-project coordination issues, future research could study how firms should design and implement internal practices and organizational structures to improve cross-project interconnectivity, and how project attributes and factors at other levels (e.g., firm or individual) are related to project portfolio management. More specifically, it would be interesting for future research to examine the extent to which internal firm practices for cross-project coordination should be formal, informal, or a mix of both, based on project attributes. Relatively, it would also be relevant to examine how organizations can manage potential tensions deriving from the simultaneous adoption of formality and informality (Bagherzadeh & Brunswicker, 2016; Majchrzak et al., 2015). As to organizational design, future research could investigate which is the ideal organizational structure (e.g., flat, hierarchical) for fostering project portfolio management success based on project attributes, and analyze how such organizational structure might influence intra- and inter-project knowledge flows.

4.4. The importance of multilevel studies

Arguing for the importance of project-level analyses in this special issue, does not hinder the importance of other analysis levels when studying B2B OI management. As shown in the paper by Barbic et al. (2021), project- and firm-level factors actually influence each other. Thus, it would be relevant for future studies to further explore how the interactions between project attributes and firm-level characteristics (e.g., cross-level interactions) impact B2B OI management. Similarly, as highlighted in the papers by Cheah & Ho (2021) and Tang et al. (2021), it is important to explore how individual-level characteristics (e.g., openness, motivation, commitment, diversity, experience of project team members) (e.g., Salter, Criscuolo, & Tel Wal, 2014) influence B2B OI management at project level (i.e., business partner selection, B2B OI process, and B2B OI outcomes). Finally, given the need for a multilevel understanding of B2B OI, as also argued for OI research in general (Chesbrough & Bogers, 2014), it is relevant to employ a cross-level approach in future studies to explore the joint impact of characteristics of different levels (e.g., firm, project, and individual) on B2B OI management (Bogers et al., 2017; Dahlander, Gann, & Wallin, 2021).

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