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Integrating open innovation and business process innovation: Insights from a large-scale study on a transition economy

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ABSTRACT

Open innovation and business process innovation (BPI) have been investigated by their respective research communities for decades. However, the important relationship between externally focused open innovation and internally implemented BPI is currently unexplored, particularly in transition economies. The main purpose of this study is to contribute toward closing this important research gap. This study describes the main findings of a research study of innovation practices of 224 companies operating in a transition economy.

We propose and validate a comprehensive model of integrative innovation and offer some important insights into the relationship between externally focused R&D collaboration and a firm's internal process innovation.

1. Introduction

At present, companies are faced with unprecedented environmental complexity created by rapidly changing technologies, dynamic information environments, and new types of business models. In order to remain competitive, many companies are working on two fronts – within and outside of their organizational boundaries. *Externally*, companies actively pursue opportunities to collaborate with customers, suppliers, universities, research centers, consultants, other firms, and sometimes even with their direct competitors. With their closed (internal) innovation strategy reaching its limits [40], they are finding new ways to engage in *open innovation* [13,14]. Thus, by using external resources and capabilities, these companies significantly enhance their innovation capacity [13,14]. Competitive advantage is obtained by gaining access to both new and complementary knowledge as well as unique resources that are not available internally. The factors that are successful in open innovation tend to not only view partnership as opportunities to acquire new technologies but also absorb partners' skills and capabilities to use these relationships to build skills and diffuse new knowledge [35].

In addition to external effort, companies are also working *internally*, aiming to reinvent and transform their business processes (BPs) as a primary means of business value creation and delivery [36]. In many cases, these BP transformation projects are triggered by globalization and regulatory pressures [60]. Business process innovation (BPI) is often based on a strategy of active price competitiveness typical for mature markets with more intense competition [2]. Consequently, BPI has evolved into a core focus area for all successful organizations [46]. Kirchmer [46] further suggests that any type of innovation involves BPI, resulting in processes with new structures, more accurate data, new organizational responsibilities, new activities, and better products. It is important to note that BPI research tends to focus on process innovation within organizational boundaries as confirmed by a comprehensive review of BP research by Sidrova and Isik [65].

The industry trends toward externally focused open innovation and internally focused BPI. As described above, they have been investigated by their respective academic communities for many years. However, important research has often been conducted within disciplinary silos. Focusing on R&D collaboration, we argue that, in order to actively and effectively engage in open innovation, companies also need to reconsider their internal BPs as the main means of business value creation and delivery to customers and other external stakeholders. At the same time, BPI is also required to enable companies to effectively absorb new knowledge and skills acquired through open innovation, leading to production

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and delivery of new/improved products and services. However, this important relationship *between externally focused open innovation* and *internally implemented BPI* is currently unexplored by both open innovation and BPI research communities. For example, research on managerial implications (i.e., internal consequences) of open/collaborative (external) innovations is still lacking [33]. Furthermore, Teirlinic and Spithoven [68] argue that companies need absorptive capacity and managerial skills of the internal R&D personnel to engage in external research collaborations and R&D outsourcing. We posit that both open innovation and BPI should be integrated into an "innovation loop" that spans the firm's internal/external boundary, thereby calling for multidisciplinary research.

The main objective of this study is to contribute toward a better understanding of the relationship between a firm's open innovation and BPI effort, using a multidisciplinary approach that spans the observed research silos of open innovation and BPI research. Therefore, we focus on the following broad research question: *What are the predictors of the relationship between R&D collaboration with external partners engaged in open innovation and the level of a firm's (internal) BP innovations?*

In practice, we aim to contribute toward removing the boundary between external and internal aspects of the firm's innovation, thus enabling a more effective "innovation loop" to be established between external collaboration and internal means of value creation through BPs.

Using insights from this multidisciplinary literature review, we propose a comprehensive conceptual model (framework) designed to combine the elements of a firm's open innovation with BPI (i.e., a firm's "external/internal innovation loop"). The proposed model is then verified by a large-scale survey of 240 large and small companies from Bosnia and Herzegovina (B&H). Our choice of business context and our focus on a small country operating in a very challenging (postwar) transition economy makes our study even more significant for several important reasons. This study on BPI and open innovation (let alone their combination) predominantly focuses on highly developed companies in Western economies, rather than small transition economies. Yet, "emerging markets and their unique conditions offer interesting opportunities for researchers and companies alike in the area of service innovation and digital technologies" ([7], p. 150). This is because these economies are fundamentally different from their Western counterparts in their institutional and economic structure [7]. National context is also important, because open innovation is still "deeply rooted with the culture of a particular region" [38]. Furthermore, while Western companies are driven by the need to sustain competitive advantage under familiar market conditions, companies in former socialist countries are forced to enter free market conditions, which are unfamiliar to their management and employees [66]. Therefore, for these companies, the ability to innovate (both internally and externally) with very limited resources and in very different market conditions [66] becomes a matter of survival.

Our research confirms the importance of an integrative approach to combine a firm's external (open) innovation with internal BPI effort. Apart from proposing and validating a model of *integrative innovation*, this study also offers some important and interesting insights into the relationship between external R&D collaboration and a firm's internal process innovation. For example, while the existing research confirms that companies operating in certain industries (e.g., high-tech or technology-intensive) are more focused on BPI [40,12,20,10,57,74], we found in our sample of companies that industry type *was not significant* for a company's ability to "absorb" the effects of open R&D innovation into their internal BPs. In addition, the number and variety of a company's external partners were not recognized as significant determinants of the company's ability to innovate its internal BPs. In other words, whether a company searches for new knowledge/technology widely and deeply or not was not found to be important for its capacity to use externally acquired knowledge/technology within their internal BPI. While the relevant literature confirms the influence of search strategy (exploit vs. explore) on innovation performance [49,43], we found that the nature of a firm's search processes in open innovation does not affect its BPI. Finally, this study identifies customers and suppliers as the prime sources of knowledge and technology for a firm's BP innovation effort, prompting companies to focus on building valuable relationships.

This article is organized as follows. Section 2 introduces the foundation concepts of open innovation and BPI, setting the context for our research. Section 3 provides an overview of the related literature used as information to the proposed research model and hypotheses. This is followed by a description of the research method in Section 4. Section 5 presents the research results including their analysis, while Section 6 discusses the main research findings and illustrates their importance, using the relevant literature. Section 7 summarizes the main research and practical contributions, limitations, and recommendations for future research. Finally, Section 8 offers concluding remarks and insights into our future research effort.

2. Open innovation and BP innovation: background

Since proposed by Chesbrough [13,14], the concept of open innovation has been extensively discussed by academic and managerial literature in different disciplines such as economics, management, information technology, psychology, and sociology. "The basic premise of open innovation is opening up the innovation process" ([39], p. 2). Inbound innovation refers to internal exploitation of external knowledge, while outbound innovation describes external exploitation of internal knowledge [39,64,9,52,15].

In the open innovation literature, inbound and outbound innovation processes are also known as outside-in and inside-out processes [40,30,31,26,71], technology exploitation and exploration [39,33,70,37]), or incoming and outgoing spillovers [8]. Furthermore, open innovation is considered complementary to collaboration approaches [19,27,34,47]. Consequently, researchers tend to use both terms – open innovation and collaborative innovation – interchangeably.

So far, collaboration effort to improve the ability to innovate tends to focus on firm–firm partnerships and associated mutual benefits such as creating new products/services and new processes. When considered in combination, the existing literature on interorganizational collaboration and open innovation focus on innovation performance in general, often without distinguishing between product and process innovations [40,20,10,74,52,15,30,70,1,11,18,21,22,24,25,48,50,51]. Compared with product innovation, which tends to be more prominent, there is a lack of literature related to the possible effects of open innovation on BPIs, particularly in the collaborative context.

The second related area relevant to our research is BPI. In general, BPI projects range from radical process innovations disrupting the existing business models to incremental process innovations that are more common and include minor changes mainly based on existing technology, procedures, and processes [40,50,51,53]. Incremental process innovations are often observed as process improvements. In addition, BP improvements are often perceived as innovations that are new to a firm, but not to the industry, while radical BP innovations are new to the particular industry [62].