Evolution of the open innovation paradigm: Towards a contingent conceptual model

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A B S T R A C T

Openness has increasingly become a trend in innovation management. This study aims to propose a contingent conceptual framework for open innovation that reflects the evolution of this concept based on the academic literature. Besides, it aims to analyze how open innovation can affect firm and innovation performance. Additionally, it identifies the key contingent variables that affect the relationship between open innovation and performance. To accomplish these objectives, the research design is a systematic literature review, merging bibliometrics, content analysis and mind maps. The bibliometrics was applied to investigate the key references and topics. For the content analysis, a detail-coding schema was developed. Then, a mind map approach was applied towards a contingent conceptual model. Finally, a methodological triangulation was applied for understanding in-depth the insights of these research methods applied. As a result, a contingent conceptual model of open innovation has been developed. In this model, the open innovation construct is an independent variable classified as inbound or outbound, and the dependent variables are firm performance and innovation performance. Moreover, contingent variables (control and moderator) were identified, highlighting the moderate effect of knowledge flow. Finally, open innovation antecedents and enablers were identified.

1. Introduction

In an increasingly competitive and innovative-driven environment, the collaborative view of innovation has stood out. Particularly, the open innovation phenomenon has increasingly attracted attention in innovation management (Popa et al., 2017). It is a field of research under rapid development (Bogers et al., 2017), which can be proved by the rising number of academic publications and special issues in journals (Cheng and Huizingh, 2014); however OI research has only just begun (Gambardella and Panico, 2014; West and Bogers, 2014).

Besides, researching on open innovation is complex. OI has multiple facets (Randhawa et al., 2016) and it is a multi-level phenomenon (Bogers et al., 2017), leaving major gaps on how such innovation is integrated (West and Bogers, 2014). It brings distinctive contexts and different levels of analysis to the research design, demanding more theory development efforts (Bogers et al., 2017). Moreover, OI is an inherently dynamic process, and so the research needs to incorporate dynamic elements (Appleyard and Chesbrough, 2017).

On the one hand, identifying the key variables and factors affecting open innovation is still a research challenge. Innovation openness can involve several features, such as risk, belief, exchange and share,

governance, partner and feature training (Kratzer et al., 2017). Besides, it is important to understand the structures and processes that facilitate open innovation at the organizational level (Bogers et al., 2017), knowledge management strategies (Cammarano et al., 2017), as well as the human side of openness (Ahn et al., 2017).

On the other hand, understanding the key aspects is not enough. It is also important to understand the implications of open innovation on performance on distinctive levels of analysis, such as organizational performance (Caputo et al., 2016; Cheng and Huizingh, 2014), innovation performance (Chen et al., 2011, Greco et al., 2017) and OI efficiency (Greco et al., 2017). The impact of open innovation on innovation performance and organizational performance is still a controversial issue, and the concept of its efficiency is novel in the literature (Greco et al., 2017). It is difficult to measure the impact of an internal innovation openness on innovation and on economic measures, and results demonstrate the limited impact (Kratzer et al., 2017), eventually diminishing marginal returns of open innovation in the innovation performance (Greco et al., 2017).

Moreover, due to the complex nature of interdependencies between open innovation and performance, the choice of the contingent variables represented a particularly important part of the research design.
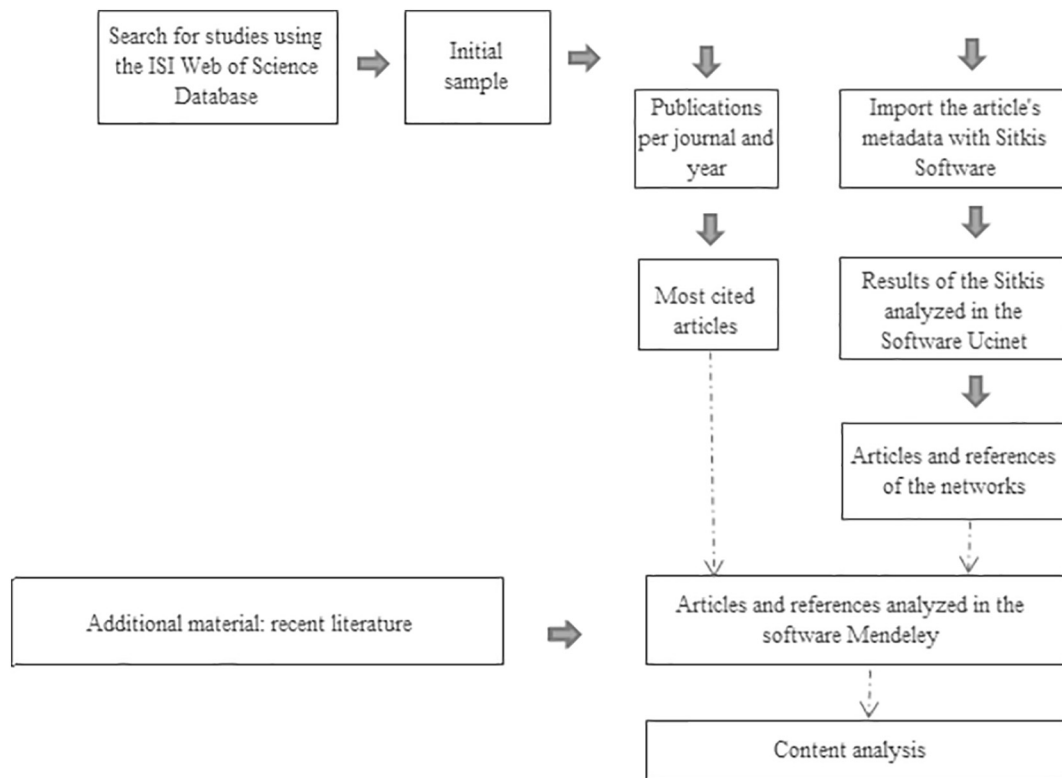
Fig. 1. Workflow of systematic literature review.

The literature pointed out some contingent variables that can affect the relationship between OI and performance, at higher or lower levels of analysis (Bogers et al., 2017). It can be influenced by both internal and external environment (Greco et al., 2017), such as firm size (Greco et al., 2017), interdependencies between organizations and various stakeholders in an innovation ecosystem setting (Bogers et al., 2017).

In this context, in which the existing literature on open innovation is not sufficiently theorized (Bogers et al., 2017; Gambardella and Panico, 2014), researchers do not sufficiently draw on theoretical perspectives (Randhawa et al., 2016) and it is mainly descriptive by nature (Martinez-Conesa et al., 2017). This paper helps to narrow this gap by performing a mapping study, analyzing the emergent literature on open innovation and its impact on performance towards a contingent conceptual model. To accomplish this objective, this paper seeks to answer the following research questions: (RQ1) Which are the key constructs and variables to investigate open innovation?, (RQ2) How open innovation can affect organizational and innovation performance? and (RQ3) Which are the contingent variables that influence the relation between open innovation and performance?

To address these questions, the research design is a systematic literature review, merging bibliometrics, content analysis and mind maps. The bibliometrics was applied to investigate the key references and topics. For the content analysis, a detail-coding schema was developed. Then, a mind map approach was applied towards a contingent conceptual model. Finally, a methodological triangulation was applied for understanding in-depth the insights of these research methods applied.

This paper proceeds by presenting the methodological approach of a systematic literature review in Section 2. After that, Section 3 presents the research results, followed by the theoretical framework in Section 4. Finally, Section 5 brings the conclusions, highlighting the main findings, theoretical and practical implications, and future research paths.

2. Research design

As mentioned in Section 1, the aim of this study is to propose a conceptual framework on open innovation that reflects the evolution of this concept based on a literature review. The systematic literature review on open innovation in this study aimed to identify and synthesize a research on open innovation in a comprehensible way by applying structured, transparent and replicable procedures for each phase of the process (Littell et al., 2008).

According to Carvalho et al. (2013) and Takey and Carvalho (2016) a systematic literature review can be developed by applying multimethods to mitagate single method limitation, such as bibliometrics, content analysis and meta-analysis. A combination of bibliometrics and content analysis was applied in this study.

The increasing growth of research and academic publications has stimulated interest in bibliometric studies (Ikpaahindi, 1985; Randhawa et al., 2016). Bibliometrics was chosen to respond if there are patterns in the literature, to identify the journals that published most articles on the subject, and how these publications evolved over time (Prasad and Tata, 2005). On the other hand, bibliometrics also made it possible to analyze the citations, and identify studies that had a significant impact on the field, as well as the relation between these articles and their references, through citation networks (Herther, 2009; Neely, 2005). The examination of the citation networks allows the analysis of the significant relationships between articles and references in common (Kessler, 1963).

In order to complements the quantitative approach of bibliometrics, the content analysis was chosen. Thus, an in-depth analysis of sample studies was made following the content analysis procedures suggested by various authors, such as full reading of the texts, definitions, hypotheses, propositions, models, and other relevant information (Ramos-Rodríguez and Ruíz-Navarro, 2004; White and McCain, 1998).

2.1. Sampling process and research workflow

Fig. 1 presents the workflow of the systematic literature review. The database chosen for obtaining the initial sample was the ISI Web of Science, since articles from other databases, such as Scopus, Proquest