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Unpacking the innovation ecosystem construct: Evolution, gaps and trends

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ABSTRACT

The innovation ecosystem construct has emerged as a promising approach in the literature on strategy, innovation and entrepreneurship. It draws upon former business ecosystem literature. However, the term innovation ecosystem has been employed in very polysemic and sometimes competing ways. Many adjectives used with reference to innovation ecosystems render the consolidation of the construct more difficult - which its characteristics, boundaries and relation with other, to some extent competing, constructs, such as supply chain and value chain are. To clarify concepts, to identify trends and research opportunities, we conducted a systematic literature review from 1993 to 2016, with a hybrid methodology including bibliometric and content analysis. Besides highlighting the most influential papers and exhaustively discussing the innovation ecosystem concept and its variations, we identify a turning point in the literature, the transition from business ecosystem to innovation ecosystem. Business ecosystem relates mainly to value capture, while innovation ecosystem relates mainly to value creation. We conclude by describing six research streams in innovation ecosystem: industry platform × innovation ecosystem; innovation ecosystem strategy, strategic management, value creation and business model; innovation management; managing partners; the innovation ecosystem lifecycle; innovation ecosystem and new venture creation. These streams lead us to propose opportunities for further research to solidify the innovation ecosystem concept.

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1. Introduction

There is an ongoing and fundamental debate around the organization of activities inside and outside the boundaries of the firm (Kapoor and Lee, 2013). Traditionally, this debate has focused mainly on the outsourcing of production activities (Rong et al., 2013c). Recently, many scholars turned their attention to the phenomenon of the network of actors involved in developing and in commercializing innovations. This phenomenon received different labels, such as open innovation (e.g., Chesbrough, 2003) or innovation networks (e.g. Lee et al., 2015). Indeed, this phenomenon might be observed in a number of cases, involving some of the most innovative companies in the world. Adner and Kapoor (2010) argue that complex innovations tend to involve a series of actors, demanding changes not confined to the supply networks (other actors may be impacted, such as regulators). To address this process of joint value creation, several scholars proposed and developed the concept of innovation ecosystem (e.g., Adner, 2006, Adner and Kapoor, 2016), which draws upon the former concept business ecosystem, initially proposed by Moore (1993).

The concept of innovation ecosystem has increasingly gained ground in the literature on strategy, innovation, and entrepreneurship. Scholars have developed a set of definitions and concepts in a variety of contexts, employing innovation ecosystem with different labels and, in some cases, with different meanings and purposes: digital innovation ecosystem (e.g., Rao and Jimenez, 2011), hub ecosystems (e.g., Nambisan and Baron, 2013), open innovation ecosystem (e.g., Chesbrough et al., 2014), platform-based ecosystem (e.g., Gawer, 2014). On the one hand, such uses might be associated with the relevance and flexibility of concept. On the other hand, such different conceptualizations might lead to contradictory and, in some cases, competing concepts. For instance, recently several scholars started regarding the business ecosystem as a synonymous of innovation ecosystem (e.g., Overholm, 2015, Gawer and Cusumano, 2014, Nambisan and Baron, 2013) while others suggested that innovation ecosystem and business ecosystem are different (e.g., Valkokari, 2015). Thoroughly examining the use of innovation ecosystem, Oh et al. (2016) found that the literature does not provide a robust definition of what an innovation ecosystem is. Thus, a lack of theoretical consistency concerning innovation ecosystem terminology may intensify the fuzzy landscape of research. As a consequence, the use of innovation ecosystem may produce a very fragmented and diverse theory, making comparison among studies difficult and failing to ensure a consolidation of knowledge.

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In these situations, literature review studies might help by providing an understanding of how the field evolved, shedding light on the points of consensus and divergences among scholars and diagnosing whether the intellectual structure within the discourse of a given theme has been properly discussed in the field. Although the innovation ecosystem literature has grown in recent years, little attention has been paid to empirical evidence employing bibliometric indicators (e.g., citation/co-citation) to understand the evolution of the innovation ecosystem approach. In this sense, the question that guides this paper is how the innovation ecosystem theory has evolved. To answer this research question we adopt a hybrid methodology, combining bibliometric and content analysis in a sample of articles about the innovation ecosystem, published in the main journals in the fields of strategy, innovation, and entrepreneurship.

This study provides a number of contributions to the innovation ecosystem literature. First, we show how the literature on innovation ecosystem has evolved by identifying the most-often cited papers and authors, and the main journals in which the innovation ecosystem construct has been developed. This may be useful, especially for new entrants in the field. Second, we undertook a number of analyses in order to understand the connections among the researchers involved in the innovation ecosystem literature and the main keywords employed. Hence, we identified the main features of innovation ecosystems, which might be a fundamental framework for understanding what an innovation ecosystem is. We showed the turning point articles: papers that promote a deep change in the field. In addition, we proposed that the concept of innovation ecosystem is different in relation to the concept of business ecosystem, although several scholars use them synonymously (e.g., Nambisan and Baron, 2013). We suggest a different understanding: innovation ecosystem is related to value creation while business ecosystem refers to value capture. We highlight the opportunities that such conceptualizations might offer to scholars. Fourth, we discuss in detail what makes the innovation ecosystem distinct in relation to other system approaches, notably the supply chain and value chain approaches. This discussion might shed light on the circumstances under which the innovation ecosystem concept is most appropriate. Fifth, we identify some areas of research, indicating some research questions, and gaps. Finally, we suggest a number of opportunities for further research and trends for the evolution of innovation ecosystem theory.

To do so, this paper is organized into four sections. The second section refers to research methods and explains the methodological procedures of the systematic literature review in detail. In the following

section, we present our main findings and discuss how the innovation ecosystem literature evolved. In the final section, we present the main conclusions of this paper, trends, and further research opportunities.

2. Research methods

The systematic review of the literature on innovation ecosystems conducted in this study includes a bibliometric and a content analysis. Bibliometric studies are gaining relevance, considering the growing number of scientific publications and the ability to use techniques to quantify the written communication process (Ikpaahindi, 1985), and how citation analysis can be used to identify important scientific papers, as well as their interrelationships (Chai and Xiao, 2012). The combination of content analysis with bibliometric analysis aims to identify literature trends, the most frequently discussed topics and fields, and gaps that may exist within the literature (Carvalho et al., 2013). Fig. 1 presents the phases of the systematic review.

2.1. Description of the sample

The bibliometric database was extracted from the *ISI Web of Science* database by *Thomson Reuters*. It was selected because it offers a feature through which a set of metadata can be collected, such as abstracts, authors, institutions, number of citations, references cited, and the journal impact factor, among others, which are essential for carrying out a bibliometric analysis.

In order to select the research database, we considered search criteria for the following topics: “*Innovation Ecosystem*” or “*Business Ecosystem*”. We employed business ecosystem as a topic for a number of reasons. The concept of innovation ecosystem draws upon the business ecosystem in the management field. As we mentioned, some authors regarded business ecosystem as synonymous of innovation ecosystem while others consider that both concepts are different. Thus, it is not clear in the literature how both concepts have evolved. Understanding the evolution of both concepts might shed light on differences and commonalities between them, opening new avenues of research. By addressing both innovation ecosystem and business ecosystem, we will be able to discuss the differences between them, which will help to make the innovation ecosystem construct more precise. Therefore, in the following analysis, we will address both constructs, by later specifying them and proposing the differentiation based on the focus on value creation or value capture.

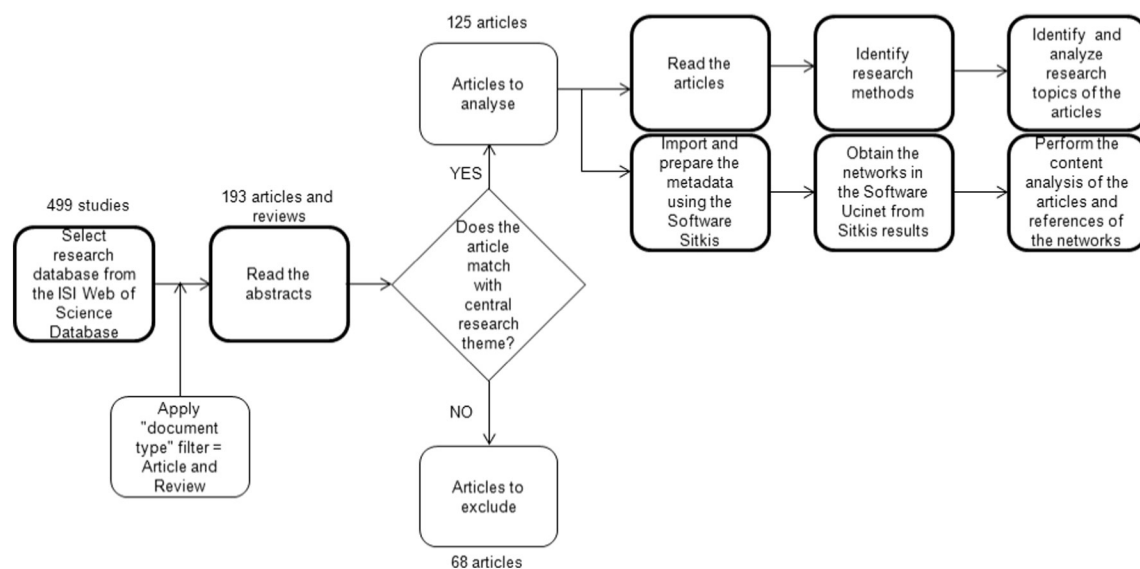


Fig. 1. Phases of the systematic review.

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