Multiple facets of innovation and business ecosystem research: the foci, methods and future agenda

1. Problem: What specific innovation management problem does the submission focus on?

Research referring to the ecosystem terminology is increasing rapidly. In today's markets were divergent companies and other organizations and stakeholders are interlinked and form webs of actors that together work for innovation become extremely relevant. Therefore in this paper we adopt an ecosystem perspective that examines the innovator/innovation as a part of a system comprising interdependent stakeholders.

"Making" innovation, i.e. turning invention to innovation is a complicated and arduous task that seems to require support and input by multiple firms, organizations and stakeholders: it is not researchers in the lab or R&D experts in firms who make innovation; rather, the society and a system of multiple stakeholders, "the ecosystem," enables realization of the ultimate goal (see Geels, 2004). To have a product with supreme technical features alone is often not enough. Due to the interconnectedness of technologies and market and societal actors, particularly innovation diffusion and consequent success is impacted by many interrelated organizations and individuals who reciprocally influence each other's behavior, and who will not switch to a new product unless they are convinced that most of the other players will also switch – a situation that is highly typical to some industries, such as interconnected high-tech (see Chakravorti, 2004; Chiesa & Frattini, 2011). Studying innovation from an ecosystem perspective is therefore pivotal.

2. Current understanding: What is known about this problem, who and how has it been tackled before?

Innovation research adopting the ecosystem perspective has increased rapidly since 2010, featuring conceptualizations such as the "innovation ecosystem" (Adner & Kapoor 2010), "business ecosystem" (Moore 1993), or "start-up ecosystem" (Isenberg, 2010). With regard to theoretical streams, these conceptualizations are linked to research on innovation, management, and marketing (Adner & Kapoor 2010; Moore 1993); development and commercialization of technologies and industry clusters (Gawer & Cusumano 2014; Rohrbeck et al. 2009); and entrepreneurship policy and regional systems (Clarysse et al. 2014; Fukuda & Watanabe 2008), thereby highlighting that the phenomenon of a "innovation/business ecosystem" is inherently multidisciplinary.

Innovation/business ecosystem approach seems to resonate with different disciplines related to technology, management, innovation, marketing and policy, just to mention just some examples. This complicates building a comprehensive picture on the concept of business/innovation ecosystem and the phenomenon beyond the concept. For example, terms business and innovation (business) ecosystems are often used interchangeably, which highlights the vagueness of conceptualization. We acknowledge that multiple literature reviews have been recently made on innovation/business ecosystems (e.g. Tsujimoto 2015 et al.) but these reviews have not taken the multidisciplinarity of the phenomenon and the inherited diversity of conceptualizations and research methods into the focus.

The core of the ecosystem perspective is that, instead of taking an isolated view, the innovator/innovation is examined as a part of a system comprising interdependent stakeholders and institutions. Since an established definition for "innovation/business ecosystems" is lacking, we integrate knowledge from the previously mentioned ecosystem literature and define the innovation ecosystem as consisting of diverse stakeholders, i.e., end-users/customers and user communities, developers and research organizations, interest groups, complementing firms representing actors in the value-chain, big business players, and small start-ups supported by incubators, regulators, policy makers, investors, and media actors.

3. Research question: What is the submission's goal?

The purpose of this study is to develop a comprehensive categorization for business/ecosystem research based on a systematic analytical review. To integrate and structure the extant knowledge on ecosystems, this article conducts an extensive metatheoretical literature review (see Torraco, 2005) and maps the multidisciplinary research area of innovation/business ecosystems. Accordingly, our goal is to contribute to the extant literature in three ways:

1. To build a comprehensive picture on the emergence and development of business/innovation ecosystem research and its diverse distinctive streams as an interdisciplinary phenomenon

The related research questions are 1) How business/innovation ecosystem research has been emerged and developed due to diverse streams 2) What are the major streams of business/innovation ecosystem research; 3) What are the typical features of the major streams

2. To analyze the prevalence of business/innovation ecosystem research with different contexts and methods.

The related research question is how business/innovation ecosystems are conceptualized, studied and depicted?

3. To outline the future research agenda for innovation/business ecosystem approach

The related research question is what are the main avenues and topics for business/innovation ecosystem research?

4. Research design: How precisely & in detail was/will the work (be) executed- describe the methodology/approach.

In order to analyze the extant knowledge on innovation/business ecosystems in depth and to generate comprehensive classifications, we followed an established research procedure for systematic literature reviews. While innovation ecosystem and business ecosystem concepts are often discussed in interchangeably, it was first necessary to extensively source all articles that concentrate on business/innovation ecosystems. Therefore, we began by identifying and collecting all relevant research articles on business/innovation ecosystem; the multidisciplinary WOS database was selected as it covers a wide range of good quality journals in the field of technology and innovation management, marketing, and management. We began with a systematic search for all articles in which the title, keywords, or abstract mentioned the words “business OR innovation ecosystem.” The search covered all articles published prior to the end of June 2015. The search yielded a total of 302 articles which has been analyzed by a group of researchers with collaboratively developed analysis schema.

5. Findings: What are/will be the main outcomes and results?

Our findings are three-fold: Firstly our analysis builds a big comprehensive picture on the emergence and development of the ecosystem approach. We for example show how “industry ecology” stream first emerged besides “business ecosystem” stream (e.g. Moore 1993) but then business ecosystem streams starts to take over. Furthermore, we identify eight different streams, namely

1) Business ecosystem (creates value, value-creation network, emphasizing collaboration and supply or competition)
2) Firm/product-centric product/solution ecosystems (including platform ecosystems, digital system "apps", industry clusters )
3) National start-up or entrepreneurship ecosystem, regional innovation systems
4) Industrial ecology (focus on how natural ecosystem is interlinked and related to business/innovation ecosystems in certain industries, e.g. energy, waste)
5) Ecosystem approach highlighting user communities and societal responsibility

6) Service ecosystem referring to systemic value co-creation and service-dominant logic approach on b-to-b markets
7) Societal and policy approach to business/innovation ecosystems (including regulators; concerns often politically important infrastructures, e.g. energy, vaccination and health care)
8) Business networks as ecosystems (referring to strategic collaborations)
These streams include different research foci; our findings also display differences in business/innovation ecosystem streams with regard to the boundaries and what is considered as the centric entity.

Secondly we found that in terms of methods, the innovation/business ecosystems has triggered both mostly conceptual research, but also quantitative and qualitative research (interview and case studies). However, longitudinal research methods and research designs seem to be lacking from the extant ecosystem research. Therefore it seems to be natural – to give some examples from our future research agenda developed based on the existing research business/innovation - ecosystems should be studied more empirically and particularly with process methods that enable analyzing the dynamics of the phenomenon. Our analysis also reveals that multiple actors beyond the conventional business and technological actors (e.g. user communities, regulators, etc.) deserve more research.

6. Contribution: What will the outcomes and results add to current understanding or theory in the IM community?
By extending and restructuring the present understanding of the innovation/business ecosystem concept and particularly focusing on its multifaceted and multidisciplinary and cross-disciplinary nature, we provide significant theoretical contributions to the current research (e.g. Adner & Kapoor 2010; Clarysse et al. 2014; Fukuda & Watanabe 2008; Isenberg, 2010; Moore 1993). Furthermore, our findings deepen and structure understanding of diversity of stakeholders in different business/innovation ecosystems that together “make the innovation”. The ultimate contribution, generated through aggregation of the extant multi-disciplinary knowledge on business/innovation ecosystems, will enable researchers in the future to amend their choices in terms of theoretical streams, methods and visualizations.

7. Practical implications: Who will practically gain what and in which way from the findings?
Our findings develop also pragmatic advice on how innovating organizations and society can improve innovating that inherently require interaction with the surrounding ecosystem comprising diverse stakeholders with differing logics (with perspective of technology, marketing, management, nature, policy, regulation etc.). For society, the findings suggest insights for developing more effective policies and public support for innovation.

8. Reference List (Very strictly: 5 to 10 references)

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