

Researching Open Innovation: Theoretical and Empirical Approaches at Different Levels of Analysis

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ABSTRACT

Open innovation is a management concept that describes the purposive management of knowledge flows across organizational boundaries. It has attracted a lot of attention from management researchers and has been approached from a variety of angles. Nevertheless, open innovation has been mostly investigated from the organizational level, while the antecedent, processes and outcomes on other levels remain relatively unexplored. This PDW particularly addresses how open innovation can be researched at different levels of analysis, with a specific focus on various theoretical perspectives and empirical approaches that may be useful in this context. The levels of analysis that are addressed include intra-organizational, organizational, extra-organizational, inter-organizational, system, and society. Based on this range of analysis levels, particular themes that are introduced by and discussed with expert facilitators are: The role of individuals in open innovation; Open innovation & entrepreneurship; Profiting from open innovation: Costs and business models; The role of users/consumers in open innovation; Tools for open innovation; Open innovation networks & communities; Open innovation in ecosystems; Crowdsourcing & crowdfunding; Boundary conditions of open innovation; Social aspects of open innovation.

ADDITIONAL INFORMATION

In the PDW, the facilitators will present a one-minute “pitch” of their position statement, highlighting what they believe to be a promising area of research within open innovation and at a specific level of analysis. Based on these pitches, the audience can select to join one of the facilitators for an extensive round table, with a focus on theory, methods, and related research questions and research designs. Subsequently, there is a plenary discussion, involving all facilitators and round tables, to collect the main insights and work towards a synthesis. The PDW will end with some concluding remarks, and an open-ended discussion and networking among the audience.

PARTICIPANTS

Table 1: List of participants of the PDW (organizers and facilitators, in alphabetical order)

<i>Name</i>	<i>Affiliation</i>	<i>Research focus related to open innovation</i>
Allan Afuah	University of Michigan	Business models, crowdsourcing
Esteve Almirall	ESADE	Open data, smart cities
Marcel Bogers	University of Southern Denmark	Role of individuals, users, business models, ecosystems
Sabine Brunswicker	Purdue University	Innovation ecosystems, business models, open data
Linus Dahlander	ESMT	Individuals, communities
John Ettlie	Rochester Institute of Technology	Strategy, structures
Dries Faems	University of Groningen	Alliances, performance
Lars Frederiksen	Aarhus University	Role of individuals, communities
Annabelle Gawer	Imperial College	Platforms, ecosystems
Marc Gruber	EPFL	Entrepreneurship
Stefan Haefliger	Cass Business School	Open source, business models
John Hagedoorn	Maastricht University	Legal aspects, performance
Dennis Hilgers	Johannes Kepler Universität Linz	Public management, open government, open data, citizen participation
Mats Magnusson	KTH Royal Institute of Technology	Social networks
Ann Majchrzak	University of Southern California	Communities, innovation ecosystems, tools, the role of individuals
Kathrin Moeslein	Universität Erlangen-Nürnberg	Organizing, the role of space and place
Ian McCarthy	Simon Fraser University	Creative consumers, social media
Satish Nambisan	University of Wisconsin Milwaukee	Entrepreneurship, ecosystems
Frank Piller	RWTH Aachen University	Organizing, the role of users
Cristina Rossi-Lamastra	Politecnico di Milano	Open source, SMEs, crowdfunding
Anne ter Wal	Imperial College	Individuals, geography
Ann-Kristin Zobel	UC Berkeley	Dynamic capabilities, ecosystems

OVERVIEW OF THE PDW

Background and Motivation

An increasing amount of research has been conducted in the domain of “open innovation”—an innovation phenomenon that involves knowledge flows across organizational boundaries (Chesbrough, 2003; Chesbrough, Vanhaverbeke, & West, 2006, 2014). Open innovation has been researched from a number of perspectives, although linkages to established theories and related phenomena are still emerging (Dahlander & Gann, 2010; West & Bogers, 2013). The research on open innovation has moreover predominantly addressed the firm as a unit of analysis, while there is a growing recognition that other units of analysis need to be addressed in order to get a more detailed understanding of the exact antecedents, processes and outcomes of open innovation. There is also a lack of a critical perspective on open innovation, given that most research emphasizes positive aspects of open innovation with a limited understanding of boundary conditions.

In this PDW, we involve a number of experts in different fields related to open innovation (see Table 1). Our objective is to identify, discuss and specify some of the most promising theoretical and empirical approaches, at different levels of analysis, for future research in the domain of open innovation. We believe that this will allow current researchers in open innovation to share and develop their research ideas, and it will invite researchers who are new to this domain to be informed about the (future) state-of-the-art of open innovation research. This will then facilitate both current and new researchers to do meaningful research in the context of open innovation.

We follow recent calls for more research on the various levels of analysis (Chesbrough & Bogers, 2014; West, Vanhaverbeke, & Chesbrough, 2006), and we link those to specific

emerging research themes. While some of the themes are related to the traditionally considered level of analysis of the organization, others have to do with determinants, processes and outcomes within the organization, outside of the organization, between organizations, or at the larger context of industries, innovation systems, and the society at large (see Table 2).

Table 2: Possible level of analysis and research objects for open innovation research

<i>Level of analysis</i>	<i>Possible research object</i>
Intra-organizational	Individual Group/Team Project Functional area Business unit
Organizational	Firm Other (non-firm) organization Strategy Business model
Extra-organizational	External stakeholders: individual, community, organization
Inter-organizational	Alliance Network Ecosystem
Industry	Industry development Inter-industry differences
Regional innovation systems	Local region Nation Supra-national institution
Society	Citizens Public policy

Source: Chesbrough and Bogers (2014)

State-of-the-Art at Different Levels of Analysis

Here, we briefly review some of the relevant and emerging research on open innovation that resides at different levels of analysis. We particularly focus on the participants' contributions to this literature, thereby highlighting both strengths and limitations of extant literature as well as possible themes for future research that build the foundation for this PDW.

Recent research has demonstrated a number of examples of open innovation themes that reside at these different levels of analysis. At the intra-organizational level, for example, recent studies highlight the role of individuals in the implementation of open innovation, including for example the changing role of the technology gatekeeper in managing knowledge flows across the organization (Ettlie & Elsenbach, 2007; Whelan, Teigland, Donnellan, & Willie, 2010), or the increasing usage of digital technology and social media by employees (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). Additional research topics emerging at the intra-organizational level of analysis include applications of open innovation at the functional (Bogers & Lhuillery, 2011) and the project level (Du, Leten, & Vanhaverbeke, 2014).

At the traditional firm-level unit of analysis, the issue of how to organize for open innovation is not yet fully understood (West & Bogers, 2013) calling for additional research on structures, mechanisms and tools of open innovation (Piller & Walcher, 2006). Furthermore, there has been a limited focus on failures and the costs and downsides of open innovation (Faems, de Visser, Andries, & van Looy, 2010; Laursen & Salter, 2006, 2013). In general, emerging research needs to further add to a better understanding of how firms can profit from open innovation by aligning open innovation strategies to the business model (Baden-Fuller & Haefliger, 2013) and governing inter-organizational relationships (Hagedoorn, Lokshin, & Zobel, 2013). Research at the organizational level of analysis also expands beyond the initial focus on large firms (e.g. Chesbrough, 2003) by exploring the role of external knowledge sources for small and medium sized enterprises (SMEs) (Brunswicker & Vanhaverbeke, 2011) and entrepreneurs (Gruber, MacMillan, & Thomson, 2013).

Going beyond or cutting across the organizational level of analysis, a variety of important themes has emerged, such as the role of users and communities (Autio, Dahlander, &

Frederiksen, 2013, Bogers, Afuah, & Bastian, 2010), and how such external sources can be leveraged through internal organizational attributes (Colombo, Laursen, Magnusson, & Rossi-Lamastra, 2011; Dahlander & Magnusson, 2005; Nambisan, Agarwal, & Tanniru, 1999).

At the inter-organizational level of analysis, an important emerging theme relates to how organizations practice open innovation in ecosystems in which all participants are depending on each other in co-evolving their capabilities and innovation outcome (Adner & Kapoor, 2010; Rohrbeck, Hölzle, & Gemünden, 2009; van der Borgh, Cloudt, & Romme, 2012; Gawer & Cusumano, 2013). More recently, the theme of “crowdsourcing” has attracted increasing attention to explore how firms can broadcast their problem solving to a “crowd” of external problem solvers (Afuah & Tucci, 2012; Jeppesen & Lakhani, 2010).

Finally, open innovation is increasingly considered in a wider variety of contexts that go beyond the innovativeness and profitability of firms. For instance, open innovation is becoming more recognized on the level of entire industries and regions (Cantner, Meder, & ter Wal, 2010) and even nations or governments, to thereby address the potential of open innovation for citizens and the public sector more generally (Almirall, Lee, & Majchrzak, in press; Hilgers & Ilh, 2010). Furthermore, the concept of open innovation is increasingly applied outside of its traditional domain of technology and R&D to acknowledge applications in areas such as manufacturing, services and education (Chesbrough, 2011; Chesbrough & Bogers, 2014; Huff, Möslein, & Reichwald, 2013).

Extending the State-of-the-Art

In this PDW, we critically discuss and build on this emerging research to develop possible theoretical and empirical directions for future open innovation research across different levels of analysis. In order to facilitate discussion in the round tables, we discuss a number of

themes, which are each associated to a facilitator who will initiate and lead the discussion. For each of the themes there will be a number of facilitators who will prepare some discussion questions, moderate the round table discussions, and summarize the key outcomes of the discussion.

RELEVANCE TO THE TIM DIVISION

Innovation is at the core of the TIM division and open approaches to innovation have long been central to the members of the TIM division as well as to TIM-related journals. However, there is still considerable debate concerning what constitutes open innovation, and there is a particular lack of understanding how open innovation works and can be studied at different levels of analysis. This PDW seeks to explore which theoretical and empirical approaches are most promising to researching open innovation at different units of analysis, while also taking a critical look at existing theories and methods. By combining insights from experts in various domains related to open innovation with the experience and interests of new or established open innovation researchers, this PDW can contribute to shaping a research agenda that is core to the TIM domain.

RELEVANCE TO THE BPS DIVISION

Innovation is central to a firm's ability to create and sustain a competitive advantage. The notion of open innovation suggests that firms are changing their innovation strategies as they include a larger range of actors and a larger range of mechanisms for sourcing knowledge and commercializing this knowledge via both internal as well as external paths. Open innovation have moreover features dominantly in strategy-journals, such as the Strategic Management Journal. However, the development and implementation of such a strategy is faced with many

pitfalls and contingencies. This PDW particularly explores the contingencies of an effective and efficient open innovation strategy, ranging from micro-foundations, to organizational level, to the larger level of inter-organizational arrangements and the systemic context. This PDW thereby enables members of the BPS division to consider key research questions and research design to link their work to the notion of open innovation. Besides the participation of BPS members will be beneficial to the overall discussion, not only because open innovation is important in the BPS domain, but also because the theoretical and empirical foundations of much work in the BPS domain (on different levels) will create important synergies in the overall discussion as we envision it in this PDW.

RELEVANCE TO THE ACADEMY THEME: THE POWER OF WORDS

This PDW has an important relation to the theme “The Power of Words” because open innovation is contingent of flows of data, information, knowledge and technologies that may all involve words in either tacit or explicit forms. It will be of particular interest to consider the power of words in open innovation at different analysis levels, given that words may have a different meaning and effect in different contexts. A related issue is that much discussion in open innovation would benefit from a clear utilization of words to describe the antecedents, processes and outcome of open innovation, both in research and in practice. We therefore hope that our PDW will contribute to a more careful consideration of words in the context of open innovation, which will be beneficial for both academic research and industrial practice, to maximize the potential that the open innovation concept has.

FORMAT OF THE PDW

The PDW is designed to both inform and enable interaction among the audience. We combine the experience, insights and ideas of expert facilitators with the input of the audience who may be more or less involved in open innovation research. The selected facilitators are researchers who, through their previous or current work, are experts in the proposed discussion themes, and they have the skills to initiate and moderate a constructive discussion.

We propose the following 120-150 minutes program (with an optional last 30 minutes):

1) 0.00-0.30: Introduction to the PDW and round tables (Marcel Bogers)

Welcome and brief introduction to open innovation. One-minute “pitch” by facilitators to introduce themselves and their proposed analysis level and theme (see also keywords in list of participants).

2) 0.30-1.15: Round table discussion (Facilitators)

Based on these pitches, the audience can select to join one of the facilitators for an extensive round table. Facilitators act as discussion leaders and moderate the discussion. The expected outcome is a number of key research questions and research designs related to the particular open innovation theme (see Table 3).

Guidelines will be provided for steering the round table discussion, relating to three main aspects:

- 1) Theory: Useful theoretical approaches and critical aspects;
- 2) Methods: Useful methodological approaches and critical aspects;
- 3) Proposed research questions and research designs.

Table 3: Levels of analysis, round table themes, and facilitators

<i>Level of analysis</i>	<i>Round table themes</i>	<i>Facilitators</i>
Intra-organizational	1) The role of individuals in open innovation	Lars Frederiksen Ann Majchrzak
Organizational	2) Open innovation & entrepreneurship 3) Organizing for open innovation 4) Profiting from open innovation: Costs and business models	Marc Gruber Satish Nimbisan John Ettl Kathrin Moeslein Dries Faems Stefan Haefliger
Extra-organizational	5) The role of users / consumers in open innovation 6) Open innovation networks & communities	Frank Piller Ian McCarthy Linus Dahlander Mats Magnusson
Inter-organizational	7) Open innovation in ecosystems 8) Crowdsourcing & crowdfunding	Sabine Brunswicker Annabelle Gawer Allan Afuah Cristina Rossi-Lamastra
Industry / Regional Innovation Systems	9) Boundary conditions of open innovation	John Hagedoorn Anne ter Wal
Society	10) Social aspects of open innovation	Esteve Almirall Dennis Hilgers

3) 1.15-1.45: Panel Discussion (Facilitators)

A panel discussion aims at collecting the main insights from the round tables. What are the main theoretical approaches / critical aspects with regard to theory? What are useful methodological approaches and critical aspects with regard to research designs? What can be summarized with respect to the main future research questions?

4) 1.45-2.00: Discussion of key conclusions (Ann-Kristin Zobel)

This brief section will include a summary of round table and panel discussions, general closure of the event and summary of future outlook. Based on the discussion, the facilitators will

also write a short summary of the most interesting and promising research questions and research designs, which will be published by the organizers as a blog post on the Academy of Management Meeting blog page, and we intend to cross-post it at other relevant blogs and websites.

5) 2.00-2-30 Networking (optional)

This last session offers the opportunity for facilitators as well as PDW participants to discuss future research opportunities - possibly cutting across different theories, methods, and levels of analysis - in a more informal setting.

ROOM REQUIREMENTS

Based on earlier PDWs and symposia, organized and attended by the organizers, we believe that this PDW, given its scope and format, has the potential to attract a large number of people (in the range of 100-150 or more). In order to enable a useful discussion and accommodate to good attendance, we would need to be able to accommodate a maximum of 20 round tables (one for each facilitator) with the capacity of 8-10 people per table. Our target is to have 100 attendees, which mean an average of five per facilitator, and we can easily accommodate up to 200 attendees, which would mean an average of 10 per facilitator. In case of a lower attendance (e.g., around 50 people), we would merge different facilitators according to the different round table themes as listed in Table 3.

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