

***Innovation Beyond The Four Walls: A Lifecycle Model for  
Cross Innovation***

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## **Introduction and theoretical grounding**

Nowadays organizations operate in a highly competitive context. Maintaining a competitive position in a rapidly changing market is crucial and can be facilitated through constant innovation (Global Innovation Index Report 2020: p. Xvii-Xxii). The innovative potential of a company, however, depends on a complex combination of factors (Srinivasan et al., 2010). Recent studies have shown that innovations emerge the most when different partners from different fields interact (Weber & Heidenreich, 2016). Particularly such interactions beyond industry boundaries in which innovation is created through existing knowledge and is transferred from one industry to another industry is referred to as cross industry innovation (Dingler & Enkel, 2016; Enkel, & Gassmann, 2010). One of the outstanding cross innovation examples is the BMW's I-Drive System of the automotive industry, which has been transferred and adapted from the gaming industry (Dingler & Enkel, 2016; Enkel, & Gassmann, 2010). Thus, already existing solutions from other industries are creatively integrated and retranslated to solve the needs of the company's current market or products.

Most of the regions in Germany are composed of small and medium-sized enterprises (SMEs), which provide an important source for such innovation as they make up a large part of the economy (OECD, S., & Outlook, E. 2019: p. 7-8; Sommer, 2015: p. 1512-1532). The ability to innovate is crucial for SMEs to persist. Specially the resources of SMEs are often limited to intensively detect and monitor new important trends. Thus, SMEs have more constraints than larger companies to adapt quickly with own strategies and solutions for innovation. Therefore, innovation through a cross innovation approach is expected to be of high potential and a useful solution for SMEs and the region where they are located in.

## **Design/methodology/approach**

To pave the way for the systematic integration of cross innovation into SME's and to obtain more knowledge on what is already described for cross innovation activities for businesses, we discuss approaches on cross innovation from the literature, focussing on processes and management activities (Brunswick & Hutschek, 2010; Gassmann & Zeschky, 2008; Chesbrough, 2003). The literature we cover is mainly focused on post case reports of interaction between larger firms, demonstrating the outcomes and products of cross innovation. We did not find a clear complete description of an overall strategy, concepts or processes, which would help developing cross innovation (short -XI) capability in SME's. Also we identified a lack of information on mapping cross innovating activities, planning and controlling cross innovation activities in SMEs. Thus, more information on managing activities in businesses belonging to an overall concept is urgently needed for cross innovation approaches.

In particular, we have discovered that the publications in the field of XI range from a theoretical focus (Gassmann et al., 2010) to a more practical application (Kerl & Moehrle, 2015). Previous studies in the field of XI came up with various definitions or processes of XI (Ciliberti et al., 2016; Echterhoff et al., 2013; Hauge et al., 2017; Lyng & Brun, 2020; Winterhalter et al., 2016). However, these studies specifically focussed on one industry only (Brunswick & Hutschek, 2010), which makes it more difficult to generalize the insights. Previous studies suggest to develop one XI-process and further enrich it e.g. by additional methods (Rothaermel & Deeds,

2004). We here expand on this approach to answer the question: *How to express cross innovation in a process model?*

In order to answer this question, we broadened our literature research onto three further segments: (a) innovation management, which provides evidence on the processes of how innovation evolves and the broader environment (Weber & Heidenreich, 2016), (b) open innovation, emphasizing that enterprises open their innovation activities in order to connect internal and external ideas (Chesbrough, 2003), (c) innovation methods, considering techniques which have been implemented already and determine whether and how they can be adopted to XI.

Along this line, it is well known that cooperation between different actors, e.g. science and industry, contributes to an increase of the innovative strength and contribute to new developments (Rothaermel & Deeds, 2004). This is what is traditionally referred to as a closed versus an open innovation paradigm (Chesbrough, 2003). Many organizations follow the open innovation paradigm and make use of collaborative innovation in opening their organizational boundaries to external players, such as Lego ideas (Andersen et al., 2013). Open innovation is defined as "a distributed innovation process, based on purposively managed knowledge-flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model" (Chesbrough & Bogers, 2014). Knowledge from various external actors can be transferred to the firm along all stages of the innovation process (Lakhani, 2006). Our understanding of XI is that it describes the process of knowledge transfer (in form of technology, business models, products, processes etc.) between organizations of different industries into a new environment where it is modified and adapted or recombined, in order to save R&D costs, add new value, open new markets, and satisfy customer needs. By formulating this definition, we classify XI as a specific type of open innovation: in innovating together with other players, organizations follow the open innovation paradigm. Yet, the partners they choose for this collaboration are "cross"-partners, this is, that firms intentionally search partners from other sectors to work with. This is why we frame it as cross open innovation. However, innovating together with other players also is associated with several risks of knowledge transfer (Larsson et al., 1998). Thus, a XI model should be comprehensive and meet relevant requirements and important factors that are needed to enable XI in SMEs, while it should also be applicable to other organizations.

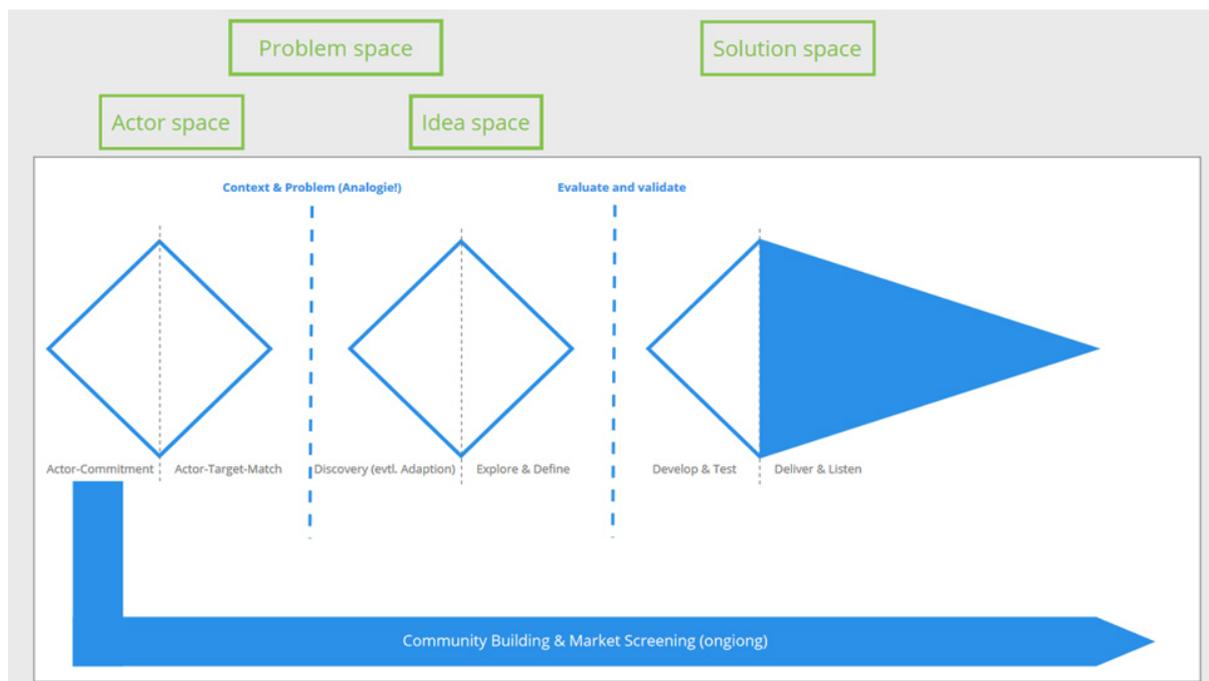
## **Methods**

Our methodological procedure consists of a profound literature research (Tranfield et al., 2003). As stated above in our research objectives, we have addressed the following research question based upon our literature research: *How to express cross innovation in a process model?* Second, we searched the literature for relevant articles. We carried out a keyword search using databases including Google Scholar, Jstor, EBSCOHOST Science Direct, Wiley Online Library by entering the keywords *cross AND innovation, cross industry AND innovation, open AND innovation, (Cross) innovation management*. This search resulted in 40 studies meeting our search criteria. The third step comprised selecting the relevant studies for our purposes (Boaz & Ashby, 2003) including only peer-review articles. In addition, we went through the abstracts/introductions to determine whether the article fits our criteria or not. In a next step, we conducted an analysis of the full text of the remaining studies and selected only those studies

which address cross innovation by mentioning a definition, a process or a model. Finally, we conducted a snowball search of articles, by screening also the literature cited in the selected articles. We ended up with a total of 20 articles. Fourth, we followed Tranfield (2003) by carefully analysing the selected articles in more detail. We therefore built an Excel sheet including articles' general information (authors, year, journal/book), whether and if yes which definition, process and/or model was presented for cross innovation. In the fifth and very last step, we report our results comprising them in Excel files. We take all findings together and bring up a comprehensive XI model, which includes the theoretical patterns developed in prior research. By screening the literature, we then broadened our initial framework and build up an agenda for future research. To secure quality, we applied researcher triangulation and discussed findings and possible inconsistencies within the team as well as externally (Campbell et al., 2013). Our final set includes 13 articles including definitions for XI and 8 articles including a process or model for XI.

### **Results: Findings and discussion.**

Our literature research played a key role in shaping the emergence and development of the model for XI. This model (Fig 1.) allows us to put forward new conceptualizations and directions for organizations and their future work, and it sets out new practical paths for cross innovation approaches. After having set up this XI model, we went back into other streams of literature in order to determine whether we can further integrate their findings. However, general innovation management *processes* can hardly be transferred or applied in XI settings because actors and their knowledge-bases are so different from each other (Larsson et al. 1998; Howard et al., 2016). Some innovation *methods* can be easily transferred from innovation management to XI model while others cannot be transferred directly. However, it is important to classify them to the different stages in which XI evolves. According to our sampling criteria (e.g. group size, participants, feasibility (online), expected outcome), we selected 12 formats from traditional innovation management that might be adopted to XI management. In addition, we have invited participants from different sectors from the Lower Rhine region to participate in XI workshops and practically test our proposed XI model. In these workshops we applied our previously tested workshop formats along the XI process by choosing topics that are highly relevant to SMEs in that region. We conducted 32 workshops with 12 different firms. Our XI model takes these specificities into consideration. We developed a process and model for XI including different preconditions such as willingness to exchange information and knowledge (Andersen et al., 2013) as well as specific stages. The stages and other relevant outcomes can be found in the following graphic and table:



**Figure 1. Lifecycle model of cross innovation**

**Table 1. Lifecycle model of cross innovation**

Stage	0 Community Building & Market Screening	1 Actor-Commitment	2 Actor-Target Match	3 Context & Problem	4 Discover y	5 Explore & Define	6 Evaluate & Validate	7 Develop & Test	8 Deliver & Listen
Target	Ongoing exchange	Ongoing exchange	Find a common topic	Market analysis	Focus on ideas	Show feasibility, prototypes	Concept to verify acceptance	Implement idea	Action, benefits
Input	Motivation, creating opportunities	Networking, exchange	Know about competence/interest of others	Research, field tests	Identify problem and formulate it	Generate and evaluate ideas	Preliminary design, proof of feasibility	User requirements are met	Adaptation for use in own company
Output	Networking, exchange	Know about competences/interest of others	Find and pursue a common topic	Identify problem and formulate it	Generate and evaluate ideas	Preliminary design, proof of feasibility	User requirements are met	Adaptation for use in own company	Final implementation

### Conclusion: Originality/value

In this paper, we have presented a normative model for XI, where rational aspects from the literature were taken to make up the decisions. Our model leans on the model of Francis and Bessant (2005), which includes all challenges that arise when organizations organise and manage innovations. It includes the diamond shape for undiscovered areas in innovation space.

This is different from the classical settings of a design thinking process, where a double diamond is proposed (Council, D., 2021), the XI-model is visualized as a dripple diamond (Fig 1).

We here, thus contribute to research and practice in several ways. (a) In the emerging literature there are several definitions, processes, models which target different settings. We unified this magnitude and developed the model of XI, which consists of a comprehensive structure and can be seen as guideline for research and practice. (b). We illustrate the interplay between key components of XI, define stages and corresponding inputs and outputs and assign methods to these stages. (c) We provide a guideline and framework for practitioners to implement XI successfully. In summary, our model aims to create a mutual understanding among all participants in a multi-disciplinary innovation environment. From a practitioners' perspective, we have established several workshop formats that can be applied and are particularly suitable for the different stages of a XI process. By assigning various innovation methods to the different stages of the XI process, we give practitioners a tool by hand to find and select appropriate means of performance.

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8<sup>TH</sup> Annual World Open Innovation Conference

# WOIC 2021

9-10 December 2021 | Eindhoven, The Netherlands

 [www.worldopeninnovation.com](http://www.worldopeninnovation.com)

Conference Theme:

**“BUILDING SUCCESSFUL ECOSYSTEMS THROUGH OPEN INNOVATION”**

Location: Online in Gather.Town. Hosted by the High Tech Campus Eindhoven

## CONFERENCE DAY 1: THURSDAY, DEC 9, 2021

Time		Location in Gather.Town
12:30 – 13:00	Meet & greet	Lobby & lake
13:00 – 13:15	Welcome by Marcel Bogers & John Jorritsma	Auditorium
13:15 – 14:00	Keynotes by Hans Hofstraat & Carmen van Vilsteren	Auditorium
14:00 – 14:30	Networking break	Lobby & lake
14:30 – 15:30	Parallel sessions 1: paper presentations	Breakout rooms
15:30 – 16:00	Networking break	Lobby & lake
16:00 – 17:00	Parallel best practice sessions	Breakout rooms
17:00 – 17:30	Networking break	Lobby & lake
17:30 – 18:00	Keynote by Henry Chesbrough	Auditorium
18:00 – 18:15	Closing remarks by Robert-Jan Smits	Auditorium
18:15 – 18:30	Award session by Marcus Holgersson	Auditorium
18:30 – 19:00	Networking	Lobby & lake
19:00	End of day 1	

## CONFERENCE DAY 2: FRIDAY, DEC 10, 2021

Time		Location in Gather.Town
12:30 – 13:00	Meet & greet	Lobby & lake
13:00 – 13:15	Welcome by Marcel Bogers	Auditorium
13:15 – 14:00	Practitioner experience interactive panel	Auditorium
14:00 – 14:30	Networking break	Lobby & lake
14:30 – 15:30	Parallel sessions 2: paper presentations	Breakout rooms
15:30 – 16:00	Networking break	Lobby & lake
16:00 – 17:00	Parallel sessions 3: paper presentations	Breakout rooms
17:00 – 17:30	Networking break	Lobby & lake
17:30 – 18:15	Keynotes by Carliss Baldwin & Focco Vijselaar	Auditorium
18:15 – 18:30	Closing session	Auditorium
18:30 – 19:00	Networking	Lobby & lake
19:00	End of day 2	

## WORKSHOP: FRIDAY 10:30 – 12:00, DEC 10, 2021 (OPTIONAL)

Workshop will be on the topic: “Research in R&D Management: Past Experiences and Future Trends”. Attendance is free.

**Note:** The conference takes place in [Gather.Town](#) online environment. You can watch this [tutorial](#) to get familiar with it.



# WOIC 2021

8<sup>th</sup> ANNUAL  
WORLD OPEN INNOVATION CONFERENCE

# CONFERENCE DAY 1

Thursday, 9 December 2021

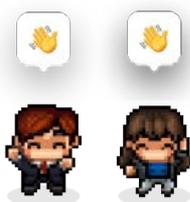
Location: Online in Gather.Town. Hosted by the High Tech Campus Eindhoven

## WELCOME & KEYNOTES

12:30-13:00

### MEET & GREET AT GATHER.TOWN

Lobby & lake



#### Say Hello/Hallo!

Use your avatars to walk around the lobby and the lake, say hello, catch up and share stories with friends and colleagues.

13:00-13:15

### WELCOME TO THE WORLD OPEN INNOVATION CONFERENCE

Auditorium



#### Marcel Bogers



WOIC Conference Chair and Professor at Eindhoven University of Technology

Marcel Bogers is a Full Professor of Open & Collaborative Innovation at the Innovation, Technology Entrepreneurship and Marketing (ITEM) group at Eindhoven University of Technology (TU/e). He is also Affiliated Professor at the University of Copenhagen and Garwood Research Fellow at UC Berkeley.

### SPECIAL WELCOME ADDRESS

Auditorium



#### John Jorritsma



President of the Brainport Foundation and mayor of the City of Eindhoven

John Jorritsma has been mayor of Eindhoven since September 2016. Before that, he was the King's Commissioner in Friesland, director of the Brabant Development Company and mayor of the municipality of Cranendonck.

13:15-14:00

### INDUSTRY KEYNOTE

Auditorium



#### Hans Hofstraat



Vice President, Senior Fellow and Program Manager at Philips Research

In addition to being the vice president, Hans Hofstraat is Innovation Program Manager and member of the Healthcare Program Board within Philips Research, focusing on various innovation topics across and adjacent to the Philips Healthcare portfolio.

### POLICY KEYNOTE

Auditorium



#### Carmen van Vilsteren



Chair of the Dutch national 'Topsector' Life Science & Health, Director Health at Eindhoven University of Technology and Chair of the e/MTIC Board

Carmen van Vilsteren has an impressive entrepreneurial background and has been active in both startups and multinationals. Her most recent position was as Solution Development Manager at FEI Company (2008-2015). In addition to her work at TU/e, she also acts as mentor for MedTech startups.

14:00-14:30

## NETWORKING BREAK

Lobby & lake



### Track 4: Digital transformation and open innovation

📍 Bohr

#### Chair/Discussant: Ann-Kristin Zobel

Teaching open innovation: from curriculum development to pilot

By: Yvonne Kirkels, Daria Podmetina, Ekaterina Albats and Iulduz Khairullina

The good, the bad, the ugly, and the beautiful of digital transformation: a critical multi-level research agenda

By: J. Dabrowska, A. Almpantopoulou, A. Brem, H. Chesbrough, V. Cucino, A. Minin, H. Hakala, F. Giones, S. Nørskov, C. Marullo, A. Mention, L. Mortara, P. Nylund, C. Oddo, A. Radziwon and P. Ritala

Where digital meets physical: utopianism vs. reality in the adoption of 3D printing

By: Thierry Rayna and Joel West

### Track 5: Implementing open innovation

📍 Debye

#### Chair/Discussant: Aurelia Engelsberger

The implementation of open innovation at the UK manufacturing firms

By: Nicole El Maalouf, Hanna Bahemia and Savvas Papagiannidis

Shush! Opening innovation without revealing it: how linguistic openness moderates the alliances-R&D outcomes relationship

By: Jingning Ao

Opening up open innovation: deep diving into the main challenges of Dutch fieldlabs from the network governance perspective

By: Shazia Khan, Fleur Deken and Hans Berends

### Track 6: Capturing value of open innovation

📍 Raman

#### Chair/Discussant: Francesco Cappa

New directions for customer value propositions in markets with a changing customer environment: the case of healthcare innovation

By: René Unteregger, Annelies Bobelyn, Johanna Höffken and Isabelle Reymen

Money changes everything: when do users perceive firms' commercialization of their innovation as unfair?

By: Tuong-Vi Sophie Quach and Nikolaus Franke

Are firms within densely connected clusters more innovative? A web approach to inter-firm relationships

By: Eric Schaap, Dominik Mahr, Ines Wilms and Piet Daas

### Track 7: New applications of open innovation

📍 Zernike

#### Chair/Discussant: Sunny Mosangzi Xu

Innovating outside the four walls: a cross innovation lifecycle model

By: Kathrin Weidner, Jutta Wirth and Karsten Nebe

A project-level approach to green open innovation

By: Lorena D'Agostino

Two complexity perspectives in OI studies and how they affect teams' key competencies and innovation performance

By: Ryszard Kleczek and Monika Hajdas