V

ESSENTIAL CHARACTERISTICS OF LEAD-USERS IN DIFFERENT STAGES OF THE NEW PRODUCT DEVELOPMENT PROCESS

Béla Venesz
Tibor Dőry

Széchenyi István University, Hungary

The availability of creative ideas is a necessary but insufficient condition for the successful innovation process. Despite the talented lead-user's ideas, the success rate of the innovation process remains low if no proper personal characteristics are attached to the individuals. Based on this phenomenon and by filling a research gap, we performed a systematic literature review to collect, summarize, analyse and synthesize published literature between 2000 and 2020 and report findings about the required personal characteristics of lead-user. The resulted 45 studies demonstrated that diverse characteristics are required in different stages of the NPD process different in the consumer and industrial context. Based on the research results we made a contribution to theory by extending the lead-user method in the form of a partial theory named "LU-char-co". By applying the review results managers can make a better selection of lead-users for their NPD process. We found additionally that in the case of incremental innovations, companies apply their technical knowledge and they do not require additional expertise from users. In the case of radical innovations, users only with high technological competencies are involved in the development stage of the NDP.

Keywords: personal characteristics, lead-users, new product development, systematic literature review

W

CIRCULAR PUBLIC PROCUREMENT – THE LINK BETWEEN PUBLIC PROCUREMENT AND CIRCULAR BUSINESS MODELS

Jessica Lagerstedt Wadin
Eva Svensson Myrin

Lund University, Sweden

This research note is about circular public procurement (CPP) linked to circular business models (CBM). Due to its large yearly turnover public procurement is pointed out as an important tool to reach sustainable production and consumption. Green public procurement (GPP) is well known and strives to decrease environmental impact from producing and using goods and services, commonly in a linear context. Now the necessity of a circular resource flow is acknowledged, and PP is again recognized as an important tool for transition.
Despite this recognition few studies have been made about CPP and in absence of dedicated studies the conclusion that CPP suffers from the same obstacles as GPP is sometimes made. This can lead to misunderstandings as CPP principally focus on the flow of resources itself, and not necessarily the impact of the flow.
Our study strives to give important knowledge of CPP by investigating the link between CPP and circular business models (CBM). We take a starting point in the different CBM defined by Charter and McLanaghan and in a Swedish context, together with experienced public procurement officers, we reveal perceived obstacles for procuring from each CBM. We find that business models like Product-Service-Systems meets more, and more severe, obstacles in the public context then for example Extended lifetime.

Keywords: transition to a more circular society, public procurement, innovating for a better future

INNOVATING OUTSIDE THE FOUR WALLS: A CROSS INNOVATION LIFECYCLE MODEL

Kathrin Weidner
Jutta Wirth
Karsten Neb

Rhine-Waal University of Applied Sciences

In this research we described how cross innovation (short -XI) can systematically be integrated into small and medium-sized enterprises. Based on a profound literature research specified on XI and innovation management in more general (processes and management activities) we developed a model for XI which allows us to put forward new conceptualizations and directions for organizations. We illustrate the interplay between key components of XI, define stages and corresponding inputs and outputs and assign methods to these stages. Besides contributing to the development of theory, this research also sets out new practical paths for XI approaches. We provide a guideline and framework for practitioners to implement XI successfully. In summary, the model aims to create a mutual understanding among all participants in a multi-disciplinary innovation environment.

Keywords: cross innovation, open innovation, innovation management, innovation methods, design thinking

FROM LINEAR TO CIRCULAR – IMPACTS ON THE BUSINESS MODEL DESIGN

Melanie Wiener
Christina Schatzl

Johannes Kepler University, Austria

INNOVATING OUTSIDE THE FOUR WALLS: A CROSS INNOVATION LIFECYCLE MODEL

Kathrin Weidner, Jutta Wirth, Karsten Nebe
Rhine-Waal University of Applied Sciences
Kathrin.Weidner@hochschule-rhein-waal.de

ABSTRACT

In this research we described how cross innovation (short -XI) can systematically be integrated into small and medium-sized enterprises. Based on a profound literature research specified on XI and innovation management in more general (processes and management activities) we developed a model for XI which allows us to put forward new conceptualizations and directions for organizations. We illustrate the interplay between key components of XI, define stages and corresponding inputs and outputs and assign methods to these stages. Besides contributing to the development of theory, this research also sets out new practical paths for XI approaches. We provide a guideline and framework for practitioners to implement XI successfully. In summary, the model aims to create a mutual understanding among all participants in a multi-disciplinary innovation environment.

Keywords*: Cross innovation, open innovation, innovation management, innovation methods, design thinking*

1. THEORETICAL AND EMPIRICAL BACKGROUND AND RELEVANCE

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 (Dutta et al., 2020). The innovative potential of a company, however, depends on complex combinations of factors. Recent studies have shown that innovations emerge the most when partners from different fields interact (Weber and Heidenreich, 2016). Such interactions beyond industry boundaries with the aim to create innovation through exciting knowledge is referred to as cross industry innovation (Dingler and Enkel, 2016). One of the outstanding cross innovation examples is the BMW´s I-Drive System of the automotive industry, which has been adapted from the gaming industry (Enkel and 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, 2019). The ability to innovate is crucial for SMEs to persist. The resources of SMEs are often limited to intensively detect and monitor new important trends. Thus, SMEs have more constrains 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 as well as the region where they are located in.

2. RESEARCH OBJECTIVES, PROBLEM AND/OR HYPOTHESES

To pave the way for the systematic integration of cross innovation into SME´s we discuss approaches on cross innovation from the literature, focussing on processes and

management activities (Brunswicker and Hutschek, 2010; Gassmann and Zeschky, 2008). 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/concept/process which would help developing cross innovation (short -XI) capability in SME´s. Also we identified a lack of information on mapping, planning and controlling XI-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 to a more practical application. Previous studies in the field of XI came up with various definitions or processes of XI (Hauge et al., 2017; Lyng and Brun, 2020). However, these studies specifically focussed on one industry only (Brunswicker and Hutschek, 2010) which makes in more difficult to generalize the insights. Previous studies suggest to develop one XI-process and further enrich it e.g. by additional methods (Rothaermel and Deeds, 2004). We here expand on this approach to answer the question: *How to express cross innovation in a process model?*

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 and Deeds, 2004). This is what is traditionally referred to as a closed versus an open innovation paradigm. 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 a distributed innovation process in which an organization purposively manages its knowledge-flows across organizational boundaries (Chesbrough, 2003). Our understanding of XI is that it describes the process of knowledge transfer 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 (cross open innovation). However, innovating together with other players also is associated with several risks of knowledge transfer (Howard et al., 2016). 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.

3. RESEARCH DESIGN

Our methodological procedure consists of a profound literature research (Tranfield et al., 2003). First, we formulated 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, Science Direct, Wiley Online Library by entering the keywords *cross* AND *innovation, cross industry* AND *innovation*, *open* AND *innovation*, and *(cross)* AND *innovation* AND *management*. The third step comprised selecting the relevant studies for our purposes by selecting only those studies which address XI by mentioning a definition, a process or a model. 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, whether and if yes which definition, process and/or model was presented for XI. In the fifth and very last step, we reported our results comprising them in Excel files. We took all findings together and brought 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. Our final set includes 13 articles including XI-definitions and 8 articles including a process or model for XI.

4. Analysis and Discussion

Our research design played a key role in shaping the emergence and development of the model for XI. The XI-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 (Howard et al., 2016). Some innovation *methods* can be easily transferred from innovation management to the XI-model while other 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. We have invited participants from different sectors 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 the participating SMEs (32 workshops in total). 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:

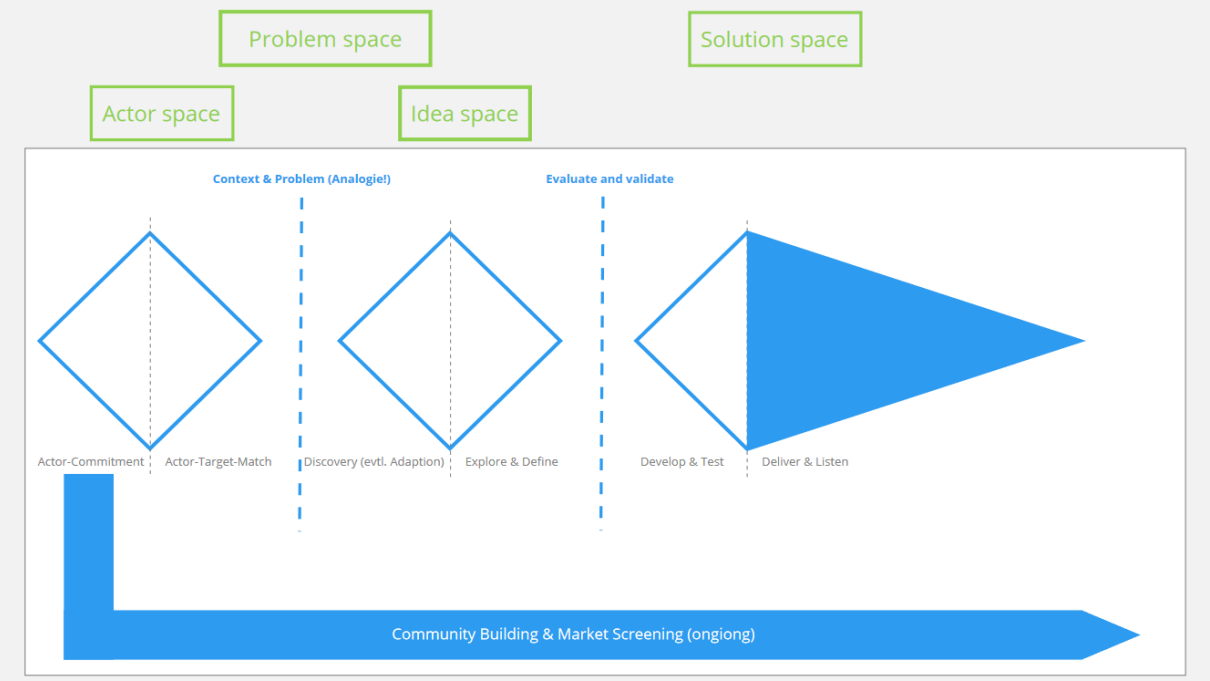

Figure 1. "Lifecycle model of cross innovation"

Stage	0 Community Building & Market Screening	1 Actor-Commitment	2 Actor-Target Match	3 Context & Problem	4 Discovery	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

Table 1. "Lifecycle model of cross innovation"

5. EXPECTED CONTRIBUTION

In this paper, we have presented a normative model for XI, where rational aspects from the literature were taken to make up decisions. The XI-model leans on the model of Francis and Bessant (2005) including all challenges that arise when organizations organise and manage innovation. However, it adds another diamond to the double diamond shape for undiscovered areas in innovation space (see Council, 2021) (see. Fig. 1). By doing so, we 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 a XI-model 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, the 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.

REFERENCES

Andersen, P. H., Kragh, H. and Lettl, C. (2013), Spanning organizational boundaries to manage creative processes: The case of the LEGO Group, Industrial Marketing Management, Vol. 42, No.1, pp. 125-134.

Brunswicker, S. and Hutschek, U. (2010), Crossing horizons: leveraging cross-industry innovation search in the front-end of the innovation process, International Journal of Innovation Management, Vol. 14, pp. 683-702.

Chesbrough, H. W. (2003), Open innovation: The new imperative for creating and profiting from technology, Harvard Business Press, pp. 2-3.

Council, D. (2021), What framework innovation design councils evolved double diamond, URL: https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond.

Dingler, A. and Enkel, E. (2016), Socialization and innovation: Insights from collaboration across industry boundaries, Technological Forecasting and Social Change, Vol. 109, pp. 50-60.

Dutta, S., Lanvin, B., Wunsch-Vincent, S. (2020), Global Innovation Index 2020: Who Will Finance Innovation? Ithaca et al., URL: https://www.globalinnovationindex.org/gii-2020-report.

Enkel, E. and Gassmann, O. (2010), Creative imitation: exploring the case of cross-industry innovation, R&d Management, Vol. 40, No. 3, pp. 256-270.

Francis, D. and Bessant, J. (2005), Targeting innovation and implications for capability development, Technovation, Vol. 25, No. 3, pp. 171-183.

Gassmann, O. and Zeschky, M. (2008), Opening up the solution space: the role of analogical thinking for breakthrough product innovation, Creativity and Innovation Management, Vol. 17, No. 2, pp.97-106.

Hauge, E.S., Kyllingstad, N., Maehle, N. and Schulze-Krogh, A. C. (2017), Developing cross-industry innovation capability: regional drivers and indicators within firms, European Planning Studies, Vol. 25, No. 3, pp. 388-405.

Howard, M. Steensma, H. K., Lyles, M. and Dhanaraj, C. (2016), Learning to collaborate through collaboration: How allying with expert firms influences collaborative innovation within novice firms, Strategic Management Journal, Vol. 37, No. 10, pp. 2092-2103.

Lyng, H. B. and Brun, E. C. (2020), Making Your Knowledge Mine: The Integration of External Knowledge in Cross-Industry Innovation, International Journal of Innovation Management, Vol. 24, No. 5, pp. 2050050.

Rothaermel, F. T. and Deeds, D. L. (2004), Exploration and exploitation alliances in biotechnology: A system of new product development, Strategic management journal, Vol. 25, No. 3, pp. 201-221.

Tranfield, D., Denyer, D. and Smart, P. (2003), Towards a methodology for developing evidence-informed management knowledge by means of systematic review, British journal of management, Vol. 14, No. 3, pp. 207-222.

OECD (2019), OECD SME and Entrepreneurship Outlook 2019, OECD Publishing, Paris, https://doi.org/10.1787/34907e9c-en.

Weber, B. and Heidenreich, S. (2016), When and with whom to cooperate? Investigating effects of cooperation stage and type on innovation capabilities and success, Long Range Planning, Vol. 51, No. 2, pp. 334-350.

Continuous Innovation NETWORK

22nd CINet Conference

Organizing innovation for a sustainable future

13-15 September 2021

Book of Abstracts

CHALMERS UNIVERSITY OF TECHNOLOGY