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Opening the open innovation box with an industrial network approach

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Abstract

In this paper we set out to explore the opportunities for mutual learning between the industrial network approach and open innovation models. We take the starting point in the role of resources which is central in both models, not least related to the firm's possibilities to create and capture value through innovation. We use mini-cases based of resource combining across firm boundaries. The paper ends with a concluding discussion raising three themes for future research regarding capabilities, openness and value.

Key words: open innovation, resources, industrial network approach, interaction, openness

INTRODUCTION

Over the last 30-40 years the Industrial Network Approach (INA) has emerged as a powerful tool for analyzing business-to-business (B2B) markets (Håkansson et al, 2009). Also known as IMP (Industrial Marketing and Purchasing) this stream of literature, consisting of a large number of publications, has led to increasing understanding of B2B markets, in particular regarding such topics as marketing and sales, sourcing and purchasing, and technological innovation. With its focus on interaction among firms and other types of organization operating in network-like structures, INA provides a fruitful theoretical framework for carrying out various types of empirical studies. The focus is often on business relationships between selling and buying firms and how these relationships can be managed in different contexts. The research has shown, *inter alia*, that such relationships play an important role when firms develop and commercialize new technologies. In other words, new innovative

products (goods and/or services) and related manufacturing processes tend to be the outcome of collaborative activities taking place in business networks (e.g. Håkansson & Waluszewski, 2002). The exchange and combination of resources owned and controlled by individual actors is a key element in the collaboration.

In parallel to the development of INA, Open Innovation (OI), starting with Chesbrough's pioneering book from 2003, has emerged as another important stream of literature also focusing on how firms innovate by exchanging resources and collaborating with each other. The core idea is that in order to create an innovation (e.g. a new product), firms should focus on and allow knowledge exchanges across the firms' boundaries. Similarly to INA, open innovation scholars stress that the knowledge held by external actors is fundamental to develop innovation. Therefore, firms must be prepared to open their boundaries and facilitate interaction with others.

There are many similarities but also differences between these two theoretical perspectives. As pointed out by Öberg (2016, p. 554), the research interests among INA/ IMP and OI scholars are close in certain dimensions but not in all:

…the phenomenon studied in OI and IMP innovation studies is overlapping, while it is not to be seen as one homogeneous phenomenon, but one with several different characteristics and dimensions. Through exchanging knowledge between IMP and OI, a better understanding for various innovation processes that span company borders can be created, while theoretical ideas may be challenged and thereby also developed.

Hence, INA/IMP and OI have in common their focus on interaction mechanisms and the effects on innovation derived by the firms' interactions with external actors. At the same time, INA/IMP and OI tend to approach innovation in somewhat different manners. In industrial networks, innovation is the outcome of mutual interaction processes among actors which are dependent on each other and more or less strongly tied through business relationships. The network context within which the actors operate has great impact on the actors' interplay and what comes out of the interaction. According to the OI model by contrast, the innovation is more dependent on the focal firm's own capability to seek external knowledge and combine it with its own knowledge (the outside-in branch of open innovation).

It is our belief that there is a potential to develop both the INA and OI models through cross-fertilization and mutual learning. For example, it should be possible to use the openness concept to increase the understanding of how firms innovate in industrial networks. At the same time, we assume that knowledge about how B2B companies innovate by networking with business partners offers opportunities to develop the OI model.

Hence, in this paper we explore the opportunities for mutual learning between the industrial network and open innovation models. We take the starting point in the role of resources which is central in both models, not least related to the firm's possibilities to create and capture value through innovation. In industrial networks, the combining of resources held by different actors is a key element in the innovation process (e.g. Håkansson & Waluszewski, 2002; 2007). These resources are heterogeneous which means that their value is dependent on how they are combined with other resources (internal and external). The OI model builds on the assumption that useful resources, especially in the form of knowledge, are widely distributed. This means that organizational boundaries need to be permeable so that they "… enable

combinations of resources beyond an individual actor's resource endowments" (Chesbrough, Lettl & Ritter, 2018, p. 931).

Value is thus another key concept in both models, and it is strongly related to the use of resources. As pointed out by Chesbrough, Leetl & Ritter (ibid), to sustain the purpose of innovation the activities must not only lead to value creation but also enable the firm to capture the value created through the collaboration.

The purpose of the present paper is thus to explore, based on a resource perspective, how the OI and INA models can be further developed by learning from each other. Differently put, our aim is to create a dialogue between the two research communities, thereby contributing to open up the open innovation box.

The paper is basically a conceptual one, but it draws on a rich base of empirical research on industrial networks carried out over a long period of time. The authors themselves have been involved in a fairly large number of network studies. Empirical illustrations from this research, in the form of mini-cases, are used in order to support our reasoning. Generally, as described in the original publications these cases are mainly based on semi-structured interviews with key people in the companies involved. All cases have been reviewed and approved for publication by the companies

THEORETICAL STARTING POINTS

The theoretical starting points consist of the industrial network approach and the open innovation model. INA has its origin in many years of research on marketing and purchasing in B2B markets (see, e.g. Håkansson & Snehota, 1995; Håkansson et al, 2009). The INA research has shown that business relationships and networks in many situations play an important role for technological development (see, e.g., Håkansson, 1987; Håkansson and Waluszewski, 2007). Successful innovation usually requires involvement of customers/users and suppliers but sometimes also other external actors from which valuable resources can be obtained (e.g. universities and research institutes). Thanks to this research we have learned a great deal about how firms in B2B markets innovate by interacting with each other. Much of the research has focused on resources and how these can be used and developed. Resources are elements that have a known or potential use value for someone. Useful resources in the form of, for example, knowledge and facilities are distributed among different actors in the network. It is by combining these resources through inter-organizational exchange processes that innovation can be successfully achieved.

The Open Innovation (OI) model as coined by Chersbrough (2003) has been recognized as a new paradigm within innovation studies (Gassmann, 2006; Gassman et al., 2010) and OI has opened up a new research stream. It builds on the notion that companies have to change their perspective on how to develop innovation by recognizing the importance of exploiting their internal knowledge as well as by using external knowledge dispersed in the business environment. Openness' thus refers to the company's attitude to combining the internal knowledge with the externally available knowledge held by other potential counterparts.

Within OI literature resources are generally identified as knowledge and they are important assets in any OI initiative (Gassmann, 2006). Openness regards the fact that companies must deal with others in order to catch new resources outside their boundaries (Dahlander & Gann, 2010).

Managing knowledge and other resources requires the holding of specific competencies to be applied within and outside the focal firm. For example, Lichtenthaler (2011) stresses the importance of achieving specific capabilities in order to gain full advantage of knowledge exploitation. Thus, it seems that resource access and resource combination depend on the holding of particular *firm-capabilities* such as the internal capability (relational capability) of building and managing inter-organizational relationships to keep control over the flow of resources. Moreover, access to resources is linked to the specific 'absorptive capacity' which distinguishes every single firm (Randhawa et al., 2016). As pointed out by Zobel (2017), the real advantage of implementing OI would derive from the capability of the firm to absorb and transform any external resource into a technology-related capability.

RESOURCE COMBINING IN INDUSTRIAL NETWORKS

The concept of resource combining is important in this paper and we describe how it is used in INA. In subsequent sub-sections, we use mini-cases to illustrate how resource combining actually takes place in collaborative innovation projects and how it is related to openness and closeness in industrial networks. The mini-cases deal with firms from different parts of the world (e.g. Sweden, Italy and Japan) which operate in B2B markets and have been involved in collaborative innovation projects. It is shown, *inter alia*, that such collaboration can be either dyadic or multi-relational and characterized, depending on the context, by varying degrees of openness and closeness. It is concluded, for example, that openness between collaborating parties is often a prerequisite for successful resource combining.

The analysis shows that the concepts of openness and closeness can help us to better understand why collaborative projects in industrial networks look like they do and why they develop in the way they do. This is not the same type of openness as usually discussed in the OI literature. But still our discussion shows that looking at collaborative innovation from an openness point of view might be a useful tool in INA-based research. We have also shown that the related concept of closeness is relevant to use in the analysis of collaborative innovation.

Different forms of openness and closeness exist in industrial networks. Of great importance is that openness within relationships (dyads) is a necessary condition for effective resource combining. In many situations, as exemplified by our mini-cases, the required openness cannot be realized without establishing closeness to other parts of the surrounding network. This includes other actors with which the innovating firms have direct or indirect relationships. Another form of openness has to do with other actors' possibility to commercially benefit from the innovation. Under certain circumstances, there can be a predetermined openness in this regard, or an opening not intended from the beginning that occurs as a consequence of how the interaction among partners unfolds.

Compromises and trade-offs may thus emerge while companies interact with the purpose of developing something new. Indeed, those 'negotiation episodes' are an essential part of the overall process of collaboration.

CONCLUDING DISCUSSION: CREATING A DIALOGUE BETWEEN OI AND INA

In this paper we set out to explore the opportunities for mutual learning between INA and OI and we attempt to contribute to this by creating a dialogue between the two research communities. With dialogue we mean an exchange of viewpoints and perspectives concerning innovation in business-to-business context, hence the ambition is to foster a productive exercise of mutual learning between the oldest (INA) approach and OI. In starting with this paper we asked ourselves the question if open innovation is anything new or if it is a phenomenon that already has been researched for many years. Lakemond & Tell (2016) raised the same question and gave the answer that the phenomenon of open innovation has been studied in other fields, such as technological collaboration among firms in supply chains and strategic alliances among firms. Related, we see that the research based on INA would definitely be one such field (see Öberg. 2016).

However, according to Lakemond & Tell (2016), open innovation is new when it seen in broad terms, including inbound as well as outbound flows and monetary as well as non-monetary flows, then open innovation has new impact on organizations. Nevertheless, "*we cannot ignore the relevance of nearby research fields and we hope that these fields can cross-fertilize each other*" (Lakemond & Tell, 2016, p. 298, translated). In this paper our ambition is that we can identify areas for cross-fertilization or mutual learning and not least we aspire to create a dialogue between INA and OI scholars. In this concluding discussion we start with raising questions based on the above reasoning of resource analysis in INA and OI and identify both similarities and differences. This forms the base for formulating three themes for further research – an initial research agenda for open innovation in industrial networks.

The first theme deals with the acknowledgement that capabilities, and the role of capabilities, are important for companies in several respects. Through capabilities – which have to be formed and owned also by counterparts – companies may optimize the resources (Chesbrough, Lettl & Ritter, 2018) necessary for carrying out innovation and exploit the value generated by that process. '*We argue that an open-innovation capability is a dynamic capability, as it changes the resource base of the firm'* (Chesbrough, Lettl & Ritter, 2018, p. 934). Clearly, within the OI paradigm, the dynamic nature of capabilities as well as its strong tie with the concept of 'absorptive capacity' (Randhawa et al., 2016) are recognized. The firms' capabilities to absorb resources – such as knowledge – together with the attitude of keeping the boundaries open would create an extremely advantageous condition for innovating. It would hence be possible to maneuver and drive innovation by developing certain specific capabilities. From an INA perspective the focus is more on the relevance of the interactive nature of the innovation process. Performing innovation – which is within INA based on the combination of heterogeneous resources dispersed in the business network (Baraldi et al., 2011) and often held by actors which have their own different agendas – requires certainly holding capabilities which are not known a priori. It would become relevant to develop capabilities in order to coordinate the complexity in the own and counterpart organization: more than developing a specific competence/capability, INA observes as fundamental the acknowledgement that coordinating is necessarily the most urgent capability to develop.

Concluding from above, we propose that capabilities are central factors which affect the entire innovation development process, but they are formed while *interacting* and they depen/d on the reciprocal perception of the actors of the benefit derived from the collaborations. Following our reasoning, key questions to address might be formulated as follows: What is the content of the capability? How would the capability 'change' with respect to the business context (see the next theme) where the focal company is embedded and operates?

The second theme we would like to bring to the fore regards the presence of multiple forms of openness. According to OI, openness may assume different forms or even it may be interpreted as a strategy to develop innovation (Enkel et al., 2009). The forms describe several available scenarios. One critical aspect concerns the fact that the forms are *known a priori* whereas within INA the presence of multiple forms would depend on how the company deals with the business context. The importance of the business context in which companies interact emerges from our empirical illustrations, for example the Mexus case (Baraldi et al., 2012). The business context influences the way companies do innovation and collaborate, the way they deal with each other, and how they develop business relationships. Therefore, the process of resource combining – so central in giving birth to innovation – may assume more than one specific configuration over the firms' boundaries. Some relevant questions can be outlined as follows: To what extent should companies keep their boundaries open? In what circumstances openness/closeness may effectively work and favor the innovation process?

The third themes concerns the creation and capture of value from innovation projects. The concept of value is important both to OI and INA. One can distinguish between value-in-use and value-in-exchange (see e.g. Chesbrough, Lettl & Ritter, 2018). The former is created through a process where resources are consumed and results in an outcome with certain benefits (ibid). The process can be internal to a firm or collaborative where several actors are involved and contribute resources. The outcome of such a project is typically a new product or application. The outcome brings certain benefits to the actors involved. The value consists of the difference between the benefits and the sacrifices made by the actors.

OI research deals primarily with value-in-exchange (ibid, pp. 933-934). In typical OI projects, resources are exchanged across firm boundaries without being changed. In a following step, by unlocking the embedded value of the resource through an innovation project the receiver can create value-in-use.

In INA research by contrast, the value-in-use is more important. It focuses on collaborative projects where two or more actors are involved. Resources from different actors are combined in an innovation process which creates value for the parties. For the customer, value is created when it uses the new product in its own operations, for example, in order to solve a problem or improve the final product. There is creation of value also for the supplier who can implement the new product in its own production and sell it to the partner and possibly also to other customers. Besides the availability of a new product, both supplier and customer may gain other short-term or long-term benefits, such as for example new knowledge.

According to INA, the interaction can have effects on three levels, namely, actor, dyad and network (Håkansson & Snehota, 1995). Hence, besides the creation of value for the interacting parties, there can be value created also on the other two levels. For example, there can be a strengthening of the relationship in terms of activity links, resource ties and actor bonds (ibid). This can facilitate future collaboration. On the network level, it is possible that other network actors can benefit by getting a chance to buy and use the new product.

Although the creation of value-in-exchange is less important from an INA point of view, it occurs. Like in typical OI projects, valuable resources may be transferred without carrying out collaborative activities (e.g. collection of user information from specific counterparts).

The capturing of value can be challenging to participants both in OI projects (ibid) and in network-based collaboration. Both suppliers and customers attempt to increase the value they can appropriate from collaborative projects. We would argue that the height of the value captured by the different actors depends on the openness and closeness of the relationship.

Thus, how the relationship evolves in this respect can be expected to affect the agreed upon conditions for exploiting the project outcome, and also the price to be paid for the product. Both in the OI and INA literature, the role of trust is emphasized. However, as pointed out by Chesbrough, Lettl and Ritter (2018, p. 936), unlike network collaboration OI projects often involve a large number of loosely coupled actors who do not have close and long-lasting relationships with each other.

Like the two preceding themes, we end this reasoning about value by suggesting a few questions for future research: What different types of value can be created through innovation projects where two or more actors are involved? How can different types of participating actors capture value from the collaboration? How does the characteristics of the relationship in terms of openness and closeness affect the creation and capture of value? We think that these questions have relevance both for OI and INA researchers.

In conclusion, there is no doubt that openness is an intriguing phenomenon, not least given the existence of various boundaries in the business landscape. One such boundary is in space: that is, between firms. It can be questioned to what extent – and how – openness is needed for effective resource combining. Other boundaries are in time: for example, resources that have historically been owned and protected by certain actors may at some point in time become available to others. One may ask the question what determines the timing for this opening.

In this concluding section, we have posed several questions that we think deserve further research. We look forward to digging more deeply into these questions in order to enhance our knowledge of openness in different types of innovation projects.

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