Industrial Marketing Management xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Industrial Marketing Management

journal homepage: www.elsevier.com/locate/indmarman

Business creation in networks: How a technology-based start-up collaborates with customers in product development

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ARTICLE INFO

Keywords:
Start-ups
University spin-offs
R & D collaboration
Customer relationships
Business networks

ABSTRACT

This paper deals with business creation in networks by setting the focus on how technology- based start-up companies collaborate with customers in product development. The aim is to analyze the pattern of customer collaboration by using the industrial network approach as theoretical point of departure. The method consists of a process-based single case study. The focal case is Oxeon, a Swedish rapidly growing university spin-off company commercializing a new technology for making carbon fiber composites. The development of products and applications has taken place in close collaboration with their customers. The paper addresses three research issues, which are related to the timing, mutuality and organizing of the collaboration. The analysis of the Oxeon case results in identification of five crucial aspects on the management of customer collaboration: (i) the need for involving customers early, (ii) the choice of application areas, (iii) the mutual process of choosing and getting chosen as collaboration partner, (iv) the external networking role of the start-up, and (v) the internal organizing of the start-up in relation to its ambitions for external interaction with customers. The results are summarized by formulating a set of propositions that can be taken as starting point for further research.

1. Introduction

In the current business-to-business (B2B) landscape, inter-organizational collaboration in product development and innovation is an important topic both for managers and academic business researchers. Joint research and development (R & D) activities with suppliers, customers and universities are common parts of the landscape (see e.g. Brem & Tidd, 2012; Cantù & Corsaro, 2015; Cantu, Corsaro, & Tunisini, 2015; Freytag & Young, 2014). Especially the role of customers and how to involve them in product development have been strongly emphasized in the recent literature (Chang & Taylor, 2016; La Rocca, Moscatelli, Perna, & Snehota, 2016; Lagrosen, 2005; Lynch, O'Toole, & Biemans, 2016; Öberg, 2010). The benefits of interacting with customers are many-fold, including for instance that customers can provide detailed information on their problems and needs, give feedback, present ideas for innovative solutions and function as lead-users (Von Hippel, 1986). The literature also reports on challenges for innovating firms regarding, for example, risk sharing and different expectations (Brockhoff, 2003).

To start-up companies, building collaborative relationships with customers is especially important since these firms often have scarce resources (Baum, Calabrese, & Silverman, 2000; Coviello & Joseph, 2012). Collaboration is thus needed in order to access complementary resources to be used in the company's commercialization of its inventions (Chorev & Anderson, 2006; Paradkar, Knight, & Hansen, 2015). As pointed out by Antolin-Lopez, Martinez-del-Rio, Cespedes-Lorente, and Perez-Valls (2015), how to carry out product development collaboration with different partners is a strategic decision for the start-up, since it can reduce both innovation costs and risks. The customer side of the firm is of significance since the customers may possess valuable information about what product they need and want to use and hence what product the start-up should produce (Blank, 2013; Chorev & Anderson, 2006; La Rocca, Ford, & Snehota, 2013).

How firms develop over time is very much dependent on how they interact in the network and how they manage to establish relationships with different types of external actors (Håkansson & Ford, 2002). It also depends on their expectations and considerations regarding how the future will unfold (Araujo, Mason, & Spring, 2014; Corsaro, Ramos, Henneberg, & Naudé, 2012). This holds for established firms as well as for more newly founded companies, including start-ups which are still struggling to develop their business model and build positions in networks (Aaboen, Dubois, & Lind, 2012; La Rocca & Perna, 2014). However, despite the large number of studies on customer involvement in product development in B2B markets, there is still a need for additional in-depth studies. As pointed out by La Rocca et al. (2016 p.45): "*Empirical studies on the customer involvement process in NPD* [*New Product*

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http://dx.doi.org/10.1016/j.indmarman.2017.07.009
Received 13 October 2016; Received in revised form 16 June 2017; Accepted 20 July 2017
0019-8501/

Development] *are rare and there is a tendency to black-box the process through which customers are involved*". Biggemann, Kowalkowski, Maley, and Brege (2013) call for more studies on the process of customer involvement in relation to the development and implementation of customer solutions, which are customized combinations embedded in relational processes between customer and supplier. Also Lynch et al. (2016) pinpoint the further need for approaching the process in terms of operationalizing customer involvement. For start-ups, collaborating with customers in product development appears to be vital, and shedding light on this process is thus a way of contributing to the expressed need for additional studies (Coviello & Joseph, 2012).

Against this background, the aim of this paper is to analyze the pattern of customer collaboration in product development for a technology-based start-up. A pattern is a descriptive regularity in the development of phases of a process over time (Bizzi & Langley, 2012). This aim is achieved by using one in-depth single case study. It deals with Oxeon, which is a Swedish high-growth company with origin in university research. Its business builds to a large extent on fruitful R & D collaboration with various types of counterparts, primarily customers, suppliers and research organizations. The collaboration takes place in inter-organizational relationships that Oxeon has established during different phases of its development, which started some ten years ago. Oxeon is operating in a B2B market where the customers consist of other firms, more precisely, composite manufacturers. This paper contributes to the current literature on customer involvement in product development by using a process-based single case study approach (Biggemann et al., 2013; La Rocca et al., 2016). Furthermore, by identifying patterns in this development, and related management issues, the paper adds to the literature on start-ups' customer relationship development (Aaboen, La Rocca, Lind, Perna, & Shih, 2017; Coviello & Joseph, 2012) by providing detailed knowledge on how start-ups develop products and applications through interaction with customers.

The paper is structured in the following way. First, we present our theoretical framework followed by a method description. The case of customer collaboration in product development in Oxeon is then presented and subsequently analyzed. This is followed by a Discussion section. Thereafter, in the concluding section, the findings are summarized by formulating a set of propositions. Some managerial implications are also included.

2. Theoretical framework

This paper takes its main theoretical starting point in the Industrial Network Approach (INA) for studying firms operating in B2B markets. Here, the business exchange to a large extent takes place in business relationships, which in different ways are connected to each other and form network-like structures (Håkansson, Ford, Gadde, Snehota, & Waluszewski, 2009; Håkansson & Snehota, 1995). Individual firms are thus parts of networks where they for commercial purposes interact with other firms and organizations acting primarily as buyers or sellers. The business relationships are to varying degrees characterized by, for example, long duration and long-sightedness, frequent communication, mutual adaptations, and joint development activities. This holds for established firms as well as for young start-ups developing and commercializing products (goods and/or services) for a B2B market. In order to create business and start growing, such firms need to establish themselves in networks, and they do this by forming and developing relationships with customers, suppliers, and other types of potential business partners (Aaboen et al., 2017).

2.1. Collaborative product development

Business relationships and networks are important not only for the pure marketing and purchasing in B2B markets. Also, the technological development to a large extent takes place in networks where firms interact and collaborate with each other (Håkansson, 1987). This means that both product and process innovations tend to be the outcome of a process where several actors contribute and carry out joint development activities. Product development collaboration between buying and selling firms is thus an important part of the innovation process. It is a means for firms to link development activities, combine resources (e.g., competence, technology and facilities) and as a result develop new knowledge, products and processes that create value for both parties. This kind of interactive effects is difficult to achieve on arm's length distance.

Firms may collaborate with other types of counterparts (e.g. universities), but as Håkansson (1990) showed in his cross-sectional study of 123 Swedish firms, customers and suppliers are the dominant partners, accounting for three out of four collaborative relationships. Later research carried out in the INA tradition has confirmed this pattern and contributed to increase our understanding of R & D collaboration and innovation in industrial networks (Baraldi, Gressetvold, & Harrison, 2012; Cantù & Corsaro, 2015; Freytag & Young, 2014; Håkansson & Waluszewski, 2002, 2007; Laage-Hellman, 2002; Lind, 2015; Olaru & Purchase, 2015; Wedin, 2001). It can be noted that inter-organizational R & D collaboration and networking have also been the subject of research based on other theoretical perspectives (Cooke, 2001; D'Este & Patel, 2007; Greer & Lei, 2012; Lagrosen, 2005; McKelvey, Zaring, & Ljungberg, 2015; Melander, 2014; Powell, 1998; Von Hippel, 2005).

How firms in B2B markets involve customers, or other types of users, in their product development can be described and analyzed by using five key questions (Coviello & Joseph, 2012; Laage-Hellman, Lind, & Perna, 2014): Why, When, Who, How and What. These are of relevance to established firms as well as to new firms, including technology-based start-ups. The first question, Why, has to do with the reason for involving customers/users. It can be for the purpose of collecting information, gaining access to technology and competencies, testing various objects, and getting help with and/or financial support for the development of solutions. Second, and related to the When question, firms may choose to involve customers in different phases of the innovation process. Third, the Who question concerns what types of customers that are involved. Potential partners may differ for example with regard to their position in the value chain, which technologies or application areas they represent and what organizational characteristics they have. Fourth, there are many different ways in which a customer can be involved. This is the How question. For example, some commonly used methods for involving customers are surveys, interviews, workshops, user testing, and field tests carried out together with customers. Finally, there is a fifth question, namely, What (Coviello & Joseph, 2012; Laage-Hellman & Rickne, 2014). It pertains to the object of the collaboration in terms of what technologies or products the collaborative activities are concerned with and which aspects are in focus (e.g. when testing). The answers to the What question are very context-specific, and this probably explains why this question has not been dealt with so much in the literature. In a practical situation, however, firms need to make decisions on what the collaboration should focus on.

Coviello and Joseph (2012), grounding their research in these five questions, have developed a taxonomy of new product development activities and customer roles in major innovations created by small and young technology firms. Their study address, for example, customers' roles and pinpoint that in successful cases customers participate in all activities and perform multiple roles. In particular, successful firms differ from failures by using customers to a larger extent as source of latent needs, financier, advisor, co-developer, approver, promoter, and feedback giver. On the one hand, their study address similar topics as those mentioned above. On the other hand, our study is different in that it does not differentiate successes and failures but instead aims to grasp the process of customer collaboration.

For innovating firms, to be able to collaborate with customers in an