



ELSEVIER

Contents lists available at ScienceDirect

Technovation

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

Boundaries of R&D collaboration

Iivari Bäck^{a,*}, Marko Kohtamäki^{a,b}^a University of Vaasa, Department of Management, PO Box 700, FI-65101 Vaasa, Finland^b Luleå University of Technology, Entrepreneurship and Innovation PO Box 700, FI-65101 Vaasa, Finland

ARTICLE INFO

Article history:

Received 24 September 2014

Received in revised form

22 June 2015

Accepted 18 July 2015

Available online 26 July 2015

Keywords:

Research and Development

New product development

Organizational boundaries

Supplier involvement

ABSTRACT

Building on organizational boundary theories (competence, efficiency, power, and identity), this study examines the boundaries of R&D collaboration, based on a qualitative, comparative case analysis of six long-term R&D relationships within the supplier network of a leading multinational corporation that manufactures electrical devices and systems. The results reveal that competence development, facilitated by trust, enables joint learning and the creation of tacit knowledge in long-term partnerships, and has a central role in boundary formation. Competence and accumulated experience also improve the efficiency of the relationship, which has a central impact on decisions to continue or end the collaboration. Power conception, drawing on resource dependency theory, is dominant in boundary setting only in cases where trust or mutual dependence between partners is low. The boundaries set by identity are based on managerial sensemaking and prior experience, and they tend to be dominant for as long as external demands force managers to re-consider them. First, the study contributes to supplier involvement literature by utilizing firm boundary theories in the context of R&D collaboration. Second, the study contributes to firm boundary literature by complementing the theory with trust and joint learning approaches, and by examining the interplay between different theories. The results also suggest practices that should be at the forefront of managers' thinking when they consider their firms' relational development needs in the context of R&D collaboration. The results also highlight the importance of long-term experience and trust in facilitating collaboration in the relationship.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

Research and development (R&D) is a key source of competitive advantage for high-technology firms (Van Echtelt et al., 2008; Artz et al., 2010; Eng and Wong, 2006). Working under the pressure of highly competitive environments, characterized by rapid and unpredictable technological changes and short product life cycles, managers of high technology firms have to integrate, build, and re-configure internal and external resources, capabilities, and competencies to address these environmental changes (Teece et al., 1997). In search of both competence and cost advantages, firms have extended their R&D activities across organizational boundaries and outsourced innovation work to suppliers (Johnsen, 2009; Wagner and Hoegl, 2006; Quinn, 2000). There is a need to develop a greater understanding of the characteristics and management of R&D work that crosses organizational boundaries (Johnsen, 2009; Davis and Eisenhardt, 2011). A central managerial challenge in R&D organizations is to make boundary decisions on which tasks and activities are

performed by the focal organization (hierarchical governance), and which are to be outsourced (market governance).

As the existing empirical work on organizational boundaries in an R&D context typically utilizes single theories, such as transaction cost efficiency (Athaide and Zhang, 2011; Eng and Wong, 2006), competence (Verona, 1999; Yasuda, 2005), power (Gulati and Sytch, 2007; Mayer and Nickerson, 2005), or organizational identity (Tripsas, 2009), many of the earlier studies neglect the interplay between different boundary conceptions, particularly in the context of R&D relationships. This is surprising because, first, boundary decisions play a particularly important role in R&D relationships, where knowledge asymmetries are great, and second, because of the emphasis placed on the interplay between boundary conceptions by Santos and Eisenhardt (2005, p. 503), who suggested that the conceptions may coevolve and exert a joint impact.

This study intends to fill this gap by answering the following research question: *Which practices are related to firm boundary conceptions, and how do they interplay in long-term R&D relationships?* Using a qualitative comparative case study to analyze a network of R&D relationships, this study contributes to supplier involvement literature by utilizing firm boundary theories (Santos and Eisenhardt, 2005) in the context of R&D collaboration. Second, the study contributes to firm boundary literature by complementing the

* Corresponding author.

E-mail addresses: iivari.back@uva.fi (I. Bäck), marko.kohtamaki@uva.fi (M. Kohtamäki).

organizational boundary theory with trust and joint learning approaches, and by examining the interplay between different boundary theories. A qualitative comparative case study was chosen for this study because that method permits in-depth interpretation when it is necessary to understand the dynamic mechanisms between boundary conceptions, as is the case when firm boundaries are defined and re-defined. By developing a framework to analyze boundary delineation in the context of R&D relationships, this study could enable firms to make consistent decisions on organizational boundaries in R&D work.

2. Theoretical background

Building on the theoretical background of firm boundary theories, the present study intends to contribute to the R&D supplier involvement literature. For effective R&D operation in a dynamic environment of knowledge-intensive, high technology industries, it is important for managers to understand which resources must be coordinated within the focal organization, and which can be obtained from the network to complement competencies, improve performance, share costs, and mitigate risks (Lavie, 2006; Eisenhardt and Schoonhoven, 1996). The present study uses organizational boundary theories to analyze how specific activities are coordinated between a customer organization and its R&D suppliers. Following the definition of Santos and Eisenhardt (2005), an organization boundary is the demarcation between the organization and its environment. Organizational boundary separates a legal organization from its environment, and thereby defines which activities are implemented within the organization and which activities are acquired from external organizations. The term conception refers to theory or approach. The literature usually cites four theories under the umbrella of the theory of the firm: resource-based theory, transaction cost theory, the power approach, and organizational identity. The firm boundary conceptions are summarized in Table 1.

2.1. Competence – the resource-based view

The conception of competence is based on the resource-based view (RBV) (Eisenhardt and Schoonhoven, 1996; Lavie, 2006), suggesting that firms are continuously searching for resources and processes (Long and Vickers-Koch, 1995) to configure combinations that function as a source of competitive advantage (Santos and Eisenhardt, 2005). In addition to a supplier's own resources, the resources provided by its partner network contribute to the focal firm's performance (Lavie, 2006; Gulati, 1998), which emphasizes the

meaning of the R&D supplier's network capabilities. According to the RBV, resource configurations should be valuable, rare, inimitable, and non-substitutable (VRIN). As the resources are heterogeneous between firms, and imperfectly mobile (Eisenhardt and Schoonhoven, 1996; Lavie, 2006), firms have to complement internal resources with external ones, such as the R&D capabilities of a partner supplier. From the resource-based perspective, R&D partnerships are seen as a means to increase internal competences (Parmigiani and Mitchell, 2009), and to share the costs and risks of innovation (Eisenhardt and Martin, 2000). However, as the integration of R&D knowledge is challenging – because it is tacit in nature – joint learning is required to implement knowledge integration (Teece et al., 1997; Huikkola et al., 2013). In this study, joint learning is defined as a joint activity between the supplier and customer, where the parties share knowledge, jointly make sense of the knowledge, and integrate that knowledge into relational memory.

2.2. Efficiency – transaction cost economics

According to the efficiency conception, the costs of collaboration are important when considering whether the organization of R&D work should be based on an arm's length, a collaborative, or a hierarchical structure (Williamson, 2008; Rindfleisch and Heide, 1997). The efficiency conception is dominated by transaction cost economics that considers the costs of coordination resulting from the interplay between different dimensions (Santos and Eisenhardt, 2005), such as asset specificity, and environmental and behavioral uncertainty (Rindfleisch and Heide, 1997; Williamson, 1975, 2008). In R&D literature, it has been suggested that behavioral uncertainty is positively related to hierarchical governance, whereas high technological uncertainty favors market governance to mitigate obsolescence and preserve flexibility (Dyer, 1996), which is typical in rapidly developing high technology areas. On the other hand, the risk of opportunistic behavior by partners (Barney, 1999), in knowledge-intensive R&D collaborations, in turn tends to increase transaction costs (Rindfleisch and Heide, 1997). While supplier involvement may increase transaction costs in the short term, supplier involvement may also produce benefits, by saving future production costs. Moreover, the increased trust developed in the earlier stages of the relationship may lessen interaction costs in the future (Lewicki et al., 2006; Dyer and Chu, 2003). This therefore suggests that the competence view may outweigh transactional efficiency in terms of boundary formation in these dynamic environments (Santos and Eisenhardt, 2005, p. 499). Overall, the vast information asymmetries and resulting challenges for negotiations and monitoring, which are involved in R&D exchanges, increase governance costs, which then affect make-or-buy decisions (Kohtamäki et al., 2013). Therefore,

Table 1
Summary of firm boundary conceptions.

Conception	Theory	Drivers for relational organization	Mechanism	Key dimensions in R&D collaboration	Related interview questions
Competence	Resource-based view	Maximizing the value of the organization's resources	Tends to extend the firm boundary to maximize valuable competences and capabilities	Resource complementarities Mobility of the resources and capabilities Joint learning	A1–A2B1–B4
Efficiency	Transaction cost economics	Minimizing the costs of governing activities	Internalize when outsourcing is not efficient	Information asymmetries Behavioral uncertainty Monitoring and meeting practices	A3–A4B5–B12
Power	Resource dependency	Maximizing strategic control over external forces by controlling strategic dependences	Internalize when dependence on external partners is too high	Processes and agreements Customer's dependence on supplier Switching cost	A5–A7B13–B14
Identity	Organizational identity, managerial cognition	Collective sensemaking of organizational members	Tends to maintain existing practices (status quo)	Mutual dependence Managerial sensemaking	A8–A10

Download English Version:

<https://daneshyari.com/en/article/1021829>

Download Persian Version:

<https://daneshyari.com/article/1021829>

[Daneshyari.com](https://daneshyari.com)