



From new-product development to commercialization through networks

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ABSTRACT

The research on research and development (R&D) networks is plentiful but network relations in commercialization of innovations attract surprisingly little attention. This study analyzes how firms combine resources and utilize their relations in order to ensure the success of their innovations. The theoretical basis combines literature on innovation, industrial networks, and innovation networks. The study includes two cases on commercialization networks. The results indicate that an innovating firm needs resources to engage in customer education, distribution, marketing communication, relationship mediation, and credibility building when moving from R&D tasks to commercialization tasks. To acquire these resources, the firm needs to experience changes in network relations. Accordingly, the innovating firm needs particular commercialization competence in terms of accessing, mobilizing, and organizing relational resources.

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1. Introduction

The tendency to develop innovations within research and development (R&D) networks is becoming stronger because of high costs and technological complexity (Biemans, 1991; Ritter & Gemünden, 2003). Diverse network actors such as customers, distributors, research institutions, and competitors can contribute to innovation development (Ritter, 1999; Ritter & Gemünden, 2003). The research on innovation networks concentrates mainly on resource combinations for product development (Ritter & Gemünden, 2003) and emphasizes how to get the technology ready for the market (Story, Hart, & O'Malley, 2009). Nevertheless, firms also need to mobilize the relational resources within their networks to ensure that the market accepts the product. Successful commercialization is crucial in transforming invention into innovation (Schumpeter, 1934). Even though a few studies of innovation network mention commercialization or launch (Heikkinen, Mainela, Still, & Tähtinen, 2007; Millson & Wilemon, 2008; Partanen, Möller, Westerlund, Rajala, & Rajala, 2008), they do not focus on commercialization networks. Some research investigates how users and stakeholders can contribute to innovation diffusion (Troshani & Doolin, 2007) and launch (Biemans, 1991; Harrison & Waluszewski, 2008) but does not emphasize the network approach to commercialization in-depth. Hence, the purpose of this paper is to analyze network relations, actors, and resource requirements for the commercialization of innovations.

The innovation process includes both development and marketing activities that may overlap. According to the linear view, the process begins with an idea, proceeds with product development, and ends when the product actually creates wealth, whereas an increasingly popular non-linear approach emphasizes interaction with partners on product development and marketing/commercialization activities (Pellikka & Virtanen, 2009). The term commercialization refers to the development of the product concept, its successful launch, and interaction with potential buyers (Jolly, 1997; Pellikka & Virtanen, 2009).

Bringing a new product to market requires new activities and resources related to the creation of demand, markets, and delivery channels (Harrison & Waluszewski, 2008; Woodside & Biemans, 2005), creating critical new challenges for innovating firms (Easingwood & Koustelos, 2000; Urban & Hauser, 1993). Firms that are technology-oriented and concentrate on product development tend to face problems in the acquisition of marketing resources, in communicating effectively with end-users, in building national and international distribution channels, and in accessing market and customer information (Harrison & Waluszewski, 2008; Pellikka & Virtanen, 2009). Additionally, customers and other actors in the business environment tend to resist new products (Christensen, 1997; Harrison & Waluszewski, 2008). Nevertheless, successful diffusion requires adoption among users, complementors, and intermediaries (Woodside & Biemans, 2005).

The basic premise of this study is that the resources of a single company are rarely sufficient to cover the commercialization of a new product, and therefore resource interaction with other actors in commercialization is crucial. The resources of diverse network actors facilitate not only the generation but also the commercialization of

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innovations. Customers and other actors external to the firm may have a role in commercialization by identifying potential users, demonstrating how the product works, assessing its market potential, and evaluating the extent to which it meets user needs (Biemans, 1991; Harrison & Waluszewski, 2008).

Small firms in particular may lack financial and competence resources and the legitimacy that enables them to reach potential customers. Additionally, innovating firms may create future demand and new markets by integrating their complementary resources, products, and channel relationships through networking (Möller & Rajala, 2007). In offering access to the resources of other firms (Håkansson & Snehota, 1995), network relations could provide manifold complementary resources for commercialization and thereby support diffusion and adoption of new products.

The emphasis in this study is on the role of network relations in both R&D and, specifically, commercialization activities. Because the innovating firm requires different resources for commercialization than for R&D, it needs to renew its existing relations or create completely new ones. Hence the first research question is: What kinds of actors and resources are able to contribute to commercialization activities, and how do the changing resource requirements change network relations?

Certain periods and events induce particular changes in networks (Håkansson & Snehota, 1995; Halinen, Salmi, & Havila, 1999). The commencement of commercialization activities presumably leads to changes in resource requirements and thus changes in network relations. However, knowledge about change in innovation networks is still deficient, and empirical studies are few in number (Heikkinen et al., 2007).

Network competence is essential in the R&D phase (Ritter, 1999; Ritter & Gemünden, 2003), but also in commercialization, firms need the ability to access and mobilize the necessary relational resources (Story et al., 2009). Commercialization, particularly, sets up substantial challenges in managing network relations. For example, Heikkinen et al. (2007) show how a new-product-development network disintegrated during the commercialization phase because of actors' diverging goals. The second research question is thus: What kinds of network competence facilitate the management of resources during commercialization?

This paper aims to enhance the theoretical understanding of the network approach to commercialization by identifying the necessary resources and actors, providing descriptions of network change during the innovation process and analyzing network competence in managing relations related to commercialization activities. A commercialization network refers to a group of actors involved formally or informally in the commercialization of an innovation. The literature suggests manifold definitions of the term innovation (Garcia & Calantone, 2002). This study concentrates on product innovations, and employs the term innovation to mean a successfully developed and launched new or improved product (Trott, 2002).

The structure of the article is as follows. The next section focuses on commercialization activities and resources, changes in network relations, and the management of relations. The subsequent empirical study describes two cases of innovation commercialization. A case analysis and discussion about network relations in commercialization follow. The final section discusses the theoretical conclusions, the potential contributions, and the managerial implications.

2. Moving toward networks for commercialization

2.1. Commercialization activities and the necessary resources

New activities emerge when a firm begins commercialization of an innovation. The imperative is no longer to combine resources in order to create a new product, but to overcome the resistance of end-users, intermediaries, and complementaries, and to share knowledge about

the benefits and potential use (Harrison & Waluszewski, 2008; Woodside & Biemans, 2005). The firm needs to focus on marketing activities such as demonstrations of the product, advertising, brand development, promotional events, and organizing distribution (Biemans, 1991; Harrison & Waluszewski, 2008; Partanen et al., 2008).

The necessary resources and activities depend on the features of the innovation including its complexity, trialability, relative advantage, observability, and compatibility (Rogers, 1983). Ease of use of the innovation facilitates its diffusion and speeds-up its adoption. Running trials reduces customer uncertainty and reinforces positive attitudes, and thus eases adoption (Robertson, 1971). Customers evaluate the relative advantage and therefore need to be convinced about the potential benefits (Rogers, 1983). The more observable such benefits are and the more compatible the innovation is with existing values, experiences, and needs, the faster the adoption tends to be. Hence, awareness-building, customer education and trial opportunities improve innovation success (Easingwood & Koustelos, 2000; Eng & Quaia, 2009). Communicative activities, such as synergetic marketing communication and supporting brands (Chen, Shen, & Chiu, 2007), and word-of-mouth communication (Hoeffler, 2003), weaken resistance toward adoption. Intermediaries, whose resistance can negatively affect commercial success, need educating and convincing of the value of the innovation for their customers (Parthasarathy, Sohi, & Hampton, 1994; Woodside & Biemans, 2005).

Diverse actors provide resources for commercialization. Actors in R&D networks may include competitors, distributors, buyers, consultants, suppliers, research institutes and universities, government agencies, and industry associations (Biemans, 1991; Möller, Rajala, & Svahn, 2005; Ritter & Gemünden, 2003). Presumably, commercialization networks also comprise similar organizational and personal actors. Vertically related actors provide distribution resources, and horizontally or diagonally related competitors or partners beyond the traditional supply chain facilitate bringing innovations to market by pushing/pulling the new product through or creating new markets (Möller & Rajala, 2007; Story et al., 2009). Intermediaries are crucial in the case of consumer products because they make the product available to users (Parthasarathy et al., 1994; Woodside & Biemans, 2005).

Public organizations and educational institutions may support diffusion by articulating optimistic visions of the use of the innovation in society, but due to a lack of power they often take a wait-and-see stance (Troshani & Doolin, 2007). Users contribute by demonstrating the use of products and acting as references (Biemans, 1991; Harrison & Waluszewski, 2008). Local municipalities and universities establish trust and expertise and foster relations with political authorities that could facilitate the development of new business (Möller & Svahn, 2009; Partanen et al., 2008). New ventures in particular need high-profile partners in order to establish credibility (Zott & Huy, 2007), given that the credibility of reputable companies tends to spread to their partners (Anderson, Håkansson, & Johanson, 1994).

The literature on adoption and diffusion highlights the role of individuals in innovation success. For example, lead users, mavens, expert opinion leaders and hub persons impact on opinion formation/change and thus accelerate or block the adoption of the product (Goldenberg, Han, Lehmann, & Hong, 2009; Harrison & Waluszewski, 2008; Woodside & Biemans, 2005). Such key persons provide publicity, give advice and function as lead-teachers, demonstrate the new product, and explain its unique benefits over what is currently available (Harrison & Waluszewski, 2008; Woodside & Biemans, 2005).

In summary, commercialization requires resources such as technical competence, experience of the industry, customer and market knowledge, the ability to identify the optimal functionality of the product, communication, distribution, and close relationships with key actors. Interconnectedness among actors provides indirect relationships through direct relations, considerably increasing the resources available and producing access effects (Håkansson & Snehota, 1995; Ritter, 2000). The actors and their resources contribute

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