



Are Innovation Networks in Need of a Conductor? Examining the Contribution of Network Managers in Low and High Complexity Settings



Sven Heidenreich, Johannes Landsperger, Patrick Spieth

Innovation networks, like organizations, need to be managed thoroughly. With rising numbers and actor heterogeneity in an innovation network, the potential for organizations to create, distribute and acquire knowledge more efficiently increases, but the complexity of managing the network also increases. Having someone in place to gain insight into the participating organizations' structures, and to keep track of and coordinate the available and usable resources, represents a clear advantage. While scientific research and management practice have acknowledged the importance of network managers for network performance, little research effort is dedicated to empirically investigate and validate this theoretical proposition. This paper fills part of this gap by examining the influence of the simple existence of network managers on core management functions and performance outcomes in low and high complexity settings. Our results confirm that employing a network manager significantly improves core network management functions and relational as well as structural network performance, which in turn enhance goal achievement performance and network retention. Furthermore, our results from interaction analyses show that the network managers' contribution is even greater in high complexity settings.

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Introduction

In times of globalization and the resulting increased pace of worldwide competition, the continuous development and successful launch of innovations are essential for profit-oriented organizations of any kind (Nooteboom, 1999; Bayus et al., 2003; Gourville, 2005). While an invention can emerge at any place, an innovation requires combining a number of different aspects, such as a variety of knowledge and specific resources and capabilities (Tidd et al., 2005). However, single organizations are often unable to provide one or the other of these prerequisites (Möller and Svahn, 2003). Hence, companies need to collaborate with their suppliers, customers or even competitors in networks to gain access to other entities' resources and capabilities in order to succeed with their innovation tasks (Dooley and O'Sullivan, 2007; Wissema and Euser, 1991). As a result, many recent innovation breakthroughs have not been achieved by a single actor but are the result of a broad network of people in an organization, and beyond its limits (Björk and Magnusson, 2009; van der Valk et al., 2011).

Innovation networks foster joint innovation efforts between partners, enabling innovating organizations to share risks, grant access to complementary assets, mitigate critical mass problems, gain access to readily skilled staff and acquire scarce competencies (Dooley and O'Sullivan, 2007). A network-generated innovation thus "should not be seen as the product of one actor, but as the result of interplay between several actors" (Ojasalo, 2008, p. 51). However, it would be misleading to assume that mere participation in networks is a recipe for successful innovation (Harris et al., 2000). Just like organizations, innovation networks need to be managed thoroughly (Landsperger et al., 2012). While a large number of members and actor heterogeneity in innovation networks are seen as prerequisites to gain access to heterogeneous knowledge, specific resources and capabilities as one source of competitive advantage (Sammarra and Biggiero, 2008), the potentially successful combination of available resources is a challenging process. As a result, having someone in place to gain insight into the participating organizations' structures, and to keep track of and coordinate the available and usable resources, will be a clear advantage.

While scientific research and management practice have acknowledged the importance of network managers for the effectiveness of innovation networks (Batterink et al., 2010; Rampersad et al., 2010), little research effort has gone into empirically investigating and validating this theoretical proposition (McGuire, 2009; Möller and Svahn 2009). Most research on innovation networks focuses on network management in general (Håkansson and Snehota, 2006; Dooley and O'Sullivan,

2007; Batterink et al., 2010; Henneberg et al., 2010; Möller et al., 2005), rather than on the specific role and contribution of network managers (McGuire, 2009; Batterink et al., 2010). Furthermore, studies that focus on network managers have mainly been concerned with the appropriate allocation of a network manager's managerial resources (McGuire, 2009), with establishing strategic guidance rules for network managers (Rycroft and Kash, 1999), or with the network competency gained by appointing a network manager (Dilk et al., 2008). However, very few studies have dealt with the empirical evaluation and validation of a network manager's influence on a network's performance. While Batterink et al. (2010) investigated the role of innovation brokers in orchestrating innovation networks and found a positive influence on a network's management functions, they did not evaluate effects on network performance. Landsperger et al. (2012) shed light on a designated network manager's characteristics and attributes, and how these characteristics and attributes contribute to core management functions and network performance. Hence, this study focused on networks that had a network manager installed and explored the characteristics of an "ideal manager" rather than comparing the performance of networks with a network manager to networks without a network manager.

Furthermore, with rising numbers and heterogeneity of the actors in innovation networks, the potential for organizations to create, distribute and acquire knowledge more efficiently increases, but the complexity for managing the innovation network also increases (Becker and Dietz, 2004; Swan et al., 1999). As with high complexity projects that significantly benefit from a project manager, high complexity innovation networks might even further benefit from a network manager, compared to low complexity networks (Ojasalo, 2008). However, to the best of our knowledge, no one has yet examined whether a network manager's contribution in high complexity settings is greater than in low complexity settings.

This paper intends to fill these gaps by examining the influence of the simple existence of network managers on core management functions and performance outcomes in low and high complexity settings. Specifically, we compare networks with a network manager and networks without a dedicated network manager, and use structural equation modeling to evaluate the resulting direct effects on network management functions, relational and structural performance, as well as the resulting indirect effects on goal achievement performance and network retention. We also investigate whether employing a network manager is even more beneficial in the case of high complexity compared to low complexity settings, by performing separate interaction analyses. The remainder of this article is organized as follows. The next section focuses on the thorough conceptualization of a network manager's relationship to core network management functions as well as performance outcomes, and serves as the conceptual foundation for our research model. We then discuss our data and measures, evaluate our research model, and present our results. We conclude with the implications of our empirical results and outline some directions for future research.

Conceptual Foundation and Hypotheses Development

Network Manager Performance and Network Performance

While there have already been a considerable number of papers on company networks in general, the concentration on innovation networks first started in the late 1980s and early 1990s (Freeman, 1991; DeBresson and Amesse, 1991; Smith et al., 1991), when "[...] a certain interest in the theoretical explanation of this phenomenon awakened in economics" (Pyka, 2002, p. 152). The term "innovation network" has remained vague, and few attempts have been made to properly define it (Hagedoorn, 2002; Pittaway et al., 2004; Powell et al., 1996). However, the overriding goal of innovation networks is the joint development of innovations (Huber et al., 2010), and innovation networks can be described as a set of vertical and horizontal relationships established among various organizations as a means to coordinate industrial research and development processes (Gardet and Mothe, 2011; Pyka, 2002). Having someone in place to gain insights into the participating organizations' structures and to keep track of and coordinate cooperative industrial research and development processes is a clear advantage.

A dedicated network manager represents such a single entity in an innovation network, entrusted with steering and coordinating network activities. From a network manager perspective, an innovation network consists of sets of vertical and horizontal relationships established among various organizations — these relationships must be orchestrated. Similar to a project manager's role in an interorganizational project, a network manager is closely involved in all the activities of a network and interacts regularly with all participants (Barnes et al., 2002; Ojasalo, 2008). He or she represents the ultimate reference person regarding the allocation, coordination and management tasks that arise in an innovation network. The employment of a network manager should enhance the core management functions in innovation networks and thus contribute to their overall performance.

There are many approaches used in the literature to capture and operationalize network performance. Bucklin and Sengupta (1993), for instance, used the measure of mutual benefit (extent of alliance effectiveness), while Bode et al. (2011) used the fulfillment of predefined and weighted success factors as cooperation success measures. Other authors provide even more detailed measures, and used the extent of fulfillment of predefined goals as a measure for the extent of goal achievement in a network (Kraege, 1997), the extent of social interaction in a network as measure for relational performance (Landsperger et al., 2012), or the network's stability as a structural performance measure (Landsperger and Spieth, 2011). In sum, past literature suggests that network performance comprises three different components: (1) relational performance; (2) structural performance; and (3) goal achievement performance. To provide a comprehensive examination of a network manager's effects on network performance, our conceptual model provides theoretical rationales for effects on all three components of network performance.

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