



Actor roles and role patterns influencing innovation in living labs



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ABSTRACT

Innovation networks are embodied and shaped by their participants. This paper examines actors' roles in living labs, which are defined as networks of open innovation. The study utilizes four approaches to roles: structuralist, symbolic interactionist, resource-based, and action-based approaches. Our empirical analysis of 26 living labs in four different countries identifies a number of actor roles associated with open innovation. In addition, it reveals four role patterns characteristic of living labs: (i) ambidexterity, (ii) reciprocity, (iii) temporality, and (iv) multiplicity. These patterns distinguish actor collaboration in networks characterized by heterogeneous actors, the coexistence of individual and shared motives, high degree of openness, and user involvement. Scholars and practitioners of innovation learn that understanding of role patterns in living labs can contribute to building, utilization, and orchestration of open innovation networks.

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1. Introduction

Innovations are less and less the outcome of a company's isolated efforts. The greatest positive impact on innovation comes from networks comprising different types of partners (Nieto & Santamaria, 2007; Zeng, Xie, & Tam, 2010). Innovation networks require varied resources to be effective, and the ability to establish diverse relationships is crucial for developing a company's innovation capacity (Calia, Guerrini, & Moura, 2007). Thus, innovation networks are increasingly applying an open innovation model in which they comprise more actors and activities than those associated with the traditional model (Van de Vrande, de Jong, Vanhaverbeke, & de Rochemont, 2009). The open innovation provides an alternative to the conventional development (Chesbrough, 2003) and its benefits include cost savings (Von Hippel, 2007), improved user value (Almirall & Casadesus-Masanell, 2010), and better innovation performance (Chiaroni, Chiasa, & Frattini, 2010).

Living labs are innovation networks based on the philosophy of open innovation. They build on the fact that companies must consider ideas from external sources for the development and commercialization of innovation (Almirall & Casadesus-Masanell, 2010; Gassmann, 2006).

Regardless of viewing living labs as a new form of ICT innovation (Følstad, 2008; Herzog, Boronowsky, Ruge, Glotzbach, & Lawo, 2007), open innovation development tools (Almirall & Wareham, 2008; Kviselius, Andersson, Ozan, & Edenius, 2009), or open innovation networks (Leminen, Westerlund, & Nyström, 2012; Romero & Molina, 2012), scholars have agreed about the central role of the user in the innovation process (Almirall & Wareham, 2008; Følstad, 2008; Leminen et al., 2012; Schumacher & Niitamo, 2008; Schuurman, De Moor, De Marez, & Evens, 2011). The users become equivalent to other participants in the network, forming relationships with different kinds of actors (Edvarsson, Gustafsson, Kristensson, & Witell, 2010).

Living labs can thus be defined as physical regions or virtual realities where stakeholders form public–private–people partnerships (4Ps) of firms, public agencies, universities, institutes, and users that collaborate to create, prototype, validate, and test new technologies, services, products, and systems in real-life contexts (Westerlund & Leminen, 2011). In living labs, users shape the innovation in their daily real-life environments, whereas in traditional innovation networks or labs the users are observed and their insights are captured and interpreted by experts (Almirall, 2009). The users not only act as sources of information, but they are also testers, developers, and designers of innovation on an equal basis with the others in the living lab. However, academic research knows little about innovation networks where the users possess a role equivalent to organizational partners.

This study investigates how innovation is organized in living labs. It considers living labs as *innovation networks* characterized by *openness* and *user involvement*, suggesting that living labs provide an emerging research perspective on innovation networks (Almirall, Lee, & Wareham,

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2012; Almirall & Wareham, 2008; Kusiak, 2007). The study draws on the role theory to capture the role-sets of actors and to increase understanding on the organization of open innovation. By *roles* we refer to behaviors expected of parties in particular positions (cf. Allen & van de Vliert, 1984). Roles have been previously studied from an industrial marketing perspective (Anderson, Havila, Andersen, & Halinen, 1998; Havila, 1996; Heikkinen, Mainela, Still, & Tähtinen, 2007; Mattsson, 1985) and in relation to organizational members' functions in innovation (Howell, Shea, & Higgins, 2005; Meyer, 2000; Tushman & Katz, 1980).

In particular, we focus on the roles that different network actors in living labs adopt or create for the purpose of innovation. Drawing on prior research on roles in the open innovation context (e.g., Gemünden, Salomo, & Hölzle, 2007), our position is that *actor role-sets influence innovation in networks*. We establish an empirical study to examine roles at the actor level, meaning that the participating actors' roles in the living labs are mapped and analyzed. The article contributes to the literature on role-sets in the network context by investigating the characteristics and implications of roles in living labs. Our objectives are:

- (1) To analyze roles in living labs with different perspectives to role theory.
- (2) To discuss the ways these role perspectives effect innovation in living labs.
- (3) To propose role patterns typical of living labs.

The remainder of the study is divided as follows. After this introduction, we review the theoretical foundations of living labs, present them as networks of open innovation, and converse role theory in the innovation network context. We proceed by describing the research methodology and data collection. Then, we provide our empirical findings on actors' roles as well as role-making and role-taking behavior in living labs. Finally, we review our key findings and discuss the managerial challenges of innovating in living labs.

2. Theoretical foundation

2.1. Living labs as networks of open innovation

Living labs offer a fruitful architecture for deploying open innovation. They should be studied as networks, because open innovation builds on voluntary collaboration and each participant has a similar role and relevance (Chesbrough & Crowther, 2006; West, Vanhaverbeke, & Chesbrough, 2006). However, Möller et al. (2008) argue that one party may be more active or its interests may dominate the innovation co-creation. Consequently, Leminen et al. (2012) suggest four types of living labs based on which actor drives the operation or has a foremost interest in the innovation: provider-, enabler-, utilizer-, and user-driven. These types differ from each other in terms of their activities, structure, and organization. The driving actor has merely a coordination task, but the network becomes dysfunctional and is unable to create value for the members if the coordinator fails to comprehend the entity (Leminen & Westerlund, 2012). It is crucial that one actor takes responsibility for starting and promoting the living lab activities.

Almirall and Wareham (2008) summarize the main notions of living labs as experimentation in real-world settings and the involvement of users as co-creators on equal grounds with other participants. The user is both the subject and the object in the development work, and may be a tester and co-producer of innovation (Ballon, Pierson, & Delaere, 2005). Users can contribute to living labs by expressing their usage needs and experiences (Schuurman et al., 2011) and by shaping the innovation with the producer (Riedl, Böhmman, Rosemann, & Krcmar, 2009). This co-creation effort emphasizes user's roles in the network and the generation and realization of mutual value (Ramaswamy & Gouillart, 2010).

2.2. Diverse approaches to roles in innovation networks

The concept of role helps us understand how innovation is organized into networks. Actor roles have been widely discussed in the social sciences for several decades, with a particular emphasis on 'role theory' (e.g., Biddle, 1986; Biddle & Thomas, 1966; Broderick, 1999; Linton, 1936). As a result, several approaches to roles and their fundamental existence have emerged. Contrary to the role theory, which traditionally puts individuals as the primary unit of analysis, we also include organizations as key actors performing in an innovation network. In fact, roles have found their way into the industrial networks approach mainly at the organizational level (cf. Anderson et al., 1998; Heikkinen et al., 2007; Henders, 1992; Knight & Harland, 2005; Mattsson, 1985). Research on role theory proposes three distinct and useful approaches to examine actor roles: structural, symbolic interactionist, and resource-based.

The *structural* approach to roles is frequently denoted in business studies. This approach postulates that actors' positions determine the roles in which they can act. The concept of position locates an actor in a network (Havila, 1996). The actor assumes a pre-established position and behaves in an appropriate manner, according to the expectations of others (Baker & Faulkner, 1991; Stryker & Statham, 1985). The structural approach suggests that the firm only enters a pre-existing social structure to fill a position and perform specific roles. This view was popular in early industrial network studies; for instance, Mattsson (1985) noted that the firm is expected by others to behave according to a set of norms associated with its position in the network. Role was seen as the dynamic aspect of position, which means that position becomes a property by which certain roles are accessed and a firm may use its position to situate itself in the network (Håkansson, 1987; Havila, 1996).

The *symbolic interactionist* approach suggests that roles are not consequences of one's position in a social structure, but must be claimed before they are enacted into positions (Callero, 1994). An actor can change its position in the network as role is a situation-specific construct (Anderson et al., 1998; Ashforth, 2000). Roles are dynamic and processual aspects of positions that describe what actors intend to do. Actors' roles can also be used for granting access to important resources. Recent studies within the industrial networks research tradition are more likely to assume this approach, arguing that positions can be influenced by acting in roles (cf. Heikkinen et al., 2007) and that roles are products of actors' interpretations of situations (Anderson et al., 1998). Therefore, actors in networks are active in constructing their operating environment.

The *resource-based* approach argues that a role is a resource in two ways. First, it is a means to claim, bargain for, and gain membership and acceptance in a social community (Winship & Mandel, 1983). Second, it grants access to social, cultural, and material capital that actors exploit to pursue their interests (Baker & Faulkner, 1991). Baker and Faulkner (1991) introduce the term 'role as a resource' to analyze the process by which roles are used to create new positions and social structures in networks. Their view is quite similar to symbolic interactionism, but they also view role as an abstract classification that generalizes across social structures. Roles as resources are tools used to control other resources and establish social structures (Callero, 1994; Henders, 1992). As they make action possible, the resource-based approach is concerned with *the ways* roles are used to establish a network structure rather than the degree to which roles prescribe action (Callero, 1994).

2.3. Innovator roles and tasks in innovation networks

Previous research identifies a number of innovator roles that are crucial to innovation. They address mostly the individual's level and include 'gatekeepers' (Allen, 1970; Tushman & Katz, 1980), 'champions' (Howell & Higgins, 1990a, 1990b; Markham, 1998; Schon, 1963), and 'expert-', 'power-', 'process-', and 'relationship promoters' (Gemünden, 1985; Gemünden & Walter, 1998; Gemünden et al., 2007; Herrmann,

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