



Embedded lead users—The benefits of employing users for corporate innovation



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ABSTRACT

While most of the literature views users and producers as organizationally distinct, this paper studies users within producer firms. We define “embedded lead users” (ELUs) as employees who are lead users of their employing firm’s products or services. We argue that ELUs benefit from dual embeddedness in the user and producer domains; it shapes their cognitive structure and enables them to better absorb sticky need knowledge from the user domain. We hypothesize that ELUs are more active than regular employees in acquiring, disseminating, and utilizing market need information for corporate innovation. Using survey data from the mountaineering equipment industry ($n = 149$), we test and support our hypotheses. Additional robustness checks reveal that the observed effects are indeed due to lead users rather than to affective product involvement or job satisfaction. We discuss theoretical and managerial implications, as well as directions for future research on this empirically important but hitherto under-researched phenomenon.

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1. Introduction

Users and producers are mostly viewed as organizationally distinct—with users situated outside the boundaries of the organization (Porter, 1985; Priem et al., 2012; Schumpeter, 1926). However, the two realms are not entirely separate; new technologies and modes of organizing are extending their overlap, and blurring their boundaries (Baldwin and von Hippel, 2011; Bowen, 1986). Firms are increasingly opening their innovation processes in order to leverage external knowledge resources such as user communities (Bogers and West, 2012). User empowerment has increased, and firms are giving users a more active role in the value creation process (Nambisan, 2002). Users are even regarded as “partial” employees (Mills et al., 1983) in service encounters, and in the co-development of new products and services (Bendapudi and Leone, 2003; Kelley et al., 1990).

This paper is the first quantitative investigation of a new and important mode of user–producer integration: The *employment of (lead) users inside producer firms*. Anecdotal evidence (e.g. Chouinard, 2005; Levitt, 2009) and three qualitative studies

(Harrison and Corley, 2011; Herstatt et al., in press; Hyysalo, 2009) indicate that, in many industries users abound inside producer firms. E.g., Patagonia, Inc., a large producer of high-end outdoor clothing, encourages their employees to test and use Patagonia products, and grants them slack time to do so (Chouinard, 2005). Northsails, a maker of high-quality sails for recreational and professional use, employs a large number of current and former sailing champions (Levitt, 2009); as part of their jobs, these employees sail races jointly with customers to collect new product ideas and feedback. Hewlett-Packard and Microsoft employ computer enthusiasts and encourage them to develop products that they themselves would want (Leonard, 1995). These “special” employees are known to be particularly good at eliciting and understanding latent customer needs because they are “twin to their customers” (Leonard, 1995, p. 195).

We define embedded lead users (ELUs) as *employees who are lead users of their employing firm’s products or services*. (By definition, lead users are users who face needs that will be general in a marketplace months or years later, and who benefit significantly from obtaining a solution to those needs (von Hippel, 1986).) Note that a related but different phenomenon is learning by hiring (Singh and Agrawal, 2011) from downstream firms—e.g., the pharmaceutical industry hiring former doctors (Chatterji and Fabrizio, 2013; Wadell et al., 2013). In this case, employees cease to be active users when they enter their new employment situations. For ELUs, by contrast, the duality of their relationship to the product is contemporaneous.

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We argue that ELUs are an attractive object for management research as they differ from both regular employees and external users in interesting ways. In this paper, we lay the foundations for future work by investigating *to what extent ELUs can help firms internalize and leverage user knowledge for innovation*. We seek to theorize the employment of (lead) users inside producer firms and to move beyond the above-mentioned anecdotal evidence of their effectiveness.

Innovation has often been conceptualized as problem solving (Alexander, 1964)—a cognitive process (Duncker, 1945). Adopting this cognitive perspective on innovation, we argue that differences in ELUs' experience and cognition, compared to regular employees, explain differences in their innovation-related information processing. ELUs are more likely to have ties with other users, and they also possess need knowledge from their own personal experience. Both these aspects should facilitate the absorption and processing of need knowledge from other users (Cohen and Levinthal, 1990).

We develop and test hypotheses that link employees' lead user-ness to their customer orientation, internal boundary spanning, and innovative work behavior, i.e. their activities related to understanding customer needs, disseminating information on unmet needs inside the firm, and creating and implementing superior customer solutions. Drawing on a sample of employees in the mountaineering ($n = 149$), we show that employees' lead user-ness is associated with the hypothesized behavioral outcomes. Finally, we study product involvement and job satisfaction as antecedents to the innovation-related behaviors to delimit these effects from the ones of lead user-ness.

Our findings contribute to our understanding of the interactions between the user and producer realms in innovation (Baldwin et al., 2006; Baldwin and von Hippel, 2011; Hyysalo, 2009). To our knowledge, this is the first paper to provide a quantitative analysis of the behavior of users inside producer firms. We re-contextualize lead user-ness and bring it inside the producer firm boundaries to predict innovation behavior. Lead users are well known to be prolific innovators, but so far they have consistently been seen as external to the firm (e.g. Bogers et al., 2010; Lüthje and Herstatt, 2004; von Hippel, 1986). At the same time, employees' innovation behavior has not been studied conditionally on their personal use expertise (e.g. Janssen, 2005; Scott and Bruce, 1994; Yuan and Woodman, 2010), despite it being well-known that employees draw on local knowledge in their jobs (Davis et al., 2012). Our findings have important implications for hiring and job design decisions and for open innovation strategy.

The remainder of the paper is structured as follows: Section 2 discusses the theoretical background to this study, defines embedded lead user-ness, and formulates our research hypotheses. Section 3 describes the methodology and data. Section 4 presents the empirical findings and Section 5 discusses these findings and proposes some implications for research and practice.

2. Background and research model

2.1. (Embedded) lead users as sources of innovation

Innovation is often conceptualized as problem solving (Alexander, 1964). It addresses a specific problem or need that occurs in a use context, by applying solution techniques and principles. Need-related and solution-related knowledge must be collocated and combined for innovation to happen (Alexander, 1964; von Hippel, 1994); but this is often not the case (Magnusson, 2009): Need knowledge mostly resides with product users outside the firm boundaries, while knowledge about solutions tends to reside within producer firms (Ogawa, 1998; von Hippel, 1998). Thus, to enable innovation within producer firms, need knowledge

must be transferred by users and internalized by firms (Priem et al., 2012).

Transferring user knowledge about needs (and potentially solutions) into producer firms has proved challenging (Lettl, 2007; Mahr and Lievens, 2011). User knowledge tends to be "sticky", i.e. costly to transfer, because it is tacit (Polanyi, 1962) and context-bound (Nonaka, 1994). Further, either party may be unwilling or unable to participate in knowledge transfer (Cohen and Levinthal, 1990; von Hippel, 1994). Firm employees often have insufficient prior knowledge about use-related problems to be able to absorb new user knowledge. Their cognitive frames are bound by solutions rather than use problems, which lower their cognitive empathy with users (Homburg et al., 2009).

These issues are addressed by various literature strands, including how to "understand your customer" through marketing research (Griffin and Hauser, 1993), lead user workshops (Lüthje and Herstatt, 2004), sponsored user communities (Jeppesen and Frederiksen, 2006), and innovation and mass customization toolkits (Franke and Piller, 2004). All these mechanisms are geared to "unsticking" user knowledge. However, they consistently position the user outside the company's walls. The present study investigates a hitherto neglected way for firms to absorb user need knowledge and user innovations: employing users in producer firms.

When lead users become embedded in the producer organization, this can be expected to affect their cognition, attitudes, and behaviors. In particular, their innovation behavior will be influenced by use-related and firm-related forces, overlaying and sometimes countervailing each other.

Prior literature comparing innovation outcomes by external users and regular employees finds that user-created innovations are both more novel and more valuable than employee-created innovations (Chatterji and Fabrizio, 2012; Kristensson et al., 2004); but employee-created innovations are easier to realize within the organization (Magnusson et al., 2003). When users are embedded in producer firms, one would expect that these different effects are amalgamated and that ELUs-developed innovations lie in between those of external users and regular employees.

Unlike external users, ELUs are socialized by the firm and be exposed to corporate culture, rules and rigidities. They are bound by employment contracts that reduce coordination and transaction costs. Contracts align ELUs' activities with the producers' new product development objectives, strategies for intellectual property protection, and communication behavior. At the same time, employment and ensuing organizational socialization of ELUs introduce a new element of heterogeneity in the user community that might affect user-to-user interactions as well as their outcomes for producer firms (Chao et al., 1994; Van Maanen and Schein, 1979).

Compared to regular employees, ELUs have informational advantages. They have situated need knowledge gained from first-hand use experience and observing and interacting with other users. Being located in user networks outside the organization, they can be expected to be better able to span organizational boundaries and to transfer environmental information into the organization (Aldrich and Herker, 1977; Allen, 1971). ELUs are likely to take such boundary spanning positions, thus facilitating innovation inside the firm (Reid and de Brentani, 2004).

ELU's motivations and incentives are likely to be hybrid, combining use-related and employment-related elements, with a potential for mutual reinforcement, but also crowding effects (Alexy and Leitner, 2011). Role conflicts can arise from ELUs' dual affiliations inside and outside the firm, and from their multiple roles with regard to the product domain (Settles et al., 2002). User-producer interactions for innovation are sometimes conflict-laden, as research in the field of co-creation shows (Hoyer et al., 2010). Gebauer et al. (2013) point out that consumers may show negative

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