



Making a marriage of materials: The role of gatekeepers and shepherds in the absorption of external knowledge and innovation performance



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ABSTRACT

Through interviews and a large-scale survey of R&D scientists and engineers, this paper explores individuals' attempts to absorb external knowledge, focusing on their efforts to identify and assimilate external knowledge and promote its utilization. Extant research does not explicitly address whether individuals should better specialize in certain absorption efforts or rather work as generalists dedicated to a range of efforts. We suggest that assimilation efforts increase the value of individuals' efforts at external search and at promoting the utilization of external knowledge, which culminates in two main absorption roles that can help individuals achieve greater innovation performance. We argue that *gatekeepers* who combine external search with assimilation effort help to achieve innovation by contributing to building potential absorptive capacity, while *shepherds* who combine assimilation with utilization effort aid innovation by building realized absorptive capacity. We find support for these predictions and discuss the implications for research and managerial practice in open innovation.

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1. Introduction

By embracing more open forms of innovation, organizations are increasingly requiring their staff to make greater efforts to identify, assimilate, and utilize external knowledge (Chesbrough, 2003; West et al., 2014). Underpinning these efforts is the expectation that the use of external sources of knowledge might spur innovativeness by helping firms to explore new opportunities and to translate them into new products, processes, and services (Foss et al., 2013; Laursen and Salter, 2006; Leiponen and Helfat, 2010; Rosenkopf and Nerkar, 2001). Despite interest in the potential of external knowledge as an enabler of firm-level and individual innovation, relatively little is known about how individuals organize these tasks and how the roles they take on in the knowledge absorption process affect their ability to innovate, i.e. to contribute to the development of new products and processes for their organization (Volberda et al., 2010). In particular, previous research does not explicitly address how the external knowledge absorption process can best be deconstructed among individuals, leaving it unclear

whether individuals should better specialize in certain processes or rather work as generalists dedicated to a range of absorption efforts. As a consequence, the roles that individuals take on in absorbing external knowledge for their organization remain not well understood, and there is limited evidence of the performance implications of combinations of individuals' absorption efforts.

This paper aims to unveil the roles of individuals in external knowledge absorption by uncovering productive combinations of individual absorption activities. In part I of our study, we use interviews with R&D scientists and engineers in Neptune – pseudonym for a diversified multinational firm – in a bid to describe the activities of individuals involved in the absorption of external knowledge with greater detail and granularity than hitherto portrayed in the literature. Part II is a deductive study that draws upon a large-scale survey of R&D scientists and engineers in Neptune to examine how individuals combine those activities in distinct absorption roles and how those roles affect their innovation performance. This multi-method approach allows us to pose and try to answer the following questions: *Do individuals who search for and assimilate external knowledge contribute more to a firm's innovative performance than individuals dedicated exclusively to external search? Can individuals effectively utilize external knowledge if they are not involved also in the assimilation of external knowledge?*

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By examining these questions, the paper makes three contributions. First, in documenting synergies between types of absorption activities at the individual level, we delineate two main roles that individuals engage in when they combine different types of activities, and analyze how these roles can influence their innovative performance. We argue that *gatekeepers* who combine external search with assimilation effort help to achieve innovation by building potential absorptive capacity. Gatekeepers help create a pool of internalized external knowledge with potential for internal application because their involvement in assimilation helps them better target their external search activities, whilst their involvement in external search offers opportunities to coach external parties to facilitate easier assimilation. *Shepherds* who combine assimilation with utilization effort aid innovation by building realized absorptive capacity (Zahra and George, 2002). Opportunities to tailor the assimilation process to championing needs and to deepen the background knowledge used during championing make individuals more effective in facilitating the application of internalized external knowledge.

Second, we suggest that assimilation efforts – which involve the translation of external knowledge into a form understood internally and its transfer to colleagues who may adopt it – increase the value of individuals' efforts at external search and at promoting the utilization of external knowledge. That is, individuals who combine the assimilation of external knowledge with external search efforts or with championing the use of external knowledge are better able to broker a marriage between internal and external materials, gaining a premium in terms of innovative performance over those who specialize on one of these tasks. This finding allows us to contribute to the literature on the drivers of individual-level innovation performance by highlighting the value associated with individuals combining different roles in the absorption process.

Finally, drawing on the dimensions of absorptive capacity as distinguished at the organizational level, we help to open the black box of individuals' role in assimilation and utilization, documenting the efforts individuals make to assimilate external knowledge in the organization's pre-existing expertise, capabilities, and categories, and promote its utilization within the organization for the development of innovations. Jointly with existing measures of external search (Dahlander et al., 2016; Salter et al., 2015), our proposed measures of individual assimilation and utilization effort offer a broad assessment of individuals' contributions to external knowledge absorption in organizations. Fig. 1 summarizes the gatekeeping and shepherding roles, detailing the type of individual absorption efforts involved and the synergies between them.

2. Part I: qualitative study of individual absorption effort

Part I of the study aims to take stock of how the extant literature has described the activities of individuals involved in external knowledge absorption, and to extend this body of work with qualitative accounts of three main types of absorption efforts.

2.1. Theoretical background

The use of external knowledge within organizations is rarely straightforward. Finding valuable external knowledge requires time and effort. When found, external knowledge may not only be subject to Intellectual Property restrictions that may retard its use by the firm, it is also often sticky to the context in which it was developed (Murray and O'Mahony, 2007; Von Hippel, 1994). External knowledge needs to be translated and transformed for it to cross organizational boundaries (Carlile, 2004). The assimilation of external knowledge is required to enable it to be integrated into a firm's innovation outputs. Research shows that involvement in

open innovation requires that organizations develop new human resource practices (Foss et al., 2013), redesign job roles and tasks (Alexy et al., 2013), and form dedicated 'open innovation' teams or units (Birkinshaw and Monteiro, 2007; Dahlander et al., 2016; Whelan et al., 2011). It may also require the recruitment of new types of staff (Henkel, 2009), and the shifting of resources from internally oriented projects towards more externally facing ones (Du et al., 2014). These changes to organizational practices have profound implications for Research and Development (R&D) staff who are increasingly expected to work with external parties to develop ideas that blend internal and external knowledge (Cohen and Levinthal, 1990; Giarratana and Mariani, 2014).

Extant research studying the role of individuals in the absorption of external knowledge includes the literatures on technological gatekeepers and boundary-spanners. Despite the fact that the original work on gatekeepers paid ample attention to the translation work of gatekeepers that makes external knowledge understandable to an internal audience, later work in that tradition has focused predominantly on how gatekeepers build internal and external networks to source external knowledge (Allen, 1977; Macdonald and Williams, 1994; Tushman and Katz, 1980). As such, it provides little insight into the types of activities that individuals undertake to achieve the identification, assimilation, and utilization of external knowledge.

More recently, research has renewed attention to the internal side of boundary-spanning and developed richer descriptions of how individuals process external knowledge. Exploring the innovativeness of members of the IBM Academy of Technology, Dahlander et al. (2016) found an association between external search breadth and individual-level innovativeness. Importantly, they argue this association is conditional on how much time individuals spend attending to relationships within and outside the firm, suggesting that 'cosmopolitans' benefit from external search if they devote attention to external partners and sources of knowledge, whereas 'locals' may be inventive without external search if they devote attention to their internal colleagues. Monteiro and Birkinshaw (2017) develop a process view on boundary-spanning by documenting the processes that knowledge scouts in a dedicated scouting unit of a multinational corporation engage in to enable the use of external knowledge by their home organization. They found that scouts systematically translate external knowledge to facilitate internal understanding, engage in matchmaking to find a suitable internal application for it, and often transform or 'redefine' the internal business need to ensure fit with the external solution.

Despite these advances, a full appreciation of individual efforts in the absorption of external knowledge is still missing. The prior literature often tends to focus only on parts of the absorption process, such as external search. Detailed qualitative accounts of individual absorption efforts (e.g. Monteiro and Birkinshaw, 2017) capture a broader range of activities, although these may in part be specific to dedicated knowledge scouts, and it is unclear whether these generalize to R&D staff more broadly involved with external engagement.

2.2. Context

The research was undertaken in a large diversified multinational firm with global R&D efforts, which we refer to as Neptune. Neptune operates a dual career ladder system in its R&D department, which distinguishes between a management and a technical career ladder (Hoffmann et al., 2016; Katz et al., 1995). The study included all senior members of the technical career ladder – a total of just over 600 scientists and engineers. These individuals play a leading role in product and process development, and have impressive track records for developing valuable innovations for the company. Almost all of them have doctoral degrees, and on average they have

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