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CHAPTER FOUR

**CLUSTERS OF INTERDEPENDENT ROUTINES:
A HORIZONTAL PERSPECTIVE AND ITS POST-ACQUISITION
TRANSFER IMPLICATIONS**

ABSTRACT

In high-velocity environments such as high-technology industries, firms often engage in acquisitions to gain access to new capabilities as sources of competitive advantage. Prior research has shown, however, that attempts at post-acquisition capability transfer tend to present formidable challenges. Based on an in-depth, longitudinal case study design, this research reveals that the success of post-acquisition capability transfer crucially depends on recognizing the importance of the clusters of interdependent routines—that is, deliberate learning mechanisms aimed at experience accumulation, articulation, and codification—that constitute the microfoundations of the capability in question. More specifically, these findings demonstrate that by having a horizontal perspective toward such deliberate learning mechanisms—and thus acknowledging their interdependencies—the importance of synthesizing a practice-based approach for sharing tacit knowledge and a routine-based approach for codifying knowledge becomes evident, when aiming for capability development. As a result, these findings illustrate that both practice-based and routine-based theories are necessary to explain post-acquisition capability transfer implications and, thus, enhance capability transfer.

INTRODUCTION

We tended to have everyone available for at least one day of the week so that they could attend trainings, write white papers, make templates, share knowledge with colleagues, coach colleagues, and prepare knowledge sessions. Being a part of or participating in, Microsoft's TAPs [Technology Adaptation Programs] and RDPs [Rapid Deployment Programs]. And it all happened, too. That is why the knowledge level remained high, especially related to new technologies of Microsoft, and that knowledge was being shared among the group too.

—Interview with acquired firm's account manager

The above vignette illustrates various routines that are part of the dynamic capability of an acquired firm in the IT-industry. More specifically, it refers to the routines underlying a dynamic capability that represents a firm's systematic efforts to enhance learning by means of deliberate learning mechanisms (Zollo & Winter, 2002). In high-velocity environments such as high-technology industries, maintaining superior performance requires constant renewal of competitive advantage through the development of dynamic capabilities (e.g., Grant, 1996; Sirmon, Hitt, & Ireland, 2007; Teece, 2007). However, a question many firms face is how to develop these capabilities. Given the rapid change in such high-velocity environments and the complexity of capabilities that transcend the level of the individual employee, many firms choose to acquire capabilities instead of developing them internally (Bresman, Birkinshaw, & Nobel, 2010; Ranft & Lord, 2002). Therefore, acquisitions aimed at accessing new capabilities (hereafter, "capability-based acquisitions") have become an important vehicle for such firms to gain a competitive advantage (Ahuja & Katila, 2001; Makri, Hitt, & Lane, 2010; Ranft & Lord, 2002; Sirmon et al., 2007). Capabilities embody part of the collective knowledge of the acquired firm, especially in knowledge-intensive industries such as computer software and electronics (Ranft, 2006). This is why such firms acquire an entire company instead of simply hiring an employee or buying patents. Research on acquisitions, however, has shown that acquiring a firm does not guarantee that knowledge and capabilities will be successfully transferred (Ranft & Lord, 2002), because most acquisitions fail to meet expectations (Barkema & Schijven, 2008; Bresman et al., 2010; King, Dalton, Daily, & Covin, 2004). Post-acquisition integration problems are widely accepted as one of the main reasons for acquisition failure (Puranam, Singh, & Zollo, 2003; Vermeulen & Barkema, 2001). As such, a deeper understanding of post-acquisition capability transfer is vital for enhancing post-acquisition performance in the context of capability-based acquisitions.

Because most capabilities require integration of knowledge-based resources (Grant, 1996), the routines that enable such integration have been highlighted as being critical for enhancing post-acquisition capability transfer (e.g., Helfat & Peteraf, 2003; Ranft & Lord, 2002; Sirmon et al., 2007). In evolutionary economics, routines represent the microfoundations of organizational capabilities (Dosi, Faillo, & Marengo, 2008; Winter, 2003; Zollo & Winter, 2002), enabling organizations to mobilize their resources and leverage knowledge to create capabilities (Sirmon et al., 2007; Szulanski & Winter, 2002). Studies have shown that routines for developing dynamic capabilities operate through deliberate learning mechanisms—that is, higher-order routines focused on experience accumulation, articulation, and codification—that systematically adjust operating routines (Helfat & Winter, 2011; Zollo & Winter, 2002). Recent research reveals that not only routines but clusters of interdependent routines function as the microfoundations of capabilities, as in the case of the company mentioned in the vignette at the beginning of this chapter (Lewin, Massini, & Peeters, 2011; Sirmon, Hitt, Ireland, & Gilbert, 2010).

Building on Zollo and Winter's (2002) seminal work, which focuses on how the evolution and interaction of higher-order routines improved the ability of firms to adjust operating routines to develop dynamic capabilities, the focus is currently shifting toward the role of the interdependencies among such higher-order routines. Therefore, one could argue that the focus is shifting from a somewhat vertical view to a more horizontal perspective. This shift is due to the increasing level of knowledge intensity of the products and services firms are providing, which ensures that most innovation happens across domains of specialization (Carlile, 2004; Collins & Smith, 2006). As a result, firms must integrate a variety of activities from diverse disciplines to develop the necessary capabilities to enhance innovation and, thus, gain a competitive advantage (Carlile, 2004). In other words, firms increasingly must integrate their knowledge-based resources horizontally. Therefore, understanding the interdependencies among various routines that enable firms to create such capabilities is essential to extend existing theory. Especially in light of the causal ambiguity involved in the transfer of such capabilities, research has been highlighting the importance of copying the routines down to the smallest detail from the outset and, thus, the importance of the interdependencies of these routines. Any type of adaptation of routines—that is, adjusting the routines to fit the new context—tends to hinder the transfer process (Jensen & Szulanski, 2004; Winter, Szulanski, Ringov, & Jensen, 2011). Therefore, paying attention to the

interdependencies among such routines to implement them exactly in the same way into the new context seems to be the first priority for transferring capabilities.

Surprisingly, however, the literature has been rather silent on such clusters of routines and their interdependencies (Lewin et al., 2011; Sirmon et al., 2007). Although there are many general calls in literature for creating more clarity regarding the microfoundations of capabilities (Easterby-Smith & Prieto, 2008; Felin & Foss, 2005, 2009; Felin, Foss, Heimeriks, & Madsen, 2012; Foss, Husted, & Michailova, 2010; Helfat et al., 2007), the growing importance of capability-based acquisitions and the high failure rates that accompany them demonstrate the need for deeper insight into the clusters of interdependent routines that form the microfoundations of the capabilities in question. This study, therefore, explores the phenomenon of post-acquisition capability transfer while paying specific attention to these interdependencies. Hence, this study is guided by the research question “How does post-acquisition capability transfer take place on a micro-level?” By focusing on the microfoundations of such capabilities, this study sets out to gain a deeper understanding of how post-acquisition performance of capability-based acquisitions can be improved by demonstrating why capability transfer is such a difficult task to achieve.

Broadly speaking, the findings show that by having a horizontal perspective toward such clusters of interdependent routines—and thus, recognizing their interdependencies—the importance of a synthesis of a practice-based approach for sharing tacit knowledge and a routine-based approach for codifying knowledge to develop capabilities, is recognized. As a result, it is argued that post-acquisition scholarship could be informed by using both practice-based and routine-based literatures in combination and thus recognizing their complementary effect, in an effort to understand why capability transfer is such a difficult task to achieve and how it can be enhanced.

In the next sections, we will first discuss literature on dynamic capabilities and routines. Second, we will briefly describe the case study and explain the methodology of our research. After discussing data collection and analysis procedures, we will elaborate on the data while examining how the acquiring firm attempted to copy the clusters of routines that constituted the acquired firm’s dynamic capability to transfer this capability into its own firm. We will end with some concluding remarks.

THEORETICAL BACKGROUND

Dynamic Capabilities and the Importance of Routines

According to Zollo and Winter (2002, p. 340), a dynamic capability is “a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness.” Such capabilities constitute a firm's systematic efforts for adjusting operating routines by means of deliberate learning mechanisms such as experience accumulation, articulation, and codification. For a capability to exist, an activity has to be practiced in a routinized way, working in a reliable manner (Helfat & Peteraf, 2003; Helfat & Winter, 2011). Taking into account that sustaining competitive advantage in high-velocity markets has been mentioned to be extremely difficult (Eisenhardt & Martin, 2000), having a dynamic capability could enable firms to sustain their competitive advantage through constant reconfiguration of their resources in a reliable manner (e.g., Grant, 1996; Lewin et al., 2011; Salvato & Rerup, 2011; Sirmon et al., 2007; Teece, Pisano, & Shuen, 1997). In doing so, routines are key because they function as the microfoundations of organizational capabilities (Becker, 2004; Dosi, Nelson, & Winter, 2000; Feldman & Pentland, 2003; Felin & Foss, 2005; Felin et al., 2012; Helfat & Winter, 2011; Sirmon et al., 2007; Winter, 2003; Zollo, Reuer, & Singh, 2002).

Routines' regularities that involve generation and adaptation of employees' actions based on changes in the firm's environment and experience are at the center of a firm's dynamic capabilities (Lewin et al., 2011; Teece et al., 1997; Zollo & Winter, 2002). Dynamic capabilities can be construed as meta-routines (e.g., R&D) that go beyond operational competences that consist of smaller routines (e.g., testing prototypes) (Lewin et al., 2011; Salvato & Rerup, 2011; Sirmon et al., 2007; Teece et al., 1997). Routines enable organizations to mobilize their resources and leverage their knowledge to create capabilities (e.g., Sirmon et al., 2007; Szulanski & Winter, 2002). Such capabilities are built by creating clusters of routines that are interdependent (e.g., Lewin et al., 2011; Salvato & Rerup, 2011; Sirmon et al., 2007), such as the first vignette above illustrates. Thus, multiple smaller and observable practiced routines that are interdependent are the expressions of such higher-order meta-routines (Lewin et al., 2011). In other words, the configuration of such capabilities varies along two dimensions: (1) the actual routines being used in a cluster and (2) the interdependencies of these routines (Lewin et al., 2011). Thus, the complexity of such capabilities may not only be attributable to the individual routines of which they consist but also to the interdependencies among those routines (Lewin et al., 2011).

Over the decades, many scholars have invoked the concept of routines to shed light on organizational stability, change, learning, and knowledge transfer (Becker, 2004, 2008; Feldman & Pentland, 2003; Nelson & Winter, 1982; Pentland, 1992; Pentland & Feldman, 2008; Salvato & Rerup, 2011). Routines are “generative systems that produce repetitive, recognizable patterns of interdependent action carried out by multiple participants” (Pentland & Feldman, 2008, p. 236). Historically, there are two distinct streams of research on routines. On the one hand, research on behavioral regularities concerns itself with how routines as recurring analytic processes are carried out by employees (Becker, 2004; Salvato & Rerup, 2011) and, thus, how employees behave when performing routines. On the other hand, research from the cognitive regularities perspective focuses on abstract understandings employees have when performing routines (Becker, 2004; Salvato & Rerup, 2011). From this perspective, routines are rules, procedures, and programs, and research focuses on how employees interpret them (Becker, 2004).

Whereas the two previously described streams of literature treat routines’ behavioral and cognitive dimensions as two separate aspects, Feldman and Pentland (2003; Pentland & Feldman, 2008) recognize that the behavioral and cognitive dimensions of routines produce and reproduce each other. This producing and reproducing process is affected by the use of artifacts such as written rules, procedures, and physical settings such as an office (Becker, 2004; Feldman & Pentland, 2003; Pentland, 1992; Pentland & Feldman, 2008). Artifacts function as a guide for action and interpretation of routines (Pentland & Feldman, 2008). This role makes some artifacts (e.g., work logs) suitable to track a routine’s performative dimension—that is, how the routine is actually carried out—while others may be a reflection of the ostensive dimension—that is, the cognitive representations that employees have of a routine (e.g., written procedure) (Pentland & Feldman, 2008). Often, firms develop artifacts to create the needed representations, leading to desired performance. However, when employees carry out routines, it is not always according to these procedures or rules because many possibilities exist and, thus, employees can improvise (Pentland & Feldman, 2008). In other words, there is sometimes a deliberate choice in routines (Becker, 2004).

Routines are a part of organizational memory because they capture firms’ and employees’ knowledge about how to perform certain tasks (Becker, 2004). Acting in an individual manner that deviates from the collective could, therefore, disrupt routines (Becker, 2004). This problem becomes even more pressing when trying to transfer routines to a different context as a result of an acquisition, in which changes in the knowledge held within the firm

have an impact on routines in use (e.g., Becker, 2004). The problems associated with the transfer of routines could be due to the fact that certain aspects cannot be copied given that a great part of routines is based on tacit knowledge and that routines are embedded in a web of local learning processes and, thus, are interrelated while being a product of situated learning (e.g., Becker, 2008; Brown & Duguid, 2000; Tsoukas, 1996). Therefore, routines are context specific (Becker, 2004; Madhok, 1997). Transferring them to a different context might decrease their efficacy (Becker, 2004; Csaszar & Siggelkow, 2010; Madhok, 1997) unless they are transferred exactly as they are (Winter et al., 2011).

When changing the context of a routine, it could be that new activities—consciously or unconsciously—are added to the routines in question. Or firms might adapt the routines to fit the new context, leading to a change in the effect and meaning of the routines and, thus, the performance of such routines (Pentland & Feldman, 2008). Nonetheless, employees are usually aware of their specific role in performing a routine and that they are limited in their actions by many other activities—that is, by interdependencies of routines (e.g., Pentland & Feldman, 2008). Therefore, when changes occur that threaten the patterns deemed important by the employees involved—for example, because of a change in the context—the routine either changes in a way that such patterns important to its performance are protected or it does not change at all (Pentland & Feldman, 2008). But what happens if both employees of the acquired and acquiring firm try to protect their own routines? Could this impede the transfer of routines and, thus, also the transfer of the capability in question? Until now, literature on routines has focused mainly on the role of the ostensive dimension of routines and, thus, the representation employees have, overlooking the performative dimension and, thus, the role of employees in performing them (Becker, 2004; Pentland & Feldman, 2008). The fact that firms' capabilities are built by clusters of interdependent routines requires companies to involve various individuals from a variety of disciplines to perform such routines to create the necessary capabilities (e.g., Sirmon et al., 2007). The involvement of various employees in this process and the interdependencies among the routines they need to carry out increases the chances of variation in the performance of these routines, which could make their performance less reliable and, consequently, also the performance of the capability in question. This concern is especially acute when trying to transfer routines to a new context in which such routines need to be reestablished. Therefore, creating more clarity on how employees perform routines and what the roles of interdependencies among routines are could help better understand how such routines enable firms to develop certain

capabilities and, thus, how such capabilities can be transferred post-acquisition. After discussing our data collection and analysis process in the next sections, we will elaborate on how the transfer of routines took place during the post-acquisition phase of an acquisition aimed at gaining access to the acquired firm's dynamic capability. In addition, we will explain the function of these routines and the interdependencies among them. We will elaborate on the way employees performed these routines in this transfer process by demonstrating the various important aspects in this process, in an attempt to provide deeper insight into the complexity of clusters of routines and the way they created the capability in question.

DATA AND METHODS

The Setting

Our longitudinal case study focuses on an acquisition that took place in January 2010 in the IT industry. The acquiring company was an entrepreneurial firm founded in the Netherlands in 1998. It consisted of 1,500 employees, and the IT division of the acquiring firm responsible for the acquisition—which we refer to hereafter as “IT-infra”—consisted of 100 employees. IT-infra delivers services such as unified communications, server platforms, virtualization, and system management. IT-infra consists of two departments: project development and managed services. The project development department's core activity is to develop new IT infrastructures. This means that employees working in this department, for example, make architectural designs for clients' IT infrastructures, calculate the needed server capacity, and realize various communication channels such as e-mail, landline, mobile phone, and Office Communicator. The managed services department's core activity is to manage the existing IT infrastructures, making sure they run properly. Employees in this department, for example, offer helpdesk services to resolve day-to-day operational problems and provide small changes to the existing infrastructure, such as creating new e-mail accounts, new landlines, and more online storage space. In short, IT-infra delivers almost any service related to the creation and maintenance of IT infrastructures.

Given the fast growth of IT-infra over the previous five years—a growth of approximately 1,000 percent—IT-infra is becoming a pioneer in its industry. This rapid growth has had an impact on the operational activities of the firm, resulting in a continuing search for strategy focus, structure, best practices, new employees, and etcetera. At the same time, with the fast change in the industry, IT-infra was also searching for knowledge to

remain competitive in the market. This quest for knowledge resulted in the acquisition of a small and highly specialized firm—which we refer to hereafter as “Mitech”—within the same industry. Mitech consisted of fewer than 40 employees and was founded in 2001, also in the Netherlands. Similar to IT-infra, Mitech provided both project development and managed services activities but had a particularly strong record in project development services—more specifically, developing IT infrastructures on a project basis.

Mitech was recognized in the industry for its ability to deliver cutting-edge IT project development services, which is why IT-infra chose to acquire Mitech. Since both companies had the same types of clients, IT-infra wanted to be able to conduct projects in the same way Mitech did and, thus, deliver such cutting-edge services. In addition, because IT-infra was growing rapidly, it was deemed necessary to further professionalize the company and, thus, adapt current activities. Therefore, IT-infra aimed to internalize Mitech’s knowledge regarding “the way they did projects” (from an interview with the CEO of IT-infra).

Exactly eight months after the acquisition took place, we had the unique opportunity to examine closely the post-acquisition integration phase. Although ideally we wanted to conduct research from the outset of the acquisition, retrospectively our approach worked out even better because it enabled us to see how performance changed over time. Our findings are based on a longitudinal study over a period of five months that we were present on site.

Methodology

This research is based on theory-building case-study methodology (Eisenhardt, 1989; Van de Ven, 2007). The reasons for choosing case-study methodology are twofold. On the one hand, to gain deeper insight into the actual capability transfer process and the clusters of interdependent routines that function as the microfoundations of the capability in question, an in-depth understanding of the phenomenon under study is necessary. Such in-depth understanding is possible by collecting and analyzing qualitative data in the field while exploring the phenomenon under study. On the other hand, because little is known about the capability transfer process and its underlying routines, qualitative data could serve as stimuli to guide and inspire new ideas to extend existing theory (Suddaby, 2006; Sutton, 1997). Our aim is to advance the field’s theoretical understanding of the post-acquisition capability transfer process while using an abduction approach (Kovács & Spens, 2005; Van de Ven, 2007). This approach involves the researchers first matching intriguing observations with existing theory (Kovács & Spens, 2005; Van de Ven, 2007). When the observations do not

match existing theories, the researchers use a creative iterative process to extend existing theory and, thus, build theory (Kovács & Spens, 2005; Van de Ven, 2007). This approach, therefore, involves both deduction and induction.

Central to our exploratory approach is the single-case research design (Langley, 1999). The rationale for using this single-case design is that, on the one hand, the case under our study—a fast-growing innovative firm—was a “unique case” both in terms of the richness of data to which we had access over an extended and uninterrupted period of time as well as in terms of studying post-acquisition processes which are normally difficult for outsiders to analyze. On the other hand, our intentions with the data were to find underlying process mechanisms regarding the phenomenon under study, for which a single-case, longitudinal study is an appropriate approach (Eisenhardt & Graebner, 2007; Langley, 1999).

Since we were interested in micro-level foundations, the unit of analysis of our study was the “group.” In this case, the group of interest consisted of all the employees of Mictch, since it is a small company, and the employees of IT-infra with whom they collaborated. Data collection took place over a five-month period during which we conducted 41 interviews with 10 employees of Mictch and 13 employees of IT-infra. Table A1 shows an overview of the interviewees. On average, the interviewees were 1.5 levels removed from the CEOs of Mictch and IT-infra. Except for one (via telephone), we conducted all interviews in person, each averaging 45 minutes to an hour. The first author of this study started with 17 open-ended interviews with employees of Mictch and IT-infra (Rapley, 2001). We based our selection of employees on two aspects: (1) whether the employee conducted knowledge-intensive activities and (2) whether the employee was involved in a project group that consisted of employees from both companies, which required employees to learn how Mictch’s capability functioned. During these interviews we made no tape recordings and only took detailed notes (Bansal & Roth, 2000), which helped create the context necessary for the interviewee to feel free and unrestricted in talking about the subject of the study, while also building a trusting relationship with the interviewer. For these interviews, we used a simple protocol that entailed only five questions, which helped us conduct interviews that were broad in scope to address various issues (Bansal & Roth, 2000). The protocol contained questions regarding the department to which the employee belonged, his/her position, his/her day-to-day activities, whether the employee needed the knowledge of an employee of the other company, and how knowledge transfer took place according to him/her. Subsequently, we asked follow-up questions such as “What do you mean by that?” or “Could you elaborate

on that?” to probe and clarify the issues mentioned (Bansal & Roth, 2000; Rapley, 2001). This strategy resulted in interviews covering diverse subjects. The primary rule we followed in these interviews was “let the subject talk,” which required minimal interaction between the interviewer and interviewee (Rapley, 2001).

We used the interviews to identify the most important aspects of the knowledge-transfer process and define the scope of subsequent interviews. Thus, first-round interviews served as input for the interview protocol of the second round, during which we made tape recordings, leading to full transcription of all interviews. In addition, during these interviews the interviewees referred us to other employees with whom we could talk and, thus, created a snowball effect that resulted in 24 interviews in the second round. The analysis of first-round interviews revealed that it was not only the expertise of employees that IT-infra was trying to get access to but also the “way” they had developed this expertise within the firm and thus, the routines that underpinned Micttech’s dynamic capability, which had enabled Micttech to carry out projects the way it did. Therefore, for the second round of interviews we asked a topic-initiating question to introduce the topic of interest—Micttech’s dynamic capability and its underlying routines—and thus conducted more focused, semi-structured interviews (Bansal & Roth, 2000; Rapley, 2001). We then followed these questions either by a predefined follow-up question about the dynamics underlying this capability or by a follow-up question not predefined and, thus, focused on the implications of the answers of the interviewee in case these answers needed more clarification or brought up some new questions.

We used an iterative process of constant comparison to select the most important concepts emerging from the data, which included collecting and analyzing data simultaneously (e.g., Hitt, Harrison, Ireland, & Best, 1998; Kovács & Spens, 2005; Suddaby, 2006). This iterative process also guided our data collection process because the theory that was emerging determined which data to gather next (Kovács & Spens, 2005). By using Atlas.ti—software for analyzing qualitative data—we first used open coding to allocate data to provisional categories and thus first-order codes (e.g., Agterberg, Van den Hooff, Huysman, & Soekijad, 2010; Pratt, Rockmann, & Kaufmann, 2006). When no more new codes emerged, we moved to axial coding (Agterberg et al., 2010; Pratt et al., 2006). During this stage we consolidated categories that led to more theoretical and abstract categories and, thus, second-order codes (Maanen, 1979; Pratt et al., 2006; Spiggle, 1994) while matching these second-order codes with existing theory (Kovács & Spens, 2005; Van de Ven, 2007). In

addition, we kept in mind that in case we found a discrepancy between our findings and existing theory, we have the opportunity to extend existing theories.

Besides interviews, we used unobtrusive measures to supplement and cross-validate or triangulate the interview data (Webb & Weick, 1979). This approach helped ensure that data gained from interviews were not merely self-reports or socially desirable answers of the interviewees. Therefore, by triangulating different data sources, we ensured convergent validity of our findings (Agterberg et al., 2010). These unobtrusive measures included archival data (e.g., architecture designs), episodic records (e.g., R&D plan), and simple observations (Alison, Snook, & Stein, 2001). The latter included the first author of this study being on-site two days a week for five months, observing employees' day-to-day activities—attending meetings, brainstorming sessions, social events, and the like (e.g., Bansal & Roth, 2000). Furthermore, to ensure the communicative validity of our results, we also presented our findings from the first round of interviews to three interviewees to be sure we were on the right track and that our findings agreed with their views. Finally, after the second round of interviews, we also presented our findings during a meeting with all the interviewees, who supported our observations and ensured that our findings were in line with their views (e.g., Agterberg et al., 2010).

FINDINGS

Microfoundations of Dynamic Capabilities: Deliberate Learning Mechanisms

The key research question that guided our study was “How does post-acquisition capability transfer take place on a micro-level?” Our data revealed that, consistent with literature, three routines in the form of deliberate learning mechanisms, that is, experience accumulation, articulation, and codification, enabled Mitech to develop its dynamic capability and, thus, to carry out projects the way it did. Below we elaborate shortly on Mitech's deliberate learning mechanisms:

1. Experience accumulation: activities aimed at developing knowledge by educating employees, getting involved in programs provided by technology partners such as Microsoft's TAP (Technology Adaptation Program) and RDP, and providing employees with opportunities for experimentation.

2. Experience articulation: activities aimed at developing a sense of community and ensuring the informal sharing of knowledge among employees such as using Microsoft Office Communicator, having knowledge (sharing) sessions, and coaching.
3. Experience codification: activities aimed at codifying deliberate experience accumulation efforts or experience gained from conducting day-to-day operating routines such as using templates to make sure that knowledge can be stored on the firm's collective platform and, if appropriate, reused for subsequent assignments.

By accumulating, articulating, and codifying experience, Mictech's deliberate learning mechanisms could be positioned along a continuum, with creating individual knowledge by means of experience accumulation on one end and developing collective firm-level knowledge by means of experience codification on the other. Experience articulation might fall somewhere in the middle of this continuum, aiming to enhance sharing of knowledge within the group. By using these deliberate learning mechanisms, Mictech attempted to transform individual tacit knowledge into some form of objectified explicit firm knowledge accessible to everyone. Of course, there is no strict or pure division of routines along the continuum because such routines are interdependent and operate in a nonlinear manner in practice. Having such general analytical division, however, helps us clarify our argument throughout this study, while addressing the core contribution of each routine. Table 1 provides an overview of these routines and some exemplary quotes.

Table 1. Deliberate learning mechanisms

| Second-order codes | First-order codes | Definition | Exemplary quotes |
|-------------------------|---------------------------|---|---|
| Experience accumulation | Early hands-on experience | Activities aimed at getting experience with technologies that are not yet on the market. | “So it is not only by having assignments that are challenging and with which you learn new things, but by having a whole program [Microsoft’s TAP and RDP] beside it, with which you get the opportunity to work with technologies that are not yet on the market” (Mitech’s technical consultant: interview 11). |
| | Trainings | Activities aimed at getting certificates of new technologies. | “But yes that was done also...getting trainings and certificates, that kind of things. You did it partly in your own time and partly during the time that was reserved for it” (Mitech’s technical consultant: interview 20). |
| | Dedicated Time | Making time available for experimentation with new technologies. | “I think the most important thing is to make structurally time available for knowledge development and consistently motivating that and making it possible” (Mitech’s CTO: interview 17). |
| | Being the client | Implementing “not yet on the market” technology within own firm, in order to understand the problems that come with it while experimenting. | “Not from the client, but from our own organization. “Eat your own dog food” you know...that principle! That is what you are selling to the client and you have already worked with it for half a year. It has also its disadvantages. Yes, it is a beta version and then it could be that you will be sitting here a whole day without e-mail. But that is the investment that you do, I guess” (Mitech’s technical consultant; interview 18). |
| Experience articulation | Tools | Using IT-based tools or documents to share knowledge with colleagues. | “Another thing that was emerging at a certain moment was the use of blogs. There are a couple of persons who are fanatically blogging to store that knowledge” (Mitech’s technical consultant: interview 14). |
| | Practices | Activities aimed at enhancing interaction among the employees, in order to share knowledge. | “That is the most important thing and then you had within Mitech knowledge sessions during which, if you had got to the bottom of something, you could give a presentation to your colleagues so that they were aware of it too and knew where we were standing” (Mitech’s technical consultant: interview 11). |
| Experience codification | Codifying for reuse | Activities aimed at codifying knowledge in a standardized way to increase its reusability. | “Yes...but those were the appointed products from the expertise groups. Half of the study time was focused on making deliverables, products [such as templates] to reuse them” (Mitech’s CTO: interview 17). |

| | | | |
|--|-------------------------------|--|---|
| | Storing knowledge | Activities aimed at storing codified knowledge on the collective platform. | “That is what I find practical of SharePoint. You can see what is new, you can search for something within your expertise group, and there are some things that go across all groups. If you put that [documents] there properly, then you see that some things are aged. After two years, there is probably something new and then you have to get rid of that [aged documents] and then you see on top the new things that are taking place. But most of the time within a year you see that you can reuse a lot of things which saves you a lot of time” (Mictch’s technical consultant; interview 3). |
| | Retrieving knowledge | Activities aimed at retrieving knowledge from the collective platform. | “Collective knowledge indeed and that is just very important. That goes a lot further than just an e-mail distribution list that you get, because when you are very busy it’s just: “delete, I don’t have time for that.” But if you put it on SharePoint, it stays there and then you get a signal that something has come in on SharePoint that is interesting” (Mictch’s technical consultant; interview 19). |
| | Updating | Activities aimed at updating existing codified knowledge to make sure latest technological changes and client specific aspects are implemented in it so that such documents can be reused. | “There are new developments all the time and they are implemented in the new designs too. Based on that, if we are doing a...,for example, now at project X, I am using a lot of stuff of the previous client, say for example project Y. Just to see what have my colleagues done during project Y. How have they implemented new technologies there? What can I do with that at X? That gives me the opportunity to develop a design very fast..say based on the latest techniques” (Mictch’s technical consultant; interview 18). |
| | Creating collective knowledge | Using the collective platform to create firm-wide accessible knowledge. | “It all starts in the head of people, but we want to facilitate to store that based on distribution lists, forums, things within SharePoint” (Mictch’s account manager; interview 16). |

As the in-depth analysis of our findings reveals, Mictch’s deliberate learning mechanisms enhanced the creation and flow of knowledge within the firm and were interdependent; together, these features created Mictch’s dynamic capability. To gain access to Mictch’s dynamic capability, IT-infra attempted to copy these routines using an adaptation approach. This adaptation approach ensured that these routines were adjusted by

IT-infra to fit IT-infra's ecosystem and, thus, the new context, which impeded the transfer of Micttech's capability. Our findings illustrate that post-acquisition capability transfer can be enhanced by taking into account the interdependencies of such deliberate learning mechanisms that function as the microfoundations of the capability in question. In line with this, it is crucial for firms to transfer such routines exactly as they are into the new context and thus to not use an adaptation approach. The effectiveness of one routine depends on the existence of the other routines and, thus, their interdependencies. In addition, keeping in mind that experience accumulation, articulation, and codification—that are at the core of such deliberate learning mechanisms that create the capability in question—should be supported throughout this whole process is vital. In doing this, our findings demonstrate that getting hands-on experience with, for example, new technologies, ensuring that the routines address employees' core practices, and implementing the artifacts that provide the needed incentives to work according to such routines is key.

In the following subsections, we first elaborate on the interdependencies of deliberate learning mechanisms to provide more clarity on how clusters of routines function. Subsequently, by means of an in-depth analysis, we demonstrate how IT-infra attempted to transfer each of these deliberate learning mechanisms—that is, experience accumulation, articulation, and codification routines—post-acquisition.

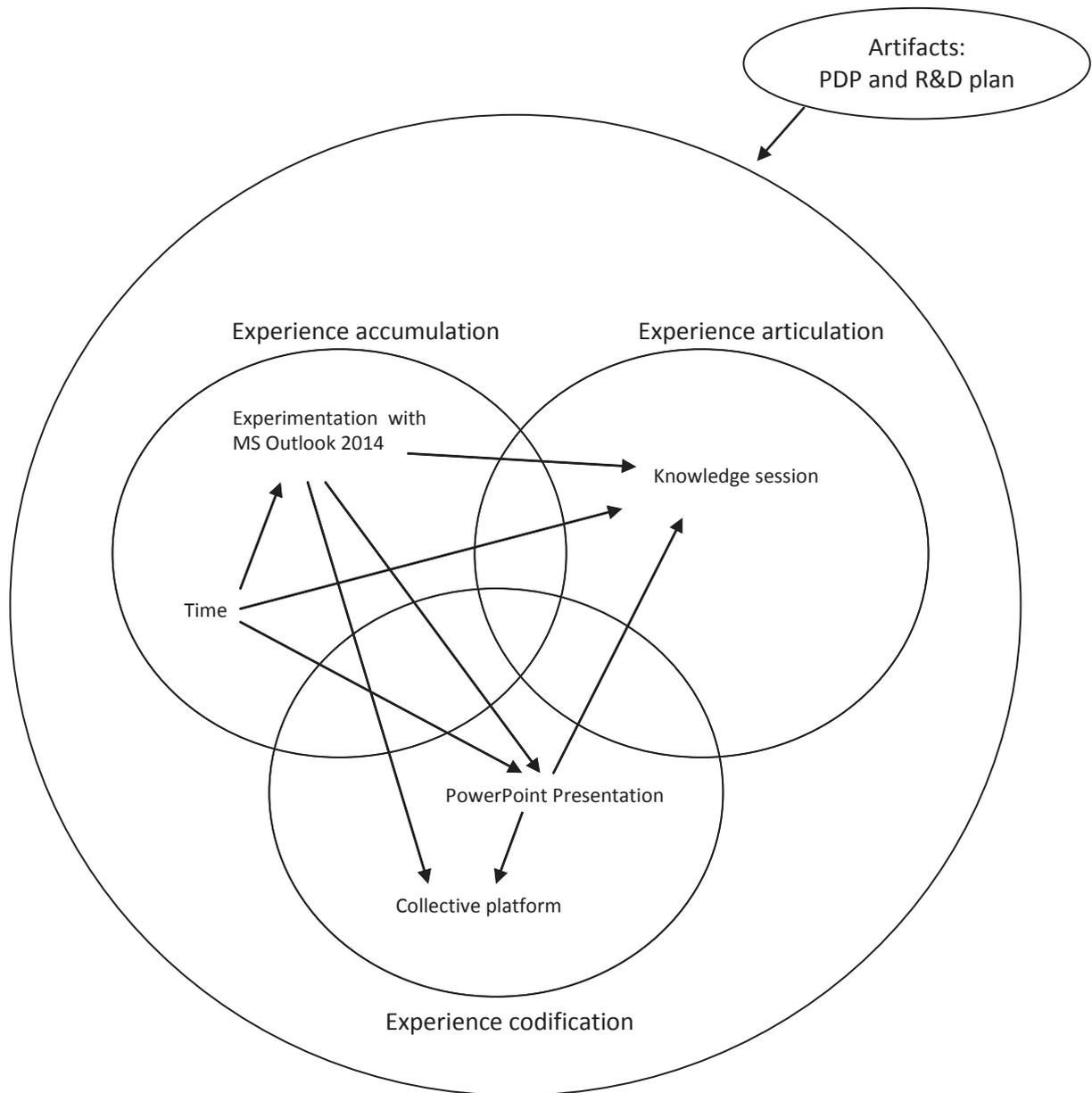
Ecology of Deliberate Learning Mechanisms

As mentioned in the previous section, our data revealed that, consistent with literature, Micttech's dynamic capability consisted of three routines: experience accumulation, articulation, and codification. These routines, however, were highly interdependent; that is, the value of one routine was dependent on the other routines. Table 2 provides some quotations about the interdependencies of these routines. Figure 1 illustrates the interdependencies among these routines using an example.

Table 2. Interdependencies of deliberate learning mechanisms

| Exemplary Quotes |
|---|
| “One [of these deliberate learning routines] cannot exist without the other. Look, when you give a knowledge session you want to build up a PowerPoint slide deck that you can use later, easily, for a client. So, if a client says I am interested in Lync or the newest generation of SCOM, monitor next level or exchange next level, then you should be able to take a slide deck from SharePoint while leaving a few slides out of it to make it less technical and adjust the agenda a little bit, put the logo of the client in it, and adjust the date. And that is it. I have my slide deck and I am going to give a presentation for a client. So, one thing has definitely to do with the other. The result that you should provide should always be measureable. So, there is always a link. You cannot see them as separate activities. They have to be related to each other.” (Mitech’s technical consultant: interview 19) |
| “What we did at Mitech was that there was just time reserved. Time was available for everyone. Let’s say a minimum of one or two days in the month during which you worked only on knowledge development. That could be anything. A little research that you did, or that you went to a training, or picked up something on your own or a topic that you thought is interesting ... and you just had time for that. That [time] was just reserved. The result was also being shared with your colleagues. We had once a month, that was on a Monday night, we had knowledge sessions so to say. Well ... everyone could share what he had done so to say or if you had a fun topic it could be presented, to discuss it. That type of thing ... but it was just fun, a pizza-evening with everyone, a nice group together, a fun evening, very informal, and everyone could say his thing and ask questions. In this way we shared a little bit, a lot was documented, and stored on SharePoint. That kind of thing.” (Mitech’s technical consultant: interview 20) |
| “On our [company’s] website, but you can also use it [a document that explains in detail an assignment that you have done for a client] for your own website and you can also use it to write an article. You can also use it to give knowledge sessions, write a Weekly [a short note about which challenging tasks you have faced this week and how you resolved them], but also for articles in a magazine if you make sure it is anonymous. And, you also need it for your MS references—for a [MS] Gold status you also need these references. So, if you have finished an assignment and write something about it, you can use that for a Weekly ... and a lot of different things.” (Mitech’s CEO: interview 31) |
| “Yes in documents or yes, in templates ... you have heard that word I guess. But these [templates] also resulted in brochures which we could use for marketing or sales.” (Mitech’s technical consultant: interview 11) |
| “Yes, about yourself and ongoing projects. So that was one of the reasons for messaging on SharePoint. The other was documenting things that you find out about a technical field. For example, you have found something about how you do this or that and then, you should explain that on SharePoint. And, that is a separate thing than writing Weeklies. These [activities] were also a part of your goals and were taken into account during evaluations.” (Mitech’s CTO: interview 17) |

Figure 1. A cluster of interdependent routines



To start, let us take an example of a new Microsoft Outlook software and assume it concerns Outlook 2014 which is not on the market yet. For Micttech, as an early adapter of new technology, one way of accumulating experience related to the new Outlook 2014 software would be to implement a beta version within its own environment. Doing this, would help Micttech understand the compatibility of the new software with the existing software in its own IT environment. If there are problems and, thus, certain compatibility issues, Micttech employees would try to solve these, enabling them to gain new knowledge related to implementation issues of Outlook 2014 and, thus, accumulate experience through a trial-and-error learning approach. In addition to accumulating experience, a Microsoft Outlook expert could learn something new and valuable, which he could share with other colleagues. The expert could do this by, for example, holding a knowledge session. During such a session he could give a presentation to discuss the novelties he had discovered and, thus, articulate his experience. To do this, he might create a PowerPoint presentation and, thus, codify his experiences. Besides using these presentation slides during the knowledge session, he could also store the slides of this presentation on the collective platform and make it available for other colleagues or reuse it in the future. This is why such a codification approach works since such activities are embedded in a web of interrelated routines. In addition, there might be templates on the collective platform that need to be updated with the new functionalities, and, thus, the expert could use his experience to adjust these. Furthermore, to be able to do all these activities, the expert must dedicate time to accumulate, articulate, and codify experience. Therefore, having time is crucial. Finally, having the right artifacts in place, such as a personal development plan (PDP) and a Research and Development (R&D) plan, is necessary to ensure compliance with these routines. This is because these artifacts, by giving the necessary incentives by means of reserving the needed time and providing monetary and social rewards (i.e., recognition), serve as motivators to keep these deliberate learning mechanisms' cycle in motion. Of course, there are many other possible combinations of these deliberate learning mechanisms. For example, the expert in question could choose to blog instead of giving a knowledge session, if needed. Or, he could have used existing templates to carry out a test with the new software to see if the templates are still valid. However, because of space considerations only one example is provided here, to increase understanding of the interdependencies among such routines.

Post-Acquisition Implementation of Deliberate Learning Mechanisms

Experience accumulation

We use the term *experience accumulation* to refer to various activities Mictech used to develop employees' individual knowledge. Such routine activities included, for example, receiving training, attending conferences, participating in programs provided by technology partners such as Microsoft's TAP and RDP, and having experimentation opportunities. Of course, some of these activities such as TAP and RDP programs could also be conducted by the group. Nonetheless, because there was usually one specialist for each technology involved, these activities were meant to develop the knowledge of individual specialists.

The interviews indicated, however, that by getting involved in TAP and RDP programs of technology partners and by experimenting with new technologies, most of Mictech's experience accumulation activities had a strong focus on getting early hands-on experience with new technologies:

We participate in so-called TAP programs and what we do during such programs is that software which is not yet on the market gets implemented within our company in a production environment [a normal technical environment in which the software is meant to be actually used]. (Mictech's technical consultant: interview18)

Mictech gave employees the opportunity to experiment with new technologies by providing each employee 22 days a year for this purpose. The employees had the opportunity to implement new technologies within the firm to get hands-on experience with them:

Well ... usually a year before a product comes on the market, having such technology in a production environment. So, for example, with Exchange 2010, Office 2010, and Windows 7 long before they came on the market. That is why you are a Microsoft Gold partner. That is also a strategic choice to be that. But still you don't have to, if you are that [a Gold partner], to start so early with such technologies. There are companies that do that in a test environment. Just to see what that product is really about. But it is something else if you make, first, a couple of employees available to work with such beta versions and subsequently to say, before it goes in production ... before the product comes on the market, to really use it in a production environment. (Mictech's CEO: interview 31)

Since everyone within the firm was a specialist, whenever something went wrong because of the implementation of new technologies, they were able to find their way around it somehow and solve the problem. In addition, employees shared a lot of knowledge with each other, as we will describe in the next section, which helped them solve such experimentation issues.

In any case, in our own [technical] environment [which could be used] there were all technical people who were working in it. So you could easily use your own environment for that [to test products]. (Micttech's technical consultant: interview 32)

IT-infra attempted to copy Micttech's experience accumulation routine. In doing so, however, IT-infra tried to adapt it. Managers chose only certain activities that belonged to this routine and also adjusted the activities to fit the new context. This approach meant, for example, that the employees of IT-infra were not involved in Microsoft's RDP or TAP programs, which were essential for experience accumulation with new technologies:

You have two things. You have the so-called "bringing knowledge back from assignments," which is still going on because we still do such assignments. What we don't do, however, is work with new technologies that are separate from client assignments. (Micttech's CTO: interview 17)

Instead, only a subset of employees attended a conference to get to know the latest technologies:

We have indeed said, deliberately, like "ok" Micttech had a sort of approach of internal innovation for which they visited at least one or two events, innovation events ... a year. We didn't have something like that, but because of the fact that Micttech did that, we had to continue that too. So, we could make sure that IT-infra employees took part in the same events too. That resulted in, as far as I know, almost 20 percent of IT-infra colleagues going to such innovation sessions, in Techhead, in Pair World and, yes, sometimes about 5 or 6 different seminars—international seminars. (IT-infra's CEO: interview 23)

More than half of the interviewees confirmed that having experimentation opportunities was crucial because it enabled them to learn new technology and, thus, keeping the knowledge level within the firm high and being able to be ahead of market. This is why for being able to transfer Micttech's capability, IT-infra had to copy such experimentation activities too. Given its fast growth, however, IT-infra was unable to invest time in experimentation. When it came to providing employees with the needed time and a platform to play with new technologies, IT-infra did not make any of these resources available. Part of this was probably also because IT-infra was a lot bigger than Micttech, and the implications of implementing such new software within IT-infra would be huge and perhaps even unmanageable. Therefore, IT-infra was planning to create a distinct platform for experimentation about a year after the deal was closed. Providing only a platform, however, was not enough; employees also needed time to use the platform and, thus, to develop knowledge:

Developing knowledge but ... for example, four days in the week or a half day study or just in your own [technical] environment, testing new products and to do whatever. And yes the only thing is there should be time available. And at the time, on the one hand it's a good thing we are so busy, not everyone [in the market] has this much to do, but yes ... there is just so little time left to also develop knowledge, for a lot of people. (IT-infra's technical consultant: interview 21)

Furthermore, IT-infra probably did not provide the necessary time to employees because Mitech's approach demanded a large investment, specifically 22 days a year per employee. The R&D and PDP documents of Mitech confirm this observation. However, this was an enormous investment that IT-infra did not believe in:

Google doesn't even give that much, to give an example. People say one day a week of freewheeling, innovating, watching, and reading. That means actually that your factorability for the client decreases with 20 percent! [We have to] go on [with our business] of course! Do you understand? The client says "yes, let's do it" and if you don't do that because "we want to innovate," then they don't accept it. I would also like to say "let's do it," 10 percent for example and 10 percent from your time. Joint effort: employee and employer. What I mean "yes, but my career, I want to develop myself," I understand that also, but instead of watching *Sex in the City* for four hours, you can also innovate. You get four hours from your boss that is then 8 hours. But then everything should come from the employer. (IT-infra's CEO: interview 23)

For developing Mitech's capability, experience accumulation activities aimed at, especially, getting hands-on experience with new technology in an early stage were crucial for employees to become experts and for Mitech to be ahead of the market. Such experience accumulation activities created the dynamic aspect in Mitech's capability by enabling it to adjust its knowledge base, according to market developments. In addition, through providing early hands-on experience, such experience accumulation activities created Mitech's competitive advantage by ensuring that Mitech remained ahead of the market. Mitech's ability to demand premium hourly rates for its highly specialized services was one of the indicators of the success of this approach. IT-infra, however, was unable to embed such activities within its firm because, on the one hand, given its fast growth, it was not able to participate in such activities and, thus, invest time in this routine. On the other hand, conducting such activities meant for IT-infra to adjust its own routines dramatically by embedding, for example, collaboration with technology partners within its own clusters of routines. Therefore, the implementation of such experience accumulation activities was far from being successful.

Experience articulation

Mictech tried to gain maximum benefit from experience accumulated within the firm by articulating that experience as much as possible among employees through knowledge sharing activities. By doing this, employees' individual knowledge circulated within the group, which benefitted the group. For example, when Microsoft introduced new software within the specialization field of a certain employee, the employee in question shared his/her early experiences with the new software in a "knowledge session." This, in turn, helped other employees understand what the consequences of this new software were for their own field and thus, be able to think along:

That gives us an advantage when compared to our competitors and the consultants that have done that [accumulated experience concerning new technologies] can share their knowledge during knowledge sessions with the rest of the group. And then the rest of the group will not become a specialist on the same level as the one who presents it, but they can think along about new products and the functionalities that they have. (Mictech's account manager: interview 16)

To enhance sharing of knowledge among employees, Mictech used various other activities too, such as using Office Communicator and mentoring practices. For example, employees used Office Communicator to have direct contact with colleagues when they had certain questions:

Yes, that is called Lync now. So, we had that too. It is very easy if you see them like hmm ..., I am having some problem now and I don't know how to solve it, then you see like ... oh X knows everything and then you say right away, I see that he has a green light, "X, I am trying to do this, but I can't print" ... "oh, then you have to click on that to turn it on and then it will work." It really doesn't matter where X is, whether he is on the 13th floor, at client X, or in another city. (Mictech's CEO: interview 31)

By using these routine activities, Mictech enhanced the flow of knowledge among employees, while at the same time creating strong social relationships and, thus, a feeling of community:

We had once a month, that was on a Monday night, we had knowledge sessions so to say. Well ... everyone could share what he had done so to say or if you had a fun topic it could be presented, to discuss it. That type of thing ... but it was just fun, a pizza evening with everyone, a nice group together, a fun evening, very informal, and everyone could say his thing and ask questions. In this way we shared a little bit, a lot was documented, and stored on SharePoint. That kind of thing. (Mictech's technical consultant: interview 20)

During the post-acquisition phase, IT-infra attempted to copy these routines also. However, IT-infra's approach was again that of adaptation. IT-infra did not implement Office

Communicator but planned to do so as soon as possible, a year after the deal closed. In the meantime, Mitech gave a select group of IT-infra's employees access to its Office Communicator. IT-infra's employees did not use this tool much though, probably because they did not have the necessary social cohesion and perhaps also because many of their colleagues were not involved in the usage of this tool. In addition, IT-infra only sporadically used mentoring practices. However, employees did not perceive these mentoring practices as effective because their lifespan was too short:

But it is difficult. My colleague X has been walking along each time, but not enough to really get to know a product. And subsequently there must be ... there should be a follow-up project. (IT-infra's technical consultant: interview 21)

Furthermore, IT-infra embedded the knowledge sessions within its firm but adjusted them to fit the new context. This was because the sessions were now meant for all employees. For example, also project managers who were less interested in highly technical issues were now involved. This involvement resulted in a change in the character of the knowledge sessions, moving from highly technical sessions to more general sessions:

We have had some knowledge sessions indeed, but they actually have a different character than within Mitech. In Mitech they were especially technical sessions and this is more general. (Mitech's technical consultant: interview 32)

Finally, IT-infra also added an extra activity—working together in projects—to enhance sharing knowledge among employees and, thus, experience articulation. Working together in projects, however, was perceived as positive for post-acquisition knowledge sharing:

In project X, I got to know Mitech's employees. On the basis of that you can also do your things, you can approach a colleague more easily if you have certain questions. (IT-infra's project manager: interview 9)

In sum, IT-infra also used an adaptation approach toward the experience articulation activities used by Mitech. Therefore, existing knowledge within the firm was not being shared among the group. Employees, however, did start articulating their knowledge on a local level when they became involved in the same projects. Consequently, knowledge sharing in general grew on a local level.

Experience codification

Reusing knowledge for subsequent projects and making sure individual and group knowledge became collective firm knowledge was mentioned by almost all interviewees as

an important aspect for developing Mictch's dynamic capability. To codify knowledge as much as possible and reuse it for subsequent projects, Mictch required its employees to use specific templates that ensured a standardized approach toward experience codification and stored these templates on a collective platform. This routine enabled Mictch to circulate employees' codified knowledge within the group, store their codified knowledge on the collective platform to create a collective firm knowledge base, and use this knowledge for subsequent projects to gain competitive benefits. The latter was because Mictch did not have to reinvent the wheel for each project. This, in turn, enabled Mictch to complete projects more rapidly than its competitors. Often, important documents only had to be updated slightly to fit a client's situation or to make sure that the latest technological changes were implemented:

In essence, all the time that you need less for coming up with things, for reinventing the wheel so to say, is profit. And that time that you win by that, you can use that for improving a template or working on other stuff. (IT-infra's project manager: interview 15)

To copy this routine, IT-infra asked all employees to work with templates as Mictch did. This call involved both the project development and managed services departments. This approach, however, was quite conflicting, since employees involved in the managed services department oftentimes had to work according to clients' templates, which resulted in having a lot of different templates and, therefore, a nonstandardized approach to experience codification. Furthermore, because employees of the managed services department were involved in day-to-day operational activities of such IT infrastructures—that is, maintenance—they worked according to more-detailed documents that less-knowledgeable employees could also use. Given that these two departments' core activities differed, managed services employees were convinced that Mictch's templates were not that good because a lot of “important” information was missing. As a result, IT-infra's employees were generally skeptical of Mictch's codification approach and codified knowledge and, thus, of using its templates:

And a lot of times they are making fun of that on the work floor at managed services, because some of these templates are so abstract and because some things are just not mentioned in such templates. And a system administrator looks at it and thinks like “why haven't they even mentioned that?” And then it seems that there has never been a match [regarding templates] between these two [project development and managed services department] and that just remains some sort of two camps in that area. (IT-infra's technical consultant: interview 26)

Another issue arose when IT-infra encouraged its employees to work with Mictch's collective platform. The main reason for this was that developing its own collective platform would take too long, and Mictch already had a lot of codified knowledge on its collective platform. This knowledge was useful for IT-infra because the projects and clients were similar. In doing so, a select group of IT-infra's consultants who did projects similar to those of Mictch got access to Mictch's collective platform. Since most of these employees were working together with Mictch's employees on projects, the assumption was that they would start working with the collective platform too. Yet IT-infra's employees had to change their own routines to work with Mictch's and, thus, the collective platform, which prompted them not to follow the new routine:

No! I have access to Mictch's SharePoint, but I haven't had the need to use it until now. (IT-infra's technical consultant: interview 22)

Thus, IT-infra's employees did not use Mictch's collective platform and kept working according to their own routines, mostly because the PDP and R&D plans, which required working according to this routine, were not implemented:

No, they don't have a PDP at all! So, if you don't have that! Keeping it interesting [through bonuses] ..., because you don't have it, you don't have any reason to keep that knowledge level intact. That cycle stops then. (Mictch's technical consultant: interview 3)

Within Mictch we had indeed a ... there was a link between R&D and PDP. Things that were delivered from R&D came up again in your PDP. Knowledge and templates and giving knowledge sessions. I don't see any of those coming back now anymore. (IT-infra's project manager: interview 11)

Furthermore, the absence of a collective platform for all employees—not only a select group—to store such documents decreased employees' standardized codification efforts:

Template usage, however, is, firstly, very limited, as far as I know, especially because of a lack of a collective platform where you can find these templates and get them. (IT-infra's project manager: interview 15)

Well ... there is no central storage platform, so then you see that such a template gets adjusted, but not stored on some central platform. So, you have somewhere a template, you recognize it, but you see also that there are variations per theme, for example. (IT-infra's project manager: interview 11)

In sum, the lack of a collective platform that would involve all employees instead of only a select group resulted, even more, in IT-infra's employees not adapting Mictch's codification activities. In turn, employees worked with various templates, not according to one specific standardized template. This was because the situation did not address the actual practice of all employees. In other words, the post-acquisition reality did not involve all

employees and the various templates they used in practice. Therefore, the changes in IT-infra's routines did not take place because they would threaten IT-infra's employees' existing way of working, which they would have viewed as unnecessary. The latter was reinforced when the necessary artifacts, such as the R&D plan and PDP that created the needed incentives, were not implemented and the collective platform did not involve all employees, preventing the use of such a platform from becoming a part of "the way we do things here." Thus, the path-dependency of IT-infra's employees related to their own routines and ambiguity about the new routine caused them to soon revert back to their own routines. It happened mostly because of a lack of incentives, which diminished the transfer probabilities and thus the copying of this routine.

DISCUSSION

Our study of post-acquisition capability transfer demonstrates that transferring the routines that function as the microfoundations of a capability is crucial for effective capability transfer. Our study illustrates that, in line with existing literature, such routines exist within the firm in the form of deliberate learning mechanisms aimed at experience accumulation, articulation, and codification (Zollo & Winter, 2002). These routines are meant to enhance the flow and creation of knowledge throughout the firm while aiming to integrate the firm's knowledge-based resources to create the desired capabilities. Given the central role of these routines in firms' capability development efforts, our study provides in-depth insights into the dynamics of these routines to explain how capability transfer can take place on a micro-level.

Our findings reveal that because such routines are meant to integrate firms' distributed knowledge-based resources, by means of a variety of activities, they are highly interdependent and function in various clusters. More specifically, our findings demonstrate that in addition to the importance of enhancing group interaction (e.g., Birkinshaw, Bresman, & Håkanson, 2000; Bresman, Birkinshaw, & Nobel, 1999; Bresman et al., 2010; Ranft & Lord, 2002), capability transfer on a micro-level can take place by supporting firms' experience accumulation, articulation, and codification efforts, which are essential parts of the underlying routines of such capabilities being transferred. This transfer can be achieved by getting hands-on experience with, for example, new technologies, addressing employees' core practices by the routines that are meant to be copied, implementing artifacts that create the incentives to work according to such routines, and taking into account that absorbing a

focal routine depends on the implementation of other routines and, thus, their interdependencies.

Concerning the latter, our study shows that when transferring deliberate learning mechanisms that function as the microfoundations of capabilities, firms should transfer all routines as exactly as possible to the new context because the function of one routine depends on the existence of the other routines. Therefore, it is crucial to take into account the interdependencies of such routines from a horizontal perspective because these routines are only effective when they coexist.

Contributions to Literature

The main contribution of our study could be ascribed to dynamic capabilities, routines, and post-acquisition integration literature. First, concerning dynamic capabilities, consistent with existing literature, our study has confirmed that the microfoundations of dynamic capabilities are higher-order routines in the form of deliberate learning mechanisms, more specifically experience accumulation, articulation, and codification (Zollo & Winter, 2002). Until now, the focus of research has been on how such higher-order routines improve operating routines to develop dynamic capabilities; therefore, the focus took on a vertical perspective (Zollo & Winter, 2002). Recent research instead has demonstrated the importance of interdependencies among such routines for developing dynamic capabilities and, therefore, the importance of taking a more horizontal perspective (Lewin et al., 2011). In line with this, our research illustrates that these deliberate learning mechanisms are highly interdependent and are meant to enhance the creation and flow of knowledge throughout the firm wherever it is needed to enhance organizational learning and, thus, create a dynamic capability. By doing this, our study offers an empirical example of such clusters of routines that create dynamic capabilities in an effort to extend existing research (Lewin et al., 2011; Sirmon et al., 2007).

In essence, having a horizontal perspective toward the clusters of routines that create dynamic capabilities is crucial because of the nature of dynamic capabilities—that is, their aim to stimulate organizational learning. As Argote and Miron-Spektor state, “learning begins with experience” (2011, p. 1126). However, because dynamic capability involves systematic and reliable efforts to enhance learning, having only behavioral-based learning activities and, thus, semi-automatic experience accumulation, would not be enough to develop such capabilities (Zollo & Singh, 2004; Zollo & Winter, 2002). Therefore, deliberate cognitive learning activities that involve articulation and codification of such experience

accumulation activities are necessary (Zollo & Singh, 2004; Zollo & Winter, 2002). Thus, these three deliberate learning mechanisms, together, cover both the behavioral and cognitive approaches to organizational learning (Zollo & Singh, 2004). These are, however, interrelated activities (Argote, McEvily, & Reagans, 2003). This is because, for example, in order to accumulate experience one could consult a codified version of one's own experience or that of others, and to articulate experiences, one needs to codify them or experience them with a colleague. The same holds for codification of experience because it requires one to have experience and to articulate such experience (e.g., Argote et al., 2003). Therefore, implementing only one or two of these three deliberate learning mechanisms would not suffice because their value is dependent on each other. Given their aim of experience accumulation, articulation, and codification throughout the firm, such routines operate in a nonlinear logic on a deeper level within the firm than zero-order routines (Argote et al., 2003; Easterby-Smith & Prieto, 2008; Zollo & Winter, 2002). This is probably because of the fluidity of knowledge, which requires firms to have a nonlinear routine toward it (Faraj, Jarvenpaa, & Majchrzak, 2011). This, in turn, is why capabilities are complex phenomena, and creating them is such a complex task, since in order to create optimal value firms need to assimilate existing, distributed knowledge by any means, even though, sometimes, they do not know where such knowledge resides. By providing an empirical example, our study contributes to the ongoing debate about dynamic capabilities and, more specifically, about specific types of microfoundations that create such capabilities—namely processes and interactions (Felin & Foss, 2012; Felin et al., 2012).

Second, concerning routines literature, our study provides an empirical example of value creation through knowledge-based resources by dedicating distinct clusters of routines that are highly interdependent and embedded in practice to stimulate the creation and flow of knowledge within the firm to gain optimal benefit from such knowledge-based resources (Lewin et al., 2011; Sirmon et al., 2007). As discussed in the theory section, the ostensive and performative dimension of such clusters of routines produce and reproduce each other, and in doing this they are affected by artifacts (Becker, 2004; Feldman & Pentland, 2003; Pentland & Feldman, 2008). In line with this, our study has shown that because these routines and the required artifacts—that is, the PDP and R&D plans—were not implemented in exactly the same way in the new context, the artifacts were not being used, the ostensive aspect was not being totally understood since the employees did not understand why all these various activities had to take place in a certain way, and as a result the desired performance was not

being achieved. Therefore, implementing routines exactly in the new context is necessary, in all dimensions and artifacts (Winter et al., 2011).

Furthermore, another contribution of our findings is that they provide evidence for a synthesis of a practice-based approach for sharing tacit knowledge and a routine-based approach for codifying knowledge to enhance organizational learning. The practice-based literature on knowledge has been arguing for the embeddedness of knowledge in practice and the importance of learning-by-doing to share tacit knowledge. Therefore, this literature stream is skeptical of firms' codification endeavors for dealing with knowledge-related issues. However, our study shows that having such clusters of routines that are highly interdependent explains also why experience codification routines could be effective—namely, when working in concert with practices meant to share tacit knowledge—which is contrary to the existing view in practice-based literature (Gherardi, 2000; Leonard & Swap, 2004; Swap, Leonard, Shields, & Abrams, 2001; Tsoukas, 1996). In addition, given their fluid nature and their purpose of stimulating knowledge underlying firms' operating routines, such clusters of routines seem to have an evolution of their own. This development depends in part on the firm's operating routines and in part on the strategic choices of the firm related to knowledge and creation of dynamic capabilities. Whatever their evolution is, putting the importance of such clusters of routines on the map could provide deeper insights into routines and, thus, advance routines literature.

Finally, to be able to enhance post-acquisition capability transfer, the importance of such clusters of routines that function as the microfoundation of the capability in question need to be taken into account too. Acquisition integration literature, until now, has not focused on how to transfer such clusters of routines in the form of deliberate learning mechanisms and, thus, dynamic capabilities, post-acquisition. Therefore, creating more clarity on the dynamics of such clusters of routines could be vital for understanding why capability transfer seems to be such a difficult task during the post-acquisition integration phase (Bresman et al., 1999, 2010; Graebner, 2004; Graebner, Eisenhardt, & Roundy, 2010; Ranft, 2006; Ranft & Lord, 2002; Schweizer, 2005). Hence, another contribution of this research is that it provides an empirical case that demonstrates the transfer of dynamic capabilities and its implications. In an attempt to do this, our study, consistent with existing literature, reveals that dynamic capabilities consist of deliberate learning mechanisms such as experience accumulation, articulation, and codification. These deliberate learning mechanisms are highly interdependent, forming various combinations of clusters. Therefore, transferring such

capabilities post-acquisition is a difficult task. The various interdependencies among such routines make it hard to transfer capabilities. Thus, these findings suggest that literature on post-acquisition integration needs to recognize and study routines from a broader perspective to understand clusters of routines and their contingencies with firms' resources and actions and the implications for transferring such clusters of routines and, thus, the capabilities in question.

Managerial Implications

Having competitive advantage is partly a choice that requires dedication, as this research has shown. Developing a dynamic capability requires the existence of deliberate learning mechanisms that are distinct from the firm's zero-order operating routines (Easterby-Smith & Prieto, 2008; Zollo & Winter, 2002). Such routines are highly interdependent and are meant to stimulate the flow of knowledge throughout the firm to enhance organizational learning (e.g., Faraj et al., 2011; Zollo & Winter, 2002). When involved in capability-based acquisitions, understanding the ecology of such routines while recognizing their importance and interdependencies would be a good step forward in being able to transfer the capability in question. This study has illustrated that to copy clusters of routines, management's support by dedicating resources to the development of such a capability is of utmost importance. Given that resource availability is an issue for many organizations, managers involved in transferring such capabilities need a rapid approach to use. The question that remains is what should managers do when they have minimal resources? The answer is to narrow the scope and orchestrate resources in such a way that knowledge creation and flow are not neglected (e.g., Csaszar & Siggelkow, 2010; Sirmon et al., 2010).

Managers engaged in capability-based acquisitions, aiming to transfer the capability in question, should not be overwhelmed by the myriad interdependencies among the routines they encounter. Trying to detect which routines are the minimally required ones to sustain the capability in question would be key. By doing this, managers can try to prioritize their actions while focusing on bundling and mobilizing the right assets to orchestrate resources in an adequate manner. In the case of our research, managers involved could have focused only on the experience codification routine. More specifically, they could have focused on creating templates and using the collective platform for storing and reusing these new templates or existing ones. Interviewees perceived these two experience codification activities as the most

important. Moreover, the implementation of these routines required minimal effort from both management and employees because the platform and templates already existed.

The only thing that remained was involving only the employees whose core practice was addressed by such routines. For example, both IT-infra's employees of the project development and managed services departments were involved in using the collective platform of Mictch. But the platform contained templates for project development activities and, thus, did not address managed services employees' core practice. This gap led to employees of the managed services department not using the platform and becoming skeptical about the capabilities of Mictch in general and spreading this skepticism throughout the firm. A more effective approach for management would have been to focus on two highly interrelated and important routines of experience codification that addressed employees' core practice instead of shifting the focus to multiple activities, which resulted in incomplete implementation. On the other hand, merely narrowing the scope does not suffice. Therefore, managers involved in capability-based acquisitions should keep in mind that the absorption of routines depends, in part, on implementing organizational artifacts that allow such routines to become a part of "doing things here" (e.g., Pentland & Feldman, 2008).

Each acquisition, however, is unique—even for serial acquirers (Amiryany, Huysman, De Man, & Cloudt, 2012). Enhancing capability transfer, therefore, is probably inherently an idiosyncratic process. However, our study has illustrated the importance of deliberate learning mechanisms for enhancing post-acquisition capability transfer. Thus, taking into account the importance of routines' interdependencies, narrowing the scope of activities, and paying attention to artifacts could help managers enhance post-acquisition capability transfer and, as a result, acquisition performance. Finally, it is worth noting that managers of firms involved in high-technology acquisitions in search of capabilities must ask themselves what it is they are trying to buy. If it is routines they are aiming at, they need to do more than selectively cutting and pasting. Managers involved in such acquisitions should also ask themselves whether it is possible to transfer routines. It could be that the "copy exact" method mentioned by Winter et al. (2011) does not work in the context of acquisitions. It could also be that employees of the acquired firm do not know the interdependencies of these routines and, thus, how they have built such capability. They might not be able to explain it to the acquiring firm, making it harder to detect cause-and-effect relationships (e.g., Sirmon et al., 2007; Szulanski & Winter, 2002). Whatever the reason, without being able to transfer

such routines, firms could be bought for their capabilities, but the value of these capabilities will soon fade away.

Limitations and Suggestions for Future Research

By providing suggestions regarding dynamic capabilities, routines, and post-acquisition integration, this study has attempted to lay a foundation for testing by future, large-scale, research. Trying to understand whether our findings hold in a broader context, which routines are the minimally required ones with the highest interdependencies among them, and what their nonlinear logic is are important steps for future research to reveal the composition of such dynamic capabilities. However, as with all research, our research has its limitations. The findings are based on a single-case observation in the IT industry. It could be that these findings only hold for IT firms and not other types of high-technology firms, such as pharmaceutical companies. It could also be that these findings only hold for small firms. Thus, the question is whether these findings would be applicable to acquisitions involving larger firms. Regardless of the limitations, our findings address interesting paths for future research. For example, future research should reveal whether there are distinct conditions under which firms choose or need to choose only certain deliberate learning mechanisms (Zollo & Winter, 2002). Future research should also reveal which routines are the minimally required and highly interrelated ones to enhance capability development and transfer. With regard to organizational artifacts' interaction with routines (Pentland & Feldman, 2008), future research should reveal whether the transfer of such artifacts to a new context is a realistic goal given, for example, the differences in companies' cultures and structures or in the levels of integration post-acquisition. Therefore, future research should reveal the post-acquisition manageability of such clusters of routines and their artifacts and whether this study's findings are generalizable.

Furthermore, Ranft (2006) mentions that more research regarding the content of post-acquisition communication is necessary. This study shows that one of the aspects that such communication should contain is the relevance of such routines for employees involved and, thus, the link to their core practices. Moreover, Helfat and Winter (2011) call for understanding the nature and speed of change of dynamic capabilities. This study shows that the nature and speed of change are dependent on the developments in the market and are communicated to the firm through the technology partners. Future research, however, should reveal what the roles of such technology partners are in creating dynamic capabilities. Given

that self-reinforcing processes tend to narrow the scope of potential actions (Schreyogg & Sydow, 2010), it could be interesting to reveal what the roles of technology partners are regarding variations in firms' future actions. Future research should also reveal the impact of such technology partners on changes within an industry and whether creation of dynamic capabilities is affected on an industry level. For example, are dynamic capabilities scarce or quite different in an industry in which there is less interaction with such technology partners? Are such industries shaped largely by key technology suppliers? Thus, future large-scale cross-industry research including multiple stakeholders is necessary to reveal whether this study's findings are applicable to a broader context. Such research could enhance our understanding of the microfoundations of dynamic capabilities, which is an increasingly important stream of research in the strategic management field.

CONCLUSION

This study has shown that dynamic capabilities that constitute a firm's systematic efforts to adjust operating routines to improve its effectiveness operate, indeed, through deliberate learning mechanisms aimed at accumulating, articulating, and codifying a firm's experience. By means of systematic experience accumulation, articulation, and codification, deliberate learning mechanisms enhance the flow of knowledge throughout the firm, wherever necessary, in an attempt to build the needed capabilities. Given their aim of enhancing the flow of knowledge throughout the firm, such deliberate learning routines function in a non-linear manner across the firm because the firm's knowledge-based resources are distributed across a variety of specialized disciplines. This inherent attribute of such routines—that is, functioning in a non-linear manner—and the routines' aim to bundle firms' knowledge-based resources, ensures that these routines are highly interdependent and embedded in various clusters. Therefore, attempts at transferring such routines should take into account the routines' interdependencies from a horizontal perspective while ensuring that they are copied as exactly as possible into the new context because the effectiveness of one routine depends on the existence of the other routines. In doing this, our study has demonstrated that having hands-on experience with, for example, new technologies, addressing employees' core practices by means of the routines being used, and implementing the artifacts that provide the needed incentives to work according to such routines are vital for transferring these routines and, thus, the capability in question.

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APPENDIX

Table A1. Overview of interviewees

| Company | Position | Number of interviewees | Number of interviews |
|----------------|----------------------|-------------------------------|-----------------------------|
| IT-infra | CEO | 1 | 2 |
| IT-infra | Director | 1 | 2 |
| IT-infra | Project manager | 3 | 5 |
| IT-infra | Technical consultant | 8 | 14 |
| Mictech | CEO | 1 | 2 |
| Mictech | CTO | 1 | 3 |
| Mictech | Account manager | 1 | 2 |
| Mictech | Technical consultant | 7 | 11 |
| | | Total: 23 | Total: 41 |