



Faculty Publications

---

2019

## Principles or Templates? The Antecedents and Performance Effects of Cross-Border Knowledge

James B. Oldroyd

Brigham Young University, oldroyd@byu.edu

Shad Morris

Brigham Young University, morris@byu.edu

Jeff P. Dotson

Brigham Young University, jeff\_dotson@byu.edu

Follow this and additional works at: <https://scholarsarchive.byu.edu/facpub>

### Original Publication Citation

Oldroyd, J., Morris, S., & Dotson, J. Principles or Templates? The Antecedents and Performance Effects of Cross-Border Knowledge Transfer. *Strategic Management Journal*, 40(13): 2191-2213.

### BYU ScholarsArchive Citation

Oldroyd, James B.; Morris, Shad; and Dotson, Jeff P., "Principles or Templates? The Antecedents and Performance Effects of Cross-Border Knowledge" (2019). *Faculty Publications*. 3678.  
<https://scholarsarchive.byu.edu/facpub/3678>

This Peer-Reviewed Article is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in Faculty Publications by an authorized administrator of BYU ScholarsArchive. For more information, please contact [ellen\\_amatangelo@byu.edu](mailto:ellen_amatangelo@byu.edu).

# PRINCIPLES OR TEMPLATES? THE ANTECEDENTS AND PERFORMANCE EFFECTS OF CROSS-BORDER KNOWLEDGE TRANSFER

**James B. Oldroyd**

Management Department  
Brigham Young University  
Provo UT 84602  
oldroyd@byu.edu

**Shad S. Morris**

Management Department  
Brigham Young University  
Provo UT 84602  
morris@byu.edu

**Jeffrey P. Dotson**

Marketing Department  
Brigham Young University  
Provo UT 84602  
jeff\_dotson@byu.edu

**Research summary:** Strategic use of codified knowledge across borders can be a vital component for project-based work. Analyzing 237 global consulting projects, we examine the performance effects of drawing upon different types of codified knowledge. We argue and find that using principle-based forms of knowledge are likely to improve a project's customer responsiveness, while using template-based knowledge increases a project's cost effectiveness. We also explore what drives project managers to select different forms of knowledge in the first place. Specifically, we find that manager experience drives knowledge principle use, while institutional distance drives knowledge template use. Taken together, our findings suggest that organizations need to carefully consider the performance implications of different types of codified knowledge that get used and understand what drives managers to use them.

**Managerial summary:** Managers understand the importance of knowledge management systems for project-based work. Efforts are often made to ensure knowledge is codified and disseminated throughout the firm so employees can draw upon them to complete their projects. Unfortunately, however, such efforts often lead to stockpiles of information that remain untapped and underutilized. This study seeks to answer two questions. First, how can managers influence workers to utilize different types of codified knowledge in the first place? Second, do different types of codified knowledge have differential effects on performance? We find that increased individual experience drives the use of knowledge principles while workers that are more distant are more likely to use knowledge templates. At the same time, we find that when individuals draw upon knowledge principles it increases the customer responsiveness of their projects while the use of knowledge templates increases cost effectiveness. This suggests that project-based firms should carefully consider codifying both knowledge templates as well as knowledge principles and consider how to incentivize workers to draw upon these different forms of knowledge.

**Keywords:** cross-border knowledge transfer; project performance; knowledge principles; knowledge templates; Bayesian estimation

## **INTRODUCTION**

Once confined to consulting and aerospace industries, project-based work is increasingly becoming a predominant form of organizing in high-tech, banking, retail, and other sectors in the global economy (Barley, Bechky, and Milliken, 2017; ILO, 2015). The success of project-based work is often dependent upon successfully sharing knowledge from one project to the next (Staats, 2012). This requires project managers to not only identify which forms of knowledge are most likely to lead to success, but it also requires them to proactively turn to codified forms of past knowledge dispersed within a global context (Hansen & Haas, 2001). The purpose of this paper is to explore two questions: First, how do different forms of codified knowledge relate to performance? Second, what factors at the individual and organizational level are associated with the use of these different forms of knowledge in the first place?

Because reusing knowledge across contexts and geographies is difficult (Puranam and Srikanth, 2007), firms try to ensure that knowledge is codified in documents and other forms of institutional memory (Zollo and Winter, 2002). In terms of how knowledge is codified, there are two primary forms: (1) general principles of the knowledge, or (2) specific templates of the knowledge (Baden-Fuller and Winter, 2007). Templates provide a pattern or a model for other individuals to copy. A template might be a project prototype or how-to document that walks a project manager through the steps needed to successfully replicate a project. For instance, Orr (1996) found that Xerox workers effectively transferred knowledge by providing strict repair guides (i.e., templates) that helped other workers fix copiers in a step-by-step fashion.

Principles, on the other hand, provide a fundamental, primary, or general law or truth to guide individuals (Baden-Fuller and Winter, 2007). A principle may be a list of best practices, key questions, or cause-and-effect associations that provide a theoretical explanation for why they might be useful as a general guideline for other projects. For instance, IKEA uses principles to provide “general instructions on store design, HR management, etc.” to help stores adhere to general principles that make the IKEA concept work (Jonsson and Foss, 2011: 1089).

We suggest that accessing documents in which the nature of the knowledge is principle-based will allow project managers to more flexibly respond to customer needs, while accessing template-based documents will allow project managers to generate greater cost efficiencies for the firm. Being responsive to customers and being cost efficient represent two key indicators of project performance (Faraj & Sproull, 2000). To ensure quality firms must be responsive to their customer needs. To maintain financial viability firms must keep their costs down.

Knowing which form of codified knowledge leads to which type of performance can help steer project managers toward requisite knowledge, but predicting what types of knowledge project managers are likely to draw upon can help steer those assigning project managers to certain projects. Past research points out that project members often rely upon individual experience as well as firm-level factors to determine what kinds of knowledge to use (e.g., Staats, Brunner, and Upton, 2011). We suggest that individual factors such as project-specific training, experience within the country, and industry experience are likely associated with the use of principles. On the other hand, firm-level factors that put project managers on the periphery, such as geographic and institutional distance, are likely related to the use of templates. In general, we suggest that individual experience is more influential in driving principle use, while firm-level factors are more likely to influence template use.

To test our theoretical model, we examined 237 consulting projects in a large global professional service firm over a four-year period. We obtained archival data for each project, including project performance outcomes and surveyed project managers to assess which form of codified knowledge they used on their projects as well as to find out about their prior work experience. We discuss implications for firms seeking to build a more strategic approach to manage individuals and leverage codified knowledge for improved performance.

## **PRINCIPLES, TEMPLATES, AND PROJECT PERFORMANCE**

Global firms tend to rely on formal knowledge management systems to ensure knowledge transfers across

geographic locations. In establishing knowledge management systems, firms create repositories for internal documents that have captured employee experiences. These internal documents take on many forms, from project completion reports, to process checklists, to sample templates, to experiential stories (Morris and Oldroyd, 2009).

Effectively using knowledge documents from different locations can increase firm performance (Jonsson and Foss, 2011; Szulanski, Cappetta, and Jensen, 2004), but what type of performance it increases may depend on the form in which the knowledge was codified. Principles and templates emphasize two distinct forms of knowledge codification found within firms. On one hand, templates demonstrate *what* operations entail; they store and convey basic, process-based knowledge; and they provide detailed forms for employees to emulate (Baden-Fuller and Winter, 2007). For example, within the consulting industry, companies like McKinsey have employees turn to project completion reports that walk them through the specific steps other consulting teams have done in completing their own projects. These documents are not designed to explain why something was done, but rather to provide a detailed step-by-step log of what the team did during the engagement and allows subsequent projects to copy their efforts.

On the other hand, principles demonstrate the *why* in knowledge; they include experiential stories, cause and effect relationships, and keys lessons learned. For example, in addition to writing a project completion report that represents a template, a consultant at McKinsey might decide to convey some explanation behind why what they did during the project worked or did not work. The story could be used to explain the unique context they were in, while conveying some underlying rules or principles behind their decisions. These stories do not specifically tell someone the steps that need to be taken but rather prioritize rationales for institutional operations, leaving the finer details to the individual user (e.g., Eisenhardt, Furr, and Bingham, 2010; Gardner, Gino, and Staats, 2012).

While a document could contain elements of both knowledge forms, the forms remain distinct. For instance, a document might first include the steps required to complete a process and then have a section to

explain why these steps are necessary. Internal knowledge documents must entail either or both of these forms, and so the two forms often collectively represent the nature of a firm's approach to knowledge management systems (Zack, 1999). Each is effective for its own purpose and, in our context; each is codified in a distinct document type.

### **Knowledge templates and cost efficiency**

Templates are an efficient method of transferring standard knowledge across borders (Jensen and Szulanski, 2007). Bingham and Davis (2011: 48) highlight the efficiency of template-based learning, noting that the goal of this approach "is to gain the benefits of accumulated knowledge while avoiding the expense of accumulated experience." The use of templates makes cost efficiency more likely because templates are often referred to as "proof" or "best practices" for optimally allocating resources and minimizing waste. Templates likely induce adoption of unfamiliar practices without trial and/or modification (Miner and Mezias, 1996). Moreover, templates increase the acceptance of cross-border initiatives and improve employee performance within those initiatives (Jensen and Szulanski, 2007).

In addition, templates are often codified to actively resist costly modification. For instance, Szulanski and Jensen (2006) demonstrate that international franchisors engaging in exact replication of templates across geographic boundaries were able to get their franchise operations up and running more quickly. In general, units attempting to make adaptations for local customers from knowledge templates often unintentionally increase the costs of implementation, which, in turn, slows down the work. The strength of codified knowledge templates is their ability to clearly and efficiently replicate knowledge from one context to another (Kostova and Zaheer, 1999).

*Hypothesis 1: When managers use knowledge templates, their projects are more likely to be cost efficient.*

### **Knowledge principles and customer responsiveness**

In contrast to templates, the use of codified principles will likely increase a project's ability to respond to

specific customer needs because principles are by nature, flexible and adaptable to multiple contexts. Principles-based knowledge transfer works well for flexible repurposing, as principles afford the local user significant flexibility in determining how to adapt foreign knowledge to the local customer, as was found in Jonsson and Foss's (2011) research on IKEA. Along these same lines, Baden-Fuller and Winter (2007: 30) describe how senior management at Novotel Hotels used knowledge principles to improve local customer adaptation.

Knowledge principles offer project managers a broad understanding of larger organizational practices, as well as a flexible means of using prior experience to predict causality in organizational actions. For instance, Oldroyd and Gulati (2010) describe how a multinational gaming company created general principles for achieving particular customer goals, including universal recognition of customers and tiered service and customer support. This strategy fundamentally changed the company's practices, including its customer loyalty and rewards systems, across both business units and geographic regions.

*Hypothesis 2: When managers use knowledge principles, their projects are more likely to be responsive to customers.*

## **PREDICTING KNOWLEDGE USE**

Scholars have pointed out the dual necessity of projects to produce both quality and efficiency (Faraj & Sproull, 2000; Huckman & Staats, 2011; Staats, Brunner, and Upton, 2011). Project managers are most often evaluated and rewarded based on their ability to respond to customer needs while also completing their projects on time and under budget. However, even if managers are incentivized based on these dual performance objectives, it does not necessarily mean that managers will simply draw upon the knowledge that aligns with the performance needed. Because firms and individuals do not always agree in their objectives, agency issues arise. Managers may generate agency costs that are inconsistent with project objectives as they use codified knowledge that aligns with their organizational positions or individual experiences and not the

firm or customer (Pierce, 2012). In such cases, knowledge benefits can be nullified when managerial ability and interests are not aligned with firm objectives (Gartenberg & Pierce, 2017).

As a result, it is often not enough for firms to know which forms of knowledge are most beneficial for performance. Rather, firms should also understand which individual and organizational factors might influence project leaders to access different types of knowledge in the first place. For example, managers are likely to make knowledge consumption choices based on their abilities to use knowledge and the needs of the project, selecting forms of knowledge that are most useful to them given their unique skills and abilities to utilize the knowledge (Rosenkopf and Almeida, 2003). Managers may also be influenced by firm-level factors such as geographic, firm, and institutional distance that make them more or less likely to be able to reuse knowledge in a new context (Hansen and Haas, 2001; Kostova and Roth, 2003). In general, both individual and firm-level experiences provide managers with abilities, motivations, and opportunities that may shape how they access existing knowledge and use it in new settings (Jiang et al., 2012).

### **Individual factors and knowledge principle use**

The use of both principles and/or templates in any firm often requires significant effort by the user (Szulanski, 1996). However, using codified principles-based knowledge is particularly difficult. Baden-Fuller and Winter (2007: 20) note, “Principles typically require the actors to be fully and emotionally engaged in the practice” and requires “unusual personal effort” (Baden-Fuller and Winter, 2007: 20).

Managers who have high levels of local experience, such as higher tenure in the local country and greater understanding of the local language, are more likely to grasp the nuance required to successfully use knowledge in a local context and as a result utilize more of it. As described by Morris and Snell (2011: 809), those with local knowledge “may be better equipped to interpret the idiosyncratic challenges and opportunities that arise in a given host country.” Such managers may be able to effectively utilize principles-based documents from different parts of the company and figure out how to apply the general principles to their customers.



In addition, human capital gained by receiving training and having industry experience in multiple countries may improve a manager's ability to draw upon principles. Kogut and Zander (1993) identify the importance of prior international experience as one of the most persistent findings in the work on cross-border technology transfer. In fact, a manager's prior experience with different people within the firm is a strong predictor of whether knowledge will be shared (Morris, Snell, and Bjorkman, 2016). Familiarity with international conditions likely increases employees' emotional engagement with and trust in knowledge imported from external contexts (Lawler and Yoon, 1996). As trust increases, managers become receptive to foreign knowledge, particularly when that knowledge is found in principles-based form (Baden-Fuller and Winter, 2007). Based on these arguments, we propose that, because of their openness to foreign ideas, social connections forged during international experiences, and deeper understanding of the local customer context, employees with more robust individual experiences may possess the necessary drive and ability to effectively draw on principles-based codified knowledge sources.

*Hypothesis 3: Experienced managers are more likely to resort to using knowledge principles.*

### **Organizational factors and knowledge template use**

The very properties that make principles-based forms of knowledge valuable to the firm also make that knowledge challenging to transfer and use across geographic and institutional distances. In each case, as the distance increases between the home and host country, the costs of transferring knowledge increases, and the likelihood of someone being able to apply the general principles decreases. Principles provide little guidance of how one might reuse knowledge in a completely different context (Zander & Kogut, 1995).

In contrast, template-based knowledge is more easily transmitted across geographic, organizational and institutional domains, which reduces the costs to use it (Makhija & Ganesh, 1997). According to Schulz (2003: 446), using templates allows project teams to “process new incoming knowledge faster because it facilitates and speeds up the establishment of linkages between old and new knowledge.” As Cantwell (2009) noted, information technology and templates have significantly decreased the costs of global knowledge reach. While

the marginal cost of using codified templates decreases with distance, the marginal cost of understanding more nuanced principles may actually rise with distance (Audretsch, 1998; Beugelsdijk & Cornet, 2002). Given the challenge of using knowledge across geographic distances, we expect that a manager distant from source will tend to use templates (Szulanski & Jensen, 2006).

Moreover, firms often face additional costs in doing business due to differences in the institutions in which they operate (Kostova, 1999). As institutional distance increases, firms bear additional relational costs of monitoring, communicating, and trusting foreign counterparts (Eden & Miller, 2004). These differences can include cognitive differences, which are based in the beliefs or value systems, normative differences, which are based on the legitimate means to pursue goals, and regulatory differences, which are differences in rules and regulations (Eden & Miller, 2004). For example, Lyles and Salk (1996) found that different norms and rules among joint-venture partners impeded the flow of knowledge, making templates a more viable option for knowledge transfer.

*Hypothesis 4: Managers who are geographically and institutionally distant from the knowledge source are more likely to use knowledge templates.*

## **METHODS**

### **Data and sample**

To test our hypotheses, we explored the knowledge transfer choices and outcomes within a large global firm that focuses on management consulting with business, government, and nongovernmental agencies in over 100 countries. In consulting, success is often determined by a project team's ability to leverage knowledge resources (Huckman, Staats, and Upton, 2009; Von Nordenflycht, 2010). Our research in this area, then, takes advantage of a fertile ground for understanding how the use of codified knowledge affects project performance and what factors might influence project managers to access different forms of codified knowledge from previous projects within the firm (Zhang and Li, 2010).

In our sample, project managers are typically selected to lead a project based on four criteria: their geographic proximity, their availability, their location expertise, and their industry expertise. For example, in staffing a banking project in Vietnam, the company would look for available managers in Vietnam and then choose who has the most relevant experience for the banking project. Our analyses seek to better explain how geographic factors and individual expertise may be considered when selecting project managers, as these factors are likely to affect knowledge use and subsequent project performance. Once selected, all project managers were encouraged to use the codified knowledge available in the firm, but no specific direction, requirements, or incentives were provided. Thus, managers had discretion to choose to use principles, templates, both, or neither when working on their projects.

Our study focuses on 237 consulting projects conducted over the four-year period from 2006 to 2009. Each project had a project manager located in the country where the project was based. Project managers had an average duration of three years in the country prior to the commencement of the projects. Nearly all of the projects, whether serving one client or more, were specific to a single country; the few that spanned borders were specific to a single region, such as Central Africa, the Balkans, or Southeast Asia. Project objectives included increasing capacity, increasing market share, and developing a financial plan for foreign direct investment in the local market. While all project managers were encouraged to utilize the firm's vast stocks of codified knowledge resources, use of these resources was not mandatory or incentivized.

Because of the firm's extensive involvement in global consulting, the codification of organizational knowledge is key to the firm's success. As such, the firm expends significant resources on the codification of relevant knowledge for each and every project. Specifically, the firm produces a template for each project in the form of an extensive "project completion report." These detailed reports are aimed to "capture the experience of other organizations through the transfer of encoded experience" (Levitt and March, 1988: 329). Each project template is painstakingly codified, owing to a combination of the firm's uncertainty as to which projects will need to be replicated in the future and the relatively low cost of codification as compared with the cost of re-

creating the process-based and technical knowledge involved in each project.

In addition to undertaking extensive efforts to produce templates based on each project, the firm asked project managers to codify key principles from each project. These principles are codified in a short, three- to four-page summary of each project; summaries include a basic overview of the project, an overview of its objectives, and key lessons learned (including both positive and negative lessons). These principles highlighted the direct causal associations between stakeholder actions and specific outcomes.

All templates and principles are made fully available to all project managers through the firm's intranet. Additionally, both of these forms of codified knowledge are searchable by location, project objective, industry, revenue, and other relevant inputs. On average, project managers utilized principles alone in 42 percent of projects and templates alone in 20 percent of projects. Project managers used neither principles nor templates in 10 percent of projects, and they used both in 28 percent of projects.

Our study utilized three sources of data. First, we gathered information from the complete database of all consulting projects from the years 2006 to 2009, yielding a set of 1,525 projects. To avoid potential recall biases (Glick *et al.*, 1990), we focused on projects that were recently completed. We then further narrowed our focus to those overseen by a project manager who still worked for the company, which resulted in a smaller set of 620 projects.

We surveyed each of the 620 project managers. After repeated reminders, 267 managers responded to the survey, providing us with a 43 percent response rate. After cleaning and matching the data, we had 139 projects with complete archival and survey data for testing our performance-related hypotheses and 237 projects for our individual and organizational factors hypotheses. There were 142 project managers for the 237 projects in the study. The discrepancy in number of projects vs. project managers comes as some project managers led multiple projects over the four-year duration of our data. To test for the possibility that our consulting project samples differed systematically from the universe of 1,525 or the 620 total projects surveyed, we ran several tests. In general, the projects in our final sample tended to be larger than the average

project, and projects from the Europe and Central Asia and the Asian regions were more likely than North American projects to be in the final sample. Because we control for size and location in the models, these variations should not bias our results. There were no significant differences among the full set and our survey sample in cost efficiency (mean (standard deviation) 2.025 (0.623), 2.009 (0.648);  $p=0.531$ ) or customer responsiveness (2.025 (0.623), 2.017 (0.628);  $p=0.813$ ) nor among the full data set and the final projects used in our analysis of performance (cost efficiency 2.025 (0.623), 2.097 (0.558);  $p=0.223$ ; customer responsiveness mean 2.025 (0.623), 2.100 (0.614);  $p=0.208$ ).

Another major concern for our research was the possibility that “successful” project managers responded disproportionately to the survey. We used data to test if those project managers that received excellent ratings in customer responsiveness or cost efficiency were more likely than other project managers to respond to the survey. Ultimately, neither of the performance measures—cost efficiency (2.025 (0.623), 2.097 (0.558);  $p = 0.15$ ) nor customer responsiveness (2.025 (0.623), 2.089 (0.589);  $p= 0.14$ )—were a significant predictor of project manager survey response.

For each project, we matched project data and survey data with archival performance data where available. We assessed project performance using project evaluation data collected by a semi-autonomous Metrics and Evaluation (M&E) Unit within the company. This performance evaluation unit assigns project performance measures to nearly all completed projects, basing assessments on predefined criteria specific to each project that are determined before the project begins. The unit sets a target for resource usage (i.e., time, money, and staff) as well as other specific measurable outcomes that are observable on the ground (e.g., response in meeting client needs, increase in new customers for the client, improved plant productivity, increase in market share). After multiple reviews, final ratings are assigned by a full-time, dedicated, independent monitoring and evaluation staff within the organization. This M&E Unit takes great care to attend separately to two key performance objectives: cost efficiency and customer responsiveness. For most projects, efficiency and responsiveness are determined at separate points in time and by different individuals within the

M&E Unit.

## MEASURES

### Dependent variables

*Customer responsiveness.* This measure was determined by the degree to which the customer's specific goals and objectives were met by the consulting project. In the words of an internal document, customer responsiveness is the "desired final change, which measures the achievement of the original project goal," and "projects must be able to clearly demonstrate the impact they have achieved." Moreover, customer responsiveness is assessed based on project-specific criteria after the project has been completed. For example, an internal firm document states: "[consulting engagements] will need to be monitored post-completion for a period of months or years in order to effectively assess project impact." This is consistent with other consulting firms, who also measure aspects of client satisfaction or other long-term improvements to the client over time.

To determine customer responsiveness, the M&E Unit undertakes multiple means of assessment, including customer surveys and local sector or industry assessments, to determine whether a project may be directly linked to improvements for the customer or group of customers. For example, if a project was designed to develop a credit bureau in Ghana, the M&E Unit determines that project's degree of customer responsiveness by surveying the credit bureau's customers to measure whether customers saw improved quality of service that fit their local credit assessment needs. This provided a general customer satisfaction score. In addition to surveying customers of the client firm, the M&E Unit would then examine increases in sales, stock performance, etc., to determine how the project impacted the customer from a financial perspective. Finally, the unit would check to see how these performance results line up with the original goals set by the project team before starting the project.

If the project exceeded its goal, the project would receive a rating of *excellent*. If the project met its goal, the project would receive a rating of *satisfactory*, and finally, if the project did not perform to expectations it would receive a rating of *unsatisfactory*. In our sample, 13 percent of projects were rated

excellent, 62 percent satisfactory, and 25 percent unsatisfactory in customer responsiveness.

**Cost efficiency.** The M&E Unit also determines the cost efficiency of projects. In doing so, they evaluate the degree to which the project deviates from the schedule and allocated resources. Project efficiency is largely a measure of project costs. During the scoping stage of a project, project managers, in conjunction with their supervisors, examine the customer's objectives and develop a specific budget and timeline for the project based on these needs.

The M&E Unit determines each project's efficiency level. After the completion of each project, the unit evaluates efficiency by measuring the degree to which the project met two key criteria: (1) the project was on budget and (2) the project was completed within the planned period. Based on these factors, the M&E Unit then rates the efficiency of each project as *excellent*, *satisfactory*, or *unsatisfactory*. In our sample, 11 percent of the projects were rated excellent, 69 percent were rated satisfactory, and 20 percent were rated unsatisfactory.

**Codified knowledge use.** To test our hypotheses of knowledge use, we collected data by asking project managers whether they utilized a "project principles" document (*principle*) during their project. We coded each response 1 if the manager used a principle and 0 if not. Similarly, we measured knowledge template use by asking if project managers consulted a "previous project completion report" (*template*), coding the response 1 if the manager used a template and 0 if not.

We measured the prevalence of project managers using neither principles nor templates (10% of the projects, coded 1), as well as the prevalence of project managers using principles only (42% of the projects, coded 2), templates only (20% of the projects, coded 3), and principles and templates combined (28% of the projects, coded 4).

### **Other variables**

**Individual factors.** To assess individual experience, we examined each manager's project-specific training, experience within the country, and industry experience. To measure project-specific training, we surveyed project managers on the extent to which they attended global and regional training sessions to help

them in their project work. The question in the survey asked, “To what extent did you attend a [company-wide] training session related to your project?”

To measure experience within country, we measured the project manager’s local language proficiency and tenure in the local country. The questions asked managers “How many years have you worked in your current location?” and “How well do you speak the local language? (1-not at all, 2-basic, 3-proficient, 4-fluent, 5-native).” The results indicate that 44 percent of project managers were native speakers, 31 percent indicated that they were fluent, 14 percent had a basic level of proficiency, and 11 percent had no local language ability. The average local tenure was three years.

To measure industry experience, we measured the project manager’s “prior years of experience working in a related industry” prior to joining the firm, the number of foreign “languages spoken” by the manager, and by counting the number of countries in which he or she had “worked for longer than six months” (Haas, 2006). Previous tenure in a related industry ranged from six years to 36 years, with an average of 15 years. Project managers spoke two languages on average; 36 percent were trilingual, and 15 percent spoke four or more languages. Foreign experience ranged from previous placement in one country to previous placement in 18 countries, and 43 percent of managers had experience working in one or two countries, 21 percent had worked in three countries, and 23 percent had worked in four or more countries.

***Organizational factors.*** We explored the organizational-level factors that might impact knowledge utilization by creating measures of geographic, organizational and institutional distance for the projects within the firm. Geographic distance was coded as the log of the miles from headquarters to the project’s country office. Because headquarters acted as the central repository and editor of all codified internal documents, measuring the physical distance from headquarters to the location of the project manager demonstrated cultural and proximal barriers associated with someone’s ease of accessing knowledge from that distant location. The average distance was 5,581 miles with a standard deviation of 2,755 miles and a maximum of 9,724 miles. We also calculated organizational distance, which examines how much knowledge project managers reported accessing from



different units and different geographies across the organization. More specifically, if a project manager reported that she gathered knowledge inside her unit and local office, she received a score of 1. If the knowledge was from a different country and from a different unit, it received a score of 5. This score ranged from 1-5.

Institutional distance captures the difference between the institutional environments of two countries (Kostova, 1999). It is based on regulative, normative, and cognitive pillars of the institutional environment. We measured institutional distance by assessing cultural distance, which primarily involves normative and cognitive institutional distance (Eden & Miller, 2004). Using Kogut and Singh's (1988) cultural distance index formulation, we created a separate index from and deviation along all nine GLOBE indices. We corrected for variation differences within each dimension and used the average.

***Control variables.*** We controlled for numerous factors that might also influence the type of knowledge a project manager is likely to access and impact project performance. These factors include unique project characteristics, location, type of business, and reliance on alternative knowledge. First, we controlled for disparities in project characteristics by measuring the number of support staff required for each project (*support staff*). In doing so, we note that, though a large support staff may come with a substantial reserve of knowledge, larger numbers of workers also bring with them greater organizational and other process-related challenges.

Next, we controlled for the novelty of the project. Nearly 20 percent of projects were deemed "pilot" projects (*pilot*). Projects were classified as pilot projects if they were relatively new undertakings for the firm; because these projects covered newer knowledge domains, they were less likely to benefit from the reuse of codified organizational knowledge.

We further controlled for the location of the project by including a dummy for each of the following five regions outside of North America: Europe and Central Asia (*ECA*), Latin America and Caribbean (*LAC*), Middle East and North Africa (*MENA*), Asia (*A*), and Sub-Saharan Africa (*SSA*). Additionally, we controlled for differences in the line of business the project fell under, recognizing that projects with diverse goals may

vary significantly in both organizational structure and necessary resources. The firm we studied undertakes projects in four diverse fields of business: Access to Finance (*access to finance*), Investment Climate (*investment climate*), Public-Private Partnerships (*public-private*), and Sustainable Business (*sustainable business*).

We further controlled for project managers' use of alternative knowledge sources. We identified several categories of alternative knowledge, including whether a project manager flew out an expert to help with the project (*flyout*), if he or she attended internal training sessions specific to the project (*training*), if he or she contacted others within the organization via social media (*social media*), and if he or she contacted others via phone (*phone*). Controlling for these alternative sources of knowledge is key (Haas and Hansen, 2005), particularly as alternative knowledge sources proved popular with project managers in our study.

Table 1 presents the means, standard deviations, correlations, and reliabilities within the study.

-----  
 Insert Table 1 about Here  
 -----

### Description of empirical models

In the first model, the dependent variable is an assessment of the success of the project, as manifest through three categorical outcomes (i.e., unsatisfactory, satisfactory, and excellent). We modeled the impact of human capital and codified knowledge form on the performance of each project (denoted by  $i$ ) using a multinomial logit:

$$\Pr(y_i = k \in \{unsatisfactory, satisfactory, excellent\}) = \frac{e^{u_{ik}}}{\sum_j e^{u_{ij}}} \quad (1)$$

where the latent utility for each option is expressed as a linear function of the focal and control variables described above:

$$u_{ik} = \sum_h \gamma_{kh} c_{ih} + \gamma_{k1} Prin + \gamma_{k2} Temp + \varepsilon_{ik} \quad (2)$$

where  $c_{ih}$  denotes the set of control variables (including an intercept), and  $Prin$  and  $Temp$  denote the use of

Principles or Templates. For identification, we normalized the utility of the “satisfactory” project outcome to be equal to 0 (i.e., the baseline outcome). Estimated coefficients are therefore interpreted relative to this base outcome.

An econometric challenge in inferring the relationship between project performance and the use of codified knowledge is the fact that the latter are selected by the project manager, ostensibly with the intent to maximize success of the project. If the independent variables in a linear model (or generalized linear model) are selected with knowledge of their idiosyncratic (and heterogeneous) impact on the dependent variable, they are endogenous to the system of study and can lead to both biased and inconsistent inference if not explicitly included in the model.

As this is likely the case in this context, we addressed this problem by jointly modeling the outcome of the project (as expressed in equation 1) and the selection of codified knowledge (as expressed in equation 3). This methodology is consistent with the approach developed in Nandialath, Dotson, and Durand (2014) and implemented in Mackey, Barney, and Dotson (2017). Both of these papers show that joint modeling of the process of interest and the selection process for the endogenous independent variable results in recovery of the true, causal effect of action on outcome. Further, the application of these approaches allowed us to formally test the assertion that the decision variables are endogenously determined, thus providing insight into the decision-making process of the managers in the study.

We formally modeled the selection of codified knowledge form (i.e., principles or templates) as a binary choice process where managers can use principles, templates, or a combination of the two. Managers select the type of codified knowledge as a function of its expected impact on performance (i.e., the response coefficients). In the case of the use of principles, this can be expressed as a logit where:

$$\begin{aligned} \Pr(\text{Prin} = 1) \\ &= \frac{e^{\alpha_{\text{Prin}} * \gamma_{k1}}}{1 + e^{\alpha_{\text{Prin}} * \gamma_{k1}}} \end{aligned} \tag{3}$$

Information about the response coefficients is contained in both models as the parameter  $\gamma_{k1}$  appears in

both equation 1 and equation 3. The choice of templates can be modeled in a similar fashion. Following both Nandialath and colleagues (2014) and Mackey and colleagues (2017), we used Bayesian statistical methods to estimate the parameters of the model.

Specifically, we constructed a MCMC sampler that sequentially draws from the posterior distribution of all of the models' parameters. We iterated between draws of the parameters for equation 2 and the endogenous selection equations for principles and templates following the parametric form of equation 3. We ran each chain for 100,000 iterations and retained the last 50,000 iterations for inference. Convergence was assessed using standard methods.

In our second model, to test our hypothesis regarding the link between human and firm level factors and reliance on codified knowledge modes, we used multinomial logistic regression models with standard errors clustered at the project manager level. We clustered errors by project manager because 15 percent of project managers were responsible for two projects, and 5 percent were responsible for three projects.

Our measures of knowledge use are constructed as an ordinal scale in which 1 connotes the use of neither principles nor templates, 2 connotes principle use, 3 connotes template use, and 4 connotes use of both principles and templates. Ordinal data can be analyzed using ordinal logistic regression if the data satisfies the assumption of proportional odds (e.g., assuming that a step from 1 to 2 is equivalent to a step from 2 to 3). Empirical tests reveal that our data violates this assumption (chi-squared test = 31.66 with a *p*-value of 0.01). In light of this finding, we conduct our analysis using multinomial logistic regression, rather than ordinal logistic regression. Multinomial logistic regression makes no assumptions regarding the proportional ordering of the categories.

## **RESULTS**

Hypothesis 1 predicts that use of principles is positively correlated with customer responsiveness. Model I of Table 2 tests this hypothesis. Results demonstrate that managers who achieved excellent customer responsiveness ratings are significantly more likely than other projects to have used knowledge principles, (7.27, 5% confidence interval 1.00–21.91) supporting Hypothesis 1.

-----  
Insert Table 2 about Here  
-----

Hypothesis 2 predicts that the managers use of templates is correlated with their project's cost efficiency. Model II in Table 2 tests Hypothesis 2. We find that template use has a significant positive effect on projects rated as excellent in cost efficiency, (2.26, 5% confidence interval 1.65–6.11), supporting Hypothesis 2. Moreover, an interesting finding that was not hypothesized is that the use of principles was negatively associated with projects rated as excellent in efficiency (-5.49, 5% confidence interval -10.69 – -1.72). This suggests that while the use of principles is helpful for customer responsiveness it is likely to reduce the cost efficiency of projects.

The results of our test of the effects of human and organizational factors on knowledge consumption are found in Table 3. Model I of Table 3 demonstrates the effects of the control variables on project managers' use of principles, use of templates, and use of both principles and templates. Model II of Table 3 tests Hypothesis 3. Hypothesis 3 predicts that individual experience is associated with an increase in the use of codified knowledge. The results support Hypothesis 3, indicating that actors with more country experience (0.935,  $p = 0.009$ ), tenure (0.236,  $p = 0.025$ ), and related industry experience (1.570,  $p = 0.024$ ) are positively correlated with the use of principles.

Model II of Table 3 tests Hypothesis 4, which posits that distance is positively correlated with template use. We found some support for this hypothesis. Specifically, institutional distance (0.017,  $p = 0.017$ ) is positively correlated with the use of templates. We also found but did not hypothesize that geographic distance (-7.488,  $p = 0.001$ ) is negatively associated with the use of principles. This may be because distance is likely to make it difficult for individuals to draw upon principles.

-----  
Insert Table 3 about Here  
-----

## **DISCUSSION**

On the whole, we develop a framework to understand how the use of different forms of codified knowledge is

linked to different performance outcomes and how firms can select project managers who are more likely to use the different forms of knowledge in the first place. While prior studies have demonstrated that global companies benefit from institutional attributes that allow for greater cost efficiency and customer responsiveness (e.g., Bartlett and Ghoshal, 1989; Rivkin, 2001), our study links the use of different forms of codified knowledge to these specific outcomes.

Further, this paper increases our understanding of how micro-level factors might influence macro-level outcomes. Specifically, our results suggest that attributes of individuals and organizations can act as important selection criteria that may increase the likelihood that project managers will use different forms of codified knowledge in the first place. This finding is particularly useful in a knowledge-based economy, where knowledge workers are afforded control and decision rights. We demonstrate that when employees have more individual experience they are likely to use principles, and as institutional distance increases they likely use templates. Hence, while a global company is likely to create the “social community” around knowledge integration, effectively transferring such knowledge may also depend upon the cognitive characteristics of the individuals within these social structures, rather than just the structure itself (Ambos and Ambos, 2008). Overall, a project team’s ability to be cost efficient and responsive to customers is not only a result of organizational design (e.g., knowledge systems) and social structure (e.g., personal networks; Kogut and Zander, 1993) but also an outcome of how the employees’ and firm’s characteristics enable them to use the codified knowledge in the first place.

### **Implications**

Our findings have several important implications for firms. First, firms should rigorously evaluate investments they make in knowledge management systems. Investing in codifying only one type of knowledge may limit the firm’s potential to generate different project outcomes. The production and use of templates, for example, may improve project efficiency but not customer responsiveness; likewise, the production and use of principles may improve local responsiveness but not project efficiency. Firms, then, must consider the costs and benefits

of preparing templates, which provide detailed, step-by-step process manuals for project work, as well as codifying principles that provide the key takeaways from past projects.

Second, a firm's stock of human capital and organizational distance may indirectly affect performance at the project level by influencing the extent to which actors use codified knowledge in the firm. Efforts to improve the stocks of human capital such as employee training that is relevant to the local market, employee rotation programs, corporate trainings, or communities of practice (Stahl, Björkman, and Morris, 2012) may have limited success. Isolated investments in human capital may compromise the vitality of knowledge transfer structures. Rather than making these isolated investments, then, firms should undertake a combined strategy that prioritizes development of both individual factors and activities that are attuned to distance within the firm. Indeed, these investments in technology may allow organizations to augment their knowledge transfer efforts that fail across distance with technology-based solutions that operate context free (Ambos and Ambos, 2008). Such an understanding of institutional distance may help drive individuals to use knowledge templates.

### **Limitations and future research**

Our results suggest several avenues for future research. We are one of the first to study the use of knowledge principles and templates simultaneously, and so this topic remains a fertile ground for further study. Future research might explore the additional and interactive effects of other types of organizational knowledge. For example, research on how learning capabilities affect the use of other types of codified and non-codified knowledge might be productive in exploring knowledge transfer utilization and success. Future research may also benefit by exploring tradeoffs or synergies inherent in the use of principles and templates. Building on the existing knowledge that principles provide flexibility while templates increase efficiency, future research may include key questions such as: Do project managers benefit from the sequential use of principles and templates? If so, in which order and to what extent do leaders utilize these important sources of knowledge? Can project managers draw on a particular combination of knowledge transfer modes to create project ambidexterity and build their transnational capabilities?

The nonrandom nature of project assignments presents an additional challenge and opportunity for research in this area. In our study, leaders are likely selected with an eye toward which type(s) of human capital they possess and how that human capital is projected to affect project success. Managers are also likely selected with regard to their expertise and knowledge utilization strategies. Future research could explore issues directly related to project manager selection and issues of individual agency (Pierce, 2012).

Additional factors such as organizational systems and social relationships may also guide employees' decisions as to which knowledge sources to access. While our study focused on individual and organizational factors specifically, the social capital literature reveals a number of network characteristics that may influence learning preferences (Burt, 1995; Hansen, 1999; Reagans and McEvily, 2003). Future research could consider the implications of broad network characteristics as well as specific tie characteristics in order to determine the extent to which these characteristics affect the utilization of codified knowledge within firms.

Finally, all knowledge recipient units in our study operated largely independent from the knowledge source unit and from headquarters. Project managers were free to choose which, if any, knowledge to use. Future research could vary the degree of autonomy in the relationship between knowledge recipient and source unit. For instance, to what extent does a determining factor such as human capital availability influence a manager's decision to transfer knowledge from one project to another within the context of an alternative structural relationship (for example, an arm's-length market relationship or a top-down centralized hierarchy)? The hierarchical nature of interactions within the boundaries of a firm could have important implications for the nature and context of the attendant communications (Gartenberg & Pierce, 2017). Future research could help better ascertain how such structural factors might influence different forms of knowledge transfer.

## **CONCLUSION**

In this paper, we have sought to explore key factors influencing how project managers utilize concentrated, codified knowledge within a large global firm. We found that knowledge principle use is positively linked to customer responsiveness and knowledge template use is positively linked to cost efficiency. We also found that



project managers experience is positively correlated with the use of codified knowledge principles within the firm and that institutional distance is positively correlated with the use of knowledge templates. Ultimately, project-based organizations must understand that the use of different forms of codified knowledge is likely to lead to different outcomes. Moreover, selecting project managers who are likely to use the right forms of codified knowledge in the first place requires assessing both individual and organizational factors.

## REFERENCES

- Ambos T, Ambos B. 2008. The impact of distance on knowledge transfer effectiveness in multinational corporations. *Journal of International Management* **15**(1): 1-14.
- Audretsch B. 1998. Agglomeration and the location of innovative activity. *Oxford review of economic policy*, **14**(2), 18-29.
- Baden-Fuller C, Winter S. 2007. Replicating knowledge practices: principles or templates? Working Paper, Cass Business School, City University, London, UK.
- Barley SR, Bechky BA, Milliken FJ. 2017. The changing nature of work: Careers, identities, and work lives in the 21st century *The Academy of Management Discoveries* **3**(2): 111-115.
- Bartlett C, Ghoshal S. 1989. *Managing Across Borders: The Transnational Solution*. Harvard Business School Press: Boston, MA.
- Beugelsdijk S, Cornet M. 2002. 'A Far Friend is Worth More than a Good Neighbour': Proximity and Innovation in a Small Country. *Journal of management and governance*, **6**(2), 169-188.
- Bingham C, Davis J. 2011. Learning sequences: their existence, evolution and effect. *Academy of Management Journal* **55**(3): 611–641.
- Burt R. 1995. *Structural Holes: The Social Structure of Competition*. Harvard University Press: Boston, MA.
- Cantwell J. 2009. Location and the multinational enterprise. *Journal of international business studies*, **40**(1), 35-41.
- Eden L, Miller SR. 2004. Distance matters: Liability of foreignness, institutional distance and ownership strategy. In " *Theories of the Multinational Enterprise: Diversity, Complexity and Relevance*." : 187-221.
- Eisenhardt KM, Furr NR, Bingham CB. 2010. Microfoundations of performance: balancing efficiency and flexibility in dynamic environments. *Organization Science* **21**(6): 1263–1272.
- Faraj S, Sproull L. 2000. Coordinating expertise in software development teams. *Management science*, **46**(12), 1554-1568.
- Gardner HK, Gino F, Staats BR. 2012. Dynamically integrating knowledge in teams: Transforming resources into performance. *Academy of Management Journal*, **55**(4), 998-1022.
- Gartenberg C, Pierce L. 2017. Subprime governance: Agency costs in vertically integrated banks and the 2008 mortgage crisis. *Strategic Management Journal*, **38**(2), 300-321.
- Glick WH, Huber GP, Miller CC, Doty DH, Sutcliffe KM. 1990. Studying changes in organizational design and effectiveness: retrospective event histories and periodic assessments. *Organization Science* **1**(3): 293–312.
- Govindarajan, V. and Warren, A., 2016. How Amazon Adapted Its Business Model to India. *Harvard Business Review*. <https://hbr.org/2016/07/how-amazon-adapted-its-business-model-to-india>.
- Haas MR. 2006. Acquiring and applying knowledge in transnational teams: the roles of cosmopolitans and locals. *Organization Science* **17**(3): 367–384.
- Haas MR, Hansen MT. 2005. When using knowledge can hurt performance: the value of organizational capabilities in a management consulting company. *Strategic Management Journal* **26**(1): 1–24.
- Hansen MT. 1999. The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly* **44**(1): 82–111.
- Hansen MT, Haas MR. 2001. Competing for attention in knowledge markets: electronic document dissemination in a management consulting company. *Administrative Science Quarterly* **46**(1): 1–28.
- Huckman RS, Staats BR, Upton DM. 2009. Team familiarity, role experience, and performance: Evidence from Indian software services. *Management science*, **55**(1), 85-100.
- Huckman RS, Staats BR. 2011. Fluid tasks and fluid teams: The impact of diversity in experience and team familiarity on team performance. *Manufacturing & Service Operations Management*, **13**(3), 310-328.
- Jensen R, Szulanski G. 2007. Template use and the effectiveness of knowledge transfer. *Management Science*

- 53(11): 1716–1730.
- Jiang, K., Lepak, D.P., Hu, J. and Baer, J.C., 2012. How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of management Journal*, **55**(6), pp.1264-1294.
- Jonsson A, Foss NJ. 2011. International expansion through flexible replication: learning from the international experience of IKEA. *Journal of International Business Studies* **42**: 1079–1102.
- Kogut B, Singh H. 1988. The effect of national culture on the choice of entry mode. *Journal of International Business Studies* **19**(3): 411–432.
- Kogut B, Zander U. 1993. Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies* **24**(4): 625–645.
- Kostova T. 1999. Transnational transfer of strategic organizational practices: a contextual perspective. *The Academy of Management Review* **24**(2): 308–324.
- Kostova T, Zaheer S. 1999. Organizational legitimacy under conditions of complexity: the case of the multinational enterprise. *The Academy of Management Review* **24**(1): 64–81.
- Kostova T, Roth K. 2003. The use of the multinational corporation as a research context. *Journal of Management* **29**(6): 883–902.
- Lawler EJ, Yoon J. 1996. Commitment in exchange relations: test of a theory of relational cohesion. *American Sociological Review*: 89–108.
- Levitt B, March JG. 1988. Organizational learning. *Annual Review of Sociology* **14**: 319–340.
- Lyles MA, Salk JE. 1996. Knowledge acquisition from foreign parents in international joint ventures: an empirical examination in the Hungarian context. *Journal of International Business Studies*: 877–903.
- Mackey TB, Barney JB, Dotson JP. 2016. Corporate diversification and the value of individual firms: a Bayesian approach. *Strategic Management Journal*. forthcoming.
- Makhija MV, Ganesh U. 1997. The relationship between control and partner learning in learning-related joint ventures. *Organization science*, **8**(5), 508-527.
- Miner AS, Mezias SJ. 1996. Ugly duckling no more: pasts and futures of organizational learning research. *Organization Science* **7**: 88–99.
- Morris S, Oldroyd JB. 2009. To boost knowledge transfer, tell me a story. *Harvard Business Review*, **87**(5), 23.
- Morris SS, Snell SA. 2011. Intellectual capital configurations and organizational capability: an empirical examination of human resource subunits in the multinational enterprise. *Journal of International Business Studies* **42**: 805–827.
- Morris SS, Snell SA, Bjorkman I. 2016. An architectural framework for global talent management. *Journal of International Business Studies* **47**(6): 723-747.
- Nandialath AM, Dotson JP, Durand R. 2014. A structural approach to handling endogeneity in strategic management: the case of RBV. *European Management Review* **11**(1): 47–62.
- Oldroyd JB, Gulati R. 2010. A learning perspective on intraorganizational knowledge spill-ins. *Strategic Entrepreneurship Journal* **4**: 356–372.
- Orr JE. 1996. *Talking About Machines: An Ethnography of a Modern Job*. Cornell University Press: Ithaca.
- Pierce L. 2012. Organizational structure and the limits of knowledge sharing: Incentive conflict and agency in car leasing. *Management Science*, **58**(6), 1106-1121.
- Puranam P, Srikanth K. 2007. What they know vs. what they do: how acquirers leverage technology acquisitions. *Strategic Management Journal* **28**(8): 805–825.
- Reagans R, McEvily B. 2003. Network structure and knowledge transfer: the effects of cohesion and range. *Administrative Science Quarterly* **48**(2): 240–267.
- Rivkin J. 2001. Reproducing knowledge: replication without imitation at moderate complexity. *Organization Science* **12**: 274–293.
- Rosenkopf L, Almeida P. 2003. Overcoming local search through alliances and mobility. *Management Science*

- 49(6): 751–766.
- Schulz M. 2003. Pathways of relevance: Exploring inflows of knowledge into subunits of multinational corporations. *Organization Science*, **14**(4), 440-459.
- Staats BR, Brunner DJ, Upton DM. 2011. Lean principles, learning, and knowledge work: Evidence from a software services provider. *Journal of operations management*. **29**(5): 376-390.
- Staats, BR. 2012. Unpacking team familiarity: The effects of geographic location and hierarchical role. *Production and Operations Management* **21**(3): 619-635.
- Stahl GK, Björkman I, Morris S (eds). 2012. *Handbook of Research in International Human Resource Management*. Edward Elgar Publishing: London.
- Szulanski G. 1996. Exploring internal stickiness: impediments to the transfer of best practice within the firm. *Strategic Management Journal* **17**(SI): 27–43.
- Szulanski G, Cappetta R, Jensen R. 2004. When and how trustworthiness matters: knowledge transfer and the moderating effect of causal ambiguity. *Organization Science* **15**(5): 600–613.
- Szulanski G, Jensen R. 2006. Presumptive adaptation and the effectiveness of knowledge transfer. *Strategic Management Journal* **27**(10): 937–957.
- Teece DJ, Pisano G, Shuen A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal* **18**(7): 509–533.
- Von Nordenflycht A. 2010. What is a professional service firm? Toward a theory and taxonomy of knowledge-intensive firms. *Academy of Management Review* **35**(1): 155–174.
- Zack MH. 1999. Managing codified knowledge. *MIT Sloan Management Review* **40**(4): 45.
- Zander U, Kogut B. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization science*, **6**(1), 76-92.
- Zhang Y, Li H. 2010. Innovation search of new ventures in a technology cluster: the role of ties with service intermediaries. *Strategic Management Journal* **31**(1): 88–109.
- Zollo M, Winter SG. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science* **13**(3): 339–351.

Table 1. Descriptive statistics and correlations

Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10
1 knowledge use	2.657	0.990	1.000	4.000										
2 Support staff	3.787	3.058	1.000	22.000	0.055									
3 Pilot	0.043	0.204	0.000	1.000	0.034	0.482								
4 Region ECA	0.209	0.408	0.000	1.000	-0.096	0.007	-0.111							
5 Region LAC	0.195	0.397	0.000	1.000	-0.055	-0.125	0.092	-0.281						
6 Region MENA	0.083	0.276	0.000	1.000	-0.075	-0.053	0.005	-0.170	-0.170					
7 Region A	0.108	0.311	0.000	1.000	0.114	-0.085	-0.074	-0.186	-0.186	-0.112				
8 Region SSA	0.130	0.337	0.000	1.000	0.100	-0.056	-0.026	-0.217	-0.217	-0.131	-0.144			
9 Investment climate	0.159	0.366	0.000	1.000	0.007	0.040	0.023	0.213	-0.065	0.058	-0.153	0.018		
10 Public-private	0.079	0.271	0.000	1.000	0.094	-0.042	-0.055	-0.054	-0.012	-0.023	-0.091	0.042	-0.114	
11 Sustainable business	0.531	0.500	0.000	1.000	-0.044	0.072	0.067	-0.165	0.019	0.062	-0.055	0.015	-0.474	-0.282
12 Flyout	1.390	0.489	1.000	2.000	-0.082	-0.120	0.007	-0.125	0.148	0.017	-0.083	0.023	-0.038	-0.170
13 Training	1.693	0.462	1.000	2.000	-0.001	-0.114	0.044	0.030	0.120	-0.016	0.020	0.054	-0.196	0.092
14 Social media	1.625	0.485	1.000	2.000	-0.052	0.022	0.076	-0.010	-0.031	0.008	0.049	-0.080	-0.017	-0.013
15 Phone	1.275	0.448	1.000	2.000	-0.102	-0.032	-0.044	0.059	-0.075	0.048	-0.020	-0.028	0.045	0.022
16 Local tenure	36.245	3.018	32.000	52.000	-0.020	0.069	0.160	0.089	0.144	-0.001	-0.145	-0.105	0.016	0.125
17 Language proficiency	4.087	1.294	1.000	5.000	-0.110	-0.062	0.020	0.115	0.084	0.091	-0.374	-0.005	0.104	0.024
18 Language count	2.556	0.925	1.000	6.000	0.048	0.002	0.056	-0.257	0.236	0.012	0.067	0.001	-0.078	0.031
19 Country experience	2.859	1.704	1.000	10.000	0.107	0.070	0.061	-0.083	0.043	0.051	0.095	-0.047	0.088	-0.037
20 Previous tenure	15.560	6.054	6.000	36.000	0.106	0.052	-0.074	0.038	-0.151	0.100	0.043	-0.055	-0.047	0.120
21 Related industry	1.282	0.451	1.000	2.000	-0.109	-0.169	-0.049	0.132	0.088	-0.056	0.000	0.014	0.256	-0.136
22 Geographic distance	8.763	0.354	7.250	9.182	0.044	0.101	-0.054	0.453	-0.370	-0.654	-0.045	0.304	0.049	-0.022
23 Institutional distance	2.512	1.255	1.000	5.000	0.153	0.079	0.023	-0.123	0.049	-0.072	0.077	0.026	-0.069	0.134
24 Organizational distance	3.084	1.368	1.000	5.000	0.037	-0.011	0.017	-0.018	0.090	-0.076	-0.071	0.048	-0.032	0.120

  

	11	12	13	14	15	16	17	18	19	20	21	22	23
12 Flyout	0.137												
13 Training	0.052	0.150											
14 Social media	-0.034	0.111	0.357										

15	Phone	-0.089	0.212	0.298	0.311									
16	Local tenure	0.066	0.000	0.197	0.063	0.058								
17	Language proficiency	0.059	0.131	-0.053	-0.145	0.067	0.375							
18	Language count	-0.003	-0.026	0.030	0.044	-0.102	-0.009	-0.035						
19	Country experience	-0.096	-0.095	0.058	0.140	-0.087	-0.200	-0.521	0.227					
20	Previous tenure	-0.034	-0.055	0.097	0.113	-0.033	-0.105	-0.270	-0.072	0.212				
21	Related industry	0.047	0.093	0.111	0.102	0.209	0.227	0.188	-0.107	-0.190	-0.307			
22	Geographic distance	-0.021	-0.114	-0.031	-0.046	-0.008	-0.126	-0.035	-0.237	-0.079	-0.001	0.042		
23	Institutional distance	-0.027	-0.224	-0.152	-0.153	-0.228	-0.107	-0.067	0.086	0.038	0.046	-0.058	0.012	
24	Organizational distance	-0.005	-0.149	-0.086	-0.019	-0.151	0.094	0.020	0.116	-0.026	-0.086	0.078	-0.057	0.432

Table 2. Performance and Knowledge Principle and Template Use

Variable	Model I - Customer Responsiveness						Model II - Cost Efficiency					
	Excellent			Unsatisfactory			Excellent			Unsatisfactory		
	Mean	2.50%	97.50%	Mean	2.50%	97.50%	Mean	2.50%	97.50%	Mean	2.50%	97.50%
(Intercept)	0.25	-0.57	1.17	0.07	-1.00	0.62	-2.10	-3.03	-0.36	-1.11	-2.41	-0.11
Support staff	-0.50	-1.22	0.15	-0.29	-0.72	0.06	-0.35	-0.64	-0.03	-0.50	-0.92	-0.11
Pilot	1.36	-0.99	4.79	-0.68	-2.19	0.37	0.90	-0.28	2.82	0.42	-0.53	1.26
Size	0.24	-0.56	0.86	0.54	0.02	1.09	-0.05	-0.65	0.65	-0.41	-0.86	0.16
Frontier	-1.49	-2.30	-0.08	-1.32	-2.10	-0.31	-0.04	-0.12	0.04	-3.48	-4.20	-2.61
Region ECA	1.06	0.32	1.66	1.13	0.29	2.08	-2.50	-4.45	-0.93	0.70	-0.04	1.91
Region LAC	-0.41	-1.09	0.64	0.97	0.27	1.52	-1.11	-1.94	-0.02	-0.89	-1.56	0.05
Region MENA	-1.80	-2.42	-1.20	-2.97	-5.11	-0.52	1.97	-0.05	3.30	-1.36	-2.17	-0.51
Region A	-0.28	-0.80	0.31	-0.84	-1.85	-0.03	-3.92	-5.75	-2.51	-1.20	-1.83	0.22
Region SSA	-2.59	-3.24	-2.10	-0.27	-1.05	0.96	-2.93	-3.39	-2.22	-0.38	-1.94	0.46
Investment climate	-1.39	-3.22	0.49	-0.67	-1.49	0.90	-3.66	-4.28	-2.83	2.42	1.97	2.94
Public-private	0.88	-0.05	2.03	-0.57	-1.18	0.02	-0.78	-1.49	-0.08	-0.96	-1.58	-0.29
Sustainable Business	-0.84	-1.37	-0.30	-0.88	-3.12	0.57	1.19	0.41	2.00	0.32	-0.38	0.91
Flyout	-1.32	-1.92	-0.39	0.37	-0.64	1.30	0.90	0.08	2.06	0.51	-0.49	1.47
Training	-0.94	-1.80	-0.16	0.78	-0.04	1.33	-1.73	-2.24	-1.26	0.49	-0.44	1.19
Social media	-1.22	-1.92	-0.24	-0.37	-2.13	0.58	-1.26	-2.46	-0.38	0.69	-0.20	1.88
Phone	0.32	-0.53	1.54	0.41	-0.69	1.17	-0.38	-1.99	1.25	-1.36	-2.96	0.28
Local tenure	0.33	-0.02	0.52	0.00	-0.27	0.29	0.32	0.04	0.55	-0.06	-0.32	0.25
Language proficiency	-0.45	-1.06	0.30	0.32	-0.57	0.89	-1.82	-2.62	-0.70	0.30	-0.12	0.93
Language count	-0.24	-0.89	0.52	-1.23	-2.09	-0.42	0.20	-0.68	1.09	-0.63	-1.28	0.34
Country experience	0.76	0.19	1.46	0.95	0.09	1.79	0.13	-0.60	0.67	0.07	-0.50	0.49
Previous tenure	-0.01	-0.17	0.18	-0.12	-0.46	0.09	0.35	0.09	0.60	0.10	-0.03	0.27
Related industry	0.47	-0.34	1.26	-1.68	-2.78	-0.36	1.73	0.05	3.25	-1.42	-2.15	-0.52
Geographic distance	-1.98	-2.34	-1.33	-0.62	-1.82	0.72	-0.61	-1.04	0.10	0.57	-0.29	1.31
Institutional distance	0.39	0.01	0.76	-0.23	-0.93	0.57	-2.31	-2.87	-1.79	-1.68	-2.38	-0.87
Organizational distance	-0.44	-0.99	0.35	-0.84	-1.65	-0.19	1.55	0.76	2.55	0.30	-0.29	1.16
<b>Principles</b>	<b>7.27</b>	1.00	21.91	2.32	-4.03	9.28	<b>-5.49</b>	-10.69	-1.72	<b>5.74</b>	1.40	11.88
<b>Templates</b>	0.76	-6.55	10.01	0.71	-10.81	13.69	<b>2.26</b>	1.65	6.11	0.95	-1.84	3.67

Mean values that do not span zero in the 2.50% - 97.5% confidence interval are significant at the p=.05 level. Coefficients are bolded for emphasis.

Table 3. The Impact of Individual and Organizational Factors on Knowledge Principle and Template Use

Variables	Model I			Model II		
	Principle	Template	Both	Principle	Template	Both
<b>Constant</b>	-1.140	4.065	-0.257	53.750	17.063	45.476
	[0.442]	[0.014]	[0.860]	[0.005]	[0.255]	[0.015]
	(1.482)	(1.656)	(1.452)	(19.099)	(14.989)	(18.681)
<b>Individual factors</b>						
Local tenure				0.145	-0.394	0.168
				[0.345]	[0.812]	[0.265]
				(0.154)	(0.165)	(0.150)
Language proficiency				-0.364	-0.107	-0.260
				[0.347]	[0.787]	[0.508]
				(0.388)	(0.398)	(0.392)
Language count				0.539	0.398	0.399
				[0.157]	[0.528]	[0.282]
				(0.381)	(0.474)	(0.371)
Country experience				0.935	0.403	0.933
				[0.009]	[0.283]	[0.008]
				(0.360)	(0.375)	(0.351)
Previous tenure				0.236	0.233	0.244
				[0.025]	[0.034]	[0.018]
				(0.105)	(0.109)	(0.103)
Related industry				1.570	-0.070	0.606
				[0.024]	[0.927]	[0.376]
				(0.697)	(0.773)	(0.684)
<b>Organizational factors</b>						
Geographic distance				-7.488	-2.149	-6.553
				[0.001]	[0.161]	[0.001]
				(2.208)	(1.532)	(2.057)
Institutional distance				0.247	0.705	0.319
				[0.379]	[0.017]	[0.251]



				(0.281)	(0.296)	(0.278)
Organizational distance				-0.371	-0.302	-0.207
				[0.098]	[0.258]	[0.408]
				(0.224)	(0.267)	(0.251)
<b>Project control variables</b>	Included	Included	Included	Included	Included	Included
<b>Geographic control variables</b>	Included	Included	Included	Included	Included	Included
<b>Project type control variables</b>	Included	Included	Included	Included	Included	Included
<b>Knowledge type control variables</b>	Included	Included	Included	Included	Included	Included
Chi-square		1098.68			1305.85	
n		266			237	
Pseudo R2		0.167			0.285	

<sup>a</sup> The dependent variable of the multinomial logit model is use of knowledge (=1 for use of neither principles nor templates, =2 for use of principle, =3 for use of a template, =4 for use of both principle and template). Use of neither is the benchmark outcome category.

Notes: p values are reported in brackets. Errors clustered at the project manager level are reported in parentheses.