



**CIFE** CENTER FOR INTEGRATED FACILITY ENGINEERING

Mobilizing Institutional Knowledge  
for International Projects:  
A Summary Report

By

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**ACQUIRING AND SHARING INSTITUTIONAL KNOWLEDGE FOR  
INTERNATIONAL PROJECTS IN MULTINATIONAL DEVELOPMENT,  
CONTRACTOR AND ENGINEERING FIRMS**

**2007-2008 CIFE SEED Project**

**Amy Javernick-Will and Prof. Raymond Levitt  
March 26, 2009**

**A NOTE ON THIS REPORT**

This report summarizes a three-year research effort aimed at understanding how multinational companies in the Architecture-Engineering-Construction (AEC) industry acquire and transfer knowledge. The research was made possible through funding from a 2007-2008 CIFE Seed Grant, CRGP Grant, Clarkson Oglesby Fellowship, and Stanford Graduate Fellowship. The research resulted in the first author's dissertation. This report contains modifications of sections from this dissertation, "[Mobilizing Institutional Knowledge for International Projects: The Relative Importance, Acquisition and Transfer of Institutional Knowledge for International Firms](#)" (Javernick-Will, 2009). This dissertation follows the "three journal paper" format. Each of the middle chapters (Chapters 2, 3, and 4) are stand-alone papers (referred to in this report as Paper 1, 2 and 3). Paper 1, "[Who Needs to Know What?: Institutional Knowledge and Global Projects](#)", and Paper 3, "[Mobilizing Institutional Knowledge for International Projects](#)" have been submitted to the Journal of Construction Engineering and Management. Paper 2, "[Organizational Learning During Internationalization: Acquiring Local Institutional Knowledge](#)" will be submitted to a journal soon. Please click on the embedded links to access each of these papers.

**ABSTRACT**

Knowledge regarding a local area's "institutions"—regulations, norms, and cultural-cognitive beliefs and meanings—is recognized as being critically important for firms entering foreign countries. Acquiring and maintaining this knowledge can reduce the liabilities, costs and risks faced by firms when internationalizing—especially developers, engineers and contractors engaged in global projects. However, the relative importance of different types of institutional knowledge, identification and analysis of external methods and sources for acquiring this knowledge, and recognition and analysis of processes that different types of firms use to integrate and share this kind of knowledge remain poorly understood. This research employed qualitative, case-based research methodology with 113 informants from fifteen international real estate development, construction and engineering firms in the Architecture-Engineering-Construction (AEC) industry to help address these issues. The research results are presented in three distinct papers that have been submitted for publication. The first paper identifies the types of local institutional knowledge that are important for firms engaged in international projects, categorizes these according to Scott's three pillars of institutions—regulative, normative, and cultural-cognitive—and analyzes differences according to firm types. The second paper explores and elaborates the sources firms use to acquire this knowledge when they enter a foreign market; it accounts for differences according to firm and knowledge type; and it develops propositions about why organizational learning approaches differ across types of firms. The

third paper identifies knowledge sharing methods and processes used within firms to integrate and transfer institutional knowledge across the firm over time; and it discusses the benefits and limitations associated with the identified transfer processes. Overall, the research expands upon existing theory, contributing to a more complete understanding of organizational learning and knowledge transfer for the institutional knowledge required on international projects. It also addresses a practical need for international AEC firms who want to understand where they should focus their efforts for acquiring, integrating and transferring the knowledge that is most important to their specific organizations and strategies. The long-range goal of this research, when combined with follow-on work, is to allow firms to capture and reuse global institutional knowledge more effectively, so they can develop economically, environmentally and socially sustainable practices for diverse local environments.

## **OBSERVED PROBLEM**

International engineering, construction and development firms work on projects in diverse countries, encountering many differences in each market that they enter. Many of these differences result from the entrant firm working with other foreign firms, and with local firms and governments that operate under a different set of institutions—regulative, normative and cultural-cognitive (Scott 2001; Scott 2008)—than those to which the entrant firm is accustomed. The institutional differences encountered on global projects can create project cost overruns, increase schedule delays and result in misunderstandings and damaged reputations (Orr 2005; Orr and Scott 2008). This increases liabilities for firms working internationally, and has been labeled the “liability of foreignness” (Hymer 1976; Zaheer 1995).

Acquiring and maintaining institutional knowledge for each country in which global firms operate is therefore critical (Lord and Ranft 2000) as it can help entrant firms reduce knowledge gaps—the difference between the knowledge needed to work in a foreign environment and the knowledge the entrant firm possesses—when working internationally (Petersen et al. 2008). This can help firms entering foreign markets reduce problems with understanding laws and norms (Eriksson et al. 1997), lessen cost overruns and delays (Orr and Scott 2008) and decrease their “liability of foreignness”. Because of these advantages, the internationalization process view stresses the importance of organizational learning during internationalization (Johanson and Vahlne 1977).

Following this view, most studies have focused on learning through direct experience during internationalization. These studies have shown that the perception of international business opportunities becomes more realistic when based on experience (Barkema and Vermeulen 1998; Delios and Beamish 2001) and that there is a positive relationship between experience and survival rates (Li 1995). In addition, many studies link experience to performance outcomes to support the theoretical argument that knowledge has been developed through each firm’s own experience (Barkema and Vermeulen 1998; Hitt et al. 1997). The primary focus on experience in foreign markets has led to research regarding knowledge development over time. Studies have concentrated on managers’ changing perceptions of the importance of institutional knowledge over time (Chetty et al. 2006; Petersen and Pedersen 2002; Petersen et al. 2008) and indicated that the liability of foreignness is likely to diminish with elapsed time in a market (Hymer 1976; Zaheer 1995; Zaheer and Mosakowski 1997).

These and other prior studies have made many contributions to our theoretical understanding of acquiring knowledge during internationalization; however, many areas remain unaddressed. For instance, the focus on learning through experience over time tends to treat

knowledge development as a “black box” (Chetty et al. 2006). These studies discuss knowledge development in broad, illustrative terms and typically infer the process rather than examining and deconstructing the process directly (Lord and Ranft 2000). As a result, the methods and mechanisms of knowledge development by which learning occurs are poorly understood and insufficiently explored in the international context (Henisz and Delios 2002). This has resulted in calls for further research to determine processes to reduce knowledge gaps (Petersen et al. 2008).

In addition, prior studies on international learning tend to generalize the local knowledge needed (Makino and Delios 1996). For instance, Lord and Ranft’s (2000) study surveyed firms regarding general “local market knowledge” about the country, including questions about the political and legal environment, economy, and cultural differences. Studies that have focused specifically on institutional knowledge have also combined various types of knowledge into a general category termed “institutional knowledge”. This has included knowledge of business laws, financial practices and laws, and the business culture (Chetty et al. 2006); knowledge of business laws and rules, financial practice, the local business culture and customers and suppliers in a foreign market (Petersen et al. 2008); and knowledge of language, laws, norms and standards in foreign markets (Eriksson et al. 1997). Prior studies have not broken down and analyzed the finer grained components of institutional knowledge.

Finally, studies on organizational learning and the transfer of institutional knowledge tend to treat firms as homogeneous entities, assuming all firms are alike in their learning (Lord and Ranft 2000) and in their response to institutional environments (Henisz and Delios 2002). Many of these studies do, however, acknowledge that differences exist between firms and their organizational learning processes (Lord and Ranft 2000; Petersen and Pedersen 2002). In addition, Orr (2005) shows that different types of firms have different levels of embeddedness on a project, leading to more or less emergent uncertainty in foreign markets and variable levels of knowledge required. For instance, more deeply embedded firms, such as general contractors, have a greater number of local relationships and thus may require more knowledge related to operations in an area. Given the large differences that exist between firm’s business goals, processes, and level of embeddedness, comparing differences among types of firms in learning processes and knowledge transfer methods appears highly desirable.

It is thus important to disentangle the aggregation of firm and knowledge types to determine what types of knowledge are important for different types of firms. In addition, unraveling the “black box” of learning about institutional knowledge will enlarge the focus from learning through direct experience and through joint ventures to include different learning methods. This is particularly important for project-based firms, such as those in the Architecture-Engineering-Construction (AEC) industry, that do not always have the luxury of repetition and past project experience in foreign markets. Comparing firm type and learning mechanisms will also aid firms who are struggling to decide which kinds of knowledge, sources or learning methods to pursue. Finally, many scholars have recognized the importance of knowledge to an organization. Being able to capture, transfer and reuse the institutional knowledge acquired through past projects will aid the organization in avoiding duplicate efforts and repeated mistakes. However, prior studies have primarily theorized about this transfer (Nissen 2007) without empirically examining the process. A notable exception is the study by Lord and Ranft that analyzed firms with permanent operations abroad. However, even this study focused primarily on the impact of incentives and corporate centralization and did not analyze

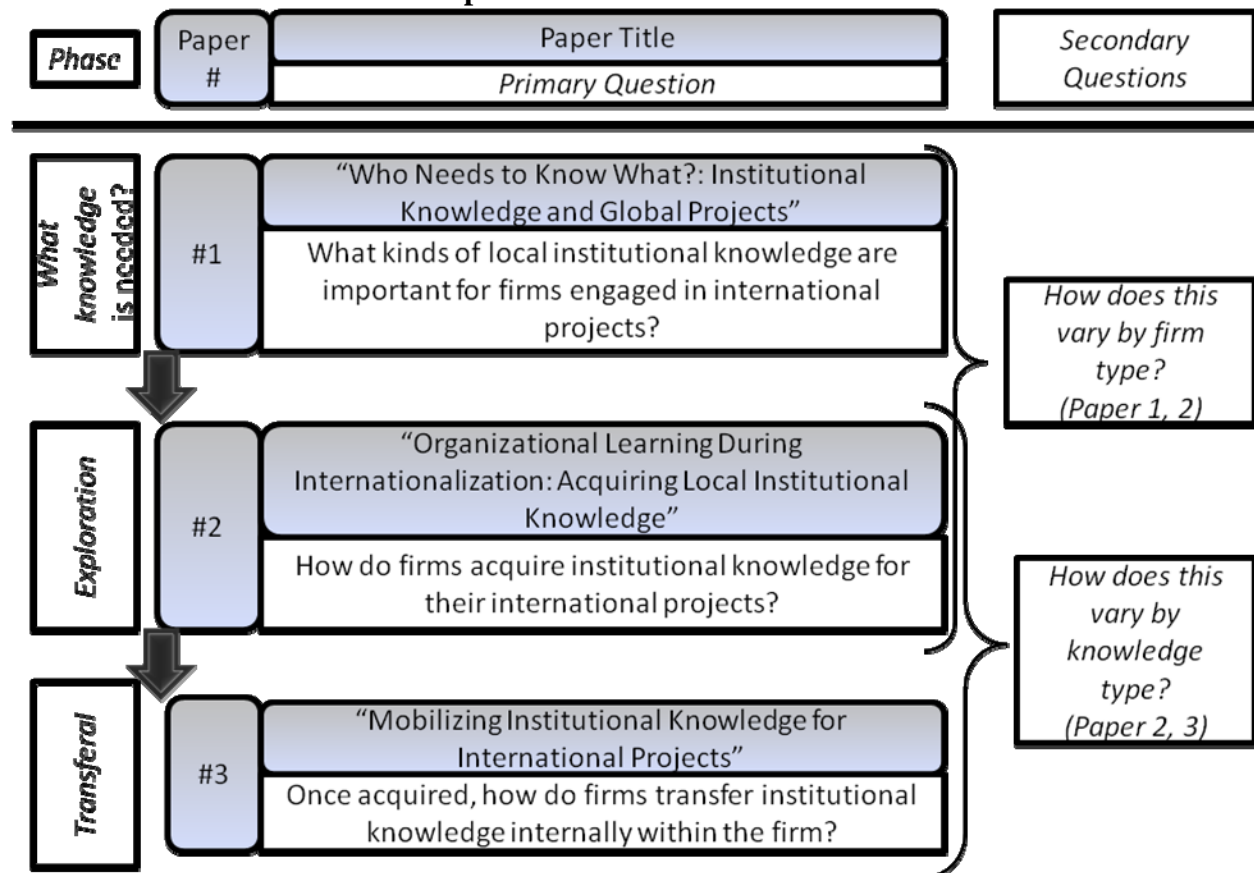
specific methods to transfer knowledge. Our study will explore the various methods employed to transfer knowledge.

This research is an effort to advance theoretical knowledge and aid firms in recognizing, acquiring and transferring the institutional knowledge that is important for their business. The ultimate goal of this work, when added to contributions from past and future studies, is to develop, design and build construction projects in ways that are locally sustainable—economically, environmentally and socially— and thereby increase the success rate of international projects for firms.

## RESEARCH QUESTIONS AND CONCEPTUAL OVERVIEW

To address the practical and theoretical needs identified above, this research is organized around three primary questions that link to and build upon one another. Figure 1 provides a conceptual overview of the content and questions posed in this research.

**Figure 1: Conceptual Overview of Research Questions Presented in each of the Working Papers within the Dissertation**



To compare and disentangle “local market knowledge”, Paper 1 identifies important knowledge for international projects, categorizes the knowledge by applying institutional theory, and compares differences in the relative importance of different types of knowledge according to firm type. To unpack the “black box” of knowledge development during internationalization, Paper 2 identifies the methods and external sources firms use to acquire the institutional knowledge identified in Paper 1. Paper 2 also analyzes differences between these learning methods based on firm and knowledge type. Finally, in an effort to address requests to examine

institutional knowledge transfer, Paper 3 identifies methods used in practice to share institutional knowledge within the firm. This compares methods with institutional knowledge type and examines the benefits and limitations associated with each of the transfer methods.

### **Situating the Research**

This research uses case studies with 113 informants in fifteen companies across three firm types. The unit of analysis is the responses from participants, which are embedded in the firm and firm type or knowledge type. Additional information regarding the research methodology can be found in each of the three papers.

I selected a case study methodology to achieve a combination of breadth and depth. In comparison, an ethnography would have provided additional depth and insights into a particular firm or project, but would have limited the study to one or two firms, decreasing the ability for comparison across multiple firms and firm types. Surveys, on the other hand, would have allowed for increased breadth and comparison but would not have allowed participants to provide open-ended responses, which was necessary due to the relatively early stage of exploration in this area. This research is situated in the middle, allowing for some depth through open-ended responses that can build upon existing theory, and allowing for some breadth to provide a basis of comparison across multiple firms and firm types. Future work can increase the breadth of the study by surveying a greater array of participants and firms using the results collected.

### **SCOPE**

This research began with a broad focus on knowledge integration and transfer in project-based firms. However, due to our interest in international firms and projects, we rapidly narrowed the focus to study and understand how global developers, engineers and contractors acquire and transfer *institutional* knowledge about foreign host countries in which they work. We collected data on acquisition and transfer of other types of knowledge (such as technical knowledge and company processes and procedures); however, the results presented in this report and the dissertation and papers focus specifically on the acquisition and transfer of institutional knowledge. Data on acquisition and transfer methods for technical or business knowledge collected during this study, and the observed differences between firms in this regard, will be the focus of future analysis by the first author.

This research interviewed informants from international developers, construction and engineering firms, limiting the generalizability of its findings to these types of firms. Future research can test and validate or refine the findings of this research for other kinds of firms.

### **LINKS TO DISSERTATION AND PAPERS**

Dissertation:

- Javernick-Will, A.. “Mobilizing Institutional Knowledge for International Projects: The Relative Importance, Acquisition and Transfer of Institutional Knowledge for International Firms” Doctoral dissertation, D#016, Stanford University, 2005.

Paper #1:

- Javernick-Will, A. N., and Scott, W. R. (2009). "Who Needs to Know What? Institutional Knowledge and International Projects." *Submitted to: Journal of Construction Engineering and Management (under review)*.
  - Note: An early version of this paper will be published in the 2009 CRC conference proceedings:

- Javernick-Will, Amy, and Raymond E. Levitt. "Acquiring Local Knowledge for International Projects." Proceedings of the ASCE Construction Research Congress, Seattle, WA, April 5-7, 2009 (Accepted).

Paper #2:

- "Organizational Learning During Internationalization: Acquiring Local Institutional Knowledge"

Paper #3:

- Javernick-Will, A. N., and Levitt, R. E. (2009). "Mobilizing Institutional Knowledge for International Projects." *Submitted to: Journal of Construction Engineering and Management (under review)*.
  - Note: An early version of this paper won the best paper award at ASCE's 2009 LEAD Conference in Tahoe:
    - Javernick-Will, Amy, Raymond E. Levitt, and W. Richard Scott. "Mobilizing Knowledge for International Projects." Proceedings of the 2008 ASCE LEED Conference, and Winner of the Best Paper Award, Lake Tahoe, California, October 16-19, 2008.

## CONTRIBUTIONS

Each of the three papers listed above and contained in the body of the dissertation contribute to a more complete understanding of how engineering, construction and development firms acquire and transfer institutional knowledge for their international projects. The first paper employs an analytical schema identifying the different facets of institutional knowledge that are important for different firms to acquire on their international projects. The second and third papers build upon these results to analyze external and intra-firm methods to acquire and transfer institutional knowledge. Figure 2 presents a revised conceptual overview based upon Figure 1 that adds the general contributions and results.

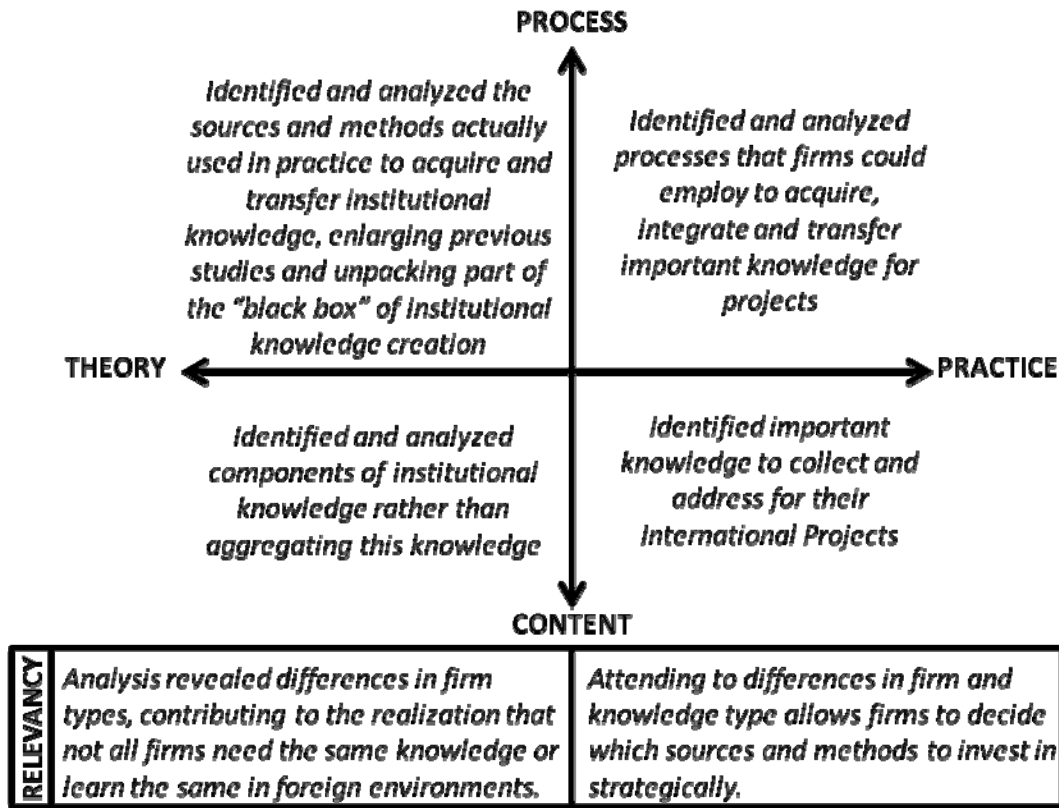


**Figure 2: Overview and Contributions from Dissertation**

Paper #	Paper Title	General Contributions and Results
	Primary Question	
	Secondary Questions	
#1	“Who Needs to Know What?: Institutional Knowledge and Global Projects”	<ul style="list-style-type: none"> <li>• <i>Identified</i> Important Knowledge for International Projects</li> <li>• <i>Applied</i> Institutional Theory and <i>categorized</i> this knowledge</li> <li>• <i>Analyzed</i> differences between firm types</li> </ul>
	What kinds of local institutional knowledge are important for firms engaged in international projects? →	
	<i>How does this vary by firm type?</i>	
#2	“Organizational Learning During Internationalization: Acquiring Local Institutional Knowledge”	<ul style="list-style-type: none"> <li>• <i>Identified</i> external sources and learning methods use to acquire institutional knowledge</li> <li>• <i>Analyzed</i> differences between firm and knowledge types</li> </ul>
	How do firms acquire institutional knowledge for their international projects? →	
	<i>How does this vary by firm &amp; knowledge type?</i>	
#3	“Mobilizing Institutional Knowledge for International Projects”	<ul style="list-style-type: none"> <li>• <i>Identified</i> methods used to transfer institutional knowledge internally</li> <li>• <i>Analyzed</i> differences between knowledge types</li> <li>• <i>Discussed</i> benefits and limitations of the methods</li> </ul>
	Once acquired, how do firms transfer institutional knowledge internally within the firm? →	
	<i>How does this vary by knowledge type?</i>	

Observed practical problems with knowledge capture and reuse in global AEC projects motivated the research questions and provide the area of application for the results presented in this dissertation. The research results make theoretical contributions by providing a more comprehensive understanding of institutional knowledge and its acquisition and transfer in global project-based firms. The contributions add new knowledge in three primary areas: content, process and relevancy. We present a visual overview of these contributions in Figure 3 before discussing the contributions to theory and practice in more detail.

Figure 3: Overview of contributions to Theory and Practice



### CONTRIBUTIONS TO THEORY

This research offers several theoretical contributions to each of our main points of departure—institutional theory, organizational learning, and the knowledge-based-view of the firm—and adds novel insights, due to the overlap between these theories. In addition, it provides contributions to the international engineering and construction project management literature.

The research augments recent studies that have recognized and employed institutional theory as a useful framework for identifying and analyzing differences encountered on international projects (Mahalingam and Levitt 2007; Orr and Scott 2008). It enhances these studies by applying institutional theory as a conceptual framework to categorize knowledge identified as being important for these projects. This lays the foundation for future work related to institutional knowledge and international projects. In addition, although the three pillars of institutions—regulative, normative, and cultural-cognitive—are analytical distinctions that underlie and influence one another, Paper 1 categorizes the institutional knowledge into the three pillars of institutions proposed by Scott (Scott 2001; Scott 2008) by attempting to identify what appears to be the dominant element for each type of knowledge. This paper also develops subcategories of important knowledge within each of these three pillars for the firms studied. Knowledge was coded with the attribute of importance if one of three conditions were met: (1) the participant indicated the knowledge was important directly; (2) the organization collected the knowledge, indicating that it was important to the organization; or (3) the participant described a problem due to the lack of knowledge on the project, indicating that it was retrospectively important. To compare and contrast the importance of knowledge, the attribute of importance was cross-tabulated with the knowledge types and the relative frequencies of responses were

analyzed. Five subcategories of *regulative knowledge* were identified, including: laws and regulations, operating laws, knowledge of the local government, design and construction standards and approval processes. Important subcategories of *normative knowledge* included: work practices, social norms, expectations and local preferences, the organization of local industry, logistics, relationships, resources and productivity, and market knowledge. Cultural beliefs, language, and concepts and meanings composed important *cognitive-cultural knowledge*.

The application of institutional theory contributes to the international project literature by directing new attention to the importance of “normative” and “cultural-cognitive” knowledge. Previous studies focused primarily on risks resulting from lack of regulative knowledge. When normative and cultural-cognitive differences were included, they were typically aggregated to include an analysis of general “social” and “cultural” differences. As my results indicate, knowledge categorized as “normative” was identified as the most important type of knowledge (based on relative frequency) for firms working on international projects (refer to Paper 1). However, the analysis revealed variations in the level of importance of different subcategories of institutional knowledge categories for different firm types. I propose that this is due to the firm’s time-horizon commitments and revenue sources.

Papers 2 and 3 build upon the results presented in Paper 1 to contribute to a greater understanding of organizational learning and knowledge transfer during internationalization. Prior studies regarding learning during internationalization have aggregated the local knowledge needed by a foreign entrant firm and describe knowledge as general “institutional” (Chetty et al. 2006; Eriksson et al. 1997; Petersen et al. 2008) and “local market” knowledge (Lord and Ranft 2000). Breaking this knowledge into the three institutional pillar categories allowed for a deeper analysis of differences between learning and transfer methods. In addition, as addressed in prior sections, previous studies on organizational learning during internationalization have tended to treat firms as homogeneous, neglecting differences between firm types (Henisz and Delios 2002; Lord and Ranft 2000). We noted and intentionally analyzed differences between firms to capture and comment on different learning approaches, and create propositions regarding why these differences exist.

Paper 2 extends Orr’s (Orr 2005; Orr and Scott 2008) internationalization strategies to understand how firms increase their supply of local knowledge. Previous studies tend to focus on learning through direct experience or to focus on entry modes that learn from others through contractual arrangements such as joint ventures or partnerships. Many of these studies concentrate on firms with permanent operations abroad. Due to the project-based nature of firms in the AEC industry, I expanded attention to include other sources that informants mentioned during qualitative data collection. After data collection and analysis, I identified 26 sources (aggregated to 14 larger categories) used to acquire this knowledge. This helped to answer calls indicating the need to unravel the existing “black box” of knowledge development during internationalization (Chetty et al. 2006; Henisz and Delios 2002; Lord and Ranft 2000; Petersen et al. 2008).

Because I segregated institutional knowledge types, I was able to analyze and compare differences in methods according to knowledge type. For instance, the results indicate that local consultants are one of the most important sources for acquiring regulative knowledge due to their ability to stay up-to-date on frequently changing regulative institutions like laws, regulations and permit requirements. However, local consultants’ importance declines as the knowledge becomes more tacit in normative and cultural-cognitive knowledge (with the exception of language). As this occurs, we see an increase in “pioneering” and personal learning as informants went through

the project. The results also directed us to focus on differences between knowledge acquisition methods based on firm type. Differences between firms were based on the half-life of the knowledge that is important to the firm as well as the firm's financial and contractual obligations on the project.

Finally, this research builds upon the knowledge-based-view of the firm by empirically examining the sources and processes individuals within firms use to transfer institutional knowledge to others within the organization. To my knowledge, the transfer of institutional knowledge has been theorized (Nissen 2007) but not examined directly. Recognizing the critical importance of institutional knowledge to the firm, this research provided insights into how organizations are actually able to reuse institutional knowledge acquired previously to benefit their projects. Overall, we identified eleven groups that contained 48 total transfer methods. We categorized these groups into formal and social processes as well as an overlapping category, the use of an interactive, online knowledge-sharing platform. We found that companies used social methods most frequently across all types of knowledge; however, the use of social interaction methods declined as the knowledge became more explicit, making it easier to transfer in a written format. We also identified benefits and limitations for these methods, focusing primarily on the ability to transfer different types of institutional knowledge and the reach of knowledge transfer between methods. We found that interactive online systems were uniquely able to transfer regulative and normative knowledge and identify individuals within the organization who could be contacted directly to provide cultural-cognitive knowledge

## **CONTRIBUTIONS TO PRACTICE**

My prior experience within the AEC industry led me to focus on a topic that was relevant and meaningful to practitioners and that had the opportunity to improve projects within the industry. This research focused on identifying and analyzing the knowledge that was important and needed on international projects as well as the processes through which individuals can initially acquire and later transfer the needed knowledge to others in the organization. This can help firms who wish to implement a global market development strategy reduce their liability of foreignness, and hence the risks and costs that they encounter on international projects to help these firms avoid repeating past mistakes and reinventing the wheel. In addition, organizational learning and knowledge management strategies are often expensive and costly to pursue. Having tools available to identify the appropriate types of knowledge to collect and the processes to use to acquire and transfer this knowledge can be extremely beneficial to a firm.

Paper 1 offers three primary takeaways for international AEC firms. The first is the identification of important knowledge gaps that exist when working on international projects and the knowledge that is needed to reduce these gaps. Although many of the informants had years of experience working on international projects, much of the knowledge they had acquired resided within their heads. Documenting the stories and answers to my questions during data collection converted much of this knowledge, which was previously tacit, into an explicit form during analysis. This allowed us to identify and categorize knowledge that informants deemed important or relevant for their international work. The second takeaway was the application of institutional theory as a framework to categorize this knowledge. This categorization offers firms a framework and set of categories to recognize and attend to knowledge that is important for their particular firm. For example, this categorization tool can be used in risk checklists or to identify and categorize knowledge in knowledge management tools. The third takeaway is the comparison of important knowledge across the three firm types; developers, engineers and

contractors. This helps firms understand what types of knowledge may be particularly relevant for them to collect on their projects instead of the typical general analysis across firms.

Paper 2 enables firms to understand the variety of sources and methods available to help acquire institutional knowledge when entering a foreign market. By analyzing these results across firm type and combining this with results collected from Paper 1, firms can better understand what processes they should strategically implement to collect knowledge that is important for their specific role on the project. The expansion of focus from direct experience is particularly helpful for firms in the project-based AEC industry that do not always have the luxury of time to acquire the knowledge needed within a new region of the world.

Finally, Paper 3 recognizes the importance of previously collected knowledge to the firm. By focusing on the methods informants used to mobilize institutional knowledge from others within the firm, we captured the relative frequency of use of different processes for different types of knowledge. To avoid repeating mistakes and reinventing the wheel, firms can use these results to determine what processes the organization could implement to gain full value from knowledge that is important for their organization. The insights into benefits and limitations associated with each of the transfer methods also helps firms decide which methods to employ based upon their size, geographical spread and the type of knowledge most frequently needed in their business.

## **SUGGESTIONS FOR FUTURE RESEARCH**

The research presented in this report and corresponding dissertation and papers was exploratory in nature and based on a significant, but nonetheless limited, number of qualitative case studies. I addressed validity and reliability within the confines of case study research design; however, future research can address the remaining limitations by collecting additional qualitative and quantitative data to support and expand upon the findings.

Although I interviewed over 113 informants across fifteen firms, the results can be expanded and validated by surveying an even larger array of participants and firms. The qualitative data led to findings and propositions that can be validated with surveys, easing the time, geographical and financial constraints of both researchers and participants. Using QSR NVivo, I was able to calculate the importance of knowledge types in two steps: (1) Coding knowledge as important if: the informant specifically mentioned it was important, the organization collected the knowledge, or a significant problem arose and (2) Calculating the relative frequency of these responses within each category of knowledge. Now that results from the exploratory data collection have been obtained, a survey could ask participants to rank the order of importance for the collected knowledge types instead of relying upon the cross-coding and relative frequencies of responses.

In addition, although I expanded prior studies by focusing on subcategories of institutional knowledge and attending to firm type, future research can account for other variations. First, the results and interviews appear to indicate that project type, scope of work and contractual requirements, and project phase, may alter the kinds of important knowledge to collect as well as affect the optimal organizational learning and knowledge transfer methods. For example, a firm may enter a market to construct a building project, which can lead to additional building projects within the area. In this situation, a contractor may want to embed itself in an area by opening a permanent or semi-permanent office, increasing the importance of different types of institutional knowledge and making the acquisition and integration of this knowledge even more critical. On the other hand, infrastructure projects may be rare within a

particular area. In this case, the contractor may not have as great an incentive to acquire and capture local knowledge for later reuse.

Future research could also use informants and projects as the unit of analysis to learn whether scope and contractual requirements modify the importance of different types of knowledge for the firm. Logically, this should occur. For instance, a EPC (Engineer-Procure-Construct) contract should create a greater need for local institutional knowledge than a contract to construct a project based on pre-produced plans. Finally, identifying the phase of the project in which the knowledge is needed most would help firms determine the appropriate time to emphasize the collection and mobilization of this knowledge for the project.

Second, additional work could focus on deciphering how the importance of institutional knowledge and organizational learning methods vary across context and settings. This research questioned informants regarding foreign markets, but did not separate differences between home country markets or the foreign market the firm was entering. Differences between countries can magnify the impact of knowledge deficits, thus making the knowledge more or less critical. Context can also change the sources and methods available by which firms can learn. For instance, firms entering “developed” countries may find institutional knowledge to be more readily available through public documents or find an array of consultants offering to provide the firm with this knowledge. “Emerging” markets, on the other hand, will have less developed legal and regulatory procedures, and consulting capabilities, and may thus require more groundwork to obtain the needed knowledge. Addressing the current limitation of cross-national heterogeneity would be a large research undertaking, but could yield fruitful results. However, undertaking this research is difficult due to the frequent presence of a multi-cultural workforce within companies.

This research relied on informants’ perceptions and recollection of past projects. This limited the results to knowledge that the informant recognized and recalled. Specifically, the research may not have uncovered the full extent of the importance of and learning methods for cultural-cognitive knowledge. This knowledge is tacit and typically taken-for-granted within an institutional setting. Informants may have not realized differences that existed or been able to comprehend and share how they obtained this knowledge. Future research, particularly by trained cross-cultural social psychologists and anthropologists, may be better able to uncover the differences and learning mechanisms employed to acquire this knowledge. In addition, informants provided some indications of the trust and credibility of various sources—for instance, they preferred to send people in to observe practices directly through the company’s employees’ own eyes rather than relying strictly on what subcontractors told them. Nevertheless, I did not attend to this distinction across interviews. Future work can address which sources companies find to be the most credible in procuring the needed knowledge.

Another limitation was that the research was centered on informants who agreed to participate in the research and that the first author was able to interview. Unfortunately, we were not able to interview all employees within a firm, which limited the analysis of benefits and limitations of knowledge sharing methods within a firm. Future research could increase the validity of knowledge sharing methods by using quantitative methods with a larger number of employees within the firm. This can help determine whether different knowledge sharing methods are more frequently used across age, title, or particular office area locations.

The intra-firm knowledge transfer section did not study the cost to initiate and maintain various methods of acquiring and sharing knowledge. Obviously, determining values— or at least a range of values—for these costs is critical for firms to weigh the costs versus benefits, in

order to decide which knowledge sharing methods they should implement within their organization.

Although there have been many contributions within the knowledge management literature, many promising areas remain that future research can fill. Additional work can be conducted not only on organizational structures, such as incentive alignment for knowledge transfer, but also on project structures. Project-based organizations are unique in that each project is a temporary, mini-organization. The project organizational structure has the ability to impact the overall organization and thus, impact organizational knowledge and sharing. In addition, there can be further exploration and analysis related to relationships and their influencing factors on how knowledge flows and is mobilized.

The methods identified for organizational learning and knowledge transfer were also limited to mechanisms the informant had used in the past. Future research can conduct experimental studies along the lines of design charrettes, using new methods that may not be implemented in current practice.

I coded other types of knowledge, including technical knowledge and company processes and procedures, but did not analyze this knowledge. Future work can compare and contrast differences between institutional knowledge and other knowledge types for integrating and transferring knowledge. In addition, this research attempts to segregate the acquisition of knowledge (discussed in Paper 2) neatly from the transfer of knowledge (discussed in Paper 3). This limits the discussion of the processes firms use to integrate the knowledge between the acquisition and transfer stages. Many of the results presented in Paper 3 indicate an organization's integration processes or lack thereof—for instance, personal discussions do not result specifically from a formal integration process; however, the development of processes and procedures do indicate a formal integration process). Future research can address the processes that firms use to integrate these various knowledge types into their organizational memory.

Finally, several topics emerged from the study that suggest promising avenues of future research on multi-national enterprises. The first concerns “Glocalization”: What global standards can multi-national firms mandate, vs. what needs to be adapted to the local environment? This can impact the organizational structure as well as knowledge acquisition and transfer methods for the firm. The second concerns work sharing, or completing work across multiple offices, within project-based multi-national organizations. What structures and methods are in place to determine scope and work flow? Related to the current research topic, how is the project area's local institutional knowledge distributed across teams working on the same project? This is particularly important for engineering firms who often distribute work and may complete work at a different location than the project site. The third promising topic draws from Orr's thesis (Orr 2005) related to embeddedness. Do firms exhibit differences in knowledge sharing methods if they are more or less deeply “embedded” within networks of relationships in a given area? Existing data that I collected combined with this work suggest a “paradox of embeddedness”—the more firms need to be embedded and obtain local knowledge, the less likely they are to capture and share this knowledge within the larger organization.

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