

FACTORS LEADING TO SUCCESSFUL KNOWLEDGE INTEGRATION IN OFF-SHORING RELATIONSHIPS: A PRELIMINARY MODEL

*Richard L. Jenson, School of Accountancy, Utah State University, 3540 Old Main Hill, Logan, UT 84322-3540,
(435) 797-2335, richard.jenson@usu.edu*
*Jeffrey S. Rickords, School of Accountancy, Utah State University, 3540 Old Main Hill, Logan, UT 84322-3540,
(435) 797-2330, j.r.rickords@aggiemail.usu.edu*

ABSTRACT

As organizations continue expand their off-shoring relationships with foreign vendors, the maintenance and management of organization knowledge becomes increasingly complex. Concerns have been raised about the possible degradation of the principal's knowledge and capabilities over time as more knowledge processes are entrusted to off-shore vendors. Moreover, the ability of both principal and vendor to share knowledge with each other has been shown to subject to a number of situational and technological factors. The authors introduce a preliminary model of factors that influence the effectiveness of knowledge sharing relationships in these situations.

Keywords: off-shoring, outsourcing, knowledge integration.

INTRODUCTION

As off-shoring relationships continue to expand, domestic organizations face a number of challenges in ensuring that their off-shoring relationships remain profitable. Although the primary motivations for off-shoring continue to center on cost reduction and access to foreign markets, there is growing concern that such purported benefits may, in the longer term, be overshadowed by the gradual degradation of organizational competence and knowledge in the domestic company. On the other hand, there are many who view off-shoring relationships as significant opportunities to expand the capabilities of the domestic organization by partnering with innovative vendors off-shore. Using the literature from several research streams, this paper attempts to identify the factors that will hopefully lead to a more effective knowledge-sharing relationship between the domestic principal and the off-shore vendor.

OFF-SHORING AND RISKS TO ORGANIZATIONAL KNOWLEDGE

Off-shoring relationships may expand the number of opportunities for organizational learning as the domestic organization and the foreign vendor develop closer ties over time. Contractors tend to enter into off-shoring arrangements to reduce costs. However, as the relationship between the off-shore supplier and contractor develop, the contractor is likely to learn about novel outsourcing possibilities, widening the range of activities considered acceptable for outsourcing. Maskel, et. al [10] gathered survey data on 1,674 Danish firms as to the number and types of outsourcing activities and the motives for entering into the outsourcing relationships. The results confirmed their hypothesis that firms initially begin outsourcing for purposes of cost reduction. While the cost reduction motive remains significant, motives related to knowledge acquisition increase in importance.

Off-shoring has raised concerns about the potential loss of the domestic organization's knowledge base and competencies as a result of long-term off-shoring contracts. Moreover, when the initial cost savings begin to diminish, it may be prohibitively expensive to re-establish competency and "backshore" the

process. According to Cha, et. al, [5], domestic firms may grossly underestimate their ability to exploit the learning-by-doing knowledge generated by the foreign vendor's economies of scale. While managers may justify decisions to off-shore based on wage savings in the short term, such gains may be lost because of long-run degradation of the company's knowledge base. An off-shoring contract, despite its short-run benefits, may become particularly disadvantageous to the domestic company when it exhausts the benefits of the off-shoring arrangement and tries to backshore outsourced operations. When knowledge transfers are not sufficiently large, short-lived off-shoring projects may still generate cost savings to the domestic firm. However, because of losses in learning-by-doing, longer duration projects may cause a disruption in the knowledge supply chain. The authors attribute this to the erosion of the domestic company's knowledge during the off-shoring period. Their analysis indicates an immediate increase in total costs due to backshored operations that is greater than the cost decreases experienced at the start of the outsourcing arrangement. Therefore, there is a tradeoff of short-run losses and long-term benefits after the decision to backshore. Companies must consider if the foreign vendor is capable of providing mentoring to domestic workers with respect to skill sets that may suffer degradation due to outsourcing [5].

Schosser, et. al. [11] assert that there is a strategic risk that in-house expertise will be lost permanently when human resource (HR) functions are outsourced. Experiential learning, interpretation of organizational history, and shared organizational memory are adversely affected by outsourcing because the temporary nature of outsourcing weakens the traditions and routines associated with a strong organizational culture.

FACTORS THAT INFLUENCE AND ENHANCE KNOWLEDGE SHARING RELATIONSHIPS: AN EXPLORATORY MODEL

This paper reviews literature pertaining to knowledge sharing in the context of off-shoring relationships and makes a preliminary identification of factors that influence the nature and effectiveness of such relationships. These are divided into *situational* (or moderating) factors, *facilitating* factors, and *absorption* factors.

Situational factors influence the need for the facilitating factors. Three main situational factors are identified:

- (1) modularity/interdependency;
- (2) imbalance in the rate of technological change; and
- (3) the knowledge intensiveness of processes.

Facilitating factors increase the "bandwidth" of sharing between the principal and the vendor. They include:

- (1) knowledge management technology;
- (2) cultural intelligence; and
- (3) maturity of outsourcing/off-shoring relationship.

Absorption factors represent the organization's readiness to accept and exploit new knowledge and include:

- (1) integrative knowledge; and
- (2) absorptive capacity.

The model is summarized in Exhibit 1 below. The individual elements of the model discussed in more detail below.

Exhibit 1. Exporatory Model: Factors That Facilitate Knowledge Sharing

<u>Situational Factors</u>	<u>Facilitative Factors</u>	<u>Absorption Factors</u>
Modularity	Knowledge Mgt. Technology	Integrative Knowledge
Technological Imbalance	Cultural Intelligence	Absorptive Capacity
Knowledge Intensiveness	Off-shoring Maturity	

Situational Factors

Modularity / Interdependency. Outsourced product components or software modules that can be developed independently are considered to be modular. Brusoni, et. al, [4] define a modular innovation as “a change in the core design concept of a component that does not affect its relationships with the others.” The degree of modularity influences the coordination effort required to integrate the various modules. In contrast, we would expect highly interdependent products to require much more coordination effort and also require a more intensive knowledge sharing relationship. Brusoni, et. al, proposed that the predictability of product and component interdependencies is one of the determinants of the appropriateness of interfirm relationships [4].

Rates of Technology Change. Brusoni, et. al, [4] also proposed that the unevenness in the relative rates of change of component technologies (technological imbalances) is also a key determinant of the approach used to manage outsourcing relationships. In their study of three airplane engine manufacturers, they noted the rate of technological change was much faster in the area of digital electronics than in the area of gas turbines.

The unevenness in technological advances of the different fields underlying aircraft engines required some degree of integration at the knowledge level to identify potential novelties in fast-moving technological fields (e.g., digital electronics), understanding their implications for the others (e.g., gas turbines), and integrate changes in the existing or new product architectures [4].

A major implication of this concept for the current paper is that the domestic firm must continue to make investments in technological knowledge even though the off-shore vendor is the party utilizing the technology in the component manufacture.

Knowledge Intensiveness of Processes. Currie, Michell, and Abanishie [7] defined knowledge process outsourcing (KPO) as a process continuum ranging from rule-based processes upward toward higher-valued, judgment-based processes. In examining nine financial services outsourcing vendors, they found that most principal firms still tended to outsource only those activities with well-defined inputs and outputs and tended to keep knowledge-intensive processes in-house. Vendors that were surveyed responded that perceived cost advantage should not be the primary basis for KPO decisions because the current cost advantages will be transitory. We would expect that rule-based processes, requiring mostly explicit knowledge, will require a less-intensive knowledge sharing relationship. However, processes requiring higher level judgment and intuition would require the exchange of tacit knowledge and necessitate a more intensive knowledge sharing relationship.

Facilitating Factors

Notwithstanding the challenges of protecting organizational competencies and knowledge resources in the course of off-shoring activities, the literature suggests several factors that are promising contributors to productive knowledge sharing relationships.

Knowledge Management Technology. With outsourcing becoming a prevalent business model, knowledge management will be required to transcend organizational boundaries in order to include sourcing partners. Gottshchalk [8] asserts that knowledge transfer is the most important knowledge process in an IT outsourcing relationship. He also proposes that an increase in knowledge transfer will enhance the quality of the outsourcing partnership. A higher level of strategic intent requires a higher stage of knowledge management systems. This requires that both vendor and principal be at the same stage of technology growth in order to successfully communicate with each other.

Cultural Intelligence. Not all organizations are equally situated to benefit from an off-shoring relationship. The off-shoring relationship is typically complicated by differing languages and cultures.

Also, many domestic firms may lack the overseas network required to succeed in an international environment. Ang, et. al [3] assert that when an organization ventures overseas, firm-level cultural intelligence (CQ) is a necessary predictor of organizational performance in foreign ventures such as off-shoring. Cultural intelligence is the firm's ability to function and manage effectively in culturally diverse settings. They developed a framework of cultural intelligence consisting of managerial CQ, competitive CQ, and structural CQ. Managerial CQ represents the CQ held collectively by the firm's managers and used to manage the off-shoring relationship. Competitive CQ includes the processes and routines that exist in the firm that enable it to manage the competitive factors associated with off-shoring. Structural CQ includes the organizational and reporting structures, as well the social networks and cliques the firm has at its disposal to support intercultural operations.

Absorption Factors

Both parties to the knowledge sharing relationship must have adequate preparation in order to absorb the transfer of knowledge from a knowledge partner. Both parties must possess some level of complementary or overlapping knowledge in order to make learning possible.

Integrative Knowledge. Even as knowledge processes are outsourced to off-shore vendors, the domestic principal must continue maintain the knowledge infrastructure necessary to integrate the off-shored or outsourced processes. Brusoni, et. al [4] argue that the decisions to outsource production and other business processes is different from decisions to outsource technical knowledge. For example, they observed that aircraft engines are multi-technology, multi-component products. Engine components exhibit varying degrees of interdependencies and rely upon widely varied technological fields that develop at different rates. They demonstrate that multi-technology firms need to have knowledge in excess of what they need for immediate manufacture in order to ensure their ability to integrate the components during the manufacturing process.

Absorptive Capacity. Cohen and Levinthal [6] introduced the term absorptive capacity to represent the ability of an organization to recognize the value of new information based on the company's prior related knowledge. The premise of absorptive capacity is that an organization needs prior related knowledge to assimilate and use new knowledge. They assert that "the prior possession of relevant knowledge and skill is what gives rise to creativity, permitting the sorts of associations and linkages that may have never been considered before [6]. The Alavi and Leidner [2] note that there is a requisite level of shared knowledge in order for the exchange of tacit knowledge to occur. Abecassis-Moedas and Mahmoud-Jouini [1] argue that the relationship between absorptive capacity and performance in new product development (NPD) is moderated by *complementarity* between source (designers) and recipient (manufacturers) knowledge. Complementarity is defined as knowledge that is both related and diverse. A firm will need to possess a knowledge base in the same or similar area, as only such similarity will allow for an understanding of the intricacies of the new knowledge and its applicability to the firm's unique circumstances.

Maturity of the Outsourcing Relationship. Most firms embark on outsourcing relationships in order to reduce costs and facilitate entry into foreign markets [10]. Gottschalk and Solli-Saether [9] introduce a maturity model for information technology outsourcing in which an outsourcing relationship progresses from the *cost stage*, to the *resource stage*, and finally on to *partnership stage*. In the cost stage, the principal is concerned with achieving high economic benefits, low transaction costs, and efficient division of labor. The resource stage focuses on access to vendor resources for innovation and the development of core competencies. Finally, the partnership stage is characterized by alliance work, social exchanges, and the balancing of stakeholder interests.

IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

The preliminary model attempts to address a number of challenges associated with off-shoring activities. Currently, most domestic principals engage in off-shoring activities with the intent of exploiting lower wage rates and market entry abroad. However, off-shoring relationships based primarily on cost savings may not be sustainable. As competition for foreign capabilities increases, costs will inevitably increase for such services, and the profitability from such ventures will decline. Moreover, it is likely that sustained off-shoring relationships will result in the loss of learning-by-doing knowledge. Principals may find themselves in a double-bind if they attempt to backshore such operations because of the cost of reestablishing competencies domestically.

Because of sustainability issues discussed above, principals must reconsider their strategic intent in pursuing off-shoring activities. A number of research articles have suggested that principals move beyond the traditional wage differential arbitrage toward a higher level knowledge sharing relationship. This not only addresses the problem of degraded domestic capability, but also opens up opportunities for greater learning to occur between principal and vendor. However, the establishment of wider learning bandwidth is a complex undertaking. Organizations vary in the types and levels of knowledge processes they off-shore. In addition, off-shored processes vary in modularity, which impacts on the intensity of the knowledge transfer, as well as the coordination effort. Organizations also vary in the extent of their knowledge transfer infrastructure (facilitating factors) which includes their knowledge management technology (systems that support knowledge sharing), their cultural intelligence. Finally, organizations must be prepared for the absorption and exploitation of knowledge that accrues from the off-shoring relationship. This requires that both parties have or develop overlapping and complementary knowledge bases to enable the assimilation of new knowledge.

Limitations of the model are clearly evident. Much additional work needs to be done to more clearly delineate the relationships among the factors, propose hypotheses to test, operationalize variables, gather and analyze data. This paper is presented to engender discussion and elicit comments and suggestions from conference participants.

CONCLUSION

It appears likely that domestic firms will continue to expand their off-shoring relationships with foreign vendors. It also appears likely that companies off-shoring strictly for cost reduction purposes will encounter diminishing returns as foreign wage rates rise. Of perhaps greater concern is the degradation of the principal's learning-by-doing knowledge, the result of extended off-shoring relationships. Nevertheless, opportunities will exist for both principal and vendor to cooperatively build their respective knowledge bases, and in so doing, expand their innovative capacities. This paper has proposed a preliminary model that will hopefully assist organizations in achieving more effectiveness in their knowledge integration activities.

REFERENCES

- [1] Abecassis-Moedas, C. & Mahmoud-Jouini, S. B. Absorptive capacity and source-recipient complementarity in designing new products: An empirically derived framework. *Journal of Product Innovation Management*, 2008, 25:473-490.
- [2] Alavi, M. & Leidner, D. E. Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 2001, 25(March):107-136.

- [3] Ang, S. & Inkpen, A. C. Cultural intelligence and off-shore outsourcing success: a framework of firm-level intercultural capability. *Decision Sciences*, 2008, 39 (August): 337-358.
- [4] Brusoni, S., Prencipe, A., & Pavitt, K. Knowledge specialization, organizational coupling, and the boundaries of the firm: Why do firms know more than they make? *Administrative Science Quarterly*, 2001, 46 (December):597-621.
- [5] Cha, H. S., Pingry, D. E., & Thatcher, M. E. Managing the knowledge supply chain: An organizational learning model of information technology off-shore outsourcing. *MIS Quarterly*, 2008, 32 (June):281-306.
- [6] Cohen, W. M. & Levinthal, D. A. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 1990, 35 (March): 128-152.
- [7] Curie, W. L., Michell, V., & Abanish, O. Knowledge process outsourcing in financial services: The vendor perspective. *European Management Journal*, 2008, 26:94-104.
- [8] Gottschalk, P. Research propositions for knowledge management systems supporting it outsourcing relationships. *Journal of Computer Information Systems*, 2006,46 (Spring): 110-116.
- [9] Gottshchalk, P. & Solli-Saether, H. Maturity model for IT outsourcing relationships. *Industrial Management and Data Systems*, 2006, 106(2): 200-212.
- [10] Maskell, P., Pedersen, T., Petersen, B., & Dick-Nielsen. Learning paths to off-shore outsourcing: From cost reduction to knowledge sharing. *Industry and Innovation*, 2007, 14(July): 239-257.
- [11] Schosser, F., Templer, A., & Ghanam, D. How human resource outsourcing affects organizational learning in the knowledge economy. *Journal of Labor Research*, 2006, 27 (Summer): 291-303.