

# **Information Technology Outsourcing: Reducing Costs or knowledge?**

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## 1.0 Introduction

Businesses have been outsourcing information technology (IT) activities since the early 1950s (Costa, 2001; Due, 1992; Klepper and Jones, 1998). However, outsourcing has grown tremendously since Kodak outsourced its IT in 1989. Early outsourcing arrangements were motivated primarily by operational cost saving (DiRomualdo and Gurbaxani, 1998), but more recently, the motivation for outsourcing has shifted to strategic business performance improvement (Currie and Seltsikas, 2001; DiRomualdo and Gurbaxani, 1998; Yang and Huang, 2000). An increasing range of IT functions are being outsourced, including applications programming, telecommunication management, systems integration and systems operations (Grover, et al., 1996). Firms that earlier outsourced only small part of IT functions are now outsourcing their entire IT department. This phenomenon of outsourcing is not just limited to IT. In general, there is a great surge in the wholesale outsourcing of less tangible and specifiable activities, such as research and development activities (Greco, 1997; Howells, et al., 2003; Liebeskind, et al., 1996; Mol, 2005).

One aspect of outsourcing that has gone essentially under-examined in the literature and practice is the value of knowledge and learning associated with outsourced activities and processes (Baxter, 2003; Elitzur and Wensley, 2002; Hui and Beath, 2004; Willcocks, et al., 2004). When organizations perform some activity, they learn more about that activity as a by product. Outsourcing, therefore, strongly affects an organization's ability to learn and acquire new knowledge. If having greater knowledge about some area of business is central to how a company competes, it might not be prudent to outsource the activities related to that business.

Quinn (1992) proposed that firms should outsource anything that is not core to their strategy. From this perspective, for example, it would make perfect sense for an automobile manufacturing company to outsource its IT functions. However, one could make the case that outsourcing critical functions such as R&D go beyond Quinn's prescription not to outsource strategically important activities. While this may lower costs in the short run, it transfers the learning and new product opportunities to the outsourcing provider.

Our perspective goes beyond the strategic value of a particular activity or task (e.g., Lacity,

et al., 1996) to focusing on the strategic value of the *knowledge and learning* associated with the activity. Activities produce specific outcomes, while knowledge can be viewed as a platform from which many activities and outcomes can be derived (Kogut and Kulatilaka, 1994). Outsourcing the ability to maintain and enhance the knowledge associated with an activity has a more profound effect on an organization's long term ability to compete than merely outsourcing the activity itself. This perspective is the essence of the knowledge-based view. That is, every decision is evaluated relative to its effect on the firm's knowledge and learning (Zack, 2003). Our focus, for example, is on *knowledge* partitioning of activities, not task partitioning (Takeishi, 2002)

One of the reasons why organizations are not taking knowledge and learning associated with outsourced activities into consideration is that they find it difficult to determine the economic or strategic value of such intangible assets (Bounfour, 1999). We argue that firms must consider the value of knowledge and learning associated with performing an activity before making an outsourcing decision. Although the paper focuses on IT outsourcing, the insights derived from this research can be applied to the phenomenon of outsourcing in general.

We specifically focus on IT for several reasons. Outsourcing of IT poses some unique problems owing to the pervasiveness of the IT function in most organizations. When executives mistakenly consider IT to be entirely of a commodity or non-strategic nature ripe for outsourcing, they may find that IT is source of strategic innovation (King and Malhotra, 2000; Lacity, et al., 1995; Lacity, et al., 1996; Sambamurthy, et al., 2003). Even, business strategy may be influenced by emerging technologies. When this is so, the lack of appropriate IT resources that have been outsourced may severely limit an organization's ability to compete. Further, a decision to outsource one set of non-core IT activities may unintentionally lead to the firm's outsourcing of a wider array of other closely related competencies and activities or to a deterioration of the retained competencies and activities, particularly if the IT resources are shared among a large number of subunits (Lei and Hitt, 1995). IT outsourcing tends to fall in this category because IT pervades, affects and shapes most organizational processes in some way (Kern and Willcocks, 2002; Khalfan and Alshawa, 2003; Willcocks, et al., 1996).

The paper is organized as follows. First, we define outsourcing. Second, we survey the major theoretical approaches used to examine outsourcing. Third, we examine outsourcing from the knowledge and learning perspective, and derive a framework for outsourcing strategy. Finally, we raise implications for researchers and practitioners followed by concluding remarks.

## 2.0 Defining IT Outsourcing

Outsourcing is an abbreviation for “*outside resource using*” (Arnold, 2000; Buhner and Tuschke, 1997; Koppelman, 1996; Quinn and Hilmer, 1994). However, in general, outsourcing has been defined in many different ways, as shown in Table 1.

<b>Table 1</b>	
<b>Author(s)</b>	<b>Definition</b>
(Altinkemer, et al., 1994)	The act of subcontracting a part, or all, of an organization’s IS work to external vendor(s), to manage on its behalf.
(Aubert, et al., 2004)	The handover of an activity to an external supplier as an alternative to internal production.
(Cheon, et al., 1995)	To turn over part or all of an organization’s IS functions to external service provider(s)
(Chorafas, 2003)	A delegation of the authority to another party for the provision of services.
(Kern and Willcocks, 2002)	A process whereby an organization decides to contract out or sell its assets, people and/or activities to a third party supplier, who in exchange provides and manages these assets and services for an agreed fee over an agreed time period.
(King and Malhotra, 2000)	The use of external agents to perform an organizational activity.
(Klepper, 1995)	The provision of services by a vendor firm to a client.
(Lacity and Hirschheim, 1993a)	A significant transfer of assets, leases and staff to a vendor that assumes profit and loss responsibilities

(Lacity and Hirschheim, 1993b)	The provision of or purchase of a product or service that could be provided within the buyer firm.
(Loh and Venkatraman, 1992a)	The significant contribution by external vendors in the physical and/or human resources associated with the entire or specific components of an infrastructure in the user organization.
(Martinsons, 1991)	It is the act of subcontracting all or parts of the organizational functions to an external vendor.
(Surpin and Weideman, 1999)	The process of contracting an outside company to provide a service previously performed by staff.
(Willcocks and Lacity, 1998)	Handing over to third party management of organizational assets, resources and/or activities for a required result.

These definitions commonly hold that outsourcing represents contracting with outside parties to manage and provide services. Linder (2004) found that, in practice, business leaders similarly agreed that outsourcing involves purchasing services from an outside company. However, Linder considered this definition too broad and narrowed it only to purchasing those services from outside companies “*that a company currently provides, or most organizations normally provide, for themselves*” (p. 27). This suggests that what is considered outsourcing depends on the extent of relatedness to internal or core activities (Markides and Williamson 1994). For example, an automobile manufacturer subcontracting some portion of assembly would be considered outsourcing because companies in that industry might normally manage their own manufacturing and assembly operations. Today it is still commonly accepted that most business organizations manage most of their IT resources internally, therefore contracting for these services is considered outsourcing. By the same token, almost no company would say it outsources its investment banking, auditing, or custodial services, because the vast majority of companies typically purchase these services. We adopt Linder’s definition of outsourcing.

This definition of outsourcing also raises the aspect of time (Linder, 2004). Organizations may outsource discrete projects or contract for ongoing services. When an organization contracts with another organization, for example, to develop a specific computer application, the

responsibilities of the contracted organization might end when the system is delivered. On the other hand, the provider may be contracted to provide ongoing maintenance and support services. Outsourcing call centers represents an ongoing arrangement that typically is intended to continue. We include both as outsourcing as long as they represent activities that might normally or reasonably be performed in-house.

A second aspect of time is that the line between what is and what is not outsourcing moves over time based on accepted practice (Linder, 2004). For example, as late as 1966, the US Naval Academy operated its own production facility to provide milk for the midshipmen (Linder, 2004). At the time when these services were handed off to third party, the organizations might have said they “outsourced” them. Today, however, no one would refer to buying milk from a dairy as outsourcing. As the prevalence of application service providers increases and the notion of leasing applications on a use basis becomes more common, certain aspects of IT outsourcing will no doubt migrate to accepted purchasing practice as well.

Regardless, our focus on knowledge and learning holds, and in fact addresses the dynamic by which activities may permanently migrate outside the client organization and the strategic implications of that process.

### **3.0 Existing Theoretical Perspectives**

Most organizations engage in outsourcing for economic or strategic reasons. Economically, outsourcing is attractive when the tasks being outsourced can be performed by the provider at a lower total cost. Strategically, outsourcing is attractive when organizations have capacity and/or capability constraints that prevent them from servicing a market. When a firm does not have personnel of requisite quantity and skill, or sufficient physical capacity to deliver its product or services within a required time frame, it either has to postpone the work, or outsource to get the work done within the required time frame and level of quality.

Apart from economic and strategic reasons, many organizations outsource because of a “herd mentality.” Organizations become concerned when others in the industry outsourcing their work, potentially benefiting economically and/or strategically, while they are not. They believe they

may “miss the boat” and lose out on the expected benefits that competitors may come to realize. These three rationales are supported theoretically by transaction cost theory, resource based theory and institutional theory, respectively. The following sections examine these theoretical approaches to understand the growing trend toward outsourcing.

## **Transaction Cost Economics Theory**

Cost reduction has been the primary rationale for outsourcing (DiRomualdo and Gurbaxani, 1998; Lacity and Willcocks, 1998; Takac, 1994). Transaction Cost Economics (TCE) (Coase, 1937; Williamson, 1975; Williamson, 1979; Williamson, 1985) provides a theoretical foundation for addressing outsourcing from a cost perspective. Transactions are the exchanges of goods or services between firms. TCE maintains that the allocation of economic activity among firms depends on balancing each firm’s internal costs against the cost of transacting for goods and services in the market (Alchian and Demsetz, 1972). This is the familiar make vs. buy argument which proposes that firms buy services from other firms (via “the market”) if it is less costly than producing those services in-house (via “hierarchy”). Conversely, when the market “fails” then products and services must be produced internally; the reason why firms exist according to TCE.

TCE addresses two types of costs: production and coordination (Alchian and Demsetz, 1972). Production costs represent the costs of actually producing the goods or services, and would be expected to differ among firms. Coordination costs are the costs of controlling and monitoring workers if the goods are produced internally or vendors if purchased in the market. These costs arise from the need to define, negotiate and enforce contracts, and to monitor and coordinate activities across organizational boundaries. Buying in the market typically offers lower production costs through specialization and economies of scale. However, markets have high transaction costs because vendors tend to behave opportunistically and therefore require monitoring of their activities. Hierarchies, on the other hand, may have higher production costs because of their inability to achieve as great economies of scale. Hierarchies should have lower coordination costs, however, because employees can be managed more effectively and efficiently than vendors.

Transaction costs are also affected by asset specificity, uncertainty and frequency of

transactions (Williamson, 1985). Asset specificity in the context of IT outsourcing refers to the degree to which a vendor's hardware and/or software architectures and skill set of IT employees are specific to a particular client. Such idiosyncratic investments would serve to increase the vendor's costs of any transactional relationship with a particular client because the resources cannot be used with another client, the costs can not be amortized over other clients, and the client can threaten to terminate the relationship rendering the vendor's resources valueless. Vendors would be expected to demand higher fees. Conditions of high uncertainty in a relationship may be a result of an unpredictable market, technological, economic trends, or contractual complexity. The more uncertainty, the more difficult it is to completely specify a contract and therefore the greater cost to the client to monitor vendor behaviors. Many behaviors are difficult to monitor and pose a higher risk. The more frequently the parties transact, the less costly the transaction because of relationship building and trust which can substitute for monitoring, as well as the ability to amortize some cost over a greater number of transactions. Thus TCE would suggest that relatively common and stable activities would be the most cost-advantageous candidates for outsourcing.

According to TCE, then, outsourcing decisions are based on the production and coordination cost trade-off (Cheon, et al., 1995). The goal is to find a governance structure (make or buy) with the lowest transaction cost, and involves answering two key questions: 1) should the firm outsource certain functions or provide these services internally? 2) If the decision is to outsource, which vendor and what type of contractual arrangement should be selected?

TCE, while offering a useful framework for analyzing the costs (or savings) associated with outsourcing, ignores the cost of forgone knowledge and learning that may occur when outsourcing a process or activity (a "production" opportunity cost), plus the costs to transfer that knowledge back to the client (a transaction cost) to the extent that the knowledge gained by the vendor is transferable.

## **Resource-Based Theory**

Filling the gaps in IT resources is a second major rationale for outsourcing (Lacity and Willcocks, 1998). This may be because of an increase in workload beyond an organization's



current capacity (Radding, 1995), or a disparity between the existing and required IT resources (DiRomualdo and Gurbaxani, 1998, p.68). The Resource Based View of the firm (RBV) (Penrose, 1959) provides a theoretical foundation for addressing outsourcing from a resource gap perspective.

Resource-based theory views a firm as a collection of productive resources (Penrose, 1959) and organizations compete based on having or controlling unique, valuable and hard-to-imitate resources (Barney, 1991). Rather than competing from a specific product/market position, a set of resources could be used to create various products for various markets. Advantage comes from being the only organization with the resources needed to create and deliver those products. Sustainability of the advantage depends on resource immobility, that is, the difficulty for others to copy, acquire, or develop those resources (Rumelt, 1984). If competitors face no significant cost disadvantage or obstacle in developing those resources, then the resources can provide only a temporary ability to compete until they are copied by another firm.

Outsourcing is about acquiring resources from the market. Those resources cannot, by themselves, be strategic according to RBV, as they are not unique and can be acquired by competing firms. However, RBV is concerned not only with the deployment of existing resources, but with their leverage as well (Grant, 1991). To fully exploit a firm's existing unique resources the external acquisition of complementary resources may be necessary (Grant, 1991). Those resources would be acquired externally because they may be more costly for the firm to create on its own (as per TCE). A firm may still realize a unique benefit from a purchased resource when combined with one that is unique, especially if that acquired resource complements or supplements its existing resources more effectively than it does for competitors (Dierickx and Cool, 1989). For example, while two competing firms may use the same outsourcing vendor to provide a CRM capability, it may be that one of the firms has a more unique and valuable production capability, sales force, distribution channel, or other related resource which, in net, provides a greater overall advantage. Thus filling resource gaps through an outsourcing strategy not only maintains the firm's stock of resources, but can also augment resources and capabilities to remain competitive (Cheon, et al., 1995).

While the notion of complementary resources explains how outsourcing can potentially be strategic, it too ignores the role played by knowledge and learning in developing a competitive advantage. Firms need to know more than competitors about how to integrate and deploy their resources, especially those that are externally contracted for and thus commonly available (Zack, 1999).

## **Institutional Theory**

The Eastman Kodak decision is regarded as a turning point in outsourcing's history. Loh and Venkatraman (1992b) examined the adoption of outsourcing before and after Eastman Kodak's decision to outsource and found that adoption of IT outsourcing was motivated more by imitative behavior, than by external influence amongst user organizations. Outsourcing is often an imitative response to the hype and publicity surrounding the subject - the so-called "bandwagon effect." (Hu, et al., 1997; Lacity and Hirschheim, 1993a; Lacity and Hirschheim, 1993b; Lacity and Willcocks, 1998).

Institutional theory provides a theoretical foundation for explaining the imitative behavior regarding outsourcing (Ang and Cummings, 1997; Hu, et al., 1997). Institutional theory posits that organizations within the same organizational field grow increasingly similar. There are three mechanisms of isomorphic changes. Coercive isomorphism is a result of formal or informal pressures. Mimetic isomorphism is a result of organizations imitating other organizations within their field that they perceive to be legitimate or successful. Normative isomorphism is a result of normative pressures in the environment (DiMaggio and Powell, 1983). Thus, companies may make outsourcing decision based on other organizations that have already outsourced. In addition, organizations may adopt outsourcing due to other external factors such as the influence of vendors, consulting firms, trade periodicals and the general business climate. And again, the impact of outsourcing on knowledge and learning is not taken into account.

## **4.0 The Knowledge-Based View of Outsourcing**

We have presented the theoretical rationale underlying the three primary reasons firms adopt while making outsourcing decisions: reducing costs (TCE), closing strategic resource gaps (RBV), and imitating competitors (institutional theory). While these theories are well accepted,

the outsourcing literature has under-investigated the prevalent emerging theory of the firm – the Knowledge Based View (KBV). The little research that has taken the KBV of outsourcing has not investigated it directly or put enough emphasis on the strategic value of knowledge and learning. For instance, Willcocks et al. (2004) suggested that both clients and vendors must make special arrangements to create and capture knowledge in outsourcing arrangements. Poppo and Zenger (1998) found that TCE provided a better explanation over KBV in determining outsourcing decisions. However, they treated knowledge simplistically as a resource to be contracted for; if an organization lacks knowledge then it should outsource. Quinn (1999) and Jayatilaka, et al. (2002) similarly propose that organizations should consider their knowledge gaps while making outsourcing decisions, a variant of the RBV of outsourcing. Several researchers (Aubert, et al., 1998; Beaumont and Costa, 2002; Clark, et al., 1995; Duncan, 1998; Earl, 1996; McAulay, et al., 2002; McCray and Clark, 1999; Willcocks and Lacity, 1998; Willcocks, et al., 1999) have identified knowledge erosion as one of the risks arising from IT outsourcing but mainly viewed it from resource perspective.

Consider a scenario illustrating the importance of taking a knowledge and learning perspective on outsourcing decisions. An organization that builds IT products is considering outsourcing its technical support services to an outsourcing vendor that runs call centers for such services. In this case, the client believes that it has competencies in product development but lacks sufficient resources to provide direct services to its customers. From the perspective of transaction cost economics, if it is less costly to outsource the activity than to develop and manage it internally, the client organization will have made an appropriate decision. Taking the resource-based view, if it outsources the technical support activity to a vendor that has greater capacity or competence to provide that service, and the combination of the client's product development skills and resources and the vendor's call center resources provides a competitive advantage (even though competitors could contract for the same service), it will have made an appropriate decision. From the perspective of institutional theory, it may be wise to outsource the technical support activity because more and more organizations in various industries are choosing it to do so. From the three traditional perspectives on outsourcing, outsourcing a call center may make sense, and in fact has accounted for a large portion of outsourcing activity. However, from a knowledge-based view, call centers, and customer service in general, are a

primary means by which organizations come to learn about their markets. Through technical support, organizations learn not only about the shortcomings in their existing products but also acquire new knowledge regarding future products and markets. From this perspective, support activity offers an enormous amount of knowledge and learning to an organization and may not be prudent to outsource (even given lower costs) if the knowledge and learning being forgone is strategic to the client organization. Thus the relationship between outsourcing and an organization's ability to compete is contingent on the outsourcing's impact on the organization's knowledge and learning.

Focusing specifically on IT, Earl (1996) argues that much learning about IT is experiential and that organizations learn to manage IT by doing. They learn the value of IT applications and further opportunities for development by using them. Many strategic information systems were discovered in an evolutionary experiential fashion. For example, several airline reservation systems began as automation initiatives to save clerical costs before they were seen as stock optimization systems and electronic distribution channels (Copeland and McKenney, 1988). If a firm makes outsourcing decisions from a cost and/or competency perspective, it may discount the value of an application, classifying it as commodity or non core, only to discover that it could become strategic, core, or high value in the future. More broadly firms may lose their ability to harness the future benefits of IT in general (King and Malhotra, 2000).

According to the KBV, organizations exist to create, transfer and integrate knowledge (Grant, 1996; Hedlund, 1994; Kogut and Zander, 1992). A firm's ability to create value is not primarily based on its physical or financial assets, but instead is generated from its sets of intangible, knowledge-based resources (Itami, 1987). A firm's marketable products and services are the end result of successful learning and application of value creating knowledge (Nonaka, 1991; Spender and Grant, 1996; Teece, et al., 1997; Zack, 1999). Organizations therefore compete on the basis of their ability to learn and utilize knowledge efficiently and effectively (Leonard-Barton, 1998; Nonaka, 1994). The knowledge within an organization can exist in the form of explicit or tacit. Explicit knowledge can be articulated, codified, and accessed using verbal communication and written documentation (Winter, 1987), which makes explicit knowledge easy to transfer but correspondingly less likely to give any ability to compete because

it might be transferred across as well as within organizations. On the contrary, tacit knowledge is socially complex form of knowledge that is difficult to imitate or transfer. This is precisely why it provides an ability to compete. Tacit knowledge is difficult to articulate and codify, time consuming to teach and learn, complex in terms of having multiple interactive components (Kogut and Zander, 1992; Winter, 1987). Tacit knowledge is based on accumulated experience and is reflected in the expertise, skills, and routines acquired by organizational over time (Nelson and Winter, 1982; Winter, 1987).

Thus, from the perspective of KBV, it becomes extremely important that organizations consider what knowledge and learning domains should remain within or under their control while making outsourcing decisions. An organization's knowledge base is a valuable asset and that enlarging the knowledge base and improving its use through learning can contribute to the competitiveness of the firm (Nonaka and Takeuchi, 1995; Tsoukas, 1996) because as soon as an organization gains a minimum ability to compete due to some knowledge and learning, the underlying competences developed so far become difficult to imitate. The further development in an ability to compete happens due to the self amplifying effect of the positive feedback from the knowledge and learning. Thus in this way the more specialized knowledge and learning an organization gains, the more difficult it becomes for its competitors to appropriate knowledge and learning at the same level (Zack, 1999).

In summary, our general thesis relating the KBV to outsourcing is based on the premise that knowledge is a key strategic resource and that learning is required to sustain a knowledge advantage (Zack, 2005). Coupled with the notion that organizational learning is a by-product of activity (Nelson and Winter, 1982), outsourcing an activity becomes a strategic decision to continue or discontinue defending a competitive knowledge position. This further implies the need to factor into the outsourcing decision the strategic costs of any forgone knowledge and learning

## **5.0 Outsourcing Strategy**

The outsourcing decision must be broken down into two key sub-decisions that address

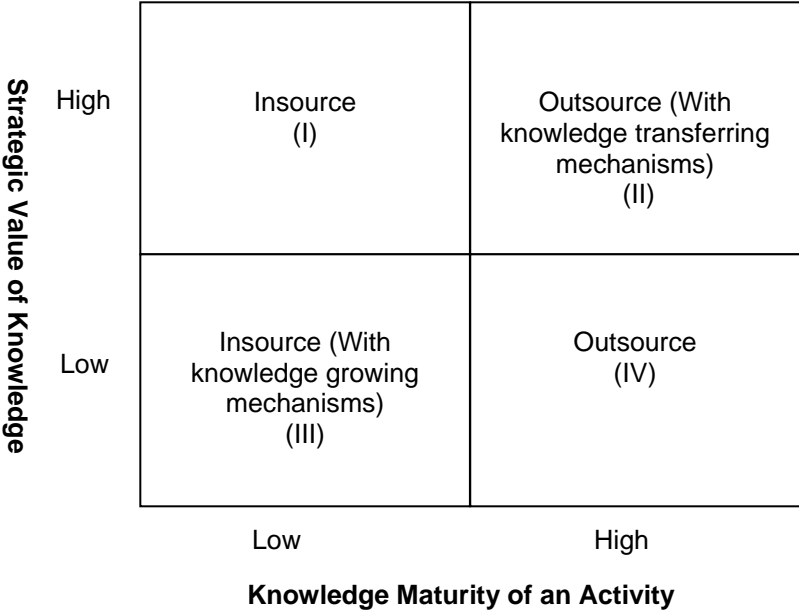
whether or not to outsource an activity (sourcing governance), and what geographic or locational arrangements for sourcing be used (sourcing proximity). The following sections will address the two sub-decisions.

## **5.1 Sourcing Governance**

Lacity et al. (1996) proposed that the maturity of the activity and its strategic importance were two key considerations for deciding whether or not to outsource an activity. We take a similar stance, but focus instead on the knowledge underlying the activity. Thus, an organization that is considering an activity for outsourcing must evaluate the value of that activity across two dimensions – the strategic value of knowledge associated with the activity and maturity of that knowledge – before it makes an outsourcing decision. By strategic, we mean 1) knowledge that is required by the firm to execute its competitive strategy, and to execute it more effectively than competitors pursuing a similar strategy (Zack, 1999), and 2) that is also unique or rare, valuable, and difficult to imitate or acquire other than through experience (Winter, 1987). As a practical matter, “strategicness” can be treated as a continuous variable. That is, some knowledge is more or less strategic than others. The more strategic the knowledge, the less appropriate it is to outsource that knowledge. Knowledge once outsourced is exposed to other firms and is no longer entirely unique, rare, or inimitable – the fundamental characteristics of a strategic resource (Barney, 1991). Strategic knowledge that a firm does decide to outsource will require greater control over protecting and appropriating the knowledge as well as effective mechanisms for its transfer back to the firm, both costly endeavors that must be explicitly taken into consideration when making an outsourcing decision.

Knowledge maturity refers to the extent to which an activity offers a learning opportunity, that is, learning how to perform the activity more effectively or efficiently over time. Some activities are mature and stable enough that they offer very little in the way of additional learning, while others may be novel and offer a large potential for learning and improvement. As the more mature the knowledge, the less the potential learning opportunity, highly mature activity would appear to make the best candidates for outsourcing, as there is little learning to be had (and forgone), and what learning does take place is easier to transfer. Bohn (1994) suggest that mature knowledge is more specifiable. The more specifiable an activity, the easier it is to transfer.

Activities can range, then, from being based on non-strategic, highly mature knowledge and for which learning how to perform the activity better over time is limited and has little strategic significance to an organization (e.g., accounting or custodial services), to those that are intangible, hard to specify in a written procedure, and where the opportunity to learn from experience is both great and strategically important (e.g., customer service, new product development, or expeditionary marketing). By mapping the strategic value of knowledge and its knowledge maturity, four categories of potential outsourcing candidates emerge (see Figure 1).



**Figure 1**

**Quadrant I: High Strategic Value of Knowledge/Low Knowledge Maturity of Activity**

Activities in quadrant I are based on knowledge that is highly strategic to the organization and that provide significant learning opportunity and thus the ability to maintain a knowledge advantage. Organizations often fall into the trap of outsourcing such activities if they interpret their business solely in terms of its present product and service offerings rather than future learning opportunities. The activities that fall under this category should not be outsourced if possible. Organizations that rely on outsourcing such an activity may find themselves “locked out” from acquiring new knowledge and learning that is critical to compete. For instance, an organization that outsources advanced IT accumulates little knowledge about its implementation or use and is unlikely to benefit strategically as the vendor’s knowledge matures and appreciates

in value.

### **Quadrant II: High Strategic Value of Knowledge/High Knowledge Maturity of Activity**

Activities in quadrant II are based on knowledge that is highly strategic to the organization today, but offers little in the way of future learning and improvement. Being strategic, the knowledge differentiates the organization from its competitors. If outsourced, it will no longer represent a strategic resource. This may lead some organizations to keep this activity in-house. However, it may be useful to outsource the activity for two reasons.

First, a forward-looking organization may want to shift its basis of competition to a less mature knowledge platform. To do so, it may be necessary to reallocate resources to some new activity on which the future strategy depends. In that case, the organization is betting that it can learn faster about its new strategic knowledge position than the rate at which the strategic value of its old knowledge position will degrade (as well as learning faster than competitors for the same knowledge position) (Zack, 2005).

Second, an activity that appears mature to one organization, may in fact offer a learning opportunity to another who is able to conceive of the activity in a new and innovative way. The path dependency of learning suggests that organizations improve incrementally based on what they already know (Nelson and Winter, 1982). Vendor organizations with significantly different historical experience, capabilities, or knowledge bases may be able to conceive of the activity in very different and more innovative ways. They can spark innovation in the client if the client uses the vendor merely to help it over the initial hurdle, but the client will need to maintain close communication ties with the provider. This new knowledge will be useful for the client because it is of high strategic value, but the new knowledge needs to be transferred back to the client and protected from the competitors or else it will result in eliminating strategic value of that knowledge. To transfer this knowledge, a conscious management action will be required (Mohr and Sengupta, 2002), something which organizations often neglect (Willcocks, et al., 2004).

The knowledge and learning realized by the innovative provider taking on ostensibly mature processes may be very difficult to transfer back to the client, as the client may not know enough



to understand and absorb the new learning if radically different than its past way of operating (Cohen and Levinthal, 1990; Simonin, 1999). In the worst case, this dynamic may create a reinforcing spiral of dependency on the provider. If effectiveness of knowledge transfer depends on the client's familiarity with the knowledge context and content (Simonin, 1999) and if that familiarity decreases over time, then knowledge will become progressively harder to transfer back, leaving the client even less knowledgeable about and familiar with the activity, creating an even greater need to outsource (Lei and Hitt, 1995).

### **Quadrant III: Low Strategic Value of Knowledge/Low Knowledge Maturity of Activity**

Activities in quadrant III are based on knowledge that is of low strategic value but which offers a significant opportunity to improve on that knowledge. An activity that falls under this category also presents an interesting opportunity. An organization may want to outsource the activity because of low strategic value of the associated knowledge, but because the knowledge maturity is low the future potential of the knowledge is unknown. Overtime such an activity may migrate to the high strategic importance quadrants as the associated knowledge matures.

Organizations in this situation may want to retain the activity in-house, in effect investing in an option to retain and grow the knowledge underlying the activity until its future strategic value becomes clearer. Were the firm to outsource the activity, learning would stop and the existing knowledge would become obsolete, given the low maturity level. Taking on the activity again at some future time would be difficult given the lack of sufficient knowledge. On the other hand, if the firm believes that the knowledge associated with the activity will not be of strategic value, it may choose to outsource the activity. However, the activity, because of the learning opportunity it represents, may represent added value to the provider and therefore may give the client bargaining power to negotiate a lower service cost. The provider, by consolidating the outsourced learning experiences of its clients can learn to the point where it enjoys a strong knowledge advantage over its clients and its competitors, making its strategic knowledge position highly defensible.

### **Quadrant IV: Low Strategic Value of Knowledge/High Knowledge Maturity of Activity**

Activities in quadrant IV are based on knowledge that is of low strategic value and that offer

little in the way of future learning. The activities that fall under this category are good candidates for outsourcing. The knowledge associated with an activity is highly mature and therefore offers little opportunity to learn by doing. It is of low strategic value and therefore does not create a strategic vulnerability because of its exposure. This may be because a client is not capable of improving the activity, or there is only an apparently small opportunity for improvement available. Payroll, benefit, and accounting systems are often prime candidates for outsourcing. Most of the learning in these areas has been accomplished by the accounting industry at large, and outsourcing these activities presents little strategic disadvantage in terms of knowledge and learning. External vendors are likely to have achieved low costs and efficiency through standardization. By outsourcing, an organization will get the benefits of high quality and low cost, which may improve its ability to compete. Not outsourcing those activities may drain its resources and reduce its ability to compete. Clients will gain by freeing up internal management time to focus on more critical activities. Thus we propose,

*Proposition 1a: The lower the maturity of the knowledge (i.e., the higher the opportunity for strategic learning) associated with an activity, the greater the negative impact on an organization's ability to compete if outsourced.*

*Proposition 1b: The higher the strategic value of the knowledge and learning associated with an activity, the greater the negative impact on an organization's ability to compete if outsourced.*

*Proposition 1c: The lower the maturity of the knowledge (i.e., the higher the opportunity for strategic learning) and more strategic the knowledge underlying an activity, the greater the incentive to perform the activity in-house.*

## **5.2 Sourcing proximity**

Today organizations are operating globally, maintaining operations in various countries around the world through subsidiaries, joint ventures or contracts. This provides organizations with more sourcing options in terms of proximity. While the choice of location is often stated as either domestic or international, in reality, proximity is more continuous. For example, a firm

might chose to outsource to a domestic location that is in the same city, to one that is more distant but in the same country, to another country that is geographically close and culturally similar (e.g., U.S. to Canada), to another country that is geographically distant but culturally similar (e.g., U.S. to Australia) or a country that is both geographically and culturally distant (e.g., India or China).

Proximity has several sub-dimensions including organizational distance, physical distance, institutional distance, relationship distance and cultural distance, and they all affect knowledge transfer ability (Hansen and Lovas, 2004; Mowery, et al., 1996). Organizational distance refers to embeddedness in relationships such as franchises, chains, federations, strategic alliances, and networks. Organizations are able to transfer knowledge more effectively among members of such relationships than with outsiders since embeddedness enhances the social ties, free-flow of communication, consistency in administrative controls, and levels of trust which create more opportunities to share knowledge (Simonin, 1999). The physical distance between the parties can affect the difficulties, time requirements and expenses of meeting face-to-face and communicating needed for knowledge transfer (Zack, 1993). The institutional distance refers to the degree of congruity between the institutional environments of the two contracting parties (Cummings, 2003). Research on U.S and Japanese organizations supports the effect of the regulatory environment on knowledge transfer (Spencer, 2000). The relationship distance refers to the duration and quality of the experience that the two contracting parties have working together (Cummings, 2003). If the organizations have worked longer with each other and have positive experience, they will transfer knowledge more effectively (Cavusgil, et al., 2003; Kotabe, et al., 2003). Finally, the cultural distance refers to cultural difference between the two contracting parties (Simonin, 1999). Research shows that the cultural differences between partners are key obstacles to interorganizational knowledge transfer (see Holtbrugge and Berg, 2003; Mowery, et al., 1996; Simonin, 1999).

Per the KBV proximity between a client and a provider must be chosen carefully, as it is an important predictor of the ease of transferring knowledge and learning from the provider to the client. The key driver for outsourcing globally (also referred as offshoring), has been labor cost savings (Carmel, 1999; Khan and Fitzgerald, 2004; Pfannenstein and Tsai, 2004). However,

outsourcing globally introduces various proximity issues, as discussed above, which create constraints on knowledge flow between a client and its provider (Beulen, et al., 2005; Cummings and Teng, 2003; Simonin, 1999; Sinha and Terdiman, 2002). For example, Western organizations often face issues in transferring knowledge back from international joint ventures with Chinese firms due to factors that could be related to relational, organizational, institutional and cultural distances (Si and Bruton, 1999). On the other hand, biotechnology organizations in close proximity to each other are able to promote exchange of ideas which enhances knowledge transfer among them (Decarolis and Deeds, 1999). Thus, we expect the barriers to transferring knowledge between international locations of the same company to be easier than between separate companies (Figure 2). Even if the company operates globally, its international units will have a similar corporate culture and governance structure (Almeida, et al., 2002; Kogut and Zander, 2003). Thus we propose,

*Proposition 2a: Transferring the knowledge and learning back to a client from a vendor will range from easiest to hardest as follows:*

- *Insource/local*
- *Insource/global*
- *Outsource/local*
- *Outsource/global*

Due to the knowledge transfer issues, proximity is also related to the earlier discussion regarding the strategic value of the underlying knowledge and knowledge maturity of an activity (Figure 1). First, an activity associated with a knowledge that is of high strategic value and low maturity, the organization should insource to local centers of inhouse expertise. Second, one of the issues that a client faces with an activity of high strategic value and high maturity is to be able to monitor the knowledge. If a vendor innovates using the knowledge, the client must be able to transfer that knowledge back since the knowledge is strategically important. Third, if the knowledge associated with an activity is of low strategic value and low maturity the organization may need some time to experiment with the activity to gain more understanding and know if the activity will be of any strategic value. Finally, if an organization wants to outsource an activity that has knowledge of low strategic value and high maturity than knowledge transfer is not an

issue. Such an activity can be offshored to a vendor that can provide the best benefits without worrying about the knowledge transfer. The knowledge transfer needs for such an activity, at best, will be minimal.

<b>Sourcing</b>	<i>Insource</i>	Globally distributed centers of expertise (Somewhat more difficult knowledge transfer)	Local centers of in house expertise (Easiest knowledge transfer)
	<i>Outsource</i>	Off shoring (Most difficult knowledge transfer)	Traditional outsourcing (Moderately difficult knowledge transfer)
		<i>Global</i>	<i>Local</i>

**Proximity**

**Figure 2**

## 6.0 Discussion and Conclusion

Although there is a widespread consensus on the importance of firms' outsourcing decisions, it remains unclear whether or how these decisions affect various dimensions of firm performance (Leiblein, et al., 2002). For example, it is asserted that outsourcing capital intensive production activities improves a firm's ability to respond flexibly to changes in IT or demand, to accumulate external knowledge, to avoid coordination inefficiencies, and to compress product development cycle times. However, outsourcing also contributes to the hollowing of corporations, resulting in the depreciation of existing capabilities. In this article, we have investigated this paradox to suggest that the relationship is contingent on knowledge and learning. It requires active learning by the buyers about IT. This learning is done by either doing the activity or by actively transferring the knowledge back. Following an absorptive capacity argument, even if an organization is not concerned about accumulating IT skills, it might still consider whether or not it will be able to absorb knowledge that is related to IT products or services delivered by other so that they can use or apply IT products or services effectively. Recent case method research has

investigated how firms try and mitigate the potential loss of technical knowledge by retaining the appropriate resources in-house (e.g., Aubert, et al., 2001; Willcocks and Lacity, 1999)

Zack (2003) suggests that a knowledge-based organization take a knowledge perspective for all of its strategic decisions. Organizations often make outsourcing decisions based on task partitioning (von Hippel, 1990) rather than knowledge partitioning (Takeishi, 2002). The two perspectives are different because task partitioning relates to what tasks should reside within a firm and what can be outsourced based on labor division, whereas knowledge partitioning relates to what task should reside within a firm and what can be outsourced based on what knowledge should organization develop and preserve internally. Takeishi (2002) emphasizes, firms need to consider knowledge partitioning while outsourcing an activity. Penrose (1959) pointed out the importance of knowledge and learning to understand the firm. Viewing the firm as a repository of knowledge and experience, she argued, that knowledge is the critical factor to explain the growth of individual firms.

The paper makes various contributions to outsourcing practice. We provide a framework for practitioners that can be used in outsourcing decisions. The framework is by no means limited to outsourcing IT but can be applied to any activity. The paper also makes contributions to outsourcing research. The literature has mostly focused on outsourcing from either a cost reduction or resource gap perspective (Costa, 2001), and has underplayed the role of knowledge and learning. We have argued that organizations must consider an opportunity for learning from an activity that is being considered for outsourcing. While making no pretensions of comprehensiveness, the framework and its concepts can guide future empirical research. The paper builds propositions, which researchers in future can test through longitudinal case studies. Future work should expand the framework, identify specific and testable constructs and propose and test hypotheses. Doing so will contribute to an understanding of the current research and to improving future research and practice while establishing a cumulative tradition for this work.

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## References

- Alchian, A.A., and Demsetz, H. "Production, information costs and economic organization," *American Economic Review* (62), 1972, pp. 777-795.
- Almeida, P., Song, J., and Grant, R.M. "Are firms superior to alliances and markets? An empirical test of cross-border knowledge transfer," *Organization Science* (13:2), 2002, pp. 147-163.
- Altinkemer, K., Chaturvedi, A., and Gulati, R. "Information systems outsourcing: Issues and evidence," *International Journal of Information Management* (14:4), 1994, pp. 252-278.
- Ang, S., and Cummings, L.L. "Strategic response to institutional influences on information systems outsourcing," *Organization Science* (8:3), 1997, pp. 235-256.
- Arnold, U. "New dimensions of outsourcing: A combination of transaction cost economics and the core competencies concept," *European Journal of Purchasing and Supply Management* (6), 2000, pp. 23-29.
- Aubert, B.A., Patry, M., and Rivard, S. "Assessing the Risk of IT Outsourcing," *Proceedings of the The 31st Annual Hawaii International Conference of System Science*, Hawaii, 1998.
- Aubert, B.A., Patry, M., Rivard, S., and Smith, H. "IT Outsourcing Risk Management at British Petroleum," *Proceedings of the The 34th Hawaii International Conference on System Sciences*, Hawaii, 2001.
- Aubert, B.A., Rivard, S., and Patry, M. "A transaction cost model of IT outsourcing," *Information and Management* (41), 2004, pp. 921-932.
- Barney, J.B. "Firm resources and sustained competitive advantage," *Journal of Management* (17), 1991, pp. 99-120.
- Baxter, R.J. "A knowledge based view of the impact of information systems outsourcing," *Proceedings of the Americas Conference on Information Systems*, Tampa, Florida, 2003.
- Beaumont, N., and Costa, C. "Information technology in Australia," *Information Resources Management Journal* (15:3), 2002, pp. 14-31.
- Beulen, E., Fenema, P.V., and Currie, W.L. "From application outsourcing to infrastructure management: Extending the offshore outsourcing service portfolio," *European Management Journal* (23:2), 2005, pp. 133-144.
- Bohn, R.E. "Measuring and managing technological knowledge," *Sloan Management Review* (26:1), 1994, pp. 61-73.



Bounfour, A. "Is outsourcing of intangibles a real source of competitive advantage?," *International Journal of Applied Quality Management* (2:2), 1999, pp. 127-151.

Buhner, R., and Tuschke, A. "Outsourcing.," *Die Betriebswirtschaft* (57:1), 1997, pp. 20-30.

Carmel, E. *Global Software Teams, Collaboration Across Borders and Time Zones*, Prentice Hall, New Jersey, 1999.

Cavusgil, S.T., Calantone, R.J., and Zhao, Y. "Tacit knowledge transfer and firm innovation capability," *The Journal of Business and Industrial Marketing* (18:1), 2003, pp. 6-21.

Cheon, M.J., Grover, V., and Teng, J.T.C. "Theoretical perspectives on the outsourcing of information systems," *Journal of Information Technology* (10), 1995, pp. 209-219.

Chorafas, D.N. *Outsourcing, Insourcing and IT for Enterprise Management*, Palgrave Macmillan, New York, 2003.

Clark, T.D., Zmud, R.W., and McCray, G.E. "The outsourcing of information services: Transforming the nature of business in the information industry," *Journal of Information Technology* (10:4), 1995, pp. 221-237.

Coase, R. "Nature of the Firm," *Economica* (4), 1937, pp. 386-405.

Cohen, W., and Levinthal, D. "Absorptive capacity: A new perspective on learning and innovations," *Administrative Science Quarterly* (35:1), 1990, pp. 128-152.

Copeland, D.G., and McKenney, J.L. "Airline reservation systems: Lessons form history," *MIS Quarterly* (12:4), 1988, pp. 353-370.

Costa, C. "Information technology outsourcing in Australia: A literature review," *Information Management and Computer Security* (9:5), 2001, pp. 213-224.

Cummings, J.L. "Knowledge sharing: A review of the literature," The World Bank, 2003.

Cummings, J.L., and Teng, B.S. "Transferring R&D knowledge: the key factors affecting knowledge transfer success," *Journal of Engineering and Technology Management* (20), 2003, pp. 39-68.

Currie, W.L., and Seltsikas, P. "Exploring the supply side of IT outsourcing: evaluating the emerging role of application service providers," *European Journal of Information Systems* (2001:10), 2001.

Decarolis, D.M., and Deeds, D. "The impact of stocks and flows of organizational knowledge on firm performance: An empirical investigation of the Biotechnology industry," *Strategic Management Journal* (20), 1999, pp. 953-968.

- Dierickx, I., and Cool, K. "Asset stock accumulation and sustainability of competitive advantage," *Management Science* (35:12), 1989, pp. 1504-1514.
- DiMaggio, P., and Powell, W. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," *American Sociological Review* (48:April), 1983, pp. 147-160.
- DiRomualdo, A., and Gurbaxani, V. "Strategic intent for IT outsourcing," *Sloan Management Review* (39:4), 1998, pp. 67-80.
- Due, R.T. "The real costs of outsourcing," *Information Systems Management* (9:1), 1992, pp. 78-81.
- Duncan, N. "Beyond Opportunism: A Resource-based View of Outsourcing Risk," *Proceedings of the the 31st Annual Hawaii International Conference of System Science*, Hawaii, 1998,
- Earl, M.J. "The risks of outsourcing IT.," *Sloan Management Review* (37:3), 1996, pp. 26-32.
- Elitzur, R., and Wensley, A.K.P. "Further thoughts on information structure, knowledge management and outsourcing," In *Information Systems Outsourcing*, R. Hirschheim, A. Heinzl and J. Dibbern (eds.), Springer-Verlag, New York, 2002.
- Grant, R.M. "The resource based theory of competitive advantage: implications for strategy formulation," *California Management Review* (33), 1991, pp. 114-135.
- Grant, R.M. "Toward a Knowledge-based Theory of the Firm," *Strategic Management Journal* (17), 1996, pp. 109-122.
- Greco, J. "Outsourcing: The new partnership," *Journal of Business Strategy*:July/August), 1997, pp. 48-54.
- Grover, V., Cheon, M.J., and Teng, J.T.C. "The effect of service quality and partnership on the outsourcing of information systems function," *Journal of Management Information Systems* (12:4), 1996, pp. 89-112.
- Hansen, M.T., and Lovas, B. "How do multinational companies leverage technological competencies? Moving from single to interdependent explanations," *Strategic Management Journal* (25), 2004, pp. 801-822.
- Hedlund, G. "A model of knowledge management and the N-form corporation," *Strategic Management Journal* (15), 1994, pp. 73-90.
- Holtbrugge, D., and Berg, N. "Knowledge transfer in multinational corporations: Evidence from German firms," *Management International Review* (44:Special Issue), 2003, pp. 129-145.
- Howells, J., James, A., and Malik, K. "The sourcing of technological knowledge: distributed innovation processes and dynamic change," *R&D Management* (33:4), 2003, pp. 395-409.

Hu, Q., Saunders, C., and Gebelt, M. "Research report: Diffusion of information systems outsourcing: A reevaluation of influence sources," *Information Systems Research* (8:3), 1997, pp. 288-301.

Hui, P.P., and Beath, C.M. "The IT sourcing process: A framework for research - (Under review at MISQ)," 2004,

Itami, H. *Mobilizing Invisible Assets*, Harvard University Press, Cambridge, MA., 1987.

Jayatilaka, B., Schwarz, A., and Hirschheim, R. "Determinants of ASP Choice: an Integrated Perspective," *Proceedings of The Hawaii International Conference on System Sciences*, Hawaii, 2002.

Kern, T., and Willcocks, L.P. "Exploring relationships in information technology outsourcing: The interaction approach," *European Journal of Information Systems* (11), 2002, pp. 3-19.

Khalfan, A.M., and Alshawa, A. "IS/IT outsourcing practices in the public health sector of Kuwait: A contingency approach," *Journal of Enterprise Information Management* (16:3/4), 2003, pp. 215-228.

Khan, N., and Fitzgerald, G. "Dimensions of offshore outsourcing business models," *Journal of Information Technology Cases and Applications* (6:3), 2004, pp. 35-40.

King, W.R., and Malhotra, Y. "Developing a framework for analyzing IS sourcing," *Information and Management* (37), 2000, pp. 323-334.

Klepper, R., and Jones, W.O. *Outsourcing Information Technology, Systems and Services*, Prentice-Hall, Englewood cliffs, NJ, 1998.

Klepper, R.J. "The management of partnering development in IS outsourcing," *Journal of Information Technology* (10:4), 1995, pp. 249-258.

Kogut, B., and Kulatilaka, N. "Operating flexibility, global manufacturing, and the option value of a multinational network.," *Management Science* (40:1), 1994, pp. 123-139.

Kogut, B., and Zander, U. "Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology," *Organization Science* (3:3), 1992, pp. 383-397.

Kogut, B., and Zander, U. "Knowledge of the firm and the Evolutionary Theory of the Multinational Corporation," *Journal of International Business Studies* (24:4), 2003, pp. 625-646.

Koppelman, U. "Grundsatzliche Uberlegungen zum Outsourcing," In *Outsourcing*, U. Koppelman (ed.) Schaeffer-Poeschel, Stuttgart, 1996, pp. 1-9.

- Kotabe, M., Martin, X., and Domoto, H. "Gaining from vertical partnerships: Knowledge transfer, relationship duration, and supplier performance improvement in the US and Japanese automotive industries," *Strategic Management Journal* (24:4), 2003, pp. 293-316.
- Lacity, M.C., and Hirschheim, R. "The information systems outsourcing bandwagon," *Sloan Management Review* (35:1), 1993a, pp. 73-86.
- Lacity, M.C., and Hirschheim, R. *Information Systems Outsourcing: Metaphors, Myths and Realities*, Wiley, New York, 1993b.
- Lacity, M.C., and Willcocks, L.P. "An empirical investigation of information technology sourcing practices: Lessons from experience," *MIS Quarterly* (22:3), 1998, pp. 363-408.
- Lacity, M.C., Willcocks, L.P., and Feeny, D.F. "IT outsourcing: maximizing flexibility and control," *Harvard Business Review*), 1995, pp. 84-93.
- Lacity, M.C., Willcocks, L.P., and Feeny, D.F. "The value of selective IT outsourcing," *Sloan Management Review* (37:3), 1996, pp. 13-25.
- Lei, D., and Hitt, M.A. "Strategic restructuring and outsourcing: The effect of mergers and acquisitions and LBOs on building firm skills and capabilities," *Journal of Management* (21:5), 1995, pp. 835-859.
- Leiblein, M.J., Reuer, J.J., and Dalsace, F. "Do make or buy decisions matter? The influence of organizational governance on technological performance," 23:817-833), 2002.
- Leonard-Barton, D. *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation.*, Harvard Business School Press, Boston, MA, 1998.
- Liebeskind, J.P., Oliver, A.L., Zucker, L., and Brewer, M. "Social networks, learning, and flexibility: Sourcing scientific knowledge in new biotechnology firms," *Organization Science* (7:4), 1996, pp. 428-443.
- Linder, J.C. *Outsourcing for Radical Change: A Bold Approach to Enterprise Transformation*, AMACOM, New York, 2004.
- Loh, L., and Venkatraman, N. "Determinants of Information Technology Outsourcing: A Cross-Sectional Analysis," *Journal of Management Information Systems* (9:1), 1992a, pp. 7-24.
- Loh, L., and Venkatraman, N. "Diffusion of information technology outsourcing: Influence sources and the Kodak effect," *Information Systems Research* (3:4), 1992b, pp. 334-288.
- Martinsons, M.G. "Outsourcing information systems: A strategic partnership," *Long Range Planning* (26:3), 1991, pp. 18-25.

McAulay, L., Doherty, N., and Keval, N. "The stakeholder dimension in information systems evaluation," *Journal of Information Technology* (17:4), 2002, pp. 241-255.

McCray, G.E., and Clark, T.D. "Using system dynamics to anticipate the organizational impacts of outsourcing," *System Dynamics Review* (15:4), 1999, pp. 345-373.

Mohr, J.J., and Sengupta, S. "Managing the paradox of inter-firm learning: The role of governance mechanisms," *The Journal of Business and Industrial Marketing* (17:4), 2002, pp. 282-301.

Mol, M.J. "Does being R&D intensive still discourage outsourcing? Evidence from Dutch manufacturing," *Research Policy* (34:571-582), 2005.

Mowery, D.C., Oxley, J.E., and Silverman, B.S. "Strategic Alliances and interfirm knowledge transfer," *Strategic management journal* (17), 1996, pp. 77-91.

Nelson, R., and Winter, S.G. *The evolutionary theory of the firm*, Harvard University Press, Cambridge, MA, 1982.

Nonaka, I. "The knowledge creating company," *Harvard Business Review*:November-December), 1991, pp. 96.

Nonaka, I. "A Dynamic Theory of Organizational Knowledge Creation," *Organization Science* (5:1), 1994, pp. 14-37.

Nonaka, I., and Takeuchi, H. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, New York: Oxford University Press, 1995.

Penrose, E. *The Theory of the Growth of the Firm*, Basil Blackwell, London, 1959.

Pfannenstein, L.L., and Tsai, R.J. "Offshore outsourcing: Current and future effects on American IT industry," *Information Systems Management* (21:4), 2004, pp. 72-80.

Poppo, L., and Zenger, T. "Testing alternative theories of the firm: Transaction cost, knowledge-based, and measurement explanations for make-or-buy decisions in information services," *Strategic Management Journal* (19:9), 1998, pp. 853-877.

Quinn, J.B. *Intelligent Enterprise*, The Free Press, 1992.

Quinn, J.B. "Strategic outsourcing: Leveraging knowledge capabilities," *Sloan Management Review* (40:4), 1999, pp. 9-21.

Quinn, J.B., and Hilmer, F.G. "Strategic outsourcing," *Sloan Management Review* (35), 1994, pp. 43-55.

Radding, A. "Outsourcing options for help desks," *Computerworld* (29:32), 1995, pp. 100.

- Rumelt, R.P. "Towards a strategic theory of the firm," In *Competitive Strategic Management*, R. B. Lamb (ed.) Prentice-Hall, Englewood Cliffs, NJ, 1984, pp. 556-570.
- Sambamurthy, V., Bharadwaj, A., and Grover, V. "Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms," *MIS Quarterly* (27:2), 2003, pp. 237-263.
- Si, S.X., and Bruton, G.D. "Knowledge transfer in international joint ventures in transitional economies: The China experience," *Academy of Management Executive* (13:1), 1999, pp. 83-90.
- Simonin, B.L. "Ambiguity and the process of knowledge transfer in strategic alliances," *Strategic Management Journal* (20:7), 1999, pp. 595-623.
- Sinha, D., and Terdiman, R. "Potential risks in offshoring sourcing," Gartner Research, 2002.
- Spencer, J.W. "Knowledge flows in global innovation system: Do US firms share more scientific knowledge than their Japanese rivals?" *Journal of International Business Studies* (31:3), 2000, pp. 521-530.
- Spender, J.C., and Grant, R.M. "Knowledge of the firm: Overview," *Strategic Management Journal* (17), 1996, pp. 5-9.
- Surpin, J., and Weideman, G. *Outsourcing in Health Care, The Administrator's Guide*, American hospital Association, Chicago, IL, 1999.
- Takac, P.F. "International Journal of Technology Management," *Outsourcing: A key to controlling escalating IT costs?* (9:2), 1994, pp. 139-155.
- Takeishi, A. "Knowledge Partitioning in the Interfirm Division of Labor: The Case of Automotive Product Development," *Organization Science* (13:3), 2002.
- Teece, D.J., Pisano, G., and Shuen, A. "Dynamic Capabilities and Strategic Management," *Strategic Management Journal* (18:7), 1997, pp. 509-533.
- Tsoukas, H. "The Firm as a Distributed Knowledge System: A constructionist approach," *Strategic management journal* (17), 1996, pp. 11-25.
- von Hippel, E. "Task partitioning: An innovation process variable," *Research Policy* (19), 1990, pp. 407-440.
- Willcocks, L.P., Fitzgerald, G., and Lacity, M.C. "To outsource IT or not? Recent research on economics and evaluation practice," *European Journal of Information Systems* (5), 1996, pp. 143-160.
- Willcocks, L.P., Hindle, J., Feeny, D.F., and Lacity, M.C. "IT and business process outsourcing: The knowledge potential," *Information Systems Management* (21:3), 2004, pp. 7-15.

Willcocks, L.P., and Lacity, M.C. "The sourcing and outsourcing of IS: Shock of the new?," In *Strategic Sourcing of Information Technology: Perspectives and Practices*, L. P. Willcocks and M. C. Lacity (eds.), Wiley, Chichester, 1998, pp. 1-41.

Willcocks, L.P., and Lacity, M.C. "IT outsourcing in insurance services: risk, creative contracting and business advantage," *Information Systems Journal* (9:3), 1999, pp. 163-180.

Willcocks, L.P., Lacity, M.C., and Kern, T. "Risk mitigation in IT outsourcing strategy revisited: longitudinal case research at LISA.," *Journal of Strategic Information Systems* (8:3), 1999, pp. 285-314.

Williamson, O. *Markets and Hierarchies: Analysis and Antitrust implications, a study in the economics of Internal Organization*, Free Press, New York, 1975.

Williamson, O. "Transaction cost economics: The governance of contractual relations," *Journal of Law and Economics* (22:2), 1979, pp. 233-261.

Williamson, O. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*, The Free Press, New York, 1985.

Winter, S. "Knowledge and competence as strategic assets," In *The Competitive Challenges: Strategies for Industrial Innovation and Renewal*, D. Teece (ed.) Harper and Row, New York, 1987, pp. 159-184.

Yang, C., and Huang, J. "A decision model for IS outsourcing," *International Journal of Information Management* (20), 2000, pp. 225-239.

Zack, M. "Developing a knowledge strategy," *California Management Review* (41:3), 1999, pp. 125-144.

Zack, M. "Rethinking the Knowledge-Based Organization," *Sloan Management Review* (44:4), 2003, pp. 67-71.

Zack, M. "The Strategic Advantage of Knowledge and Learning," *International Journal of Intellectual Capital and Learning* (2:1), 2005, pp. 1-20.

Zack, M.H. "Interactivity and Communication Mode Choice in Ongoing Management Groups," *Information Systems Research* (4:3), 1993, pp. 207-239.