

Putting the Organizational Knowledge System Back Together Again: A Strategic Knowledge Management Typology for Outsourcing Firms

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This paper offers three strategic types that depict how outsourcing influences a firm's ability to create an effective knowledge management strategy. Outsourcing firms encounter unique problems when creating knowledge management programs. These firms may seek to leverage their "whole" knowledge base when they only retain some of the parts. We propose that a firm's strategic intent to management knowledge from internally and externally performed activities is contingent on the firm's motive for outsourcing. Using transaction cost economics, capability logic, and open innovation, this discussion presents three strategic types that illustrate how outsourcing firms resolve knowledge creation, transfer, and integration problems.

Keywords: Knowledge Management, Outsourcing, Strategy Formulation

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I. Introduction

In a globally competitive and technologically complex business environment, scholars argue that the purpose of the firm is to establish efficient processes and systems that facilitate the creation, coordination, and transformation of knowledge into new products and services (Kogut and Zander, 1992, Grant, 1996). Executives may inadvertently undermine this purpose by re-configuring their value chain to become more adaptive to environmental challenges (Greer et al., 1999). A firm's value chain consists of productive and secondary activities. Productive activities such as logistics or research and development (R&D) that directly influence delivery goods and services to the customer and secondary activities such as accounting or procurement support productive activities. Organizational knowledge resides in interconnected repositories (Argote and Ingram, 2000), where knowledge flows between and connects productive and support activities.

When outsourcing, a firm may eliminate or disrupt processes, social interactions, and structures that facilitate the emergence and deployment of organizational knowledge into value-generating products and services. The increasing demands of a hyper-competitive environment require firms to manage their knowledge resources in order to gain advantage. Outsourcing may hinder firms' ability to access or leverage all their knowledge resources, thereby reducing the firm's capacity to: (1) respond to customers' needs and (2) capitalize on opportunities as they arise.

The role of knowledge management (KM) is increasing in many organizations, as executives have begun to realize that effective management of knowledge resources is a source of competitiveness (Randeree, 2006). Outsourcing firms (hereafter outsourcers) face unique KM challenges because their knowledge is distributed within the core processes of the external service provider. KM is a

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process of identifying, capturing, and leveraging a firm's collective knowledge to help it compete (von Krogh, 1999). A broad eclectic stream of research has focused on the most effective and efficient ways of managing knowledge. Some KM researchers have addressed systems and integration (Sanchez and Mahoney, 1996; Mahlotra, 2005), others have identified critical KM success factors (Wong and Aspinwall, 2005), and still others have concentrated on KM process effectiveness (Chong and Chong, 2009). Existing studies have enhanced our understanding of how effective KM strategies influence firm performance. Yet, an implicit assumption in KM research is that firms have continuous control of and the ability to access and deploy their knowledge at their discretion.

This may not be the case for outsourcers, because they have a knowledge gap in their systems. When a function is outsourced, the outsourcer loses peripheral knowledge (Tiwana and Keil, 2007), which involves how the activity is performed and how it links to other activities (Henderson and Clark, 1990). The outsourcing gap represents the loss of processes, personnel, and knowledge associated with the outsourced function. Heedful, caring, and attentive care (Weick and Roberts, 1993) relationships that once existed among employees may be fraught with mistrust and uncertainty. Through heedful interactions, geographically dispersed or functionally different groups and teams use "heed" as a currency that facilitates knowledge creation, sharing, and integration. Outsourcing leads to the readjustment of a firm's workforce in terms of roles, responsibility, and size (Ranganathan and Outlay, 2009), all of which can lead to disruptions in a firm's knowledge production system. Knowledge creation, transfer, and integration are social activities (Larsen, 2001). When outsourcing occurs, the social interactions among employees change because jobs may be eliminated and employees may be terminated or reassigned to different departments.

As adaptive systems, firms can compensate for the gap in the system by developing KM strategies that afford them access to the knowledge generated by their outsourced activity. Since organizations outsource for different reasons, their KM strategies may also need to vary in order to address the gap. For example, a biotechnology firm that outsources R&D activities, such as lab testing, has different KM needs than an accounting firm that outsources its payroll function. The biotechnology firm has a need for quality and coordination between the firm and the service provider (Mudambi and Tallman, 2010). Since the accounting firm is outsourcing a standard process, its KM needs may be minimal. We propose that an outsourcer's desire and strategic intent to manage its entire knowledge base by creating a KM strategy, which includes internal and external knowledge, is contingent on the firm's motive for outsourcing.

The purpose of our paper is to present a typology that describes how different KM strategies arise from the way outsourcers' attempt to close their outsourcing knowledge gap. A typology allows us to explore extremely complex phenomena in a relatively simple fashion by combining a number of variables into a single construct (Mechanic, 1962). In constructing our typology, we answer three questions:

- What are firms' motives for outsourcing?
- What is the nature of the outsourcer's knowledge gap?
- How do outsourcers resolve KM problems that arise when closing the gap?

To achieve our purpose, we use contingency theory to create strategic types that depict how KM strategies vary based on organizations' outsourcing motives. Contingency theory contends that there is no one best way to organize or strategize (Donaldson, 2001; Hofer, 1975). Thus, organizational effectiveness is a function of the fit among contingency factors (Zott and Amit, 2008). "Fit" reflects the notion that managers will make choices that are consistent with their

organization's strategy (Zahra and Covin, 1994). In this discussion, fit involves two contingency factors: (1) outsourcing motives and (2) knowledge-based activities.

A review of the literature highlights three common motives for outsourcing. First, firms outsource to reduce cost, improve efficiency, and focus on core business, innovation, modernization, and even business transformation (Ferguson, 2009). Transaction-cost economics theory involves saving money by converting fixed costs into variable costs (Ellram, Tate, and Billington, 2007). Second, capability-based logic suggests that firms eliminate non-value-added activities in order to focus its resources on conducting and strengthening activities that provide them with a basis for developing and sustaining a competitive advantage (Tiwana and Keil, 2007; Insigna and Werle, 2000). Third, open innovation depicts how organizations have begun outsourcing more visible, innovative, and sensitive functions such as R&D (Leiblein, Reur, and Dalsace, 2002), because they do not possess all the knowledge to out-innovate their competitors (Quinn, 2000).

We propose that a firm's motive for outsourcing describes the nature gap and the KM challenges that outsourcing firms may encounter when attempting to close it. The make-up of the knowledge gap consists of outsourcer's need to access outsourced knowledge and the characteristics of the relationship between the outsourcer and the service provider. Regarding the accounting firm that outsources its payroll function, there may be minimal need for contact between the outsourcer and the external service provider except to share information on new hires, salaries, and deductions. All of which is standard information that can be transferred via an interface between the two parties' IT systems. Interactions between the outsourcer and the supplier are contractual. Since the information that passes between the two parties is standard, the outsourcer may encounter problems when attempting to close the gap because its processes and systems are constructed to gain access to easily codified knowledge. Few channels may exist to transfer tacit knowledge between the parties. Therefore, the outsourcer may rely heavily on contractual methods to close its knowledge gap.

Outsourcing motives lie on one side of the gap, while knowledge-based activities lie on the other side. Scholars have found that an organization's ability to solve KM issues related to creation, transfer, and integration is inextricably linked to its propensity to succeed in an increasingly competitive business environment (Grant, 1996; Kogut and Zander, 1992; Nonaka, 1994). Knowledge creation is defined as the method through which new ideas are generated, incorporating activities, interactions and other organizational mechanisms (Styhre, Roth, and Ingelgard, 2002). Knowledge transfer reflects the perceived receipt of information and/or advice that has a positive impact on organizational tasks or activities (Levin, Abrams, and Cross, 2004). Knowledge integration involves the synthesis of knowledge into situation-specific systemic knowledge (Alavi and Tiwana, 2002).

This discussion brings both sides of the gap together to create a single typology that includes three strategic types (minimizers, developers, innovators) categorized according to their motives. We offer a single typology because the phenomenon - the outsourcing knowledge gap, is common across outsourcers; however, the manner in which outsourcers solve KM problems that arise while closing the gap will differ based on their outsourcing motives. The three strategic types are defined by their desire to reduce costs (minimizers), focus on core capabilities (developers) or participate in outsourcing activities to gain access to innovative ideas that advance new product development (innovators).

These categorizations are important to the field of knowledge management as they help draw attention to how outsourcing disrupts a firm's knowledge production system. Scant

attention has been paid to outsourcing knowledge gaps. We believe this is an important topic as firms dissect their value chain into pieces and disseminate some of these pieces to external service providers around the world. The days of internalizing the entire value chain may be gone. In the era of a distributed value chain, firms still need to leverage all their knowledge resources. Understanding their outsourcing knowledge gap may contribute to organizational competitiveness. A potentially new era in KM, our second objective is to present an analytical tool such as a typology that may encourage scholarly discussions. By initiating these discussions, this typology will help scholars and managers understand the phenomenon of outsourcing knowledge gaps, develop theories, and propose empirical questions to explore them.

This paper is organized as follows: it highlights the firm as a knowledge-production system. Then, it advances the KM typology, followed by concluding discussion which outlines a possible agenda for future research.

II. Literature Review

The primary argument put forth in this paper intimates that outsourcing leads to a gap in a firm's knowledge system. The purpose of this literature review is to support this argument by achieving two goals. We portray the organization as a knowledge production system. Then we identify potential changes to this system that would lead to gaps in the system.

A. The Firm—A Knowledge Production System

The centrality of knowledge in the management science literature emerges from the Resource Based View of the Firm (Wernerfelt, 1984), which "directs attention into idiosyncratic firm capital and postulates that performance is ultimately a return on the unique assets owned and controlled by the firm" (Spanos and Lioukas, 2001, p. 908). Knowledge is one such asset that firms can use to create and sustain a competitive advantage because of its unique characteristics. Organizational knowledge resides in people, tools, and tasks (Argote and Ingram, 2000). Research on embeddedness draws attention to how the type of knowledge influences how easily it can be shared with and imitated by others.

There are two forms of knowledge: explicit and tacit. Codified or explicit knowledge is revealed by its communication (Grant, 1996) and is easily shared with others. Tacit knowledge resides in the human mind (Polanyi, 1966); therefore, it is sticky and difficult to transfer (Szulanski, 1996). In addition to residing very close to the domain of origin, tacit knowledge is ambiguous, with individuals and whole firms sometimes claiming that they cannot articulate "what they know or why they know it." Pieces of the system work together but it is difficult for employees to articulate a reason (Simonin, 1999). Firms seeking to acquire tacit knowledge must be willing to commit resources and effort to dislodge and transfer specialized knowledge (Santoro and Bierly, 2006). Knowledge stickiness and ambiguity make it difficult for a firm's competitors to duplicate its knowledge resources.

Since it is difficult to duplicate and is ambiguous, tacit knowledge is essential to an organization's ability to create value and develop a competitive advantage. Of all possible resources that a firm might possess, its knowledge base has perhaps the greatest ability to serve as a source of sustainable differentiation and competitive advantage (Gupta and Gavindarajan, 2000, p. 473). Kogut and Zander (1992) acquiesce with their peers with an even stronger sentiment on knowledge. The scholars propose that organizations exist to create and coordinate specialized

knowledge. This perspective is similar to the one put forth by Nonaka and Takeuchi (1995) that describes the organization as a knowledge creating entity. Grant (1996) adopts a different approach by suggesting, "the primary role of firms is in the application of existing knowledge to the production of goods and services" (p. 112). The literature clearly explicates that the purpose of the firm and its ability to gain an advantage depends on managers' ability to leverage the firm's knowledge in productive activities such as creation, integration, and application.

Regarding KM, there are two critical elements to the conceptualization of the firm as a knowledge-based system. First, the firm represents is the entire KM system. This conceptualization does not address the possibility of KM being an inter-organizational activity. Second, managers can control and leverage a firm's knowledge resources at their discretion. This perspective represents the "computer metaphor" approach to KM strategies (Fiol, 2002), which assumes that firms can access, store, and retrieve knowledge as needed. However, outsourcing is causing the organizational knowledge landscape to change.

When a firms' outsource, scholars (Hutchins, 1991; Weick and Roberts, 1993) propose that organizational knowledge is dispersed (i.e. it is situated in many different places in the firm) and not possessed or known by a single employee (Larsen, 2001). The challenge for organizations is to manage knowledge that is emergent, partly originates outside the firm, and it is never complete at any point (Tsoukas, 1996, p. 22). Our typology attempts to describe how outsourcing distributes knowledge across organizational boundaries, and identify the challenges that outsourcers encounter when attempting to manage.

III. Knowledge Management Typology for Outsourcing Firms

Contingency theory suggests that an organization's effectiveness is contingent upon an organization's ability to fit organizational characteristics to its situation. Fit is a homeostatic condition that exists between an organization and its operating environment. In this state, a firm attempts to adapt to its environment in order to achieve its goals and objectives. When top executives develop strategies, they are motivated to attain fit because it leads to higher and more effective performance (Donaldson, 2001). One method to determine how firms achieve fit or alignment with their environment is through classification.

We selected outsourcing motives and KM activities to examine how KM strategies emerge when outsourcers attempt to find a fit within their dispersed knowledge environment. Outsourcing is an important factor because firms may encounter long-term consequences if they fail to manage their outsourcing knowledge. Outsourcers may lose the ability to seize and develop new opportunities (Bettis, Bradley, and Hamel, 1992) and may experience a decline in productivity, quality, and collective knowledge (Kakabadse and Kakabadse, 2000; Prahalad and Hamel, 1990) as employees leave due to increased job dissatisfaction (Kennedy et al., 2002).

After reviewing the literature, scholars (Grant, 1996; Kogut and Zander, 1992; Nonaka and Takeuchi, 1995) identify knowledge creation, transfer, and integration as activities that play a critical role in organizational competitiveness. In this discussion, the KM activities represent the structure of a firm's knowledge production system that represents the flow of knowledge throughout the organization, the links between the KM activities, and the channels used to disseminate knowledge to relevant parties. In the following discussion, we present outsourcing and KM activities as the core elements of how outsourcers create KM strategies that align to their new organizational reality. Outsourcing motives will be present with each strategic type. Our goal in the following discussion is to introduce outsourcing as a disruptive activity.

A. Outsourcing

Organizations assess their value chains to identify their capabilities, uncover sources of redundant and inefficient activities, and gain access to customers in order to identify and fulfill their needs, which in turn may yield profits and loyalty. The decision to outsource or vertically integrate a value chain activity represents one of the more complex choices facing a firm's managers (Leiblein et al., 2002, p. 817). Outsourcing calls for a firm "to contract out or sell the functions, assets, people, information, information technology, and activities to a third-party supplier who, in return, manages the people and assets and provides a service for a financial return" (Braganza, 2002, p. 565). There are two types of outsourcing: substitution and abstention. Substitution represents a restructuring of the value chain by ceasing internal production of a good or service and procuring it from an external provider (Gilley and Rasheed, 2000). Abstention occurs when firms acquire expertise from intermediate markets of making the necessary investments to internalize production (Holcomb and Hitt, 2007).

This discussion focuses on substitution because this type of outsourcing involves removing a part of a firm's existing system. In doing so, the firm may need to reconfigure activities to address the elimination of a part of the whole. Research shows that outsourcing increases job turnover as the survivors of outsourcing/downsizing are motivated to leave (Trevor and Nyberg, 2008). Under the best circumstances, outsourcing may cause fear, uncertainty and may even lead to depression or violence among affected employees (Overby, 2004). Given the psychological effects of outsourcing, firms often encounter diminishing service quality (Kakabadse and Kakabadse, 2001) because employees who survive outsourcing layoffs have a decreased commitment to the organization.

Since employees are an organization's main source of tacit knowledge, outsourcing related layoffs, terminations, and departmental transfers reduces the firm's stock of knowledge assets. In other words, outsourcing causes a gap in a firm's knowledge system. As previously mentioned, the gap consists of the outsourcer's need to access outsourced knowledge and the nature of the relationship between the outsourcer and the service provider. Since knowledge is a social construct, relationships or lack thereof will play an important role in how outsourcers adapt their KM activities to acquire knowledge from the service provider.

B. KM Activities

KM strategies support the articulation and reinforcement of a firm's corporate or business strategy. Based on extant knowledge literature, an outsourcing firm's KM strategy should focus on three knowledge issues: creation, transfer, and integration. These three issues highlight a firm's ability: (1) ability to succeed in an increasingly competitive business environment and (2) to leverage its knowledge resources in a distributed environment (Kogut and Zander, 1992; Nonaka, 1994; Nonaka and Takeuchi, 1995; Grant, 1996). The following section examines three knowledge-related issues: creation, transfer, and integration.

First, knowledge creation is defined as the method through which new ideas are generated, incorporating activities, interactions and other organizational mechanisms (Styhre, Roth, and Ingelgard, 2002). The process involves identifying, making sense of, and harnessing knowledge created by individuals and connected it to a firm's organizational knowledge system (Nonaka and von Krogh, 2009). Creating new knowledge involves the interplay between individual effort and social interaction and is driven by the interplay of human capital needed to meet product or

customers' needs (Kakabadse, Kourzmin, and Kakabadse, 2001). While there is no magic formula to achieve this, the literature contains many descriptions of the social interplay required to create new knowledge.

For outsourcers, the new knowledge problem involves an activity that is performed by an external service provider. Expanding McFadyen and Cannella's (2004) definition, we define new knowledge as insights identified by the external service provider when performing an outsourced activity that had not been previously identified by outsourcer. Outsourcing eliminates the "work" or social interactions needed to create knowledge. The outsourcing knowledge gap does not involve coordinating social interactions. The gap involves awareness. In order for an outsourcer's managers to make strategic decisions about the disposition of the new knowledge, they have to know about it first.

Second, after discovering the new knowledge, an outsourcer's managers may seek to gain access to it. Knowledge transfer reflects the perceived receipt of information and/or advice that has a positive impact on organizational tasks or activities (Levin, Abrams, and Cross, 2004). The process involves the transmission and absorption of knowledge, which culminates in a behavioral change by the recipient (Davenport and Prusak, 1998, p. 32). Employee-related issues lie at the heart of the knowledge transfer problem. Knowledge transfer occurs when individuals feel a sense of connection with their colleagues (Bresman, Birkinshaw, and Nobel, 1999), with perceived trust-worthiness increasing cooperation between the two parties (Dirks and Ferrin 2001).

The transfer solution draws attention to an organization's ability to motivate its employees, use technology as a tool to exchange information and facilitate interactions. An organization should develop structures that break down hierarchies in the organization, thereby enabling it to transfer knowledge (Nonaka, 1994). Cross-functional collaboration also contributes to employees being able to develop a common language. An individual can internalize tacit knowledge when the partner possesses similar capabilities or resources (Mowery, Oxley, and Silverman 2002). The efficiency and effectiveness of knowledge transfer can be expressed in terms of a common language (Grant, 1996, p. 111).

Information technology (IT) systems play a critical role in the knowledge transfer process. Channels such as electronic communities provide channels for employee communication regardless of geographic location. When participating in online communities, members can develop relationships, build social capital, and engage in collaboration knowledge sharing (Riverin and Stacey, 2008; Munos, 2006). Online networks bring employees together to facilitate knowledge transfer. By actively participating in the community, members establish their legitimacy and commitment to the network, which enables them to gain access to network resources (Kale and Singh, 2009). In summary, knowledge transfer influences the outsourcing knowledge gap in several ways. First, the outsourcers' and external service providers' employees must be incentivized to share knowledge. Second, the outsourcer's managers may need to expose employees to diverse sources of knowledge so they can make sense of the external service providers' knowledge.

Once a firm gains access to knowledge, it must integrate it into its knowledge repositories. Third, knowledge integration involves the synthesis of knowledge into situation-specific systemic knowledge (Alavi and Tiwana, 2002). The process hinges on how members acknowledge and integrate their individually held "know-how," implying that timely insights can be drawn at the right moment for sense-making by the transactors—in other words, knowledge can be exchanged, shared, evolved, refined, and made available at points of need (Badii and Sharif, 2003). The final burden rests with individuals who decide how to translate raw

knowledge into usable knowledge via their acute understanding of business contexts (Lee and Yang, 2000).

Knowledge integration solutions entail structures that facilitate sense making, organizing, and cooperative behaviors. Firms may use formal and informal mechanisms to facilitate transfers of existing knowledge to different areas (Szulanski, 1996) and to stimulate the creation of firm-specific knowledge (Matusik and Hill, 1998). Acting as "semi-structures," formal interventions may consist of simple rules that are sufficiently rigid to produce organized change, but not so rigid as to prevent change from occurring (Eisenhardt and Sull, 2001). In addition to formal structures, firms may use electronic communities as well as personal interactions to facilitate communication because these devices allow everyone to talk at their discretion, overcoming barriers of space and time (Fuchs, Minnite, and Shapiro, 2000). The use of personal relationships and electronic networks are complementary methods of coordination with suppliers rather than competing mechanisms (Kraut et al., 1999, p. 735). Formal and informal structures are central to a firm's ability to integrate knowledge. Table 1 summarizes these KM activities.

In summary, a firm's KM activities involve a series of complex activities among people, processes, and technologies that involves the creation, dissemination and integration of knowledge to produce value. When a firm outsources a function or activity, productive knowledge sources that supported the activity may be eliminated or redeployed, which leads to an outsourcing knowledge gap.

Table 1: Summary of Knowledge Management Problems

	Creation	Transfer	Integration
Definition	Insights identified by the external service provider when performing outsourcers' activity that had not been previously known or identified by outsourcer (McFadyen and Cannella, 2004).	The knowledge transfer process consists of transmission and absorption, culminating in a behavioral change by the recipient (Davenport and Prusak, 1998, p. 32).	Knowledge integration implies that timely insights can be made available to be drawn at the right juncture for sense making and be made readily available at the point of need (Badii and Sharif, 2003).
Problem	Awareness of new knowledge.	Creating systems that motivate employees to share their knowledge and support cross-functional collaboration	How members know and integrate their individually held know-how.
Solution	Processes that facilitate the identification of new knowledge that emerges from an outsourced activity.	Systems enable employees to interact across boundaries and reward them for sharing knowledge.	Structures that guide sense making, facilitate action, and promote communication.

C. Strategic Types

Creating a typology involves "arranging a set of entities into groups, so that each group is as different as possible from all other groups, but each group is internally as homogeneous as possible" (Bailey, 1994, p. 1). A typology is a form of classification that "begins with theory: it specifies combinations of variables for testing a priori generated conceptual types (Miller and Friesen, 1984). There is a significant trend in the literature to explore outsourcing phenomena using the transaction costs economics perspective (Ellram, Tate, and Billington, 2007; Kaufman, Wood, and Theyel, 2000), capability perspective (Espino-Rodriguez and Gil-Padilla, 2005; Holcomb and Hitt, 2007), and open innovation (Quinn, 2000; Howells, Gagliardi, and Malik, 2008). We employ these theoretical perspectives to construct three KM strategic types that describe how outsourcing firms close their knowledge gaps.

Our first strategic type, Minimizers, outsource to reduce costs. This strategic type's outsourcing decision depends on the relative monitoring costs that arise from the inability to make perfect decisions, and from the uncertainty that arises when the firm must trust a self-interested external agent, which may be prone to opportunistic behavior (Kaufman et al., 2000). Developers, our second strategic type, outsource to diversify their knowledge base given the boundaries of their technological trajectory. Our final strategic type, Innovators, use outsourcing to develop innovative capabilities, searching for partners who possess diverse ideas that extend beyond the traditional corporate perspective (Munsch, 2004).

The following section presents these strategic types by describing each category's outsourcing motives and characteristics of the outsourcing knowledge gap. As previously discussed, the outsourcing knowledge gap reflects the outsourcer's need for the external service provider's knowledge and offers insight on the nature of the relationship between the two parties. Characteristics of the outsourcing knowledge gap play an important role in how these three strategic types address problems tied to knowledge creation, transfer, and integration.

C.1. Minimizers

Outsourcing Motives: One of the most common reasons for outsourcing is the reduction of costs. Firms that outsource for costs follow a rational, linear path that focuses on reducing costs by decreasing its transactions, which enables them immediately save money by reducing costs (Kelley, 1995). This motive highlights research on transaction costs economics (TCE) and follows a long tradition of academic interest (Coase, 1937; Williamson, 1985) on issues relating to the boundary of the firm. TCE proposes that vertical boundary decisions may be influenced by characteristics associated with efficiency of the chosen firm or organization (Leiblein and Miller, 2003, p. 841). An organization's decision to outsource depends on the "relative monitoring costs that arise from the inability to make perfect decisions and from the uncertainty that arises when the firm must trust a self-interested external agent, which may be prone to opportunistic behavior" (Kaufman, Wood, and Theyel, 2000, p. 650). Cost-related outsourcing decisions help the firm achieve short-term benefits.

Outsourcing Knowledge Gap: For Minimizer's, when there is a high-level of specificity associated with the outsourced function or activity, outsourcers, it may be more efficient for a firm to internalize the activity. Since monitoring costs increase with the resource specificity, the outsourced activities will have low specificity and easily standardized. The nature of the relationship between the outsourcer and the external service provider is limited to stipulations

agreed to the in the outsourcing contract. Minimizers use the relationship as a medium to monitor and monitor the externals service provider.

Knowledge Management Activities: Minimizers' knowledge creation problem focuses on how they will control knowledge created by outsourcing suppliers. Minimizer short-term focus on cost cutting draws managers' and employees' attention away from knowledge creation activities and toward operational activities; however, these firms may seek to gain control of knowledge generated by the agent in the course of performing their contracted duties. Controlling or ownership of the knowledge is important because it provides Minimizers with the right to profit from or exploit knowledge generated from their assets, functions, or services. Minimizers use two methods to gain ownership of their knowledge resources.

First, they can specify rules of ownership ex-ante in service level agreements. This solution requires Minimizers to use planning and analysis techniques to anticipate what type of knowledge the supplier could create to enhance the outsourced function, activity, or service. Planning requires managers to create models and scenarios to find answers to critical questions regarding the firm's desired future positioning (Mazzola, Marchisio, and Astrachan, 2008). The Minimizer assumes that it can accurately forecast its knowledge needs, which is a difficult task because "managers must use information from lower-level employees, who may filter out negative information, to compile an accurate account of external activities" (Starbuck, 1993, p. 80). The Minimizer does not have the flexibility to incorporate new and alternate scenarios into the forecast (Rudd et al., 2008) after the outsourcing service agreement is signed. If Minimizers inaccurately assess the suppliers' knowledge-creation capabilities, then the suppliers may use this miscalculation as an opportunity to increase costs by supplying unnecessary knowledge and information. A benefit associated with the solution is that it requires that Minimizers assess the operations, which may enhance its ability to garner additional cost savings.

Second, Minimizers may attempt to gain ex-post control of knowledge created by the supplier by threatening to terminate the contract or to use litigation to resolve the issue. In this instance, Minimizers have low bargaining power because they did not include a stipulation regarding the ownership and control of knowledge in the outsourcing contract. Thus, a key issue at hand is the appropriability of the knowledge. If appropriability is low, it may increase Minimizers' costs to pursue a legal remedy to obtain a resource that may not be exploitable. If the appropriability of the knowledge is high, it may be advantageous for Minimizers to seek joint ownership, which will allow both parties to earn profits from the knowledge without incurring legal costs.

Minimizer's transfer problems draw attention to how to gain access to the new knowledge. The solutions to the transfer problems involve implementing control and monitoring the system to in order to identify (a) changes such as new knowledge creation, (b) how new knowledge may benefit their operations, and (c) how to secure new knowledge from suppliers. When firms execute complex business activities, they must do more than guard against opportunism and must solve significant logistical and communication problems—problems of coordination (Kraut et al., 1999, p. 725). Minimizers solve the transfer problem by implementing control and monitoring systems that support the articulation of its efficiency strategy. Control processes regulate organizational activities to align them with the firm's goals and objectives (Muralidharan and Hamilton, 1999). Minimizers use information systems and electronic networks to monitor and control the integration process.

The use of technology enables Minimizers to receive a timely flow of information that can be then fed back to into the organization to ensure continuous operations. Since the relationship

between the supplier and Minimizer is primarily transactional, information systems and electronic networks provide Minimizers with the best opportunity to monitor the transfer process. These systems provide the Minimizer with an opportunity to establish a medium of communication with its supplier(s) and actualize a method for measuring the transfer process. Control systems provide the Minimizer with the ability to monitor all aspects of the outsourced activity. However, monitoring can be very resource intensive and expensive. Consequently, monitoring techniques may erode short-term cost savings, which drive the Minimizer's motive for outsourcing.

The Minimizer defines its knowledge integration problem in terms of facilitating and coordinating suppliers' knowledge for purposes of enhancing ongoing operations. Minimizers move to develop efficient quality control processes. These processes create standards and facilitate smooth knowledge integration across firm boundaries. However, this plan may leave it vulnerable to opportunistic behavior. For example, when a Minimizer outsources component production, it must still develop technical knowledge to support the integration of the component into its system. Supplier-created technological knowledge may cause component integration problems if the Minimizer does not develop the requisite knowledge for keeping pace with suppliers. In outsourcing relationships, knowledge asymmetry tends to favour suppliers. On the positive side, Minimizers have a greater capability to communicate with suppliers, thus contributing to operational transparency and reducing opportunism. Table 2 summarizes the Minimizer's KM strategy.

Table 2: Minimizers' Knowledge Management Strategies

KM Activity	Problem	Solution
Knowledge Creation	How to predict new knowledge creation?	Plan and forecast knowledge needs that are incorporated into the outsourcing contract.
Knowledge Transfer	How to ensure that the suppliers share their transaction-based knowledge?	Implement structures to control and monitor knowledge transfer.
Knowledge Integration	How to integrate suppliers' knowledge to enhance operations?	Create standards and facilitate smooth knowledge integration across firm boundaries.

C.2. Developers

Outsourcing Motives: The capability-based perspective contends that when "there is neither competitive advantage nor significant internal capability, any in-house activity should be stopped as quickly and cleanly as possible to avoid any further drain on the enterprise's resources" (Insigna and Werle, 2000: 66). Firms should outsource an activity based on its competitive value, conditions that makes the activity a source of a competitive advantage: for example, valuable, costly to imitate, and non-substitutable (Espino-Rodriguez and Gil-Padilla, 2005). A firm should internalize what it does well in order to exploit existing capabilities and outsource non-core capabilities to gain access to superior capabilities that exist beyond the firm's

boundaries. In other words, a firm should contract out everything but its soul (Kouzes and Posner, 2003).

Outsourcing Knowledge Gap: Developers seek to diversify their knowledge base by maximizing their learning and innovative opportunities given the boundaries of their technological trajectory. This strategic type builds up competencies in closely related fields by identifying opportunities to acquire new knowledge from its external service provider. To do so, Developers establish strong links with the service providers to identify knowledge today that will be useful in the future.

KM Activities: Developers define its knowledge creation problem as how to allocate resource attention to knowledge exploration and exploitation activities. The solution requires the Developer to implement systems that facilitate continuous environmental scanning and participate in external networks. Scanning refers to the managerial activity of learning about events and trends in the organization's environment (Hambrick, 1981). Firms that compete in a high-velocity environment should develop and maintain effective scanning mechanisms to enable managers to identify and act on shifts in environmental trends that may provide opportunities for new products and services (Barringer and Bluedorn, 1999). The exchange of information with the environment and extra-organizational professional activities can help managers and non-managers to improve their knowledge of environmental events and trends in order to initiate change and propose new ideas for adoption (Damanpour and Schneider, 2006, p. 220). Effective environmental scanning programs enable decision-makers to understand current and potential changes taking place in their institutions' external environments (Fahey and Narayanan, 1986). Once alerted to changes in its supplier's environment, the Developer can then marshal its resources towards capitalizing on exploration or exploitation opportunities. Scanning provides managers with access to real-time information that increases their ability to make decisions and their options of choices.

The second part of this solution addresses the importance of the Developer's social network of external contacts. Networks are effective mechanisms through which members can exchange information and knowledge to those who need it (Gulati, Dialdin, and Wang, 2002). Participating in social networks, the Developer can build relationships and enhance its reputation by showing itself as trustworthy and competent. These attributes are the cornerstones of successful inter-organizational relationships. The Developer may also benefit by capturing spillovers from the partner's network connection. Network participation offers the Developer opportunities to operationalize its exploration strategy, but it may become constraining when employees fail to look beyond the network to access additional knowledge (Gulati et al., 2002).

Developers define knowledge transfer problems in terms of preserving proprietary knowledge associated with core competencies while benefiting from their partners' knowledge. Knowledge transfer is a dyadic process through which Developers' employees can be both recipients and providers. The duality of the transfer process is problematic for the Developer, who desires to keep knowledge regarding its core competencies proprietary. The Developer, similar to the Minimizer, must guard against opportunistic behavior. The Developer should create and implement structures that facilitate knowledge sharing and minimize the threat of opportunism. The solution hinges on the Developer's ability to initiate and sustain a long-term relationship with its partner. Long-term contractual arrangements are types of social control mechanism that induce cooperation by fostering an attachment. Through a long-term agreement, both parties can demonstrate their competence and show their commitment to accomplishing interdependent goals. Developing long-term outsourcing relationships reflects a "trend away from short-term contracts with numerous

suppliers" (Sako, 1992, p. 52), to long-term contracts that "match the organization's intent and goals to vendor relationships" (Diromualdo and Gurbaxani, 1998, p. 73).

Considered a form of social control, long-term contractual arrangements induce cooperation by fostering attachments. Through long-term agreements, parties demonstrate competence and commitment to accomplishing interdependent goals. As the nature of the relationship shifts from contractual to partnership-based, knowledge sharing becomes more critical to success (Lee, 2001). Since both firms have a stake in relationship success, knowledge sharing is encouraged. Long-term relationships give Developers and suppliers the necessary time to establish a common language and to facilitate employee social networks. A drawback is the potential for being stuck in relationships with partners who lack the necessary skills for performing outsourcing functions. Developers must use their existing networks to minimize this risk.

The Developer defines its integration problem as how to increase employees' ability to make sense of and apply the supplier knowledge while enacting their roles. The Developer can implement policies that enable employees, from various parts of the organization, to work with external service providers for a specific length of time. Cross-functional collaborations rescue employees from their departmental mental models by offering them a chance to learn and incorporate new knowledge into their work activities. Rotating employees facilitates the distribution of knowledge across different functions and business units. By rotating teams, the Developer enhances employees' ability to make sense and distribute the partner's knowledge. While participating in an inter-organizational team, employees possess the ability to learn new skills from the partner while enhancing their existing knowledge.

Furthermore, it is essential for the Developer to select the right employees for these teams. For example, it may be detrimental for the Developer to require one of its subject matter experts to participate on the team. The expert may share proprietary information or challenge the partner's knowledge, which may foster negative feelings between group members. Table 3 summarizes Developers' KM strategies.

Table 3: Developers' Knowledge Management Strategies

KM Activity	Problem	Solution
Knowledge Creation	How to allocate resource attention to exploration and exploitation activities?	Create structures that facilitate continuous environmental scanning to identify opportunities to explore new or exploit existing knowledge.
Knowledge Transfer	How to keep knowledge related to its core competencies proprietary while benefiting from its partners' knowledge?	Use long-term contracts as a social control mechanism to promote goal interdependence and knowledge sharing.
Knowledge Integration	How to increase employee's ability to make sense of and apply the supplier knowledge while enacting their roles?	Rotate different employees to work with external service providers to provide employees with exposure to different knowledge, which increases their ability to make sense of new information.

C.3. Innovators

Outsourcing Motive: Previously, organizations believed outsourcing the creative initiative to an external party would be outside the realm of consideration by many to leave the future of their company vulnerable (Munsch, 2004). R&D and other value-added functions were untouchable, and peripheral activities were often outsourced. Given rising costs, outsourcing has emerged as a strategy that organizations use to enhance their innovative capabilities. Linder, Jarvenpaa, and Davenport (2003) surveyed executives and discovered that nearly 50 percent of their innovative activity was produced by external sources. In a similar study, Howells, Gagliardi, and Malik (2008) surveyed pharmaceutical executives to assess R&D outsourcing. The study revealed that 72.3 percent of the responding firms outsourced some of their research and that firms of all sizes actively outsourced R&D. By leveraging relationships with suppliers, organizations increase their innovative capabilities because a high percentage of all innovation occurs at the interface between innovative supplier and customers (von Hippel, 1988).

Outsourcing Knowledge Gap: Firms in every industry use outsourcing to source innovation; however, they are primarily located in high technology industries because of the multi-disciplinary knowledge and capabilities required to bring new products to market (Howells, Gagliardi, and Malik, 2008). Collaborative innovation provides outsourcers with opportunities to gain access to knowledge from different sources and experts (Schroll and Mild, 2011). Unlike other aspects of business, innovation is not a separate activity or the sole responsibility of a specific group; instead, it requires the participation of many members both inside and outside firm boundaries. Innovation occurs within a community, in which employees from both firms create, share, and apply knowledge during the practice of work.

KM Activities: Unlike the Minimizer or the Developer that may not be aware that the service provider is creating new knowledge, close collaboration offers Innovators that opportunity to gain access to the new innovative knowledge being created by the outsourcing partner. Innovators' define their in terms of their employees' ability to recognize and exploit external knowledge created by the outsourcing partner. Specifically, their employees' absorptive capacity and maintaining social connectedness play significant roles in developing a solution.

The first part of the solution, absorptive capacity, enables a firm to exploit new extramural knowledge, but to predict more accurately the nature of future technological advances (Cohen and Levinthal, 1994, p. 227). Zahra and George (2002) classified absorptive capacity into two segments: potential and realized. The former focuses on factors that involve the acquisition and assimilation of new knowledge. While the later includes factors that address the transformation and exploitation of new knowledge. These factors describe a dynamic concept that highlights a firm's ability to locate, integrate, and exploit extramural knowledge.

Research indicates that a firm's potential and realized absorptive capacity resides with its employees. Employees' ability to identify value external knowledge resides in their experiences. Kirzner (1979) intimates individuals have an entrepreneurial alertness. This alertness is a special cognitive process or filter that develops as we accumulate educational, employment, and personal experiences. Entrepreneurial alertness enables us to identify certain opportunities that match our experiences. Employees' ability, their educational background, and acquired job-related skills represent prior knowledge (Minbeava et al., 2003). Along these lines, managers can create formal mechanisms such as job rotations and cross-functional training that provide employees with opportunities to access diverse knowledge stocks and flows and increase their

absorptive capacity (Jansen, van den Bosch, and Volberda, 2005). These activities may enhance employees' ability to make sense of and apply knowledge created by an external service provider.

The second part of the solution involves fostering and enabling social interactions that lead to creativity (Brown and Duguid, 2000). Solutions entail developing structures and systems that consistently articulate innovation and knowledge creation, with innovators supporting the development of communities of practice across boundaries. Lave and Wenger (1991) argue that knowledge is situated in the practices of communities. Through the social collaborations that occur within the practice of work, knowledge is transformed for individual to collective. When employees integrate tacit knowledge into their practice of work, the organization learns and develops competencies, as the knowledge is adapted to fit an organization's unique processes and systems. Since practice is not organizationally bound, partners' employees can also participate in practice communities, which help both parties achieve shared goals.

Innovators approach knowledge transfer problems in terms of promoting knowledge sharing within a practice. O'Donnell (2000) has offered interdependence network theory as a solution to these kinds of problems. Traditional control mechanisms do not work in interconnected environments because cooperative (as opposed to restrictive) behavior is required to promote knowledge exchange and organizational learning. A social control technique known as lateral integration encourages cooperation among members by encouraging them to analyze their individual relationships and understand the impacts of those relationships on their organizations. Finely crafted social-based controls foster connections among members that promote sharing.

Innovators define their knowledge integration problems in terms of developing organizational structures that enhance their ability to benefit from externally generated knowledge. An important rationale for outsourcing is to develop less bureaucratic departments, which are often criticized for the constraints they impose on operational flexibility (Greer et al., 1999: 90). The solution to this problem requires Innovators to be cognizant of its administrative heritage (Ostroff, 1999). Designing a structure is costly and very time consuming. However, it enables an organization to identify the relationships among its units, products, and technologies. Table 4 summarizes this discussion on the Innovator.

Table 4: Innovators' Knowledge Management Strategies

	Problem	Solution
Knowledge Creation	How can to improve employees' ability to identify and leverage valuable external knowledge.	Supports the employees' absorptive capacity and the development of communities of practice across organizational boundaries.
Knowledge Transfer	How to promote the sharing of knowledge in a practice?	Uses the interdependence network theory model as a solution to control problems in a network.
Knowledge Integration	How to develop an organizing structure that enhances inter-organizational knowledge creation and transfer?	Requires Innovators to be cognizant of its administrative heritage (Bartlett and Ghosal, 1987) or its core processes, according to Ostroff (1999).

D. Typology Summary

We proposed that different KM strategies would arise as outsourcers solved KM problems that arose while trying to close the outsourcing knowledge gap. In summarizing our typology, this section will highlight the outsourcing benefits and risks associated with each strategic type and then compare the firm's KM strategies.

D.1. Strategic Types Outsourcing Motives

Minimizers outsource to save costs. Their bottom-line numbers improve quickly but too often outsourcing is a hastily made decision focused on reducing the bottom line quickly. Cost reductions are typically associated with layoffs or downsizing after outsourcing an activity. In addition to costs, firms seek to eliminate salaries as well as their problems. However, outsourcing does not absolve a firm of its responsibility—a firm cannot outsource its problems (Laplante et al., 2004). Many firms use outsourcing to reduce costs by getting rid of problem activities or processes and give the headache to the external service provider. The problem does not go away; it comes back amplified (van Wyk, 2011). External service-level providers will address the problem, but the "fix" is going to cost the outsourcer. One risk of cost-based outsourcing is that outsourcing decisions made in haste, in order to reduce costs or eliminate problems, can leave a firm vulnerable to poor service, rising costs, and opportunistic behavior.

For Developers, one advantage of outsourcing is that outsourcers can use it as a source of learning. Holcomb and Hitt (2007) intimate that an advantage of capability-based outsourcing is that firms acquire the ability to access new and more valuable capabilities by establishing outsourcing relationships with firms that have specialized capabilities. A potential drawback occurs when activities classified as tactical or commodity today may become strategic, core, or high-value tomorrow (Earl, 1996, p. 30). Firms that outsource their peripheral activities to focus on their core must also maintain knowledge links to the outsourced activity in order to capitalize on the service providers' knowledge and keep their skills current just in case the activity is brought in-house after the outsourcing contract expires.

Maintaining access to outsourced activities and the ability to learn from the service provider is critical in an increasingly turbulent business environment, where the basis of competition changes rapidly. Internalizing external service providers' knowledge is common in R&D intensive industries. For example, Genelabs Technologies, a biotechnology firm, discovered the hepatitis E virus, and licensed the rights to the discovery to GlaxoSmithKline (GSK), to a large pharmaceutical firm (BusinessWeek, 2008). Two years after the initial licensing contract, GSK purchased Genelabs Technologies in an effort to bolster its infectious disease product line. Although hepatitis E was not a part of GSK's core product line, it used an outsourcing licensing contract, to explore Genelabs Technologies' technological capabilities while developing a vaccine for the hepatitis E virus. The promising results of the vaccine studies then led GSK to acquire and gain access to Genelab Technologies' knowledge.

Innovators embrace outsourcing due to increasing R&D costs, complex technologies, and competitive pressures. Many R&D intensive firms are transitioning from a closed process, where science and technologies occurred within a firm's boundaries, to an open process, where firms do not have to invent innovation to profit from it (Chesbrough, 2006). Acquiring innovation from external parties increases outsourcers' competitiveness by reducing the time required to bring new products to market (Quinn, 2000; Gupta et al., 2000). Those firms that do not participate in

open innovation reduce their knowledge stock and flows, which are critical to the innovative process. Firms that keep their R&D processes closed reduce their ability to enter into exchange relations with other firms and organizations (Koschitzky, 2001).

In an open innovation process, knowledge produced and exploited among a network that includes nonprofit, government, and commercial firms. Each firm in the network plays an important and specific role in new product development. In today's business environment, outsourcing provides organizations with additional avenues to innovate by working closely with suppliers. However, firms must have a plan to get the most out of the process (Linder et al., 2003) and address long-term risks associated with developing dependence on outside firms (Gupta et al., 2009).

Our typology consists of three strategic types that possess unique outsourcing motives. Research often provides a prescriptive approach to KM, which suggests that firms can improve their performance by following general KM guidelines. We propose that a one-size-fits-all KM strategy ignores how outsourcing decisions impact a firm's knowledge production system and its desire to create a KM strategy that allows it to leverage knowledge from all of its activities—those performed in-house and by an external service level provide. The heterogeneous nature of the outsourcing motive may be indicative of the need for diverse KM strategies that incorporate this difference. Table 5 presents the benefits and risks associated with the three outsourcing motives discussed in this section.

Table 5: Outsourcing Motives—Benefits and Risks

Strategic Type	Outsourcing Motive Benefits	Outsourcing Motive Risks
Minimizer	Short-term cost reductions. Rapid improvement in financial condition.	Suppliers may gain access to outsourcing firm's knowledge and become a competitor (Bettis et al., 1992).
Developer	Focus on the activities it performs well. .	Activities classified as a commodity today may become strategic in the future (Earl, 1996, p. 30).
Innovator	Interface with suppliers to develop new products.	Outsourcer may become dependent on supplier for innovation.

D.2. KM Spectrum

We proposed that different KM strategies would emerge based on an outsourcer's outsourcing motive. The KM strategies presented above fall along a spectrum. At one end of the spectrum, Minimizers occupy one end of the spectrum KM strategy seek to monitor and control their external service providers' knowledge using processes and technologies to standardize information and promote quality is based on monitoring and controlling. The relationship between the outsourcer and service provider is formal; therefore, there are limited opportunities for the development of trust that is needed to exchange knowledge.

Innovators lie at the other end of the spectrum. This strategic type's KM strategy focuses on developing a practice of communication between the outsourcer and service provider. A complex web of inter-relationships among network members legitimizes and maintains the relationship between the outsourcer and the service provider. Since there are close connections

among members, the desire remain a part of the community limits potential malfeasance by network members. Innovators use technology and processes to support the creation of communities of practice across organizational boundaries.

Developers fall in the middle of the KM spectrum. This strategic type's KM strategy is not purely contractual or social. This group recognizes the benefits of utilizing a blended perspective. Developers' KM strategy emphasizes interdependence by using long-term contracts to ensure it can identify and leverage the service provider's knowledge if needed. They use technology and processes to scan and make sense of new knowledge.

In summary, we believe the typology presented in this paper reveals three unique strategic types that adopt different approaches to closing their gaps. Table 6 provides a summary of the strategic types.

Table 6: Knowledge Management Typology

Strategy Type	KM Strategy	Outsourcer and Service Provider Relationship	KM Process and Technologies
Minimizers	Facilitating monitoring and controlling	Contractual Relationship	Promoting Quality and Standardization
Developers	Fostering Interdependence	Long-Term Formalized Relationship	Enabling Scanning
Innovators	Building Inter-organizational Innovation Practice	Relationship Embedded in a Network of Economic Activity	Supporting a Community of Practice

V. Discussion

The purpose of this work has been to present strategic types that depict how outsourcers, with different strategic motives, address the challenges of managing knowledge that resides in a disconnected value chain. Outsourcing is a disruptive process in which firms encounter countervailing forces that propel them to create a thinner, more flexible, and efficient value chain by eliminating activities in order to leverage economies of scale and scope while disrupting the relationships, structures, and processes that play critical roles in a firm's system of creating, transferring, and integrating knowledge.

A. Importance of Typology

We believe our typology is important because it brings light to a new organizational perspective that has not been addressed in KM research. An implicit assumption in most knowledge research is that the firm controls all the knowledge from its functions. Outsourcing disrupts the knowledge system, which must then be repaired. However, we speculate that there may be a new normal, where an organization is not managing a whole knowledge production system but one where it manages a knowledge system comprised of in-house and outsourced knowledge. In other words, there will always be gaps in the value chain. An Apple executive explained this new KM era when describing how the U.S. lost the manufacturing of the iPod to China.

The scale of overseas factories as well as the flexibility, diligence and industrial skills of foreign workers have so outpaced their American counterparts that "Made in the

U.S.A." is no longer a viable option for most Apple products (Duhigg and Bradsher, 2012).

The knowledge embedded in the people, processes, and technologies that supported the manufacturing of the iPod have left Apple. As long as Apple remains a going concern, it will have a knowledge production system with at least one outsourcing knowledge gap. If a firm outsources different functions, for different strategic reasons, then in order to manage knowledge it will have to manage a portfolio of outsourcing knowledge gaps as well as those stocks and flows of knowledge that reside within its knowledge production system.

Typologies are often used to promote scientific exploration of a phenomenon. They are critical to theory development because they propose a set of principles for classifying things or events (Mills and Margulies, 1980). If there is a new era of knowledge management emerging, then our typology may encourage thinking about how firm simultaneously manage both pieces. In addition, organizations would need to understand the criticality of the gap (i.e., whether the knowledge is needed) the characteristics of the gaps, and channels through which it could acquire knowledge from the service provider when needed. Our typology provides some insight into an emerging era of KM. We do not portend that the strategic types contained within our typology are exhaustive. However, we believe the value of the typology is to encourage scholarly discussions about typology dimensions, empirical testing, and category inclusiveness.

B. Theoretical Implications

We put forward two possible theoretical implications of this discussion involving change: knowledge depreciation and structure. First, an important factor for outsourcers to consider is the knowledge depreciation associated with the outsourced activity or function. Knowledge depreciation highlights the ongoing erosion of an organization's knowledge stock and indicates that the experience-based knowledge stock is not accurately represented by total accumulated production (Boone, Ganeshan, and Hicks, 2008). Employees play a critical role in utilizing their experiential and tacit knowledge to enhance task performance. An outsourcing strategy requires firms to reconfigure their value chain by sourcing out activities or functions to external service providers. In doing so, outsourcers have the ability to reduce costs by eliminating employees who perform that outsourced activity.

When firms terminate employees, they lose valuable tacit knowledge. An important factor to consider is how outsourcing influences the rate of depreciation of a firm's knowledge stock. Contractual and competitive changes may lead a firm to re-sourcing; bring back in-house an activity that has been previously outsourced. Firms that had an effective KM system used tools, processes, and procedures to convert an employee's tacit knowledge to explicit knowledge; therefore, when resourcing a previous outsourced activity, the firm has documented routines, processes, and procedures that facilitate bringing the process in-house. Speculatively, understanding the factors that influence knowledge depreciation as well as hasten the rate change to a firm's knowledge stock has long-term consequences for a firm's competitiveness.

Second, we proposed that outsourcing disrupts a firm's knowledge system. The type of disruption can either be minimal or radical. One potential method to determine the impact of outsourcing is to examine the structure of a firm's knowledge system. Weick (1976) argues that more loosely-coupled organizations offer advantages in complex environments. Loose coupling indicates links among interdependent elements in the system preserve some degree of determinacy, but are subject at the same time to spontaneous change (Ravasi and Verona, 2001,

p. 48). Autonomous agents may be more sensitive to environmental change. If problems develop in one part of the system, the area can be sealed off from the rest of the system. The resulting total system may be more stable when loosely coupled. When an organization's knowledge repositories consist of tightly coupled structures, employees may not experiment because changes in one repository instigate changes in other repositories. In a loosely coupled knowledge system, employees have the flexibility to explore different connections because changes made in one repository remains local and do not affect the other repositories. Future researchers may consider how value chain coupling influences the degree to which outsourcing changes an outsourcer's knowledge system. This research may provide managers with information they can use to develop interventions that will minimize the degree of disruption that outsourcing has on a firm's knowledge system.

C. Practical Implications

Conceivably, an outsourcer can expect to lose some knowledge from employee termination, employees' forgetting when assigned to other functions, or the extinction of routines associated with the outsourced activity. Firms regularly monitor important assets such as inventory, patents, or property, plant, and equipment. With an eye toward long-term competitiveness, an outsourcer may perform an audit of an outsourced activity by ensuring employees' tacit knowledge has been codified and stored in hard copy and electronic form for retrieval. A knowledge audit is an inventory of an organization's intellectual capital assets...that what knowledge is needed, available missing, applied and contained (Liebowitz et al., 2000: 3). The need for a knowledge audit is quite simple—firms waste millions on developing knowledge management strategies because they do not understand what knowledge they need, or how to manage it (Stewart, 2002).

There are two possible goals associated with a knowledge audit. First, the knowledge audit provides the outsourcer with a plan on how to adapt the existing knowledge management system to accommodate for the gap in the system that will occur when the external service provider gains control of a function. Second, a knowledge audit offers an outsourcer an opportunity to update information about knowledge possessed in its people, processes, and technologies. The organizational system is constantly evolving and adapting to environmental conditions. An audit is a qualitative depiction of how a KM system has changed since implementation. By conducting a knowledge audit, a firm may: (1) highlight problems within the existing KM system and (2) provide recommendations for improvements in the system. A knowledge audit provides the outsourcer with insight regarding its KM system and a guide that can be used to perform that activity or function if it is resourced.

A knowledge audit may help a firm prepare for outsourcing; however, a firm may need to possess the requisite managerial capabilities to leverage information from the audit. Strategic management studies propose that a firm's alliance management capabilities play an important role in a firm's ability to benefit from inter-organizational relationships and to use them to achieve firm's goals. As firms use outsourcing to operate thinner and flexible value chains, developing outsourcing management capabilities may help a firm use outsourcing to reach its strategic goals and support long-term competitiveness.

D. Limitations and Conclusion

This article reflects an uncomplicated approach to developing a contingency-based KM framework by presenting the notion that an organization may only outsource one function and the motive for outsourcing this function falls neatly into one category. From a practical perspective, an organization may use many different motives for contracting out pieces of its value chain. Multi-function outsourcing may reflect actual practices. Initially, the contingent relationship between outsourcing and KM may be best explored by investigating the relationship in a simplistic form. The framework presented in the article provides a platform for understanding this relationship. Future researchers may use this platform to further understand these complexities. Despite these limitations, this typology provides a broad umbrella that future researchers may utilize to further explore the KM complexities that arise when organizations restructure and transform their value chains.

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