

## A THEORY-BASED FRAMEWORK FOR EXAMINING THE ROLE OF FLEXIBLE SYSTEMS IN IT-OUTSOURCING COLLABORATIVE PARTNERSHIPS

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### ABSTRACT

In the early stages of IT outsourcing, most client-vendor relationships were arms-length transactions. IT outsourcing has since evolved beyond handing over routine applications and coding functions to vendors, and has more recently encompassed a range of services provided through collaboration and strategic alliances. Forging collaborative alliances has become a significant part of the IT sourcing strategy of modern organizations. However, many IS scholarship and practitioners assume that because advances in IT reduce transaction costs and enable disaggregation of business processes, we should expect more inter-firm relationships to resemble arms-length transactions rather than close inter-firm collaborations. We argue that this notion comes from a somewhat narrow interpretation of the role of IT in reducing transaction costs. We discuss how three major theoretical perspectives can provide insight into why *flexibility* of business processes enabled by IT, or flexible IT systems, render close inter-firm collaboration even more important in IT outsourcing partnerships, not less. Namely, we draw upon the theoretical perspectives of *contracting*, *coordination*, and *dynamic capabilities* to present a framework to guide research studies as well as help formulate appropriate sourcing strategy within the context of specific organizational environments.

**Keywords:** *IT Outsourcing; Strategic Alliance; Contracting, Coordination, and Dynamic-Capabilities perspectives.*

### INTRODUCTION

A major reason organizations outsourced their IT activities in the past was to reduce their high cost of application development (Lee, 2001). However, while IT outsourcing practices during late 80's and 90's have predominantly encompassed routine, transaction-based type activities such as program coding and help desk activities, a growing number of recent outsourcing contracts cover higher-level, knowledge-based IT activities such as business processes and ERP. IT outsourcing arrangements are evolving from the arm's length transaction model to the strategic partnership model (Pralhad and Krishnan 2008). Clients and vendors are more open to sharing knowledge and joint collaboration in creating systems and providing services. The shift to strategic collaboration has elevated benefits of IT outsourcing beyond the limits of arms-length transaction and, when implemented properly, provides both clients and vendors greater rewards than merely lower development costs (Cederlund et. al., 2007; Koh et.al. 2004).

The proliferation of collaborations and alliances in IT outsourcing beginning in the late 1980's has coincided with greater investments in information technology (IT), modular designs, common digital standards, and use of electronic networks (Straub, Rai, & Klein, 2004; Wareham, Mathiassen, Rai, Straub, & Klein, 2005; Rai, Patnayakuni, & Seth, 2006). The emergence of digitally enabled inter-organizational networks has expanded the range of possible cooperative arrangements from which firms can derive value, enabling firms to act simultaneously as "supplier...competitor, customer, and consultant" (Fulk 1995, p. 344). This has led many partnering firms to become nodal entities in a global ecosystem, to rapidly tap into resources across corporate and geographic barriers, and to provide services that are increasingly complex and customized (Pralhad & Krishnan, 2008).

By enhancing the flexibility and modularity of business processes, flexible IT systems such as those based on service-oriented architectures (SOA) allow business processes to be disaggregated, in a way that facilitates collaboration across a broad spectrum of business activities (Babcock 2007). Inter-organizational collaboration can include the sharing of tacit knowledge in the joint creation of new systems and services, rather than just developing computer code for a fee. IT is being used not just to automate the exchange of information and optimize the efficiency of supply chain relationships, but also to reconfigure business processes in order to develop innovative business models that span organizational boundaries (Tafti, Mithas, & Krishnan, 2012). For these reasons, it becomes particularly important to understand how flexible IT systems can enhance the ability of firms to generate value from alliance partnerships, not just for the sake of theory building but also to guide managerial practice. Further, it becomes important to understand how the value of flexible IT relates to various characteristics of a firm's alliance partnerships, such as the governance form, the asset-specificity of resources, and the complexity and diversity of tasks involved in the alliance partnerships.

This paper describes how the theoretical lenses of transaction cost economics (TCE), the resource-based view (RBV), and dynamic capabilities each provide different insights into formation of strategic alliances in IT outsourcing. We build on these theoretical perspectives to identify three means by which flexible IT can enhance IT outsourcing alliances—*reduction of contracting hazards, reduction of coordination costs, and enhancement of dynamic capabilities*.

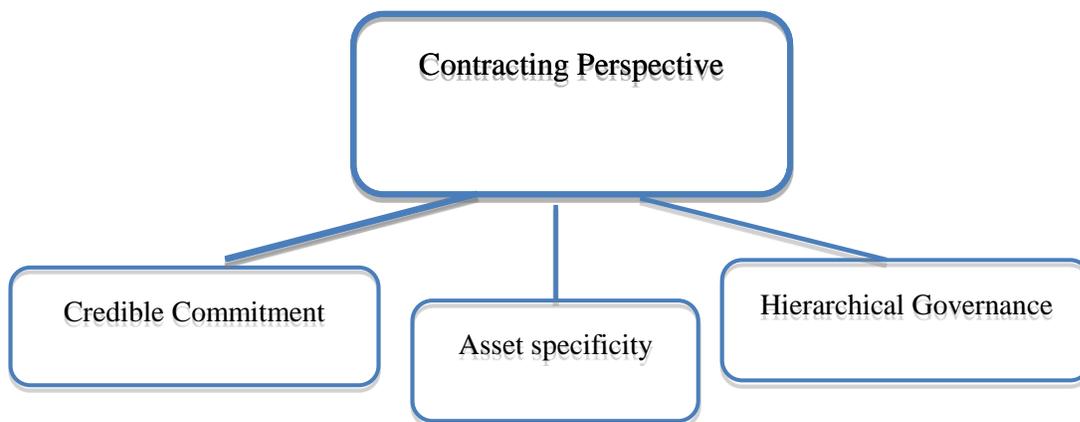
The remainder of this paper is structured as follows. First, we consider contracting hazards in the governance of IT outsourcing alliance relationships. In particular, we consider the implications on the value of flexible IT investments, as firms engage in a greater number of alliance relationships, and as those alliances involve greater asset-specificity, credible commitments, or hierarchical forms of governance. Second, we consider how flexible IT may enhance coordination capabilities, particularly in alliances involving high complexity or diversity of cooperative tasks. Third, we draw from the perspective of dynamic capabilities to examine how flexible IT may be more influential in alliances forged under conditions of high industry dynamism, alliances involving recombination of system components or processes, or alliances involving tacit knowledge or work processes.

## CONTRACTING PERSPECTIVE

A substantial body of research exists on why firms enter alliances, how they expect to benefit from them, and what are the risks. The contracting perspective covers a broad swath of literature including transaction cost economics (TCE), property rights and social exchange theories. Within this theoretical perspective, the outcomes of interest in most research studies have been the following decision variables: whether and when firms should engage in alliances, the optimal scope of collaborative activities, and the types of contracts that should be used to govern alliances (Oxley & Sampson, 2004).

The contracting perspective begins with the premise that alliances involve self-interested agents acting opportunistically. This perspective is useful for exploring the influence of trust, asset-specificity, and mutual dependence in alliances, as well as examining the role of strategic flexibility in alliances (Young-Ybarra & Wiersema, 1999). From the premise that inter-organizational relationships involve self-interested agents that act opportunistically, three insights emerge on the role of IT in inter-organizational relationships: the asset-specific nature of IT, the role of incomplete contracting in essential complementary investments, and the impact of IT on the quality of inter-firm monitoring and governance. Figure 1 shows three major constructs regarding the contracting perspective.

Figure 1: Contracting Perspective Constructs



### **Contracting Perspective: Credible Commitment and Flexible IT Systems**

Establishing new relationships requires firms to make asset-specific (or relation-specific) investments in IT. Relation-specific IT systems involve highly specific investments for setup and maintenance, and typically involve capabilities that are not easily transferable to other partners (Kim & Mahoney, 2006). Disinvestment can become particularly costly when firm resources are highly intertwined in relation-specific inter-organizational IT systems—such as ERP systems which can take months to configure and set up for a particular partner. From the perspective of TCE, relation-specific IT systems have desirable contractual properties, particularly when there are greater risks of opportunism, rivalry, or the appropriation by one firm of its partner's

valuable knowledge (also known as 'information leakage') (Kim & Mahoney, 2006). Rigid IT linkages create a kind of mutual hostage situation that reduces the risk of opportunism (Venkatraman, 1994). On the other hand, rigid and tightly-coupled EDI-based process linkages can sometimes lock firms into sub-optimal relationships (McAfee, 2005). If a firm is held up with highly asset specific investments, it can be impeded from efficiently reallocating resources among its alliance partners in a timely fashion. Hence, from the point of view of TCE, there are competing benefits and risks in investing in such inter-organizational systems. TCE models have provided insights regarding how to induce such relation-specific investments in the context of inter-firm collaboration (Williamson, 2002).

Flexible IT systems enable a firm to engage and derive value from a larger number of alliance opportunities. Although an inflexible system may sometimes be beneficial in creating a mutual commitment, as an alliance partnership evolves over time, alliance partners will mutually benefit from the ability to modify inter-organizational business processes or to exit from the relationship when it is no longer deemed mutually optimal.

### **Contracting Perspective: Asset-specificity and Flexible IT Systems**

A second contribution of the TCE perspective is that leveraging value from IT investments requires complementary investments on the part of business partners, including investments in innovative work practices and business processes (Mata, Fuerst, & Barney, 1995; Bresnahan, Brynjolfsson, & Hitt, 2002; Melville, Kraemer, & Gurbaxani, 2004). The problem is that such complementary investments are often not observable or enforceable (Barney, 1991; Mata et al., 1995). Due to the complexity of IT projects, firms cannot foresee or specify all of the contingent steps to be taken by partner firms. Since many IT-leveraging investments will be specific to an alliance relationship, there are high risks of opportunistic behavior (Williamson, 1981). Therefore, firms must consider how partner firms can best be incentivized to make complementary investments that leverage IT capabilities, to lower the risk for themselves and to maximize cooperative behavior of partners (Kim & Mahoney, 2006).

Under asset-specific conditions of an alliance, we argue that firms will have a greater need for flexible IT systems in order to modify business processes within an alliance, especially as business and contractual conditions may increase the difficulty of exiting from the alliance relationship. As alliance partners find it more difficult to exit from an asset-specific relationship, it becomes more important that they be able to co-evolve in response to challenges that arise within their alliance relationships. As the need for flexibility in both modification and exit increase with asset specificity of alliance partnerships, the value of flexible IT also becomes greater (Young-Ybarra & Wiersema, 1999).

### **Contracting Perspective: Hierarchical Governance and Flexible IT Systems**

A third contribution of the TCE perspective is the idea that IT enhances the quality of information exchange—improving the ability of inter-organizational partners to monitor each other. Through greater mutual monitoring between business partners, greater information sharing, and closer inter-firm linkages, IT can contribute to a reduction in opportunistic behavior (Kim & Mahoney, 2006). This allows firms to sense and react to sudden changes in supply or demand,

improving coordination in inter-firm processes, and leading to expanded cooperation (Bensaou 1997; Bensaou and Venkatraman 1995; Nicolaou and McKnight 2006). From the perspective of TCE, contractual hazards can be overcome through information-rich channels that enable greater monitoring, and that make tacit agreements more binding (Oxley, 1997). Hence, by increasing the transparency of information exchange, IT can reduce the transaction costs inherent in an alliance.

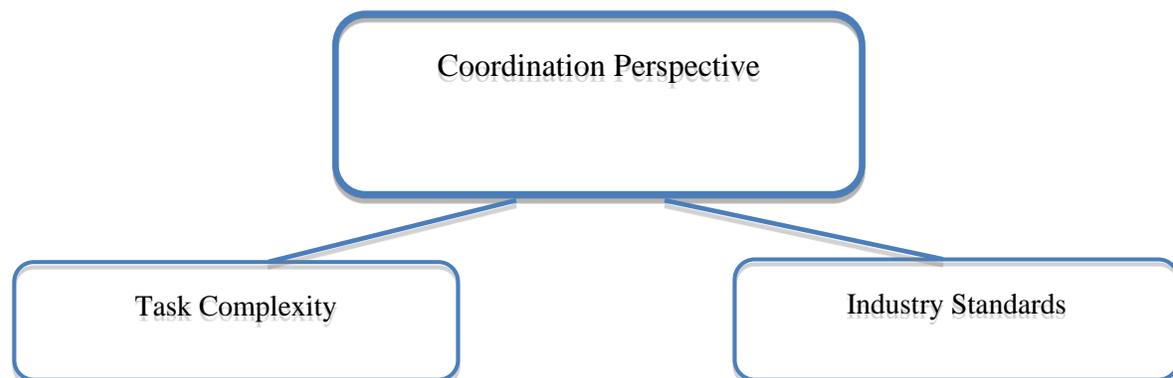
Therefore, the flexible IT system becomes much more useful in the alliance context if there is a structural mechanism in place to safeguard the potential vulnerabilities (Pisano 1989). Flexible IT systems have greater value in the context of alliance relationships featuring greater hierarchical governance structure, as when partnering firms share in risks through equity investments in a new joint-venture entity.

In summary, from the contracting perspective of IT outsourcing, we identify three major constructs to explain the catalyst role of flexible IT systems in facilitating formation of outsourcing strategic alliances: credible commitment, asset specificity, and governance.

### COORDINATION PERSPECTIVE

The greater the scope of the alliance, the greater is the coordination complexity, knowledge interchange, interdependence, and depth of collaboration (Sampson and Oxley 2004). As firms establish organizational capabilities to handle coordination complexity, they can better capture synergies among the various processes that lead to new sources of business value. This suggests that even when incentives are aligned and the conditions for inter-organizational trust are established, firms sometimes encounter process-related complexities that can hinder the ability to create value in inter-organizational relationships. Hence, any useful theoretical perspectives on the role of IT in inter-organizational relationships would need to address many facets of process-related capabilities. As we argue next, flexible IT can enhance the coordination of operations and business processes, and also enhance the recombination or reconfiguration of resources. This allows alliance partners to better leverage new opportunities, to develop new business models, and to better achieve the synergies in their alliance relationships. Figure 2 shows two main theoretical constructs from the coordination perspective that may help understanding the role of flexible IT systems in mitigating barriers to forming IT outsourcing alliance.

**Figure 2: Coordination Perspective Constructs**



### **Coordination Perspective: Task Complexity and Flexible IT Systems**

Just as industries vary in the complexity of production, alliance activities vary in the complexity of tasks involved in the cooperative arrangement (Simon, 1962; Sahaym, Steensma, & Schilling, 2007). Sometimes coordination with alliance partners is made difficult as a result of the complexity and variety of inputs needed to create or provide a product or service. This presents substantial coordination challenges, such as maintaining information quality, accuracy, and efficiency, in addition to knowledge-management challenges (Malhotra, Gosain, & El Sawy, 2005).

Flexibility in IT systems can enable firms to cope with high coordination complexity. As diverse inputs can lead to greater interdependencies between firm functional units, flexibility in IT systems makes it easier for the firm to coordinate among diverse sources and high volumes of information flow, by decomposing units of business process functionality at fine levels of granularity. Through increased modularity of business processes, the firm is able to fine-tune specific components of business process functionality without causing inadvertent changes to another component (Gosain, Malhotra, & El Sawy, 2005).

### **Coordination Perspective: Industry Standards and Flexible IT Systems**

Standards enable the codification of knowledge that is often exchanged, reduce the amount of knowledge that remains in tacit form, and facilitate the establishment of inter-organizational business routines. Prior studies have argued that flexible IT is associated with industry standards, and therefore, flexible IT systems become more valuable with the existence of standards (Sahaym et al., 2007). Flexible IT systems become more valuable under industry conditions that demand it, essentially making up for other industry standards that are missing or under-utilized. Therefore, flexible IT systems can help alleviate situations in which certain industry-specific or firm-specific routines do not conform to any open standards and are highly tacit in nature.

Flexible IT enhances the codifiability of standards by facilitating the creation of new layers of standards, which becomes particularly valuable in situations where industry standards don't otherwise exist. Likewise, when a collaboration involves tacit forms of knowledge exchange, business process routines are inherently difficult to specify or codify (Galunic & Rodan, 1998). It is precisely in such conditions that flexible IT systems become valuable, such as with SOA-based systems. Flexible IT systems can mitigate the lack of standards, for instance, by using software wrappers that hide the firm-specific language of mainframes (Neat, 2006). When the codified routines or standard functional interfaces are missing on one level, SOA and other types of frameworks can help create open interfaces on a different level of business process protocols. Therefore, flexible IT systems enhance coordination capabilities among alliance partners by mitigating inadequacies of industry standards.

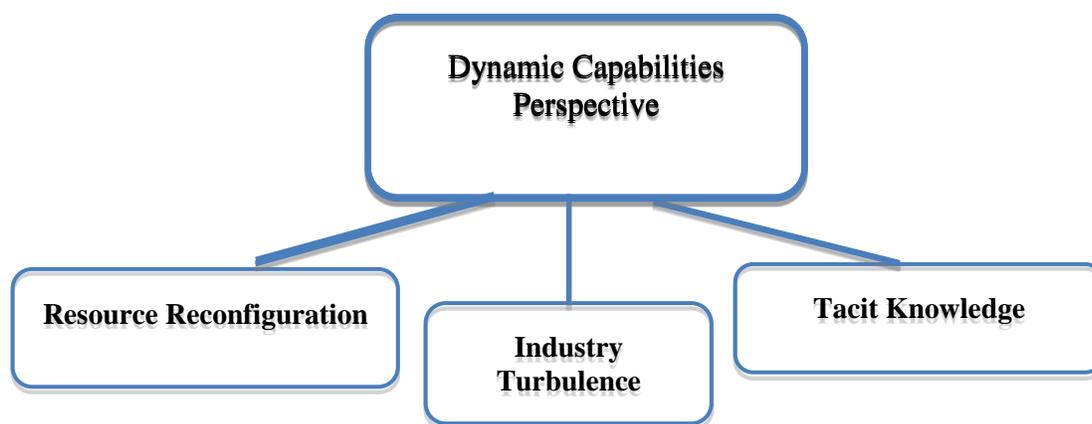
## **DYNAMIC CAPABILITIES PERSPECTIVE**

Teece, Pisano, and Shuen (1997, p.516) define dynamic capabilities as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments.” This definition contains two inherent points of emphasis. First is the emphasis on

the creation, reconfiguration and recombination of resources. Second is the emphasis on the need for agility in a “rapidly changing environments”, which requires flexibility of organizational processes and routines. The dynamic capabilities perspective goes beyond the resource-based view to assert that merely attaining resources that are non-substitutable and inimitable is insufficient. Firms must also develop capabilities that enable them to unleash value from such resources—through innovation in processes and adjustment, and particularly through novel resource reconfigurations (Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000).

The dynamic capabilities perspective can enhance our understanding of the role of IT in inter-organizational relationships in the following ways. First, leveraging inter-organizational synergies requires firms to re-examine architectural knowledge that is “embedded in the practices and procedures in the organization” (Henderson & Clark, 1990, p. 15). Second, the ability to reconfigure routines and develop new routines enhances inter-organizational learning through “joint contribution to understanding complex problems” that are “coordinative management processes” (Teece et al., 1997, p. 520). Inter-organizational learning is enhanced as firms mobilize and re-apply tacit knowledge to new contexts (Teece et al., 1997; Jacobides & Winter, 2005). Third, the dynamic capabilities perspective emphasizes the importance of agile responsiveness to unforeseen challenges or opportunities (Jacobides & Winter, 2005). Such responsiveness is needed to handle complex interdependencies among business processes that span multiple functional areas (Sambamurthy, Bharadwaj, & Grover, 2003). The next set of constructs draws from the perspective of dynamic capabilities to understand the role of IT flexibility in strategic alliances.

**Figure 3: Dynamic Capabilities Constructs**



**Dynamic Capabilities Perspective: Industry Turbulence and Flexible IT Systems**

The dynamic capabilities perspective is often applied to explore the effects of industry turbulence. As business process requirements rapidly evolve in highly turbulent industry environments, the need for flexibility in modification or exit from the alliance becomes greater (Young-Ybarra & Wiersema, 1999). In highly turbulent industries, alliance partnerships can be fraught with high transaction costs. In these scenarios, alliance formation opportunities represent ‘options value’ which is enhanced by the dynamism of the industry (Vassolo, Anand, & Folta, 2004). Strategic flexibility often depends on the ability to have flexibility in IT-enabled business

processes (Gosain et al., 2005). Therefore, the flexibility to modify or create new business processes in the context of alliances will enhance the value of alliances particularly in highly dynamic industries, and will also reduce the potential risk and costs should the competitive environment require firms to modify their alliance relationships. As the business environment creates new opportunities to generate alliance value, firms will need to respond with agility when new business opportunities arise. Thus, flexible IT will be more valuable to alliances in the conditions of industry dynamism; since the flexibility to modify or exit the alliance become especially necessary due to turbulent industry conditions.

### ***Dynamic Capabilities Perspective: Resource Reconfiguration Requirements and Flexible IT Systems***

Many strategic alliances involve the recombination of resources between firms in the process of innovation, and not just the exchange of data (Conner & Prahalad, 1996). Flexible IT systems can lead to a greater capacity for recombining resources and reconfiguring business processes, which enables firms to generate greater synergies from their alliances. Success in recombination of such services depends in large part on the seamless integration of disparate systems, which requires flexibility in the IT infrastructures on which the respective systems are based. With increased digitization of business processes, investments in flexible IT systems become particularly important in collaborative partnerships such as joint ventures that involve the development of new products or services.

### ***Dynamic Capabilities Perspective: Tacit Knowledge Exchange and Flexible IT Systems***

When processes are digitized, a firm has a greater visibility into its own business processes. As accessibility and transparency of information increase, business processes become more transparent, putting firms in a much better position to identify opportunities for innovation. Galunic and Rodan (1998) argue that knowledge often has the property of tacitness; and the possibility of novelty in recombination in alliances is greater when tacitness of routines or a knowledge base is high (Monteverde 1995). However, tacitness also reduces the likelihood of detection of discovery of opportunities for innovation and increases the costs of exchange of knowledge resources (Galunic & Rodan, 1998). We argue that flexible IT systems can help generate tools and an organizational apparatus that systematically increases the visibility, transparency, and codifiability of knowledge— increasing the likelihood of detection and reducing the costs of resource recombination. Such investments include not only systems, software, and hardware, but also trained technical staff with business process competencies. For example, as a firm achieves greater visibility and systematic control of business processes, it can better steer the technical design of a jointly developed system so that it works better in the context of its own business. For precisely this reason, JP Morgan reversed a potentially cost-cutting outsourcing arrangement with IBM in 2005; and instead invested billions of dollars to develop internal technical competencies (Hovanesian, 2006).

Based on the discussion above, we argue that investments in flexible IT can enable firms to have greater transparency and visibility of firm processes. This, in turn, helps enhance the detection of opportunities for innovation while decreasing the costs of resource recombination.

## CONCLUSION

Multiple theoretical perspectives are needed in order to examine the complex issues regarding IT outsourcing (Lacity et. al., 2011). Despite the substantial prior research on inter-organizational systems as well as the business value of IT, there has been a theoretical gap in the prior literature in assessing the value of flexible IT systems in the context of strategic alliances. A clear understanding of the role of IT flexibility in facilitating formation of collaborative partnerships in general, and in IT outsourcing in particular, requires a general framework that takes relevant theory into account.

In this paper, we described the role of IT flexibility, and identified empirically testable theoretical constructs regarding how IT flexibility will affect the characteristics of strategic alliances. While some contracts and incentive structures may constrain the flexibility of firms in alliance relationships, we argue that it is precisely when firms are constrained by such conditions that they benefit most from flexibility in their IT systems. By distinguishing the capabilities of flexibility from the incentives—through the perspectives of contracting, coordination, and dynamic capabilities—we are able to better understand how IT flexibility can be valuable in the context of strategic alliances.

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