CAN CLIENT FIRMS ACHIEVE RADICAL INNOVATION IN IT OUTSOURCING?

Completed Research Paper

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Abstract

There is growing evidence that client firms expect outsourcing suppliers to transform their business. Most outsourcing vendors indeed deliver incremental innovation to client firms. However, radical innovation in outsourcing is more challenging to achieve. While prior studies have provided some evidence regarding how innovation in outsourcing may take place, research has so far failed to conceptualize and operationalize the factors affecting radical innovation in outsourcing. It is not yet clear how contractual and relational aspects affect such innovation. This paper, therefore, is set about exploring the effect of contract types and client-supplier relationship on radical innovation. Results suggest that joint-venture contract and strong client-supplier relationship lead to radical innovation while time and materials and fixed-price contracts are less likely to lead to radical innovation. The strength of client-supplier relationship mediates the effect of joint venture contract on radical innovation. The paper concludes by discussing the theoretical and practical implications.

Keywords: Outsourcing, radical innovation, contracts, relational approach.

INTRODUCTION

The last ten years have witnessed significant growth in the outsourcing industry (Oshri et al. 2009). While the early years of IT and business process outsourcing were mainly characterized by a quest for costs savings (Loh and Venkatraman 1992; Lacity and Hirschheim 1993) and focus on core competences (Quinn and Hilmer 1994), recent evidence suggests that client firms now seek to achieve added value from outsourcing (Lewin and Peeters 2006) by accessing suppliers' competences (e.g. Dyer and Nobeoka 2000; Quinn 2000). Mol (2005: 571) argues that 'firms are increasingly relying on partnering relationships with outside suppliers that can act as an effective substitute to the internal generation of knowledge and innovation'. Similarly, Linder et al (2003) and Weeks and Feeny (2008) argue that client firms rely on external suppliers in the search for new ideas. More recently, accepting that innovation is outsourced and offshored, Lewin et al (2009) studied the determinants driving firms to offshore innovations to only conclude that firms have been entering a global race for talent in which solutions will be sought wherever skills are available. Such observations bring to the fore the role that innovation plays in outsourcing engagements. Indeed, the study of innovation within a firm and between firms is wide and diverse. For example, in an attempt to understand the factors affecting innovativeness of a firm, one study identified the Research & Development (R&D) base of the firm, specialization, managerial attitude towards change, slack resources and internal and external communications as imperative to developing an innovativeness capability (Damanpour 1991). While past studies in the innovation literature have been helpful in conceptualizing the factors affecting innovativeness in a firm, the outsourcing context presents a setting in which a client and a supplier carry out the outsourcing project based on a formal contract that dictates the terms upon which fees will be paid for service (Gopal, Sivaramakrishnan, Krishnan and Mukhopadhyay 2003), as well as based on the nature of the partnership developed throughout the outsourcing project which is derived from the strength of the relationship between client and the supplier (Saunders et al. 1997). Perceiving outsourcing as such, innovation in this context has traditionally been studied as an independent variable of outsourcing performance (Lacity et al. 2010). Further, studies that took interest in innovation in outsourcing have provided anecdotal evidence of the phenomenon based on a small number of case studies (Quinn 2000; Linder et al. 2003; Weeks and Feeny 2008). While past studies have been helpful in providing initial guidance regarding the process through which innovation can be achieved in outsourcing, the outsourcing field is lacking a conceptualization of factors affecting innovation in outsourcing. In this regard, it is not clear which factors central to the outsourcing arrangement affect the ability of a client and a supplier to achieve innovation.

Therefore, the aim of this research is to understand how a client firm can benefit from innovation generated by its outsourcing supplier by examining the role that the contract type and the strength of the relationship between client and supplier play in achieving innovation. Innovation manifests itself in both radical and incremental forms (Dewar and Dutton 1986); however, radical innovation is more challenging to achieve within the firm and as part of an outsourcing engagement and therefore will be the focus of this study.

The rest of the paper is organized as follows: first we review the literature on innovation in the context of IT and business services outsourcing of; then we explain the role of contract types and the client-supplier relationship and develop a set of hypotheses connecting these factors with radical innovation as an outcome of an outsourcing engagement. This is followed by an explanation of methods and results. Then we discuss our findings in the light of the existing literature. The paper concludes with theoretical and practical contributions.

LITERATURE REVIEW AND HYPOTHESES

Innovation in the Context of Outsourcing Services

Outsourcing of IT and business services has been recognized as one of the risks leading to the loss of innovative capabilities inside a client's firm (Weeks and Feeny 2008). Past studies, however, have persistently anticipated that outsourcing will deliver new ideas and value to both business operations and strategic objectives (Lacity and Hirschheim 1993; Lacity et al. 2010). Despite the above risk, innovation is

one of the promises of outsourcing; however, one which is poorly understood. For example, most studies in the outsourcing literature have provided anecdotal accounts of instances in which innovation has or has not been achieved (e.g. Quinn 2000; Levina and Vaast 2008; Weeks and Feeny 2008). Further, in the few studies in the outsourcing literature that have attempted to model innovations, this concept was perceived to be an independent variable (e.g. Kishore et al. 2004) rather than a possible outcome of an outsourcing project (Lacity et al. 2010).

The innovation literature distinguishes between various types of innovations. Undoubtedly, the vast majority of studies on innovation have adopted the concepts of incremental and radical innovations as central to understanding innovation (e.g. Ettlie et al. 1984; Dewar and Dutton 1986; Malhotra et al. 2001). While the conceptualization of radical and incremental innovation originated in the product development and innovation literature, several recent studies in the service innovation literature have adopted the concepts of radical and incremental innovations, using similar definitions (e.g. de Brentani 2001; Oke 2007). Thus, in the context of service industries incremental innovation implies service line extensions (Droege et al. 2009), small adaptations and improvements to existing services and improvements in efficiency of services (Jansen et al. 2006). Radical innovations, on the other hand, are designed to meet the needs of emerging customers or new markets. In this respect, radical innovations may result in new service lines (Droege et al. 2009), entering new markets (Berry et al. 2006) and introducing new distribution channels (Jansen et al. 2006).

Most firms tend to excel in incremental innovations and fail to achieve radical innovations. In the context of outsourcing, incremental innovation can be achieved when the supplier focuses on quality improvements in the outsourced IT or business services (Rottman and Lacity 2006b; Weeks and Feeny 2008). For example, Weeks and Feeny (2008), whose 'IT operational' and 'business process' innovation typologies are incremental innovations and 'strategic innovations' corresponds with the definition of radical innovation, show that the vast majority of innovations achieved in outsourcing projects are mainly at the incremental innovation level. Further, when examining cases of radical innovations in outsourcing, they conclude that both client and supplier tend to struggle to successfully innovate. Similarly, Quinn (2000) provides ample examples of client firms engaging in outsourcing innovation where the vast majority of these projects resulted in incremental innovations. Lacity et al (2010) confirm the emphasis on incremental innovation by suggesting that among the main drivers to outsource are improvements in processes and services (DiRomualdo and Gurbaxani 1998), achieving change (Linder 2004) and improvements of the delivery time (Khan and Fitzgerald 2004)). They conclude that 'truly strategic reasons for outsourcing IT have been relatively under-studied' (Lacity et al. 2010 :406). Consequently, radical innovation, as one of the strategic challenges firms face in general and in the context of outsourcing in particular, will be the focus of this study. An example of radical innovation in outsourcing is when a vendor designs and implements a solution for a client that completely transforms the client's service approach. Such radical innovation is not necessarily a-priori defined in the outsourcing contract, and sometimes emerges over time through consultation between the client and the supplier regarding various challenges that the client faces. Nonetheless, many outsourcing contracts tend to have a generic innovation clause included in which client firms expect innovation from their suppliers.

There has been some research on the factors affecting radical innovations in organizations. The few studies that examined the antecedences of radical innovation have mainly focused on organizational factors such as structural complexity (Damanpour 1996), complementary assets and the effect of environmental factors (Srinivasan et al. 2002), and the diversity of knowledge (Fichman and Kemerer 1997). Focusing on the service industries, Oke (2007) found that innovation strategy, human resource management, creativity and ideas management, selection and portfolio management, and implementation are significantly related to radical innovation. While these findings are of value to firms that come up with in-house radical innovation, these factors have little relevance to outsourcing settings.

In outsourcing arrangements, client and supplier firms mainly rely on a contractual agreement (Gefen et al. 2008) to agree upon the work that will be carried out and the set of criteria which will assess the quality of work performed by the supplier. Indeed, the most commonly found contracts are fixed-price or time and materials which pose different risk levels for the client and the supplier depending on the nature of the business or IT service outsourced (Gopal and Sivaramakrishnan 2008). In this regard, fixed-price contracts were found to deliver better quality than time and materials as suppliers tend to staff such projects with trained personnel to ensure risk mitigation (Gopal and Koka 2010). While the contract is a

formal mechanism 'legally binding' client and supplier firms, as outsourcing commences, the client and supplier tend to develop a relationship which may enhance outsourcing performance (Saunders et al. 1997), including radical innovation.

In the next section, we elaborate further on the relationship between contract types and the ability to achieve radical innovations in outsourcing projects.

Contract Types and Radical Innovation

The IS outsourcing literature has examined the role of contracts in outsourcing from various angles (e.g. Gopal, Sivaramakrishnan, Krishnan and Mukhopadhaya 2003; Gefen et al. 2008). For example, Platz and Temponi (2007) studied the key challenges associated with outsourcing contracts. Another stream of research focused on understanding which contract types clients should apply in outsourcing engagements. Gopal and Koka (2010), who examined the different incentive structures built into contract types, identified time and materials and fixed-price contracts to be the key types applied in outsourcing engagements. They found out that service quality in fixed-price contracts is higher than in time and materials contracts because '"[…] the power of incentives and the ability to measure, even imperfectly, the progress made by the supplier on a project provides appropriate motivations for managers to pay attention to all important aspects of a services engagement through the project life cycle'. Gefen et al (2008) also consider time and materials and fixed-price contracts to be the main contractual approaches in outsourcing. Their study concludes that there is a strong connection between business familiarity and clients' tendency to prefer time and materials contracts. In other words, the higher the suppliers' business familiarity with the clients' business, the more likely the client will choose to use a time and materials contract. From the supplier side, Gopal and Sivaramakrishnan (2008) argue that fixed-price contracts will be the suppliers' preference for larger and longer outsourcing projects that require large teams and a time and materials contract for scenarios in which there is a high risk of employee attrition. While time and materials and fixed-price contracts have been identified as central to outsourcing engagements (Banerjee and Duflo 2000), there has been growing evidence that client firms and suppliers set up partnership contracts in the form of joint ventures to address other business objectives. In this instance, the partnership contract defines how client and supplier firms contribute resources to the new venture and how profits will be shared (Kogut 1988; Koh and Venkatraman 1991). Among the many drivers to form a joint venture, research has highlighted overcoming entry barriers into new markets, speeding up entry strategy to new markets and technologies, achieving economies of scale, managing risk sharing and getting access to complementary assets (tangible and intangible) located outside the firm's boundaries (Hennart 1988; Koh and Venkatraman 1991). There has been little research about partnership contracts in the context of outsourcing (e.g. Willcocks and Choi 1995) that shed light on client's consideration when opting for a joint venture contract. Recent commentary from professional sources indicate the main drivers to pursue a joint venture arrangement between client and supplier are risk and award sharing, buyer improves control over the operations, on-going incentives for the supplier to maintain interest in the venture1. To our best knowledge, in the context of outsourcing IT and business processes, research and commentary from industry sources have not considered radical innovation as a driver to set up a joint venture between a client and a supplier.

Considering that radical innovation projects present a high degree of uncertainty and complexity regarding the ability to a priori define the expected outcomes and precisely predict the costs involved, using fixed-price contracts, which are rather strict and clearly defined, may inhibit the flexibility needed when uncertainty arises. Time and materials contracts may offer flexibility when uncertainty is high; however, such contracts also elevate concerns regarding suppliers' opportunism under uncertain conditions (Steensma and Corley 2001; Kern et al. 2002). A partnership contract in the form of a joint-venture contract has been reported to be highly successful in economic terms (Saunders et al. 1997) as such contracts offer a joint risk approach and the potential to appropriate value from the innovation for both client and supplier. We therefore hypothesize the following:

[1] For example: commentary on Outsourcing Times, April 6, 2006: http://www.blogsource.org/2006/04/joint_ventures_.html, last accessed April 18, 2011.

H1: A fixed-price contract is associated with less radical innovation while a joint-venture contract with profit sharing is associated with more radical innovation.

Client-Supplier Relationship and Radical Innovation

There is general agreement in the literature that client-supplier relationship improves outsourcing outcomes (Lee and Kim 1999; Kishore et al. 2003b; Lacity et al. 2010). In this regard, the client-supplier relationship represents the connections between staff from the supplier and client side that result in information and knowledge exchanges (Tsai and Ghoshal 1998). Jansen et al (2006:1663) explain that such connectedness concerns linkages between people and comprises a more voluntary mode of coordination than hierarchical structure. Client-supplier relationship as an independent variable has been studied in the outsourcing literature (Lacity et al, 2010) using twenty-five different factors, among them most frequently studied were effective knowledge transfer (e.g. Lee 2001; Rottman and Lacity 2006a), cultural distance (e.g. Dibbern et al. 2008) and trust (e.g. Hoecht and Trott 2006; Lee et al. 2008). Several studies also emphasized client-supplier relationship, focusing on the role it plays when innovation is sought as an outcome of the outsourcing project (Kern et al. 2002; Kishore et al. 2003a; Koh et al. 2004; Moon et al. 2010). For example, Weeks and Feeny (2008) argue that the relationship between client and supplier will become instrumental in building the supplier's business process design, which is the learning capability of the supplier, and client-industry knowledge, which is the supplier's pool of business solutions, both imperative capabilities for radical and strategic innovations (Weeks and Feeny 2008). In this regard, radical innovation as an outcome of the outsourcing engagement requires a strong relationship between the client and supplier to enable the supplier to learn about the client's business and the solutions that will transform the client's business. The exchange of information and knowledge between supplier and client employees will facilitate the creation of new knowledge, which is the source of radical innovation. Thus, we hypothesize the following:

H2: The more the outsourcing engagement is based on a client-supplier relationship, the more radical innovation will be achieved.

Contract Types, Client-Supplier Relationship and Radical Innovation

Both contract types and client-supplier relationships have been examined as independent variables of outsourcing outcomes (Baldwin et al. 2001; Barthe´lemy 2001). Research has established that contract type affects outsourcing outcomes (Lacity and Willcocks 1998). In a similar vein, relationship characteristics have been positively associated with outsourcing outcomes (Lacity et al. 2010). Further, several studies found that contractual governance interacts with relational governance (Saunders et al. 1997; Sabherwal 1999; Poppo and Zenger 2002). For example, Goo et al (2009) found out that well-structured SLAs have significant positive influence on the various aspects of relational governance in IT outsourcing relationships. While the IS literature has advanced our understanding regarding the links between contractual and relational governance, it is not yet clear how contract types affect client-supplier relationship and consequently radical innovation. In particular, as partnership-based contracts require trust and cooperation (Weeks and Feeny 2008), hinting at close relationships between client and supplier. Similarly, time and materials contracts are associated with vendor's business familiarity of the client, suggesting an intimate relationship between the client and the vendor (Gefen et al. 2008). Fixed-price contacts are believed to be based on a transactional approach; yet their impact on client-supplier relationship is unclear. We therefore hypothesize the following:

H3: A partnership-based and time and materials contract is associated with stronger client-supplier relationships.

H4: The strength of the client-supplier relationship mediates the effect of contract type on radical innovation.

METHODS

Data Collection

The data collection involved high level executives in the IT and business fields that engaged in at least one outsourcing arrangement. Our unit of analysis is the client firm in the outsourcing arrangement. The targeted firms included a mix of industries and sizes to represent variation in the economy. The survey was conducted in late 2010. Once companies had been screened to meet the study criteria, over 2000 executives were contacted and 248 fully completed the survey instrument, resulting in a response rate of 12.5%. Forty-seven percent of the interviews were collected by telephone and the remaining 53% were conducted via an online survey.

To minimize potential biases, the respondents were assured that their responses and identities would remain confidential and that only aggregate information would be published. In addition, to minimize respondent bias, we only surveyed those who participate in the decision making related to the topic of the survey (Phillips and Bagozzi 1986). We specified that respondents be individuals who are involved with the decisions to outsource. A 'don't know' response category was added to each question to minimize the risk of obtaining inaccurate responses from participants who may not know the answers to certain questions. This would avoid a respondent feeling pressured to respond to a question which they did not feel confident to answer.

Overall the respondents were divided between several industries. Banking and finance represent 19% of the sample. Insurance comprises another 15% of the sample. Internet and media represent an additional 16% of the sample. Manufacturing represents 19% of the sample. Retail represents 16% of the sample and finally telecommunications represents 15% of the sample. Half of the firms are located in the United Kingdom. An additional 10% are from each of the following regions: Benelux, Germany, Nordics countries, France and Switzerland. Forty-nine percent of the sample had between 500 million and 1 billion dollars in revenue the previous year; 26% had between 1 billion and 5 billion dollars in revenue the previous year, and the remaining 25% had over 5 billion dollars in revenue the previous year. The respondents are in top management positions at their firms: 40% of the respondents represent their function at the executive level. An additional 26% of the respondents have global responsibility for their function. Finally, 38% have national responsibility for their function.

Measurement

This study used previously validated scales from the literature, but since the scales were oriented towards intra-organizational processes, they were adapted to fit outsourcing arrangements. The appendix provides the actual wording of the questions used in the survey.

Radical Innovation: We measured radical innovation using the scale developed by Jansen et al (2006) (α=.812). This measure is designed to measure the extent to which organizations depart from existing knowledge and pursue innovations. We adapted this measure to incorporate innovation with outsourcing partners rather than solely internal processes.

Client-Supplier Relationship (α=.801) was measured using a five-item scale adapted from Jaworski and Kohli (1993). They developed this scale to measure the extent to which employees were networked to various other levels of the hierarchy. This scale was used in other studies (e.g. Jansen et al, 2006). We have adapted the measure to include cross boundary connections between the client and supplier firms.

We assessed the construct validity of all items pertaining to our constructs through exploratory and confirmatory factor analysis (CFA). Exploratory factor analysis of all items (dependent and independent variables) indicates a two factor structure. Each item loaded on its intended factor (all factor loadings were above 0.65 with cross-loadings lower than 0.31), and all factors had eigenvalues greater than one. An integrated CFA on all items (with each item constrained to load on the factor for which it was the

proposed indicator) yielded a model that fits the data well ($\chi 2/df$ = 3.21, goodness-of-fit index (GFI) = 0.88, comparative fit index (CFI) = 0.85, and a root-mean-square error approximation (RMSEA) = 0.06). Item loadings were as proposed and significant (p<.001).

Independent Variables

Type of contract: In order to test how the fee structure of the arrangement influences both the client-supplier relationship and the degree of innovation, we include measures on types of contracts the organizations used with their outsourcing partners. The type of contract considered to have the highest degree of a fixed fee structure is the fixed-price contract, followed by time and materials contract and the type of contract with the least fixed fee structure is the joint-venture with profit sharing. Contract type was gathered by asking respondents which types of contracts they use with their outsourcing firms: 42% responded that they used time and materials contracts, 78% indicated that they used fixed fee for specified services, and 21% used joint ventures with profit sharing. Each contract type is indicated as a 1 if the respondent indicated that they use that type of a contract with an outsourcing client and a 0 if they do not use that contract type with an outsourcing client.

Control Variables

In the empirical study, we controlled for possible confounding effects by including various relevant control variables[2]. Three types of outsourcing arrangements were considered: business processes, IT development processes and IT application maintenance. Of the types of outsourcing used, 74% of the respondents indicated they outsource business processes, 80% outsource IT development and 88% indicated that they outsource IT application maintenance.

ANALYSIS AND RESULTS

Table 1 presents descriptive statistics and the correlations for the study variables. Table 2 presents the results of the linear regression analyses for client-supplier relationship and radical innovation.

Table 1. Means, Standard Deviations and Correlations

	Mean	Std. Dev.	1	2	3	4	5	6	7
1. Radical Innovation	3.34	0.79							
2. Client-Supplier Relationship	3.32	0.82	.39**						
3. Time and materials	0.42	0.49	.13*	.156*					
4. Fixed fee for specified service	0.78	0.41	-0.08	-0.04	-0.09				
5. Joint venture with profit sharing	0.21	0.41	.21**	.21**	-0.05	0.01			
6. Outsource Business Processes	0.74	0.44	-0.05	0.00	0.05	0.03	-0.01		
7. Outsource IT Development	0.80	0.40	.13*	.31**	0.06	-0.07	.16*	-.30**	
8. Outsource IT Maintenance	0.88	0.33	0.09	-0.02	0.06	-0.05	0.01	0.10	-.19**

Note: n= 248. *p< 0.05, ** p<0.01

[2] We attempted additional controls including industry, country and size of the company, but none of them had a significant effect on the outcomes.

In order to test our hypotheses six models were estimated. Model 1 estimates the effects of the control variables on our mediator variable client-supplier relationship. Model 2 then adds the contract types to Model 2, in order to test the mediation effect predicted in Hypothesis 4 (see Baron and Kenny 1986 for a further discussion of testing for mediation). Model 3 estimates the effects of the control variables on radical innovation. Model 4 adds the contract types to Model 3 allowing us to test hypothesis 1. Model 5 adds radical innovation to Model 3, allowing us to test hypothesis 2. Finally Model 6 is tested which allows us to test Hypothesis 4, which argues that client-supplier relationships mediate the effects of contract type on innovation.

The baseline models (Models 1 and 3) contain control variables. Outsourcing business processes did not have a significant effect on client supplier relationships or radical innovation. Outsourcing IT development had a positive and significant effect on client supplier relationship (β=.35, p< .01) and radical innovation (β=.15, p< .05). This indicates that firms that outsource IT development have stronger client-supplier relationships and are more likely to experience radical innovation. Finally, outsourcing IT maintenance does not have a significant effect on the client supplier relationship, but does have a significant and positive effect on radical innovation (β=.13, p< .05).

Table 2. Results of Linear Regression Analyses: Effects on Client-Supplier Relationship and Radical Innovation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Client-Supplier Relationship	Client-Supplier Relationship	Radical Innovation	Radical Innovation	Radical Innovation	Radical Innovation
Outsource Business Processes	.09	.08	-.01	-.02	-0.04	-.04
Outsource IT Development	.35**	.31**	.15*	.10	.02	-.01
Outsource IT Maintenance	.05	.03	.13*	.11^{+}	.11^{+}	.10
Time and materials		.13*		.12^{+}		.07
Fixed fee for specified service		-.01		-.05		-.05
Joint venture with profit sharing		.17**		.21**		.15**
Client-Supplier Relationship					.38**	.34**
Adjusted R2	0.1	0.13	0.02	0.07	0.14	0.16
R		0.03		0.05	0.12	0.14
N	248	248	248	248	248	248

Note: Standardized regression coefficients are reported
Telecommunications is the reference category for industry
$^{+}$ p < .1, *p< 0.05, ** p<0.01

Model 4 was estimated to test hypothesis 1, which argues that the type of contract affects the degree of radical innovation achieved in outsourcing. There is support for hypothesis 1. Using a fixed-fee contract has a negative, but not significant effect on radical innovation (β=-.05, ns). Using a time and materials contract has a small positive, but marginally significant effect on radical innovation (β=.12, p < .1). The strongest effect on radical innovation was from a joint-venture with profit sharing contract (β=.21, p < .01). Using this type of contract has the strongest positive and significant effect on radical innovation.

In order to test the effect of the client-supplier relationship on the degree of radical innovation achieved in outsourcing (H2), Model 5 was estimated. This hypothesis is supported; there is a significant positive effect of client-supplier relationship on radical innovation (β=.38, $p < .01$). The stronger the client-supplier relationship, the more radical innovation is likely to occur in outsourcing.

Model 2 tests the relationship between contract types with an emphasis on joint-venture with profit sharing contracts and the client-supplier relationship (H3). The hypothesis was supported. Using a fixed-fee contract has a negative, but not significant effect on the client-supplier relationship (β=-.01, ns). Contracts that involve time and materials have a positive and significant effect on the client-supplier relationship (β=.13, $p < .05$). Joint-ventures contacts with profit sharing have the strongest positive and significant effect on the client-supplier relationship (β=.17, $p < .01$). The relative weight of each of the estimates lends support to the hypothesis; partnership based contracts have a positive effect on the client-supplier relationship, while those that incorporate time and materials have a smaller, but still positive and significant effect on the client-supplier relationship. Finally, using a fixed fee approach has a negative effect on the client-supplier relationship, meaning that they have the lowest level of client-supplier relationship in their arrangements.

In order to test hypothesis 4, we estimated model 6, which adds the effect of the client-supplier relationship to model 4 in order to test the mediation effect[3]. Having previously established that the degree to which a contract incorporates a fixed fee basis has an effect on both radical innovation and the client-supplier relationship (models 4 and 2 respectively), we add the strength of the relationship between client and supplier to the model to test for mediation. The strength of the client-supplier relationship has a positive and significant direct effect on radical innovation (β=.34, $p < .01$). The results indicate there is a partial mediation of the effect of the contract type through the strength of the client-supplier relationship. The effect of incorporating time and materials (β=.07, ns) loses its significance, but more importantly in terms of mediation, the effects of both on radical innovation are lessened by the addition of the strength of the client-supplier relationship. The effect of using a fixed-fee contract is not mediated by the addition of the strength of the client-supplier relationship (β=-.05, ns). There is no change in the effect or the significance of a fixed-fee contract on radical innovation when the strength of the client-supplier relationship is added to the model. The effect of incorporating a joint venture with profit sharing into the contract is also reduced by the addition of the strength of client-supplier relationship to the model, but it does retain its significant effect on radical innovation (β=.15, $p < .01$). Thus, the direct effects of having a time and materials contract or a joint-venture with profit sharing are partially mediated by the addition of the strength of the client-supplier relationship.[4]

DISCUSSION

The results of this study highlight three key areas of interest within the literature on innovation in outsourcing. First, the results show that a joint-venture with profit sharing contract has a positive effect on radical innovation while fixed-price and time and materials contracts have no effect. Past studies found that fixed-price contracts deliver higher service quality (Gopal and Koka 2010) and are more suitable for long-term and large outsourcing projects (Gopal and Sivaramakrishnan 2008); however, client firms expecting suppliers to deliver radical innovation in outsourcing engagements will not benefit from a fixed-price contract. Radical innovations are typically associated with a high degree of uncertainty regarding the scope of work involved and the possibility to design precise metrics to measure outcomes (Dewar and Dutton 1986; Henderson and Clark 1990). This may deter suppliers from using fixed-price contracts regardless of the strength of the client-supplier relationship or the degree to which the supplier is familiar with the client's business (Gefen et al. 2008). Clearly, because of the elevated risk of encountering opportunism in which a supplier is acting untruthfully to serve self-interests (Kern and Willcocks 2002; Calantone and Stanko 2007) within an outsourcing engagement for innovations, clients will stay away

[4] Sobel tests were conducted to assess the significance of the mediation tests. The tests for mediation showed that the strength of the client-supplier relationship significantly mediated the effect of the type of contract on radical innovation.

from using time and materials contracts. On the other hand, a partnership based contract, such as a joint-venture contract which is based on profit sharing, creates motivation for both parties to collaborate and contribute towards radical innovation. This explanation is in line with the assertion (Powell 1996; Hoecht and Trott 2006) that radical innovations are likely to be found in inter-organizational relationships and networks that provide access to resources and capabilities that cannot be found internally. For example, inter-organizational networks can facilitate the development of joint research capability required for radical innovation which is greater than the research capability that the client firm can develop on its own (Mol 2005). A joint research capability still may lead to a continuous bargaining process between the client and supplier about the appropriation of the value created (Mol 2005; Dankbaar 2007), while a joint-venture contract may overcome this challenge by introducing transparency regarding profit sharing and by setting up clear expectations about profit sharing, which is usually based on the proportional contribution of each party.

Secondly, the strength of the client-supplier relationship has a positive effect on radical innovation. In line with observations made based on several case studies by Weeks and Feeny (2008) and Quinn (2000), our study models the link between client-supplier relationship and radical innovation to find that a strong relationship between client and supplier may lead to a shift from a transactional to a relational governance approach (Zaheer and Venkatraman 1995; Kishore et al. 2003a). The relationship between client and supplier facilitates the supplier's ability to learn about the client's business; (Gefen et al. 2008), helping the supplier to offer radical solutions to ongoing challenges. This explanation is in line with the conclusion of the recent conceptual study that proposed that a greater degree of trust in the client-supplier relationship leads to client's ability to access the supplier's Intellectual Property (IP), and may result in incremental and radical innovation (Roy and Sivakumar 2011). In this regard, our study responds to the call by Roy and Sivakumar (2011) to test the connection between client-supplier relationship and radical innovation.

Third, we found that the client-supplier relationship mediates the effect of a joint-venture contract and radical innovation. Strong relationships between the client and supplier do not improve the effect that fixed-price and time and materials contracts have on radical innovation. These remain insignificant, hinting that a shift towards a relational governance approach cannot compensate for the risks involved in pursuing fixed-price or time and materials contracts for radical innovation in outsourcing engagements for the reasons explained above. The role of the client-supplier relationship in mediating between a joint-venture contract and radical innovation is, particularly, important as there are still risks in such partnerships that need to be mitigated. For example, there still might be a possibility that the client firm will be concerned with information leakage (Hoecht and Trott 2006; Ho 2009) or the loss of Intellectual Property, in particular if there is a risk of the supplier applying knowledge generated in the joint venture in its engagements with other clients (Roy and Sivakumar 2011). In such cases, a strong client-supplier relationship, which is based on trust, can help the client communicate their concerns without having to engage in a legal action. Having discussed the results of our analysis, we now consider the implications of this study to theory and practice.

THEORETICAL AND PRACTICAL IMPLICATIONS

The study of innovation in outsourcing and the service industry is relatively new. While several studies examined radical innovation in new service development settings (e.g. Avlonitis et al. 2001; de Brentani 2001; Oke 2007), the focus of these studies was on the generation of radical innovation within the firm, which is not applicable to the context of outsourcing. In this regard, our study extends the literature on innovation to include the factors affecting radical innovation in client-supplier settings. Indeed, the central role that client-supplier relationship and contract types play in achieving radical innovation in outsourcing settings emphasizes the need to consider factors that are shaped by the firm and external partners, as innovation can be, and in this context often is, generated outside the firm.

To our knowledge, this is the first study that investigates radical innovation as a dependent variable of outsourcing (Lacity et al. 2010). Further, this study is a timely response to Roy and Sivakumar's (2011) call to examine the factors affecting radical innovation in outsourcing engagements. In this regard, our study extends past studies that examined the effect that various types of outsourcing contracts have had on outsourcing performance (e.g. Gefen et al. 2008; Goo et al. 2009; Gopal and Koka 2010) to reveal that

only joint-venture contracts have positive effect on radical innovation in outsourcing. We also extend our understanding regarding the relationship between client-supplier relationship and outsourcing outcomes (Kishore et al. 2003a; Koh et al. 2004; Moon et al. 2010), specifically for the case of radical innovation as a dependent variable. We confirm past observations that client-supplier relationships positively affect outsourcing outcomes, including radical innovation. Further, while research has argued that relational governance and contractual governance act as complements rather than substitutes (e.g., Saunders et al. 1997), our analysis suggests that such interactions between these two governance approaches are likely to happen in the case of radical innovation when joint venture contracts are in use and less likely to happen in the case of fixed-price and time and materials contracts.

There are some practical implications that surface from this study. As the outsourcing services industry is maturing, executives of client firms seek to extract innovations from their partners (Weeks and Feeny, 2008). Our study supports the observations made by Gopal and Koka (2008) and Gefen et al (2008) that certain contract types affect outsourcing performance. However, our analysis shows that relying on fixed-price and time and materials contracts will not support radical innovations as an outsourcing outcome. Executives will need to consider using joint-venture with profit sharing contracts in order to enable radical innovations. However, the academic literature and also this research suggest that the vast majority of client firms use fixed-price contracts. For example, our analysis shows that only 21% of our sample is accustomed to use joint-venture contracts while 78% of the firms in our sample use fixed-price contracts (see Table 1). For radical innovation to take place in outsourcing, client firms need to consider their strategic intent (Bengtsson et al. 2009) regarding the expected outcomes.

Our analysis also shows that the client-supplier relationship mediates the effect of the joint-venture contract on achieving radical innovation. Therefore we conclude that while the joint-venture contract maintains its importance in achieving radical innovations, client firms should focus on developing client-supplier relationships as the driving force to achieve radical innovation.

The analysis presented in this paper is subject to several limitations. First, we have used three types of contracts which are not necessarily representing the complete range of contracts applied by firms in their outsourcing engagements. Future research should consider extending the range of contracts used in outsourcing engagements such as outcome-based contracts. Second, our sample is biased towards the European perception of radical innovation in outsourcing which can be affected by the relative immaturity level of the European outsourcing market as compared with the USA market. We see an opportunity to conduct a similar study in the context of the USA outsourcing industry to compare with the results of this study. Third, DiRomualdo and Gurbaxani (1998) found that clients need to match the type of ITO decision (business improvement, IS improvement, or commercialization) with the right kind of contract. Our study did not consider the strategic intent of the client firm as our intention was to test top executives' general perceptions regarding the link between outsourcing and radical innovation. Future research can refine our results by including the strategic intent as a variable affecting the type of contract selected for outsourcing. Fourth, as data were collected at the firm level, the results represent executives' perception, based on their aggregated experiences in outsourcing, rather than a reflection on a specific outsourcing relationship in which radical innovation has been achieved. Future research should test our model at the relationship level. Fifth, our results suggest that IT maintenance and IT development outsourcing projects have an effect on radical innovation while BPO projects do not have any effect on radical innovation. This is rather perplexing, in particular regarding IT maintenance, as such projects often involve repetitive and simplistic tasks that do not call for radical innovations. In the absent of explanation for our results, future research should extend our model to include 'the strategic importance of the outsourced task' in order to contribute to explaining the effect of each outsourced function on radical innovation. Last but not least, we have attempted to collect information from executives whose responsibility is to execute outsourcing projects and at the same time bring innovations into the firm. In reality, in many firms executives, such as CFOs and CIOs, will be responsible for executing outsourcing projects while not necessarily maintaining high degree of involvement in innovation. On the other hand, some executives, such as the Vice President (VP) of R&D or VP of engineering will be leading innovative work yet with a low degree of involvement in outsourcing projects. Future research on innovation in outsourcing should control for the function outsourced (e.g. IT, Finance and Accounting or R&D) and the role of the respondent to eliminate such shortcomings.

APPENDICES

Appendix 1: Measures and Items

*Radical Innovation**

Based on Jansen et al (2006)

We have invented new products and/or services working with 3rd parties.
We experiment with new products and services in our existing market through work with 3rd parties.
Our organization accepts demands from clients that go beyond existing products and services.
We commercialize products and services that are completely new to our organization through work with 3rd parties.
We frequently utilize new opportunities in new markets through work with 3rd parties.
Our organization is exploring opportunities to use new distribution channels to deliver products and services through work with 3rd parties.

Client-supplier relationship

Based on Jaworski and Kohli (1993)
In our organization, there is ample opportunity for informal conversation among our staff and third party employees that are based on our premises.
In our organization, our employees and third party staff feel comfortable approaching each other when the need arises.
Managers discourage employees discussing work-related matters with those who are not immediate superiors.**
People involved in outsourcing relationship are quite accessible to each other (regardless whether they represent client or supplier side).
In our outsourcing organization, it is easy to talk with virtually anyone you need to, regardless of rank, position or organization he/she belongs.
*All items were measured on a five-point scale, anchored by 1=strongly disagree and 5=strongly agree.
** Reversed item.

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