Exploring and managing the “innovation through outsourcing” paradox

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A B S T R A C T
This paper identifies the conditions that create a paradox when firms try to obtain innovation using outsourcing contracts. While outsourcing can be a way to obtain new ideas from business partners, most of the guidelines related to good contract management seem to deter innovative behavior. Managers trying to innovate using outsourcing are therefore facing two opposing sets of constraints, and have to manage both at the same time. In this paper, the nature of the “innovation through outsourcing” paradox is discussed in terms of the tensions between a contractual view of outsourcing and an innovation view of outsourcing, along with their associated reinforcing cycles. The paper outlines four mechanisms that are essentially self-correcting cycles. They include: 1) dual formal reviews; 2) matching governance with level of innovation focus; 3) dynamic decision-making/“extreme contracting”; and 4) ambidextrous organization. These can enable managers to deal with this paradox and obtain innovation from outsourcing arrangements in a successful manner. Complexities involved in implementing these mechanisms are discussed and some avenues for future research are offered.

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Introduction
In the current economy, innovation is a key driver for growth, for firm productivity, and for firm profitability. It is important for companies of all sizes, from start up to multinational firms (Rosenbusch et al., 2011; Tushman and Nadler, 1986). Innovation includes the generation, development, and implementation of new ideas in organizations (Damanpour, 1991). It enables companies to survive in the long term and to remain competitive. While traditionally innovation was done by a single organization, more and more, it requires firms to exchange ideas with other organizations (Chesbrough, 2003). The speed of innovation, and the variety of information required to innovate, increasingly force companies to collaborate with external partners. Not surprisingly, some firms have looked at their outsourcing partners or suppliers for sources of innovation (Oshri et al., 2015). Other research also shows that a firm does not innovate alone, it uses its network of suppliers...
to access their knowledge (Amin and Roberts, 2008). For example, IBM uses a large set of alliances and outsourcing arrangements to create new products or services (Ghemawat, 2007). Further, the benefit of the heterogeneity of contributors on innovation has also been suggested for software innovations (Boudreau, 2012).

However, much research on information technology outsourcing (ITO) has focused on the determinants of ITO, the properties and management of the outsourcing arrangements, and on the specific outcomes associated with the outsourcing contract (Dibbern et al., 2004; Lacity et al., 2010), and there is hardly any research focused on innovating through outsourcing. Researchers have looked at outsourcing as a dependent variable (explaining what to outsource) or looked at its immediate consequences (explaining how to outsource successfully) (Lacity et al., 2010). Research on business process outsourcing mirrored this choice of dependent variables (Lacity et al., 2011). Outsourcing has been mostly analyzed under a contracting or relationship lens, even when investigating the motivations of managers (Seddon et al., 2007). The key results obtained reflect this focus on contract and traditional contractual outcomes.

Moreover, when considering the outsourcing literature, it seems that some elements associated with successful outsourcing contracts might be at odds with innovation, which is known to require flexibility, slack resources, and adaptability (Crossan and Apaydin, 2010; Damanpour, 1991). For instance, successful outsourcing contracts are generally associated with low uncertainty, measurability, and detailed contracts (Lacity et al., 2010). It appears that innovation through outsourcing is a paradox: a set of contradictory elements that both exist and persist over time (Smith and Lewis, 2011). While several elements support the idea that innovation can be obtained through outsourcing, the guidelines for successful outsourcing appear to deter innovation.

This paper uses paradox as the theoretical lens to explore the phenomenon of developing innovations through IT outsourcing, and to develop propositions for successfully managing the paradox and innovate through outsourcing. First, the notion of paradox is reviewed, and its applicability to IT outsourcing and innovation is assessed. Results show that outsourcing and innovation really form a paradox. Following this description, four mechanisms are offered to understand how to resolve the “innovation through outsourcing” paradox: how to obtain innovation from outsourcing, while still ensuring that the outsourcing contract remains manageable. These mechanisms suggest different ways to manage outsourcing relationships when innovation is expected from the outsourcing arrangement. The avenues developed are not solely interesting for practitioners, they open new paths for research on IT outsourcing and innovation.

What is a paradox?

Organizations are complex systems. In order to manage this complexity and to adapt organizations to their environment, managers set up different structures and rules to facilitate their work (Galbraith, 1974). While these rules and modi operandi are established, conflicting elements sometimes emerge. These create tensions. These tensions are numerous: tension between exploitation of current business lines and exploration of new lines (Chesbrough, 2010), tensions between employee discretion for problem solving and formal monitoring in Just-in-Time management, or between the need for companies to be global and to adapt locally at the same time (reported in Lewis, 2000). These tensions are often qualified as paradox.

A paradox can be defined as “contradictory yet interrelated elements that exist simultaneously and persist over time. This definition highlights two components of paradox: (1) underlying tensions—that is, elements that seem logical individually but inconsistent and even absurd when juxtaposed and (2) responses that embrace tensions simultaneously” (Smith and Lewis, 2011, p. 382).

In organizations, a paradox reflects the joint existences of two elements that seem logical when considered in isolation, but appear incompatible when considered together, like collaboration and competition, or innovation and efficiency (Eisenhardt, 2000).

On a theoretical level, exploring paradoxes helps discover creative solutions. Different paths were offered to deal with paradoxes when conducting theory building. Researchers could simply accept the existence of a paradox, or try to resolve it by clarifying the level of analysis, by separating conflicting elements into different times, or by introducing new elements offering a new perspective (Poole and Van De Ven, 1989). These avenues are not mutually exclusive.

Paradoxes are important to identify correctly. If they are not recognized, there is a risk that they will be managed by focusing only on the most pressing problem. This can lead to a downward spiral in which actions only address one of the conflicting components. Ignoring paradox to select only one path can lead to a tunnel vision and be detrimental to the organization. In these situations the managers enter vicious circles in which each response to a difficulty intensifies the problem instead of solving it (Miller, 1992). Paradoxes can also create paralysis in organizations. Managers can be torn between conflicting demands and become incapable of deciding a course of action (Lewis, 2000).

Adequately managing paradoxes and meeting conflicting demands enable long-term success for organizations (Smith et al., 2010; Smith and Lewis, 2011). Paradoxes have been used to understand many complex organizational situations: control and autonomy in team innovation (Gebert et al., 2010), or in corporate governance (Sundaramurthy and Lewis, 2003), exploration and exploration in innovation (O'Reilly and Tushman, 2004), or in business strategy (Smith et al., 2010).

Investigating the paradox in innovation through outsourcing

In order to resolve a paradox, Sundaramurthy and Lewis (2003) proceed with three steps:
(a) Identifying the tensions behind the paradox in order to illustrate the differences and similarities between the two approaches opposing each other.

(b) Identifying what can happen when one approach is overemphasized by managers. This enables a description of the cycles, often reinforcing ones, created by the actions taken.

(c) Examining the various means by which one could deal with the paradox.

These steps will be followed in this paper to understand how to understand and ultimately reconcile the prescriptions associated with the management of outsourcing contracts in the pursuit of innovation within those contractual arrangements.

Identifying the tensions

When innovation is sought through outsourcing, a paradox can be identified. On the one hand, managers from the client firm are pressured to ensure that the contract will be managed adequately and that the supplier will keep its promises. This requires monitoring, clear measures, low uncertainty, and control. On the other hand, these managers are told to offer flexibility, slack resources, and flexibility to their supplier to ensure innovation, which is a high uncertainty activity. Each set of criteria is sound when assessed in isolation. However, when paired, each set is at odds with the other one. The following sections highlight the key elements in each set of criteria. We begin our discussion with innovating with external partners.

Innovation and outsourcing

Traditionally, innovators assumed the risks associated with innovation, and benefited from the rewards, often through patents (Arrow, 1962; Arthur, 2006). The traditional model of innovation was mostly conducted inside an organization, which tried to create interactions between the different spheres of business (different departments for example), influencing each other to bring out the best possible solution (Kline and Rosenberg, 1986; Rosenberg, 1982). Research suggests that organizations have to remain flexible, offer slack resources, decentralize, and provide information exchange between their units in order to foster innovation (Crossan and Apaydin, 2010; Damanpour, 1991).

Information technologies have paved the way for new approaches to innovation. These approaches use increased collaboration, sharing, and active participation of individuals and working groups (Tapscott and Williams, 2008). While these elements were argued necessary inside firms conducting innovation (Damanpour, 1991), new approaches argued that they could be applied between different organizations. In this wave of changes, outsourcing rose significantly. The organization now fits at the heart of a dynamic system where collaboration with suppliers, customers, and competition is necessary to innovate.

In this open model, organizations cannot solely rely on their internal skills. Accessing the skills of external partners is a sine qua non condition for the success of the innovation process (Chesbrough, 2003, 2006). These models acknowledge the fact that firms use and integrate in a systematic way both internal and external knowledge in order to innovate, and rely on internal and external distribution circuits (Christensen et al., 2005; Von Hippel and Von Krogh, 2003). The boundaries of the firm are permeable. Therefore, outsourcing is one of the ways to open up the innovation process and access outside ideas (Chesbrough and Kardon Crowther, 2006).

These elements have important strategic implications in terms of sharing and acquiring knowledge, but also in terms of development of creative capabilities (Drazin et al., 1999; Woodman et al., 1993). A firm does not innovate alone, it uses its network of suppliers to access their knowledge (Amin and Roberts, 2008). For example, IBM uses a large set of alliances and outsourcing arrangements to create new products or services (Ghemawat, 2007). The benefit of the heterogeneity of contributors on innovation has also been suggested for software innovations (Boudreau, 2012).

Outsourcing contributed to a change in the sources of value. It fostered the creation of value networks, in which organizations have access to a multiplicity of information sources, and cannot control this knowledge inside their boundaries. In a sense, outsourcing contributed to the emergence of bazar of innovations (Raymond, 1999). Work division has increased in the world of innovation and there is a trend toward more R&D outsourcing and alliances (Gassmann et al., 2010). The organization is no longer a sole entity involved in the innovation process. It relies on the contributions of a multitude of interconnected agents (Bjork and Magnusson, 2009; Pittaway et al., 2004).

Managing the innovation outsourcing contract for success

Outsourcing research has investigated contract and contractual outcomes. Recommendations emanating from the ITO literature suggest that activities outsourced should be measurable and entail low uncertainty (Aubert et al., 2012). Process standardization, measurability, and contract completeness are associated with outsourcing success (Wüllenweber et al., 2008).

In the outsourcing literature, contracts are mostly discussed as protection mechanisms between clients and suppliers who are likely to have divergent interests. The contracts entail clauses defining monitoring, property rights protection,
dispute resolution, and contingency planning (Chen and Bharadwaj, 2009). The contracts typically include audits, reviews, benchmarking procedures, etc.

The attention given to the contractual aspect of outsourcing also led to efforts to define and understand the service level agreements (SLAs) (Goo, 2010), and how SLA characteristics impacted relational outcomes (Goo et al., 2009). SLAs are a central element of the contract (and the IT outsourcing relationship) since they specify, usually in great details, the activities that will be performed by the parties, the outcome of those activities, and penalties associated with non-performance. Change characteristics embedded in the contract had a negative effect on trust and commitment in the relationship (Goo et al., 2009). This suggests a view of the outsourcing arrangements that is closer to a standardized delivery of services rather than an innovation-oriented relationship.

Barthélemy and Quelin (2006) indicated that firms had to be careful and try to control the vendor as much as they could, by developing tight and precise contracts, when outsourcing activities that were closer to their core business. Willcocks et al. (2006) acknowledge the difficulty linked to extracting innovation from outsourcing, indicating that it requires significant in-house capabilities and strong business leadership.

In addition to the contractual elements, outsourcing was often analyzed with respect to the knowledge it entailed and the knowledge and capabilities required for innovation. Following the resource-based view, outsourcing an activity meant losing the knowledge associated with the activity (Espino-Rodríguez and Padrón-Robaina, 2006). This could lower the capacity of the firm to innovate. Literature suggests that innovation is dependent on the accumulation of knowledge in the organization. This knowledge cannot be easily bought and sold (Hoecht and Trott, 2006). This suggests that it has to be developed in the organization, thus making outsourcing at odds with the development of the innovative capacity of the firm when it involved IT (Straub et al., 2008).

This suggests that while outsourcing has the potential to offer efficiency gains, it might be at the expense of innovation capacity related to the outsourced activities (Gewald and Dibbern, 2009). It would explain why a negative relationship was observed between outsourcing and financial performance as product and process innovations increased (Murray et al., 1995, reported in Espino-Rodríguez and Padrón-Robaina, 2006).

**Outlining the paradox**

Table 1 highlights the key elements of the foci and prescriptions pertaining to the paradoxical situation. On the left all the elements associated with “good outsourcing management” seem to lead to an innovation-poor environment. On the right, all the elements linked to innovation within outsourcing relationship seem to lead to a problem-prone contract. Yet, managers have to deal simultaneously with elements on both sides of the table when managing their innovation through outsourcing arrangements.

**Identifying the reinforcing cycles**

As mentioned in the introduction, organizations are under stronger pressure than ever to innovate. They are forced to use outsourcing more and more as a source of innovation in order to gain access to novel external resources, a sine qua non condition for the success of innovation. As also discussed, innovation by its very nature requires adaptability, flexibility, and risk taking, favoring a loose contractual regime for outsourcing contracts. At the same time, these firms need to be efficient in their management of outsourcing contracts. Suppliers have to be monitored to ensure that promises are kept and the desired goals are achieved, suggesting a tight contractual regime for these contracts. As illustrated in Fig. 1, if managers focus only on one aspect – innovation success with a loose contractual regime or outsourcing efficiency with a tight contractual regime and neglect the other one, they will not get the expected benefits. Each reinforcing cycle is explained in more details in the following paragraphs.

**Tight contractual terms to curb moral hazard**

When designing a contract to limit moral hazard, managers will include elements that are detailed, well specified and measurable. The client will have the required knowledge to monitor the contract. However, this will limit from the start the capacity of the supplier to take initiatives and risks that are inherently necessary for innovation since the SLAs in a tight contractual regime are expected to be detailed and will provide a low level of flexibility to the supplier. The supplier cannot easily provide ideas, knowledge, and expertise that would not have been specified ex ante. Constrained by the terms of the contract, the supplier is unlikely to innovate. This in turn should drive the client firm manager to enforce penalties for not innovating, and monitor the contract even more closely. This will further reduce the flexibility of the supplier, and generate even less opportunities to innovate.

**Loose contractual terms to foster innovation**

The second option is to devise a contract favoring innovation. The contract will be only loosely specified and will offer the required margin for the supplier to take different paths in order to innovate. This will create an environment in which there is little control over the supplier's work.

Depending on the incentives and the supplier’s profile, there may or may not be much work done. It will be very difficult for the client to assess the extent and the functionality/quality of the work that is completed since the contract is poorly specified. This may lead to a lack of appropriate corrective action on the part of the client even when the vendor performance...
is low. This in turn will confirm to the supplier that the client cannot adequately monitor the progress and/or the outcome, and will make it even more likely that little work will be delivered in the future. In this case the client pays too much for the service delivered.
Even if the supplier does complete and deliver the required work as per the contract, the fact that there is low control over the work suggests that the supplier is more likely to pursue innovation that is targeted towards the supplier’s interests rather than toward the client’s interests. Even when innovations are observed and delivered, it is difficult for the client to steer the supplier toward innovations that are more interesting for the client, because the contract is loosely specified. In this case, innovation is delivered, but it may not match the needs of the client.

**Summarizing the reinforcing cycles**

The two reinforcing cycles based on tight and loose contract specification, shown in Fig. 1 and discussed above, are simplifications of reality and are shown to highlight the nature of the paradox. In reality, in addition to the contract, managers will use relational governance to some extent in both the archetypes dependent upon a number of other factors, such as the duration of prior relationships, number of prior contracts and successful contracting history. This may affect the contractual calculus for both parties and weaken to some extent the extreme reinforcement of the cycles shown above.

However, other countervailing influences such as the vendor’s own goals for commercial gains from the planned innovation may strengthen the reinforcement. For example, if the vendor assesses that the planned innovation holds much value for the vendor, it may make investments in addition to those required by the contract. Due to information asymmetry that exists even in tight contractual regimes, the vendor may not disclose the strides it has made in developing the innovation using its own investments, resulting in a further tightening of the contract and its monitoring in already tight contractual regimes. In a loose contractual regime, the vendor may deliver only a part of the innovation developed or the entire innovation but on terms and at a price that may greatly reduce the benefits for the client firm.

In summary, even though the cycles discussed above are caricatures of the actual contract monitoring and resulting actions in the two contractual regime archetypes, it is clear that the two cycles for the two contractual regimes in the context of innovation through outsourcing are reinforcing cycles, a fundamental hallmark of a paradox. Further, the two reinforcing cycles illustrate the fact that focusing only on one side of the paradox is unlikely to lead to a successful innovation through outsourcing contract. At the same time, focusing on both sets at the same time may not work either. Contracts cannot be at the same time tight and loose. Choosing a middle ground simply by crafting contracts that are “neither too tight nor too loose” might bring all the disadvantages of both the contractual regimes without offering the advantages sought. Some elements might need constant readjustments, depending on the evolution of the work included in the contract. Therefore, other mechanisms have to be devised that can engage and enable self-correcting cycles to manage the paradox, and we discuss them next.

**Box 1 Illustrating the paradox.**

An illustration of the paradox embedded within innovation through outsourcing can be found in Barrett (2008). In the case, Globalco seeks to use the capabilities of a supplier as a “problem solver” who could collaborate in a variety of new ventures and expanding the Asian market. The relationship, after a few small projects to help build trust, grew into a form in which the main vendor would be a “global team member.” Unfortunately, low control over the supplier led to late deliveries and loss of quality. A response of some managers within Globalco was to revert to control and micro-management, which could trigger a tight regime cycle. Globalco seemed to recognize the risks of taking such a path and senior management took clear actions to ensure that the vendor remained a “sister lab.” Doing so the company remained in a relatively loose relationship regime with the supplier. The vendors kept missing expectations and it was not clear toward the end of the case how this situation could be resolved. While the case is not solely about paradox as there are notably cultural issues at play, it illustrates nicely the tension between the space a client might want to give to its supplier to foster innovation, and the control it wishes to retain at the same time to control the contractual relationship. The client wishes to do both sets of actions at the same time, while realizing that they are at odds with each other.

**Examining the self-correcting cycles for dealing with the paradox**

Several avenues enabling the management of paradoxical demands have been explored in literature. From a practical point of view, these avenues offer possibilities for companies to pursue innovation through outsourcing. From a research point of view, each avenue offers a possibility to investigate further the complex relationship between innovation and outsourcing.

Self-correcting cycles are used to manage control and collaboration (Sundaramurthy and Lewis, 2003). These rely on promoting what is labeled “seeds” for reinforcing cycles. These seeds can ensure that both sets of demands are always considered at the same time. For example, when trying to reconcile control and collaboration in the context of the role of boards in organizational governance, Sundaramurthy and Lewis (2003) suggest promoting simultaneously a diversity of view point as well as a shared understanding of the situation to enable boards to manage control and collaboration at the same time.
Each way of dealing with the paradox fits with one of three general means: acceptance, confrontation, or transcendence (Lewis, 2000; Poole and Van de Ven, 1989). The first one enables managers to admit that there is a paradox and that actions are subject to tensions. Confrontation enables discussions to increase understanding of the situation, and transcendence offers a way to think differently about the paradox to offer more complex solutions, often by reframing the problem (Lewis, 2000).

In the context of the present study dealing with the paradox of “innovation through outsourcing,” four types of mechanisms were identified to help managing the paradox. The first three, dual formal reviews, matching innovation level with governance, and dynamic decision making, stem from examination of internal aspects of the “innovation through outsourcing” contract. They concern the allocation of roles and the distribution of activities within the contract. The last one, ambidextrous organization, is looking at structural aspects of the organization managing the outsourcing contract. Most mechanisms enable acceptance of the paradox. One clearly offers a way to confront it, and one enables a form of transcendence. These four mechanisms are discussed in the following pages.

**Dual formal reviews**

The paradoxical demands imposed by innovating through outsourcing can be managed by a conscious and formal process of periodic reviews of the outsourcing contract, considering both the contractual view and the innovation-driven view described in Table 1. Such a formal, periodic review process as part of the governance of the outsourced innovation project would serve as a continuous reminder for both the client and the vendor that both the innovation and the contractual components of the innovation-oriented outsourcing contract are important for the success of the overall contract.

The IT outsourcing literature highlights the importance of both the formal contractual approaches utilizing detailed contracts, service level agreements, key performance indicators, and measurement charters (e.g., Anderson and Dekker, 2005; Chen and Bhuradwaj, 2009; Goo et al., 2009; Susarla et al., 2010) as well as the informal relational approaches involving social mechanisms of trust, commitment, mutual dependence, social ties, and psychological contracts (e.g., Goo et al., 2009; Kotlarsky and Oshri, 2005; Lioliou et al., 2014; Sabherwal, 1999; Wiener et al., 2014) for successful coordination of IT outsourcing projects.

Further, formal contractual control in outsourced IT projects could be accomplished using both process/behavior and outcome control mechanisms (Choudhury and Sabherwal, 2003; Ouchi, 1980; Srivastava and Teo, 2012). Process/behavior control mechanisms involve periodic measurement and review of the process used to fulfill and deliver the IT project, such as the software development process, as well as the behavior of employees involved in the delivery process and could include such mechanisms as client visits to vendor locations, conference calls, periodic meetings to review project progress against plan, code reviews and walkthroughs, and periodic project progress reports. Outcome control mechanisms involve the periodic measurement and review of project outcomes rather than the process of delivery, and may include such mechanisms as a review of functionality and/or performance of delivered software vis-à-vis specifications, software tests, costs incurred, elapsed time, etc. Studies have shown that firms typically combine various types of control mechanisms to construct a portfolio of control that they use to coordinate and control outsourced IT projects (Choudhury and Sabherwal, 2003). A dual formal review in the context of innovation through outsourcing would ensure that the paradoxical nature of the various types of control be explicitly recognized to ensure that balance is maintained.

The innovation literature has also investigated the different types of control mechanisms and their effectiveness in managing innovation projects and successfully developing new products. Both process control mechanisms such as phase-gate (a.k.a. stage-gate) model and quality function deployment, as well as outcome control mechanisms such as clear initial specification and periodic review of technical performance and cost parameters, completion deadlines and market success criteria are used for controlling new product development projects (Bonner et al., 2002). Further, with a stage-gate approach that is typically used in new product development (NPD) projects, periodic performance evaluation for control of an NPD project is typically done at NPD evaluation gates that coincide with the NPD stages (including idea generation, concept development, building the business case, product development, market testing, and market launch) (Hart et al., 2003). Formal reviews during these NPD gates have been found to have a positive effect on commercial success and cost objectives (Lewis et al., 2002). However, overly complex process controls that specify development project activities in great detail at high levels of granularity may have a detrimental effect on innovation outcomes. These controls may not only reduce the autonomy necessary for team creativity and risk-taking, they may also reduce the team’s flexibility necessary for making adjustments based on emergent situations in the innovation environment (Bonner et al., 2002). This is particularly true in the early front-end stages of the innovation project where a high degree of process formalization can lead to negative impacts on strategic contribution of the new product in terms of creating new markets and developing new technological knowledge (Poskela and Martinsuo, 2009).

Combining the two bodies of literature, we propose that the paradox of innovation through outsourcing can be managed by instituting formal reviews at key milestones that coincide with established NPD gates and that combine the elements from both the contractual and the innovation views into a portfolio of outsourced innovation controls.

**Proposition P1.** *Innovation through outsourcing can be managed effectively using dual formal reviews at NPD evaluation gates, emphasizing, but not limited to, outcome controls in the review process pertaining both to the outsourcing and the innovation aspects.*
Dual formal reviews offer a way to address the tensions mentioned in Table 1. These formal reviews recognize the existence of the tensions and suggest that these are revisited periodically. At regular intervals the two views (contractual vs innovation-driven) are re-evaluated and the prescriptions are rebalanced. It ensures that the contracting strategy is balanced and that its evaluation recognizes the dual challenge of measuring the activities while allowing for sufficient slack resources to enable innovation. Reviews should also help identify the knowledge needed for the completion of the activities and location of this knowledge (vendor or client). It should also offer check points at each period for governance and choice of supplier to ensure that the contract does not enter into a detrimental cycle. With formal reviews, all the tensions are considered at regular intervals to ensure adjustments are made each time it is required. This mechanism enables the managers to confront the paradox. They discuss explicitly the tensions to improve their actions (Lewis, 2000).

Matching governance with level of innovation focus

Another approach to manage the innovation through outsourcing paradox is that of differentiating constraints between different levels (Poole and Van de Ven, 1989); explicitly recognizing that actions at one level can constrain possible actions at another level. This approach offers an interesting path to look at tensions mentioned in Table 1. IT innovation can be examined with different levels of granularity. One could look for example at innovation impacting the general architecture of the IT infrastructure or innovation concerning at a specific system like the payroll system or the MRP system, or modifying a specific process. Often, a large architecture-level innovation might be accompanied by several localized innovations.

If one wanted to introduce innovation that affects the whole infrastructure or the whole organization, the innovation would be qualified as systemic. A systemic innovation is one in which all the components are transformed at once, including how they interact. Conversely, a modular innovation is limited to modifying a component, but not changing its interactions with other components (Langlois and Robertson, 1992; Robertson and Langlois, 1995).

A classic example of modular innovation is the type of innovation occurring constantly in the computer industry. Computers are made of standard components. The modularity of the computer architecture enables manufacturers like Intel to improve their processors or Toshiba to introduce a new hard drive while staying compatible with the other components of the computer systems (Langlois and Robertson, 1992). This works well since all the interfaces are standardized. All these innovations are modular innovations.

Outsourcing was found to be more suited for non-core elements and structured activities that could be easily controlled (Lacity et al., 2008). Part of the explanation is that non-core activities are likely to be more modular and therefore separable than core activities of the firm. In a similar vein, Lacity and Rottman (2006) indicated that an efficient manner to protect intellectual property was to separate projects into a series of segments, given to different suppliers. This prevented any of them to have a clear view of all the elements associated with the activities. It is likely that it could also limit the innovation potential of the outsourcing arrangement. It prevents the supplier to assess the global picture. These authors also indicated that adequate knowledge transfer, when required to conduct outsourced activities, was difficult and costly.

This differentiation between modular and systemic innovation might explain why in some cases authors have argued that outsourcing could lead to less innovation, and other authors said that outsourcing could lead to more innovation. It is entirely possible that authors who came to opposite conclusions were simply not assessing the same types of innovation.

If the innovation required is modular, it would make sense to seek knowledge outside the firm to innovate on one of the component of the product or system. A new supplier could bring new ideas and, as long as the interfaces with the other activities or components do not change, control is preserved. A company could give more freedom to the supplier to benefit from its knowledge.

If however the innovation sought through outsourcing is systemic, outsourcing could impede innovation since it would split the control over the components between two companies, thus removing the easy coordination required to change all the components at the same time.

In a paradox framework, the modularity would enable two levels of analysis. At the global level, defining how the innovation fits with the rest of the organization, the client organization could define clear measures and standards. The client would retain the knowledge linked with the architecture and control the interfaces linking modules (thus leaning on the left-hand side of Table 1 tensions). However, within the module or set of activities outsourced, the supplier could have the flexibility and latitude to develop and introduce innovation as required, using strategies that rely on its unique skills (using strategies matching the right-hand side of Table 1 tensions).

Proposition P2. When innovation done through outsourcing has a systemic element, contractual view should be used to define how to integrate the innovation within the organization. Alternatively, modular innovation done through outsourcing should downplay contractual constraints and emphasize an innovation-driven view to ensure that innovation occurs.

While formal reviews offered periodic “recalibration” of views and prescriptions to take into account the tensions associated with innovation through outsourcing, modularity offers a way to adjust to the tensions that depends on the activities performed. A modular view of activities, when possible, will isolate elements for which the interface can be defined using a contractual view, focusing on measures, control of the vendor, protection of knowledge, etc. This matches the left side of the tensions described in Table 1. However, the internal processes of the modules can be left to the discretion of the vendor to utilize its unique skills and competences, matching the perspective presented on the right-end column of Table 1.

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This approach seems to enable managers to transcend the paradox. It offers a way to think paradoxically. Managers introduce a different logic (modularity) to look at innovation through outsourcing and are able to reframe the problem in a way that shows the complementarity of the two sets of tensions (Lewis, 2000).

**Dynamic decision-making/"extreme contracting"**

Another way to deal with paradoxical demands is to ensure that the individuals involved in the management of these activities are always reminded of the paradoxical nature of the situation and can readjust decisions using informal interactions (Sundaramurthy and Lewis, 2003). This prevents participants to enter into a detrimental reinforcing cycle. If at regular intervals participants are forced to re-evaluate their point of view, considering each time the other side of the decision-making problem, it is more likely that paradoxical demands can be met.

This can be achieved by shifting managers from one role to the other (Smith et al., 2010). In the context of innovation through outsourcing, it would mean having a contractual manager, formerly responsible for the contractual outcomes (like cost control and monitoring), given responsibilities linked with fostering innovation. At the same time, a former innovation manager would be given responsibility for cost control and monitoring. This would ensure that stakeholders can understand the dual conflicting perspectives associated with the contract. It means that managers would alternate between roles emphasizing each facet of the paradox.

If pushed to the extreme, this could lead to joint management. Instead of asking two managers to swap roles at regular interval to get a new point of view, they could simply manage together, confronting points of view on a continuous basis. This would lead to a contract management process analogous to extreme programming. It could be labeled “extreme contracting.”

Extreme programming facilitates communication using pair programming: two persons are assigned to a task (Hummel et al., 2013). It uses short cycles and re-evaluations, enabling constant adjustment to uncertainty (Cao et al., 2004). Pair programming offers controls similar to a clan (Harris et al., 2009). Such clans are appropriate in complex situations (like innovation) for which outputs or rules cannot be specified ex ante (Ouchi, 1980).

Transposed to an innovation through outsourcing contract, a pair would consist of an innovation manager and a contract manager. In a manner similar to agile environments (Barlow et al., 2011), such a team would be able to adjust tasks and requirements as the innovation progresses, while ensuring that contractual requirements are met.

Similarly to the situation observed in extreme programming (Bose, 2008), “extreme contracting” would likely be more appropriate for smaller contracts. At the same time, scaling of extreme programming is possible with some adaptation (Cao et al., 2004). It is possible that such adaptation could be introduced in contracting. For instance, Cao et al. (2004) suggest flexible pairs working together, creating a network of collaborators. In a contracting environment this would facilitate dynamic decision-making and the exchange of multiple points of views as desired. It would also be possible to adopt a layered approach, in which a core set of elements is agreed upon after a first set of iterations. This first set is then developed using a more traditional contractual approach (left side of Table 1). Once this base layer is established, other innovative iterations are performed to enrich the project.

Enabling extreme contracting does not mean that all the principles of extreme programming have to be translated in a contractual setting. Extreme programming, when used in organizations, uses a subset of the approach features (Bose, 2008). A similar logic would apply to contracting. Some features of the “extreme” approach could be tailored to the situation to ensure that dynamic decision-making is maintained.

**Proposition P3.** For innovation through outsourcing contracts, alternating the roles of the person responsible for contractual control and the person responsible for innovation, would enable the consideration of paradoxical demands.

**Proposition P4.** For innovation through outsourcing contracts, “extreme contracting” using a pair of contract managers (one responsible for innovation and one for contractual control) would enable the consideration of paradoxical demands.

Dynamic decision making allows individuals who are used to one perspective (for example innovation-driven view) to look at the innovation through outsourcing contract from another perspective (contract efficiency for instance). They would alternate between the two sides described in Table 1. In “extreme contracting” mode, the pair of managers would ensure that the tensions are taken into account all the time. In a way, “extreme contracting” could be seen as a form of permanent formal review.

In this case, it would seem that P3 is a form of acceptance of the paradox (Lewis, 2000). The alternation of roles would help managers to be aware of the tensions without formally confronting them. As for pair managers, it could probably be acceptance or confrontation of the paradox depending on the dynamic of the pair. The pair of managers could decide to “play along”, in a manner similar to the image of a music Quartet used by Lewis (2000) or they could confront each other's perspective.

**Ambidextrous organization**

A challenge faced by organizations is the difficulty to simultaneously manage both exploration of new ideas to ensure future growth and to exploit their current ideas to ensure profitability (March, 1991). This challenge is similar to the one
that is faced when innovation is done using an outsourcing strategy. Both the management of the outsourcing contract and the discovery process need to be performed successfully to achieve overall success in innovating through outsourcing.

The challenge of simultaneous pursuit of exploration and exploitation has gained the attention of organizational scholars who note that one of the mechanisms for achieving this balance is organizational ambidexterity (Benner and Tushman, 2003; Burgelman, 1991; Christensen, 1997; Gibson and Birkinshaw, 2004; Gupta et al., 2006; Levinthal, 1997; Weick, 1976). March (1991) noted early on that while both exploration and exploitation are important for the long-term growth of an organization, they are also fundamentally incompatible due to competition for resources and the radically different mindsets and organizational routines that are needed for both exploration and exploitation. In other words, they are substitutes by nature, and “adaptive processes characteristically improve exploitation more rapidly than exploration (March, 1991, p.73).”

Since the publication of March’s seminal article, however, researchers have come to suggest that it is possible for an organization to become ambidextrous by organizing the exploration and exploitation activities simultaneously. There are at least three ways for organizations to be ambidextrous. First, they can organize exploration and exploitation in separate subunits (see Gupta et al., 2006; Lavie et al., 2010 for a detailed review). For example, Benner and Tushman (2003, p. 252) articulate the details of such an organization in a comprehensive and cogent manner, noting that:

“Ambidextrous organization designs are composed of highly differentiated but weakly integrated subunits. While the exploratory units are small and decentralized, with loose cultures and processes, the exploitation units are larger and more centralized, with tight cultures and processes. Exploratory units succeed by experimenting—by frequently creating small wins and losses (Sitkin, 1992). Because process management tends to drive out experimentation, it must be prevented from migrating into exploratory units and processes. In contrast, exploitation units that succeed by reducing variability and maximizing efficiency and control are an ideal location for the tight coordination associated with process management efforts.”

Tushman et al. (2010, p. 1336) summarize this organizational duality nicely when these authors note that “Exploitative subunits are organized to be efficient, while exploratory subunits are organized to experiment and improvise.”

In addition, organizations may balance exploration and exploitation by temporally separating efforts devoted to either of them: they explore at a certain time and then shift to exploitation, or vice versa (Lavie et al., 2010). For instance, using firms’ alliance portfolio data, Lavie and Rosenkopf (2006) found that firms gradually transit between exploration and exploitation in particular domains, such as in the value-chain function. More recently, Boumgarden et al. (2012) develop the concept of “organizational vacillation”. It refers to organizations “dynamically achieving high levels of both exploration and exploitation by temporally and sequentially alternating between organizational structures that promote either exploration or exploitation, respectively” (Boumgarden et al., 2012, p. 588). Building on case studies of HP and USA Today, they found that vacillation may offer higher long run performance than structural ambidexterity.

Based on these ideas, we propose two potential ambidextrous organizations for managing the paradox of innovation through outsourcing. First, responsibilities pertaining to innovation through outsourcing could be isolated and then assigned to two different teams, each with specific focus (one set linked with contractual elements – the left side of Fig. 1, and one set linked with innovation elements – right side of Fig. 1), both on the client and the vendor side. In essence, this will create structural ambidexterity. The dual structure will reflect the tensions presented earlier and ensure that each one is constantly represented in the decision making processes and in the conduct of the activities. Firms may also make a temporal separation between each view of innovation through outsourcing. They would alternate between a contractual view of the arrangement and the innovation view at another time.

**Proposition P5.** Innovation through outsourcing could be managed effectively through structural ambidexterity, using two teams, to focus respectively on contractual and on innovation aspects of the innovation through outsourcing arrangement.

**Proposition P6.** Innovations through outsourcing could be achieved through temporal ambidexterity by oscillating over time between organization structures that promote contract performance and innovation, respectively.

Propositions 5 and 6 reflect directly the tensions presented in Table 1. In Proposition 5, the tensions are mirrored in the organizational structure, ensuring that each side is considered at all time. In Proposition 6 the tensions are included in a cycle, enabling each side to take preeminence at regular intervals. It is likely that proposition 5 would be easier to implement for larger contracts. Small projects might not justify the formal dual structure. In those cases, oscillation might be more realistic.

When considering the means of managing paradox described by Lewis (2000), it seems that ambidextrous organizations are a way to accept the tensions inside the paradox. It does not enable managers to transcend the situation. In addition, the two teams in a structural ambidexterity situation would not necessarily confront each other. With temporal ambidexterity, confrontation (through time) becomes impossible.

**Toward an innovation through outsourcing framework**

The first contribution of the paper is the recognition that there is indeed a paradox when organizations use outsourcing as a means to develop IT innovations, including both novel technology and novel IT-enabled business process innovations.
There are tensions inherent to such an undertaking, emanating from conflicting demands and requirements associated with innovation and with a successful outsourcing contract. Focusing only on one aspect, whether it is the contract or the innovation, is detrimental to the organization and would not provide the anticipated benefits form outsourcing. This situation is truly a paradox, and not simply a contingency. It means that managers have to achieve both sets of conflicting demands at the same time, not one or the other depending on a particular situation. As shown in the reinforcing cycles, focusing on a single side of the paradox is fraught with problems.

The second main contribution of the paper is in terms of the four mechanisms that we develop in this paper and that can facilitate the management of paradoxical demands faced by managers when using outsourcing to generate innovation. It is clear that none of these mechanisms is an easy or cheap path for contract management when innovating through outsourcing. They involve setting up complex arrangements with multiple levels and kept through multiple time periods, often using different people assuming opposing roles, or ensuring that the same people involved in the contract are confronted with different sets of demands regularly.

Innovation is risky in general. Therefore, it is understandable that innovation through outsourcing will be more risky than regular outsourcing, and that these outsourcing arrangements will be more complex than their traditional counterparts.

Interconnections among the four mechanisms

The four mechanisms discussed in this paper and the six related propositions are interconnected with each other and are part of an overall architecture for managing the paradox of “innovation through outsourcing.” This architecture brings together the four crucial organizational dimensions of what, how, by whom, and when, and is shown in Fig. 2.

The “what” dimension deals with the level of innovation targeted. It is important to assess if the most important element is the development of modular innovation or it is the integration of a modular innovation within a larger ensemble (systemic innovation). This is captured in the mechanism named “Matching Governance with Level of Innovation Focus.” As discussed earlier for P2, the literature seems to suggest that only modular, and not systemic, innovations can be successfully developed using outsourcing arrangements. But a modular innovation needs to be integrated within the larger system after it is successfully developed. As P2 suggests, governance should focus on contractual concerns with respect to global integration but focus on innovation-driven considerations with respect to the development of a modular innovation.

The “how” dimension of the architecture deals with the way governance should be conducted when developing innovations through outsourcing arrangements, and is captured in the mechanism titled Dual Formal Reviews. As P1 suggests, dual formal reviews should be conducted at each gate of the NPD process from the perspective of both outsourcing considerations as well as the innovation process. Further, these formal reviews would emphasize either outsourcing or innovation concerns based on the level of innovation focus at a given point, as discussed in P2 above.

The “by whom” dimension of the architecture deals with the structures and roles associated with innovation development and governance process, and is captured in two mechanisms outlined in this paper: dynamic decision making/extreme contracting; and ambidextrous organization. Dynamic decision making/extreme contracting, with propositions P3 and P4, deals with the individual roles associated with the governance process. Ambidextrous organization, with propositions P5 and P6, deals with the organization structure itself.

P3 suggests that the roles of the person responsible for contractual control and the person responsible for innovation aspects should be alternated. These individuals could be together responsible for conducting dual formal reviews as suggested in P1 above, and would emphasize either outsourcing or innovation concerns based on the level of innovation focus at a given point, as discussed in P2 above. P4 suggests that instead of alternating roles, two individuals could constitute an “extreme contracting” team with one person focused on outsourcing aspects and the other person focused on the innovation aspects. The connections of P4 to P1 and P2 are similar to the connections of P3 with P1 and P2.

Based on the notions of ambidexterity, P5 and P6 transpose the logic followed for P3 and P4 from the individual level to the organizational level. P5 suggests the use of two different teams: one responsible for contractual focus and a second one responsible for innovation. As the skills/ capabilities, incentives, and the development process for these two ends of the tensions are different, each one will ensure that both sides are constantly taken into account in the decision making process. Exchange mechanisms, as suggested in P3, could be embedded in a dual structure prosed by P5.

P6 suggests using the notion of temporal ambidexterity: temporally and sequentially oscillating between two organizational structures (Boumgarden et al., 2012). The appropriate structure prevalent at a particular time will emphasize one side of the tensions presented in Fig. 1, but for a time short enough that the other side is not damaged or forgotten before the structure is readjusted to take into account this other side (and vice versa). It parallels, at the organizational level, the idea expressed in P3 that individuals can alternate between roles.

Finally, the “when” dimension of the architecture deals with some important conditions under which some mechanisms proposed in this paper will be most conducive for the organization attempting to innovate using outsourcing. We suggest that P2 is especially relevant with modular innovations. This is self-evident as P2 has been developed only for the context of modular innovations. It is likely that P3 and P4 would be especially useful when innovation is a primary concern for the organization, and the intent of the organization is to train key managers and employees in the dual tasks of innovation development and outsourcing control. Regular job rotation implied by this proposition will lead to a strong set of innovation-through-outsourcing skills in the organization. However, developing skills and capabilities is a time consuming and arduous process (Foote and Folta, 2002) that will be justified only when innovation is a key concern for the focal
organization. Similarly, P5 is likely associated with larger size initiatives. It will be justified when innovation is a primary strategy for the organization, and when the organization and the outsourcing contracts are large enough. This is because developing two distinct set of capabilities and processes in two separate teams housed within two separate organization structures is neither easy nor cheap, and will be justified only when innovation through outsourcing is pursued intensively and on a regular basis. Finally, P6 offers an alternative for smaller organizations, or organizations that do not have innovation through outsourcing contracts large enough to justify the use of dedicated teams as proposed in P5.

This offers interesting avenues for IT outsourcing research. First, when innovation is expected from the arrangement, the evaluation of success cannot be centered on simple contractual performance measures. The innovation has to be a key component of the definition of success. Innovation itself being complex, this means that the definition of success will be complex too. This complex dependent variable requires more nuanced theoretical explanations requiring an increase in the scope and bandwidth of theories explaining IT outsourcing success. When considering the inventory of independent variables used in outsourcing literature (Lacity et al., 2010), it is obvious that economic theories were the most often used theories to guide the research (the variables most often used were uncertainty, asset specificity, measurement difficulty, and transaction costs). These variables are not well suited if one seeks to explain innovation and how outsourcing can enable innovation. This suggests that future research may have to consider more complex models and theories to take into account the many facets of “success” when innovation is expected from outsourcing. Theories will have to address both contractual elements and innovation outcomes, as well as their paradoxical nature.

The propositions developed in this paper also offer interesting avenues for research. Each proposition demands to be tested and refined to assess its value. In addition to the evaluation of each proposition, other questions arise:

- There might be other considerations to include. For instance, should the notion of distance, more and more prevalent with offshoring, be considered explicitly? Offshoring would probably not be a constraint in case where the multi-level avenue is taken. Different independent components could be separated among different countries and local innovations would be integrated later. However, it might prove difficult to offshore activities if dynamic decision-making is chosen as the mechanism to address the paradox since it implies constant interactions between advocates of contract rigor and advocates of innovation.
- The types of innovation might also change the way a company tries to manage the paradoxical demands. If modularity exists, using the various levels appears a natural choice. However, design choices can influence modularity. Therefore, outsourcing may lead to increasingly modular innovation. The other criteria are more difficult to define. Maybe dynamic decision-making would be more appropriate for innovations with short delivery horizon, leading to short contracts, where pairing is likely to be sustainable. In the case of longer horizon ventures, self-correcting cycles using dual formal reviews might be more appropriate. The use of ambidextrous organization might not be constrained as much by the type
of innovation but by the organizational culture. Having two very different sets of rules, incentives, culture, and processes is possible in some organizations tolerating these differences. In organizations trying to build a common culture, it might be too difficult to implement.

- Considering the interconnections between the four paradox management mechanisms it seems clear that they are not independent. Maybe a specific sequence of them could be optimal. It seems from the literature on ambidexterity, for instance, that managing divergent sets of constraints for long periods is difficult for organizations (Tushman et al., 2010). The tensions associated with ambidexterity mentioned by these authors create a certain fatigue in the organization. Similarly, perhaps alternating among the four paradox-resolving mechanisms, when possible, would make the management of paradoxical demand easier.

Another avenue for future research arises from the fact that we considered only internal organization of people and activities and structural elements. There is at least one other major avenue for developing self-correcting cycles, that of contract design. For example, the client could use small, sequential contracts with a vendor to alleviate the problems associated with uncertainty (inherent to innovation). It could also try to devise incentives and profit-sharing mechanisms in contracts to entice the supplier to behave in the client’s best interest. These are ideas worth exploring further and designing mechanisms for dealing with the paradox of innovation through outsourcing.

Yet another interesting and important avenue of future research pertains to the type of innovation expected from outsourcing arrangements. It is possible that specific types of innovations might have specific implications for the tensions as well as the paradox-resolving mechanisms. It is likely, for instance, that the tensions will be stronger for radical innovation than for incremental innovation, perhaps requiring a refinement of the self-correcting cycles (mechanisms) proposed in this paper.

The literature on outsourcing can also be used to inform the literature on innovation. In the latter literature, attention is mostly given to the innovation itself and the factors enabling innovation. However, little attention is given to the practicalities involved in the contractual aspects of outsourcing and collaborating with vendors to innovate. Outsourcing literature has extensive knowledge of these constraints and challenges, and it could offer insights to innovation research. This is a type of contribution to other disciplines that was advocated by Lacity et al. (2010).

Conclusion

Identifying and exploring paradoxes helps in the pursuit of theory building and discovering creative solutions. In this paper, the pursuit of innovation through outsourcing arrangements was identified as a paradoxical situation. It puts managers in a position in which they have to give freedom and flexibility to their supplier to foster innovation, while simultaneously defining its contract as clearly as possible, avoiding uncertainty, and monitoring its activities closely to ensure that the contract does not open the door to opportunistic behavior.

By focusing specifically on the innovation through outsourcing, which is a specific type of outsourcing contract, we identified a paradox. This enriches our understanding of outsourcing, and the complexity it entails when outsourcing is chosen to enable innovation. Paradoxes are not easy to solve, and the solutions are often not simple. Rooted in the literatures on outsourcing, innovation, management, and economics, four mechanisms, essentially self-correcting cycles, were developed to address the innovation through outsourcing paradox. These four paradox-resolving mechanisms cover the three means identified by Lewis (2000) – acceptance, confrontation, transcendence – to create a state in which two sets of constraints (the ones associated with innovation and the ones associated with outsourcing) would be addressed in tandem, even if they appear to be opposing each other.

These four mechanisms also offer new paths for research. Their nature also suggests relatively complex strategies to investigate them. For instance, the multiple-period aspect would require longitudinal studies to assess the characteristics of the governance process over different phases of the contract. Assessing the contract situation at one point in time could lead to misguided conclusions. Several mechanisms described in the paper were at an abstract level. For example, while it is conceptually interesting to think of a “pair of managers”, one would still have to see how it is implemented in an organizational context. Would these managers be solely dedicated to this role? Could it be done at the same time as other roles? Would other forms of “balanced representation” be as effective as paired managers? Similarly, oscillating structures, while they have been documented in the innovation literature, remain difficult to use in practice. They would depend on the sustained support of a key decision maker. This makes them vulnerable since tenure time of senior managers is often short.

Notwithstanding these challenges, identifying and investigating the paradox associated with innovation through outsourcing is essential. The pressure to innovate restlessly with the help of collaborators is unlikely to diminish (Tapscott and Williams, 2008). In order to harness the ideas of external collaborators, a sophisticated understanding of the management of these relationships is needed. This paper is an attempt to shed light on this complex paradoxical problem and to provide some concrete mechanisms that can help achieve the goal of innovation through outsourcing.

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