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**Assessing the Risk of
IT Outsourcing**

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Assessing the Risk of IT Outsourcing^{*}

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Résumé / Abstract

Ce texte porte sur l'évaluation du risque d'impartition des services informatiques. Le risque est défini ici comme étant fonction d'événements indésirables pouvant résulter d'une décision d'impartir, et des facteurs pouvant mener à ces événements indésirables. La théorie des coûts de transaction et la théorie de l'agence servent de base théorique à l'identification des principaux facteurs de risque. Les événements indésirables sont identifiés à partir d'une recension des écrits sur l'impartition des services informatiques.

Outsourcing decisions, and contractual arrangements of the type required by an IT outsourcing deal, entail risks. This is not to say that outsourcing is bad in itself. It only means that, as in other risky business ventures such as new product development, capital investments, and IS projects, risk assessment and risk management are important contributors to the success of an IT outsourcing venture. This paper focuses on risk assessment. After providing a brief conceptual definition of risk, the paper reviews the empirical literature in order to identify the main undesirable outcomes that may result from an IT outsourcing deal. It then uses transaction cost and agency theory as a primary theoretical basis, and proposes a framework for categorizing risk factors which have been identified in the literature. Finally, the paper discusses the dynamics of risk, by examining how the various risk factors are linked to the undesirable outcomes.

Mots Clés : Sous-traitance des systèmes informatiques, théorie de l'agence, économie des coûts de transaction

Keywords : Outsourcing of IS, agency theory, transaction cost economics

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1. Introduction

"To outsource or not ? "

Such was the title of an article published in 1992, in the *International Journal of Information Management* [9]. Five years and numerous studies on IT outsourcing later, the question is still relevant. Some argue that outsourcing IT leads to lower costs, economies of scale, access to specialized resources, and new business ventures [18,19]. Others, however, warn firms against the negative consequences that IT outsourcing may have: escalating costs, diminishing service levels, loss of expertise, and contract irreversibility, to name a few [13, 16, 22].

Outsourcing decisions, and contractual arrangements of the type required by an IT outsourcing deal, do indeed entail risks. This is not to say that outsourcing is bad in itself. It only means that, as in other risky business ventures such as new product development, capital investments, and IS projects, risk assessment and risk management are important contributors to the success of an IT outsourcing venture [34].

This paper proposes a conceptual framework for risk assessment. After providing a brief definition of risk, the paper reviews the empirical literature in order to identify the main undesirable outcomes that may result from an IT outsourcing deal. It then uses transaction cost and agency theory as a primary theoretical basis, and proposes a framework for categorizing risk factors which have been identified in the literature. Finally, the paper discusses the dynamics of risk, by examining how the various risk factors are linked to the undesirable outcomes.

2. Risk defined

The notion of risk is pervasive to the business literature in general, and to the IS literature in particular. However, the term often refers to two different concepts. For instance, risk is sometimes used as a general expression that refers to negative outcomes: shortfalls in systems performance, in the case of a software development project [8], disruption of service to customer, in a business process reengineering (BPR) context [35], and hidden costs or loss in innovative capacity, in the case of IT outsourcing [13]. Other times, the term risk refers to the factors leading to negative outcomes: continuing stream of requirement changes or personnel shortfalls in a systems development context [8], lack of upper management commitment, in BPR [34], and inexperienced staff or business uncertainty when discussing IT outsourcing [13].

In fact, the concept of risk encompasses these two components. Following Boehm [8], risk is defined here as "the possibility of loss or injury", and is further translated into the concept of risk exposure which is a function of the following:

$$RE = P(UO) * L(UO)$$

where RE is the risk exposure, P(UO) the probability of an undesirable outcome, and L(UO) the loss due to the undesirable outcome [8, 27,40].

In any situation, several undesirable outcomes may occur. Among the examples listed above, undesirable consequences would be: shortfalls in systems performance, disruption of service to customers, hidden costs, and loss of innovative capacity [25]. The loss due to a given undesirable outcome can be approximated either via quantitative analysis (for instance, by evaluating the amount of sales lost due to disruption of service to customers) or via qualitative assessment of the organizational impact of each negative outcome (for instance, by using Likert scales to assess the importance of the impact of the undesirable outcome) [5, 35].

In certain circumstances, the probability of occurrence of an undesirable outcome can be estimated on the basis of past performance characteristics of the object under study [26], or subjective probabilities can be assessed [8]. However, in several areas, probabilities are often difficult, if not impossible to assess on the basis of past performance [5]. Consequently, several risk assessment methods adopt the approach of approximating the probability of undesirable outcomes by identifying and assessing factors that influence their occurrence [2, 5,7]. In a software development context, for instance, Barki et al. [5] have identified such factors, which belong to five broad categories: technological newness, application size, software development team's lack of expertise, application complexity, and organizational environment. The degree to which each factor is present in a software project will contribute to increase the probability of occurrence of an undesirable outcome (here, project failure).

On the basis of this definition, risk assessment consists of the steps listed in Figure 1. Since all the risk factors do not give rise to all the undesirable outcomes, risk assessment should also link risk factors to undesirable outcomes. For instance, in the case of a software development project, the lack of project team knowledge about the activity to be supported by the application under development is a risk factor which is linked to the negative outcome of having a system that does not adequately respond to user information needs [11]. Yet, this undesirable outcome

is less likely to be closely linked to the risk factor defined as "shortfalls in externally furnished components" [8].

Some of the activities of Figure 1 are generic to a given type of project or decision, while others have to do with a particular project. Identifying the potential undesirable outcomes, identifying the risk factors, and identifying the links between risk factors and undesirable outcomes are generic activities. The literature on IS project management, for instance, provides lists of undesirable outcomes and risk factors [5]. What is specific to a particular project or decision is the evaluation of the magnitude of the potential loss due to each negative outcome, and the assessment of the importance of each risk factor.

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| <ol style="list-style-type: none">1. Assess the loss due to undesirable outcomes:<ul style="list-style-type: none">• Identify the potential undesirable outcomes for a given project;• Evaluate the magnitude of the potential loss due to each negative outcome;2. Assess the risk probability:<ul style="list-style-type: none">• Identify the risk factors that might lead to undesirable outcomes;• Identify the links between risk factors and undesirable outcomes;• Assess the extent to which each risk factor is present in the project. |
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Figure 1
Risk assessment procedure

This paper will focus on the three generic activities of risk assessment in the particular context of IT outsourcing: identifying the potential undesirable consequences of IT outsourcing, identifying the risk factors, and linking risk factors to undesirable outcomes.

3. Undesirable outcomes of IT outsourcing

In their discussions of IT outsourcing, several authors, both from academia and from practice, have identified undesirable consequences that might result from such a venture. Three sources were particularly useful in this exercise since they devote much attention to this dimension of outsourcing arrangements [4, 13, 22]. Since IT outsourcing is a typical example of a make-or-buy decision, industrial organization literature was also used as a source for identifying negative consequences of IT outsourcing. Table 1 synthesizes this literature review.

The first group of undesirable consequences pertain to hidden costs, which are sometimes said to be the biggest IT outsourcing problem [23]. Transition costs include setup costs, redeployment costs, relocation costs, and parallel-running costs, and so on. Management costs refer to the human resources that have to be put into managing an outsourcing contract. According to Earl [13], companies often underestimate these two types of costs, which can increase quite rapidly. Cross [10], for instance, reports the experience of British Petroleum who, after having outsourced its IT operations to several outsourcers, discovered that such contracts "required far more management resources than they were worth [10, p.94]. In a discussion about the cost-benefit aspects of the software acquisition decision, Nelson et al. [30] identify another type of costs that could be added to the transition and management costs mentioned by Earl. These are contracting costs, that include the costs related to searching and evaluating the appropriate vendor, benchmarking the services offered, specifying the legal terms of contracts, negotiating contracts, and resolving disputes. Lacity and Hirschheim [22] and Lacity et al. [23] identify another type of hidden costs, that is, those costs that the client assumed were included in the contract, but which, in fact, were not. They give the example of maintenance on personal computers, sales tax on equipment purchases, rewiring for office moves, etc, which can add up to several hundred of thousands, even millions, of dollars.

Table 1
Undesirable consequences of IT outsourcing

Hidden costs	Hidden transition costs and management costs [10, 13,30] Hidden service costs [22, 23]
Contractual difficulties	Costly contractual amendments [13] Disputes and litigation [4, 22] Difficulties in renegotiating contracts [22] Lock-in [31]
Service debasement	Diminished quality of service [4] Increased costs of services [22]
Loss of organizational competencies	Loss of IT expertise [12, 13, 22] Loss of innovative capacity [13] Loss of control of the activity [38] Loss of competitive advantage [12, 13]

Contractual difficulties constitute another category of negative outcomes of outsourcing. Contractual amendments are often necessary, either because the

client's needs are changing, or because most contracts are indeed incomplete [28, 42]. As a result, several firms have seen their outsourcers charge them high fees for such new services or changes in the services rendered [13,22]. Sometimes, requests for changes give rise to disputes, and even litigation. Disputes also occur over the meaning of contractual terms: services to be rendered, service level, personnel expertise, etc. At the time of contract renewal, other difficulties may arise. An unsatisfied client may wish to repatriate the service. Yet, they may encounter several difficulties in attempting to do so. Often, the required assets will have been transferred to the outsourcer, along with the personnel who possessed the expertise to conduct the outsourced activity. Not only can repatriation be very costly [4]; in some occasions, it will be impossible [31]. The client might then consider the alternative of transferring the service to another outsourcer. Yet, if the number of suppliers is small, this might be an impossible alternative. Hence, the lock-in problem [21,41,42].

Service quality and service costs are two major issues in IT outsourcing. The literature provides numerous examples of degrading service levels resulting from outsourcing: poor response time, poor turnaround time, late updates of software, applications that do not meet the requirements, and so on. Often, parallel to service degradation, service costs rise. For instance, one of the firms studied by Lacity and Hirschheim indicated that their outsourcing costs were almost three times the costs of internal services.

The area of organizational competencies appears to be quite vulnerable in the outsourcing context. Outsourcing deals almost always include IT personnel. The very fact that no, or little, IT expertise remains in the firm is seen as dangerous, since the firm will have lost its ability to use IT efficiently and effectively, and will remain dependent on an external supplier. The ability to align IT with the firm's strategy might also be hampered, thus affecting the firm's ability to maintain competitive advantage, and to use IT in an innovative fashion [12, 13].

4. Risk factors

According to the risk definition provided earlier, undesirable outcomes are due to risk factors. Table 2 presents a list of such factors identified from the literature. In the context of outsourcing, transactions costs theory and agency theory are particularly relevant to the risk factor identification exercise. Table 2 outlines the risk factors according to the three key concepts of these two theoretical frameworks (agent, principal, and transaction).

Table 2
Risk factors in IT outsourcing

Agent	Opportunism: moral hazard, adverse selection, imperfect commitment Lack of experience and expertise with the activity to be outsourced Lack of experience and expertise in managing outsourcing contracts Number of suppliers
Principal	Lack of experience and expertise with the activity to be outsourced Lack of experience and expertise in managing outsourcing contracts
Transaction	Asset specificity Uncertainty Measurement problems Frequency Interdependence of activities Proximity of core competencies Technological discontinuity

Agency theory is concerned with the coordination and motivation issues that are inherent in a relationship between a principal (the client) and an agent (the outsourcer). A basic assumption of agency theory is that opportunism is an inherent characteristic of such a relationship. Opportunism leads the principal or the agent to seek their interest "with guile", to deviate from the behavior prescribed by the contract whenever they benefit by doing so, "cheat", "shirk" or "lie". This is not to say that principals and agents will always adopt an opportunistic behavior. Moral codes, social norms, the risk of prosecution, and the possible detrimental effects on reputation tend to limit the extent of opportunism. Yet, these constraining factors do not prevent *all* opportunistic behavior [14, 37].

Opportunism is an important risk factor in an outsourcing contract. There are three main manifestations of opportunism: *moral hazard*, *adverse selection*, and *imperfect commitment*. Moral hazard results from the fact that it is impossible for a principal to observe the behavior of the agent, without incurring prohibitive costs. Since the client cannot directly observe the level of effort deployed by its supplier, it cannot easily tell whether a problem is due to negligence on the part of its supplier or to an unforeseeable event. Since the supplier knows the client cannot

tell, the supplier can always blame poor performance on circumstances beyond its control.

Adverse selection will develop when the principal cannot observe the characteristics of the agent. The client must validate the suppliers' claims, which often is a difficult task. On the other hand, the supplier is often aware of this difficulty. Failure to deal adequately with adverse selection will make it very challenging for the client to choose the appropriate supplier. Sometimes the agent truly believe that they actually have the required characteristics to adequately perform the activity. In some circumstances, the supplier may commit an error of overoptimism in evaluating its true capacity to fulfill its contractual obligations. An excess of confidence will then lead him into a contractual agreement he, and the client, will soon discover he cannot respect. Roll [36] has suggested that many acquiring firms which accepted to pay huge premiums to a target were led by managers with exaggerated beliefs in their capacity to "turn around" the target. This is the "hubris hypothesis", from the Greek "Hubris", which means "over exuberance".

Finally, imperfect commitment is the imperfect capacity of both the client and the supplier to commit themselves. For instance, clients and outsourcers may be tempted to renege on their promises and commitments. No contract is immune from such behavior. A supplier will refuse to deliver the services or adapt applications because, for instance, it claims that such adaptations had not been foreseen, or because the language of the outsourcing contract is not clear.

Other characteristics of the agent constitute sources of risk. The lack of experience and expertise of the agent with the outsourced activity is one of them [13]. It may happen that a supplier, eager to obtain a contract, exaggerates the expertise it possesses with certain activities. Lack of expertise may also occur over time. Since several firms decide to outsource their legacy systems, vendors hire and retain IT personnel who are familiar with older technology. When the client needs support with new technology, the supplier might not have the required skills available. Another risk factor is the lack of experience or expertise of the agent with the management of outsourcing relationships, which could lead to disputes and to escalating costs.

Finally, the extent of competition among agents, which is often related to the number of available vendors, is also a risk factor. A small number of vendors may bring about the lock-in problem, since it will be difficult for the client to find alternative sources of services [29].

The principal itself is a source of risk factors. In particular, Earl, and Lacity et al. identify the lack of experience or expertise of the principal with the activity to be outsourced as a major risk factor. These authors claim that while firms might be tempted to outsource those activities that they do not do well, or that they do not

understand well, going ahead with an outsourcing decision would lead to negative outcomes. The lack of expertise with the outsourced activity may also have a negative impact on the ability of the principal to adequately manage the contract, since they will have difficulty in assessing the quality and the costs of the service rendered. As was the case with the agent, the principal's lack of experience and expertise with the management of outsourcing contracts is another risk factor, since an inexperienced principal is more likely underestimate transition and management costs, for instance and be vulnerable to the agent's opportunistic behavior.

Some characteristics of the transaction, that is, of the activity to be outsourced, are important risk factors. Asset specificity refers to the degree to which an asset can be redeployed without sacrificing its productive value if the contract is to be interrupted or prematurely terminated. Because the "next best use" value of a specific asset is much lower, the investor would lose part of its investment if the transaction was not completed. This creates a lock-in situation where the other party (not investing) could extract an advantage from the investor by threatening to withdraw from the transaction [17, 41].

For a market to be efficient, parties must be able to predict with enough certainty the activities to be performed in a contract and to measure the value of the elements exchanged. This is often proven false. Transactions are conducted with a certain level of uncertainty and are subject to measurement problems [1,6]. For example it may be difficult to predict future user needs in a given project. Evaluating the adequacy of a specific system delivered is also a arduous task, since system quality is difficult to assess without extended use [30].

Frequency is another key dimension of a transaction. Organising a transaction within the firm implies the creation of a governance structure. This generates important and irreversible costs. If a transaction is known to be unique, these costs will likely be too significant to allow for the integration of the activity within the firm. The firm will prefer to bear the cost of the risks associated with investments or uncertainty rather than invest in order to internalise a single transaction [41].

The degree of interdependence of the activities to be outsourced - or technological indivisibility [13] - has also been identified as a one of the transaction characteristics that constitutes a risk factor. According to Earl, outsourcing interdependent activities may cause serious difficulties. Aubert [3] illustrates this type of problem with a dispute over poor response time. The supplier in charge of computer operations blamed the telecommunications firm for poor service, while the telecommunications firm blamed the principal for not having the appropriate equipment, and the principal put the blame on the outsourcer responsible for computer operations for not providing good service. In such a situation, the real source of the problem might be very difficult and costly to determine.

Technological discontinuity is closely related to uncertainty, since it refers to one aspect of the "volatility of the environment that cannot be anticipated" [29]. By technological discontinuity, we mean technological changes and breakthroughs which may make obsolete the technology which is was part of the contract. In the case of a long term contract which specifies a certain type of technology, transferring to the new technology may incur additional, prohibitive costs. On the other hand, if the client does not adopt the new technology, and its competitors do, reduced competitiveness might result.

Finally, proximity to core competencies is also a risk factor, the presence of which may lead to undesirable consequences. Outsourcing an activity that is close to the core competencies of the organization presents risks [33]. Fine and Whitney [15] detailed the risks of dependency that were associated with that behavior. When handing out these activities to a supplier, the organization risks that the suppliers will either supplant the client in its own domain, or move in directions different from the ones the client might have chosen. Organizations also must keep the learning associated to their core activities in-house. However, this is often not an easy task since the core is not always a stable set. This analysis is linked to the corporate coherence. Organization learning is facilitated when the organization is centered around its essential capabilities. Outsourcing an activity at the core of the organization might impede organizational learning and lower the competitiveness of the organization [39].

5. Relationships between risk factors and undesirable outcomes

As mentioned earlier, all risk factors do not lead to all undesirable outcomes. Risk assessment then requires that the link between a consequence and the risk factor(s) leading to it be drawn. Table 3 summarizes those links. It should be noted that only those factors that, from our review of the literature, appear to be the most closely related to a given outcome are indicated in the Table.

Hidden transition and management costs are likely to be due to a lack of experience and expertise of the principal with the outsourced activity. If the principal does not have enough knowledge in the activity to provide the agent with a complete description of the tasks to be performed and to clearly specify its needs, it is probable that unexpected costs will be incurred during transition. Both partners will discover the existence of gray areas in the definition of the activity, once again adding to the original cost. In fact, many clients seem to be ignoring the agency costs as defined by Jensen and Meckling [20]. Any principal giving work to an agent will have to incur costs to supervise and monitor the agent. The principal might have a difficult time doing so because the principal will lack information about the agent's activities. Acquiring this information is costly.

Table 3
Links between undesirable consequences and risk factors

Undesirable consequences	Risk factors
Unexpected transition and management costs	<ul style="list-style-type: none"> • Lack of experience and expertise of the principal with the activity
Lock-in	<ul style="list-style-type: none"> • Specificity of the transaction • Small number of suppliers
Costly contractual amendments	<ul style="list-style-type: none"> • Uncertainty • Technological discontinuity
Disputes and litigation	<ul style="list-style-type: none"> • Measurement problems • Lack of experience and expertise of the principal and/or of the agent with outsourcing contracts
Service debasement	<ul style="list-style-type: none"> • Interdependence of activities • Lack of experience and expertise of the agent with the activity • Supplier size • Supplier financial stability
Increased costs of services	<ul style="list-style-type: none"> • Opportunism of the agent • Lack of experience and expertise of the principal with contract management
Loss of organizational competencies	<ul style="list-style-type: none"> • Proximity of the core competencies

A lock-in situation often results from specific investments that were made by the supplier when the contract was first signed. At contract renewal time, if no other supplier is ready to make specific investments, the client does not have other alternatives but continue its relationship with the current supplier [21]. The supplier can then increase its fees, because of this lack of alternatives. The lock-in situation may also occur in an industry where there is only a small number of suppliers. Once again, when time comes to renew the contract, the client does not have many alternatives. The agent can then almost dictate the conditions of the contract [41].

Costly contractual amendments are related to the level of uncertainty of the outsourced activity. When requirements, quality criteria, service levels and so on are not well defined, the client is likely to ask for adjustments. Contracts have to be reopened and modified. Such modifications are often mandatory for the conduct

of the principal's business. Contract modifications often bring about costs. Technological discontinuity is another source of contractual amendments. Since very few contracts make it mandatory for a supplier to respond to unforeseen technological changes, it is likely that the client will have to pay quite a high premium when these changes actually occur [32].

Service debasement may result from several risk factors. Interdependence between an outsourced activity and activities which remained inside the firm is one of them. When an activity is outsourced, it is expected that the fact that it is performed outside the firm's boundaries will not have negative consequences on those activities that remain inside the organization. Once the activity is outsourced though, the firm may realize that there were indeed dependencies between activities, and that the conduct of the firm's business is perturbed. This is linked to the systemic nature of some activities [24]. The lack of experience and expertise of the agent with the activity may also be a cause of poor service quality. Also, it may happen that the supplier does not have the necessary resources, either because of its size or financial situation, to devote to the activity, in order to ensure an appropriate level of service.

Increased costs of services may be due to the agent's opportunistic behavior. The agent may be tempted to overcharge for the activities performed in order to obtain a higher profit from the relationship. The agent's opportunistic behavior is still more likely, and its impacts more important, if the principal lacks experience and expertise with the management of outsourcing contracts [22].

Learning about an activity and the acquisition of expertise and experience with the conduct of the activity most often come with the conduct of this activity. When the activity is outsourced, the firm is likely to lose some of its expertise. If the activity is not close to the core competencies of the organization, the consequences are not necessarily dramatic. However, if it is close to the firm's core competencies, outsourcing may even reduce the organization's ability to do business [33].

6. Discussion and conclusions

The notion of risk is present in the majority of articles published on outsourcing. Up to now, though, very little had been done with respect to providing the elements of a conceptual definition. This paper represents a first step in this direction. The approach adopted for doing so is a "factor" approach, in that it identified the main factors that may lead to undesirable consequences of outsourcing. Much remains to be done to improve the proposed lists and to develop an appropriate measure of risk. Case studies and Delphi studies may be conducted in order to provide a first validation of the lists and to add to them.

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