2000s-30

A Resource-Based Analysis of IT Sourcing

Vital Roy, Benoit Aubert

Série Scientifique
Scientific Series

CIRANO
Centre interuniversitaire de recherche en analyse des organisations

Montréal
Septembre 2000

CIRANO

Le CIRANO est un organisme sans but lucratif constitué en vertu de la Loi des compagnies du Québec. Le financement de son infrastructure et de ses activités de recherche provient des cotisations de ses organisations-membres, d'une subvention d'infrastructure du ministère de la Recherche, de la Science et de la Technologie, de même que des subventions et mandats obtenus par ses équipes de recherche.

CIRANO is a private non-profit organization incorporated under the Québec Companies Act. Its infrastructure and research activities are funded through fees paid by member organizations, an infrastructure grant from the Ministère de la Recherche, de la Science et de la Technologie, and grants and research mandates obtained by its research teams.

Les organisations-partenaires / The Partner Organizations

- •École des Hautes Études Commerciales
- •École Polytechnique
- •Université Concordia
- •Université de Montréal
- •Université du Québec à Montréal
- •Université Laval
- •Université McGill
- •MEQ
- •MRST
- •Alcan Aluminium Ltée
- •AXA Canada
- •Banque Nationale du Canada
- •Banque Royale du Canada
- •Bell Québec
- •Bombardier
- •Bourse de Montréal
- •Développement des ressources humaines Canada (DRHC)
- •Fédération des caisses populaires Desjardins de Montréal et de l'Ouest-du-Québec
- •Hydro-Québec
- •Imasco
- •Industrie Canada
- •Pratt & Whitney Canada Inc.
- •Raymond Chabot Grant Thornton
- •Ville de Montréal

ISSN 1198-8177

A Resource-Based Analysis of IT Sourcing*

Vital Roy†*, Benoit Aubert*‡

Résumé / Abstract

Ce document étudie les liens entre le choix d'un mode de gestion (interne ou impartition) et la valeur stratégique des ressources utilisées pour la conduite de l'activité évaluée. Les éléments de base de l'approche des ressources sont présentés et un modèle d'approvisionnement est dérivé de cette approche. Un cas est utilisé pour illustrer les concepts.

This paper studies the relationships between the choice of a sourcing mode for information systems, the value of the resources used in systems development activities and the presence of those resources at sufficient level within the firm. The objective is to better understand the factors underlying the decision to keep the development of an information system inside the firm or to entrust it to an outside partner. A sourcing model is proposed using the resource-based theory. A case study is used to illustrate the concepts used in the research model. Data from this case illustrate how the model could be used to predict the appropriate sourcing mode, given the availability of the necessary resources and their strategic value.

Mots Clés : Théorie fondée sur les compétences, développement de logiciels, impartition, gestion de projets de développement de systèmes

Keywords: Resource-based theory, software development, outsourcing, management of software development projects

* Corresponding Author: Benoit Aubert, CIRANO, 2020 University Street, 25th floor, Montréal, Qc, Canada H3A 2A5 Tel.: (514) 985-4024 Fax: (514) 985-4039 email: aubertb@cirano.umontreal.ca

† École des Hautes Études Commerciales

‡ École des Hautes Études Commerciales and CIRANO

Introduction

Faced with growing demands from higher management, both in terms of the services required and cost reduction, several companies have taken a second look at their information system function structure. For many, the outsourcing of the IS function is proposed as an effective strategy to either lower information technology (IT) costs while allowing the managers to refocus on the core activities or the firm. The argument generally put forward to support this realignment, in addition to providing better access to advanced technologies, is that the handing over of all or part of the IT services to specialized suppliers may in fact generate substantial savings. This view of outsourcing has not won unanimous support, however.

For some, IT is nothing more than a simple production factor easily available on the market. In their view, the relevant question is how IT can be acquired in the most economical way possible (Loh and Venkatraman, 1992). For others, however, such outsourcing represents a risk that has been badly evaluated by both researchers and managers (Earl, 1996). Hence, the fundamental skills needed to create a future range of competitive products cannot be "rented" by means of outsourcing (Prahalad and Hamel, 1990). Information technology was also studied as an instrument for implementing strategic initiatives. Studies have evaluated the potential role of IT in strategic design. The competitive forces model proposd by Porter and Millar (1985) is probably the framework most frequently used for this type of study. For information technology to play a meaningful role at the strategy level, many assert that IS strategies must be closely aligned with organizational strategies (Chan, Huff, Barclay, and Copeland, 1997; Henderson and Venkatraman, 1993). This might not be compatible with the use of external vendors providing generic IT services. Outsourcing the production of any service involves some divestment. Some authors argue that several companies give up their basic competencies unwisely when they cut their investments in what they believe, wrongly, to be simple cost centers. Although outsourcing might lead to the hasty launching of a competitive product, it would contribute very little to the creation of the competencies needed to maintain supremacy in the long term.

This reasoning can certainly be relevant in the IS field, insofar as the outsourcing of certain IT activities can involve the loss of technological or organizational competencies that are crucial in ensuring the long-term competitiveness of the company (Scarborough, 1998). Outsourcing of systems development is particularly sensitive to this risk (Aubert, Patry and Rivard, 1998; Earl, 1996). The expertise related to IS development activities includes not only technical skills (i.e.: mastering development methods) but also, organizational competencies and a thorough knowledge of the specific context of the business processes. Being specific and tacit in nature, these competencies are difficult to codify and cannot be transmitted easily from one individual to another, or from one company to another, except by transferring the individuals who possess them. This is even more critical when activities are systemic and have many links with other activities in the firm. Outsourcing of systemic activities can lower the potential of a firm to innovate (Langlois and Robertson, 1992). The loss of such competencies through an inadvertent outsourcing decision could potentially have disastrous effects on the future capability of the firm to innovate and adapt to a turbulent environment. On the other hand, and for the same reasons, their acquisition through outsourcing poses major difficulties in the absence of the outright purchase of the external supplier and the subsequent integration of his personnel within the purchasing firm. To get a better grasp of the mechanisms at play in

this kind of situation, the resource-based theory was used to provide a sensible framework to further study the problem.

The issues surrounding outsourcing of information technology have been studied most frequently with the tools provided by Organizational Economics (see for examples: Aubert, Rivard, and Patry, 1996; Gupta and Gupta, 1992; Lacity and Hirschheim, 1993; Loh and Venkatraman, 1992; Nam, Rajagopalan, Rao, and Chaudhury, 1996). These studies are based, at least partially, on the works of Alchian and Demsetz (1972), Barney and Ouchi, (1986), and Williamson (1985) These approaches suggest that measurement problems, uncertainty, investments, asset specificity, and frequency play a critical role in sourcing decisions. The political dimensions have also received extended coverage, most notably in Lacity and Hirschheim (1993). Using a series of case studies, they showed that although economic rationality was often alleged, political behavior could often explain outsourcing decisions. Finally, strategic implications of IT outsourcing were also studied (see for examples: Marcolin and McLellan, 1998 and MacFarlan and Nolan, 1995).

This paper explores IT outsourcing from a different angle, looking at resources required to perform activities and at the strategic value of these resources. The following sections give an overview of the approach.

Theoretical Framework

In a world of perfect competition, there is no sustainable competitive advantage. All the economic actors have access to the same information, the same technology, and the same resources. If a firm has developed expertise, competitors should be able to acquire equivalent expertise, like any other factor of production. Yet, we can observe several companies which seem to enjoy some preferred position in a given market for extended periods of time. Examples of such firms, as Wal-Mart, Caterpilar, and Nucor Steel, were described by Barney (1993) who noted that these firms were able to enjoy above than average returns in their industry, while still operating in a very competitive environment.

The resource-based theory provides an explanation to understand why firms do obtain strategic advantage and are able to keep it. It has been used previously in IT to explain how information technology could be used to gain competitive advantage (Mata, Fuerst, and Barney, 1995; Pereira, 1999). It also gives an interesting framework to assess whether an activity should be kept within the firm or given to a supplier. It focuses on the strategic resources that firms develop and nurture. Even though they are not always readily discernible, these resources are important investments for the organizations and they should try to leverage strategic advantages from these investments (Barney, 1991).

The key elements on which the resource-based theory is constructed are simple deviations from the perfect market environment. Resource-based theory argues that, in many situations, three hypothesis of a perfect market are not met: the firms are constrained by their past choices (history matters), the resources are not perfectly mobile, and expertise is not easy to reproduce or to imitate. These elements are discussed in sequence.

History matters. Arrow (1974) argued that firms invested in learning, codes, skills, and that these investments either permitted or prevented alternatives available to the firm. These past

choices color each organization in a unique way, giving it a unique personality and distinctive capabilities (Barney, 1999). Of course, this heritage can lead to positive or negative outcomes. Some companies are able to use these distinctive capabilities to gain competitive advantage. Valuable competencies, applied systematically, will tend to reinforce themselves. The companies possessing them will gain strategic advantage and, by reinvesting in their capabilities, through their continuous application, will strengthen their strategic position, creating a virtuous circle. However, for other organizations, these capabilities, ill-adapted to market conditions, can impede the organization's actions and lead to its demise. This poses a serious challenge to organizations. Investing heavily into specific abilities can simultaneously create an advantage and a potential threat. As long as the abilities fit the market, they are beneficial. When market conditions change, the same abilities become a liability. The more specialized the organization became, the more difficult it will be to adopt a new set of abilities.

This implies that resources are not mobile. When managers of a company realize that some key resources are missing from its portfolio, filling the gap may be an impossible task, at least within a given period of time. First, they have to clearly identify what are these resources, which can be an arduous task. Second, they have to acquire them or, for human resources, to lure them into their organization. To build organization capabilities, it takes time.

Imitation is difficult. Even if managers were able to acquire resources, organizing them into a profitable configuration might be impossible. The case of Wal-Mart is a good illustration. Wal-Mart does not differentiate itself by selling unique products, any store can sell the same array of products. They do not provide a uniquely nice environment for the shoppers, and if it was the case, competitors could copy their store design. Their pricing scheme is also observable. Any competitor can walk into the store, observe the pricing scheme and reproduce it. Why is it that competitors find it difficult to compete with Wal-Mart (or why Wal-Mart is more profitable than its competitors). Independently of all the individual items linked to its strategy, which can individually be adopted easily by competitors, the overall configuration is what is difficult to imitate. Causality is ambiguous. One cannot pinpoint exactly what makes the company more profitable, it is a multitude of little details, individual elements as well as interactions between elements that create a unique organization, with a distinctive strategic advantage. Observation is not sufficient for a competitor to reproduce it afterward. Wal-Mart strategy was analyzed and published. Stalk, Evans, and Shulman (1992) described what were Wal-Mart competencies and the main reasons explaining why it was outdoing its competitors. These competitors could read the paper and try to implement the same strategies. This should have lead to a reduction of Wal-Mart competitive advantage. Yet, last year, Wal-Mart reported its highest increase on sales in the past five years and higher dividends than ever. Net income has been increasing steadily for the past ten years (Wal-Mart annual report, 2000).

Strategic resources are precious. These deviations from a world of perfect competition lead to several consequences. First, firms rely on their set of competencies to perform. Their set of competencies (or profile) is relatively stable. It cannot be changed on short term horizon, and competencies can easily be lost (for example by selling a unit) but are relatively difficult to acquire. These competencies are investments. They require some nurturing and they have to be chosen carefully. Finally, the firms must focus their investments in the competencies that will bring strategic advantages, avoiding to waste resources on competencies with no strategic

value.

The value of a given set of resources can be conceived only through the activities that they contribute to support or realize and, by extension, through the products that emanate from these activities. Indeed, their contribution to a sustained competitive advantage is valuable inasmuch as they make it possible to conceive and accomplish activities that increase the performances of the company in an appreciable way, either by neutralizing the threats or by allowing it to exploit opportunities that arise. These resources help the company attain a competitive advantage by increasing its operational efficiency, either by automating certain key activities or by supporting congruence and complementarily between these activities.

The strategic value of a company's resources is reflected in the value added to the product. The following example illustrates this point. The value of the talents of a singer is intangible: one cannot measure it directly. This value manifests itself only through the artistic act of the performer. This value becomes tangible (and measurable) when the fans agree to pay for a copy of the songs or to attend a show. In a similar way, the value of the firm's resources, in the context of an IS project, can be estimated in relation to the anticipated value of the information system resulting from the development activity in which these resources take part. The anticipated value of the future system can thus be used as substitute measure for the strategic value of the resources that help create it. This use of a substitute measure (proxy variable) is analogous to the use of the small number of suppliers to estimate vertical integration or the degree of asset specificity in Economics (Caves and Bradburd, 1988).

A Resource-Based Analysis of Outsourcing

Intuitively, outsourcing would be appropriate for activities requiring non-strategic resources while activities linked to key competencies should be jealously kept in-house. A detailed analysis can be more specific about appropriate sourcing strategies. Using the resource-based theory as a framework, it is possible to explain information systems sourcing decisions in relation to the resources the firm has in its possession and the strategic value of those resources as measured by the strategic value of the system itself.

In a general way, from the perspective of the resource-based approach, the less the appropriate resources are present within the firm, the more the firm will seek to overcome this weakness by calling upon external expertise. External partners may be the only way to have access to the expertise, because of the relative immobility and the difficulty to imitate, as discussed earlier. Conversely, the more the appropriate resources are present, the more the firm will seek to boost and exploit this expertise. On the other hand, the lower the strategic value of these resources, the more the company is justified in parting with them through outsourcing. Keeping assets with a low strategic value would monopolize resources that could be put to better use elsewhere. Conversely, the higher the strategic value of the assets, the more the company is justified in preserving and exploiting them internally. The advantages are, in this latter case, the achievement of higher-than-average performances, the safeguarding of key process confidentiality, a better control over their realization and the minimization of the risks of developing dependencies towards an external supplier.

Consequently, interactions between these two factors (*Strategic value* and *Presence of appropriate resources*), depending on whether they simultaneously take values located on a "high – low" continuum should have a foreseeable impact on the sourcing mode chosen: in-house development in the former case (In-house governance/Conservation), outsourcing in the latter (Outsourcing). This contingency is illustrated by the lower left and upper right boxes in Figure 1.

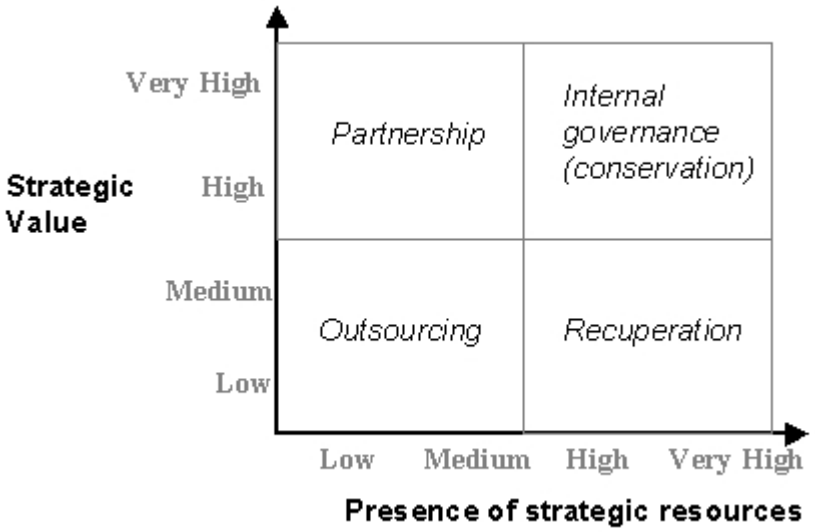

Figure 1 – General Framework

However, reality is not limited to these two simple cases. The situation becomes more complicated when these two factors take opposite values. Which sourcing mode is retained, for example, when *Presence of appropriate resources* is low and when *Strategic value* is high? Conversely, what do managers do when the *Presence of appropriate resources* is high and *Strategic value* is low? This possibility is illustrated by the upper left and lower right boxes in Figure 1. In the situation of high *Presence of appropriate resources* and low *Strategic value*, the model proposes that an acceptable solution would be to share the information system with potential competitors (or with any organization willing to pay to have access to the resources), thus recuperating some of the investment (Recuperation). This mode of sourcing can take at least two forms. In the first one, the company creates a new entity (a joint venture) with associates in order to further develop and to exploit the information systems in question. A second form consists in developing the system by itself and selling part of its surplus capacity to competitors without asking them to be formally associated with its development or operation. The Colonial Group of mutual funds of Boston illustrates this situation (Meador and Pyburn, 1993). The company developed a sophisticated portfolio accounting system. Realizing that such a system could be marketed without harming its strategic objectives, Colonial Group created an affiliate company, whose mission was to distribute and further develop the system, thus offsetting part of its development costs.

In the situation of low *Presence of appropriate resources* and high *Strategic value*, the model suggests that a satisfactory solution would be to enter into a partnership with an external supplier who is in possession of the needed resources to realize the project. This mode of

sourcing can be formalized through an explicit contract or through a joint venture in which both partners provide significant resources. For example, it can be agreed that the consulting firm will provide the technical expertise and the supervisory staff for the project whereas the client company will provide the business processes expertise and the infrastructure. Mixed teams will then collaborate throughout the project to complete the desired applications. In another form of arrangement, it can be agreed that the supplier has the prime responsibility for the initial phases of the project. Progressively, as the project moves forward, the client company's personnel would then join the supplier's teams and gradually transfer the intrinsic knowledge to bring the project to fruition and eventually, exploit it. In short, the critical aspect of this sourcing mode is that the client company seeks to obtain more than a satisfying information system from its partner, as it would be the case in an outsourcing deal. In fact, the company seeks to get the effective co-operation of the supplier and to acquire the corresponding competencies. In doing so, the organization also lowers the inherent risk of the project by sharing with the partner the profits (and the possible losses).

If the resource-based arguments are sound, it would mean that appropriate sourcing strategies could be explained by the two key dimensions: strategic value of the competencies and the level to which these competencies are found in the organization. Appropriate choice of sourcing strategy would lead to a stronger strategic position. Alternatively, inappropriate sourcing strategies can lead to various less than successful outcomes

If an organization outsourced activities corresponding to the upper right quadrant of Figure 1 (high-value and high level), it should experience a loss of strategic competencies and a deterioration of its competitiveness over a period of time. If such an organization failed to take advantage of potential recuperation of an activity in the lower right quadrant, it would not necessarily deter its strategic position, it would merely be a loss of revenues. However, if activities in the lower left corner were conducted in-house, the firm would be inefficiently allocating its resources, while probably getting lower quality results since it does not have the intrinsic capabilities linked to the activities. Similarly, performing in-house and without partners the activities in the upper left corner would be inefficient and lead to lower quality results. However, in the latter case, the consequence might be more serious since these activities are of high strategic value. Poor quality in the conduct of these activities would threaten the strategic position of the organization.

In order to validate the framework, a case study was conducted. In this case, a project for which different sourcing strategies were used, with various levels of success, was documented. Observations were then compared with predictions made using the model to assess its validity.

Methodology

The Resource-based approach provides a complementary perspective on outsourcing decisions. It has been used previously by Duncan (1998) to evaluate the risk associated with outsourcing, even when opportunism is ruled out. She concludes her paper by suggesting avenues for more empirical work (which is still scarce). Because of the scarcity of work using this approach, a case strategy was deemed to be the most appropriate way to evaluate the fitness of the resource-based approach to explain outsourcing behavior. The case used for this

purpose is an IS development project in a large financial institution. The research was carried out between 1997 and 1999. Data acquisition was based on a variety of data sources: documentation, direct observation, semi-structured interviews and physical artifacts. The use of varied data sources permits a certain level of triangulation (Benbasat, Goldstein, and Mead, 1987).

A financial institution was deemed an appropriate environment because the financial industry is composed of intensive users of IT. Their activities require the constant and intense support of IT and their products and services directly incorporate a high level of information. Consequently, the IT applications developed in these firms are more likely to have strategic value. The project chosen for the case study had to be of significant size in order to facilitate documentation. Finally, the projects had been in place for at least a few months so that their success could be assessed.

An interview protocol based on the theoretical model was developed at the outset of the research and served as an interview guide. Data was gathered through semi-structured face to face interviews with top management, owners of the intended system, senior IS managers, IS project leaders and representatives of outside firms linked to the projects. Information was also obtained through archival documents and field notes. Most interviews lasted one to one and a half hour. All interviews were recorded and transcribed, and the data were classified and analyzed according to the variables of the research model. All relevant documents provided by respondents have been scanned and indexed into the database. Each text was then subdivided into smaller segments, usually sentences, so that one or more codes could be assigned to each segment.

The result of this initial phase is a detailed report on the project. This report served multiple functions, including summarizing the information collected, facilitating the appropriation of the basic characteristics of the case and generating a first level of interpretation. The report was submitted to the principals in the project for review and validation and their feedback has been taken into account in the final version of the report.

When all the data (interview reports and documentation) were coded, the dimensions (*Strategic value and Presence of resources*) were assessed for the project and mapped to the theoretical model. From this evaluation, it was possible to compare the chosen sourcing mode with the one predicted by the theory. A fit between the two should lead to successful development, while an absence of fit should lead to some problems (inefficiencies or more dramatically, failure of the development process). This served three purposes. First, the evaluation of the variables themselves provided a first assessment of the applicability of the theoretical model. Each variable had to be operationalized for the case study and the consistency of their evaluation, using many information sources, strengthen the confidence in the existence of these dimensions. A second purpose was the evaluation of the model itself, to assess the predicting power of the theory. Finally, this study also served as a first step for a larger scale research. The evaluation of the case enabled the refinement of the model and its dimensions. Other case studies, or a survey, can be conducted to enable the generalization of the results.

Case Description

The case was conducted at Desjardins-Laurentian Life Group, an insurance company

employing over 3000 persons, with assets of $7.7 billion (www.desjardins.com/ang). Desjardins-Laurentian Life Group (DLLG) is among the leaders of the Canadian insurance industry. Its activities encompass insurance, pension and annuity services. Services are provided on an individual or a group basis. DLLG is operating in Canada and in the Bahamas. The DLLG holding also includes a fund management company, Canagex, which manages $10.5 billion in assets.

The project studied during this research was undertaken after the merger of the Desjardins insurance group with the Laurentian insurance group, following the acquisition of the latter by Desjardins. The main goal of the project was to reorganize customer service and to integrate all the distribution channels of DLLG (the new entity). The project implied a redesign of the business processes, the redefinition of the business structure as well as the development of the systems required to support the new processes. It was aimed at providing better information to customers (more accuracy) and to provide it more rapidly. It was also a marketing tool. When companies or employee groups inquire about potential services, it is important to show them that the insurer has a very good customer support infrastructure. The collection of systems, departments, and service procedures inherited from the past acquisitions did not meet this requirement. Finally, the new system and business process would increase efficiency. The relationships between front and back offices would be totally paperless. Claim processing would be improved. Overall annual savings of 20% were expected.

This project was conducted in three phases, the first two were done using total outsourcing, each phase involving a different supplier, while the last one relied on internal governance. The first two phases were considered failures. The last phase ended in a completed system and a reorganization of the business processes. It is considered a success.

Timeline of the Project

The first phase of the project started in March 1996, when ABC[1] was selected to undertake the task. The supplier was given the responsibility for the requirement analysis, the project planning and the production of a cost/benefit analysis. In doing so, the ultimate objective of DLLG was to have the whole project done by the supplier, on a turnkey contract basis. Rapidly, ABC produced a project plan that was very aggressive, notably by reducing the work force by some 20% (40 employees on 400). This plan promised recurring savings of more than 2 900 000$ with a total investment of 1 600 000$. A unified infrastructure of the systems was considered essential to maximize the effectiveness of the renewed system.

Unfortunately, this proposition did not take very much into account Desjardins-Laurentian's way of doing things. The project leader mentioned that while their solution was not intrinsically wrong, it did not reflect a proper understanding of the organization, its structure, its history and its culture.

[1] The names of the suppliers were changed to provide anonymity.

The same analysis is observed at the managerial level. While the managers were pleased with the anticipated gains of the proposition, they considered that the solution was simply not feasible for lack of coherence with existing procedures and work practices within DLLG. According to one of the senior managers involved in the project, the supplier would not take into proper consideration the company's culture, its values, and its business objectives.

> *They came here with the idea of doing a henchman's job centered solely on production, whereas our objectives were to make a complete overhaul in our services to the customers. In addition, we wanted to put the emphasis as much on the quality of the services as on production. We eliminated ABC for that reason.*

In June, immediately after the termination of ABC, supplier DEF was hired to take the project lead. This firm was deemed more aware of the company culture, organizational procedures, and needs. DEF senior consultants had been acting as IT strategic advisors to the upper management of Desjardins-Laurentian for a long time. Because of this relationship, DEF was thought to have a much better understanding of the company. The team from DEF clearly defined the roles of the back-office and of the front-office (the latter coupled with a call center). DEF identified the key areas of change (business processes, technology, organizational structure, job assignments and manager profiles for the new structure). As envisaged, the new supplier had a good comprehension of the global objectives of the company and showed a clear intention to produce a solution compatible with these objectives. This was a much-appreciated improvement over the previous unsuccessful experience with ABC. Although many aspects of this second try were quite positive, an essential ingredient was still missing: the intimate knowledge of the critical processes and people that are at the center of the activities supported by the future system. This is what the project manager had in mind in the following commentary:

> *"We nevertheless went part of the way with them. We laid down the main orientations at the process level. A manager profile was defined. Much of our attention was centered on the theoretical aspects of what was to be done in the project. But nothing concrete had been done [as of December 1996]. I think that at the conceptual level we had made some headway with them. Some of things that they made were good. […] [Their difficulty was] to be able to know the internal environment which is essential to work efficiently and to get minimal collaboration from everyone."*

In other words, the consultant was unable to get access to the detailed information at the micro level for each process and could not integrate the multiple components necessary to make the new system work coherently. Consequently, the DEF team plainly could not acquire the requisite knowledge to define and develop the functional systems to implement the projected call and claim-processing centers. The problem was not simply because one or both parties did not try hard enough: the task at hand was simply overwhelming for an outsider.

The consultants complained that DLLG's personnel were not cooperating and withhold vital information. On the other hand, the end-users thought that the DEF specialists were not competent enough to understand their problems. They had the impression that the project managers lacked the drive and the authority to get all the different stakeholders to work together on the project. Finally, after eight months of arduous and often frustrating efforts on the part of both companies, the steering committee decided to terminate the contract with DEF, alleging their incapacity to carry out the project.

Undaunted by these two consecutive failures, the project was put back on tracks again in the closing days of December 1996. This time, however, DLLG would use an internal governance structure. As explained by the president of the steering committee, the leaders of DLLG now much were sensitized with the critical importance of the project and with the risks associated with dealing with external vendors for this project. Consequently, they were ready to invest themselves much more in its realization.

> *Then, we rebuilt the whole internal structure of the project team. So, we went to seek the presidents of two subsidiary companies and the first V-P responsible for the Back Office part of the project. […] Within a few months, we regained the time we had lost in our previous attempts.*

Three streams of development were clearly identified: the business process reengineering, the updating of the IT platform and the human resources issues. As the project manager reports in the following segment, each function of the company affected by the project had to contribute its share to the success of the unit.

> *"We had decided to keep every one onboard. Thus, it became great challenge of human resources formation and development. [Once this became clear], the people from HR understood their mission better. The IS People realized that it was hell coming their way. People from the material resources services understood that it meant a complete refitting of a large section of the company. At the same time, we did not know precisely what that meant. But there was one thing which was clear, it is that we needed the cooperation of everyone."*

For all but the information technology sub-project, everything was done in-house. The front desk and call center group were placed under the direct responsibility of the Senior VP for Customer relations. Whereas before TRANSAC each product line had its own customer relation component, the new front desk integrated in a single unit all the calls from the clients concerning the majority of DLLG's products and services. These employees were equipped with the necessary systems to answer inquiries from clients about their insurance benefits, their premiums and any other questions they might have concerning their insurance policy. The resources necessary to man this new center were selected from the pool of volunteers coming from the former product line sectors. They were given an intensive eight to ten weeks training on the operation of a call center. They were also trained to understand and support all

the product lines of the company.

In the back-office, the claim evaluation and processing group was put under the responsibility of the Senior VP for Insurance Payment and Expertise. Consisting of more than 400 workers coming from the former claim departments of the various product divisions of the company, this group was thought to be fairly ready to play its new role as a claim-processing-only function. The reasoning was that the work procedures would in essence be the same as before, to the exception that the personnel working on claim processing would not be disturbed by clients' calls any more. On the other hand, they had to become proficient with many different products, which was not the case before. In contrast with the front-office group where the focus was improving customer service and satisfaction, the accent for the back-office was on productivity gains and optimization. Productivity gains would accrue through specialization, automated workflow management and the use of an integrated interface to all major corporate information systems. Optimization would be attained through work procedure redesign, benchmarking analysis and rationalization. The implementation of the new procedure occurred in synchronization with the developments in the front office. These changes were implemented solely from the interior, with DLLG personnel.

For the IT component of the project, the development team was composed of Desjardins-Laurentian employees and of a new supplier (GHI), in what was labeled a partnership. The major challenge posed by the project, aside from the integration of the telephony systems, was interfacing the new system with the corporate databases. To accomplish this, cutting hedge expertise was required in telephony and workflow management systems as well as a thorough knowledge of the legacy systems of the corporation. As explained by the CIO, DLLG chose a different approach to manage this part of the project:

> *"There are two projects, one called 'Unified Interface' and another one, 'TRANSAC', with the same firm which is GHI. There, we had a very strong 'responsibilisation' of the supplier: shared risks, guarantees of performance, etc. These projects were really entirely, very strongly under their control, with the participation of people from on our premises for reasons of knowledge acquisition."*

A project leader from GHI was put in charge of the technological aspects of the project. He worked in tandem with DLLG's own technical project supervisor in assigning the appropriate resources to the development teams as required. Participation of DLLG people on all facets of the project was essential to ensure the transfer of knowledge from the supplier to the client.

Strategic Value of the Resources

The strategic value of the resources involved have to be inferred from the activities themselves. The project undertaken was evaluated, by the respondents, as having a high strategic value.

First, the new processes, and the system supporting them, affect directly customer service. It is the organization of the front-office that is at stake in this project. While the system will not

change the insurance products themselves, it will define how the company is able to respond to the clients. In this business, and more so in the collective insurance side of it, the quality of service is a key factor for contract renewal. The front office is the showcase window of the insurance company.

The second aspect is related to the back-office. Managers evaluated that the streamlining of the business processes in the back-office would lead to recurrent savings of $4 million annually. These would come from workforce cuts or “synergies”. The new processes, supported by the appropriate technology, would greatly facilitate the information flow among workers and eliminate duplication and inefficient activities. The experts would be grouped together to ensure steady work quality.

Another indicator of this strategic value is the presence of three vice-presidents in the monitoring committee. The project leader reported directly to the Change Management Vice-President. All these facets of the system suggest that it was of high strategic value for Desjardins-Laurentian.

Presence of the Resources at Desjardins

The resources needed to conduct the project successfully were of various types, corresponding to the three streams into which the project was divided. First, a thorough knowledge of the business, the processes, the clients and the customer service was required to perform the business process reengineering. This knowledge was highly specific. Since the new units would integrate client data, products, and staff from what were formerly different organizations, information about each component was essential (on top of understanding of the insurance business). The knowledge was also very broad. The integration of all units into one front-office and one back-office meant that casualty, health, and travel insurance units, which previously operated independently, would be integrated.

Technological know-how was also required. The new processes could not be implemented without a major revamp of the systems in place. Document and contract management had to be implemented to ensure that all process could be conducted from end to end without paper. It meant also that the new technology had to interface with many other systems used by Desjardins-Laurentian, while still providing a unified interface.

Finally, knowledge of change management and human resources practices was required to conduct the organizational transformation properly and to link the new unit with the rest of Desjardins-Laurentian.

Competencies were available internally for most aspects of the project. Managers had extensive knowledge of the insurance product and industry, as well as detailed information about the different units and their intricacies since they came from these various units. Technological expertise was not as high as business knowledge. Many of the systems or interfaces required were new to Desjardins-Laurentian. Finally, the expertise related to change management and human resource were considered average. While the organization had gone through many changes and acquisition in the past, the respondents still described it as very conservative and resistant to change. Adaptability cannot be considered a key asset of Desjardins-Laurentian.

Outcome of the project

In May 1997, the call center finally went online supporting the health and accidents line of products. The other products were gradually phased-in in the following months. According to the president of the steering committee, the results were remarkable:

> *" Today, our clients do not call back repeatedly any more. They have a response on the first call in 93-94% of the cases. [...] The principal indicator we looked for was the number of unanswered calls. Therefore, we aimed at 5% of unanswered calls. We almost reached that average on July 31. We were at 7,5%. We were at 18,6% before."*
>
> *"Normally, when somebody calls, it is necessary that, inside 24 hours we return an answer. When we started, it was terrible. I think that we were able to return from 10 to 15% of our calls in a 24-hour period. After four months, we are now at the 70% mark of returned calls."*

Even if the "Front office" component of the project was considered a resounding success, the situation was somewhat different for "Back office" component, which encountered some difficulties during the first year of operation, as described by one of the senior VP affected by the new system.

> *"Perhaps we did put aside the back-office, and that, the people reproach it to us. They said: 'You did not deal with us in the "back". You did not train us. You did not update our systems so they would be more powerful. You trained the call center people. You only made sure that their systems would be more user-friendly, etc.."*

The final cost of the project slightly exceeded 2M dollars. This is above the initial evaluation (of 1.6M) but it is not considered a disproportionate cost overrun by the DLLG managers.

Analysis

If we position on a graph the value of the strategic resources, as well as their presence (for each type), we can note that theory would suggest a combination of internal procurement and partnership. The technical aspects would be the ones benefiting the most from a partnership, because of the lack of such resources inside the company. The change management expertise would also gain from the association with an external partner. Finally, the significant business expertise suggest the use of internal governance for the business process reengineering portion of the venture.

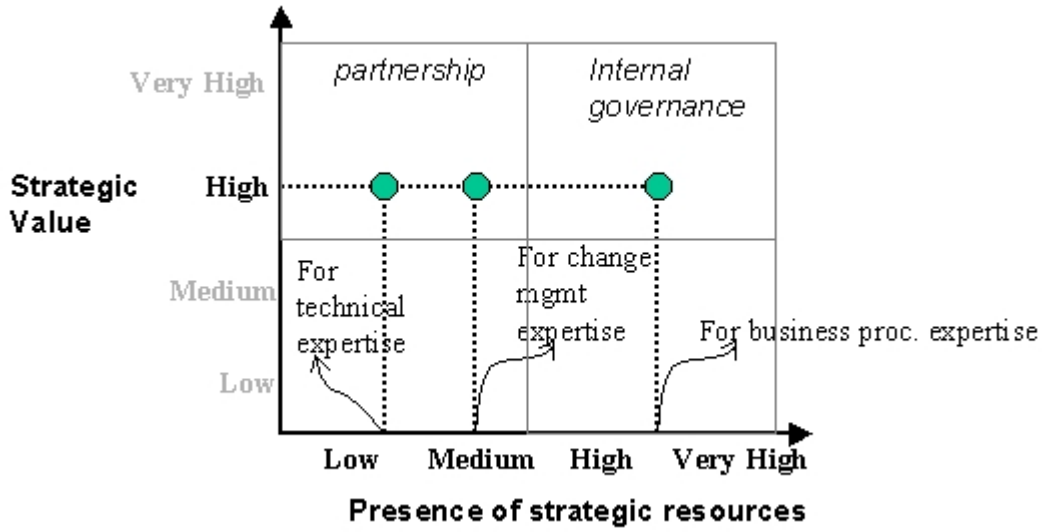

Figure 2 – Map of Case

The observation of the outcomes of the three phases of this project are coherent with the framework. The relative position of the three facets of the project in Figure 2 suggest a mix of internal governance and partnership, depending on the aspect of the project. The first two attempts to conduct the project, using outsourcing, were failures. The suppliers could not conduct the activities. The key aspects of the project could only be mastered by the client organization itself.

The third attempt, relying on internal governance, was deemed a success. In this case, the organization relied on appropriate governance modes for two of the three facets of the project. The BPR aspect was managed in-house and lead to the expected results. The model suggested that the technology stream be managed through a partnership. This was done with success. The system was developed within budgets and deadlines and is working as expected.

The only aspect that was not managed along the lines recommended by the framework is the change management. Interestingly, this was presented by the managers as the only shadow in the overall successful portrait of the project outcomes. While the system works as expected and the business processes are implemented as designed, employee reactions vary widely. The employees of the front office are very satisfied with the new design, the system, and the results of the project. The productivity has increased as expected. On the other hand, the employees of the back-office are not pleased with the change. The resent being cut from the clients. They have the impression that the front-office is the “glamorous” part of the organization and that they are left behind, considered as second-class citizens. While gains have been realized in the back-office operations, these gains are not as high as expected. Managers believe that the expected targets will be reached but acknowledge that it will take more time than expected. Employees are not performing to expectations. It seems that the change management team overlooked this part of the problem. The analysis indicated that it was an area where expertise was lacking to a certain degree. While it is impossible to say if the use of outside help would have prevented the employees of the back-office from feeling

cast off, experts might have at least anticipated this fact. Even if no solution was found, at least it would not have been an unpleasant surprise.

Conclusion

The sourcing model we have described in this paper focuses on two important factors affecting the sourcing decision of an IS system: its S*trategic value* and the P*resence of the appropriate resources* to develop it. Rather than focussing exclusively on the economic aspects of the project (the strategic value), the model draws attention to the knowledge dimension (*Presence of appropriate resources*) that is endogenous to any IS development. It is theorized that it is the interplay between these two factors that will best explain why, under certain circumstances, a company will choose to keep the development of a highly strategic system in-house and why, under another set of circumstances, it will seek outside assistance to develop its system. The case study presented is an example of this situation.

The results of this study have interesting repercussions for IS research and for managers who need to decide on an acceptable solution for their IS development needs. Moreover, for the IS research field, the study is one of the first attempts at operationalizing the resource-based framework. This theoretical framework, with the exception of Duncan (1995a-b) and Mata, Fuerst, and Barney (1995), has not been extensively used in IS research. Its use in this research presents a possible new approach for the study of information systems sourcing. The study has also helped clarify the concepts used in the theoretical model and identify relevant empirical referents for evaluation purposes.

For practitioners, the proposed model provides decision-makers with a more refined set of criteria on which to base their sourcing decisions. Also, it is interesting for managers to have access to a broader range of documented sourcing mode choices. In addition, by taking into account the effective availability of resources within the firm and their strategic value, managers can be more attentive to the long-term consequences of their sourcing decisions.

The resource-based theory has enabled us to formulate a model that can be used to study information systems sourcing modes. Following development of the model, a research plan was devised to identify the critical dimensions of IS development project sourcing decisions in terms of the resources required and their strategic value. Implementation of this research plan has provided the data needed to analyze the nature and intensity of the links between the various dimensions. The study should cast a new conceptual light on the phenomenon and offer additional and innovating tools for decision-makers.

References

Alchian, A. and H. Demsetz "Production, Information Costs, and Economic Organization", *The American Economic Review*, Dec. 1972, pp. 777-795.

Arrow, Kenneth J. *The Limits of Organization*, W. W. Norton and Company, 1974.

Aubert, B., M. Patry, and S. Rivard "Assessing the Risk of IT Outsourcing", *Proceedings of HICSS-31*, Jan. 6-9, 1998.

Aubert, B., S. Rivard, and M. Patry "A Transaction Cost Approach to Outsourcing Behavior: Some Empirical Evidence", *Information & Management*, Vol. 30, 1996, pp. 51-64.

Barney, J. and W. Ouchi Transaction-Cost Economics: Governing Economic Exchanges, *Organization Economics*, Barney & Ouchi (eds), Jossey-Bass Publishers, 1986, 72-80.

Barney, J. "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, Vol. 17, No. 1, 1991, pp. 99-120.

Barney J. "Looking Inside for Competitive Advantage", *Academy of Management Executive*, Vol. 9, No. 4, 1995, 49-61.

Barney J. "How a Firm's Capabilities Affect Boundary Decisions", *Sloan Management Review*, Spring 1999, 137-145.

Benbasat, I., D.K. Goldstein and M. Mead "The Case Research Strategy in Studies of Information Systems", *MIS Quarterly*, Vol. 11, No. 3, 1987, pp. 369-386.

Caves, R.E. and Bradburd R.M. "The Empirical Determinants of Vertical Integration", *Journal of Economic Behavior & Organization*, Vol. 9, No.3, 1988, pp. 265-279.

Chan, Y. E. Huff, S.L. Barclay, D.W. and Copeland, D.G. "Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment", *Information Systems Research*, Vol. 8, No. 2 June 1997, 125-150

Duncan, N.B. "Capturing Flexibility of Information Technology Infrastructure: A Study of Resource Characteristics and Their Measure", *JMIS*, Vol. 12, No. 2, 1995a, pp. 37-57.

Duncan, N.B. "The Invisible Weapon: A Study of Information Technology Infrastructure as a Strategic Resource in the Insurance Industry", *Unpublished Doctoral Thesis*, Texas A&M University, 1995b.

Duncan, N. "Beyond Opportunism: A Resource-based View of Outsourcing Risk", *Proceedings of the HCISS-31*, Vol. 6, H. Watson (ed.), Hawaii, Jan. 1998.

Earl, M.J. "The Risks of Outsourcing IT," *Sloan Management Review*, Spring 1996, pp. 26-32.

Gupta, U. and Gupta, A. "Outsourcing the IS Function: Is It Necessary for Your Organization?", *ISM*, Summer 1992, pp. 44-50.

Henderson, J.C. and Venkatraman, N. "Strategic Alignment: Leveraging Information Technology for Transforming Organizations", *IBM Systems Journal*, Vol. 32, No. 1, 1993, pp. 4-16.

Lacity, M.C. and Hirschheim, R. *Information Systems Outsourcing*, John Wiley & Sons, New

York, 1993.

Langlois R.N. and P.L. Robertson "Networks and Innovation in a Modular System: Lessons from the Microcomputer and Stereo Component Industries", *Research Policy*, Vol. 21, 1992, pp. 297-313.

Loh L. and Venkatraman N. "Determinants of Information Technology Outsourcing: A Cross-sectional Analysis", Journal of MIS, Vol. 9 No. 1, Summer 1992, 7-24.

Marcolin, B. and McLellan, K. "Effective IT Outsourcing Arrangements", *HCISS-31*, Vol. VI, H. Watson (ed.), Hawaii, Jan. 1998.

Mata, J.F., W.L. Fuerst and J.B. Barney "Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis", *MIS Quarterly*, Vol. 19, No. 4, 1995, pp. 487-505.

McFarlan, F.W. and R.L. Nolan "How to Manage an IT Outsourcing Alliance", *Sloan Management Review*. Winter 1995, pp. 9-23.

McGrath, R. MacMillan I.C. and Venkatraman, S. "Defining and Developing Competence: A Strategic Process Paradigm", *Strategic Management Journal*, Vol. 16, 1995, pp. 251-275.

Meador, C.L. and Pyburn, P.J. "IT Outsourcing: Operational Improvement or Strategic Imperative?" *MST Working Paper*, 1993.

Nam, K., Rajagopalan, S., Rao H.R. and Chaudhury, A. "A Two-Level Investigation of Information Systems Outsourcing," *Communications of the ACM*, Vol.39, No.7, July 1996, pp. 37-44.

Pereira, R.E. "Resource View Theory Analysis of SAP as a Source of Competitive Advantage for Firms", *Database*, Vol. 30, No. 1, Winter 1999, pp. 38-46.

Pisano, G.P. "The R&D Boundaries of the Firm: An Empirical Analysis", *Administrative Science Quarterly*, Vol. 35, 1990, pp. 153-176.

Porter, M.E. and Millar, V.E. "How Information Gives You Competitive Advantage", *Harvard Business Review*, Vol. 63, No. 4, 1985, pp. 1493-160.

Prahalad, C. K. and Hamel, G. "The Core Competence of the Corporation", *Harvard Business Review*, Vol. 68, No.3, 1990, pp. 79-91.

Quinn, J.B. and Hilmer, F.G. "Stragegic Outsourcing" *Sloan Management Review*, Vol. 35, No. 4, 1994, pp. 43-55.

Scarbrough, H. "The External Acquisition of Information Systems Knowledge", in: Willcocks, L.P. and Lacity M.C. (ed.), *Strategic Sourcing of Information Systems*, Chichester: Wiley & Sons1998, pp. 136-161.

Stalk, G., Evans, P. and Shulman, L. Competing on Capabilities: The New Rules of Corporate Strategy, *Harvard Business Review*, March-April 1992, 57-68.

Wal-Mart, Annual Report, 2000 (http://www.walmartstores.com/corporate/)

Williamson O.E. *The Economic Institutions of Capitalism.* Free Press, 1985.

Liste des publications au CIRANO *

Cahiers CIRANO / *CIRANO Papers* (ISSN 1198-8169)

99c-1 Les Expos, l'OSM, les universités, les hôpitaux : Le coût d'un déficit de 400 000 emplois au Québec — Expos, Montréal Symphony Orchestra, Universities, Hospitals: The Cost of a 400,000-Job Shortfall in Québec / Marcel Boyer

96c-1 Peut-on créer des emplois en réglementant le temps de travail? / Robert Lacroix

95c-2 Anomalies de marché et sélection des titres au Canada / Richard Guay, Jean-François L'Her et Jean-Marc Suret

95c-1 La réglementation incitative / Marcel Boyer

94c-3 L'importance relative des gouvernements : causes, conséquences et organisations alternative / Claude Montmarquette

94c-2 Commercial Bankruptcy and Financial Reorganization in Canada / Jocelyn Martel

94c-1 Faire ou faire faire : La perspective de l'économie des organisations / Michel Patry

Série Scientifique / *Scientific Series* (ISSN 1198-8177)

2000s-29 The Impact of Government-Sponsored Training Programs on the Labor Market Transitions of Disadvantaged Men / Lucie Gilbert, Thierry Kamionka et Guy Lacroix

2000s-28 Hope against Hope: Persistent Canadian Unions in the Interwar Years / Michael Huberman et Denise Young

2000s-27 The Impact of Human Resources Practices on IT Personnel Commitment, Citizenship Behaviors and Turnover Intentions / Guy Paré et Michel Tremblay

2000s-26 Organizational and Individual Determinants of Atypical Employment: The Case of Multiple Jobholding and Self-Employment / Gilles Simard, Denis Chênevert et Michel Tremblay

2000s-25 Les déterminants organisationnels et individuels de l'emploi atypique : Le cas du cumul d'emplois et du travail autonome / Gilles Simard, Denis Chênevert et Michel Tremblay

2000s-24 L'engagement organisationnel et les comportements discrétionnaires : L'influence des pratiques de gestion des ressources humaines / Michel Tremblay, Philippe Guay et Gilles Simard

2000s-23 Environmental Risk Managemant and the Business Firm / Bernard Sinclair-Desgagné

2000s-22 Temporal Aggregation of Volatility Models / Nour Meddahi et Éric Renault

2000s-21 Le projet Harmonie / Richard Landry et Suzanne Rivard

2000s-20 Towards an Innovation Intensity Index: The Case of CIS 1 in Denmark and Ireland / Pierre Mohnen et Marcel Dagenais

* Vous pouvez consulter la liste complète des publications du CIRANO et les publications elles-mêmes sur notre site Internet à l'adresse suivante :

http://www.cirano.umontreal.ca/publication/documents.html