2001s-23

A Resource-Based Analysis of Outsourcing: Evidence from Case Studies

Vital Roy, Benoit Aubert

Série Scientifique
Scientific Series

CIRANO
Centre interuniversitaire de recherche
en analyse des organisations

Montréal
Mars 2001

Ce document est publié dans l'intention de rendre accessibles les résultats préliminaires de la recherche effectuée au CIRANO, afin de susciter des échanges et des suggestions. Les idées et les opinions émises sont sous l'unique responsabilité des auteurs, et ne représentent pas nécessairement les positions du CIRANO ou de ses partenaires.
This paper presents preliminary research carried out at CIRANO and aims at encouraging discussion and comment. The observations and viewpoints expressed are the sole responsibility of the authors. They do not necessarily represent positions of CIRANO or its partners.

A Resource-Based Analysis of Outsourcing:
Evidence From Case Studies[*]

Vital Roy[†], Benoit Aubert[‡]

Résumé / Abstract

De plus en plus, les technologies de l'information sont au centre des préoccupations des gestionnaires. Elles commandent des investissements massifs et peuvent être gérées de diverses manières. Traditionnellement, une gestion interne était favorisée pour fournir à l'organisation des services sur mesure et pour protéger des pratiques uniques, permettant à l'organisation de se différencier. Les détracteurs de cette approche soutiennent que l'impartition est un meilleur choix. L'impartition permet à la firme de se concentrer sur ses compétences de bases tout en lui donnant accès à des spécialistes de pointe. Pour mieux comprendre le lien entre les compétences de la firme et l'impartition, 21 projets sont étudiés. Les résultats indiquent que le meilleur prédicteur de succès est l'adéquation entre le mode de gestion et le profil de compétences de la firme.

The central role that information technology plays in the management of companies, the massive investments that are required, and a preoccupation for rationalization explain in good part the renewed interest in the strategies used for information systems sourcing. In-house provision is often seen as the best way to provide an organization with IT services that are well adapted to support its business activities while preserving its trademark processes and know-how. On the other hand, critics argue that a better solution is to outsource those IT activities to specialists, thus permitting the company to focus on its core business. The choice of a sourcing mode has an impact on the ability of the firm to implement its systems and ultimately to compete in its field of business. In order to better understand under what conditions a firm should choose one sourcing mode over another, we argue that it is necessary to analyze the interactions between a firm's competencies and the strategic value of those competencies. This is investigated using evidence from 21 information system projects. The main findings were that the best predictor of success and failure, by far, is the fit between the governance mode and the position of the project in the value/availability matrix. Another interesting finding is that no sourcing mode per se seems to lead to successful outcomes. It is always a matter of selecting the appropriate mode for each situation.

[†] École des Hautes Études Commerciales

[‡] École des Hautes Études Commerciales et CIRANO

1   Introduction

In recent years, the strategies used for information systems (IS) sourcing have raised much interest, both in the practitioner and the academic literatures (Avery, 2000; Sambamurthy and Zund, 2000; King and Malhotra, 2000). The central role that information technology (IT) plays in the management of companies, the massive investments that are required and a preoccupation for rationalization explain in good part this interest (Dixon and John, 1989; Lacity et al., 1996; Smith et al., 1998). Basically, an organization can get its information systems from two sources: internally, from its own IT department, or externally, through outsourcing (McFarlan and Nolan, 1995; Aubert et al., 1996).

In-house provision is often seen as the best way to provide an organization with IT services that are well adapted to support its business activities while preserving its trademark processes and know-how (Chesbrough and Teece, 1996). On the other hand, in-house provision has also been described as excessively expensive, anachronistic and inefficient (Huber, 1993; Fields, 1995). Internal IT projects are notorious for being long, late, and over budget (The Standish Group, 1995; Rockart et al., 1996; Keil et al., 1998). Moreover, they are said to distract a company from its core business by draining scarce resources to accomplish an allegedly marginal activity. As reported by Earl (1996), the critics of in-house development argue that a better solution is to outsource those IT activities to specialists, thus permitting the company to focus on its core business. The presumption underlining this argument is that specialists are better equipped to take advantage of economies of scale while offering access to the best IS development practices. The resultant savings should eventually translate in more cost-effective IT services for the firm (Gupta and Gupta, 1992; Fields, 1995; Elmuti et al., 1998). Since the early 1990's, the outsourcing approach has gained both in popularity and importance, to the point that in some companies, the entire IT function has been outsourced (Loh and Venkatraman, 1992a; Grover et al., 1994). While outsourcing has certainly provided managers with an interesting IT procurement option, it is also evident that its ill-considered use has led to disastrous and unexpected results (Strassmann, 1995). Hence, as noted by Lacity et al. (1995), total outsourcing is no more the mythical silver bullet for information systems sourcing than is the use of exclusive in-house development. For managers, the challenge thus consists in finding an adequate balance between these two options.

Arguably, the choice of a sourcing mode has an impact on the ability of the firm to implement its systems and ultimately to compete in its field of business. Indeed, as discussed by Mata et al. (1995), the process of organizing and managing IT within a firm (which includes sourcing decisions) is a class of IT activities susceptible to generate a competitive advantage for the firm. Successful integration of IT, notwithstanding the need to master technical IT skills, is primarily based on a thorough knowledge of the firm's processes and the establishment of strong partnering relationships between IT and other functional managers (and even with managers from other companies). In order to better understand why and under what conditions a firm chooses one sourcing mode over another, it is necessary to analyze the effect of interactions between a firm's IT competencies and the strategic value of those competencies. This is done using evidence from

21 information system projects.

This paper is organized as follows. The following section describes the literature review of the information system sourcing phenomenon and its determinants. The third section presents the resource-based theory on which the research model is based. This framework has led to the formulation of four research propositions. This is followed by a short description of the research plan and the analysis strategy used in this study. The last section summaries the analysis of the case studies that were used in this research, followed by a brief discussion of the results and their significance for research and practice.

2   Theoretical Background

In the last few years, the resource-based theory (RBT) has gained much influence in Strategy. This approach results from several research streams, notably economic theory and strategic management. Its roots go up to the 1950's, with the work of Penrose (1959). More recently, Rumelt (1984), Wernerfelt (1984), Dierickx et al. (1989) and Barney (1986, 1991, 1999) have strongly contributed to its development.

According to classical economics, the capacity of a company to obtain a profit margin higher than its cost of capital depends on two principal factors: the attraction of the industry in which it operates and the establishment of a competitive advantage over its rivals (Porter and Millar, 1985). Within this framework, the objective of strategic analysis is mainly to identify an industry having a favorable environment, to locate interesting sectors and strategic groups inside this industry and to identify effective means to counter the market forces being exerted in this environment. This approach rests on the premise that the source of competing advantage derives mainly from the positioning of the company inside a given industry. Moreover, it assumes that the companies have free access, at least in the medium term, to the resources required to offset or influence the market forces.

This way of explaining a sustained competing advantage has a weakness, which is addressed by the resource-based theory. The majority of the studies using classical economic theories do not manage to establish significant links between the characteristics of an industry and the profitability of the individual businesses which make it up (Rumelt, 1991; Rumelt et al., 1991; Hansen and Wernerfelt, 1989). According to Rumelt (1991), the variations of performance between individual firms inside the same industry are much more important than the variations of performance between different industries[1]. This observation underscores the possibility that the main source of competing advantage comes primarily from within the company in the form of resources and distinctive competencies that are not easily imitable for the competition. RBT aims to conceptualize this idea. Resource-based thinking considers that a company's resources include

---

[1] In this context, the "performance" of an industry represents the calculated average performance of the firms included in this industry.

2

all assets, organizational characteristics, processes, aptitudes, information and knowledge controlled by that company and its employees (Barney, 1991). A firm's competencies stem from its ability to reconfigure and exploit its assets in such a way as to attain a competitive advantage. These competencies derive from practical and theoretical knowledge acquired through experience and formal learning. This expertise is implicitly encoded in the firm's routines and in the individual know-how acquired by the firm's personnel throughout its history (Prahalad and Hamel, 1990).

Barney (1999) argues that if the resources and competencies that a company possesses are heterogeneously distributed in an industry, and if these competencies are difficult to emulate or substitute, then that company can implement competitive strategies that its competitors will be unable either to conceive or to implement, since they do not have access to an equivalent set of resources. Resources can be difficult to emulate or substitute because of their intrinsic properties, either because their use implies complex interactions between members of the personnel or between members of work groups (social complexity), or because the actions necessary to acquire them are not perfectly identified and depend on tacit knowledge (causal ambiguity). They can also result from specific historical conditions (historical context) or from a long and difficult to replicate learning process (path dependency). All these elements restrict the mobility of the resources. (Barney 1986, 1991; Dierickx et al., 1989).
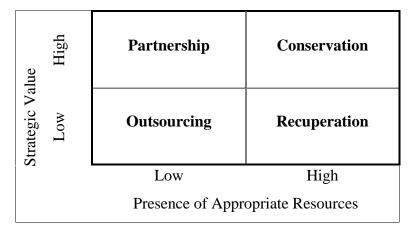
In the context of IS development, these resources can take the form of technical skills such as expertise in analysis and design, and the ability to integrate emerging technologies with the firm's strategic objectives. They can also take the form of managerial skills such as the ability to establish close links with the user community, the ability to effectively develop appropriate IT applications, and the ability to anticipate the future IT needs in terms of IS development. Together, these competencies contribute to a competitive advantage by increasing the firm's operational efficiency and flexibility, either by automating certain key activities or by supporting congruence and complementarily between these activities (Mata et al., 1995; Bharadwaj, 2000). Aside from being valuable for a company, these competencies are difficult to acquire or imitate, since they often depend on interpersonal relationships, tacit knowledge, and are developed over long periods of time through trial and error.

The strategic value of resources can be viewed as the degree to which these resources have an impact on the growth and the prosperity of the company. It is the extent to which key activities create added value for the customers. Actually, their contribution to a sustained competitive advantage is made possible either by neutralizing threats or by allowing the organization to exploit opportunities that arise. The actual value of IT resources can be assessed only through the activities that they contribute to support and, by extension, through the products and services that result from these activities. To use a comparison, the talents of an artist can only be appreciated through his or her production (i.e. what the patrons are ready to pay for his or her work). Likewise, in the context of an IS project, the anticipated value of the system can serve as substitute measurement for the strategic value of the resources that help create it. This use of a proxy 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). It is also comparable to the concept of user satisfaction to approximate the degree of effective utilization of a system in the IT field (Bailey and Pearson, 1983).

2.1   A Resource-Based Information System Sourcing Model

From RBT, the less the necessary resources are present within the firm, the more the firm will seek to overcome this weakness by calling upon external expertise. Conversely, the more the necessary resources are present, the more the firm will seek to boost and exploit this expertise to gain a competitive advantage (Prahalad and Hamel, 1990; Winter, 1987). On the other hand, the lower the strategic value of these resources, the more the company is justified in parting with them and in relying on outsourcing. Keeping assets with a low strategic value would monopolize resources that could be put to better use elsewhere. Then again, 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 (Lacity et al., 1995).

Figure 1 : Model of IS Sourcing

	Low	High
High	Partnership	Conservation
Low	Outsourcing	Recuperation

Strategic Value (vertical axis: High, Low)

Presence of Appropriate Resources (horizontal axis: Low, High)

Consequently, interactions between these two factors (*Strategic value* and *Presence of appropriate resources*), should have a foreseeable impact on the sourcing mode. These prospective effects are represented by the four quadrants of Figure 1. For instance, in a situation where the *Strategic value* is high and the *Presence of appropriate resources* is also high, the firm would be well advised to develop the new system in-house (Conservation), thus safeguarding its trade secrets and efficiently leveraging its distinctive competencies to further its strategic goals. When choosing this mode of sourcing, the company assumes full responsibility for the eventual success (or failure) of the project and stands to gain the eventual benefits (or the losses) that will result.

4

In the opposite situation, where the *Strategic value* is low and the *Presence of appropriate resources* is also low, the sensible choice would be to outsource the development of the future system (Outsourcing) to a supplier. Under these circumstances, there would be no rationale to invest time and scarce resources to acquire competencies that would only be used in a non-core project. Typically, the company would hire a consultant to develop its information system. In its most extreme form, a company can outsource its whole information system development function. The case of Continental Bank (Huber, 1993), which outsourced the development and the exploitation of its data processing to ISSC, illustrates this situation. This type of sourcing seems rather exceptional, however. Much more frequent are cases where the company contracts out a specific system development or even a subset of the development. The Y2K projects were typical examples of such cases where the objective of the companies was to get a satisfactory update of their systems at the best possible price. Another case of outsourcing is when a company acquires an existing, off-the-shelf information system and simply parameterizes the application without making major modifications to the application itself.

The situation is somewhat more complex when the *Strategic value* and the *Presence of appropriate resources* take opposite values. In the case of high *Strategic value* and low *Presence of appropriate resources*, the company does not have much choice but to solicit external help to get the system it needs through a partnership agreement with a specialized IT consultant (Partnership). This mode of sourcing can be put into effect through an informal agreement, an explicit contract or even the setting-up of a joint venture. 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 provides the businesses processes expertise and the necessary infrastructure. Mixed teams will then collaborate throughout project to carry out the desired system development. In another form of arrangement, it can be agreed that, initially, the consultant will be the chief designer and developer of the system, but that progressively, the client personnel will join in with the development team and begin the transfer of knowledge necessary to implement and use the new system. In short, the main characteristic of the Partnership mode is that the client seeks to obtain more than a satisfying information system from its partner, as would be the case in a classic outsourcing agreement. In fact, the company seeks to share the responsibilities and the benefits of the project while ensuring the effective co-operation of the supplier, particularly with regard to the transfer of expertise.

In the case of low *Strategic value* and high *Presence of appropriate resources*, the exact reverse situation is encountered. Through mergers or acquisitions, the company may find itself with low value IT resources that are underutilized and expensive to maintain. It will then try to recoup some of its investments by sharing the system with selected competitors (Recuperation). For example, a company can launch a new affiliate or a joint venture with competitors[2]. The Colonial

---

[2] One could wonder what the sharing or the sale of information services have to do with IS sourcing. Let us stress that such sharing can be considered, in this case, as one strategy amongst others allowing the company to acquire an information systems which would otherwise be inaccessible for the firm.

Group of mutual funds in Boston (Meador and Pyburn, 1993) is an example of this situation. The company developed a very sophisticated portfolio accounting system. Realizing that such a system could be marketed without harming its strategic objectives, Colonial Group created a subsidiary company with the aim of marketing and of continuing to develop this system, recovering by the same occasion part of its development costs. A company can also sell its non strategic asset to a supplier, who then seeks other clients to leverage this asset while continuing to provide the service to the company.

These four modes of sourcing represent generic cases that could be encountered. They do not exclude the possibility of intermediate modes, such as joint ownership of information systems by two or several partners or the purchase of an existing system rather than the development to measure by an external supplier.

2.2   Research Approach

Because of the scarcity of work using the resource-based theory (see Duncan, 1998), a case strategy was deemed to be the most appropriate way to evaluate its fitness to explain sourcing behavior in IT projects. A series of cases were conducted. The logic underlying a multiple cases approach in is one of "reproduction", where one seeks to show that a particular phenomenon is likely to be observed, being given a combination of specific factors predicted by the theory (literal reproduction). Moreover, the idea is also to show that this same phenomenon will not be observed in the absence of the specific combinations of factors (theoretical reproduction) (Miles and Huberman, 1994).

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 et al., 1987). It also helps to counter certain biases, such as social desirability or selective memory of events.

2.2.1   Site Selection

Six companies took part in the research, enabling the evaluation of twenty-one IT projects. All six firms operate in the financial industry. Financial institutions were chosen because they are intensive users of IT. Their activities require intense support from IT and their products and services directly incorporate a high level of information (Porter and Millar, 1985). Consequently, the IT applications developed in these firms are more likely to have an identifiable strategic value. The data was collected between June 1997 and November 1999.

2.2.2   Project Selection

The projects chosen for the case studies were of significant size. This ensured that they were managed with diligence by the firms. It also facilitated documentation. They cover the different theoretical dimensions described in the research model – the four quadrants –, as prescribed by Eisenhardt (1989). It was important to find projects with as wide a variety of characteristics as possible both for strategic value and presence of the appropriate resources. Finally, the projects

6

had been in place for at least a few months so that their success could be assessed. Projects labeled as successes as well as failures were included in the research.

2.2.3 Respondents

Respondents were interviewed at several levels of the organization. To ensure a greater effectiveness to these meetings, an interview protocol (see Appendix 1) was systematically used, based on the theoretical elements drawn from the literature review.

As recommended by Pinsonneault and Kraemer (1993), the first step in the data collection was to contact a senior executive to obtain the required authorizations for access. These first interviews also served to collect general information on the company (history, mission, market position, outline of business and IT strategies, etc.). This information was supported with data found in annual reports and specialized periodicals.

These interviews also helped to identify a number of information system development projects presenting a wide array of characteristics (with respect to the theoretical variables). They were followed by other interviews with other respondents whom were associated with the projects. In this second series of interviews, the project leaders were interviewed. The CIO and selected members of the steering committee for each project were finally interviewed. All this information served to establish the basic characteristics of each project and to make use of all the sources of information that could help document the case were assessed.

2.2.4 Interview Procedure

The interview protocol included open questions designed to elicit a description of the organizational context of the project and to let the respondent express his or her point of view about the reasons that justified the selected sourcing strategy. The interview protocol also used a series of semi-structured questions covering the theoretical dimensions of the research model. The respondents were encouraged to add any nuances or comments that they deemed appropriate. Follow-up questions and requests for precision complemented the interviews. As Yin (1994) explains, the questionnaire used in this type of research is used as a guide for the researcher to enable him to cover all the important aspects identified in the research model.

The interviews were all tape-recorded and transcribed. The transcription makes it possible to detect ambiguities and missing details that may have slipped during the meeting. It was possible for the interviewer to clear up these points with the respondent in a follow-up interview. On average, five persons were interviewed at the company level. Then, four to five interviews per project were done with the appropriate persons. The average interview lasted 1h15. In total, 130 interviews were conducted. All the interview transcripts were included in a text database.

Another important source of information is documentation on the development activities and their contribution to the business objectives of the firm. Project presentations, status reports, post-implementation reports and press releases are among the sources that were used, when available. One hundred and fifty such documents were digitized and included in the text database. Once purged of irrelevant material, the resulting database contained 2,550 pages (single space) of text

for analysis.

2.2.5 Data Coding

The collected data came in the form of event accounts, interview reports, documents, IT applications and multimedia files. Printed documents were scanned and the data was mapped according to dimensions of each variable comprised in the research model. A system of coding was developed in order to tag the various data elements found in each document (usually at the level of a sentence or a paragraph). The Nu*dist V4.0 system was retained for data analysis.

The quality of the coding procedure is of great importance in a qualitative research, given the central role that this process occupies in the analysis of the data. The following section presents the steps taken in order to evaluate the reliability and the validity of the coded data.

2.2.6 Reliability

The first step consisted in asking two judges (a Ph.D. in IS and an experienced project leader with a M.Sc. in IS) to code sixty randomly selected segments of text drawn from transcripts of interviews and from the documentation of the first four projects. Each judge received a short explanation of the procedure, as well as instructions detailing the code (with a definition and an example for each). These segments were distributed as follows: 15 segments associated with the sourcing mode, 15 segments associated with the presence of appropriate resource, 15 segments connected to the strategic value of the project and 15 segments pertaining to the success of the projects. The judges completed the task in 1h00 approximately. Results were compared to those of the researcher and the differences were discussed.

For each category, the percentage of agreement between the judges' coding and the researcher's coding were computed. According to Miles and Huberman (1994), an acceptable proportion of inter-raters agreement would be around 70%. This percentage would increase as the judges gain experience using the codes and should reach approximately 80% towards the end of the process. In the present study, the minimum value recorded is 73%. Most of them are over 85% (see Table 1). Cohen's Kappa statistics was also computed (Table 1). The Kappa statistics measures the agreement between two judges when random agreement has been taken into account. A value of 1 would indicate a perfect agreement, whereas a value of zero would indicate an agreement equivalent to what could occur by chance alone. Kappa coefficients respected guidelines provided by Cohen (1960) and coding reliability is thus considered acceptable.

Table 1: Inter-coder Agreement Results

Coder	Presence		Value		Mode		Success	
	%	K_p	%	K_p	%	K_p	%	K_p
A	93	0,88	86	0,79	93	0,92	73	0 ,66
B	73	0,53	86	0,79	86	0,91	86	0,83

It is also important to make sure that the coding carried out at the beginning of the cycle is consistent with and the coding carried out at the end. To evaluate this aspect, a coding-recoding test was carried out on the same segments of text at two different periods during the coding phase. Fifty segments were tested and the percentage of agreement between the two tests is 86%, which is higher than the threshold suggested by Miles and Huberman (1994).

2.2.7 Validity

To ensure validity of the results, reports were drafted for each project and submitted to respondents (project managers) for validation. The senior officer who had initially authorized the research in the company also received a copy of the reports for evaluation purposes. All the reports were eventually returned to the researcher and the annotations and suggestions were accounted for.

2.3 Analysis Procedure

The analysis of the cases consists in detecting the similarities and contrasts between each case using several comparison matrices where the value for each variable is indexed. These matrices are structured in such away as the specific values of the variables of interest are ordered, thus facilitating the comparison between the values of the other variables of the model (Miles and Huberman, 1994). The analysis is drawn from these matrices.

This technique of analysis, known as "pattern matching", is frequently used. The researcher compares a given distribution (the structure) of the variables, obtained empirically, with the structure predicted by the theory. The procedure then consists in verifying that, for each combination of the actual values of the independent variables, the predicted value for the dependent variable (the sourcing mode for each case) is observed. This analysis technique is similar to the Q techniques (multidimensional scaling, cluster analysis, hierarchical clustering) described by Miller (1978).

3 Results

The results from the case studies are extremely encouraging. Of the 21 projects, 15 support entirely the theoretical framework, 3 provide partial support, and 3 do not support the framework. Appendix 2 to 4 present the projects, their governance mode, the results obtained, the fit between the characteristics and the governance mode and whether or not the project support the model. Projects with the appropriate governance mode are expected to but successful, while projects with a different governance mode than the one suggested by the model are expected to be unsuccessful. This is the criterion used to establish if a project supports the model or not. The results will be discussed by grouping the projects according to their level of support for the model.

3.1 Projects Supporting the Model

Two groups of projects supporting the model can be identified. The first one comprises projects where all types of resources (for a given project) were available at a similar level, making the analysis simpler. The second group encompasses projects for which different types of resources showed different levels of availability, for a given project. These two groups will be discussed in sequence.

3.1.1 Projects with Homogeneous Characteristics

Among the projects supporting the model, the first seven, A to G, are the most straightforward. The projects can be considered as more simple because they only used one governance mode, and their characteristics were uniform for all aspects of the project. Of these seven projects, four used internal provision while three were conducted through outsourcing. Six were successes and one is a failure. They are presented in Appendix 2.

All three projects conducted in house (A, C, E) had high or very high strategic value and high availability of resources. Projects were varied, ranging from virtual office to risk management software. The high strategic value of the project was expressed in a variety of ways by the respondents. Application A was described as "*integrating all the activities of the financial advisor*" and "*providing a tool that was not available to competitors*". It also changed significantly the costs associated with providing the service to customers. Therefore, it could lead to a major reduction in the fees charged to clients. Application C enabled the same number of people to increase productivity from 50K requests processed per year to 80K. It also aimed at shortening the time it takes the company to provide quotes (proposals) to potential clients, which increases the odds that these proposals are accepted. Project E was described as "*providing a two-year lead over competitors*" and "*facilitating the closure of a sale*" while enabling the firm to cut twenty-two jobs, which meant an annual saving of 1.1 million dollars. For these projects, resources were available. "*An internal team had just completed a reengineering exercise in the company and was available*" – project A. "*The project manager was excellent*", "*staff was available and highly qualified*" – project C. "*IT department people had worked on requirements and had the relevant expertise*" – project E.

These projects were conducted within budget and deadlines. They achieved intended goals. Project A was implemented and users were described as "*enthusiastic*" and "*trilled and ready to adopt the changes*". Project C has become the exemplar case of a success in the organization. Customer service was improved and the system has proven to be expandable and flexible. The only reservations expressed regarded project E. While respondents indicated that customer service was increased and that most business objectives were met, they would have liked a more intense use of the tools but felt that it would come over time, when vendors would have become more familiar with the system.

Three outsourced projects were successful. These systems were a tracking system for new requests (B), a workflow system for life insurance (D), and a voice response system (F). All three were considered non-strategic. Project B only affected 25 employees and concerned a peripheral

activity, which would not affect performance. Project D was relatively modest ($400K) and concerned a sector that had been neglected (not on the strategic radar screen). It was seen as a good place to try a new technology before introducing it to a more strategic sector. Project F aimed at providing additional information to clients, for group pensions. It did not affect products or workload of employees and it was estimated that only 15% to 20% of the clients would use this service. The respondents deemed these systems has having limited impact on the organizations. Appropriate resources were not available for these projects. In one case (D) all internal resources were involved in the Y2K effort. In the other two projects, the required skills were simply absent in-house. All three projects were developed by consulting firms, within traditional outsourcing arrangements. All respected allocated budgets. Project F suffered a small delay but handles the estimated volume of calls. Project B has proven to be adaptable and users are satisfied. While projects themselves were deemed successes by the managers, they had some reservation with respect to projects B and F. In the first case, the supplier went bankrupt after the system had been delivered. While it does not affect the current system, it might affect its maintainability. In the latter case, the client found that new features offered by the vendor, while interesting, were costly.

Finally, a project having very high strategic value, for which resources were not available within the organization, was outsourced (G). The model would have suggested the use of a partnership approach in such a situation. It concerned the development of a data management system that would have to handle two to four millions new entries per day. The system covers all aspects of business and could enable the organization to gain competitive advantage. It could facilitate the elimination of barriers between different services (most notably banking and insurance) and enable the employees to have a global understanding of their clients needs. The project was developed within budgets and deadlines. However, the business needs were not met and the system is not used.

3.1.2   Projects with Mixed Characteristics

The other projects supporting the model are more complex and deserve a closer examination. The first observation pertains to the strategic value of these projects. All eight of them have above than average strategic value (either high of very high). What makes them more complex is the distribution of the resources. These projects showed more complex characteristics with respects to the availability of resources. Very often, resources were only partially available. For example, many projects presented a situation where business competencies were available but technical competencies were lacking. Other projects had different sets of competencies over time. While the projects showed more complex resource profiles, some were managed like if they were simple projects (this lead to failure in all cases) while others were successfully managed in a more sophisticated manner, taking into account the mixed resource profile. These projects are presented in Appendix 2 (H to P).

Projects H, I, J, and K share a similar profile. They show a mixed profile in terms of competencies. In all cases, the organization had only business knowledge available, which usually translated into a good understanding of the business goals and the underlying business

processes. These organizations lacked the technical competencies required for the projects. Respondents used expressions like "*no up-to-date knowledge*" and "*limited expertise*" to express the lack of technical competencies. In the interviews, these deficiencies in resources were not always reported by everyone. In some cases, business analysts or projects managers indicated that they had a good understanding of the processes involved and appeared to trust that their technical staff mastered the technical side. However, when these persons were interviewed, they candidly admitted that they did not have the required competencies. While some retained the services of consultants to provide such technical expertise, all projects were basically conducted in-house, with internal teams taking full responsibility of the project and retaining full control.

As the model would predict, these project resulted in failures. On delivery, project H looked like a success, respecting budgets and deadlines. This good image lasted until… users tried to use the system. Project H required many subsequent phases for optimisation. The lack of technical competencies, not formally acknowledged by the organization in the way the project was managed, was a very plausible reason behind this failure. Performance was inadequate and the system had major architectural flaws. One year after delivery, an additional amount equivalent to one third of the overall budget had to be spent modifying the database structure. It took years for the company to have a satisfactory running system.

Projects I and J are addressing the same need in the same organization. They tried to implement an imaging and workflow system to enable the firm to conduct all the processes linked to the client digitally. Project J was conducted after the failure of project I, basically with the same internal team. The organization members had a very high business understanding of the project. They lacked the technical competencies to carry it, notably on the integration of imaging technology with the current transactional systems. The team used consultants for some technical aspects while still retaining the full control and responsibility of the project. Project I ended with a prototype that worked in a stand-alone mode (which is ironic when considering that the main gain from this project was to be obtained from the integration with the organization systems). None of the components of the imaging system could be integrated (workflow, scanners, servers, etc). Project J, a second attempt after project I, did not do much better. Two and half year after delivery, the objectives are still not met. Network incompatibilities occur frequently, files are lost and the time to process a file (assessing risk) went from 3 ½ days to 11 days, generating a backlog of more than 7000 files. Even now, a backlog of 45 days remains. The costs were more that twice the allocated budget. One of the respondents mentioned that many project expenses were billed to other accounts to save the project image. If true, this means that the costs could be much higher than the acknowledged figure.

In project K, the project was delivered with many bugs and totally inadequate performance. The company had to replace almost immediately the 600 portable computers used by its employees and to undertake major modifications to the applications themselves.

A very different approach was taken in project L. This was a strategic project. The whole Web strategy of the institution was linked to this project, which consisted in developing a transactional web site to enable the clients to do Internet banking. Financial institutions have to provide this

service to their clients to remain competitive. In this case, as in the previous projects, the organization had the competencies linked to the application development but lacked the technical skills necessary for the development of the whole Internet infrastructure, especially considering that everything had to be very secure. Recognizing this fact, they literally spliced the project into two parts, which were then managed very differently. All aspects linked to infrastructure were developed in partnership with IBM while the applications were developed in-house. The outcome of the project was very positive. It was conducted in time, cost less than what was anticipated and exceeded the expected performance levels.

Having mixed modes of governance is not a guarantee of success. Project M presents a very interesting case, where competencies were unevenly distributed and corresponding aspects of the project were managed differently. However, in both portions of the project, the selected governance mode was inappropriate. The project involved integrating two key elements: insurance products and loans. The proposed software was to enable banking employees to process their loans while offering insurance for the loans on the spot. The processing of the insurance contract would be integrated with the loan application, adjusting automatically rates, prices, premiums, etc. The competencies required were of two types: banking and insurance. The organization had very good competencies related to insurance, but lacked banking competencies. Such a pattern would have suggested internal conduct of the insurance aspect of the project and a partnership for the banking side of the venture. The organization went on a different course. It used a partnership mode of governance for the insurance aspect of the contract and relied on standard outsourcing for the banking side of the project. The resulting outcome was a total failure. Developers claim to have at least developed a working prototype, while users indicate that it was unrelated to their needs. The system was never used and is still a delicate issue in the organization.

The last two projects supporting the theoretical model show an interesting pattern. In both cases, a first attempt in developing the project failed (both relied first on outsourcing). In a subsequent attempt, the sourcing strategy was revised (one to in-house provision and the other to a mix of in-house provision and partnership) and lead to successful outcomes. The first of these projects (N) concerned the development of an automated system handling large money transfer between the bank and the central system of Canadian banks. The first attempt, relying on outsourcing, was abandoned after a few months, when the bank realized that it could not provide the expected results. The Bank relied on outsourcing (rather than partnership) while the strategic value of the project was high and the related competencies were low. Interestingly, the organization recognized the lack of expertise and decided to find it a remedy. To do so, it investigated the market and identified a US company, ADTECK, having the required knowledge. They signed a deal with this software company that was two-fold. First, they acquired the software and the source code of this firm. Second, they ensured knowledge transfer to the bank employees. Having succeeded, they restarted the project with the new, highly skilled, in-house team. The project was very successful.

The other project was launched after a merger, to integrate several customer service processes

from the two former entities. The organization had a very good set of business competencies, understanding fully the required business processes for the new entity. However, technical competencies and project management skills were lacking. After a first attempt relying on outsourcing that resulted in a failure, they restarted the project using a mix of in-house provision and partnership. The partnership with Intex was used for the technological side of the project. They used mixed-teams and ensured that knowledge transfer was done. Commentaries from the users group and the owner of the system are very positive. Clients are handled very differently, not having to be transferred from one person to another. The first person taking the call is now able to process all requests, having access to the relevant information. Within two weeks with the new system, employees attained the goals set at the beginning of the project. The only drawback is the impact felt by the employees relegated to the back-office. They do not have any contacts with the clients anymore and therefore feel less important. In terms of performance however, the project is a success.

3.2 Projects Providing Partial Support to the Model

Three projects supported the model only partially. Interestingly, all three had very high strategic value. All three can be considered as complex projects, showing uneven availability of competencies. Appendix 3 presents these projects.

Project Q used a mix of partnership and outsourcing to deal with a high level of business skills and low levels of technical skills. The model would have suggested partnership and internal governance. A supplier of the bank developed the risk management module and is taking care of all the data processing now that the system is running. Another supplier partnered with the bank for the development of the customer relationship module. This supplier is currently reselling the system to other clients while paying a royalty to the bank. The partnership is coherent with the model, enabling the bank to gain the required competencies. The outsourcing portion is not very important. What is surprising is the lack of an in-house segment, suggestion that the firm is not investing enough in these strategic resources. No apparent negative consequences have occurred. The system is running. There were some area of resistance from the users, mostly from groups who saw their tasks changed more radically, but it is difficult to link these problems with the project governance mode.

Project R is a fascinating case. It started when the CSST, a government body responsible for providing work-related disability insurance, issued a request for proposal. This RFP was for an E commerce solution to handle CSST transactions. The CSST receives premium from companies buying insurance for their employees and it pays disability payments to injured employees. At the time of the RFP, CSST exchanged 8M paper documents per year with the companies and more that 6M telephone conversations. The system would handle a significant portion of these communications and the payments. For the National Bank, this system represented an opportunity to position the bank as a key player in E Commerce solutions and to improve the relationship of the bank with CSST clients. There were 180 000 potential clients. While teams from the bank managed the project ($88M, 2½ years), two other companies partnered with the

bank and shared the resulting system. Bell Canada brought expertise in valued-added networks and Desjardins (a competitor of the National Bank) provided insurance expertise. These companies were associated in a consortium. The theoretical model would have predicted in-house governance (which happened) and partnership. The latter was not used and recuperation was used instead (and some network development was outsourced). Although the association with Bell is coherent with the model, it does not suggest that the bank would share the resulting system with a competitor. In this case, it seems that joining forces with Desjardins was seen as a lesser evil. By pairing with Desjardins, the consortium (having links with the clients of both institutions) started right away with a significant share of the market. This prevented the entry of third parties. It also prevented any price war between National Bank and Desjardins.

The last project in this category is S, for which AS/400 expertise was lacking while business competencies were available. The company decided to buy a system from a supplier, and to implement the system with the in-house resources (doing the required modifications to the system internally). This choice, according to the model, is risky. The use of a shell is a good idea, lowering the competencies requirements from the in-house team (compared to developing a new system) but the model would have suggested partnering with a more competent supplier at least concerning the technical (AS/400) side. In this case, the company took the risky road but won its bet, implementing the system within time and budget.

3.3   Projects Contradicting the Model

Three projects do not support the theoretical model. They do not seem to reflect a specific pattern. One had high strategic value while the two others did not; one had available resources while the others did not; two were failures. These projects are presented in Appendix 4.

Project T is a case were strategic value was high and resources were available. This situation should have called for in-house development. While in-house teams initially managed the project themselves, it was open to competitors soon in the process. In this case, Desjardins evaluated that its volume of transaction would not justify the system. By opening it to competitors, Desjardins lost all competitive advantage from the system but recouped its costs more quickly. The system prevents the entry of new players on the market. In this sense, it provides a strategic advantage, but it is to all the companies currently involved, not only to Desjardins.

Projects U and V share a similar pattern. These were projects with limited strategic value and little available resources. The model would suggest the use of outsourcing in this case. In both projects, outsourcing was selected but the projects still failed. Project U estimates went from 5500 person-days to 16 000 person-days. Delivery was two years late. Moreover, the delivered system required many changes after delivery to be useful. After five weeks, users had requested over 100 significant changes. In the case of project V, the situation is not as dramatic but still bleak. The supplier clearly underestimated the effort required for the project. Deadlines and budgets were not met, which had severe consequences. The new system was schedule to be delivered before the end of 1999. Since the project was six months behind schedule, the company

had to deal with a late delivery and pay for the conversion of the old system to Y2K in order to prevent problems with the services the company is offering. These two projects illustrate a good point. If choosing a wrong governance mechanism can lead to negative consequences, picking the right governance mode is not a guarantee of success. Appropriate governance can be seen as a required, but not sufficient condition for success.

4   Discussion

Many findings can be drawn from the results. The first finding is overall predominance of in-house provision and outsourcing for developing systems. These modes, in the diagonal on the theoretical model, can be seen as more stable than partnership and recuperation. The latter two correspond to "uncomfortable" situations for the organizations, where the strategic value and the availability of the resources are not aligned. In fact, most of the time, the modes on the off-diagonal (partnership and recuperation) are almost (only one exception) used in conjunction with another mode of governance.

4.1   Success and Failure

The empirical results obtained strongly support the adequacy of the proposed model. It is clear that this model is not generalizable from a statistical point of view, but it certainly is from the analytical point of view, since being given similar values for each independent variable, the projects led to the results predicted by the model. As stated by Yin (1989), "*In analytic generalization, a previously developed theory is used as a template against which to compare the empirical results of the case study. If two or more cases are shown to support the same theory, replication may be claimed (p. 4).*" It is the case in the present study. The best predictor of success and failure, by far, is the fit between the governance mode and the position of the project in the value/availability matrix.

From the results, it seems that no single mode of governance is a sure recipe for success. All modes had their shares of successes and failures. In-house development lead to successes with projects A, C, E, and the second attempt of project N while H, I, J, K, and the first attempt at project P were failures. Outsourcing does not have a better record. If projects B, D, and F are successes, G, the first attempt at N, U and V were failures relying on outsourcing. Using mixed modes of governance lead to success for 4 projects: L, P (2nd attempt), Q, R and failed for project M.

It seems that the success or the failure of a project cannot be explained either by the strategic value associated with the various systems. As Lacity, Willcocks and Feeny (1996) explain, the literature on outsourcing and on sourcing modes in general often refers to, wrongly or rightly, the necessity for companies to focus on their core activities. In the context of this study, that prescription would signify that only high strategic value projects should be kept in-house. From the empirical evidence, it is quite clear that by itself, this factor cannot adequately point out to an

16

appropriate sourcing mode for an IT project. If we omit the projects in the center area and consider the extremes to have a stronger contrast, no tendency emerges. Among the projects presenting very high strategic value, five were successes (A, P-2nd, Q, R, S) and five were failures (G, H, K, M, P-1st). In the lowest strategic value area, two projects were successful (B, F) while V was a failure. The availability of resources is not a good predictor of success either. When we consider the projects (or portion of projects) having a low level of available resources, eight were successes and ten were failures. Projects presenting a high level of available resources faired slightly better, with ten success and six failures.

4.2   Other Highlights

An interesting finding of this research is the documentation of multiple sourcing mode projects. Of the 21 projects, nine used a mixed approach of sourcing. Even if the theoretical model can explain this phenomenon, it is nonetheless surprising to note the frequency to which it has occurred in this sample. Without affirming that this sample is representative of the situation in the business world, it nevertheless suggests that managers have developed a relatively flexible and pragmatic approach to choosing a sourcing mode for their IT development projects. This observation underlines the fact that, up to now, this mode of sourcing has not been very well documented in the information system sourcing literature. The notion of multiple sourcing used in the present study is not the same as the concept of *selective sourcing* used by other authors. *Selective sourcing* refers to the fact that a company will choose certain IT functions to outsource rather than others. Multiple sourcing is concerned with a specific IT project where more than one governance mode is used.

Another important finding of this research is that the choice of a sourcing mode and the eventual success of the IT project depend on a variety of skills. Special attention should consequently be paid to the presence (or the absence) of each type of resources required for an IT project.

The conceptual framework described in this research provides a more refined set of decision criteria on which the manager can base his sourcing decision. When managers reflect on the core activities of their company, the IT services are often perceived as being commodities that can easily be acquired through outsourcing. This particular way of tackling the problem can lead to disastrous sourcing decisions. The cases of failure underline the fact that the decision makers do not necessarily have the conceptual tools allowing them to apprehend the problem correctly when comes the time to decide on a suitable sourcing mode for a particular project. It is clear that drastic recipes like systematic in-house development or unconditional outsourcing of all information system development are not suitable in a dynamic environment where the client expects tailor made solutions. Obviously, the manager can draw advantage from the proposed framework by targeting more precisely his action in information system development projects. To this end, the description of multiple sourcing modes cases should provide the manager with interesting examples insofar as he can adopt a more flexible approach with respect to IT sourcing.

It is interesting to see that the Recuperation mode was only used in a limited number of projects.

These projects were difficult to find. Theoretically, these are projects where the company has highly valued resources dedicated to the activity in question. At the same time, however, this activity has only a low strategic value. At best, in any well-managed organization, this situation should represent a temporary dysfunction, but one that should be observable nonetheless, for example following mergers or acquisitions.

Still, other results had absolutely not been foreseen, such as presence of associations between rival companies in projects classified as of great strategic value or the absence of this same mode of sourcing in projects with low strategic value and low presence of appropriate resources. These unanticipated results underline the fact that the framework developed in this research would profit to be refined even more in order to cover more accurately the observed reality. Moreover, these results open the door to a very interesting investigation track concerning the new forms of partnership in information system sourcing, especially if this phenomenon is studied in the larger perspective of an increasingly globalized and integrated economy.

5   Limits

The first limit of this study relates to the generalizability of the results. It is clear that being a qualitative research based on case studies, the results apply to the analyzed projects, but not necessarily to other information system development projects coming from different organizations. What was intended here is rather an analytical generalization. These results must consequently be seen for what they are, a conceptual model representing the information systems sourcing phenomenon in six large companies in the financial sector.

A second limit of this study is linked to the operationnalization of the central concepts of the resource-based theory. As underlined in the preceding sections, this approach raises much interest in the research field. The concepts which it employs are more and more incorporated into the vocabulary used to describe the reality of contemporary companies: basic competencies, key activities, sustained competitive advantages, etc. In spite of this popularity, very few examples of its application in an empirical research are available. More work to refine these concepts and to eventually measure them formally will be required.

Another limit relates to the choice of the projects forming the sample. As mentioned earlier, one of the important criteria for the selection of the projects was their size. An unexpected effect of the implementation of this selection criterion might be a bias in favor of projects with high strategic value. This is probably why 2/3 of the projects were classified as being of high or very high strategic value.

6   Conclusion

The purpose of this research was to study 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 within the firm. Several assertions can be inferred from the

18

analysis of the data that was collected. The first of these assertions is that, indeed, the *Presence of appropriate resources* plays at least as important a role as the *Strategic value* factor in the sourcing decision. This observation, however elementary as it might be, is seldom taken into account in the literature. As Lacity et al. (1996) point out, it is the "Strategic value" or "Core competencies" dimension which generally captures attention. This study contributes to the debate by shedding some light on this "new" dimension of the information system sourcing problem. This finding echoes a recent article published by Barney (1999) in which he maintains that the competencies a company possesses should play an important role in the establishment of its frontiers. The use of the resource-based theory provides a more refined explanation of this phenomenon.

From a methodological point of view, the present research offers some notable contributions. It is one of the first attempts to operationalize the theoretical framework of the resource-based theory. To the exception of Duncan (1995b), Matha, Fuerst and Barney (1995), and Bharadwaj (2000), this theory has not been used very extensively in the field of MIS. Its implementation in the present study offers a new and promising approach for the study of information systems sourcing. It also helps clarify the concepts used in the theory and it identifies a certain number of empirical referents used to evaluate them. This contribution applies particularly with regard to the concepts of *Presence of appropriate resources* and to the Partnership and Recovery sourcing modes which had not been explored up to now.

7 References

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.

Avery, S., "IT Sourcing Strategies: Purchasing Adds Value to the Supplier Selection Process", *Purchasing*, Vol. 129, No. 1, 2000, pp. 96-103.

Bailey, J.E. and S.W. Pearson, "Development of a Tool For Measurement and Analyzing Computer User Satisfaction", *Management Science*, Vol. 29, No. 5, 1983, pp. 530-545.

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

Barney, J.B., "How a Firm's Capabilities Affect Boundary Decisions", *Sloan Management Review*, Vol. 40, No. 3, 1999, pp. 137-145.

Barney, J.B., "Strategic Factor Markets: Expectations, Luck, and Business Strategy", *Management Science*, Vol. 32, No. 10, 1986, pp. 1231-1241.

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.

Bharadwaj, A.S, "A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation", *MIS Quarterly*, Vol. 24, No. 1, 2000.

Caves, R.E. and R.M. Bradburd, "The Empirical Determinants of Vertical Integration", *Journal of Economic Behavior and Organization*, Vol. 9, 1988, pp. 265-279.

Chesbrough, H.W and D.J. Teece, "When is Virtual Virtuous? Organizing for Innovation", *Harvard Business Review*, Vol. 74, No. 1, 1996, pp. 65-73.

Dierickx, I., K. Cool and J.B. Barney, "Asset Stock Accumulation and Sustainability of Competitive Advantage", *Management Science*, Vol. 35, No. 12, 1989, pp. 1504-1510.

Dixon, P.J. and D.A. John, "Technology Issues Facing Corporate Management in the 1990s", *MIS Quarterly*, Vol. 13, No. 3, 1989, pp. 247-255.

Duncan, N.B., "Capturing Flexibility of Information Technology Infrastructure: A Study of Resource Characteristics and Their Measure", *Journal of Management Information Systems*, 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", *Unedited 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*, Vol. 37, No. 3, 1996, pp. 26-32.

Eisenhardt, K.M., "Building Theories from Case Study Research", *Academy of Management Review*, Vol. 14, No. 4, Oct 1989, pp. 532-550.

Elmuti, D., Y. Kathawala and M. Monippallil, "Outsourcing to Gain a Competitive Advantage", *Industrial Management*, Vol. 40, No. 3, 1998, pp. 20-24.

Fields, R.K., "Build Versus Buy: Resist the Seduction", *Chief Executive*, Vol. 103, 1995, p. 22.

Grover, V., M.J. Cheon and J.T.C. Teng, "A Descriptive Study of the Outsourcing of Information Systems Functions", *Information & Management*, Vol. 27, No. 1, 1994, pp. 33-44.

Gupta, U.G. and A. Gupta, "Outsourcing the IS Function: Is It Necessary for Your Organization?", *Information Systems Management*, Vol. 9, No. 3, 1992, pp. 44-50.

Hansen, G.S. and B. Wernerfelt, "Determinants of Firm Performance: The Relative Importance of Economic and Organizational Factors", *Strategic Management Journal*, Vol. 10, No. 5, 1989, pp. 399-411.

Huber, R.L., "How Continental Bank Outsourced Its 'Crown Jewels'", *Harvard Business Review*, Jan. 1993, pp. 121-129.

Keil, M., P.E. Cule, K. Lyytinen and R.C. Schmidt, "A Framework for Identifying Software Project Risks", *Communications of the ACM*, Vol. 41, No. 11, 1998, pp. 76-83.

King, W.R. and Y. Malhotra, "Developing a Framework for Analyzing IS Sourcing", *Information & Management*, Vol. 37, No. 6, 2000, pp. 323-334.

Lacity, M. and R. Hirschheim, "Implementing Information Systems Outsourcing: Key Issues and Experiences of an Early Adopter", *Journal of General Management*, Vol. 19, No. 1, 1993a, pp.17-31.

Lacity, M. and R. Hirschheim, "The Information Systems Outsourcing Bandwagon", *Sloan Management Review*, Vol. 35, No. 3, 1993b, pp. 73-86.

Lacity, M.C, L.P. Willcocks and D.F. Feeny, "IT Outsourcing: Maximize Flexibility and Control", *Harvard Business Review*, Vol. 73, No. 3, 1995, pp. 84-93.

Lacity, M.C, L.P. Willcocks and D.F. Feeny, "The Value of Selective It Sourcing", *Sloan Management Review*, Vol. 37, No. 3, Spring 1996.

Loh, L. and N. Venkatraman, "Determinants of Information Technology Outsourcing: A Cross-sectional Analysis", *Journal of Management Information Systems*, Vol. 9, No. 1, 1992b, pp. 7-24.

Loh, L. and N. Venkatraman, "Diffusion of Information Technology Outsourcing: Influence Sources and the Kodak Effect", *Information Systems Research*, Vol. 3, No. 4, 1992a, pp. 334

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, W.F. and R.L. Nolan, "How to Manage an IT Outsourcing Alliance", *Sloan Management Review*, Vol. 36, No. 2, 1995, pp. 9-23.

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

Miles, M.B. and A.M. Huberman, *Qualitative Data Analysis*, 2nd Edition, Sage Publications, 1994.

Miller, D., "The Role of Multivariate 'Q-Techniques' in the Study of Organizations", *Academy of Management Review*, Vol. 3, No. 3, 1978, pp. 515-531.

Penrose, E., *The Theory of the Growth of the Firm,* London: Basil Blackwell, 1959

Pinsonneault, A. and K.L. Kraemer, "Survey Research Methodology in Management Information Systems: An Assessment", *Journal of Management Information Systems*, Vol. 10, No. 2, 1993, pp. 75-105.

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

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

Rockart, J.F., M.J. Earl et J.W. Ross, "Eight Imperatives for the New IT Organization", *Sloan Management Review*, Vol. 38, No. 1, 1996, pp. 43

Rumelt, R.P., "How Much Does Industry Matter?", *Strategic Management Journal*, Vol. 12, 1991, pp. 167-185.

Rumelt, R.P., "Towards a Strategic Theory of the Firm", in Lamb, R.B. (Dir.), *Competitive Strategic Management*, Englewood Cliffs, NJ: Prentice-Hall, 1984.

Rumelt, R.P., D. Schendel and D.J. Teece, "Strategic Management and Economics", *Strategic Management Journal*, Vol. 12, Winter 1991, pp. 5-29.

Sambamurthy, V. and R.W. Zund, "Research Commentary: The Organizing Logic for an Enterprise's IT Activities in the Digital Era - A Prognosis of Practice and a Call for Research", *Information Systems Research*, Vol. 11, No. 2, 2000, pp. 105-114.

Smith, M.A., S. Mitra and S. Narasimhan, "Information Systems Outsourcing: A Study of Pre-Event Firm Characteristics", *Journal of Management Information Systems*, Vol. 15, No. 2, 1998, pp. 61-93.

Strassmann, P.A., "Outsourcing: A Game for Losers", *Computerworld*, Aug. 21, 1995.

The Standish Group International, Inc., "Chaos: A Recipe for Success", *Sample Research Paper*, 1995.

Wernerfelt, B., "A Resource-Based View of the Firm", *Strategic Management Journal*, Vol. 15, 1984, pp. 171-180.

Winter, S., "Knowledge and Competence as Strategic Assets", in: Teece, D.J., *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*, Cambridge, Mass.: Ballinger, 1987.

Yin, R.K, "Research Design Issues in Using the Case Study Method to Study Management Information Systems", in Cash, James and Lawrence, Paul (dir.), *The Information Systems Research Challenge: Qualitative Research Methods, Harvard Business School Research Colloquium*, Boston: Harvard Business School, Vol. 1, 1989.

Yin, R.K., *Case Study Research: Design and Methods*, Second edition, Thousand Oaks: Sage Publications, 1994.

(SENIOR MANAGEMENT)

1.   Identification of the respondent

Company, Name, Address, Function, Tel.

2. Can you identify at least one specific project in your organization for each sourcing mode (Partnership, Conservation, Recuperation, Outsourcing)**?**

Partnership (Project leader, Beginning of project, Implementation date, Main users)

Conservation (Project leader, Beginning of project, Implementation date, Main users)

Recuperation (Project leader, Beginning of project, Implementation date, Main users)

Outsourcing (Project leader, Beginning of project, Implementation date, Main users)

3. For each project, what levels of management decision-making are mainly affected by (and how)

(Strategic management, Tactical management, Operational management, Operations, Decision support)

4. How would you evaluate the strategic value of this project for the company?

(Peripheral, Important, Critical, Impacts on the performances, Better competitive position …)

5. For the company, what is the relative contribution of this project in terms of

a) Deliverable goods / services

b) Of support for the other activities of the company

c) What are the major characteristics of this project that confers it a strategic value?
  i)   Better effectiveness of management
  ii) Contribute to the development of customers loyalty
  iii) Redefines and improves services
  iv) Creation of new products
  v)   Contribute to the operational effectiveness
  vi) Contribute to costs economies
  vii) Recover the expertise of the employees
  viii) Change the manner of making competition

ix) Integrate new IT in the products/services
x) Others

<p style="text-align:center">(PROJECT LEADER)</p>

1. Identification of the respondent

Company, Name, Address, Function, Tel.

2. Description of the project

a) How do you define your role in this project? (Person in charge, coordinator, facilitator)
b) Characteristics and context of the project
c) Departments affected by project
d) Names of the functional managers
e) What level of management decision making are mainly affected by this activity?
    (Strategic management, Tactical management, Operational management, Operations,
    Decision support)
f) Importance in financial terms
g) No. People affected
h) Duration of the project (Beginning   End)
i) No. of suppliers implied   No. of person-days
j) What triggered the project (Change in the environment, top management decision, businesses
    imperatives, etc.)
k) Pursued objectives (Costs reduction, functional effectiveness, reorganization of the IS
    function, downsizing, political solution...)
l) What phases of the information systems development cycle are concerned with this project?

3. Sourcing Mode

a) ▪ Responsibility sharing clauses
    ▪ Benefit sharing clauses
    ▪ Statement of a shared perspectives
    ▪ Statements of the objectives specific to each partner
    ▪ Expertise transfer mechanisms (mixed teams, exchange of information, exchange
       of personnel)
b) ▪ Absence of formal contract with suppliers
    ▪ Composition of the committees (personnel of the company)
    ▪ The company is the primary contractor
    ▪ Low presence of external resources

c)
- Outsourcing of all development activities to external integrator
- Personnel transfer to outsourcer
- Acquisition of existing systems

d)
- Acquisition of development services from an external consultant
- Transfer of development responsibilities
- Transfer of major activities of the development cycle
- Purchase of a turn-key system

4. **How would you describe the competencies necessary to realize the development concerned by the project?**

(Technical training, IT management skills, General Management skills, Communication skills)

5. **These competencies have a link with**

a) The comprehension of the businesses needs of the company
b) Ability to work with other functional managers of the company
c) Ability to anticipate the future needs of other functional managers of the company
d) Ability to anticipate the future needs of the customers of the company
e) Skill to coordinate the IT activities in order to support the other functions of the enterprise

Appendix 2 – Cases Supporting the Model

Project	Description	Multiple Dimensions (when applicable)	Strategic value	Resource available	Mode selected	Result	Fit the model	Confirm KBT
A	Virtual environment of the credit union. Integrates all products and services. Enable clients to interact virtually with the organization.		Very high	High	Conservation	VS	Y	Y
B	Tracking system for all insured services (concerned all international products – provided to clients going out of the country)		Low	Low	Outsourcing	VS	Y	Y
C	Risk management system. This new system handles the information pertaining to all new requests for insurance. It supports users in determining the risk level of the new potential clients, and therefore their insurability.		High	High	Conservation	VS	Y	Y
D	Work-flow system for life insurance and disability claims. Implies digitalization of the whole claim process.		Average	Low	Outsourcing	S	Y	Y
E	Electronic Y portable work environment for sales force. Development includes portions bought off the shelf and original elements, all integrated by in-house staff.		High	High	Conservation	S	Y	Y
F	Voice response system enabling clients (firms or individuals insured) to have access to relevant information in a self-service mode.		Low	Low	Outsourcing	S	Y	Y
G	Very large data warehouse system covering all aspects of business. Involve daily updates. 2-4 M transactions per day.		Very high	Low	Outsourcing	MF	N	Y
H	Large project, conducted over 3 years, integrating all the client information. The system is used by all parts of the organization.	Business processes	Very high	High	Conservation	MF	Y	Y

Project	Description	Multiple Dimensions (when applicable)	Strategic value	Resource available	Mode selected	Result	Fit the model	Confirm
		Technical knowledge		Low			N	
I	Imaging and work-flow system enabling the creation of a completely digital client file.	Business processes	High	High	Conservation	F	Y	Y
		Technical knowledge		Low			N	
J	Imaging and work-flow system enabling the creation of a completely digital client file. Second attempt, after the failure of Image 1 project.	Business processes	High	High	Conservation	MF	Y	Y
		Technical knowledge		Low			N	
K	System enabling sales force to manage client relationships and to provide individualized analysis for each client (planning for retirement of death for example)	Business processes	Very high	High	Conservation	MF	Y	Y
		Technical knowledge		Low			N	
L	Transactional secured site for the organization. Permits the client to do Internet banking.	Infrastructure development	High	Low	Partnership	VS	Y	Y
		Application development	High	High	Conservation		Y	
M	Loan origination and insurance system. Enables the automation of loan insurance handling when financial institutions offer loans to their clients.	Insurance expertise	Very high	High	Partnership	F	N	Y
		Banking expertise and sys. integration		Low	Outsourcing		N	
N	Automated system handling large value transfer between the bank and the central system provided by the Canadian association.	First attempt at the project	High	Low	Outsourcing	AB	N	Y

Project	Description	Multiple Dimensions (when applicable)	Strategic value	Resource available	Mode selected	Result	Fit the model	Confirm
		2nd attempt, after knowledge acquisition (code/training)	High	High	Conservation	VS	Y	
P	Integration and optimization of the processes linked to customer service of two companies following a merger.	Business processes aspects	Very high	High	1st attempt Outsourcing	F	N	Y
		Technical resources /project mgmt		Low	2nd attempt Conservation Y partnership	S	Y	

VS : Very successful, S : Successful, MF : Moderate failure, F : Failure, AB : project abandoned/cancelled.

Appendix 3 – Cases Partially Supporting the Model

Project	Description	Multiple Dimensions (if applicable)	Strategic value	Resource available	Mode selected	Result	Fit	Confirm
Q	System supporting all sales activities in the branches. Has implications in risk management, product offering and client relationship management. Done over 2 ½ years.	Business processes and links with legacy systems	Very high	High	Outsourcing + partnership	S	Partial	Partial
		Technical knowledge		Low				
R	Creation of an inter-organizational network to enable employers to manage workplace security programs. Involves information exchanges between employers, medical organizations, a government body and financial institutions.	Financial expertise	Very high	High	Conservation + recuperation	VS	Partial	Partial
		Technical knowledge		Low	Outsourcing + recuperation			
S	System handling claims for collective insurance and pension plans.	Business processes and project management	Very high	High	Conservation + outsourcing	S	Partial	Partial
		AS/400 expertise		Low				

VS : Very successful, S : Successful, MF : Moderate failure, F : Failure, AB : project abandoned/cancelled.

Appendix 4 – Cases Contradicting the Model

Project	Description	Multiple Dimensions (if applicable)	Strategic value	Resource available	Mode selected	Result	Fit	Confirm
T	System managing claims and payments for drug insurance. Links directly the insurance company with pharmacists and companies providing such group insurance to their employees.		High	High	Recuperation	VS	N	No
U	Update of the systems supporting mortgage management. Implies the replacement of two outdated system, after an acquisition.		Average	Low	Outsourcing	F	Y	No
V	Payroll system, used to provide payroll services to 6,400 clients (which overall employ 150,000 employees)		Low	Low	Outsourcing	MF	Y	No

VS : Very successful, S : Successful, MF : Moderate failure, F : Failure, AB : project abandoned/cancelled.

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)

2001s-22   Short and Long Memory in Equilibrium Interest Rate Dynamics / Jin-Chuan Duan et Kris Jacobs

2001s-21   Unemployment Insurance and Subsequent Job Duration: Job Matching vs Unobserved Heterogeneity / Christian Belzil

2001s-20   Estimating the Intergenerational Education Correlation from a Dynamic Programming Model / Christian Belzil et Jörgen Hansen

2001s-19   The Bootstrap of the Mean for Dependent Heterogeneous Arrays / Sílvia Gonçalves et Halbert White

2001s-18   Perspectives on IT Outsourcing Success: Covariance Structure Modelling of a Survey of Outsourcing in Australia / Anne C. Rouse, Brian Corbitt et Benoit A. Aubert

2001s-17   A Theory of Environmental Risk Disclosure / Bernard Sinclair-Desgagné et Estelle Gozlan

2001s-16   Marriage Market, Divorce Legislation and Household Labor Supply / Pierre-André Chiappori, Bernard Fortin et Guy Lacroix

2001s-15   Properties of Estimates of Daily GARCH Parameters Based on Intra-Day Observations / John W. Galbraith et Victoria Zinde-Walsh

2001s-14   A Ricardian Model of the Tragedy of the Commons / Pierre Lasserre et Antoine Soubeyran

2001s-13   Carbon Credits for Forests and Forest Products / Robert D. Cairns et Pierre Lasserre

2001s-12   Estimating Nonseparable Preference Specifications for Asset Market Participants / Kris Jacobs

---