Available online at www.sciencedirect.com
SCIENCE DIRECT®
ELSEVIER
Journal of Strategic Information Systems 14 (2005) 389–415
Strategic Information Systems
www.elsevier.com/locate/jsis

Determinants of IS sourcing decisions: A comparative study of transaction cost theory versus the resource-based view

Boonlert Watjatrakul*

Department of Information Technology, Faculty of Science and Technology, Assumption University, Ram Khamhaeng Soi 24, Hua-Mak Campus, 10240 Bangkok, Thailand

Available online 7 July 2005

Abstract

Many organizations have employed the concepts of 'asset specificity' and 'uncertainty' from transaction cost theory (TCT), and 'strategic resources' from the resource-based view (RBV) as drivers of their information systems (ISs) sourcing decisions. They, however, face a dilemma when TCT and the RBV suggest different sourcing alternatives. The study identifies contexts where sourcing decisions made based on these two theories differ, and examines which theory accounts better for an organization's sourcing decisions. Results show that a high-specificity asset is a major driver of sourcing decisions. It overpowers the effects of uncertainty on sourcing decisions; while a non-strategic resource has no impact on sourcing decisions. In particular, where the two theories make conflicting predictions, organizations should not always outsource non-strategic resources. Non-strategic resources that involve high specificity should be retained internally. The paper concludes with implications for academics and practitioners, and a discussion of future research directions.

Keywords: Information systems outsourcing; Transaction cost theory; Resource-based view; Specificity; Uncertainty; Strategic resource

1. Introduction

During the last decade, the e-commerce revolution has forced the transformation of traditional IS outsourcing structures into new IS outsourcing service configurations,

* Tel.: +66 2719 1515; fax: +66 2719 1639.
E-mail address: boonlert@s-t.au.edu.

0963-8687/$ - see front matter © 2005 Elsevier B.V. All rights reserved.
doi:10.1016/j.jsis.2005.05.001

e.g. Internet service outsourcing, application service outsourcing, and business process outsourcing. The IS outsourcing market worldwide is expected to increase to more than US$110 billion by 2006 (IDC, 2002). Outsourcing, however, does not always lead to competitive advantages and cost savings (Gerwig, 1999; Lacity and Hirschheim, 1993; Loh and Venkatraman, 1992; Mahoney and Pandian, 1992), and the chances of success in outsourcing are at best 50/50 (Gartner Group, 2002). A wrong sourcing decision results in lost capabilities and exposure to risks that can result in business failure (Loh and Venkatraman, 1992; Ngwenyama and Bryson, 1999). The ultimate drivers of sourcing decisions are not identical in all circumstances (Lacity and Hirschheim, 1993; Nam et al., 1996) further complicating the sourcing decision. Organizations select the drivers of sourcing decisions based on the particular set of circumstances they face.

Two theories that have been used to understand and explain ITS sourcing decisions are transaction cost theory (TCT) (e.g. Ang and Straub, 1998; Aubert et al., 1996; Lacity and Hirschheim, 1995; Lacity et al., 1995) and the resource-based view (RBV) (e.g. Insinga and Werle, 2000; Prahalad and Hamel, 1990; Roy and Aubert, 2001; Teng et al., 1995). TCT posits that organizations insource when the costs of using the market are higher than internal governance costs (Ngwenyama and Bryson, 1999; Williamson, 1979). It builds upon three principal attributes of transactions: asset specificity, frequency, and uncertainty (Williamson, 1985b). The RBV, on the other hand, posits that organizations insource when a resource is strategic so as to enable them to sustain competitive advantage (Barney, 1991; Mahoney and Pandian, 1992). It builds upon four properties of a strategic resource: value, rareness, imperfect imitability, and non-substitutability (Barney, 1991). A question that follows, which has yet to be empirically investigated, is 'Are there contingencies that suggest when organizations should use either TCT or the RBV for their sourcing decisions?'

This study addresses the fundamental question: Which of TCT or the RBV better accounts for an organization's sourcing decision, where the organization deems that it has made an effective decision? The study develops a framework to identify circumstances where TCT and the RBV make different predictions about an organization's sourcing decision. A case-study approach is used to test these competing predictions in the context of an email-marketing system, which is an example of a contemporary business process outsourcing (BPO) decision. As a prediction from the two theories about an organization's sourcing decision may result in a mistaken decision, this study focuses on organizations that made an effective sourcing decision.

The study results offer guidance to practice, suggesting circumstances in which either TCT or the RBV should be employed for organizations' sourcing decisions. This study also fills a gap in the literature because no previous work has used empirical research to compare how well TCT and the RBV predict sourcing decisions.

2. Theoretical background

2.1. Transaction cost theory

Transaction cost theory (TCT) seeks to explain why firms exist and how firm boundaries are determined (Coase, 1937; Pitelis, 1998; Pitelis and Pseiridis, 1999;

Williamson, 1989). It has been extended to analyze the economic problem of contractual relationships between organizations and markets, based on the cost of establishing relationships or governance structures associated with sourcing decisions (Ang and Straub, 1998; Aubert, et al., 1996; Klass et al., 1999; Nam et al., 1996; Ngwenyama and Bryson, 1999).

In selecting a governance mode, organizations attempt to minimize transaction costs. A market governance mode is preferred when transaction costs are low. Because of economies of scale and scope, TCT assumes that the market will always be the lowest-cost producer of a good or service. Alternatively, an internal governance mode is preferred when transaction costs are high. The production cost advantage of the market is overwhelmed by the high transaction costs incurred. Under TCT, governance modes are explained using three dimensions of a transaction: asset specificity, transaction frequency, and uncertainty.

Asset specificity refers to the transferability of the assets that support a given transaction. A 'specific' asset is significantly more valuable in a particular exchange than in an alternative exchange and leads to a 'lock-in' effect that causes hold-up problems (Barney, 1999; Williamson, 1975). Organizations attempt to protect against hold-up problems by using an internal governance structure (Rindfleisch and Heide, 1997; Walker and Weber, 1984; Williamson, 1975, 1979, 1994). On the other hand, transactions not supported by high-specificity assets are not prone to hold-up problems. Hence, organizations opt for the least-costly governance mode available in the market (Barney, 1999; Williamson, 1975, 1979, 1985a, 1994).

Transaction frequency refers to occasional and recurrent transactions. Many researchers, however, have failed to confirm empirically that transaction frequency is associated with a choice of governance structure (e.g. Anderson, 1985; Malz, 1993, 1994). In addition, the interaction effect of transaction frequency and asset specificity on the choice of governance structure remains unclear (Rindfleisch and Heide, 1997). According to Williamson (1975, p. 79), under low asset specificity, neither recurrent nor occasional frequency has an effect on the choice of governance structure. In both cases, the transaction will still be undertaken in the market because no hold-up problems arise. Under high asset specificity (idiosyncratic), occasional frequency suggests two alternative governance structures; either unified or trilateral governance. In either case, the transaction can be insourced or outsourced by using a third-party mediator. This study, therefore, does not address transaction frequency as a predictor of the choice of sourcing decisions.

Uncertainty has two forms: behavioural uncertainty and environmental uncertainty (Rindfleisch and Heide, 1997; Simon, 1957; Slater and Spencer, 2000; Williamson, 1985b). Behavioural uncertainty creates problems for performance evaluation. Exchange partners can use their own guile to create hidden costs by performing inefficiently and ineffectively (Rindfleisch and Heide, 1997; Williamson, 1985a). Monitoring and enforcement costs must be increased, therefore, to evaluate partners' performance (Williamson, 1975). Organizations attempting to minimize transaction costs that arise as a result of behavioural uncertainty are likely to choose an internal governance structure (Anderson, 1985; Gatignon and Anderson, 1988; John and Weitz, 1988; Williamson, 1985a).

Environmental uncertainty undermines an organization's ability to predict future outcomes (Klein et al., 1990; Leblebici and Gerald, 1981). Thus, organizations have more difficulty in writing market contracts that cover changed circumstances. As a result, partners may act opportunistically when circumstances change, which may cause organizations to incur costs relating to communication, negotiation, and coordination (Klein et al., 1990; Rindfleisch and Heide, 1997; Williamson, 1975, 1991). To economize on such transaction costs, organizations use an internal governance structure when environmental uncertainty is high (Klein et al., 1990; Williamson, 1985a).

2.2. Resource-based view

Several scholars have contributed to the development of the RBV (e.g. Barney, 1991; Dierickx and Cool, 1989; Wernerfelt, 1984). Many researchers, however, have focused on contributing to and extending Barney's (1991) conceptual framework (e.g. Litz, 1996; Powell, 1992; Rindova and Fombrun, 1999; Roy and Aubert, 2001), and some have used this framework to explain outsourcing decisions (Duncan, 1998; Prahalad and Hamel, 1990; Roy and Aubert, 2001; Teng et al., 1995). Hence, Barney's conceptual framework provides the foundations for the RBV adopted in the research described in this study.

The RBV rejects traditional economic assumptions that resources are homogeneous and perfectly mobile. Instead, it argues that resources are heterogeneously distributed across firms and are imperfectly transferred between firms (Barney, 1991; Grant, 1991). Resources can be assets, capabilities, and organizational processes that enable a firm to conceive of and implement strategies to improve its efficiency and effectiveness (Daft, 1983). Firms can obtain above-normal returns if they can use their existing resources to sustain competitive advantage by exploiting opportunities in the market or neutralizing threats from competitors so-called strategic resources (Barney, 1986, 1991). Organizations, therefore, retain strategic resources that enable them to sustain competitive advantage internally (Barney, 1991; Foss and Robertson, 2000; Mahoney and Pandian, 1992; Montgomery, 1995).

Strategic resources enable organizations to sustain competitive advantage, if the resources are valuable, rare, imperfectly imitable, and non-substitutable. Valuable resources allow an organization to conceive of or implement strategies that improve its efficiency and effectiveness (Barney, 1991). Valuable resources cannot give an organization competitive advantage, however, if many organizations possess them. An organization's competitive advantage also cannot be sustained if other organizations can imitate the valuable, rare resources that give it competitive advantage. Resources might be imperfectly imitable if they involve unique history, causal ambiguity, or social complexity (Barney, 1991; Dierickx and Cool, 1989; Lippman and Rumelt, 1982). The last requirement for sustained competitive advantage is that an organization's valuable, rare, inimitable resources have no substitutes (Barney, 1991). In other words, another organization must not be able to use alternative resources to implement the same strategies.

3. Proposition development

3.1. The relationships between the two theories' constructs

An 'asset' under TCT is defined as any valuable aspect of a firm. It can be a site, a physical asset, a human asset, or a dedicated asset (Williamson, 1985a). Some researchers argue that assets comprise resources, capabilities, and competencies (Christensen, 2000; Foss, 1996). In comparison, a 'resource' under the RBV is defined broadly to include assets, capabilities, knowledge, and organizational processes that enable a firm to conceive of and implement strategies to improve its efficiency and effectiveness (Daft, 1983). Wernerfelt (1984) argues that a firm's resources could be defined as assets, both tangible and intangible. Foss (1996) also argues that resources are seen as strategic assets. Some researchers use these two terms, assets and resources, synonymously (Dierickx and Cool, 1989; Walker, 1988). This study too assumes the two terms, asset and resource—used as a source of competitive advantage, are equivalent and interchangeable.

An asset/resource can be strategic and/or specific. Specific assets under TCT cannot be redeployed or transferred to other uses without a significant reduction in value and lead to a hold-up problem (Joskow, 1991; Roodhooft and Warlop, 1999; Williamson, 1975, 1985b). *Strategic* resources under the RBV, however, yield sustainable competitive advantage by exploiting opportunities in the market or neutralizing threats from competitors (Barney, 1991; Grant, 1991; Wernerfelt, 1984). As a result, *specific* assets and *strategic* resources are different. Based on these definitions, four emergent types of resources are proposed (see Fig. 1):

(1) *Low-specificity, non-strategic resource (LSNR)*. For example, managers in one organization may use their generic skills and knowledge to plan an organization's strategies. Other managers in competing organizations have the same generic skills and strategies. They may be able to easily imitate the organization's strategies at low cost. The *low-specificity* resources (the generic skills and knowledge of the managers) are *not strategic* because they cannot be used to sustain the organization's competitive advantage.

(2) *High-specificity, non-strategic resource (HSNR)*. For example, IS managers in one organization may have highly specific technical and marketing skills. They may develop special email-marketing software that enables them to automatically track, record, and

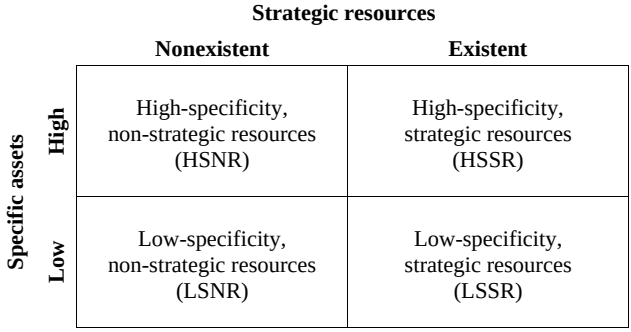

Fig. 1. Relationships between specific assets and strategic resources.

analyze client information that is important to their organization's strategy. IS managers in competing organizations may also have highly specific technical and marketing skills. They too may build a specific application program and integrate it with their email-marketing software. The application programs have little value outside the organizations for which they were designed and implemented—that is, they are *specific* assets. They do not allow the organizations to gain long-term competitive advantage, however. Thus, they are *not strategic* resources.

(3) *Low-specificity, strategic resource (LSSR)*. For example, several managers may not have a clear vision for and much experience with their organization. However, when they work in a team, the interpersonal relationships they develop and the information they share may enable them to create a complex idea as the basis for a profitable project. Managers in a competing organization may not be able to replicate the resources that led to that idea, which prevents them from imitating the project or finding a substitute project. The resources combining *low-specificity* resources (the generic abilities of the managers) are considered *strategic* because they enable the organization to sustain a competitive advantage. The competing organization may suffer from cost diseconomies and below-normal returns in attempting to imitate these resources.

(4) *High-specificity, strategic resource (HSSR)*. For example, experienced managers working in a team can share skills and knowledge that are specific to their organization to perform a highly sophisticated project that provides high value for their organization. The interconnectedness of their specific knowledge makes for causal ambiguity. Managers in competing organizations are unable to identify the factors that enabled the highly specific project to be undertaken successfully. Competing organizations may face high cost diseconomies in attempting to imitate or substitute other projects to yield an equivalent strategy. The organization can gain sustained competitive advantage from the highly specific knowledge of its experienced managers. Thus, the *high-specificity* resources (the skills and knowledge of the managers) are *strategic*.

Uncertainty under TCT, however, has no effect on strategic resources under the RBV because the RBV does not take opportunism into account. Behavioural uncertainty, which leads to a partner acting opportunistically because performance evaluation is difficult, is not considered. Similarly, environmental uncertainty, which leads to a partner acting opportunistically during contract adaptation, also is not considered.

3.2. Propositions

Based on the relationships among the theories' constructs, the study framework (Table 1) was developed to identify four major circumstances that lead to different predictions about an organization's sourcing decisions under these two theories. The study propositions were developed based on these circumstances.

3.2.1. Circumstance 1: Low-specificity, non-strategic resources (LSNR) and high uncertainty

According to TCT, under high *behavioural uncertainty*, organizations have difficulty in monitoring and evaluating their partners' performance. This leads to the possibility of partners behaving opportunistically, even though hold-up costs may be small because of

Table 1
Framework for comparison of sourcing decisions under transaction cost theory (TCT) versus the resource-based view (RBV)

			Behavioural or environmental uncertainty	
			Low	High
Low-specificity, non-strategic resource	(LSNR)	TCT	Outsourcing	Insourcing (P1a)
		RBV	Outsourcing	Outsourcing (P1b)
Low-specificity, strategic resource	(LSSR)	TCT	Outsourcing (P2a)	Insourcing
		RBV	Insourcing (P2b)	Insourcing
High-specificity, non-strategic resource	(HSNR)	TCT	Insourcing (P3a)	Insourcing (P4a)
		RBV	Outsourcing (P3b)	Outsourcing (P4b)
High-specificity, strategic resource	(HSSR)	TCT	Insourcing	Insourcing
		RBV	Insourcing	Insourcing

low specificity. Organizations opt for an internal governance structure, therefore, to avoid the costs of partners acting opportunistically. In addition, under high *environmental uncertainty*, bounded rationality limits an organization's ability to predict future contingencies and provide for them in a market contract. Ultimately, a transaction needs to be adapted to cope with subsequent contingencies. Costs arise because exchange partners attempt to take advantage of unspecified contingencies. To minimize the high adaptation costs associated with the transaction, organizations are likely to employ an internal governance structure. In sum, under the conditions of low-specificity, non-strategic resources (LSNR) and high behavioural or environmental uncertainty, TCT predicts that organizations will insource a resource and, as a result, transaction associated with the resource.

According to the RBV, non-strategic resources with low-specificity do not enable an organization to obtain a sustained competitive advantage. Therefore, the RBV predicts that organizations will outsource these resources.

P1: Where non-strategic resources have low specificity and high behavioural or environmental uncertainty exists:
P1a: organizations will insource transactions (TCT)
P1b: organizations will outsource transactions (RBV)

3.2.2. Circumstance 2: Low-specificity, strategic resources (LSSR) and low uncertainty

When asset specificity and uncertainty are low, TCT predicts that two conditions affect an organization's sourcing decisions. The first involves the effects of low asset specificity and low behavioural uncertainty. Organizations are able to express measure and evaluate partners' performance, which diminishes the chance of partners acting opportunistically. Moreover, hold-up problems are unlikely to occur where assets have low specificity. Therefore, organizations are more likely to employ an external governance structure.

The second condition involves the effects of low asset specificity and low environmental uncertainty. Low environmental uncertainty makes it easier for organizations to predict future circumstances and specify these circumstances in contracts.

Adapting the transaction to cope with changed circumstances is also easier, which reduces ex post transaction costs. In addition, hold-up problems are unlikely to occur where assets have low specificity. Organizations can also benefit from economies of scale and scope that can be obtained from the market. Therefore, organizations are more likely to employ an external governance structure.

In summary, according to TCT and under the circumstances of low asset specificity and low uncertainty, a low-specificity, strategic resource has low transaction costs. Organizations will benefit from economies of scale and scope in the market. They are likely to opt, therefore, for an external governance structure.

On the other hand, under the RBV, a low-specificity, strategic resource enables organizations to obtain a sustained competitive advantage. Thus, they are more likely to employ an internal governance structure.

P2: Where strategic resources have low specificity and low behavioural or environmental uncertainty exists:
P2a: organizations will outsource transactions (TCT)
P2b: organizations will insource transactions (RBV)

3.2.3. Circumstance 3: High-specificity, non-strategic resources (HSNR) and low uncertainty

According to TCT, there are two conditions of high asset specificity and low uncertainty. The first involves high asset specificity and low behavioural uncertainty. Organizations can explicitly measure and evaluate exchange partners' performance. This minimizes some types of opportunistic behaviour by their exchange partners. However, they cannot avoid hold-up problems that arise because their assets are highly specific. They seek to avoid hold-up costs, therefore, by using an internal governance structure.

The second condition involves high asset specificity and low environmental uncertainty. Under low environmental uncertainty, organizations can predict future contingencies, such as changes in demand and updates needed in system specifications. They can specify these contingencies in a market contract, which reduces the transaction costs associated with adaptation. However, transaction costs arise because of the hold-up problems associated with high-specificity assets. To minimize overall transaction costs (adaptation and hold-up costs), organizations are likely to employ an internal governance structure.

In sum, under the circumstance of high asset specificity and low uncertainty, TCT predicts that organizations will employ an internal governance structure. On the other hand, the high-specificity resource is not strategic. Thus, the RBV predicts that organizations will employ an external governance structure.

P3: Where non-strategic resources have high specificity and low behavioural or environmental uncertainty exists:
P3a: organizations will insource transactions (TCT)
P3b: organizations will outsource transactions (RBV)

3.2.4. Circumstance 4: High-specificity, non-strategic resources (HSNR) and high uncertainty

When asset specificity and uncertainty are high, TCT predicts that two conditions affect organizations' sourcing decisions. The first involves high asset specificity and high behavioural uncertainty. When behavioural uncertainty is high, organizations may not be able to measure and evaluate exchange partners' performance. Thus, partners can act opportunistically. In addition, high hold-up costs arise because of high asset specificity. Thus, TCT predicts that organizations will use an internal governance structure to avoid performance evaluation problems and hold-up costs.

The second condition involves high asset specificity and high environmental uncertainty. Under high environmental uncertainty, organizations are unable to predict future contingencies. Thus, they cannot provide for these contingencies in a market contract. The market contract is ineffective as a reason of reducing opportunistic behaviour by partners. Moreover, high hold-up costs arise because of high specificity. Thus, TCT predicts that organizations will employ an internal governance structure.

In sum, under the circumstances of high asset specificity and high uncertainty, a resource has high transaction costs. To minimize the transaction costs, TCT predicts that organizations will employ an internal governance structure. In contrast, if a high-specificity resource is not a strategic resource, the RBV predicts that organizations will employ an external governance structure.

P4: Where non-strategic resources have high specificity and high behavioural or environmental uncertainty exists:
P4a: organizations will insource transactions (TCT)
P4b: organizations will outsource transactions (RBV)

4. Methodology

Case-study research is useful as a means of explaining contemporary activities such as sourcing decisions within a real-life context where no control of independent variables is possible, which makes experiment research indefensible (Yin, 1994). Case-study is also needed when the measuring of relevant variables is complex and labour-intensive, which makes large-scale surveys impracticable (De Looff, 1995). Consequently, this study employs case-study research to explain the context of sourcing decisions.

4.1. Study domain and levels of analysis

An email-marketing system was used to determine factors affecting organizations' sourcing decisions. The system is in the early stages of development as an IS application for business and a contemporary business process outsourcing (BPO). It comprises seven email-marketing functions—designing, building, testing, deploying, tracking, reporting, and analyzing (Bourland and Handley, 2000; MacPherson, 2000). Each of these functions is explained below:

- The designing function enables companies to plan their email-marketing strategy. This function includes making the decision as to which email system and campaigns should be adopted. For example, companies must decide whether they should provide web-mail services, whether their message should be sent in plain text or HTML format, and what kind of segmentation of their database (email list) adds value to their company's strategy.
- The building function is necessary for companies to achieve the goals set in the 'designing' phase. Companies may desire the ability to send and handle huge messages and to deploy these messages in HTML format. Moreover, they may want their email-marketing system to be an automatic responder and/or AI system that automatically routes in-bound messages to specified divisions in the company.
- The testing function validates various segments (e.g. gender, age, state and suburb, occupation, income level, education level, and interests) of a company's database.
- The deploying function manages all in-bound responses such as complaints, suggestions, and 'unsubscribe' requests prior to processing the resulting transactions.
- The tracking function assists companies to gather important information related to their objectives and to measure the effectiveness of email system and campaign. Data is collected regarding the specific links that were clicked, the number of recipients who opened a message, the number of recipients who made one or more purchases, and the number of recipients who clicked but never purchased.
- The reporting function provides output to companies for analysis purposes. Companies may need to have accurate real-time reports and/or to customize their reports.
- The analyzing function helps companies to improve the quality of their email system and to optimize subsequent marketing campaigns to enhance one-to-one customer relationships.

These functions are useful for determining the grounds on which companies decide to insource or outsource and, as a result, skills and knowledge to perform the functions as assets/resources under TCT and the RBV are associated with these functions.

To test whether TCT and the RBV consistently predicted sourcing decisions under different levels of composite functions that combine individual functions, three levels of analysis were examined. First, the individual function analysis examined each of the seven functions independently of one another. Each function's activities are described above. Second, the integrative function analysis investigated the establishment function (combining the activities in the designing and building functions) and the implementation function (combining the activities in the deploying, tracking, and reporting functions). Third, the overall function analysis examined the complete email-marketing system (combining all seven individual functions' activities).

4.2. Data collection

Given that email-marketing is in the nascent stage of development for e-business, a preliminary study was used to find sample companies competent in terms of their email-marketing experience and knowledge in e-business. Ten Thai e-commerce companies were chosen arbitrarily from a web directory, and a manager or Webmaster from each

company was asked for interviews. Each interviewee was asked to explain how they use email-marketing in their business and how their company performed each particular email-marketing function. Based on the results of the preliminary study, three companies were deemed to perform outstanding email-marketing in terms of their email-marketing and outsourcing experiences—a web portal, an online bookstore, and an Internet bookshop. These three were selected to participate in the main study. Description of each case is presented in Appendix A. Evidence for the main study was obtained from the IS managers, programmers, and marketers through interviews and questionnaires.

The interviews were semi-structured using a common set of questions (see Appendix B) to understand how the interviewees perceived their organization in terms of the theoretical constructs, and their confidence in their sourcing decisions for each function. Interviewees were free to elaborate on their responses to each question within time constraints. The interviews took about 1 h each. A series of follow-up interviews were undertaken to discuss the interviewees' responses in more depth across all levels of analysis. Later interviews included additional questions introduced based on information obtained from earlier interviews. The interviews were also used to evaluate the participant organizations' satisfaction with their sourcing decisions to determine whether they believed they had made an effective decision. The interview data were recorded and transcribed for each interview.

The quantitative data with scale 1–5 from questionnaires were used to validate the interview data. The questionnaires along with information of the functions were provided to participants. Each participant was asked to complete the first questionnaire containing the information on individual function analysis separately from the second questionnaire containing information on the integrative and overall function analyses. In cases where interview data and/or questionnaire data disagreed, the interviewees were requested to clarify the situation.

Triangulating using the qualitative case-study evidence from the interviews, and the quantitative survey data, each function for each case was positioned in one of the 16 cells in the study framework (Table 1). This identified those instances where the two theories made conflicting predictions. Follow-up interviews were conducted to discuss these functions in more depth, and related sourcing decisions.

4.3. Data validation

The case studies employed several qualitative data collection and analysis techniques suggested to reduce threats to the study findings (Eisenhardt, 1989; Merriam, 1988; Miles and Huberman, 1994; Parkhe, 1993; Robson, 1993; Yin, 1994).

To improve construct validity, the cases used multiple sources of evidence including interviews, questionnaires, and direct observations to triangulate data. The interview transcripts were sent to the interviewees to review and/or make changes to transcripts before analysis began. Findings from the data collection process were shared and discussed with academic experts to reduce errors arising from the researcher's interpretation.

Internal validity was improved by using within-case analysis then cross-case pattern matching to determine relationships among the constructs. The study analysis compared

cases to examine whether similar decisions in different situations (functions) or different decisions in similar situations led to different consequences. Each case was also investigated through questionnaires and multiple interviews. The researcher also made several visits to the case sites to build trust and to allow cultural immersion at the case-study site.

To maximize external validity, the study used replication logic to conduct and analyze the second and third case studies. All cases used predetermined questions and specific procedures for analysis.

To increase reliability, all procedures, including the preparation of the interviews and semi-structured questionnaires and data collection and analysis, were applied consistently across all cases. All data collected was kept in a case-study database.

5. Results and discussions

Presentation of the cases' findings is confined to the cross-case analysis. Descriptions of individual cases are used only as examples of the findings. Table 2 shows the levels of each theoretical construct in relation to the interviewees' perspectives.

The observed levels of the theoretical constructs and the confidence levels of making the right sourcing decisions drawn from the interview transcripts and questionnaires across three cases are summarized in Table 3. The data from the questionnaires were used to

Table 2
The level of theoretical constructs in relation to interviewee's perspectives[a]

The study's constructs	Interviewee's perspectives	Level (value)[b]	
		Interviewee's perspectives	Theoretical constructs (in the framework)
Specificity	Use of specific skills and tacit knowledge obtained from work experience	High Low	High Low
Behavioral uncertainty	Capability to monitor and measure performance of the functions	Low High	High Low
Environmental volatility	Capability to identify or predict changes in the functions	Low High	High Low
Value	Benefit of the functions to customers	High Low	High Low
Rareness	Number of other firms that perform the same functions to achieve the same strategy	Few Many	High Low
Imperfect-imitability	Capability of other firms to imitate the implementation of the functions	Low High	High Low
Non-substitutability	Capability of other firms to substitute the equivalent outcome of the functions	Low High	High Low

[a] Data were drawn from the interview transcripts and questionnaires.

[b] Scales 4 and 5 from the questionnaire data indicate the *high* level of interviewee's perspective. Scales 1 and 2 from the questionnaire data indicate the *low* level of interviewee's perspective. Scale 3 in the questionnaire data indicates the *medium* levels of interviewee's perspective and the theoretical construct.

Table 3
Summary of email-marketing function characteristics under the RBV and TCT across the three cases[a]

Case	Levels of analysis	Resource-based view					Transaction cost theory			Making the right decision[b]
		Value	Rareness	Imperfect-imitability	Non-substitutability	Strategic resource	Specificity	Behavioural uncertainty	Environment uncertainty	
Company A	Individual functions									
	Designing	H	H	M	L	*No*	H	L	H	H
	Building	H	H	L	L	*No*	H	L	M	H
	Testing	L	H	L	M	*No*	H	L	H	H
	Deploying	H	H	L	L	*No*	H	M	H	H
	Tracking	H	H	L	M	*No*	L	L	L	M
	Reporting	H	H	L	L	*No*	L	L	L	M
	Analyzing	H	H	H	H	*Yes*	H	H	H	H
	Integrative functions									
	Establishment	H	H	L	L	*No*	H	L	H	H
	Implementation	H	H	M	L	*No*	H	L	H	H
	Overall function									
	Overall	H	H	M	M	*No*	H	M	H	H
Company B	Individual functions									
	Designing	H	H	L	M	*No*	L	L	H	H
	Building	H	M	L	L	*No*	L	L	M	H
	Testing	M	H	L	L	*No*	H	L	L	H
	Deploying	H	M	L	L	*No*	H	L	H	H
	Tracking	H	M	L	L	*No*	L	M	L	H
	Reporting	H	M	L	L	*No*	L	L	L	M
	Analyzing	H	H	H	H	*Yes*	H	M	M	H
	Integrative functions									
	Establishment	H	H	L	M	*No*	M	L	H	H
	Implementation	H	H	L	M	*No*	H	L	H	H
	Overall Function									
	Overall	H	H	M	M	*No*	H	M	H	H
Company C	Individual functions									
	Designing	H	H	L	L	*No*	L	L	H	H

(*continued on next page*)

Table 3 (*continued*)

Case	Levels of analysis	Resource-based view					Transaction cost theory			Making the right decision[b]
		Value	Rareness	Imperfect-imitability	Non-substitutability	Strategic resource	Specificity	Behavioural uncertainty	Environment uncertainty	
	Building	H	H	L	L	*No*	L	L	L	H
	Testing	L	H	M	L	*No*	M	L	L	M
	Deploying	H	H	L	L	*No*	H	L	H	H
	Tracking	H	H	L	L	*No*	L	L	L	M
	Reporting	H	H	L	L	*No*	L	L	L	M
	Analyzing	H	H	H	H	*Yes*	H	M	H	H
	Integrative functions									
	Establishment	H	H	L	M	*No*	M	L	M	H
	Implementation	H	H	M	M	*No*	H	L	M	H
	Overall function									
	Overall	H	H	M	M	*No*	H	L	M	H

[a] Data were drawn from the interview transcripts and questionnaires.
[b] Data obtained from the interview transcripts indicated that the interviewees perceived their sourcing decisions were useful and effective to their companies.
H, high level; M, medium level; L, low level.

validate the interview data. The medium level of the constructs, as shown in Table 3, cannot be distinctly designated as a high or a low level of the constructs. For example, the interviewees provided the reasons that can be used to support a high and a low level of the constructs. They also rate the moderate scale (scale 3) in the questionnaire. This level of the construct, thus, is not used for analyzing the effects of the levels of the constructs on sourcing decisions for each individual case and also not used for the cross-case conclusion. In case of the level of making the right decision (question 14 in Appendix B), the medium and high levels manifest an effective sourcing decision because the interviewees perceived their sourcing decisions were useful to their companies and their companies eventually perform functions based on their sourcing decisions. The data distilled from the interviews, as summarized in Table 3, indicate that the interviewees believed they had each made an effective sourcing decision.

The observed levels of the constructs were compared to the theoretical levels of the constructs in the study framework (Table 1) and, as a result, the functions where the two theories make conflicting predictions about sourcing decisions emerge. This enables the propositions can be evaluated.

5.1. The effects of theoretical constructs on sourcing decisions

Table 4 summarizes the main factors that affect the companies' sourcing decisions across the three cases. For proposition testing, the effects of the theoretical constructs on sourcing decisions are explained below.

The interview data indicate that the companies have much concern on specific skills and tacit knowledge that enable them to perform the functions effectively. They are also aware of the potential hold-up problems that may occur with outside partners if the functions are outsourced. For example, the IS managers of Companies A and B argued:

> If the functions had to transfer to others who had different skills and knowledge, they (others) would not be able to perform the same thing (value) unless we intensively trained them to operate those particular functions (IS manager of Company A).

> We have built our skills and knowledge from the beginning so we can monitor what is going on—why we need to strict with others (partners). I'm afraid that if they can build these kinds of skills we cannot monitor them (IS manager of Company B).

Where the high-specificity, non-strategic functions involve low behavioural or high environmental uncertainty, the companies rely on their capabilities in terms of specific skills and tacit knowledge to perform the functions rather than the effect of low behavioural, high environmental uncertainty and non-strategic resource (Proposition 3a and 4a). For example, the IS manager of Company A argued:

> We used to hire one company to prepare and present the email messages for us. We couldn't make changes on the messages as often as we requested (a manifestation of high environmental uncertainty). They do not know our business well such as our customers and the company policy (a manifestation of high specificity). We needed to correct the changes ourselves because we ran out of time in waiting for a revision from them… Though we also have one good partner that we believe they will not

Table 4
The cross-case findings in relation to the effects of the study's constructs on the companies' sourcing decisions

The study's constructs	Sourcing decisions	Conclusions
High specificity	Insourcing	Retaining and enhancing the value of the functions by using special skills and tacit knowledge of current staff Avoiding the potential hold-up problems that may occur with outside partners if the functions are outsourced
Low behavioural uncertainty	No impact on outsourcing	Gaining more control by managing the functions internally
High environmental uncertainty	Insourcing	Avoiding the potential opportunistic costs of adapting an agreement that may occur with outside partners if the functions are outsourced
Low specificity	Unclear for outsourcing	Performing functions with internal knowledge and skills that companies also possess (insourcing) Saving capital investment costs may exist with outsourcing
Non-strategic resources	Not lead to outsourcing	Exploiting benefits from continually operating the functions Having little effects on imitation and substitution
Low specificity, high environmental uncertainty, and non-strategic resource (P1a)	Insourcing	Using generic knowledge to control unexpected changes internally Avoiding the potential adaptation costs of the agreement in operating the functions in-house
High-specificity, low behaviour uncertainty, and non-strategic resource (P3a)	Insourcing	Using employees' specialized skills and tacit knowledge to easily and immediately solve problems when they are detected
High-specificity, high environmental uncertainty, and non-strategic resource (P4a)	Insourcing	Using internal skills and tacit knowledge obtained via work experience to deal with unexpected changes more effectively than outside partners who lack that tacit knowledge

> take advantage on us (a manifestation of low behavioural uncertainty), we still have skill and knowledge to handle it too… Again I don't care whether the functions can be copied by other companies (the outcome with a non-strategic resource), if those functions still have value (heightened by tacit knowledge) to the company and we have capabilities in terms of budget, personnel, and knowledge, we should keep on doing those functions.

Where the non-strategic functions do not required substantial specific skills and knowledge to perform, the companies take the effect of high environmental uncertainty into account in making their sourcing decision (Proposition 1a). For example, the manager of Company C pointed out:

> It was a matter of time constraint for preparing mail-out campaigns. We wanted to have more control on any unexpected change—easily add or drop any promotional message—in limited time (an outcome of high environmental uncertainty). This

> change, normally, does not require specific skills (a magnification of low specificity) , but we have to make it on time.

The results also show that the companies do not take account of the effect of non-strategic resources for their sourcing decisions. The IS manager of Company B commented:

> I don't really mind that other companies will learn (imitate) from us. I also give presentations to conferences/seminars about the company's email-marketing… They can use my knowledge to do some work which is similar to my company…If we still gain benefits for doing it (function) and can do it, we do not outsource only because other companies may or can do the thing.

5.2. The effects of levels of composite functions on sourcing decisions

The cross-case findings of the different levels of analysis indicate that higher-level combined functions (the overall function analysis) manifest a higher level of specificity than lower-level combined functions (the integrative function analysis) and individual functions (the individual function analysis). As a result, staff who have tacit knowledge and specific skills obtained from work experience across email-marketing functions are better able to hold up their companies compared to staff who have these skills in relation to only one or two individual functions. Their companies need to pay a high salary, therefore, to keep them.

5.3. Implications for theory and practice

The study found three theoretical implications. First, some skills and knowledge (IT or marketing) obtained via work experience within the company are *specialized* assets. They may not be *specific* assets, however. Specialized assets may still have a high value in another use (e.g. skills to reduce the memory space consumed in a recipient's mailbox for the building function). Nonetheless, if specialized skills cannot be transferred to another use without a significant reduction in value, they are also *specific assets* (e.g. IT or marketing skills and knowledge associated with the company's policy and/or customer relationships). Thus, specialized assets and specific assets may overlap, but they are not the same. Fig. 2 shows the four emergent circumstances that have different levels of specificity and specialization.

- *High-specialized, high-specificity asset*. For example, under the analyzing function, the manager from Company B suggested that the low click-through rate result might mean a campaign message was not effective (e.g. offers are not attractive) and that the wrong recipients had been targeted (the company does not implement the testing function). In Company B, the numbers of emails sent were used to analyze the click-through rate instead of the number of emails received by customers (email sent subtracted by bounce-back emails). With his experience in analyzing this kind of report, the manager pointed out that the campaign message might not be getting through to customers as a

Specialization \ Specificity	High	Low
High	high-specialized, high-specific asset (e.g., analyzing function)	high-specialized, low-specific asset (e.g., building function)
Low	low-specialized, high-specific asset (e.g., deploying function)	low-specialized, low-specific asset (e.g., reporting function)

Fig. 2. Relationships between specificity and specialization.

result of bounce-back messages. These analyses and interpretation skills obtained via work experience are specialized and applicable to other companies. In addition, with the manager's knowledge of the company's customers, he could see some changes among the company's customers in relation to their interests and buying patterns (e.g. purchasing power). This knowledge enabled him to customize the next campaign to make offers to particular customers more effective. His knowledge related to the company's customers is highly specific. Because customer interests are different and change over time, this knowledge has a low value in terms of other companies.

- *High-specialized, low-specificity asset*. For example, under the building function, the staff of Company A developed high-level skills to manage and implement their own Web-based system (server) using the LINUX platform. These skills are highly specialized and applicable to some other companies. To a small extent, Company A's staff have to operate the email system under the company's policy that are different from other companies (e.g. security issue, free memory for recipient's email account). These skills, therefore, have low specificity.
- *Low-specialized, high-specificity asset*. For example, under the deploying function, to respond to a company's customers effectively and efficiently, staff have to develop skills obtained via work experience to understand the content of the company's marketing messages and the company's purchasing process. Because these skills differ across companies, they are highly specific assets. To some extent, these staff, however, improve their communication skills (with customers) through work experience. These skills may be applicable for some other companies to a small extent. They, therefore, have low specialization.
- *Low-specialized, low-specificity asset*. For example, in the reporting function, staff simply retrieve data to prepare reports from the tracking system. These data are available through the tracking software (e.g. open rate and click-through rate) and some archival records (e.g. unsubscribe rate, customers' records). Staffs have to understand and search for the data needed. Performing this function does not need highly specialized skills. In addition, staff have to learn and understand the structure of the company's databases, which will be different to some extent from other companies' database. Many IT personnel, however, can develop these skills without difficulty. This lessens the effect of a hold-up problem on the companies when staffs who possess these skills threaten to leave. These skills, therefore, have low specificity.

Second, the result obtained from different levels of analysis implies that the specificity of the composite function may arise from interconnectedness (relationships) among assets. It is not necessary for the components to be specific or specialized assets for the composite function to have high specificity. For example, the tracking and reporting functions are low-specificity resources. They also involve some *specialized* knowledge obtained from work experience (e.g. knowledge about the tracking system and database to perform, check, and report the performance of the functions). Nonetheless, when these two functions are combined with the deploying function (which has high specificity because it involves specific skills), the combined function (the implementation function) is highly specific across the three cases. This implies that the asset specificity associated with the composite function may arise in different ways associated with the complementarity of specific and specialized assets across the three component functions (Fig. 3). Each relationship among the three different functions may lead to different levels of specificity in a composite function. Consequently, the combination of relationships among the component assets makes the way in which specificity emerges in a composite asset very complex. The composite assets, therefore, may lead to an insourcing decision.

Third, the non-strategic resources that are valuable and rare, but are imitable and/or substitutable, may provide sufficient conditions for an insourcing decision. These resources may provide above-normal returns to the companies and also enable the companies to gain a temporary competitive advantage (Barney, 2002).

Practical implications are that organizations should not always outsource non-strategic resources. They may have to consider whether the non-strategic resources involve high specificity that should be retained internally (as a result of testing Propositions 3a and 4a). Through the Internet, newcomers can watch and learn to imitate IT applications (email-marketing functions) from other successful companies. The study implies that the efficient way to imitate is to imitate specialized skills that may have higher returns than specific skills that are costly to imitate (as a value of specificity is reduced for other uses and specificity is difficult to imitate). In particular, it is difficult to imitate the value of composite skills and functions (see Fig. 3).

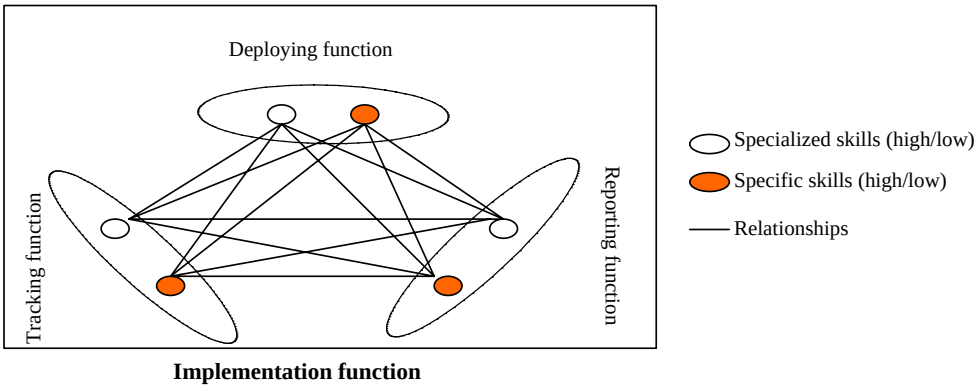

Fig. 3. The complex emergence of specificity in a composite asset that has three component assets.

6. Conclusions and future research

The data from the three cases provide evidence on how the theoretical constructs influence sourcing decisions and which theory, TCT or the RBV, better accounts for the company's sourcing decisions. The findings indicate that TCT explains an organization's sourcing decisions better than the RBV when these two theories make conflicting predictions about a sourcing decision. In particular, a high-specificity asset has a major impact on sourcing decisions. It overpowers the effects of uncertainty on organizations' sourcing decisions while a non-strategic resource has no impact on sourcing decisions.

The study has not tested all the propositions. Low-specificity, strategic resources did not exist in the study's domain. Another study with domains involving this type of resources is needed to test the predictions of sourcing decisions under the two theories. The interview data (example 2, Section 5.1) implied that an organization's ability to predict the future outcome (manifestation of environmental uncertainty) might associate with frequent changes (manifestation of transaction frequency). Future research might examine how the interaction effect of environmental uncertainty and transaction frequency affect an organization's sourcing decision. This study emphasized the effects of asset specificity on an organization's sourcing decisions, but it was found that specific and specialized assets are different. Future research studies might examine how specialized assets affect an organization's sourcing decisions. In addition, this study focused on small, eastern culture firms as opposed to large, western culture firms for which TCT and the RBV have been developed. It may limit transferability of the study's results. A number of future research studies might examine these two theories in the same context.

Acknowledgements

The author is grateful to Professor Ron Weber for his suggestions and constructive comments, which helped to complete this study.

Appendix A. Descriptions of the case studies

A.1. Case one (a web portal company)

Company A is a content service provider that provides overall web services to meet Internet surfers' needs including information, knowledge, entertainment, and a web directory. The company, which employs 13 staff, benefits from paid advertising either by posting banners in the weekly newsletter or by sending marketing email to its mailing list. It uses email-marketing in two ways: an email newsletter and direct email. The email newsletter is sent to all members each week to update them about the company's new service activities. Aimed at sustaining member satisfaction with the company, this newsletter helps the company to maintain its relationships with its members and stimulates

more traffic for its websites. Direct email, on the other hand, is used for specific marketing campaigns, and is sent to target members who subscribe for information relevant to the email campaign.

The mailing list contains two groups of members: those belonging to the common membership who subscribe directly through the company's website, and the web-mail members who register for a free email account. The IS manager, marketer, and programmer, who are mainly responsible for the company's email-marketing, were interviewed for this study.

A.2. Case two (an online bookstore)

Company B is an e-commerce bookstore that offers online products, including numerous book categories (e.g. computer, IT, business, and marketing), educational CDs and games, and some computer accessories. Although a range of products are sold, this study focuses specifically on the company's use of email-marketing to sell books. The company employs 45 staffs working in online and offline businesses, with 10 staffs responsible for online business in web development and email-marketing.

This company employs direct email-marketing to up-sell and cross-sell via two types of marketing campaigns: general direct email and special direct email. The house list is an opt-in list containing two categories of email addresses: subscribers and members. The subscribers, who are individuals registering online (website registration) and offline (booth at exhibitions), provide their name, postal address, and email address. The members, who have paid the membership fee, provide their age, gender, occupation, income, and product interests. The general direct email is sent to all subscribers three times per month to inform them about new and best-selling products, while special direct email is sent to members to offer special prices on products and give them privileges. The IS manager, the assistant manager, and the web developer were the key email-marketing staff and were interviewed to inform the study.

A.3. Case three (an Internet bookshop)

Company C is an e-commerce company that sells various products (e.g. books, magazines, maps, CDs, postcards) and products on special request. The company employs six people, has about 1000 product items (mostly books and magazines), and only sells products to overseas customers, particularly ex-patriots living abroad. The house list consists of approximately 3000 customers with details such as name, email addresses, and language choices. The company categorizes its customers' product interests (e.g. types of books) based on their purchasing history, and an email newsletter is sent to customers every 2 weeks to inform them of new products and provide news updates. This e-newsletter, sent in text format with both Thai and English versions, is intended to encourage its customers to feel confident about the company's status. The manager and the programmer, responsible for the company's email-marketing, provided information about their email-marketing activities for this study.

Appendix B. Questions for the interviews and questionnaires

The Common Questions for the Interviews*

1. To what extent do you think the conduct of this function requires facilities and technical skills that are unique to your company?** Why?
2. To what extent do you think your company performs this function in a different manner from other companies? Why?
3. To what extent do you think explicit measures can be used to gauge the performance of this function?** Why?
4. To what extent do you think it is easy to monitor whether this function is being performed correctly? Why?
5. To what extent do you think your company can predict any change that will happen to this function?** Why?
6. To what extent do you think this function will need to change or adapt based on contemporary information (such as a fluctuation of email volume and a change in the click-through rate) that cannot be predicted at this time? Why?
7. To what extent do you think this function enables your company to gain competitive advantage in a market? ** Why?
8. To what extent do you know whether competing firms already possess this function to implement the same email-marketing strategy as your company?** Why?
9. To what extent do you think other firms without the same function face a cost disadvantage in obtaining/copying it? Why?
10. To what extent do you think other firms can understand how your company developed this function so they can copy it?** Why?
11. To what extent do you think this function depends on your company's experiences such that other firms cannot develop an equivalent function?** How does it affect your sourcing decision? Why?
12. To what extent do you think this function depends on your company's experiences or your company's interpersonal relationships such that other firms cannot develop an equivalent function? Why?
13. To what extent do you think other firms can use their resources and capabilities to implement an equivalent function? Why?
14. To what extent do you think you have made the right insourcing/outsourcing decision, which is relative to this function?** Why?

Remark:

* They were used for the three levels of analysis and across the three companies.
** These questions were also used in the questionnaire.

Questionnaire*

Please rate your answers (from 1 to 5) corresponding to the following questions based on each particular email-marketing function: 1 = not at all; 2 = somewhat; 3 = moderately; 4 = very much; 5 = greatly	Levels of analysis**									
	1st							2nd		3rd
	Designing	Building	Testing	Deploying	Tracking	Reporting	Analyzing	Establish-ment	Implemen-tation	Overall
	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5
To what extent do you think the conduct of this function requires facilities and technical skills that are unique to your company?										
To what extent do you think explicit measures can be used to gauge the performance of this function?										
To what extent do you think your company can predict any change happened to this function? (e.g. changing system specifications and message format, etc.)										
To what extent do you think this function enables your company to gain competitive advantage in a market?										
To what extent do you know whether competing firms already possess this function to implement the same email-marketing strategy as your company?										

(*continued on next page*)

Please rate your answers (from 1 to 5) corresponding to the following questions based on each particular email-marketing function: 1 = not at all; 2 = somewhat; 3 = moderately; 4 = very much; 5 = greatly	Levels of analysis**									
	1st							2nd		3rd
	Designing	Building	Testing	Deploying	Tracking	Reporting	Analyzing	Establish-ment	Implemen-tation	Overall
	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5
To what extent do you think other firms can understand how your company developed this function so they can copy it?										
To what extent do you think this function depends on your company's experiences or your company's interpersonal relationships such that other firms cannot develop an equivalent function?										
To what extent do you think the conduct of this function requires facilities and technical skills that are unique to your company?										
To what extent do you think you have made the right insourcing/outsourcing decision, which is relative to this function?										

* Questionnaire data were collected from each participant to validate the interview data.

** Questionnaire data for the first level of analysis were collected separately from the data for the second and third levels of analysis.

References

Anderson, E., 1985. The salesperson as outside agent or employee: a transaction cost analysis. Marketing Science 4 (3), 234–254.

Ang, S., Straub, D.W., 1998. Production and transaction economies and is outsourcing: a study of the U.S. Banking industry. MIS Quarterly 22 (4), 535–552.

Aubert, B., Rivard, S., Party, M., 1996a. Development of measures to assess dimensions of IS operation transactions. Omega, International Journal of Management Science 24 (6), 661–680.

Aubert, B.A., Rivard, S., Patry, M., 1996b. A transaction cost approach to outsourcing behavior: some empirical evidence. Information & Management 30 (2), 51–64.

Barney, J.B., 1986. Strategic factor markets: expectations, luck, and business strategy. Management Science 42, 1231–1241.

Barney, J., 1991. Firm resources and sustained competitive advantage. Journal of Management 17 (1), 99–120.

Barney, J.B., 1999. How a firm's capabilities affect boundary decisions. Sloan Management Review 40 (3), 137–145.

Barney, J.B., 2002. Gaining and Sustaining Competitive Advantage, second ed. Prentice-Hall, Englewood Cliffs, NJ.

Bourland, A., Handley, A., 2000. Email marketing secrets: ClickZ and FloNetwork. Available at http://www.emailfactory.com/PR_clickz_03_26.htm.

Christensen, J.F., 2000. Building innovative assets and dynamic coherence in multi technology companies. In: Foss, N.J., Robertson, P.L. (Eds.), Resources, Technology and Strategy. Routledge, London, pp. 123–152.

Coase, R.H., 1937. The nature of the firm. Economica 4 (16), 386–405.

Daft, R., 1983. Organization Theory and Design. West Publishing, New York.

De Looff, A.L., 1995. Information systems outsourcing decision making: a framework, organizational theories and case studies. Journal of Information Technology10, 281–297.

Dierickx, I., Cool, K., 1989. Asset stock accumulation and sustainability of competitive advantage. Management Science 35 (12), 1504–1514.

Duncan, N.B., 1998. Beyond opportunism: a resource-based view of outsourcing risk, Paper presented at the Proceeding of the 31st International Conference on Systems Science, Hawaii 1998.

Eisenhardt, E., 1989. Building theories from case study research. Academy of Management Review 14 (4), 532–550.

Foss, N.J., 1996. Towards a Competence Theory of the Firm. Routledge, London.

Foss, N.J., Robertson, P.L., 2000. Resources, Technology, and Strategy. Routledge, New York.

Gartner Group, 2002.Anon., 2002. Strategic Sourcing: the Book. Gartner Group, Stamford, CT.

Gatignon, H., Anderson, E., 1988. The multinational corporation's degree of control over foreign subsidiaries: an empirical test of transaction cost explanation. Journal of Law, Economics and Organization 4 (2), 305–336.

Gerwig, K., 1999. Apps on tap: outsourcing hits the web. netWorker 3 (3), 13–16.

Grant, R.M., 1991. The resource based theory of competitive advantage: implications for strategy formulation. California Management Review 33 (3), 114–135.

IDC, 2002. Worldwide is outsourcing services: midyear forecast update, 2002. International Data Corporation. Available at http://www.idcresearch.com.

Insinga, C.R., Werle, J.M., 2000. Linking outsourcing to business strategy. The Academy of Management Executive 14 (4), 58–70.

John, G., Weitz, A.B., 1988. Forward integration into distribution: An empirical test of transaction cost analysis. Journal of Law, Economics and Organization 4 (2), 121–139.

Joskow, P.L., 1991. Asset specificity and the structure of vertical relationships: empirical evidence. In: Williamson, O.E., Winter, S.G. (Eds.), The Nature of the Firm: Origins, Evolution, and Development. Oxford University Press, London, pp. 117–137.

Klass, B.S., Mcclendon, J., Gainey, T.W., 1999. Hr outsourcing and its impact: the role of transaction costs. Personnel Psychology 52 (1), 113–135.

Klein, S., Frazier, G.L., Roth, V.J., 1990. A transaction cost analysis model of channel integration in international markets. Journal of Marketing Research 27 (2), 196–209.

Lacity, M.C., Hirschheim, R., 1993. The information systems outsourcing bandwagon. Sloan Management Review 35 (1), 73–86.

Lacity, M.C., Hirschheim, R.A., 1995. Beyond the Information Systems Outsourcing Bandwagon: The Insourcing Response. Wiley, New York.

Lacity, M.C., Willcocks, L., Feeny, D.F., 1995. IT outsourcing: maximize flexibility and control. Harvard Business Review 73 (3), 84–93.

Leblebici, H., Gerald, S., 1981. Effects of environmental uncertainty on information and decision process in bank. Administrative Science Quarterly 26 (4), 578–596.

Lippman, S., Rumelt, R.P., 1982. Uncertain imitability: An analysis of interfirm differences in efficiency under competition. Bell Journal of Economics 13, 418–438.

Litz, R.A., 1996. A resource-based view of the socially responsible firm: stakeholder interdependence, ethical awareness, and issue responsiveness as strategic assets. Journal of Business Ethics 15 (12), 1355–1363.

Loh, L., Venkatraman, N., 1992. Determinant of information technology outsourcing: a cross sectional analysis. Journal of Management Information Systems 9 (1), 7–24.

MacPherson, K., 2000. CRM: optimizing relationships with data. ClickZ Network. Available at www.clickz.com/cg-bin/gt/fn/emm/emm.html?article=1712.

Mahoney, J.T., Pandian, R.J., 1992. The resource based view within the conversation of strategic management. Strategic Management Journal 13 (5), 363–380.

Malz, A., 1993. Private fleet use: transaction cost approach. Transportation Journal 32 (3), 46–53.

Malz, A., 1994. Outsourcing the warehouse function: economic and strategic considerations. Logistics and Transportation Review 30 (3), 245–265.

Merriam, S.B., 1988. Case Study Research in Education: A Qualitative Approach. Jossey-Bass, San Francisco.

Miles, M.B., Huberman, A.M., 1994. Qualitative Data Analysis: An Expanded Sourcebook, second ed. Sage, California.

Montgomery, C.A., 1995. Resource-based and Evolutionary Theories of the Firm: Towards a Synthesis. Kluwer Academic Publishers, Boston.

Nam, K., Rajagopalan, S., Rao, H.R., Chaudhury, A., 1996. A two level investigation of information systems outsourcing. Communications of the ACM 39 (7), 36–44.

Ngwenyama, O.K., Bryson, N., 1999. Making the information systems outsourcing decision: a transaction cost approach to analyzing outsourcing decision problems. European Journal of Operational Research 115 (2), 351–367.

Parkhe, A., 1993. Messy research, methodological predispositions, and theory development in international joint ventures. Academy of Management Review 18 (2), 227–268.

Pitelis, C.N., 1998. Transaction costs and the historical evolution of the capitalist firm. Journal of Economic Issues 32 (4), 999–1111.

Pitelis, C.N., Pseiridis, A.N., 1999. Transaction costs versus resource value? Journal of Economic Studies 26 (3), 221–240.

Powell, T.C., 1992. Strategic planning as competitive advantage. Strategic Management Journal 13 (7), 551–558.

Prahalad, C.K., Hamel, G., 1990. The core competence of the corporation. Harvard Business Review 68 (3), 79–91.

Rindfleisch, A., Heide, J.B., 1997. Transaction cost analysis: past, present, and future applications. Journal of Marketing 61 (4), 30–54.

Rindova, V.P., Fombrun, C.J., 1999. Constructing competitive advantage: the role of firm constituent interactions. Strategic Management Journal 20 (8), 691–710.

Robson, C., 1993. Real World Research: A Resource for Social Scientists and Practitioner-researchers. Blackwell, Cambridge, MA.

Roodhooft, F., Warlop, L., 1999. On the role of sunk costs and asset specificity in outsourcing decisions: a research note. Accounting, Organizations and Society 24 (4), 363–369.

Roy, V., Aubert, B., 2001. A Resource-based Analysis of Outsourcing: Evidence from Case Studies. CIRANO, Montreal.

Simon, A.H., 1957. Models of Man. Wiley, New York.

Slater, G., Spencer, A.D., 2000. The uncertainty foundation of transaction costs economics. Journal of Economic Issues 34 (1), 61–87.

Teng, J.T.C., Cheon, M.J., Grover, V., 1995. Decisions to outsourcing information systems functions: testing a strategy-theoretic discrepancy model. Decision Sciences 26 (1), 75–105.

Walker, G., 1988. Strategic sourcing, vertical integration, and transaction costs. Interfaces 18 (3), 62–73.

Walker, G., Weber, D., 1984. A transaction cost approach to make-or-buy decision. Administrative Science Quarterly 29 (3), 373–391.

Wernerfelt, B., 1984. A resource-based view of the firm. Strategic Management Journal 5 (2), 171–180.

Williamson, O.E., 1975. Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization. Free Press, New York.

Williamson, O.E., 1979. Transaction cost economics: the governance of contractual relations. Journal of Law and Economics 22 (2), 233–261.

Williamson, O.E., 1985a. The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting. Free Press, New York.

Williamson, O.E., 1985b. The governance of contractual relations. In The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting. Free Press, New york pp. 68–84.

Williamson, O.E., 1989. Transaction cost economics. In: Schmalensee, R., Willig, R.D. (Eds.), Handbook of Industrial Organization. Elsevier, Amsterdam, pp. 136–182.

Williamson, O.E., 1991. Comparative economic organization: the analysis of discrete structural alternatives. Administrative Science Quarterly 36 (2), 269–296.

Williamson, O.E., 1994. Transaction cost economics and organization theory. In: Smelser, N.J., Swedberg, R. (Eds.), The Handbook of Economic Sociology. Princeton University Press, New Jersey, pp. 77–107.

Yin, R.K., 1994. Case Study Research: Design and Methods, second ed. Sage, California.