The inter-organizational relationship in a multi-contractor business network

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Abstract

This paper presents a study on the relationship between the client and the contractor in a multi-contractor business network. A model built on transaction cost economics and relational exchange theory is proposed to determine the preferred governance mechanism as a function of fit with the technical environment of facilities management. Hypotheses in the model are tested by means of data collected from a survey of facilities managers. The dependent variable is relational norm (defined as degree of relational control). The antecedents are asset specificity, decision making uncertainty, risk of malfunction, and trust. The unit of analysis is asset-based dyad consisting of the client and the contractor linked by the asset. It is found that decision making uncertainty has a negative effect on relational norm. On the other hand, a positive relationship exists between asset specificity and relational norm, and this relationship is moderated by risk of malfunction.

Practical Implications

The implementation of out-tasking has resulted in a business network whereby more than one contractor works for a client that also has an internal team. It is a challenge to both the client and the contractors. There are conflicting views regarding the need of the client to maintain partnership relationships with its contractors. This paper presents a decision support model, developed through hypotheses testing, for determining the optimal form of relationship that should apply between the client and its contractor in the context of out-tasking. In the continuum between contractual and relational control of the contractor, the optimal degree of relational control is contingent upon situational factors. By means of the model, the gap between the current form of relationship and the desired one can be determined. With this knowledge, the facilities manager can then plan change initiatives to close the gap.

1. Introduction

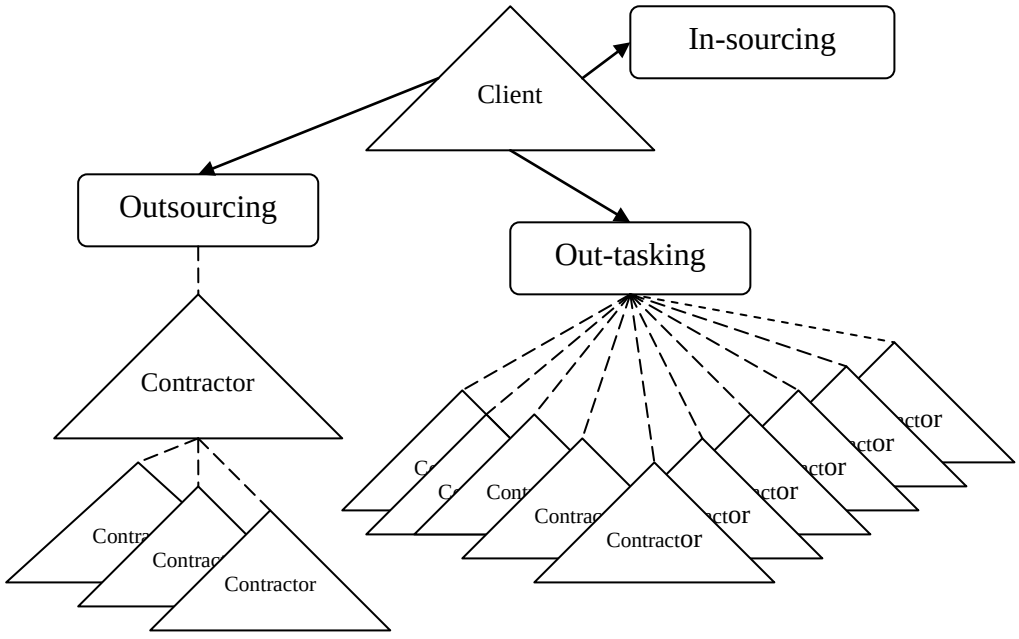
Outsourcing is common in support functions such as logistics, information system management, human resources management and facilities management (Grover, Cheon, & Teng, 1996; Murphy, 2002; Skjoett-Larsen, 2000). Through outsourcing, it is possible for organizations to focus on core activities and become competitive.

Due to keen market competition and the pressure to stay lean, many companies have broadened the scope of sourcing to cover essential services. Some of the essential services are

taken over by contractors as long as there is cost saving. This type of selective outsourcing is known as out-tasking. As quality and special know-how are required in many of such cases, it is difficult to find one company to deliver all of the needed services. More than one contractor is usually selected. As a result of outsourcing and out-tasking, the client organization ends up having to manage a network of contractors.

In the context of facilities management, it is not unusual to find more than ten contractors actively involved in the maintenance of a property. The architecture of a typical network is shown in Figure 1. The governance of this organization is a challenge to the facilities manager.

Figure 1. Network of Contractors



Some of these contractors may be driven to maximize short term profits. If not properly monitored, a contractor might behave opportunistically, against the interests of the client. The contracted out service might be essential and the contractor might use the contract primarily as a vehicle to develop its expertise, replacement of the contractor subsequent to unsatisfactory performance might not be a wise approach. How should the client work with the contractor so that the objectives of out-tasking are cost effectively achieved?

The research presented in this paper is an attempt to answer the above question. The study involves model development and hypothesis testing. It builds on the previous work of Joshi and Stump (1999a) in the manufacturing context (Joshi & Stump, 1999a). An adapted model was developed after consulting practitioners of facilities management. A questionnaire survey was conducted on a random sample of facilities managers. By analyzing the responses

relating to satisfactory cases of out-tasking in facilities management, useful insights were obtained to help facilities managers in formulating appropriate strategies for managing the contractor that provides the out-tasked services.

2. Outsourcing and Contractor Control

In outsourcing, it is important to understand what to contract out. It is necessary to differentiate core and non-core activities. Activities that do not have direct impact on the major performance indicators are non-core. Non-essential activities may be considered as non-core.

The decision to outsource non-essential activities is primarily based on economic grounds. According to the theory of transaction cost economics, the service should not be done in-house if a cheaper alternative is available from the open market (Williamson, 1975, 1985). For a service contract, transaction costs are incurred in preparing the contract document, administering the tendering process, and supervising the works performed. Since the tendering process is a time consuming exercise, service works of similar nature and complexity should be bundled together to save the need for frequent tendering. In case the scope of work is too large or the operation covers different geographical locations, tendering may be split into different packages to bring in more than one contractor. The contractor is required to take care of a list of physical assets of secondary importance.

The benefits of outsourcing are 1) Better focus on core activities; 2) Cost saving and 'Value for Money'; and 3) Single point of contact and improved accountability. Some of these benefits are intangible and hard to quantity. The shortcomings of outsourcing are 1) Quality assurance and budget control is complicated; 2) Slower response from the contractor staff; and 3) Lack of staff development by the contractor. The strategy for outsourcing success is to maximize the benefits and minimize the costs. One key issue is the risk of opportunism of the contractor. Opportunism is defined as 'self-interest seeking with guile' (Williamson, 1975). Therefore, the challenge of outsourcing is to monitor possible opportunism of the contractor.

The traditional approach to outsourcing involves incorporating incentive and penalty in the contract provision. This has to be implemented with close surveillance. In case only non-essential services are outsourced, the roles of contractors are not much different from suppliers of commodities. As the skill requirement for performing the outsourced service is low and there are many qualified contractors for selection in the open market, replacement of contractors should not be a problem. If a non-performing contractor fails to improve performance after repeated warnings, it will be replaced.

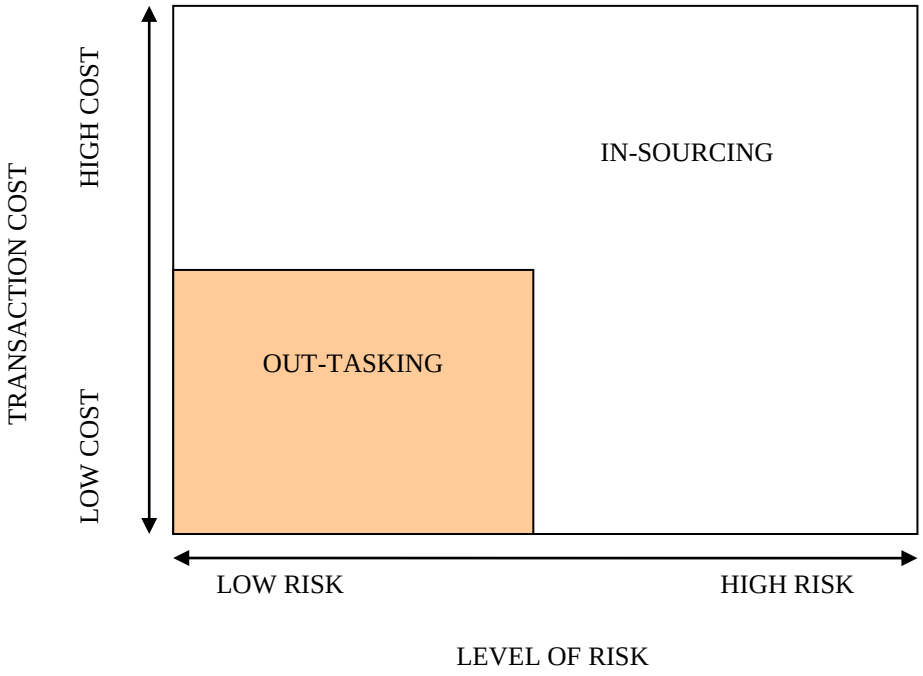
3. Emergence of Out-tasking

As a result of intense market competition, there is tremendous pressure for an organization to minimize cost. Downsizing and outsourcing are the preferred strategies of many organizations to stay lean. In order to make efficient use of limited resources, different strategies can be adopted in accordance with the decision matrix of sourcing purpose and sourcing scope. Concerning essential services, selective outsourcing is feasible to realize cost saving (Kakabadse & Kakabadse, 2000; Williamson, 1985). Selective outsourcing of essential services is also known as out-tasking. The contractor is required to provide maintenance service to a physical asset which is essential to the organization.

The rationale for out-tasking may also be explained in terms of transaction cost economics. If the maintenance service can be performed more efficiently by a contractor, it will not be performed by in-house resources. The proliferation of out-tasking is also favoured by the development of lean facility management organization. It is not cost-effective to employ a full time technician to perform maintenance work that often does not demand his service. However, there can be exception out of risk consideration. If the risk is too high in terms of possible interruption to business or production operation, the maintenance service is considered critical and should better be done by the in-house technical team (Hui & Tsang, 2004; Then, 1996).

Therefore, in-sourcing is recommended for maintenance of critical physical asset where acquisition of the requisite capability is of strategic importance. The in-house technical team has to be competitive in terms of customer service and technical performance. Out-tasking is recommended for the maintenance of essential physical asset when efficiency enhancement is the main purpose, on condition that the risk is not too high (Hui & Tsang, 2004). (See Figure 2)

Figure 2. Criteria of Out-tasking



The implementation of out-tasking has resulted in the establishment of a network of contractors. Due to the variety of tasks and specific skill requirement for each, the facilities manager has to match contractors with tasks. The objectives are quality and efficiency. In order to ensure that the cost of each task is reasonable, a few quotations have to be sought from a list of pre-qualified contractors as far as practicable. Unit rates are included in the

quotations. In most of these cases, the contractor with the most competitive offer will be selected. Sometimes, the second lowest quotation may be selected on technical grounds.

4. Challenge of Contractor Control

Managing contractors that render out-tasked services is a challenge. When the related physical asset is technically complex, communication can be an issue as the contractors are not based at the site. The requirement of service response varies from task to task. The linkage between the client and the contractor may form and break from time to time.

In view of the complexity of maintenance activities, it is impractical to specify all contingencies in the service agreement. The stake to the client is high should the contractor fail to perform the task correctly. When this happens, it may be difficult to determine definitely which party should be responsible and the extent to which it should be held responsible. Replacing the contractor after a costly incident is too reactive and may not be acceptable to the internal customers. As always, prevention is better than cure.

An alternative is to adopt a proactive approach through contractor relationship management. By means of relational control, it is possible to enhance contractor commitment and reduce possible opportunism that are essential to an effective governed relationship (Joshi & Stump, 1999b). Through socializing with the contractor, it is possible to narrow information asymmetry and internalize long term objectives (Achrol & G.T., 1999; Gallouj, 1997; Wathne & Heide, 2000). If the contractor treasures the long term business relationship with the client, it is unlikely that the contractor would trade its long term interests for short term gains. Besides, the more the contractor understands the priorities and concerns of the client, necessary precautions would be taken to ensure the quality of the maintenance task.

The benefits of partnership are widely advocated in literature (Belinski & Koehler, 1995; Blumberg, 1998; Campbell, 1995; Fan, 2000; Fitzsimmons, Noh, & Thies, 1998; Zeffane, 1995). However, opportunity cost is always incurred. Partnership needs investment of time and effort. Can the client afford nurturing a close relationship with all of the contractors? The physical assets to be maintained through out-tasking are not likely to be identical, each requiring different types of maintenance services. It is not appropriate to treat all contractors as equals. Regarding the strategy of controlling possible opportunism, there are options ranging from contractual control to relational control. Between these two extremes, there can be intermediate options where some degree of partnership on top of a contract would be appropriate. How to determine the optimal balance of contractual control and relational control for maximum cost effectiveness? The model presented below is an attempt to address the issue.

5. Inter-organizational Relationship

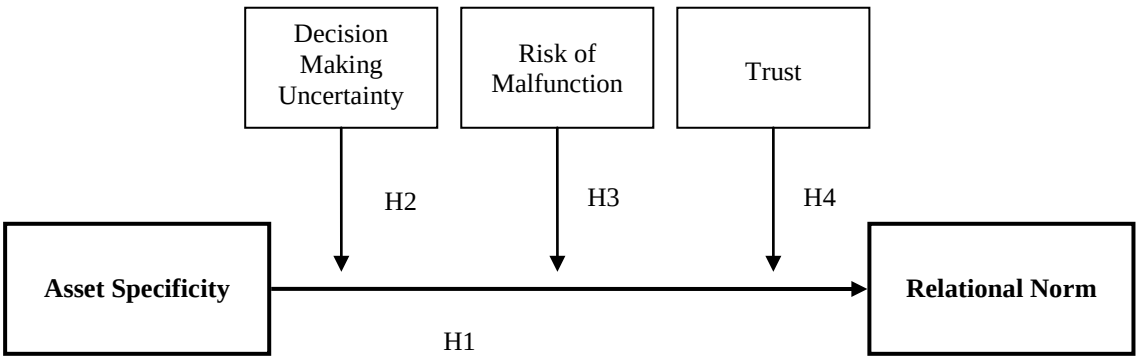
In the practice of out-tasking, the client typically has to work with a large number of contractors. In time, the client establishes a business network of contractors. From a strategic perspective, contractor relationship management is a critical up-stream issue in the value chain. The development of a productive contractor relationship becomes imperative. In order to effectively manage the network of contractors, it is important to understand the mechanism of inter-organizational relationship.

The previous research of Joshi and Stump (1999a) on inter-organizational relationship provides a theoretical model in the manufacturer-supplier context. Relational control is possible through joint action which is contingent upon asset specificity and environmental factors such as trust and decision making uncertainty (Joshi & Stump, 1999a).

As far as the relationship between companies is concerned, there are similarities between the manufacturer-supplier context and the client-contractor context — the manufacturer and client are buyers; the supplier and contractor are sellers. In the manufacturer-supplier context, the transaction typically involves the acquisition of physical goods. The manufacturer has some dependence on the goods. In the client-contractor context, typically services are purchased to ensure availability, or effective and efficient operation, of a physical asset that can be a machine, a vehicle or part of a building. The client has considerable stake in the well being of the physical asset.

In Joshi and Stump's model, the dependent variable is Joint Action which is defined as the extent of co-operation between the manufacturer and supplier in activities of product development, costing and production. However, 'Joint Action' in that model is not appropriate in describing the relationship between the client and the contractor. Usually, the contractor carries out the work without the direct participation of the in-house technical team. Relational Norm is defined as the extent of sharing of values and know-how, as well as partnering relationship between the client and its contractor (Atz & Brush, 2000; Joshi & Arnold, 1998). Based on a discussion forum with facilities managers, 'Relational Norm' is chosen rather than 'Joint Action' to describe the notion of relational control. When 'Relational Norm' is low, the client-contractor relationship is characterized by buy-sell transactions governed by the contract terms. When 'Relational Norm' is high, however, the client-contractor relationship is intimate, with the hallmarks of a partnership. Figure 3 shows a modified version of Joshi and Stump's model that could be applicable to specify the best practice of client-contractor relationship in out-tasking.

Figure 3. The Relationship between Asset Specificity and Relational Norm



Asset Specificity relates to the amount of investment dedicated to a particular contractor. When Asset Specificity is high, it will require considerable investment in effort and time (high switching cost) to develop a new contractor to take over the maintenance service provided by the existing contractor. In such case, managing the inter-organizational relationship and the possible opportunism in pursuit of superior maintenance performance becomes a challenge. The relational exchange theory informs the manager in selecting an approach to curtailing opportunism. Socialization is a typical form of relational control. It is therefore necessary to study the effect of Asset Specificity on Relational Norm.

Hypothesis H1: There is a positive relationship between Asset Specificity and Relational Norm.

In the manufacturer-supplier context, Decision Making Uncertainty (DMU) is an environmental variable. Its moderating effect is also examined in client-contractor context. It relates to the level of difficulty in exercising control over contract management. DMU is high when the client does not have adequate knowledge of the failure modes, mitigation measures, maintenance response or cost implications. When highly specific asset is involved and DMU is high, the client will become wary of possible opportunistic acts of the contractor. In such cases, the client would adopt a proactive approach of imposing more relational control on the contractor to reduce information asymmetry. For example, the client will work closely with the contractor in the planning and execution of maintenance work to gain a better understanding of operational issues. Thus, DMU may be a positive moderator for the positive relationship between Asset Specificity and Relational Norm.

Hypothesis H2: The positive relationship between Asset Specificity and Relational Norm will be enhanced with increasing levels of DMU.

In the context of client-contractor relationship, risk is an environmental variable not found in manufacturer-supplier relationships. As risk is important to management decisions, the possible moderating effect of risk in the client-contractor context cannot be overlooked (Adams, 1998; Khalil, 1997; Lonsdale, 1999). Risk assessment is usually implemented prior to major maintenance service of physical assets (Halsey, 1999; Mobey & Parker, 2002; Stickles & Firth, 1990). In case of high Asset Specificity and the physical asset has a high Risk of Malfunction, the client is likely to focus on risk reduction. Consider a scenario in which the equipment has a proprietary design and it is still operating in its run-in phase, the equipment is likely to be less reliable during this period. In response to the problem, the client would turn to the contractor (usually the equipment supplier) as a major service provider. When the service provision requires a high degree of coordination, the planning of maintenance activities will be more complicated. Hence, Risk of Malfunction may be a positive moderator for the positive relationship between Asset Specificity and Relational Norm.

Hypothesis H3: The positive relationship between Asset Specificity and Relational Norm will be enhanced with increasing levels of Risk of Malfunction.

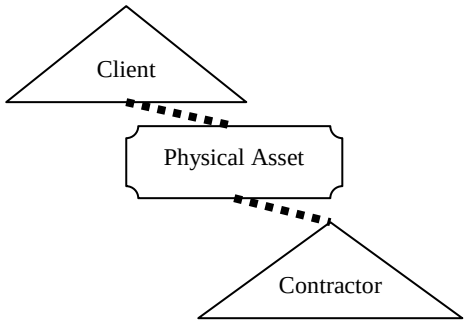
In the manufacturer-supplier context, trust is an environmental variable. This is also examined in client-contractor context. When both Asset Specificity and Trust in the contractor are high, the client will be more willing to work with the contractor as partners because it is confident that the contractor will honour what has been promised to deliver. There will be more cooperation on day-to-day maintenance activities, training, as well as work planning. So Trust in contractor may be a positive moderator for the positive relationship between Asset Specificity and Relational Norm.

Hypothesis H4: The positive relationship between Asset Specificity and Relational Norm will be enhanced with increasing levels of Trust in contractor.

6. Methodology to Test the Hypotheses

A questionnaire survey was conducted to test H1 to H4 (Hui, 2002). The focus of the research was at the organizational level and the unit of analysis was the asset-based dyad viewed by the client organization for essential assets. (See figure 4) Questionnaires were sent to facilities managers in Hong Kong based organizations randomly selected from the membership directory of Building Services Operation and Maintenance Executives Society (BSOMES) and trade directories.

Figure 4. The Asset-based Dyad



The variables in the constructs introduced above were measured on a seven-point Likert scale. Validated items in the questionnaire were used to measure these variables, for example Asset Specificity and Trust in contractor are measured with questions used in previous research (Joshi & Stump, 1999a, 1999b). Findings of the survey indicate that reliability of these measures is high, each with Cronbach's Alphas exceeding 0.8.

This study used a 'quick and simple' qualitative approach to evaluate risk in a relative

sense (Harnly, 1998). It was measured by the product of probability of failure and impact of failure; values of 1, 2 or 3 were assigned to designate 'low', 'medium' and 'high' levels of risk, respectively.

7. Analysis of Results

Out of the 100 organizations surveyed, 32 responded with 106 sets of data. Only data from respondents indicating satisfaction with the network relationship and having entered into a service contract with their contractors are used in testing the hypotheses. 74 records meet these requirements. The correlations among these variables are shown in Table 1.

Table 1. Correlations among Variables

	Mean	Standard Deviation	Asset Specificity	Relational Norm	Decision Making Uncertainty	Risk of Malfunction	Trust
Asset Specificity	4.1442	1.3465	1				
Relational Norm	4.8183	1.5377	0.543**	1			
Decision Making Uncertainty	4.6715	0.7013	-0.068	-0.280*	1		
Risk of Malfunction	2.7027	1.6858	0.280*	0.318**	0.139	1	
Trust	5.5832	0.8474	-0.139	0.143	-0.183	-0.140	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

By means of ANOVA, the interaction effects among variables are examined. (See Table 2) The data suggests that there might be interaction effects between a) Asset Specificity and Decision Making Uncertainty ($F = 2.963$, $p = 0.002$); b) Asset Specificity and Risk of Malfunction ($F = 2.429$, $p = 0.01$); and c) Asset Specificity and Trust ($F = 3.096$, $p = 0.002$). Furthermore, the interaction terms in the regression equation is examined. The partial correlations controlling for the product of each pair of variables under study are determined. At 5% significance level, the data only supports a negative interaction effect of Asset Specificity and Risk of Malfunction. (See Table 3)

Table 2. ANOVA Testing of Interaction Effects on Relational Norm

Term being Controlled	F	2-tailed significance
Asset Specificity and Decision Making Uncertainty	2.963	p = 0.002**
Asset Specificity and Risk of Malfunction	2.429	p = 0.010*
Asset Specificity and Trust	3.096	p = 0.002**

*. F is significant at the 0.05 level (2-tailed).

**. F is significant at the 0.005 level (2-tailed).

Table 3. Partial Correlations of Relational Norm

Term being Controlled	Coefficient	2-tailed significance
Asset Specificity and Decision Making Uncertainty	-0.0462	p = 0.700
Asset Specificity and Risk of Malfunction	-0.2684	p = 0.023*
Asset Specificity and Trust	-0.1291	p = 0.280

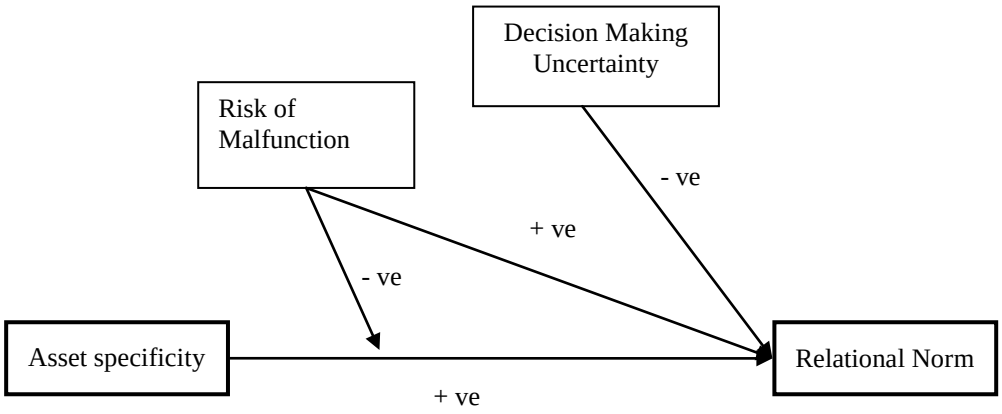
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 summarizes the results of hypothesis testing. Figure 5 shows the model of inter-organizational relationship between the client and the contractor as determined by this empirical study.

Table 4. Results of Hypotheses Testing

Hypotheses	Test Results	Remarks
H1	r = 0.543, p < 0.01	There is a positive relationship between Asset Specificity and Relational Norm.
H2	r = – 0.0462, p > 0.05	Not supported
H3	r = – 0.2684, p < 0.05	The positive relationship between Asset Specificity and Relational Norm is attenuated when Risk of Malfunction is increased.
H4	r = – 0.1291, p > 0.05	Not supported

Figure 5. The Model of Client-Contractor Relationship



Relational Norm = 3.521 + 1.022 × Asset Specificity + 1.142 × Risk of Malfunction – 0.76 × Decision Making Uncertainty – 0.161 × Asset Specificity × Risk of Malfunction

7.1. ***Main Effect of Decision Making Uncertainty***

There is empirical support for Decision Making Uncertainty to have a negative relationship with Relational Norm. (See Table 1)

Probably it has something to do with the time horizon of planning. In the case of high Decision Making Uncertainty, the client cannot afford to maintain long-term relationship with its contractor. Regardless of the value of Asset Specificity (switching cost) to the client organization, the facilities manager is more concerned with control issues now than in future. In such case, establishing long-term partnership relationship with contractors would not be a top priority issue, and the client organization tends to tighten the control of external service providers through contracts. That is, a low level of Relational Norm is preferred regardless of Asset Specificity when DMU is high..

7.2. ***Main Effect of Risk of Malfunction***

There is empirical support that Risk of Malfunction has a positive relationship with Relational Norm. (See Table 1)

When the Risk of Malfunction is high, complexity of the task may pose considerable challenge to the related parties and a cooperative relationship between them would be more effective in servicing the physical asset. To perform the repair work in situ, teamwork and effective communication between both parties would be crucial to minimize downtime. For

long-term solutions involving system re-design and development, well coordinated teamwork between the client and its contractor would produce more effective joint actions.

Contrary to the above expectation, the survey results indicate that combining high Risk of Malfunction and high Asset Specificity will attenuate the positive relationship between Asset Specificity and Relational Norm. This behaviour can be explained as in such situation the stake is too high for the short term, thus driving the facilities manager to adopt a contractual approach to ensure a cost-effective solution is found in a timely manner.

7.3. *Trust is Irrelevant for Relational Norm*

There is no empirical support for Trust to have any effect on Relational Norm. (See Table 1) This is an interesting finding. A possible explanation is that all the usable data are of high trust values. If the contractor is not trust-worthy, sustainable business relationship between the client and the contractor might not exist in the first place.

8. Discussion

Out-tasking is commonly practised in facilities management. As a result, the client organization has to work with a network of contractors. As the task concerns with essential maintenance, the control of contractor performance has become complicated. This paper presents an empirical model to determine the appropriate form of relationship with each contractor to obtain cost effective out-tasked maintenance services.

Building on a previous research in the manufacturer-supply context, an adapted model is proposed in the client-contractor context. Relational Norm is used instead of Joint Action to measure the extent of relational control. Through questionnaire survey, hypotheses are tested. The use of Relational Norm in place of Joint Action as the dependable variable is supported by empirical data. The correlation coefficient between Relational Norm and Joint Action equals 0.733. It is found that there is positive effect of Asset Specificity on Relational Norm. This effect is negatively moderated by Risk of Malfunction. There is a positive effect of Risk of Malfunction on Relational Norm. Also, there is negative effect of Decision Making Uncertainty on Relational Norm.

From the result of ANOVA, Decision Making Uncertainty and Trust might have interaction effect on the relationship between Asset Specificity and Relational Norm. However, they failed the test in regression analysis. This suggests that the interaction terms do not have linear relationship with the dependable variable. For information parsimony, they are excluded from the equation. This should not have significant effect on the prediction of Relational Norm. As Trust has no main effect on Relational Norm and the main effect of Decision Making Uncertainty is included in the equation, the exclusion of these two possible interaction terms might contribute to a small error.

The mathematical model given in Figure 5 offers a simple tool for determining Relational Norm. It has practical value to the facilities manager who has to formulate the appropriate policy for managing the relationship with a contractor. For field implementation, the suggested tactics, control, time horizon and means of exchange for different levels of Relational Norm are presented in Table 5.

Table 5. Relational Norm as a Policy Tool

Relational Norm	Tactics	Control	Time Horizon	Means of Exchange
High	Win-win Synergy	Culture Internalize goals	Long Term	Intangible Value
Medium	Win-win Motivation	System Internalize goals	Medium Term	Tangible Reward
Low	Zero Sum Competition	Legal Contract Externalize goals	Short Term	Tangible Penalty

For situations which predict a low Relational Norm, not only that the client would negotiate for a more favourable contract, the contract would be detailed to the extent that it covers bill of quantity, method statements and virtually every conceivable contingencies with penalty clauses and legal proceedings in the event of default by the contractor. During execution of a maintenance task, control is maintained at the working level. The contractor's service would be monitored and controlled closely. For example, there may be on-site supervision, surprise checks, electronic surveillance, progress reports, complaints, warnings and replacement.

For situations which predict a high Relational Norm, the client would foster an atmosphere of shared values, information sharing and partnership. Protected by the terms and conditions of the service contract, the client would socialize with the contractors' managers in adopting a win-win approach and taking the long-term interest of the company at heart. It is expected that the contractor would reciprocate by acting honestly and professionally in rendering maintenance services that will protect the client's long-term interest.

Using data from a case study on a logistics centre, the values of Relational Norm for selected physical assets are evaluated from the model shown in Figure 5. (See Table 6) Relational Norm measured on a 7-point Likert scale may be considered low if the value is less than 3. It is high if the value is over 5. Those values between 3 and 5 may be considered as medium.

The calculated Relational Norm is a recommended value based on the regression model. To allow for margin of error, some customization is necessary for implementation of the model's recommendation. The organization may have to exercise discretion in adopting slightly higher or lower relational control to suit its unique situations.

Table 6. Examples of Application of the Model of Client-Contractor Relationship

Physical Asset	AS	Impact	Probability	Risk	DMU	Relational Norm	Remarks
Automated Process	5	2	1	2	4	6.26	High

Steam System	2	3	1	3	4	4.98	Medium
Central Air-conditioning	5	1	1	1	5	5.17	High
Capacitor Bank	1	1	1	1	4	2.48	Low
Fork Truck	1	1	2	2	4	3.46	Medium

It is worth noting that Asset Specificity, Risk of Malfunction and Decision Making Uncertainty are not static. A few strategic options are available to the client maintenance organization to control these variables. These options are discussed below.

8.1 *Asset Specificity*

In a scenario where several contractors are capable of maintaining an asset, Asset Specificity is likely to be low because the client can switch contractor easily. In a scenario where only one competent contractor exists to service the asset (Asset Specificity is high), the client's bargaining power may be weakened. However, even if there is no readily available alternative contractor, competition may still be created by developing the competence of in-house technical staff. In case of unsatisfactory performance of the contractor, the in-house technical staff with the requisite know-how may step in to take the contractor's place. This is a temporary arrangement until an alternative contractor is identified and developed to take up the responsibilities.

8.2 *Risk of Malfunction*

In a scenario where there is built-in redundancy, such as the case where multiple sets of identical equipment have been installed, the perceived risk will be lower. Even if there is no built-in redundancy, risk may also be reduced either by improving the reliability of key components or by implementing an effective preventive/condition-based maintenance program.

8.3 *Decision Making Uncertainty*

According to the model, a high degree of Decision Making Uncertainty favours contractual control towards the external service provider. This suggests that the client should enter into a maintenance service contract with clearly defined detailed requirements. In addition, the performance target should be specific, measurable, achievable, realistic and timed (SMART). For example, the contractor should have a pledge of response time. Furthermore, it is advisable to have a contingency plan in place. The senior management should test the contingency plan regularly to ensure that the personnel concerned are familiar with the latest version of contingency procedure, and necessary resources such as communication facilities, back up power, tooling and materials are available on demand.

9. Summary and Conclusion

This paper presents a decision framework for in-sourcing and out-tasking. According to the framework, the in-house technical staff are sized and trained to manage assets that are critical for sustaining the organization's business operations. When servicing of essential

assets can be more economically performed by a contractor, a common situation in facilities management, out-tasking will be a sensible decision. The practice of out-tasking creates a business network of contractors that provide scheduled as well as on-call technical services. The client organization has to formulate an appropriate policy that may range between contractual control and partnering, in managing each contractor.

Based on the findings of an empirical study on the best practices of facilities management organizations in Hong Kong, a model has been developed to determine the effective form of relationship between the client and the contractor in a multi-contractor business network. With this tool, the appropriate Relational Norm for effective client-contractor relationship can be evaluated from known values of Asset Specificity, Risk of Malfunction and Decision Making Uncertainty.

The value of Relational Norm obtained from the model provides guidance to the client organization in formulating a cost effective policy for managing its contractors. If the model suggests a low value of Relational Norm, the client should implement contractual control. This form of relationship incurs higher transaction costs arising from tighter work supervision and performance monitoring. If the contractor fails to deliver satisfactory performance, it will be replaced through the market mechanism. When the model suggests a high value of Relational Norm, the client should invest in developing long-term partnership relationship with its external service provider. This has the benefit of saving the huge transaction cost of performance monitoring. The level of supervision should be similar to that of managing the in-house technical staff. The model helps facilities managers in optimizing the use of limited resources in physical asset management, enabling the client organization to operate with a lean structure without compromising its commitment to a high standard of service quality.

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