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THE UNIVERSITY OF HONG KONG

AN EXAMINATION OF JANITOR SERVICES SOURCING FACTORS IN SECONDARY SCHOOLS IN HONG KONG

A DISSERTATION SUBMITTED TO THE FACULTY OF ARCHITECTURE IN CANDIDACY FOR THE DEGREE OF

BACHELOR OF SCIENCE IN SURVERYING

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION

BY

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HONG KONG

APRIL 2009

DECLARATION

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

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ABSTRACT

It seems now a common act for organizations to outsource their property management services. Even at the HKSAR government 2002 audit report, outsourcing of janitor services in schools was recognized as a cost saving measures and more outsourcing of janitor services at schools had been suggested in the report.

Despite of the cost-reduction benefit of outsourcing, it is observed that most HKSAR schools still employ in-house janitors. The reasons behind their sourcing decisions for janitor services are examined in this dissertation. Factors are identified from the literature review and pilot interviews with secondary schools' principals. A path model is established to investigate the relationships between the factors and schools' sourcing decisions for janitor services. Path analysis has been used as the analytical tool to explore the relative importance of the factors and their corresponding weighting to the schools' sourcing decisions for janitor services. With better understanding of the factors for schools sourcing decisions for janitor services, a more efficient and smooth transition system could be suggested.

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CHAPTER ONE INTRODUCTION

1.1 Background and Scope of Study

This research area was triggered by an audit report of Education Department (2002). The report found that schools could save money from the outsourcing of janitor services. However, only 1 school out of 18 investigated outsources part of their janitor services. The audit report estimated that if all schools outsource part of their janitor services, there could be annual savings of some \$100 million in longer term. In other words, large savings could be achieved if schools adopted the outsourcing of janitor services instead of employing in-house staff. This estimation, however, is based on the outsourcing experience of 1 school only. Great estimation error might be resulted due to the single data source. The fact that the subject school could save money by outsourcing their janitor services might subject to the specific conditions of the school. The case has limited generalization power that it might not be applicable to all schools in Hong Kong. Thus, the estimation of the audit report (2002) might not be appropriate because of its limited research sample size.

Nevertheless the error in doubt, the accuracy of the estimation could not be justified without the financial data of the schools which are hardly obtainable. Hence, the conclusion of the report cannot be proved due to the restriction of financial information of schools.

However, even with the doubt of the correctness of the estimation, there are still questions about the schools sourcing decisions for janitor services. It is clear that there are 2 sourcing systems available for schools to choose between. What are the key factors behind their choices? Thus, despite the few numbers of schools adopting an outsourcing approach, the auditor report is accepted with fault and limitation. It is assumed that outsourcing of janitor services in schools is cost-reducing.

In practice, the outsourcing of janitor services is very popular among colleges and educational institutes overseas (UNICCO 2004). The feedback of outsourcing of janitor services in overseas schools is positive. It is claimed as cost-saving and more efficient(Gupta, Herath et al. 2005). Although the overseas outsourcing experience and the audit report show positive attitude to the outsourcing of janitor services, the idea is still not generally accepted by the schools in Hong Kong. Nowadays, most secondary schools in Hong Kong are still employing in-house janitor staff. Besides financial factors, there might be other common reasons or factors for HKSAR schools sourcing decisions for janitor services. Thus, it is worthwhile to study the sourcing decisions for janitor services of schools in Hong Kong.

Since secondary school facilities are more complex and they have more students, outsourcing of janitor services might be more popular among secondary schools. Thus, this dissertation would focus on the outsourcing of secondary schools janitor services.

1.2 2002 Audit Report

The audit report was prepared by the Audit Commission Hong Kong and released on the 15 October 2002. The report investigates the general revenue account of the Government of the Hong Kong Special Administrative Region. This dissertation refers to the Chapter 10 of this report. It was about the administration of primary schools in HKSAR. The objective of this part of audit review was to ascertain whether the major areas of administration in aided and primary schools function properly to support the provision of quality primary education. 18 primary schools were selected randomly for investigation.

The audit report made many recommendations as to the primary schools' management. One of the recommendations related to the management of janitor staff. Of the 18 schools reviewed, only 1 school has outsourced part of the janitor services. The school originally employed 10 in-house janitor staff. In year 2001-2002, it employed 5 outsourcing janitor staff for the work below:

- a) locking doors and windows after school;
- b) watering flowers and plants and simple gardening;
- c) assisting in school activities such as decorating;
- d) transporting furniture within the school; and
- e) replacing distilled water containers.

Therefore, the number of in-house janitor staff of the school was reduced from ten to six.

The six janitor staff then shared the work below:

- a) cleaning the principal's room, staff room and school office;
- b) serving tea to teachers;
- c) delivering student exercise books and documents;
- d) manning the school entrance; and
- e) controlling traffic.

The principal of the school reported that some \$104,000 had been saved in the year 2001-02 through the outsourcing of part of the janitor activities. The audit then estimated from this data that if all aided and primary schools outsourced part of their janitor services, some \$100 million could be saved annually for other educational purposes. Thus, the audit advised that the schools should assess the costs and benefits of outsourcing their janitor services.

The Education Department responded that they noticed the benefits of the outsourcing and will encourage schools to assess the costs and benefits of

outsourcing their janitor services. However, they predicted that the outsourcing of all schools would only be possible in the longer term.

Despite the limitation of the report's accuracy, it could be seen that outsourcing of janitor services might result in enormous cost-saving for the schools even if they outsource only part of the services. Hence, there is cost-reducing incentive for the government and schools to promote the outsourcing of janitor services.

Actually, the potential market for the outsourcing of schools' janitor services should be very huge as there are many educational institutions in the HKSAR:

Level of education	2002/03	2006/07	2007/08
Kindergarten ⁽²⁾⁽³⁾	783	1015	986
Primary ⁽³⁾	862	726	689
Secondary ⁽³⁾⁽⁴⁾	624	635	636
Post-secondary ⁽⁵⁾	30	35	35
of which			
Degree-awarding institutions	11	12	12

Table1.1 Number of educational institutions in HKSAR

Above figures are the numbers of educational and training institutions in HKSAR. Although the total number of educational institutions has decreased in the year 2007/08, it still is a big and potentially attractive market for the property management companies.

1.3 Janitor Services Management of HKSAR Secondary Schools

There are mainly four types of secondary schools in HKSAR which are:

a) Government Secondary Schools (6.79%)^{*}

- b) Aided Secondary Schools (70.75%)*
- c) Direct Subsidy Scheme Secondary Schools (8.23%)^{*}
- d) Private Schools (10.75%)^{*}

Government and aided secondary schools are financed through a government grant annually. The schools' administration is governed by the Codes of Aid and the School Administration Guide issued by the Education Department.

According to the CAPS (for aided schools) and the Education Department's circulars (for government schools), the number of janitor staff employed by a school is calculated according to the number of classes/classrooms and the number of special-purpose rooms which are operated in the school premises.

According to the Education Department's circular 005/1999 and the School Administration Guide 7.2.3(2) & (3), schools have flexibility in the use of the administrative grant to employ administrative staff and janitors to

^{*} 06/07 statistic from Education Bureau

meet their specific needs and the schools can employ in-house janitor staff or contract out the services.

The aided government schools are provided with an annual Operating Expense Block Grant (OEBG) to meet their operating expense. Similarly, the government schools are given the Subject and Curriculum Block Grant (SCBG) for their schools expense. The grant is made up of 2 separate parts:

 a) General Domain: It covers most of the recurrent grants including Administration Grant.

b) Special Domain: It covers grant for achieving specific policy objectives.

The Education Department allows both government and aided schools to retain their surplus up to 12 months' provision of the OEGB/SCBG. Surplus of General Domain could be used to top up expenditures for the special domain or other items chargeable outside the OEGB/SCBG.

Thus, the government and aided schools could choose whether to contract out their janitor services and are able to retain the savings for other educational purposes. For the direct subsidy schools, they are financed by the government through a system of block subsidy which is based on the average unit cost of an aided school place. The amount of the block subsidy that the DSS schools receive depends on their enrolment and the levels of fee charged. The DSS schools enjoy greater flexibility in curriculum design and resource allocation. Hence, they could also choose to outsource janitor services.

The private schools which do not receive government grant have responsibility for their own profit and loss. Hence, there might be greater cost-saving incentive for them to outsource their janitor services.

1.4 Research Questions

The Government auditor report clearly shows that the outsourcing of schools janitor services is cost-saving. Schools are allowed to contract out their janitor services under the regulations. They can keep the money saved and use it for other education purposes. Hence, there are cost-saving incentives for the outsourcing of secondary schools' janitor services. However, only some secondary schools currently outsource their janitor services while many of others still employ in-house janitors. Thus, the following research question would be investigated in this study:

"Given the cost-reducing incentives by outsourcing of janitor services, why there are some schools outsource but others do not?"

1.5 Objectives

To answer the research question above, this dissertation aims:

- to examine the motivation factors for the outsourcing decision of the secondary schools
- (ii) to examine the resistance factors for the outsourcing decision of the secondary schools
- (iii) to identify the relative importance of these factors for the schools with different background

(iv) To find out the weighing of effect of each factor on the schools' janitor sourcing decision

1.6 Research Methodology

In this study, a research structure is designed to address the above research question. First, a literature review will be carried out to identify the key motivation and resistance factors for outsourcing. Then, a pilot study composed of interviews will be carried out in order to understand the existing situation of the operation of janitor service in the schools.

To further investigate the results of the prior study, questionnaires will be designed and distributed to the schools principals to collect their views on the schools' janitor services sourcing system. The data collected would be analyzed through a series of statistical analyses.

Path analysis is chosen as the major analysis methodology in this study. It is a common analytical tool used in sociological or behavioral science researches.

It can cope with unobservable variables and is particularly suitable for studies collecting data by questionnaires. It could be used to predict the direct and indirect relationships among variables. The significances of hypothesizes could also be tested using path analysis.

The result is usually presented in a path diagram where relationships among variables are clearly shown and could be easily understood. Although path analysis appears to be a new tool in real estate research, it is becoming more and more popular in researches relating to outsourcing (Walker and Weber 1987; Ang and Straub 1998; Sun, Lin et al. 2002; Rajabzadeh, Asghar et al. 2008). Details of path analysis would be discussed at Chapter 6.

The hypothesized model would be tested and fine-tuned after model evaluation. Base on the results of model analysis, the resistance and motivation factors for and their corresponding weighting to the outsourcing of schools janitor services could be obtained.

1.7 Significance of the Research

According to the estimation in the government Audit report (2002), a substantial sum of money could be saved through the outsourcing of schools' janitor services. Since most of the HKSAR schools are government operated or aided, their operation cost is actually funded by the tax-payers. It is the government's responsibility to use tax-payers' money carefully and efficiently. If it is more efficient to manage the janitor services operations by market system than by in-house janitors, it is logical and sensible to shift the schools janitor services sourcing system from traditional in-house to outsourced management approach. It is a deadweight loss of social resources if a less efficient way of management is used. Through outsourcing their janitor services, schools could use the money saved for other educational issues. The resources would be better utilized in that way because the loss of the resources is reduced. The society could be benefit as a whole. Thus, it is necessary to identify the reasons behind the schools sourcing decisions for janitor services so as to shift the sourcing system smoothly and effectively.

In addition, the findings of this research could also have academic value. Actually, many of studies have been conducted to investigate business process outsourcing (BPO), little research is related to outsourcing in public or nonprofit organizations. In compare to traditional business outsourcing, nonprofit organizations may have other concerns than just financial savings. Besides, although there are many analytical tools in real estate research, not all of them are applicable to assess the factors for decision making process. This research could fill the knowledge gap and introduce an alternative and suitable tool for studies related to decision making.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

Detailed literature review has been carried out in this chapter. Historical development of outsourcing is introduced. Theories related to the choice of boundaries of firms are studies to explore the common motives and resistance for outsourcing.

2.2 Background of Outsourcing

Outsourcing is defined as

'... the transferring of an internal business function or functions, plus any associated assets, to an external supplier or service provider who offers a defined service for a specified period of time, at an agreed but probably qualified price'. (Heywood 2001)

Outsourcing is now a common management idea among both public and private organizations. It is one of the most important phenomena that induce organizational restructuring in the last decades. (Merino and Rodriguez 2007) Increased global competition makes more organizations to realized that the key to survival is not 'high volume' but, instead, 'high value'. Outsourcing has become the common mean for organizations to achieve 'high value'. (Gupta and Zhendeer 1994)

Nowadays, outsourcing is not only regarded as making or buying decision. It is implemented as the business strategy. By strategic outsourcing and focusing on the companies' core competencies, managers can leverage their firms' skill and resources.(Quinn and F.G.Hilmer 1994) Thus, firms need to recognize and reassess which company activities are not core and to decide whether to make it (produce by the company itself) or to buy it (outsource to a third party). (Lewin and Johnson 1996)

2.3 Historical Development of Outsourcing

In the post-war periods, companies were encouraged to conglomerate horizontally or vertically so as to achieve economies of scales, obtain greater market power and gain more security and control (Lonsdale and Cox 2000).

However, these diverse companies started to recognize that they were actually under-performing the market in the 1970s. They were enjoying lower rates of return than the market(Rumelt 1974). The situation became even worse in the early 1980s due to the global concession. Ideas of downsizing and focusing on core competence were emerged.

The earliest industries conducting outsourcing was actually from the UK public sectors. (Rajabzadeh, Asghar et al. 2008) Due to the global concession at the 1980s, the UK government was forced to cut cost. The non-liberal parties tried to save money by privatization and contracting-out elements in the public sector. One of the major areas to be outsourced was the facility management. Followed by the Competing for Quality White Paper, outsourcing started in UK local government in the 1980s and then moved to the central government in the 1990s.

As pointed out by Lonsdale and Cox (2002), great influences had been made by the outsourcing practices of the UK government. One of the major influences was that companies recognized that external contractors could actually provide goods and services more effectively and efficiently than in-house departments. It induced more organizations, both public and private, to start considering outsourcing of their non-core business.

2.4 Janitor Services and Facility Management

Janitor services are parts of the facility management of the school. Facility management (FM) is defined as the management of infrastructure resources and services to support and sustain the operational strategy of an organization over time(Nutt 2004). Two levels, operational and strategic levels, are involved into facility management. (Barrett 1995) Operational FM involves the business's day-to-day activities. Effective operational FM could provide a safe and efficient working environment to support the firm's core business. (Chotipanich 2004) Working scopes of the janitors are mainly daily cleaning and security which are parts of the operational FM.

Since the 1980s, outsourcing of supportive services has been developed quickly among various areas and businesses. Outsourcing of labour-intensive operations such as cleaning and security services had been becoming very common during the 1990s. From the PA Consulting Group's International Strategic Sourcing Survey below, statistics is shown for the outsourcing development trend in the 1990s over different disciplines:

Business activity	Outsourced by 1991	Outsourced by 1996	Will have outsourced by 2001
Property services	13	42	46
Application development	5	29	41
IT technical support	4	21	34
Legal services	7	19	27
Distribution/support	9	21	24
Infrastructure maintenance	4	10	14
Manufacture/assembly	6	9	12
Source: Adapted from PA Consulti	ng Group, 1996, p. :	8	

Table 2.1	Trends in	Outsourcing	(Group	1996)
	_			

Property services such as security and janitor services are the most popular functions under outsourcing due to its simple job nature(EIU/AA 1995). As shown in the Table 2.1, property services were the most commonly outsourced function compared to other business supportive functions.

2.5 Theories related to Outsourcing Decision

Due to the growing importance and increasing implementation of outsourcing, significant numbers of studies have been done on this topic. Drivers (i.e. motivation) and obstacles (i.e. resistance) of outsourcing practices are studied by many researches. Researches are mainly done from the theoretical perspective (Trunick 1989; Quinn and F.G.Hilmer 1994; Razzaque and Sheng 1998; Lankford and Parsa 1999; Kakabadse and Kakabadse 2000; Jennings 2002; Lynch 2004) or from a practical perspective (Corbett 1998; Fan 2000; Bolumole 2001; Al-Qirim 2003; McIvor 2003; Beaumont and Sohal 2004; Kakabadse and Kakabadse 2005) Management and economic theories are used to explain these outsourcing determinants. In this literature review,
two basic theories, (a) transaction cost economics and (b) agency theory, are reviewed to identify the key variables to the outsourcing decision.

2.5.1 Transaction Cost Economics

Transaction cost economics (TCE) has been the predominant theory to explain outsourcing in the past decades. (Espino-Rodriguez, Lai et al. 2008) TCE identifies the factors that should be considered when making the outsourcing decision. The main purpose of the TCE is to explain why one type of institutional arrangement is better than others for certain transactions or transactional relationships. (Greenberg, Greenberg et al. 2008) Coase (1937) suggested that the type of institutional arrangement chosen for a transaction depends on the transaction cost involved in it. A firm will replace the market when the costs of transaction within the firm are less than the costs of transaction through the market. (Coase 1937)

3 critical factors which are asset specificity, transactional uncertainty and transactional frequency (Williamson 1979; Williamson 1985; Williamson

1996) are suggested to be the characteristics of the transaction. TCE suggests that the type of transaction (whether to outsource or insource) depends on the above 3 factors.

2.5.1.1 Asset Specificity

Asset specificity is the degree to which the assets involved in the transactional relationship are not transferable to other activities or relationships (Greenberg, Greenberg et al. 2008). It has been empirically shown that the outsourcing decision largely depends on the specificity of the assets involved in the exchange (Shelanski and Klein 1995; Argyres 1996; Poppo and Zenger 1998). The degree of asset specificity depends on the degree of standardization of the transaction. An asset is said to have lower value in its next best use if its related investment is more specialized(Palay 1984). Asset specificity comprises the following:

a) site specificity;

b) the specificity of physical assets that occurs when specialized components or equipment are used in performing a transaction; and c) the specificity of human resources, which is related to the level of training and special skills required be staff to be able to execute the operation.

(F.Espino-Rodriguez, Lai et al. 2008)

Site specificity refers to the cost of moving or relocating the assets involved in the transaction for other transactional relationships. If the relocation cost is high, site specificity is presence. Physical asset specificity relates to the special investment for a particular trading relationship. Human resources specificity includes the expertise or specialized knowledge and skills for a particular employer/employee relationship. It is not transferable to other transactional relationship due to the limited relevance to other job situations. (Lamminmaki 2005)

Arnold (2000) pointed out that object with low specificity can be governed with an external outsourcing design. Since much information has to be exchanged before, during and after the transaction with high asset specificity, high market transaction cost would be resulted. Thus, internal sourcing system is preferable to be adopted. In contrast, little information has to be exchanged for goods or services with low asset specificity. There are lots of suppliers and buyers in the market and thus economics of scale could be achieved. Hence, services with low asset specificity are more possible to be outsourced. (Arnold 2000)

Janitor functions including cleaning and security services in secondary schools are usually regarded as low asset specificity. The services are highly standardized and require not much specific equipment or knowledge. There are many secondary schools and economics of scales could be achieved. Hence, schools could enjoy cost-reducing by outsourcing their janitor services.

Specificity is closely related to the strategic importance of a transaction. (Arnold 2000) Outsourcing of low-specificity activities could let the firm focus on their core competencies. Quinn (1999) pointed out that firm should focus in their core competency and outsource those non-core activities so that they could leverage their internal innovation capabilities. Quinn and Hilmer (1994) said that

"If supplier market is totally reliable and efficient, rational companies would outsource everything except those special activities in which they could achieve a unique competitive edge, i.e. their core competencies."

It is critical for the firm to determine which activities are non-core and should be outsourced. Usually, 3 types of activities are classified in a firm, which are 1) core functions that have best-in-world capability, 2) essential functions that is demanded by customer or generating the core functions and 3) non-core activities that does not generate core competencies. (Quinn 1999) The operations with high-specificity are the core functions while the functions with medium asset specificity belong to the essential activities. The low asset specificity functions are those non-core activities. (Arnold 2000)

The core activities for secondary schools would be education. Janitor services are only supportive functions to facilitate the core activity. It could be provided by the third party. Thus, the schools could leverage their resource and focus on their core competencies. Less human resources are required for the janitor services. Therefore, the teaching staff could have more time to deal with the education affaires. Hence, 'Focus on core business' would be one of the motivation factors for the outsourcing of secondary schools janitor services.

2.5.1.2 Uncertainty

There are uncertainties to the transactional environment as well as to the transactional parties.(Greenberg, Greenberg et al. 2008) Transaction parties have to adapt to the problems of uncertainties which coming from unforeseeable changes such as technological changes.(Hirschheim, Heinzl et al.) Uncertain environment might also be created when there are cultural differences between the client's and the external suppliers' organization. Transfer of their own domain knowledge would become very costly or even impossible under this situation(Greenberg, Greenberg et al. 2008).

Besides, parties in TCE are described as bounded rational and opportunistic. It means that the contingencies of the transactional relationship are unforeseeable. A full and complete contract cannot be written.(Greenberg, Greenberg et al. 2008) Poppo and Lacity (1998) pointed out that uncertainty could act with asset specificity or difficult performance measurement to make the drafting of contract more difficult. Contract should specify clauses not only to protect the specific investment assets and measure the performance of the parties, but also to facilitate adjustment for market changes.

Uncertainty of the market environment and relationship would increase the transaction cost. More time and effort would be needed for contract drafting and negotiation. Janitor service in secondary schools is not highly uncertain function. The cleaning and security services are rather standard and routine. The market environment does not subject to rapid technological revolution. Standard form of contract might be available at the market. Schools could make reference to these types of contract and thus the uncertainty and time required for contract drafting could be reduced.

However, some schools might still find it difficult to draft the specific clauses in the contract as they are unfamiliar with the arrangement of outsourcing of janitor services. Hence, "Difficulty in drafting the contract" might become one of the outsourcing resistance determinants.

2.5.1.3 Transaction Frequency

Transaction frequency relates to the frequency with which transactions involved in sourcing the same service recur.(Murray and Kotabe 1999) The frequency of transaction would affect the sourcing decision. The more often a transaction takes place, the widely spread are the fixed costs of establishing a non-market governance system.(Holmström and Roberts 1998) Williamson (1985) points out that at TCE uses frequency and asset specificity to propose an 'optimal' set of governance structure. (Table 2.2)

Frequency	Asset Specificity		
	Non-specific	Mixed	Idiosyncratic
Occasional	Outsource	Outsource with neo-classical contract	
Recurrent	with classical contract	Relational contract	Insource

 Table 2.2
 Governance Structure under Transaction Cost Economics

The frequency of transaction is measured as occasional and recurrent.

Williamson (1985) notes that for non-specific asset, outsourcing is

appropriate for both occasional and recurrent transactions as the market is

competitive and the supplier is not required to make specialized investment. Hence, transaction frequency could be considered as not a critical factor for the assets with low specificity.

The transaction frequency of the janitor services in secondary schools depends on its form of governance. For the schools employing in-house janitor, the transaction frequency could be seen as occasional as they normally seldom change the staff. For the school outsourcing the janitor services, the transaction frequency depends on the term of contract. Although the literature shows that the transaction frequency would not alter the governance form for non-specific asset (e.g. the janitor services), some schools might think it troublesome to renew the contract too often. They might need to negotiate with the supplier again and review the contract terms. Hence, 'Frequent contract renewal' is included as one of the outsourcing resistance determinants in this dissertation. "Concerned with exchanges in which one party (principal) delegates work to another (agent), agent theory endeavors to surface contractual problems arising from the assumption that the agents will behave opportunistically if their interests conflict with those of the principals......agency theory is founded on the triad of agent opportunism, information and risk," (Sharma 1997)

These contractual problems introduce agency cost to the agency relationship. Williamson (1985) notes that there are 2 basic attributes of exchange that the principal must contend: 1) monitoring cost; 2) metering cost. Another agency problem is the problem of risk sharing that arises when the principal and agent have different attitudes toward risk. Hence, they might prefer different actions because of the different risk preferences. (Eisenhardt 1989) Thus, agency problems arise and agency cost is required to write and enforce the contract.

2.5.2.1 Agency Costs

Agency costs include the costs of structuring, monitoring, and bonding a set of contracts among agents with conflicting interests, plus the residual loss incurred because the cost of full enforcement of contracts exceeds the benefits.(Jensen and Meckling 1976) To tackle with the agent opportunism, the principal has to install the information system to monitor the work of the agent. (Eisenhardt 1989) The principal might not know exactly what the agent has done. Because of the self-interest of the agent, he might deceive the principal by not acting as agreed before. Besides, the principal might select the wrong agent who does not have the professional ability or knowledge as he claimed at the time of selection. (Eisenhardt 1989) noted that the principal has 2 options to cope with this unobservable behavior (due to moral hazard or adverse selection). One of the options is to invest in information systems such as budgeting systems, reporting procedures, boards of directors, and additional layers of management. Hence, information cost is required for the principal to form the monitoring system to ensure that the service quality.

Another option is to establish outcome-based contracts (i.e. outsourcing) However, the principal has to establish a measuring system to measure the outcome of the agents if outcome-based contract is adopted. The outcome is uncertain as it could be affected by other factors such as economic state or policy changes. Risk hence is introduced to the outcome performance. The principal can transfer the risk to the agent at a price. The agent could limit the risk by specifying either fixed payoffs or incentive payoffs tied to specific measures of performance. (Fama and Jensen 1983) Thus, the principal has to pay a sum which is called residual claims by Fama and Jensen (1983) so as to transfer the risk to the agent.

Hence the principal has to trade off between the cost of measuring behavior (in-house contract) and the cost of measuring outcome (outsourcing contract). Task characteristic such as the ease of measuring behavior and the measurability of the outcome could affect the contract type. The ease of measuring behavior depends on the programmability of the task.

Programmability is defined as the degree to which appropriate behavior by the agent can be specified in advance. (Eisenhardt 1985; Eisenhardt 1988) The literatures note that behavior-based contract is more attractive for much programmed tasks since the information of the agent's behavior is more readily available (i.e. less information cost is required).

Measurability of the task also plays a role in the choice of the contract type.(Anderson 1985; Eisenhardt 1985) Some tasks require team force to complete or produce soft product which are difficult to measure the outcome within a particular time. Outcome-based contract are less attractive for these tasks since large measurement cost would be involved.

In addition, the principal is more able to assess the behavior of the agent if longer length of contract is adopted (Lambert 1983). Lambert (1983) noted that the information asymmetry between the principal and the agent would be larger for the short-term agent relationships. The principal could have deeper understanding to the agent if they engage into a longer relationship. Hence, behavior-based contracts are more preferable for long-term agency relationship. Basically, janitor tasks in secondary schools are very programmable. School janitors could work according to the school opening hours and the tasks are quite standard. The principal (i.e. school management groups) could specify the working hours and programme the tasks easily at the time of writing the contract. The outcome such as cleanness of the school is relatively easy to measure too.

However, the 'behavior monitoring cost' and the 'outcome measuring cost' are involved in both outsourcing and insourcing arrangement. Hence, the monitoring cost and measuring cost of adopting outsourcing contracts and employing in-house staff should be compared. Therefore, 'monitoring cost' and 'measurement cost' would be the resistance determinants for outsourcing.

'Length of the contract' would also affect the schools outsourcing decision. The longer is the contractual relationship between the school and the agent (either the in-house staff or the property management company), the deeper is the understanding between both parties. Lower information cost might be required by the schools to monitor the agent behavior. Thus, schools which have hired in-house janitors for a long time might be reluctant to outsourcing due to the high information cost needed to re-invest into the monitoring system. Therefore, the relation between "length of the contract" and the schools' degree of resistance to outsourcing is investigated.

2.5.2.2 Risks Perspective from Agency Theory

Entities with different risk perspective might have different 'buy' or 'make' decision. As predicted by the agency theory, risk-neutral firm is less influenced by the uncertain outcome. Some empirical results show that uncertainty does not affect the make or buy decision. For example, Walker and Weber (1984) found that the principal (a large automobile manufacturer in the case)'s outsourcing decision is not affected by the technological and demand uncertainty.

Conversely, it could be predicted if the firm is small and new and has limited resources available for weathering uncertainty, it is more likely to be risk-adverse. The firm is more sensitive to outcome uncertainty. In this case, the manager would prefer to transfer the risk to the supplying firm and choose the 'buy' option. (Eisenhardt 1989) Thus, the outsourcing decisions would be affected by organizational backgrounds, structures and natures.

2.6 Natures of organization and Outsourcing Decision

Organizational characteristics would affect the function, role scope and priority of FM. Chotipanich (2004) noted that FM should suit the organizational characteristic specifically since supporting services have different priority according to their roles in the business process.

2.6.1 Characteristics of Nonprofit Organizations

Almost all secondary schools in Hong Kong are non-profit organizations financed either by the HKSAR government or tuition fee. Hence, they behave like nonprofit entities. The overall goal of a nonprofit organization is to provide a service to the society in efficient way. Hence, the nonprofit manager has to make financial decision which could utilize the resources efficiently as well as maximize its social value. (Bauer, Richardson et al. 2009)

2.6.2 Financial Management of Nonprofit Organizations

Nonprofit organizations also need to have financial management as for-profit firms so as to survive. They also face the same market pressures for raising capital as the for-profit entities. Although schools get fixed amount of financial grant from the government each year, it also has the incentive to lower its administrative costs in order to save money for other educational-related activities. However, nonprofit entities might have different focus due to the differences in financial structure. (Bauer, Richardson et al. 2009) Bauer and Richardson noted that since the nonprofit organization does not generate return to the donors, the capital investment of the nonprofit organization need not to be profitable but must meet or advance the social objective of the nonprofit entity. The nonprofit managers are looking for investments that maximize the social return and at minimum administrative cost since this makes them easier to raise capital. Brigham and Gapenski (1996) pointed out that the nonprofit managers could consider that the total net present value of an investment is equal to the net present value of the investment (calculated as the typical financial model) plus the net present social value. However, it is difficult to be quantified.

2.7 Outsourcing in Public Organizations

Outsourcing in public organizations usually is expected to undertake similar benefits as those outsourcing in private sectors(Ponomariov and Kingsley 2008). Cutting cost or focusing on core business are not the only prime objectives of outsourcing in public organizations. Through outsourcing the public services, the innovation, technology and expertise of private entities could be utilized. However, problems raised from outsourcing such as contract design and accountability or failure to execute core competencies might deter the public sector from outsourcing their goods and services (Stewart 1993; Mulgan 1997; Johnston, Romzek et al. 2004). From the case study (Ponomariov and Kingsley 2008) of outsourcing at the Georgia Department of Transportation, barriers and limitations were found during the outsourcing process of public agencies. Because of the special characteristics in public sector organizations, the result of outsourcing might be different to the one predicted by traditional transaction costs theories.

2.8 Conclusion

The literatures provide general theories of outsourcing factors. Transaction costs and agency costs are main considerations for the firm's outsourcing decision. Janitor services are low specific assets with low uncertainty. It is the supportive services to the schools' business. The janitor work is programmable and the agency cost is relatively low. As predicted by the literature, janitor services would be one of the highly popular outsourcing areas. Outsourcing behavior, however, would also be affected by organizational backgrounds and natures. Hence, it is important to look at the educational backgrounds of schools, too. The following factors are the main reasons for the outsourcing of janitor services:

- Cost-reducing
- Focus on core business (i.e. educational activities)

In contrast, the followings are the main resistances to the outsourcing of janitor services:

- Difficulty in drafting the contract
- Frequent review of the contract
- Behavior monitoring cost
- Outcome measurement cost
- Better understanding to existing in-house staff (i.e. lower information

cost involved)

- Consideration of nonprofit organization's social values

CHAPTER THREE PILOT INTERVIEWS

3.1 Introduction

To get preliminary ideas of secondary schools' sourcing decisions for janitor services, pilot interviews have been conducted with two secondary schools' principals. The background and results of the interviews are introduced in this chapter.

3.2 Background of the Pilot Interviews

As said in the literature review, janitor services are generally considered as an area that outsourcing is highly possible. However, it is contrast to the practical observation in Hong Kong where most secondary schools choose to employ in-house janitor.

To know more about the actual situation of the janitor services operation at secondary schools and get the basic understanding of the practical factors

affecting their sourcing decisions for janitor services, a pilot interview is conducted to collect the necessary data.

Principals from 2 secondary schools with different backgrounds are interviewed because they are the outsourcing decision makers in the schools. 1 of the secondary schools does outsource their janitor services while another is employing in-house janitor staff.

3.3 Pilot Interview 1 – SAGC

The secondary school interviewed is called St. Antonius Girls' College (SAGC). It is an aided government school which is located at Yau Tong. It has been established for over 30 years. It is a catholic school.

The school is currently employing 8 in-house full time janitors and 1 in-house part-time janitor. There are no outsourcing janitors and the school has never been contracting out their janitor services. The principal claimed that the school do not outsource their janitor services due to the following reasons:

(a) Keep the family feeling

Since the school has a catholic belief, the principal perceives the whole school as a big family and see the in-house janitor as a family member. They think that in-house staff could keep the family feeling of the school and develop a better relationship with the other staff and students.

(b) Seen as part of moral education

The school considers the janitors as the 'moral teachers' to the students. Since the janitor has to stay in the school for a long time and have much contact with the students, they play an important role to teach students how to get along with others. According to the principal, the students can learn how to respect different people from the daily contact with the janitors. (c) Higher loyalty and integrity of in-house staff

The principal believes that in-house staff would have greater loyalty to the school and generally be more sincere than the outsourcing staff. For example, the in-house janitors are more willing to do extra work. They treat the students well and serve the school as a family member.

(d) More control and more flexible in staff arrangement

The principal thinks that it is easier to control and arrange the jobs for in-house staff. There might be some urgent or emergency works that are not included in the general working scope of the janitor services. It would be quicker and more convenient for the school to arrange the job because they could order the janitor directly.

(e) Informal relationship with in-house staff

Since the school has been established for a long time, some of the in-house janitors have been working for the school for many years. According to the principal, some of the janitors have been working at the school for over 10 years and they have already developed deep personal relationship with other teaching or administrative staff. Changing of staff might hurt their relationship and reduce the staff morale.

(f) Negative news of the outsourcing suppliers

There has been frequent complains from the outsourcing janitors about the low level salaries. The principal claims that it is very important for the school to maintain a good reputation. Schools are generally perceived to have a greater social responsibility and are expected to act as a role model to the society. Thus, she is afraid that the negative image of the outsourcing suppliers would bring a negative impact to the school.

(g) Difficulties in drafting the contract

The principal said that since they do not have any experience of outsourcing of janitor services before, it would be difficult for them to draft the terms in the contract. Besides, it is difficult to specify everything in details in the contract, too. (h) Bad I.T. outsourcing experience before

The school interviewed has employing an I.T. outsourcing staff before but according to the principal, the outsourcing staff did not perform well and had a very bad attitude. The school has changed the I.T. outsourcing staff for several times but the situation remains the same. Therefore, the school gets a bad impression to school services outsourcing.

To end the interview, the principal concluded that she is very satisfied with the performance of the in-house janitors and would not consider outsourcing in the coming years. Cost-reducing is not a strong incentive to her as there are enough government grants for the school's educational development.

3.4 Pilot Interview 2 – TKOHT

The second school interviewed is called Tseung Kwan O Heung To Secondary School. It is a direct subsidy scheme secondary school which is located at Tseung Kwan O. It is a new school with only 5 years history. The school has no religious. The TKOHT secondary school is currently outsourcing their janitor services. They are employing the Citybase Property Management Limited as the janitor services supplier. The supplier provides the following services to the school:

- a) 24 hr security system: 2 guards/ session
- b) 5 cleaning staff (shift duty)
- c) Maintenance when needed
- d) Landscaping (2~3 days/ week)

They also help the school to check the school premises when the school has just been built. An administrative staff is hired to monitor the work performance of the outsourcing janitors. He would be responsible to handle all the related affaires of the outsourcing of janitor services.

According to the school principal, the following are the main reasons for the school to adopt the outsourcing of janitor services:

(a) Focusing on core business

The school principal said that as the school is newly established, the teachers' workload is already very large. Outsourcing of janitor services could reduce teaching staff's time and effort to manage the staff. Human resources especially the teaching staff's time could be saved so that they could be more focused on educational activities.

(b) Easier human resources management

The principal thinks that it is easier for the management company to manage the janitor services. There are regular meetings and reviews about the performance of the outsourcing janitor. If the school is not satisfied with the performance of the outsourcing staff, they could complaint to the supplier directly. It is easier for them to replace the outsourcing staff whose performance is not satisfactory.

(c) Professional skills of suppliers

The property management company offers professional management services to the school. Professional equipments and trained staff such as security guards are provided. Professional services such as the maintenance of plant rooms and handling of dangerous goods could also be supplied. The management company could even give landscaping services to the school. Thus, as said by the principal, it is more convenient for the school to have one company to supply all the necessary property management services.

(d) More flexible

The principal considers that the arrangement of outsourcing staff is more flexible. On special events, they could request the suppliers to give more janitor staff. They do not need to hire temporary staff or part-time janitors. It is easier for them to arrange extra staff for special occasions.

The school head thinks that the relationship between the outsourcing janitors and the students is good. Changes of outsourcing staff by the suppliers is seldom. He claimed that the cost of outsourcing janitor services is actually similar to the cost of employing in-house janitors since an extra staff is required to monitor and manage the outsourcing matters. Hence, cost reducing is not a really attractive factor for them to have the outsourcing of janitor services. He also said that they had some difficulties in drafting the first contract with the management company. However, it is not a big problem because they could make reference to the similar contracts of other schools. He shows no intention to recruit in-house janitors in the following years unless the cost and services offered by the outsourcing company becomes unsatisfactory.

3.5 Conclusion

The 2 principals give very different opinions to the outsourcing of janitor services. Some of them echo with the literatures' findings while some are not revealed by the literatures. For example, factors like 'keep the family feeling' and 'keep the informal relationship' could be seen as one of the informal values of the schools. From the literature review, the school would weigh benefits of the financial opportunities (i.e. the outsourcing of janitor services) against the informal value possibly lost. Moreover, as suggested by the principals, schools background such as age and religious belief might also have an effect to its sourcing decision for janitor services. Schools with religious background or older age are expected to have less outsourcing of janitor services.

Generally, the outsourcing or insourcing reasons could be classified into 2 categories – general reasons and specific reasons of the school:

- (a) General reasons for employing in house janitors
 - Keep the family feeling
 - Seen as part of moral education
 - Higher loyalty and integrity of in-house staff
 - More control and more flexible in staff arrangement
 - Negative news of the outsourcing suppliers
 - Difficulties in drafting the contract
- (b) Specific reasons for employing in house janitors
 - Informal relationship with in-house staff
 - Bad I.T. outsourcing experience before
- (c) General reasons for employing outsourcing janitors

- Focusing on core business
- Easier human resources management
- Professional skills of suppliers
- More flexible

CHAPTER FOUR PROPOSITIONS

4.1 Introduction

In order to test the relationship between the causes (reasons) and the effect (outsourcing decision), propositions has to be set up. These propositions are mainly derived from the literature review and views of the secondary schools principals.

4.2 Propositions of the Research

The following propositions are established for the hypothesized research model:

Proposition 1 (P01): The higher the comparative asset specificity, the greater is the degree of janitor outsourcing.

The comparative asset specificity is the schools' perception of their own asset specificity compared to their peer schools. From the literature(Arnold 2000), the degree of asset specificity is directly proportioned to the degree of outsourcing. Although most of the HKSAR secondary schools are built according to the standard requirements and designs, they do have different facilities which might require special management. For example, some of the secondary schools have their own swimming pools. These schools might need to hire professional property management firms instead of hiring in-house janitors. Hence, this proposition is used to test if the view at the literature is correct in the field of outsourcing of the secondary schools janitor services.

Proposition 2 (P02): The less is the transaction costs involved in hiring external services providers, the greater is the degree of the outsourcing of janitor services.

The transaction cost is the schools' perception of the degree of difficulty in negotiating and management of the contract with the external services providers. Some of the schools principals might think that it is very troublesome and difficult to negotiate the contracts with the external services suppliers, especially for those which have hired in-house janitors for a long time. Since they are inexperienced as to the outsourcing of janitor services, they might find it difficult to draft the contract terms. From the literature reviews, if higher transaction costs are involved in outsourcing the operations, the degree of outsourcing would be lower. Therefore, this proposition is set up to test the relationship of transaction cost and degree of outsourcing.

Proposition 3 (P03): The less the agency cost involved in hiring external services providers, the greater is the degree of the outsourcing of janitor services.

The agency cost includes the monitoring costs and performance measurement costs of hiring the external services providers. It is stated in the literature that if the agency costs is higher, the degree of outsourcing would become lower. Actually, some schools hiring in-house janitors might not have any performance monitoring or measurement system now. Thus, if they hire outsourcing janitors, they would need to set up a new system to manage the janitors. Hence, the higher is the agency cost related to the outsourcing of janitor services, the lower should be the degree of its outsourcing. Proposition 4 (P04): The more is the credible suppliers in the market, the greater is the degree of the outsourcing of janitor services.

If there are more credible suppliers available in the market, the search cost of the schools for an external janitor services provider would be reduced. In contrast, if the schools' principles think that there are few credible suppliers available, they might have lower intention to outsource their janitor services. Thus, there is assumed to be a positive relationship between the credible external supplier presence and the degree of the outsourcing of janitor services.

Proposition 5 (P05): The less important the role of janitor in the school, the greater is the degree of the outsourcing of janitor services.

From the pilot interviews with the school principals, some schools might expect their janitors to have different roles or responsibilities other than their day to day work. For example, they might require the janitor to act as moral
roles to the students. Janitors need to keep good relationships with the students and care about the students. These 'jobs' might be more difficult to be delivered by outsourcing janitors or specified it into a contract. Since the janitors spend lots of time in the schools and has much contact with the student, he/ she might have great impact on the students' behavior. Thus, the schools might wish to have larger control over the behaviour of the janitors. Hence, the proposition tests the degree of impact of the schools' perception about the role of janitors to the degree of the outsourcing of janitor services.

Proposition 6 (P06): The less the schools' perception that in-house janitors are more loyal than outsourcing janitors, the greater is the degree of the outsourcing of janitor services.

As the janitors might have the chance to get confidential information about the schools and are responsible to keep the valuable property (e.g. projectors, computers, etc), some schools might require the janitors to have great loyalty to the schools. The schools' principals might perceive that the in-house janitors would have a greater loyalty to their schools instead of the outsourcing one. Hence, the schools might not hire external janitor services providers if they perceive the in-house janitors are more loyal than the outsourcing janitors. This proposition is used to test the relationship between the schools' perception about the loyalty of in-house janitors and the degree of the outsourcing of janitor services.

Proposition 7 (P07): The greater the schools' perception that the arrangement of outsourced janitors is more flexible than that of the in-house janitors, the greater is the degree of the outsourcing of janitor services.

There are many special events (e.g. the Sports Day, the Parents' Day, etc) being held during the school year. It might require more/ less janitors to prepare and help in these functions. Thus, flexibility of the janitor services arrangement is required. If the schools' principal thinks that it is more flexible to arrange the people and the job of the outsourcing janitors, he might choose to contract out their janitor services. In contrast, if the school perceived that it is more flexible to arrange the people and the job of in-house janitors, he might not want to outsource the janitor services. Hence, this proposition is set up to test the relationship between the flexibility of janitor services arrangement and the degree of its outsourcing.

Proposition 8 (P08): The less the informal costs involved in hiring external service providers, the greater is the degree of janitor service outsourcing.

Informal costs include the current relations between the janitors and other staff, how the schools perceive their janitors and their reputation. If the janitors have a good relationship with other staff in school, the school might bear great relationship loss/ damage if they shift to the outsourcing of janitor services. Moreover, some schools might perceive their janitors as 'family' members and, in that way, they prefer to keep in-house janitors instead of employing the outsourcing staff. In addition, schools might bear the risk of damaging its reputation as being accused for hiring staff with "unreasonably" low salaries. Thus, this proposition is set up to investigate how these informal costs would affect the sourcing decisions for janitor services of the secondary schools. Proposition 9 (P09): The greater the possible gains involved in hiring external service providers, the greater is the degree of the outsourcing of janitor services.

From the pilot interview, the school principal having the outsourcing of janitor services thinks that there are many gains from outsourcing. The major two are that teachers could be more focus on their teaching and professional knowledge is provided by the external suppliers. Thus, it might be possible that the more the schools perceived to gain from the outsourcing, their degree of the outsourcing of janitor services would be greater. This proposition is used to test this probability.

CHAPTER FIVE METHODOLOGY

5.1 Introduction

In this research, the aim is to find out what are the factors affecting the secondary schools' janitor services make-or-buy decision. Path analysis is used to analyze the data. It is because the variables extracted form the literature reviews and pilot interviews are unobservable variables which cannot be measured directly. Besides, data are collected by questionnaires which valued as interval data. The factors are correlated with each others. To reflect the reality more, their correlations have to be taken accounted into the model. Hence, path analysis is considered as the most suitable methodology for this study.

5.2 Selection of Methodology

This research aims to find out the factors that would affect secondary schools' janitor services make-or-buy decisions. Thus, the views of schools'

principals who are the major decision makers for their schools' janitor services arrangement are very important. Path analysis instead of multiple regression is chosen as the analytical methodology in this research.

A typical multiple regression equation is given like that: $Y = b_1X_1 + b_2X_2$ +.....+ b_kX_k . It is expressed in the equation that Y is determined by X_1 , X_2 ,.....X_k. The equation is fitted by the minimizing the observed Y and the value given by the equation $Y = b_1X_1 + b_2X_2 + + b_kX_k$ obtained from least squares methods. (Li 1975) The main purpose of traditional statistics derived from least squares is to provide the best prediction of Y, whatever the meaning is X.

Li (1975) pointed out that "The path method, on the other hand, is not so much concerned with the prediction as to the proposal of a plausible interpretation of the relationship between the variables......path analysis is concerned with erecting a causal structure compatible with the observed data." Thus, path analysis aims to provide causal explanations between Y and Xs while multiple regression aims to provide the closest prediction of Y given the information of X. In this research, the main purpose is to find out the possible causal relationships between a set of factors and the schools' principals' make-or-buy decisions. Therefore, path analysis has been adopted as the analytical methodology.

In addition, path analysis has other benefits than using multiple regressions. For example, multiple regression assume that independent variables are independent to each other. However, the interaction between two variables could also be determined by path analysis. Both direct and indirect effect between variables are estimated and hence given a more actual picture of the causal web.

Moreover, path analysis could deal with unobservable variables and assumes interval data. It is more suitable for this research as interval data is collected in this study. Therefore, path analysis is regarded as the most suitable methodology for this dissertation.

5.3 Path Analysis

In sociologist research or behavior studies, it is usually very difficult or impossible to carried out simple bivariate experiment which a single independent variable are constructed and the result due to single independent variable is observed. In social sciences studies, multiple variables are usually involved. It is common that these variables are latent variables.

Latent variables refer to those hypothetical or theoretical variables which are unobservable or immeasurable. Thus, they have to be represented by other variables which are observable and measurable.(Sanchez 2008) Sociologists have been long time used classical statistics to interpret the sociological data. However, because of the lack of procedure to incorporate the statistical results into social theory, parameter estimates are often not useful to the evaluation of the sociological theory. (Land 1969) This lead to the evolution of linear causal models which as pointed out by Land (1969), "..... (it) brings the gap between sociological theory on the one hand and the results of classical statistical analysis on the other." Factor analysis which uses linear causal models as its analytical bases is a common analytic tool used in psychology and the social sciences. It is particularly useful for the studies collecting data by questionnaires. It could be used for cases with multiple variables which some of them might be latent variables. It consists of several statistical techniques aiming to simply complex sets of data and is usually applied to correlations between variables. (Kline 1994) Factor analysis thus could be applied to analysis variables which are highly correlated. It could be used to simplify correlation matrices.

There are mainly 2 purposes of factor analysis, which are exploratory or predictive and confirmatory purposes. (Hulland, Chow et al. 1996) The predictive model is designed for searching a latent variable structure that could explain the interrelationships of the observed data set. In contrast, confirmatory models are designed for hypothesis or theories testing. In aims to investigate how well the subject model could be used for explaining the observed relationships in the data. Path analysis is one kind of factor analysis. It was firstly developed by Sewall Wright (1921,1934,1954,1960a,b) who is a geneticist. Wright (1921) stated that

"......(Path model is) a method of measuring the direct influence along each separate path in such system and thus of finding the degree to which variation of a given effect is determined by each particular cause...... In cases in which the casual relations are uncertain, the method could be used to find the logical consequences of any particular hypothesis in regard to them."

Thus, path analysis could be used to test the relationships among variables and could predict the significance of a hypothesis. Linear, additive and causal relationships are assumed among the variables. The variables are also assumed could be measurable on an interval scale. Path modeling which also known as Structural Equation Modeling (SEM) applies path analysis as its principal analytical techniques. Relationships among the variables in the model could be either represented by sets of structural equations or a path diagram.

Path diagram is in fact a visual representation of the path model. It is drawn according to conventional rules and symbols. As relationships among the variables are represented graphically, it is easier for readers to understand the model.

5.3.1Notation and Symbols

There are standard notations and rules used in the path diagram. There are 3 kinds of variables which are observed variables, latent variables and residual variables. Manifest variables are observed variables and represented by enclosed boxes. Latent variable is unobservable variables and represented by circles/ ellipse. Residual variables are disturbance terms and represented by unclosed notation ε .

There are also 3 kinds of relationships: casual links, correlation links, and relationships between variables and residual terms. Casual links mean that a variable A causes variable B. It is represented by a straight single-headed arrow. Correlation links indicate only the correlation between variables A and B but it does not imply any casual relationship among them. It is represented by curved double-headed arrows. The relationships between residual terms and variables show the affection of the residual terms to the variables. It is represented by straight lines.

The notations could be summarized as follow:



Fig.5.1 Path Diagram notation (Sanchez 2008)

Variables in path modeling are classified as 2 groups: exogenous (i.e. independent variables) and endogenous (i.e. dependent variables). Exogenous variables are those not caused by other variables in the path diagram while endogenous variables are those caused by one or more variables.

5.3.2Basic Principals of Path Analysis

When the predictor variables has not only direct effect but also indirect effect to the response variables, path analysis could be used to analysis this kind of causal relationship. It builds on top of ordinary multiple regressions. (Robert D. Retherford and Choe 1993) The simplest path model could be drawn as follow(Loehlin 1998):



Intercorrelations				
	А	В	С	
А	1.00	0.5	0.65	
В		1.00	0.70	
С			1.00	

Fig. 5.2Example path model with observed intercorrelations
of A,B and C

In this example, all variables A, B and C are observed variables. A and B are exogenous variables causing the endogenous variable, C. For example, A and B might be the fathers' and mothers' intelligence; C is their children's intelligence. Their intercorrelations (shown in the table) are observed in certain sample family populations. Hence, we could represent the above path model into equations below:

 $r_{AB} = c$

 $r_{AC} = a + cb$

$$r_{BC} = b + ca$$

As the observed value of r_{AB} , r_{AC} and r_{BC} could be get from the intercorrelation table, we could now get three simultaneous equations:

c = 0.50a + cb = 0.65

b + ca = 0.70

By calculation, we could solve a = 0.40 and b = 0.50. Therefore, we could now conclude that the casual influences of fathers and mothers to their children are 0.4 and 0.5 respectively. These numbers are called path coefficient or standardized partial regression coefficients. It shows us to what extent a change on A and B is transmitted to C.

Actually, if the variables are all observable, we could use multiple regression to solve the problem instead and the path coefficient would become the beta (β) weights. However, if latent variables are involved in the case, a simple multiple regression approach will not work. As we could not calculate correlations among unobserved variables directly, we have to set up a set of simultaneous equations with as many as the parameters to be estimated.

For example, if we considered a simple factor model with latent variables as follow:



Equations	Solution
rAB = ab = 0.60	a = 0.658
rAC = aec = 0.15	b = 0.912
rAD = aed = 0.10	c = 0.833
rBC = bec = 0.20	d = 0.600
rBD = bed = 0.15	e = 0.267
rCD = cd = 0.50	

Fig.5.3 Example path model with 2 correlated factors (E and F)

In the model, there are two latent variables, E and F. They are

represented by 4 observed variables, A, B, C and D. There are five

unknowns which are a, b, c, d and e and six equations in the path model. Observed correlations, rAB, rAC, rAD, rBC, rBD, rCD, could be computed from the observed data. Since there are more equations than unknown, a single exact solution cannot be yield. Thus, iterative least square method is required to be used in order to solve the problem.

Iterative solution which is usually carried out by the computer has to be used especially when the observed variables increases. The number of equations in a path model is given by $C^{\frac{N}{2}}$ (i.e. N(N-1)/2), where N is the number of observed variables. In additions, the number of product terms would be increased largely in this case. Thus, a straightforward matrix procedures which typically be used in solving sets of linear simultaneous equations is not applicable to this problem.

The rationale of iterative solution is like repetitive trial-and-error procedures. First, initial values would be arbitrarily set to some of the paths as a starting model. Then, correlation or covariance would be calculated and compared to the observed data. The initial fit would be poor due to the arbitrarily assigned initial values. Then, the trial value set is changed so as to improve the fit. This process would repeat and repeat again, where each process would increase the agreement between the latent and observed correlations. Finally, the process would stop (i.e. a set of values is yield) when the fit cannot be improved anymore. The set of values are said to be a 'converged' solution.

5.3.3Basic Assumptions of Path Analysis

There are few basic assumptions in the path analysis method. Firstly, variables in path model are assumed to have linear and additive relationships. A simple point-plotting could be used to test the degree of holding of this assumption in the data set. If the data is not linear at all, conventional transformations could be used to transform the data so as to hold this assumption. Moreover, data used in path analysis is assumed to be interval. It is assumed that the data are measured with interval scale properties. Dichotomous data (such as Yes/No, 0/1,etc) are allowed in path analysis. All variables in the model should behave as point variables. Otherwise, some items in a composite variable might exert much greater influence to one relationship while another item would exert different degree of effect. Including them into the same variable would result in a large error terms. Thus, items representing the variables should show strong correlations among themselves in order to put them into the same variable.

5.4 Research Model Design

In this dissertation, the reasons for secondary schools' janitor services insourcing or outsourcing are examined. Path analysis, which is a kind of factor analysis method, would be used to analysis the data. A hypothesized path model is constructed and the hypothesized path diagram is drawn to show the relationship between the latent variables. The variables are measured by a set of items.

5.4.1 Hypothesized Path Model

With the propositions above, a hypothesized path model is constructed according to the conventional rules and notations. It aims to test the validity and significance of the propositions. Since all the variables including both dependent and independent variables are unobservable, they need to be measured or represented by other observable variables. Thus, there are actually two layers in the model. To explain the model more clearly, the hypothesized path model would be divided into two parts – measurement model and structural model.

5.4.1.1 Hypothesized Structural Model

This structural model is actually parts of the hypothesized path model. It specifies the relationships among the latent variables in the model. These latent variables are drawn as ellipse as following the general notation. The model could be drawn as follow:



Fig.5.4 Hypothesized Path Model for Current Study

The hypothesized path model is set up in this study to find out the common factors for schools' outsourcing or insourcing decisions. The

dependent variable is the degree of the outsourcing of janitor services. The independent variables are the factors affecting their outsourcing/insourcing decisions. They are mainly extracted from the literature review and the pilot interviews of 2 secondary school heads. Their predicted relationships (positive or negative) to the dependent variable, make-or-buy decision, are taken from the previous propositions.

5.4.1.2 Hypothesized Measurement Model

There are lots of latent variables involved in this research. In fact, all the subject variables under investigation are latent variables. They are either developed from theories or from the pilot interviews. Thus, they have to be measured by other measurable items. It leads to the formulation of the measurement models. Since this research aims to find out the factors affecting secondary schools' principals' make-or-buy decisions, factors measurement would be based on the views of the school principals. The measurement models designed in this dissertation are making reference to the measurement models in an Information System (IS) outsourcing

research(Ang and Straub 1998). Modifications are made to the IS outsourcing measurement models in order to suit the purposes of this study. The modified measurement models are shown below:



Fig.5.5 Hypothesized Measurement Models for Current Study

From the above measuring models, each latent variable is represented by several items. The measurement system is different for the dependent

variables (make-or-buy decision) and the independent variables (sourcing factors).

The secondary schools' principals' make-or-buy decisions are measured by its degree of outsourcing. The items below are the common duties of a school janitor. These items are described in the HKSAR government 2002 auditor report. The degree of outsourcing of each item below would be measured as:

	Exclusively	Internal	Jointly	External	Exclusively
	Internal				External
Scale	1	2	3	4	5

Schools which are jointly managed by the external service provider and in-house janitors are asked to describe their type of management for each item.

Latent Variable	Item Name	Item Description*
Make-or-Buy		
Decision		
	OD2	Locking doors and windows after school
	OD3	watering flowers and plants and simple gardening

OD4	assisting in school activities such as decorating
OD5	transporting furniture within school
OD6	replacing distilled water containers
OD7	cleaning the principal's room, staff room and school office
OD8	cleaning the class room and the school premises
OD9	serving tea to teachers
OD10	delivering student exercise books and documents
OD11	manning the school entrance
OD12	controlling traffic

Below are the latent independent variables and their constructed items. A

5-point Likert Scale is used to measure the degree of agreement of schools'

principals to the statements:

	Strongly	Disagree	Neutral	Agree	Strongly
	Disagree				Agree
Scale	1	2	3	4	5

Latent Variable	Item Name	Item Description*
Asset Specificity		
(AS)	L	
	481	Compared to our peer schools, our janitor services require technical skills
	AS I	that are relatively unique.
		To provide the cleaning and security services, external service provider
	AS 2	would have to make substantial investments in equipment tailored to our
		needs.
	AS 3	Our cleaning and security operations are more complex than the cleaning and
		security operations of peer schools.
Transaction Cost		

(TC)		
	TC 1	There would be significant problems associated with negotiating a contract or agreement (e.g. agreeing the conditions, prices, etc.) with an external services-providers for our janitor services.
	TC 2	It would be very difficult to modify our contracts or agreements with external janitor services providers once a contract is signed.
Agency Cost (AC)		
<u> </u>	AC 1	External janitor service-providers would have to be closely and constantly monitored to ensure that they adhere to our contractual terms and conditions.
	AC2	It would be very difficult to measure the performance of the external janitor service-provider.
Supplier Presence		
(SP)		
	SP 1	There are a significant number of reputable external janitor service-providers who potentially could provide janitor services to our school.
	SP 2	There are a significant number of trustworthy external janitor service-providers who potentially could provide janitor services to our school.
	SP 3	If we decide to terminate the in-house janitor operations, there are other external janitor service-providers who could provide us same level of janitor service.
Role of Janitor		
(ROJ)		
	ROJ 1	Our janitors keep very good relationships with our students.
	ROJ 2	Janitors should act as moral roler to our students.
	ROJ 3	We hope that our students could learn how to respect others through getting along with the janitors.
	ROJ 4	We hope that our students could learn interpersonal skills through getting along with the janitors.
Loyalty (L)		
	L 1	In house janitors would be more loyal to our school compared to the janitors hired by the external janitor service-providers.
Flexibility (F)		
	F 1	It would be more flexible to arrange the number of janitors if we hire

		external janitor service-providers.
	Е 2	It would be more flexible to arrange the work of janitors if we hire external
	ΓΖ	janitor service-providers.
Informal Cost (IC)		
	SC 1	We perceive the whole school as a big family and the janitors are our family
	SC I	members.
	80.2	Our janitors keep very good relationships with other administrative and
	SC 2	teaching staff.
		There are complains about the low salaries of the outsourcing staff. We are
	SC 3	worried that if we hired the external service-providers, our reputation might
		be affected by these news.
Possible Gains		
from		
Outsourcing (PG)		
	PG 1	Our teaching staff could be more focused on the teaching activities if we hire
		external janitor service-providers.
	PG 2	External janitor service-providers could provide us professional services and
		equipments which could not be offered by in-house janitors.

5.4.1.3 Combined Path Model

The structural and measurement model could be combined to give a complete view of the path model. All the constructs are represented by the items described above so the relationships among the latent variables could be tested by the path model below:



Fig.5.6 <u>Hypothesized Combined Models</u>

5.4.2Data Collection Procedures

Data collection is a very important process. Reliable data could be collected by

several means such as interviews, questionnaires or observations, etc. In this

research, data are collected by questionnaires. In the questionnaire, schools' principals are asked to choose their extent of agreement to the statements.

5.4.2.1 **Questionnaire Design**

The questionnaire is designed to gather 3 kinds of information and is divided into 3 parts.¹ At the first part of the questionnaire, secondary schools' principals are asked to select their degree of outsourcing for each janitor services duty. Thus, data of degree of the outsourcing of janitor services could be obtained. Then, opinions of schools' principals about the variables' items are collected in the second part of the questionnaire. The final part is designed to collect the descriptive data such as the schools types, age, and religious background.

An on-line questionnaire is set up for the convenience of collecting data. Emails are sent to the school offices email account. A covering letter was attached to invite the school principals to fill in the questionnaire. A link of the on-line questionnaire has been attached in the letter.

¹ Questionnaire sample could be referred to the Appendix.

5.4.2.2 Sample Size

Invitation emails were sent to all the HKSAR secondary schools to avoid sample drawing problems. However, emails were not sent to night schools since they do not have the same property management system as day-time schools. Emails were sent to 514 day-time secondary schools. 36 questionnaires have been collected at this stage.

Follow up callings were given to the schools after 2 weeks of the emails. Schools principals were asked to fill in the on-line questionnaires. Questionnaires were faxed to some schools with which email system was broken down. 16 questionnaires were faxed to the schools. 70 questionnaires including 2 fax were collected at this stage.

Finally, 106 questionnaires were collected. The response rate is 20.6%.

5.4.3Data Analysis Techniques

Several analytical tools are used to explore the data reliability and to investigate the relationships among the variables.

5.4.3.1 Descriptive Statistics

Descriptive statistics are useful in giving a brief picture of the sample population characteristics. To better understand the sample populations better and to give a general relationship between secondary schools' background and the categories of janitor services management, descriptive statistics are carried out to analysis the data. Frequencies, means, medians, modes and scatter plot are used to analysis the sample population.

5.4.3.2 Correlation Analysis

Correlation analysis is carried out to measure the degree of agreement between 2 sets of scores(Kline 1994). It is conducted before the path analysis to ensure that the variables do not have a high linear dependence. Pearson's correlation coefficient (r) is usually used to measure the variable correlations(Haslam and McGarty 2003) It ranges from -1 which implies perfectly negative correlation and +1 which implies perfectly positive correlation. There is no relationship at all between 2 variables if r = 0. The strength of the relationship between 2 variables increases when the absolute r gets closer to 1, and vice versa.

5.4.3.3 Reliability Test

Reliability test is carried out to measure the internal consistency and stability of the measurement scales and the items that make up the variables. Reliability is defined as "the extent to which (measurements) are repeatable and that any random influence which tends to make measurements different from occasion to occasion"(Nunnally 1967) Cronbach's alpha (α) is the most popular statistics used for reliability test. Its formula is as follow:

$\frac{N^2 \times M(\text{COV})}{\text{SUM} (\text{VAR/COV})}$

where N^2 is the square of the number of items in the scale; M(COV) is the mean interitem covariance and SUM(VAR/COV) is the sum of all of the elements in the variance/covariance matrix.(Cortina 1993) It determines the internal consistency of items in a survey instrument to measure its reliability (Santos 1999) Values of α ranges from negative infinity to 1. The reliability of the data increases with greater α value (i.e. α approaching 1). Usually, scales are considered to be reliable with $\alpha \ge 0.7$ (Aron and Aron 2002). Reliability test is carried out and Cronbach's alpha is used in this research to test the internal consistency of the questionnaire items.

5.4.3.4 Research Model Testing

To test the validity of the hypothesized path model, a structural equation modeling (SEM) programme, AMOS 7, is used to analysis the data. A SEM such as AMOS could estimate the parameters in the model. It could get the best possible fit between the observed data and the conceptual model (Schilling and Steensma 2002). The hypothesized path model is drawn using the AMOS and data are input to it.

Maximum Likelihood (ML) estimates are used as the analytical tool to generate the path estimates. ML has better statistical properties than least squares estimators(Myers, Montgomery et al. 2002). ML estimators are unbiased or asymptotically unbiased as the number of observations (i.e. data size) becomes large. It means that the estimated value would be differed from the trued value of the parameters by very little given a large sample size. Moreover, ML could give sufficient statistics which contain all of the "information" about the parameters in then original sample size. However, as noted by Myers, Montgomery et al (2002), ML assumes normal distribution of the observations.

After generating the path coefficient by the programme, the significant levels of the coefficients are then gauged by p-value. Kline (1994) noted that a correlation is significant means that the result is unlikely to be due to chance. The coefficient is said to be statistically significant if its p-value is lower than the accepted level of significance. The 0.05 and 0.01 levels of significance are generally used.(Kline 1994) If a result is significant at 0.05 level, it means that there is 5% or less chance of its occurrence in random data is arbitrary.

In addition, the model fitness has to be tested to see how well actually the data could fit to the model. The model fitness is assessed by the Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). The comparative fit index (CFI) describes the model fitness relative to a baseline model (i.e. null model). The baseline model is any unreasonable model containing uncorrelated observed variables.

The index is defined as:

CFI =
$$1 - \frac{\max(\hat{C} - d, 0)}{\max(\hat{C}_{b} - d_{b}, 0)} = 1 - \frac{\text{NCP}}{\text{NCP}_{b}}$$

It ranges from 0 to 1 where 1 means a perfect fit. The model fit becomes better if CFI approach 1.

RMSEA, in contrast, is a population-based index. It is relatively insensitive to sample size(Loehlin 1998). RMSEA, is defined as follow:

RMSEA = $\sqrt{(d_k/df_k)}$

A 0 REMSEA index suggest a perfect fit model. Generally, a value of 0.05 or less indicates a close fit of model related to the degree of freedom. Values below 0.08 or less would indicate a reasonable error approximation of the model. A model is usually not accepted if the RMSEA greater than 0.1. Thus, a model is said to be "very good" fit with 0.5 or below RMSEA and be "good" fit for below 0.1

REMSEA. (Steiger 1989)
CHAPTER SIX RESULT ANALYSIS AND DISCUSSION

6.1 Introduction

In this chapter, data collected would be analyzed by the methods introduced in Chapter 6. Descriptive analysis and model testing would be conducted and the results obtained would be analyzed in this chapter. Implication of the model would also be discussed.

6.2 Descriptive Analysis

Descriptive analysis is carried out in this part to investigate the respondent schools' characteristics and their corresponding relationship to the sourcing decisions.

6.2.1 Background of sample schools

There are totally 106 questionnaires collected and the response rate is 20.6%. Since the questionnaires are sent to all the secondary schools in Hong Kong, there is no any specific sampling strategy and all samples are collected randomly. The sourcing categories of the respondent schools are as follow:



Fig. 6.1 Sourcing Categories of Respondent Schools

Most respondent schools (58.49%) have in-house janitors only. About 1/3 respondent schools (28.30%) have their janitor services operated by both in-house janitors and external janitors. Only few secondary schools (13.21%) have outsourced all their janitor services.

The following are the school types of respondent schools:



School Types

Fig. 6.2 School Types of Respondent Schools

There are 4 types of secondary schools in Hong Kong which are Aided, Direct Subsidy Scheme (DSS), Government and Private. All these 4 types of schools are included as in the sample. Most of the sample schools are government aided schools (52.83%). About 25% are government schools (28.3%) and about 10% are DSS schools (10.38%). The remained is the private schools (8.49%). The sampling is quite even that the school type distribution covers all type of HKSAR secondary schools and their corresponding percentages are quite similar to the existing secondary schools profile.

The religious backgrounds of respondent schools are shown below:



Schools' Religous Background

Fig. 6.3 Religious Backgrounds of Respondent Schools

The religious backgrounds of respondent schools are distributed evenly. Half of the respondents (56.6%) do not have any religious background. Another half does have religious background with different religion such as Christian and Catholic. It shows that the respondent population is quite evenly drawn. It shows the normal secondary schools' religious pattern.

A bar chart diagram is drawn to show the age of the respondent schools:



Fig. 6.4 Age of Respondent Schools

The age of the respondent schools spread over a large range. It ranges from group 1-10 years to group 180-190 year. Most respondent schools are actually between the ranges of 10- 50 years.

The descriptive statistics show that the respondent population covers all backgrounds of HKSAR secondary schools and corresponds to similar characteristics distributions of whole secondary schools' population.

6.2.2Schools' Background and their sourcing decisions

From the pilot interviews, it was claimed by the school principals that the schools' background might affect the sourcing decisions for janitor services. Hence, the relationships between secondary schools' backgrounds and their sourcing decisions for janitor services are investigated. First of all, the relationships between secondary school types and their corresponding sourcing categories are shown in the figure 6.5. It is shown in the figure that most schools have internal management of their janitor services disregard to the school types, except private secondary schools. It seems that private schools tends have the outsourcing of janitor services. However, the result might not be conclusive due to the small sample size. Generally speaking, school types do not related to the secondary schools' sourcing decisions.



School Types and Sourcing Categories

Fig. 6.5 School Types and Sourcing Categories

Schools with or without religious background have similar sourcing categories pattern. It is shown from the figure 6.6 that religious backgrounds of secondary schools do not affect their janitor services sourcing decisions.



Fig. 6.6 Religious Background and Sourcing Categories

A scatter plot is plotted (Figure 6.7) between the school age and their corresponding degree of outsourcing. No line could be drawn to fit all or most of the points. In other words, there is no relationship between school age and the degree of outsourcing.



Fig. 6.7 Scatter plot between school age and degree of outsourcing

From the descriptive statistics, secondary schools background including school types, religious belief and school age do not have direct effect to the schools' sourcing decisions for janitor services.

6.3 Correlation Analysis

Table 6.8 shows the Pearson's correlations among all the dependent variables. It is found that all variables have correlations to each other. The correlations among all dependent variables ranged from -0.53 to 0.62 for asset specificity (AS1, AS2 and AS3), -0.52 to 0.42 for transaction cost (TC1 and TC2), -0.20 to 0.28 for agency cost (AC1 and AC2), -0.58 to 0.62 for suppliers' presence (SP1, SP2 and SP3), -0.47 to 0.53 for role of janitors (ROJ1, ROJ2, ROJ3 and ROJ4), -0.28 to 0.32 for loyalty (L1), 0.23 to 0.31 for flexibility (F1 and F2), -0.61 to 0.52 for informal cost (IC1, IC2, and IC3) and -0.33 to 0.40 for possible gains of outsourcing (PG1 and PG2). Since the correlations are all smaller than 0.8 (i.e. r < 0.8), no variable is highly correlated with others. There is no linear dependency between the variables. Hence, path analysis could be carried out in the next step(Pett, Lackey et al. 2003).

Table 6.8 Pearson's correlations among dependent variables

Correlations																						
	AS1	AS2	AS3	TC1	TC2	AC1	AC2	SP1	SP2	SP3	ROJ1	ROJ2	roj3	ROJ4	L1	F1	F2	IC1	IC2	IC3	PG1	PG2
AS1	1.000																					
AS2	0.657**	1																				
AS3	0.598**	0.667**	1																			
TC1	-0.455**	-0.527**	-0.405**	1																		
TC2	-0.407**	-0.452**	-0.334**	0.622**	1																	
AC1	-0.160	-0.180	-0.198*	0.250**	0.152	1																
AC2	0.085	0.090	0.142	0.023	0.175	-0.052	1															
SP1	0.404**	0.523**	0.509**	-0.380**	-0.420**	0.015	-0.034	1														
SP2	0.555**	0.561**	0.618**	-0.518**	-0.510**	-0.11	-0.054	0.623**	1													
SP3	0.488**	0.583**	0.585**	-0.455**	-0.478**	-0.140	0.032	0.633**	0.687**	1												
ROJ1	-0.233*	-0.277**	-0.361**	0.183	0.282**	0.186	0.065	-0.364**	-0.415**	-0.354**	1											
ROJ2	-0.469**	-0.488**	-0.499**	0.321**	0.416**	0.062	0.048	-0.500**	-0.572**	-0.500**	0.325**	1										
ROJ3	-0.340**	-0.241*	-0.270**	0.214**	0.262**	0.279**	-0.030	-0.227*	-0.421**	-0.389**	0.405**	0.406**	1									
ROJ4	-0.325**	-0.331**	-0.230*	0.307**	0.282**	0.199*	-0.080	-0.235*	-0.474**	-0.336**	0.421**	0.460**	0.647**	1								
L1	-0.093	-0.089**	-0.068	0.316**	0.269**	0.228*	0.127	-0.096	-0.280**	-0.188	0.304**	0.287**	0.359**	0.328**	1							
F1	0.259**	0.143	0.222*	-0.119	-0.061	0.048	0.077	0.051	0.121	0.234*	-0.031	0.019	0.090	0.070	0.289**	1						
F2	0.304**	0.276**	0.227*	-0.166	-0.072	0.017	0.026	0.073	-0.010	0.139	-0.101	-0.025	0.020	-0.019	0.104	0.600**	1					
IC1	-0.421**	-0.365**	-0.407**	0.329**	0.372**	0.132	-0.074	-0.446**	-0.542**	-0.558**	0.431**	0.519**	0.521**	0.415**	0.261**	-0.048	-0.123	1				
IC2	-0.390**	-0.506**	-0.549**	0.289**	0.318**	0.230*	0.053	-0.434**	-0.610**	-0.583**	0.358**	0.527**	0.414**	0.361**	0.312**	-0.088	-0.188	0.693**	1			
IC3	-0.367**	-0.471**	-0.430**	0.251**	0.280**	0.254**	0.064	-0.369**	-0.420**	-0.414**	0.220*	0.330**	0.389**	0.255**	0.108	0.012	-0.009	0.412**	0.488**	1		
PG1	0.324**	0.407**	0.285**	-0.331**	-0.263**	-0.095	-0.137	0.324**	0.321**	0.317**	-0.212*	-0.258**	-0.153	-0.172	-0.088	0.130	0.343**	-0.329**	-0.390**	-0.226*	1	
PG2	0.091	0.179	0.148	-0.105	-0.020	0.116	-0.143	0.275**	0.212*	0.159	-0.032	-0.098	0.039	-0.109	-0.009	0.159	0.286**	-0.092	-0.235*	-0.180	0.416**	1

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

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

6.4 Reliability Analysis

Cronbach's alpha is generated to test the consistency of the items comprising the variables. Table 6.8 shows the Cronbach's alpha of each construct (i.e. independent variable).

<u>Construct</u>	Scale/Measures	<u>No. of items</u>	<u>Cronbach's α</u>
Asset Specificity	Perceived Asset Specificity	3	0.842
Transaction Cost	Perceived Transaction Cost	2	0.729
Agency Cost	Perceived Agency Cost	2	-0.101
Supplier Presence	Perceived supplier present	3	0.838
Role of Janitor	Perceived Importance of the janitors	4	0.749
Loyalty	Perceived Loyalty of in-house janitor	1	-
Flexibility	Perceived Flexibility of outsourcing	2	0.754

Table 6.9 Reliability levels of items to their corresponding constructs

Informal Cost	Perceived Informal cost of outsourcing	3	0.765
Possible Gains	Perceived Possible Gains from Outsourcing	2	0.598

Reliabilities of the items range from -0.101 to 0.842. Since the normally accepted reliability level is 0.7, items with lower than 0.7 are unaccepted and are taken away from the hypothesized model. Items constructing 'Agency Cost' and 'Possible Gains' fail the reliability test with -0.101 and 0.598 Cronbach's α respectively. Inconsistency of data is found in the items constructing these two variables.

2 items, AC1 and AC2, form the variable 'Agency Cost'. The questionnaire statements of AC1 and AC2 are:

AC 1	External janitor service-providers would have to be closely and constantly monitored to ensure that they adhere to our contractual terms and conditions.
AC2	It would be very difficult to measure the performance of the external janitor service-provider.

The school principles might agree that external janitors are required close monitoring. However, the schools' principal might not necessarily agree that it is difficult to measure their performance and vice versa. Actually, a very inconsistent result is gained from the reliability test indicating that these 2 statements have a very low agreement.

Similarly, the items, PG1 and PG2, do not agree with each other well and fail to construct the variable 'Possible Gains from Outsourcing'. The related questionnaire statements are:

	Our teaching staff could be more focused on the teaching activities if we hire external janitor
PG I	service-providers.
	External janitor service-providers could provide us professional services and equipments
PG 2	which could not be offered by in-house janitors.

PG1 and PG2 are examples of possible gains from the outsourcing of janitor

services. They might not necessarily co-exist. School principals might agree that

there is benefit of PG1 but not of PG2 or vice versa. This would lead to non-agreement between the item data. Inconsistence result shows that the principals think that these two benefits of outsourcing usually not co-exist.

Variables of 'Agency Cost' and 'Possible Gains from Outsourcing' are taken out form the research model due to the failure in reliability testing. The reliability levels of the remaining variables ranges from 0.729 to 0.842 which is moderate to strong.

6.5 Model Testing

Model testing is carried out to find out the relationships between the variables and the secondary schools' sourcing decisions. Model validity is also tested. Maximum Likelihood Estimates is used to analyze the effects of the constructs on the janitor services sourcing decision. Path coefficients and model fitness indices are shown in Figure 6.9. RMSEA and Comparative fit index (CFI) is generated for testing the model fitness. The path coefficients linking variables 'Asset Specificity', 'transaction cost', 'Role of Janitors' and 'Informal Cost' to the janitor services sourcing decision are statistically significant. Their coefficient directions are the same as those predicted in the corresponding propositions. The finding supports the propositions P01, P02, P05 and P08.

The path coefficients of variables 'Supplier Presence', 'Loyalty' and 'Flexibility' are not significant. It means that they are not one of the consideration factors to the secondary schools' sourcing decisions for janitor services. Propositions P04, P06 and P07 are refused.

The model fitness indices, CFI and RMSEA of the model are 0.817 and 0.072 respectively. The highest CFI would be 1 which indicates a perfect fit. 0.817 CFI shows a good fitness of this model compared to the null one.

RMSEA <0.08 shows a good fit of model (Steiger 1989). The RMSEA index for this model is 0.072 indicating a reasonably error approximation of the model.



Fig. 6.10 Path Analysis Results

* the result is significant at 0.05 level

** the result is significant at 0.01 level

6.6 Discussion of Results

The model generally has a good fit. The resulting model would be discussed in this section. Possible reasons for the effects of each factor to the janitor services sourcing decision would be first explored. Then, the implication of the research model would be discussed.

6.6.1Asset Specificity

Positive path estimates (+ 0.335) is resulted for the relationships between asset specificity and the janitor services sourcing decision. The result is significant at 0.05 level. It exerts quite a large effect and in fact is the most important factors to the schools' make-or-buy decision. It reveals that the more specified the schools' facilities (as thought by the schools' principal), the greater is the chance for them to have the outsourcing of janitor services. Proposition P01 is accepted. Agency costs comprise the following items:

AS 1 Compared to our peer schools, our janitor services require technical skills that are relatively

	unique.
AS 2	To provide the cleaning and security services, external service provider would have to make substantial investments in equipment tailored to our needs.
AS 3	Our cleaning and security operations are more complex than the cleaning and security operations of peer schools.

Some secondary schools do have some special facilities such as swimming pool, tennis court, and football playground. The operation and maintenance of these facilities are comparatively complex to traditionally janitor services operation. Schools might not get adequate support from ordinary in-house janitors to manage these special facilities. Hence, specific management knowledge and unique investments from the external service providers are required.

However, it is very rare for typical secondary schools to have these kinds of facilities in Hong Kong. Facilities such as swimming pools and tennis courts need lots of spaces and involve high maintenance cost. Usually, only few very elite secondary schools or private schools having large campus could own these facilities.Actually, most schools in HK are built according to the standard guidelines. Thus, facilities inside secondary schools should be quite similar.

In early years, most schools are operated by charities or religious organizations. Their facilities and classrooms are very simple and not much management is needed. Then, school designs have been improved during 1950-70s. Basic teaching facilities such as larger classrooms and covered playgrounds were provided. In middle 1970s and 80s, education need increased rapidly due to the booming population. Standard school design was thus appeared to fasten the construction pace for schools in order to cope with the increasing demand for education. Thus, secondary schools established for 30-50 years are most likely to be built by standard school design. They have similar structure and facilities. Not much complex facilities are involved in the schools.

However, schools in 1990s are built with more flexibility. Although they have standard site area, they are allowed to integrate flexible designs that tailored to their own need. Therefore, more advanced and special facilities are usually found in secondary schools with 10-30 years old. At 2000s, the government has a new set of design guidelines – Millennium Schools. More complex and comprehensive facilities are introduced in the new secondary schools. Besides traditional classrooms and laboratories, special rooms such as Multimedia rooms, Design and Technology rooms, Cookery rooms and landscapes are becoming more common to HKSAR secondary schools nowadays. Some secondary schools even have gymnasium rooms or recording studio. The facility management of secondary schools is becoming more and more complex nowadays. Professional knowledge and skills are required to manage the schools properties well. Thus, secondary schools might see it as the major reason for outsourcing their janitor services.

6.6.2Transaction Cost

Negative path coefficient (-0.24) is obtained for the relationships between the 'Transaction Cost' and the janitor services sourcing decision. The result is significant at 0.05 level. The variable 'Transaction Cost' is defined by two items:

	There would be significant problems associated with negotiating a contract or agreement (e.g.
TC 1	agreeing the conditions, prices, etc.) with an external services-providers for our janitor
	services.
TC 2	It would be very difficult to modify our contracts or agreements with external janitor services
	providers once a contract is signed.

The items are the costs associated with dealing a contract with the external service providers. The results shows that the more the transaction costs involved in dealing with a contract with the external service providers, the less would be the schools outsourcing their janitor services. Proposition P02 is supported.

Traditionally, secondary schools employ in-house janitors only for their property management. Many schools do not have much outsourcing experience especially regarding to the janitor services. Without much experience, schools might find it very uncertain to employ the external service providers. To reduce the uncertainty, a detailed contract is needed to constraint the external providers from behaving opportunistically. This could introduce difficulties and pressure to schools to draft a 'detailed' contract. It would be very difficult for them to negotiate the contract terms with the external suppliers if they do not familiar with the terms and conditions.

Actually, secondary schools might get 'standard contracts' from other schools having experience for the outsourcing of janitor services before. However, it is usually only possible if they are operated by the same sponsor body. Otherwise, it would be very difficult for the schools to get a 'standard' or 'reference' contract.

Thus, the transaction cost for traditional secondary schools to hire external janitor services providers might be very high that it deter them form outsourcing their janitor services.

6.6.3Supplier Presence

Insignificant result is get for the relationship between 'Supplier Presence' and the secondary schools' janitor service sourcing decisions. It means that the no. of credible market suppliers do not affect the schools janitor service sourcing decisions. The credible suppliers are defined by 3 items:

SD 1	There are a significant number of reputable external janitor service-providers who potentially
Sr I	could provide janitor services to our school.
SD 2	There are a significant number of trustworthy external janitor service-providers who
SF 2	potentially could provide janitor services to our school.
SD 2	If we decide to terminate the in-house janitor operations, there are other external janitor
51 5	service-providers who could provide us same level of janitor service.

Even if the school principals think that there are reputable and trustworthy external services suppliers which could replace their current janitor services

force, they would not consider it as a factor for their janitor services sourcing decision.

It might because that there are already many credible external services suppliers available in the market. The schools principals think that they could found credible suppliers easily if they really want to have the outsourcing of janitor services. However, there are other resistances deterring them from outsourcing their janitor services. Thus, they would not hire external janitor service providers even if there are significant credible external suppliers available in the market.

6.6.4Role of Janitors

Negative estimates (-0.26) is obtained for the relationships between 'Role of Janitors' and the janitor services sourcing decision. The result is significant at 0.05 level. It shows that schools would have less outsourcing of janitor services if they think the role of janitor is more important. The role of the janitors does

not include ordinary job duties. It is defined by 4 items:

ROJ 1	Our janitors keep very good relationships with our students.
ROJ 2	Janitors should act as moral role to our students.
ROJ 3	We hope that our students could learn how to respect others through getting along with the janitors.
ROJ 4	We hope that our students could learn interpersonal skills through getting along with the janitors.

Schools janitors do play an 'educational' role to the students. They could act as moral roles to the students and schools might expect that their students could actually learn something from the janitors. Thus, conduct and personality of a janitor would become the important criteria for schools to choose their own janitors. If a janitor does not have good conduct, they might exert negative impact to the student For example, if the janitor smokes after school and is seen by the students, it might give negative impression to the students that smoking is okay and not a big deal. The schools could not do much but can only complaint to the service provider if the staff is an external janitor. The situation might not improve much or quick. However, if the staff is in-house janitor, the school could take immediate action and have punishment on the janitor directly. Since the janitors could have direct influence to the students' behaviors, schools might thus take their role seriously and would like to have more control on their janitors' behavior.

In addition, it might be easier for the students to develop better relationships with in-house janitors than with external janitors. In-house janitors could have higher sense of belongings to the schools. They are employed by the schools and serve the students as their clients. They are supposed to have long time engagement with the schools and the students. For example, an ordinal secondary student would have 7 years study in the secondary school. The student might have the chance to develop long-term relationship with the in-house janitors. From the interaction with the janitors, students could obtained interpersonal skills and learn how to respect different kinds of people. In contrast, external janitors are employed by the property management companies and report their duty to the companies. They might need to work for different schools. The schools might not have great control on the change of the external janitor. Thus, external janitors might have lower sense of belongings to the schools. They might not serve and care about the students as much as the in-house janitors since they might not stay long at the same school.

Education is not only about the knowledge transfer. Moral education is equally important. It is also one of the key education areas for the secondary schools. Schools principals expect that their janitors would also play a key role at their core business. Contrast to common concept, janitors are not only expected to perform daily cleaning and security operation but also expected to 'teach' students something. Thus, they might prefer to have in-house janitors rather than outsourcing in order to take greater control on the quality of their 'janitor services'.

6.6.5Loyalty

Positive but insignificant result is gained for the relationships between janitors' 'loyalty' and schools janitor services sourcing decision. It means that loyalty of janitors would not affect the schools' janitor services sourcing decision. Proposition P06 is refused. A negative result is predicted in the proposition that the less is the schools' perception that in-house janitors are more loyal than external janitors, the greater is the degree of outsourcing of janitor services. However, the positive result shows that more is the schools' perception that in-house janitors are more loyal than outsourcing janitors, the greater is the degree of outsourcing of janitor services. The abnormal result is possibly due to the single item construction of the variable. The variable 'Loyalty' is constructed by only one item:

L 1	In house janitors would be more loyal to our school compared to the janitors hired by the
	external janitor service-providers.

Since the variable comprises only 1 item, it is highly error sensitive. The reliability level of the item would be very low. Thus, an unusual result might be obtained because of high error sensitivity of the variable.

6.6.6Flexibility

A highly insignificant result is obtained for the relationship between 'Flexibility' and janitor services sourcing decision. It reveals that flexibility of janitor services arrangement does not affect the schools janitor services sourcing decision at all. 'Flexibility' comprises the following 2 items:

F 1	It would be more flexible to arrange the number of janitors if we hire external janitor service-providers.
F 2	It would be more flexible to arrange the work of janitors if we hire external janitor service-providers.

It is defined by how flexible the schools could arrange the job and number of the janitors. The results show that the schools the flexibility of janitor arrangement has actually negligible effect to the schools sourcing decision.

The possible reasons might be due to the 'routine' and 'programmable' job nature of the operation of HKSAR secondary school janitor services. As many secondary schools are built according to the standard design and do not have much special facilities, the daily duties of a school janitor could be programmed and defined clearly. It could be easily listed out and communicate to the janitors. For example, the major duty of a secondary janitor might be cleaning and security such as school manning. These jobs are very routine and do not subject to fluctuating environment or technology. Since the duties of a school janitor would not change quick and frequently, flexibility might not be an important factor for choosing the sourcing strategy.

Secondary schools might need additional workforce on special events. Nevertheless, they could employ part time or temporary janitors to cope with the occasional need. Besides, there are no really much special event days which require lots of extra janitors during a typical school year. The so-called special days or events such as the Parent's Day, Sport Day, etc are programmed during every school year. The school janitors might already know very well to deal with the job arrangement. Thus, most of the work of school janitors is relatively routine and fixed. Sudden changes to their job duties are rare. Thus, even if schools principals perceive that outsourcing their janitor services could give them greater flexibility in arranging the janitors' work, it would not increase their intention to have more outsourcing of janitor services.

6.6.7Informal Cost

Negative path coefficient (-0.50) is get for the relationship between the 'Informal Cost' and the janitor services sourcing decision. The result is very significant even at 0.01 level. It shows that the greater informal costs are involved in the outsourcing of schools janitor services, the less would be the degree of the outsourcing of schools janitor services. Proposition P08 is supported. It shows that informal costs are very important consideration for schools to decide whether to outsource their janitor services. Schools which tend to employ in-house staff value the informal cost highly.

Schools are non-profit organizations which bear social responsibility. They usually want to keep a family feeling among all the staff and students. If they perceive the janitor as family members, they would want to take good care about their janitors. The school principals might think that they have the duty to take good care to their in-house janitors especially for the one who have been working there for a long time. They would like to keep their janitors as in-house staff as better benefit and care could be given to them. In return, the in-house janitors would have a greater sense of belonging to their schools and they would probably devote themselves more to their job.

Besides, some of the janitors have been worked for the school for a long time and they have already developed a very good relationship with existing teaching staff. They are actually good friends with teaching staff and students. Schools would bear great loss if they shift the in-house management to outsourcing. The teaching and administrative staff would not be happy if their friends (i.e. in-house janitors) loss their jobs. It might affect the morale and performance of the teaching staff. The schools could thus in a great trouble

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and bear high risk if they change their janitor services management from in-house to outsourcing.

Moreover, schools reputation is really important to secondary schools. It shows that the schools really cared about the negative image of the external services providers. Sometimes, there is news complaining about the low-salaries of the external school janitors. This problem has even been discussed in the Legislative Council^{*}. The councilors complain about the lack the social responsibility of those property management companies and call for penalties to them. Some schools might be worried that they might be labeled as the 'helper' or 'causer' to the low-salaries of the external janitor service if they hire these property management companies to provide their janitor services. As reputation could affect the student admission rate directly, schools usually are very careful and sensitive to the things that might affect their reputation.

Although the financial cost of shifting the schools' janitor services system from in-house management to outsourcing might be not that high, the school have to bear high informal cost that might hurt their core business. It might be

^{*} LCQ9: Outsourcing of Cleansing and Security Services in Schools, December 5, 2007

the prime reasons that why some schools do not outsource their janitor services even if it is cost reducing.

6.7 Implication of the Model

From the model, the factors and their corresponding weighting to the secondary schools' sourcing decision could be found.

It should be noticed that asset specificity is the most important reason for schools to have the outsourcing of janitor services. It means that the schools would most likely choose outsourcing when their schools facilities become more complex and comprehensive.

Secondary schools now could apply for the School Improvement Programme provided by the Education Bureau in order to build new special rooms or incorporate new facilities to suit their own special needs. Facilities in secondary schools are becoming more specialized despite the fact that many of them were built according to standard design. School facilities management is
thus expected to become more and more complex in the future. More schools would need professional facility management knowledge and techniques to tackle the increasing complexity of their school facilities. The demand for professional property management for HKSAR secondary schools would possibly keep increasing in the future.

However, factors such as informal cost, transaction costs and role of janitors are found as the resistances for secondary schools to have the outsourcing of janitor services. The most prominent resistance factor for the outsourcing of janitor services in secondary schools is the informal cost involved. It has great impact to the school principal's sourcing decisions. The school principals are very concerned about the adverse impact of outsourcing causing to their current in-house janitors as well as their reputation. Therefore, if the government and the property management companies really want to encourage more schools to have the outsourcing of janitor services, they should first relief the schools' concern.

Schemes for the retirement of current in-house janitors should be provided to safeguard their welfare. Full or extra compensation should also be

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guaranteed. As the informal cost involved is very large for schools to shift their janitor service sourcing system, a graduate shit should be encouraged instead of an abrupt change. A hybrid form of management (i.e. joint management by both in-house and external janitors) could be first encouraged.

In addition, property management companies should not only care about the quality of their services provided but should also try their best to keep a 'good' image to the society. Reducing wages of external janitors is not the best way to lower business cost as the company might actually loss their business at the same time. Due to the nonprofit nature of the schools, they care much about social responsibility than just cost cutting. They have different aims and objectives than common business entities which the management companies usually served. Thus, companies who want to serve schools should explore other ways to improve their business efficiency such as by economic of scale instead of cutting wages of staff.

In addition to informal cost, transaction cost and role of janitors also constitute negative effect to schools' sourcing decision for janitor services. These two factors share similar negative weighting to the sourcing decision. To reduce the transaction cost of outsourcing the janitor services, more market information should be available to the schools. Since schools' janitor services operation is not highly specific and uncertain, the transaction cost involved might mainly due to the asymmetric information to the schools. As schools are not experienced in the outsourcing of janitor services and there is no 'standard form' of contracts available to them, they might think it risky and troublesome to negotiate contracts with external service providers.

In fact, the transaction cost would be much lower if management companies could draft a 'standard form' of contracts and make it available to the public or all schools. Schools could amend the specific terms and conditions according to their own need. The negotiation cost and uncertainties could be much reduced in that case.

Besides, the schools expect their janitors to perform as a moral role to the students. Thus, they would like to take more control on the conduct and behavior of the janitors. The property management companies should be aware with this point and provide the schools 'suitable' janitors. The janitors trained by the management companies should equip with professional facility management knowledge as well as behave 'morally'. They should not only care about the facilities but also the students. Keeping good relationships with students is also an essential job to the janitors.

It is shown in the model that schools do not care about the supplier presence and the flexibility of janitors' arrangement. It indicates that the schools generally think that the management companies are available and accessible in the market. Government or the property management companies have done well to promote the companies. Hence, instead of giving a 'recommended' suppliers' list to the schools, the companies should do more to improve their services tailored to the schools' need.

As flexibilities are not the concern of schools, property management companies should think other ways to improve their comparative advantage. Property management companies must identify which of their comparative advantages that the schools would value the most. For example, they could invest more to provide professional skills and equipment to schools and convey better training to their staff. Duties arrangement of janitors is actually not a big concern to the schools.

CHAPTER SEVEN CONCLUSION

7.1 Introduction

This chapter is going to summarize the dissertation. The whole research structure would be reviewed again. Limitations and areas for further study are suggested in the last part of this chapter.

7.2 Summary of the dissertation

Due to the government's Audit Report (2002) about the outsourcing of schools janitor services, the research question has been raised – If outsourcing of janitor services is cost-reducing, why do the majority of schools still hire in-house janitors instead of outsourcing?

This dissertation attempts to answer this question by finding out the factors (besides cost reduction) of the HKSAR secondary schools janitor services sourcing decision. It aims to identify the motivation and resistance factors for the outsourcing of the schools janitor services. The relative importance and weighting of each factor are also examined.

Outsourcing has been carried out for many years in various disciplines at different places. Many academic discussions and pieces of research have investigated of the outsourcing issues. Hence, a literature review was carried out to identify the reasons for outsourcing in different industries. Key motivation and resistance reasons were extracted. The major motivation factors for outsourcing are: a) high asset specificity; b) focus on core business; and c) to gain professional knowledge and skills. Negative factors for outsourcing are also identified which are transaction cost and agency cost.

Two pilot interviews were then conducted in an attempt to understand the actual janitor services operations in secondary schools. Two secondary schools' principals were interviewed to get their views on the outsourcing of janitor services. More motivation and resistance factors were found to affect their sourcing decisions to janitor services. In addition to the motivation factors mentioned above, the element of flexibility in employing external janitors was suggested by the principals. Reasons for not outsourcing janitor services were also addressed by the principals. The reasons could be integrated as the following factors: a) educational role of janitors; b) loyalty of in-house janitors; and c) informal cost of outsourcing.

Next, propositions were set up to estimate the relationships between the factors and the schools janitor services sourcing decision. The presence of appropriate suppliers is added as one of the motivation factors for outsourcing of janitor services. Motivation factors suggested above are predicted to have positive effect on the degree of outsourcing of janitor services while resistance factors are expected to have negative effect to the degree of outsourcing of janitor services.

A hypothesized path model was then set up to test the propositions and the weightings of each factor to the schools' sourcing decisions for janitor services. A questionnaire was designed to collect the views of the schools' principals about the janitor services sourcing system. The questionnaires have been distributed to all the HKSAR secondary schools to avoid the sample drawing problems. 106 questionnaires are collected back and the response rate is 20.6%. Due to the unobservable variables and interval data generated from the questionnaires, path analysis was chosen as the methodology to analyze the data. Path analysis has been widely used in sociology and behavioral science research as it could deal with latent variables and interval data statistically. The hypothesized path model was then tested by maximum likelihood estimates. Path coefficients of each variable to the janitor services sourcing decision are generated.

From the pilot interviews, the school principals suggested that the schools' background might affect their sourcing decisions for janitor services. Schools with religious belief and older age would perceive the school as a "family" and their janitor staff as "family" members. Thus, less outsourcing was predicted in schools with religious background. However, from the descriptive analysis, it is found that schools backgrounds such as school type, religious belief and age do not have direct relationships with the schools sourcing decisions for janitor services.

Model testing is carried out and a good model fit is resulted. The relationships between the factors and the schools janitor services sourcing decision are obtained.

Path coefficients of supplier presence, loyalty and flexibility are not significant meaning that they are not considerations for schools sourcing decisions for janitor services.

Only asset specificity was found to have positive effect to the janitor service outsourcing. It was shown in the model that the major reason for schools to outsource their janitor services is the relatively high asset specificity compared to their peer schools. Several implications are indicated by the model. As secondary schools now could improve and introduce special facilities by applying the School Improvement Programme, the schools' facility management is expected to become more complex and comprehensive. Thus, an increasing demand for the outsourcing of schools janitor services is expected in the future.

In contrast, informal cost was found to have the greatest resistance effect to the schools outsourcing decision. As indicated in the model, schools were concerned about the welfare and payment of their janitors. Their janitors had good relationships with other staff. The schools also cared about the social image of the property management companies. Hence, the government and the property management companies should pay attention to the informal costs incurred by the schools in order to encourage more schools to have the outsourcing of janitor services. It is possible that a more gradual shift could be encouraged and a hybrid system could be tried first. Compensation schemes for current janitors should be provided. Schools are nonprofit organizations which need to bear social responsibilities. They might worry that hiring low-paid external janitors might be harmful to their reputations. Thus, property management industry has to improve their image. They should build up a positive image of corporate social responsible particularly in relation to salaries and "conditions" of employment.

In addition to the informal cost, transaction cost of the outsourcing of janitor services and the role of janitors perceived by the schools were found to be the second great resistances to the outsourcing of janitor services. To reduce the transaction cost of the outsourcing of janitor services, the property management companies could provides schools with standard form of contracts. The standard contracts should be in public and easily obtainable by the schools.

Besides, the result showed that schools were looking for janitors who are able to build up good relationships with their students. The janitors should perform as moral roles to the students. Hence, there should be an active relationship building between service providers and "clients". The external janitors should not only focus on the operation of facility management. They should also foster a good relationship with the students and the schools. Property management companies would need to provide better training programme for the external janitors.

Although outsourcing has been carried out in various business fields for many years, it is still new to the HKSAR secondary schools which are mainly non-profit organizations and have different objectives and aims to the business sectors. Hence, both government and property management companies should first understand the nature of the schools and what they are really looking for the janitor services. Providing the 'right' kind of services is very important for them to promote the outsourcing of janitor services to schools.

7.3 Limitations

The first limitation of this dissertation is its cost-reduction assumption for outsourcing of schools janitor services. The assumption is based on the estimation of the government audit report (2002). In the report, only 1 response was used for the calculation of the cost-saving estimation. A great error might be resulted which might lead to a wrong conclusion. However, the audit report (2002) was accepted with limitations since its conclusion cannot be proved or disproved without the financial data of schools in Hong Kong. With the limitation in the cost-saving assumption, the power of results obtained in this dissertation would be limited.

Another major limitation of this research would be the generalizability of the results. The small size of school samples might limit the generalizability of results. The result would be limited to HKSAR secondary schools only but could not be generalized to other industries due to their great differences in business nature. Moreover, although the school principals are the major decision maker to the outsourcing of janitor services, there might be methodological limitations of gathering data from a single source (Ang and Straub 1998).

There are limitations associated with path analysis. Error results might be obtained there is excessive error in the measurement of the latent variables. Analyzing non-experimental data by path analysis involves other limitations such as neglecting a common cause and making incorrect inferences about the directions of relationships among variables (Kunstmann 2003).

In addition, data collected using 5-point Likert scale might subject to distortion. For example, respondents might avoid choosing the extreme categories (i.e. central tendency bias) or they might tend to agree on the statements that are in favor to their organizations (i.e. social desirability bias)(Dawis 1987).

7.4 Areas for Further Study

For further study, views of external services suppliers or government officers could be collected so as to compare with the views of schools principals. In the course of examining the view of the outsourcing of janitor services in nonprofit organizations, interviews could be made with more schools so as to identify more motivation and resistance factors.

Although many researches have been done on business process outsourcing, limited studies have been carried out to the nonprofit organization outsourcing. This dissertation mainly focuses on the outsourcing of janitor services at educational institutions. More research related to outsourcing could be conducted on other nonprofit organizations such as charities, government institutions, etc.

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Appendix I - Estimated annual savings from outsourcing of

janitor services

(Source: 2002 Government Audit Report)

Estimated annual saving from outsourcing of janitor services

Existing spent in	Existing amount (based on 2001-02 salary scale) spent in employment of janitor staff (Note 1)				
Less: C	Cost o	of outsourcing of janitor services (Note 2)	\$351,726,072		
Estimat	ted a	\$100,263,636			
			Say \$100 million		
Source:	Info	rmation provided by the ED and Audit's analysis			
Note 1:	Exi:	sting amount spent in employment of janitor staff is calculated as follows:			
	(a)	Total number of janitors entitled by aided and government schools	3,743		
	(b)	Annual salary of a janitor staff	\$120,756		
	(c)	Existing amount spent in employment of janitor staff (a) \times (b) = 3,743 \times \$120,756	\$451,989,708		
Note 2:	Cos	t of outsourcing of janitor services is calculated as follows:			
	(a)	Total number of aided and government schools	731		
	(b)	Total number of janitors entitled by aided and government schools	3,743		
	(c)	Assuming subsequent to outsourcing, on average, two janitors are still required in each school for residual work. The number of janitors that would be retained in schools is:	1.(2)		
		$(a) \times 2 = 731 \times 2$	1,462		
	(d)	Annual salary of a janitor staff	\$120,756		
	(e)	Cost of retaining two janitors in each school would be: (d) \times (c) = \$120,756 \times 1,462	\$176,545,272		
	(f)	Number of janitors that may be outsourced would be: (b) - (c) = 3,743 - 1,462	2,281		
	(g)	According to the case in paragraph 3.26, an amount of $$384,000$ was incurred for the employment of five outsourced workers. Therefore, the cost of an outsourced worker is: $$384,000 \div 5$	\$76,800		
	(h)	Cost of outsourcing 2,281 janitors would be: (g) \times (f) = \$76,800 \times 2,281	\$175,180,800		
	(i)	Total cost of outsourcing of janitor services would be: (e) + (h) = \$176,545,272 + \$175,180,800	\$351,726,072		

Appendix II - Sample of the Questionnaire

Outsourcing of Janitor Services at HKSAR Secondary Schools

This questionnaire is going to collect information from school principals about their opinion to their school's janitor services. Data collected would be used to analysis the factors affecting school principals' sourcing decisions for janitor services.

Section A

Please tick ('v') the box which best describes the CURRENT way in which your school's janitor services are managed and operated. TICK ONLY ONE BOX ON THIS SECTION. Choices are:

- 1 You have your own INTERNALLY MANAGED, INHOUSE janitor service operations.
- 2 EXTERNAL SERVICE-PROVIDERS provide you with janitor services.
- 3 You janitor service operations are JOINTLY MANAGED by in-house janitors and external service-providers.
- 4 OTHER arrangement (please specify:______

Section B

For each of the janitor activities listed below, please tick ('v') the box corresponding to the CATEGORY to which decisions concerning janitor services and operation control are made internally by your school personnel; jointly (cooperatively) by your school personnel and those of external service-provider; or externally by those of



-		

external service-provider.

- 1 Locking doors and windows after school
- 2 watering flowers and plants and simple gardening
- 3 assisting in school activities such as decorating
- 4 transporting furniture within school
- 5 replacing distilled water containers
- 6 cleaning the principal's room, staff room and school office
- 7 cleaning the class room and the school premises
- 8 serving tea to teachers
- 9 delivering student exercise books and documents
- 10 manning the school entrance
- 11 controlling traffic

Section C

The following sentences are related to your school's janitor services. Please check the box beside statement that most accurately reflects the extent of your agreement with the statement.

1 Compared to our peer schools, our janitor services require technical skills that are

Exclusively	Internal	Jointly	External	Exclusively
Internal				External

Strongly	Disagree	Neutral	Agree	Strongly
Disagree				Agree

relatively unique.

- 2 To provide the cleaning and security services, external service provider would have to make substantial investments in equipment tailored to our needs.
- 3 Our cleaning and security operations are more complex than the cleaning and security operations of peer schools.
- 4 There would be significant problems associated with negotiating a contract or agreement (e.g. agreeing the conditions, prices, etc.) with an external services-providers for our janitor services.
- 5 It would be very difficult to modify our contracts or agreements with external janitor services providers once a contract is signed.
- 6 External janitor service-providers would have to be closely and constantly monitored to ensure that they adhere to our contractual terms and conditions.
- 7 It would be very difficult to measure the performance of the external janitor service-provider.
- 8 There are a significant number of reputable external janitor service-providers who potentially could provide janitor services to our school.
- 9 There are a significant number of trustworthy external janitor service-providers who potentially could provide janitor services to our school.
- 10 If we decide to terminate the in-house janitor operations, there are other external janitor service-providers who could provide us same level of janitor service.
- 11 Our janitors keep very good relationships with our students.
- 12 Janitors should act as moral role to our students.



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- 13 We hope that our students could learn how to respect others through getting along with the janitors.
- 14 We hope that our students could learn interpersonal skills through getting along with the janitors.
- 15 In house janitors would be more loyal to our school compared to the janitors hired by the external janitor service-providers.
- 16 It would be more flexible to arrange the number of janitors if we hire external janitor service-providers.
- 17 It would be more flexible to arrange the work of janitors if we hire external janitor service-providers.
- 18 We perceive the whole school as a big family and the janitors are our family members.
- 19 Our janitors keep very good relationships with other administrative and teaching staff.
- 20 There are complains about the low salaries of the outsourcing staff. We are worried that if we hired the external service-providers, our reputation might be affected by these news.
- 21 Our teaching staff could be more focused on the teaching activities if we hire external janitor service-providers.
- 22 External janitor service-providers could provide us professional services and equipments which could not be offered by in-house janitors.



Section D

1	Which of the following type does your school belong to?		
	a) Government School		
	b) Aided School		
	c) Direct Subsidy School		
	d) Private School		
2	How long has been your school opened?		yrs
3	Does your school have religious background?	Y/N	
	(If yes, please specify:)		

End of Questionnaire Thank you! Appendix III - Results of Questionnaire

Tables below show the survey results regarding the frequencies and descriptive statistics of questions related to the degree of janitor services functions.

						Statistics						
			Watering flowers and	Assisting in			cleaning the principal's	cleaning the classroom		delivering student		
		Locking doors	plant and	school	transporting	replacing	room, staff	and the		exercise	Manning the	
		& windows after school	simple gardening	activities such as decorating	furniture within school	distilled water containers	room and school office	school premises	serving tea to teachers	books and documents	school entrance	Controlling traffic
Ν	Valid	106	106	106	106	106	106	106	106	106	106	106
	Missing	0	0	0	0	0	0	0	0	0	0	0
Mean		1.93	2.35	1.98	2.08	2.20	2.09	2.28	1.95	2.06	2.22	2.29
Std. Er	ror of Mean	.111	.124	.089	.110	.116	.120	.128	.108	.110	.117	.120
Median	I	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Mode		1	1	2	1	1 ^a	1	1	1 ^a	2	1	1
Std. De	eviation	1.140	1.273	.915	1.136	1.191	1.238	1.315	1.107	1.128	1.203	1.234
Minimu	m	1	1	1	1	1	1	1	1	1	1	1
Maximu	um	5	5	5	5	5	5	5	5	5	5	5
Sum		205	249	210	220	233	222	242	207	218	235	243

a. Multiple modes exist. The smallest value is shown

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	50	47.2	47.2	47.2
	Internal	30	28.3	28.3	75.5
	Jointly	14	13.2	13.2	88.7
	External	7	6.6	6.6	95.3
	Exclusively External	5	4.7	4.7	100.0
	Total	106	100.0	100.0	

Locking doors & windows after school

Watering flowers and plant and simple gardening

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	34	32.1	32.1	32.1
	Internal	33	31.1	31.1	63.2
	Jointly	14	13.2	13.2	76.4
	External	18	17.0	17.0	93.4
	Exclusively External	7	6.6	6.6	100.0
	Total	106	100.0	100.0	

Assisting in school activities such as decorating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	35	33.0	33.0	33.0
	Internal	46	43.4	43.4	76.4
	Jointly	19	17.9	17.9	94.3
	External	4	3.8	3.8	98.1
	Exclusively External	2	1.9	1.9	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	41	38.7	38.7	38.7
	Internal	33	31.1	31.1	69.8
	Jointly	21	19.8	19.8	89.6
	External	5	4.7	4.7	94.3
	Exclusively External	6	5.7	5.7	100.0
	Total	106	100.0	100.0	

transporting furniture within school

replacing distilled water containers

	-	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	36	34.0	34.0	34.0
	Internal	36	34.0	34.0	67.9
	Jointly	18	17.0	17.0	84.9
	External	9	8.5	8.5	93.4
	Exclusively External	7	6.6	6.6	100.0
	Total	106	100.0	100.0	

cleaning the principal's room, staff room and school office

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	45	42.5	42.5	42.5
	Internal	30	28.3	28.3	70.8
	Jointly	14	13.2	13.2	84.0
	External	10	9.4	9.4	93.4
	Exclusively External	7	6.6	6.6	100.0
	Total	106	100.0	100.0	

	-	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	39	36.8	36.8	36.8
	Internal	30	28.3	28.3	65.1
	Jointly	14	13.2	13.2	78.3
	External	14	13.2	13.2	91.5
	Exclusively External	9	8.5	8.5	100.0
	Total	106	100.0	100.0	

cleaning the classroom and the school premises

serving tea to teachers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	43	40.6	40.6	40.6
	Internal	43	40.6	40.6	81.1
	Jointly	8	7.5	7.5	88.7
	External	6	5.7	5.7	94.3
	Exclusively External	6	5.7	5.7	100.0
	Total	106	100.0	100.0	

delivering student exercise books and documents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	38	35.8	35.8	35.8
	Internal	43	40.6	40.6	76.4
	Jointly	13	12.3	12.3	88.7
	External	5	4.7	4.7	93.4
	Exclusively External	7	6.6	6.6	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	37	34.9	34.9	34.9
	Internal	33	31.1	31.1	66.0
	Jointly	18	17.0	17.0	83.0
	External	12	11.3	11.3	94.3
	Exclusively External	6	5.7	5.7	100.0
	Total	106	100.0	100.0	

Manning the school entrance

Control	lina [.]	traffic
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		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exclusively Internal	36	34.0	34.0	34.0
	Internal	29	27.4	27.4	61.3
	Jointly	22	20.8	20.8	82.1
	External	12	11.3	11.3	93.4
	Exclusively External	7	6.6	6.6	100.0
	Total	106	100.0	100.0	

Tables below show the survey result regarding the frequencies and descriptive statistics of questions related to the sourcing factors.

	Ν	Minimum	Maximum	Me	ean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
monitor cost	106	1	5	3.36	.093	.958
measurement cost	106	1	5	2.92	.088	.906
no. of reputable external service provider	106	1	5	3.12	.088	.902
no. of trustworthy external service provider	106	1	5	2.96	.081	.839
other external service provider available	106	1	5	2.92	.102	1.052
relationship with student	106	2	5	3.78	.079	.817
moral role	106	2	5	3.70	.070	.719
student could learn to respect others	106	2	5	3.86	.078	.798
student could learn interpersonal skills	106	2	5	3.79	.062	.643
In-house janitor be more loyal	106	1	5	3.75	.095	.974
more flexible to arrange the no. of janitor	106	1	5	3.20	.089	.920
more flexible to arrange the work	106	1	5	3.04	.091	.935
school as a big family	106	1	5	3.69	.094	.970
good relationship with other staff	106	2	5	3.63	.071	.735
school reputation	106	1	5	3.15	.069	.714
more focus on core business	106	1	5	2.87	.091	.937
professional services and equipment	106	1	5	3.20	.087	.899
Valid N (listwise)	106					

Descriptive Statistics
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	8.5	8.5	8.5
	Disagree	34	32.1	32.1	40.6
	Neutral	50	47.2	47.2	87.7
	Agree	11	10.4	10.4	98.1
	Strongly Agree	2	1.9	1.9	100.0
	Total	106	100.0	100.0	

unique technical skills required

substantial investment needed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	6.6	6.6	6.6
	Disagree	45	42.5	42.5	49.1
	Neutral	31	29.2	29.2	78.3
	Agree	19	17.9	17.9	96.2
	Strongly Agree	4	3.8	3.8	100.0
	Total	106	100.0	100.0	

complex operations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	12.3	12.3	12.3
	Disagree	43	40.6	40.6	52.8
	Neutral	34	32.1	32.1	84.9
	Agree	14	13.2	13.2	98.1
	Strongly Agree	2	1.9	1.9	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent			
Valid	Disagree	32	30.2	30.2	30.2			
	Neutral	61	57.5	57.5	87.7			
	Agree	13	12.3	12.3	100.0			
	Total	106	100.0	100.0				

negotiation problems

difficult to modify contracts

	-	Frequency	Percent	Valid Percent	Cumulative Percent
	-				
Valid	Disagree	40	37.7	37.7	37.7
	Neutral	44	41.5	41.5	79.2
	Agree	22	20.8	20.8	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	3.8	3.8	3.8
	Disagree	14	13.2	13.2	17.0
	Neutral	38	35.8	35.8	52.8
1	Agree	40	37.7	37.7	90.6
	Strongly Agree	10	9.4	9.4	100.0
	Total	106	100.0	100.0	

	include of the second						
-					Cumulative		
		Frequency	Percent	Valid Percent	Percent		
Valid	Strongly Disagree	2	1.9	1.9	1.9		
	Disagree	38	35.8	35.8	37.7		
	Neutral	37	34.9	34.9	72.6		
	Agree	25	23.6	23.6	96.2		
	Strongly Agree	4	3.8	3.8	100.0		
	Total	106	100.0	100.0			

measurement cost

no. of reputable external service provider

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.7	4.7	4.7
	Disagree	19	17.9	17.9	22.6
	Neutral	43	40.6	40.6	63.2
	Agree	36	34.0	34.0	97.2
	Strongly Agree	3	2.8	2.8	100.0
	Total	106	100.0	100.0	

no. of trustworthy external service provider

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.8	2.8	2.8
	Disagree	28	26.4	26.4	29.2
	Neutral	47	44.3	44.3	73.6
	Agree	26	24.5	24.5	98.1
	Strongly Agree	2	1.9	1.9	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	9.4	9.4	9.4
	Disagree	29	27.4	27.4	36.8
	Neutral	31	29.2	29.2	66.0
	Agree	32	30.2	30.2	96.2
	Strongly Agree	4	3.8	3.8	100.0
	Total	106	100.0	100.0	

other external service provider available

relationship with student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	9	8.5	8.5	8.5
	Neutral	22	20.8	20.8	29.2
	Agree	58	54.7	54.7	84.0
	Strongly Agree	17	16.0	16.0	100.0
	Total	106	100.0	100.0	

	moral role								
	-	Frequency	Percent	Valid Percent	Cumulative Percent				
Valid	Disagree	6	5.7	5.7	5.7				
	Neutral	30	28.3	28.3	34.0				
	Agree	60	56.6	56.6	90.6				
	Strongly Agree	10	9.4	9.4	100.0				
	Total	106	100.0	100.0					

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	5.7	5.7	5.7
	Neutral	24	22.6	22.6	28.3
	Agree	55	51.9	51.9	80.2
	Strongly Agree	21	19.8	19.8	100.0
	Total	106	100.0	100.0	

student could learn to respect others

student could learn interpersonal skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	4.7	4.7	4.7
	Neutral	20	18.9	18.9	23.6
	Agree	73	68.9	68.9	92.5
	Strongly Agree	8	7.5	7.5	100.0
	Total	106	100.0	100.0	

in-house janitor be more loyal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.8	2.8	2.8
	Disagree	9	8.5	8.5	11.3
	Neutral	21	19.8	19.8	31.1
	Agree	51	48.1	48.1	79.2
	Strongly Agree	22	20.8	20.8	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.9	1.9	1.9
	Disagree	23	21.7	21.7	23.6
	Neutral	40	37.7	37.7	61.3
	Agree	34	32.1	32.1	93.4
	Strongly Agree	7	6.6	6.6	100.0
	Total	106	100.0	100.0	

more flexible to arrange the no. of janitor

more flexible to arrange the work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.9	1.9	1.9
	Disagree	33	31.1	31.1	33.0
	Neutral	35	33.0	33.0	66.0
	Agree	31	29.2	29.2	95.3
	Strongly Agree	5	4.7	4.7	100.0
	Total	106	100.0	100.0	

school	as	а	big	family
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	-	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.9	.9	.9
	Disagree	12	11.3	11.3	12.3
	Neutral	29	27.4	27.4	39.6
	Agree	41	38.7	38.7	78.3
	Strongly Agree	23	21.7	21.7	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	10	9.4	9.4	9.4
	Neutral	25	23.6	23.6	33.0
	Agree	65	61.3	61.3	94.3
	Strongly Agree	6	5.7	5.7	100.0
	Total	106	100.0	100.0	

good relationship with other staff

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school reputation
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		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.9	1.9	1.9
	Disagree	11	10.4	10.4	12.3
	Neutral	65	61.3	61.3	73.6
	Agree	25	23.6	23.6	97.2
	Strongly Agree	3	2.8	2.8	100.0
	Total	106	100.0	100.0	

more focus on core business

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.7	4.7	4.7
	Disagree	35	33.0	33.0	37.7
	Neutral	39	36.8	36.8	74.5
	Agree	23	21.7	21.7	96.2
	Strongly Agree	4	3.8	3.8	100.0
	Total	106	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.9	1.9	1.9
	Disagree	25	23.6	23.6	25.5
	Neutral	32	30.2	30.2	55.7
	Agree	44	41.5	41.5	97.2
	Strongly Agree	3	2.8	2.8	100.0
	Total	106	100.0	100.0	

professional services and equipment