A CONTINGENCY MODEL FOR FACILITIES MANAGEMENT OUTSOURCING RELATIONSHIPS (CORE) IN THE HONG KONG HIGHER EDUCATION SECTOR

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Ph.D. Thesis **2013**

A Contingency Model for Facilities Management Outsourcing Relationships (CORE) in the Hong Kong Higher Education Sector

An exploratory model for linking FM outsourcing performance to higher education business performance

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CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

Signed 

Ka Leung LOK (Lawrence)

Contributions

Published Conference Papers

1. Lok. K. L., Baldry, D. and Finch, E. (2013) *Sustainable Development in the Outsourcing Relationships of Facilities Management (FM): A Model for Linking FM Outsourcing Business Operations to Higher Educational Service*, SOEHK Symposium 2013 Evolution of Operations Engineering – Challenges and Sustainable Developments, Hong Kong, China, 22 June 2013, p.99 - 104

2. Lok, K. L. and Finch, E. (2012) *A Contingency Model For Outsourcing Relationships in the Facilities Sector*, paper presented at the WWP Conference, Texas, USA, available at: http://ifma.confex.com/ifma/ww2012/webprogram/Session2839.html (accessed 18 March 2013).

3. Lok, K. L., Finch, E., Chiang, Y. H. and Chan, C. M. (2010) *An Exploratory Model Linking Facilities Management Outsourcing Performance to Business Performance in Built Environment*, The 1st Greater Pearl River Delta Conference on Building Operation and Maintenance: Sustainable and Value-for-Money Built Facilities, Hong Kong, China, 22 October 2010, p.109 – 18.

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2. International Facilities Management Association (IFMA) Foundation, Scholarship award (Wisconsin Chapter), 2011

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List of Abbreviations

AHP	Analytic Hierarchy Process
CORE	Contingency Outsourcing Relationship
FM	Facilities Management
FORT	Four Outsourcing Relationship Types
HKSAR	Hong Kong Special Administration Region
IFMA	International Facilities Management Association
VTC	Vocational Training Council

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Abstract

The focus of study is to determine the relationships between clients and FM service providers by developing a yardstick for measuring and appraising the relationships in main FM outsourcing contracts in the higher education sector of Hong Kong. In this study, "outsourcing relationships" are defined as *"the extent to which an FM outsourcing contract facilitates effective ownership or control of FM assets, and enhances the competitive positioning and long-term strategies of the outsourced FM portfolio whilst the client's requirements are met".*

The most practical and successful approach for improving FM outsourcing relationships reported in the literature is a model based on quantitative assessment. A review of the literature suggests that the Four Outsourcing Relationship Types (FORT) model, used in the information technology industry, can be adapted for use in FM outsourcing. The data from two Delphi surveys and two questionnaire surveys, administered to 38 clients and 34 FM service providers, were used to build the proposed Contingency Outsourcing Relationships (CORE) model. The data analyses included the Kruskal-Wallis test, the Mann-Whitney U test and a Multi-nominal logistic regression. The Analytical Hierarchy Process and two focus group meetings were also used to develop the model.

The CORE model can be used to assess the four categories of outsourcing relationships by focusing on the four main FM outsourcing service contracts in Hong Kong's higher education sector: (i) building maintenance; (ii) security; (iii) cleaning; and (iv) catering. Other FM outsourcing service contracts are not covered by the CORE model. In the model, the combination of two different outsourcing relationship components or dimensions contributes to an outsourcing relationship type.

In conclusion, the empirical investigation reveals a significant relationship between FM outsourcing relationship types and services in the context of Hong Kong's higher education sector. Clients and service providers have indicated that applying the FM outsourcing relationship types improves the quality of the services. The findings indicate a match in the preference for the extent of outsourcing relationship dimensions on the ownership and control of service provider involvement on current outsourcing contracts for building maintenance, cleaning and catering in Hong Kong's higher education FM industry. This study also discusses that the importance of matching demand and supply of FM services plays a major role in the FM outsourcing success.

CHAPTER 1 INTRODUCTION

1.1 Introduction

This introductory chapter provides an overview of the research design and the implementation of the whole study. It is divided into the following six sections: Section 1.2 discusses the research background of the study; Section 1.3 presents the problem statement; Section 1.4 presents the research hypothesis; Section 1.5 discusses the research aims and objectives; Section 1.6 discusses the organisation of the thesis; and the limitations of the thesis are outlined in section 1.7.

1.2 Research background

During the last two decades, demand and supply being the organisation as user and the different services provided has been conducted in a clear trend towards outsourcing the provision of facilities services to external suppliers (Bailey *et al.*, 2002; Bro¨chner *et al.*, 2001; Currie, 1996; Duffy, 2000; Franceschini *et al.*, 2003; Graham and Scarborough, 1997; Harland *et al.*, 2005; Hui and Tsang, 2004; Kadefors, 2008; Quinn and Hilmer, 1994; Rao and Young, 1994; Roberts, 2001; Rogers, 2005; Salonen, 2004; Sharpe, 1997; Venka, 1992; Ventovuori and Lehtonen, 2006; Willcocks and Choi, 1995). The contracting-out of services has proliferated in various industries and property services in the UK (Field Fisher Waterhouse and Remit Consulting, 2004; Lane, 1994). Facilities management (FM) is a growing field due to globalisation, the demand for information technology (IT), the high cost of space, employees workplace environment expectations and the costs of mistakes (Becker, 2003). Within the Hong Kong government, the Efficiency Unit (2003) argues that outsourcing should be extensively used to

deliver public services and to achieve value for money – the key aim of every outsourcing exercise. Outsourcing is used to improve quality and to lower the costs of strategic procurement (Chan, 2008).

This section reviews the recent literature on outsourcing. It focuses on the inter-relationships between the modes of outsourcing and the degree of user satisfaction in the FM industry. The review shows that to understand outsourcing, it is necessary to have a holistic picture that incorporates all of the fundamental elements of outsourcing, including its nature, services, strategies, management of relationships and particularly its theoretical models. The literature review reveals the current understanding of the mechanisms of outsourcing. In the final section, a published outsourcing model is discussed in detail.

Williams (1996) describes the organisational structure of the FM team as having three key strands: 1) Premises (Hard FM) - property, operations and projects; 2) Support services (Soft FM) - staff support, business support and front-of-house; and 3) IT - hardware, software and system management. This research focuses on the business support of soft FM support services. There are two types of customers in the FM industry: corporate business clients and building users. The service expectations of the two groups of customers may be rather different; therefore, a service provider may have to develop distinct strategies for looking after the two types of customers. The building users in the built and human environment are individual customers, whereas corporate business clients provide consolidated strategic and administrative feedback to the providers. The interactive mechanism among the three stakeholders is dynamic in nature.

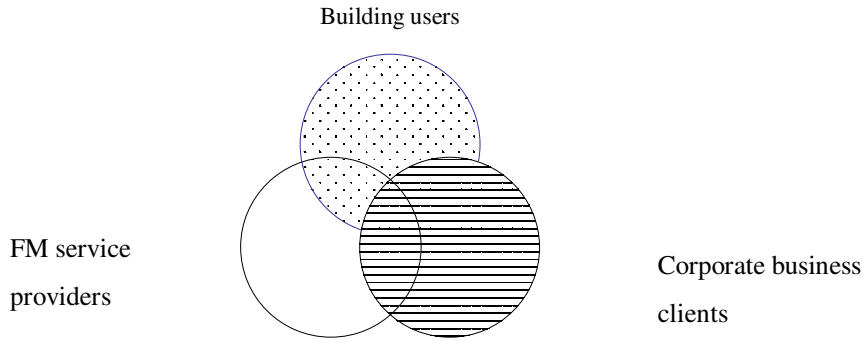


Figure 1.1 - Three FM stakeholders in the built and human environment

This study does not concern on the perspectives on general building users at the Hong Kong's higher education sector. In general, the staffs and students are required to complete the feedback questionnaires about the FM services in the campuses on the end of each semester. Thus, their needs can be understood by the FM strategists of universities and tertiary institutes in the higher education sector through the surveys. Moreover, they are not decision makers on FM outsourcing strategies. Shortly, the corporate FM clients have taken a consideration on their satisfaction of FM services. It is not important to investigate the points of view on general building users in this study.

Although the construction industry has long been a powerful engine for Hong Kong's economic growth, the industry experienced a drastic reduction in workloads and a change in market structure following the Asian economic turmoil in 1997 (Chiang *et al.*, 2013). Consequently, those regional FM outsourcing services in built environments have generally become common including

computer integrated FM, catering/vending, move management, project management (major/minor works), services installation (mechanical, electrical), cleaning and security (Moore and Finch, 2004). In the late 1990s in Hong Kong, expenditures became a greater burden with the drop in rental incomes, and hence, building owners outsourced services (Lai, Yik and Jones, 2008; Yik and Lai, 2005). In order to decrease the costs, many commercial building owners chose to outsource operation and maintenance work according to their studies. Tertiary Education Facilities Management Association (2011) reports that the high percentage on benchmark data are found on the facilities management services at the seven universities of Hong Kong including energy consumption, maintenance services, refurbishments and building operating cost especially the security services, cleaning and waste management services more than 50%. Kok, *et al.* (2011) also find that services of cleaning and maintenance have a major and direct effect on student's academic achievement whilst services of catering and security can affect staff and student satisfaction and the organisations' image. These four facility services can add different values to the higher education sector. Hence, this study only focuses on the four FM outsourcing services of maintenance, cleaning, security and catering supplied at the Hong Kong's higher education sector.

To fully understand outsourcing relationships, it is necessary to take a holistic view of the fundamental elements of outsourcing, including the nature, services, strategies and management of relationships and to examine these elements within appropriate theoretical models. The literature reveals the general working mechanisms of outsourcing (Boer *et al*., 2006 and Maskell *et al*., 2005), but the

significance of this study lies in its explication of the currently obscure relationships between FM outsourcing service providers and clients.

This study focuses on two areas: the FM domain and the business domain. The former includes major issues such as FM service providers and the delivery of FM services, whereas the latter focuses on corporate business clients and the design of outsourcing strategic manoeuvre (Figure 1.2).

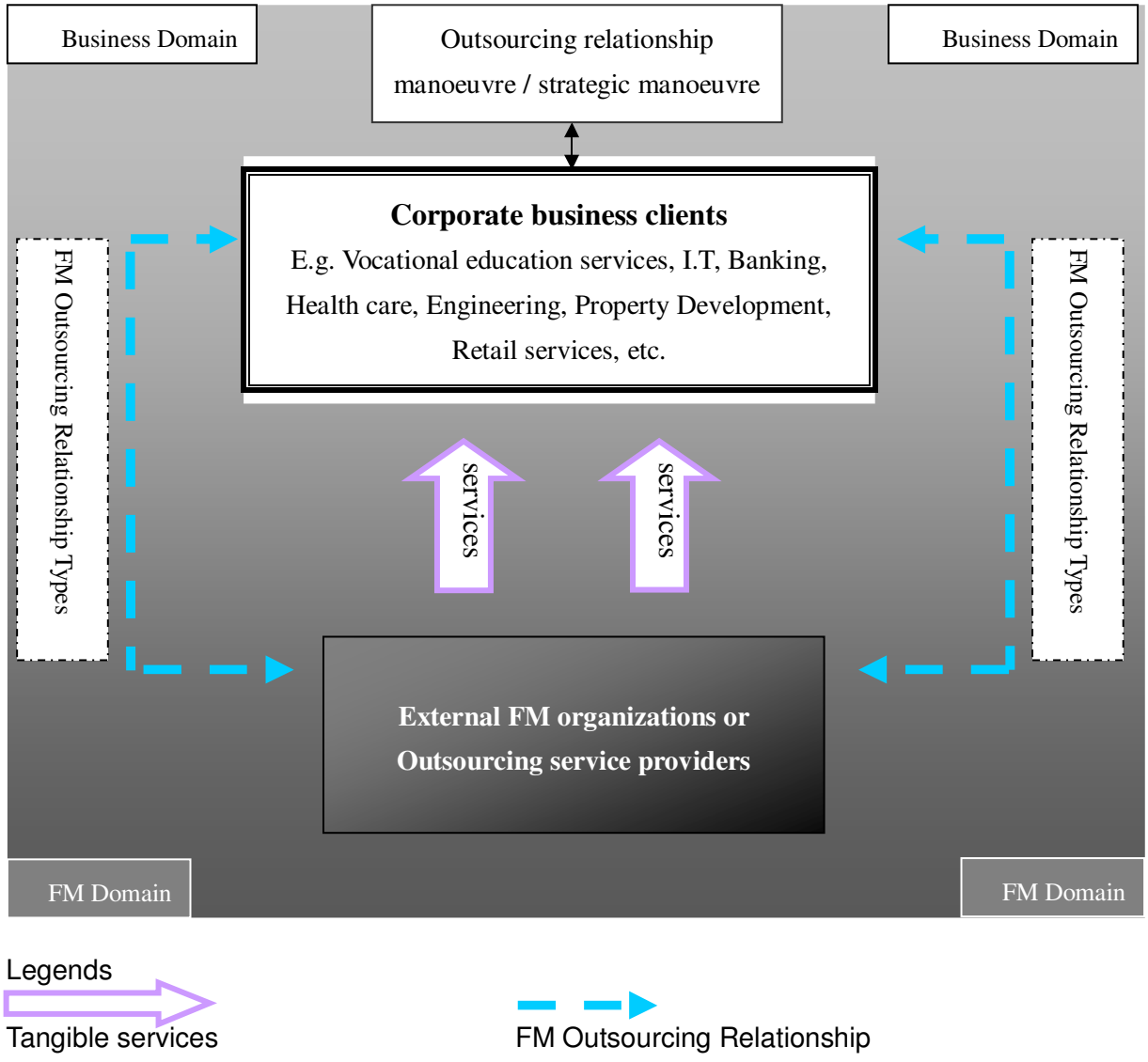


Figure 1.2 - Fundamental concepts of the FM outsourcing research

FM is a young and growing profession in Hong Kong. The local FM industry has only existed for two decades. The profession originated in Europe and North America in the early 1980s. The majority of the local FM practitioners in Hong Kong apply their own specific construction-related knowledge to the practice. The Hong Kong's construction industry has been sensitive to economic cycles (Fan *et al.*, 2010). This industry and the property market oscillated between peak and trough from the early 1980s to mid-1990s (Chiang *et al.*, 2013). During the peak period of construction industry, local professionals gained useful practical experience while working on local and international construction projects. However, the Asian Financial Crisis in 1997 resulted in a lack of jobs because of the collapse of the property market and the construction volume subsequently decreased for more than ten years in a row after reaching its peak (Chiang *et al.* 2013). The financial crisis caused economic downturn with a sharp drop of 60 percent in residential sale prices (Rating and Valuation Department, 2011). In this difficult period, local construction professionals left Hong Kong to find other opportunities in other regions such as mainland China, Macau and even the Middle East whilst others chose to enter the local young FM industry where they faced many new challenges as new comers.

The International Facility Management Association (IFMA) fully supports research on FM in Hong Kong.

"The IFMA of Hong Kong (2011) supports the idea that research must be the bedrock on which the facility management industry is founded. As a relatively new industry or profession in Hong Kong, we are still building this foundation and will be for some time to come. Coupled with the huge changes that are happening in

the way we organise work places, it is clear to see that research in all areas of FM is of immense importance to the future of the industry/profession and should be supported wherever possible. Lawrence Lok is currently starting his doctoral research in the field of FM outsourcing. His study will investigate the performance of outsourcing service providers in Hong Kong's FM industry with a particular interest in the outsourcing relationship types with the clients."

Past President of the IFMA (HK), Mr Tony Garland on 28 March 2011

In order to understand the FM outsourcing relationships at Hong Kong's FM industry, an IT industry's outsourcing model called Four Outsourcing Relationship Types (FORT) originated by Kishore *et al*., 2003 is considered to apply. According to this FORT framework, there are four outsourcing relationship types: support, alignment, reliance and alliance respectively. This framework can be applied to the FM industry and details are discussed in Chapter Three.

In recent decades, integrated resources planning (the resources are people, property and technology) has become an important part of FM. It is generally believed that the use of optimal facilities can solve business problems in the built and human environment. Today, outsourcing is prevalent in various industries. This procurement approach is considered by some proponents to be an effective and efficient management of resources (Adegoke and Adegoke, 2013; Agndal and Nordin, 2009; Hamzah *et al*., 2010; Ikediashi *et al.* 2013; Kadefors, 2008 and Li and Choi, 2009). However, organisations often fail to consider the effect of the performance of the outsourced service providers on business success. It is unclear how the type of outsourcing relationship affects business success. Hence, it is imperative to develop an outsourcing model that is specific to the FM industry.

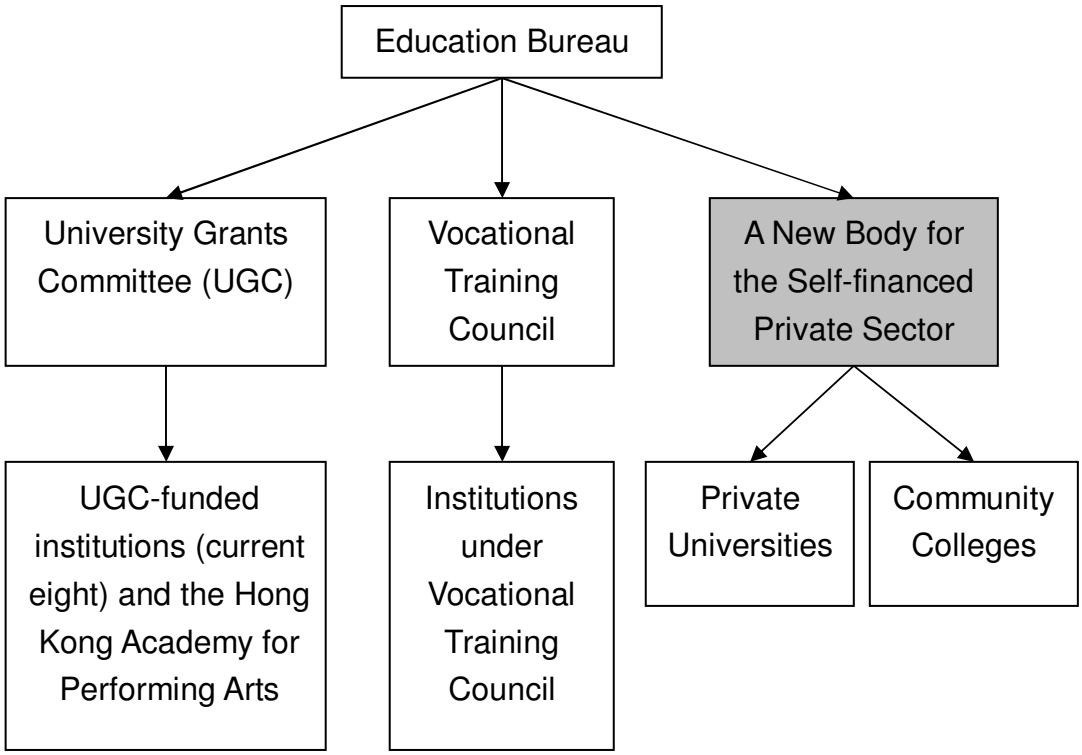
Ikediashi *et al.* (2012) aim at building an integrated best practice process model for outsourcing FM services to examine the inter-relationships between outsourcing decision, outsourcing risks and FM services' performance. They have successfully developed a hypothesized model to examine the hidden relationships between outsourcing risks variables and outsourcing of FM services provision tested using Structural Equation Model (SEM) techniques (Ikediashi *et al.*, 2013). In order to holistically build a model for outsourcing FM services, FM strategists should not only understand the outsourcing risks but also consider the outsourcing success variables to achieve outsourcing success in the FM sector. This study can, in the other way, contribute to existing research on FM by developing another hypothesized model to investigate the hidden relationships between outsourcing success variables and their impact on firm performance in terms of time and strategy. Avoiding the requirement of broad and large sample size on using SEM, other research techniques can be applied to provide validity and empirical support for the theoretical framework. It will also be beneficial to managers considering real-life outsourcing scenarios in the entrepreneurial environment. In addition, it can add academic, theoretical and practical rigour to the field.

Scope of the research

According to Brinberg and Hirshman (1986) there are three different domains in research: conceptual, methodological, and substantive. The path, i. e., moving from one to another, depends on the type of research. In this study, the conceptual domain has priority because the aim of this research is to suggest a theoretical model. Consequently, the propositions in this study were initially developed in a deductive manner. The next step was the selection of the substantive domain (i.e.

the industry sector in which the hypothesis was to be tested). The FM industry has been seen as an appropriate business sector to conduct in this research, particularly in the light of such issues as the development of outsourcing effectiveness and the emergence of globalisation that have changed the ecosystem of market.

For the purposes of the present research, the higher education sector is an attractive substantive domain. According to the recurrent government expenditure on higher and vocational education from 1998/99 (41,614 HK$ million) to 2011/12 (56,052 HK$ million), the percentage of annual expenditure on higher and vocational education are generally around 30% on overall education (Census and Statistics Department, 2012). This reflects that The Government of Hong Kong Special Area Region has had a drastic financial burden on the higher education and vocational education in the recent years. Figure 1.3 indicates the recent establishment of a body overseeing the private sector, the structure of the various bodies regulating the post-secondary sector in Hong Kong.



Remark:

The shaded box denotes new body recommended to be established.

Source: University Grants Committee (2010)

Figure 1.3 - Structure of the oversight higher education bodies in Hong Kong

In summary, there are many reasons behind choosing this sector among other sectors in Hong Kong as follows:

- It is one of the economy's most active and sophisticated sectors;
- It is one of the most important developed and updated sectors, which has recently played a significant role in Hong Kong's economy;
- The selected universities and tertiary institute are having the same varieties of FM services offered by any service providers in other institutes. It strongly emphasises FM outsourcing strategies within various contracts, which is one

of the variables of the model. Specifically, FM outsourcing contracts such as catering, cleaning, security and maintenance were selected; and

- Local higher education sector has a large economic base and high competition between universities and institutes.

Thus, the hypothesis was suggested to cover this domain. Ultimately, the methodological domain was selected at the end to test the hypothesis.

Needs of the study

This study is to investigate performance of the outsourcing service providers.

- It is to establish a clear link between FM performances to business performance.
- It is to more understand the development of outsourcing relationships between clients and service providers in the contractual period.

Reasons on the needs of the study

- The service providers expect to enhance their own capability in formulation of outsourcing strategies.
- The service providers expect to provide better outsourcing services to the clients by improving their own analytical, managerial, coordination and professional skills in solving the problems in relationships management.
- The clients expect to more understand selecting the optimum kind of service providers for their specific FM outsourcing contractual procurement.
- The clients expect to maximize value for money in each FM outsourcing contract through effectiveness.

In conclusion, clients' satisfaction depends on service providers' service. After understanding the mind of clients, the service providers can tailor-made their own business strategies for sustainable development. Thus, the purpose of the questionnaire survey is not only to acquire the comments from the clients on the performance of the service providers but also to more crucially understand what the clients expect at now and in the future. Then, clients' demand can be fulfilled with the services providers' supply of services. Again, it is important for us to discover the outsourcing relationships between the clients and service providers through understanding their links between outsourcing relationship dimensions and manoeuvres.

1.3 Problem statement

Current research on the FM outsourcing performance of clients and service providers is extensive, but most of these studies are limited in scope. Clients are often not satisfied with the performance of service providers in outsourcing contracts. However, the service providers may have a different perspective on their performance. Due to the inadequate and under-developed knowledge of how service provider performance is managed or evaluated, it is difficult to identify the reasons for these varied perspectives. This study examines these relationships. The four main problems in the outsourcing relationship between management and stakeholders, as discussed in Chapter Two, are as follows:

a) neglect of outsourcing relationships;

b) poor risk management in outsourcing relationships;

c) insufficient skills in relationship management; and

d) inefficient practices and processes in FM services.

The literature review identifies three research gaps in the field. The first is the lack of understanding regarding the link between FM and business performances. The second is a poor understanding of the outsourcing relationships between the clients, FM services providers and users. The last gap is the insufficient research on the relationships between the FM outsourcing relationship types and service providers in the built environment. The role of Facilities Managers, who have been described as the "Cinderellas" of the construction industry, is changing. Researchers and practitioners are looking for ways to meet the demands of future building users (Finch, 2012).

In this section, the research gaps in the literature are identified. The first gap is in the link between FM and business performance. Despite the publication of a handful of surveys on FM practices and processes that have aligned the corporate business strategies in industries in recent years, these studies are generally limited in terms of scope and methodology (Osgood, 2003). Krumm et al. (1998) state that the alignment of FM resources, practices and processes has not been thoroughly investigated. Furthermore, Barrett (2000) notes that there is still little understanding of FM's capacity and capability in the alignment of FM organisations and business clients. Recent research developments in FM also reflect an urgent need for pioneering studies on FM practices and processes (PCA, 2001; Then et al., 2004). This indicates that the previous studies have not

sufficiently discussed the alignment of FM performance and business success.

The second gap lies in the poor understanding of outsourcing relationships between the clients, FM service providers and users. According to the previous studies, there are insufficient explanations on the problems of outsourcing relationships in various practical scenarios (Adegoke and Adegoke, 2013; Cohen *et al.*, 2001; Harland *et al.*, 2005; Hätönen and Eriksson, 2009; Ikediashi *et. al.*, 2012 and 2013; Leaman and Bordass, 2001). This could be why it is so difficult to locate suitable solutions for outsourcing challenges. Every company has its own specific nature and characteristics. Hence, it is understandable that companies' senior management require enhancements to outsourcing performance to satisfy their business needs. However, the characteristics of the outsourcing relationships remain obscured. Not many studies discuss whether outsourcing relationship types in FM are significant or not to business success (Ikediashi *et. al.*, 2012 and 2013). In past years, there has been a dearth of empirical research on the outsourcing relationships between the clients, FM service providers and users in the higher education environment. New skills must be developed for the management of outsourcing relationships, along with the knowledge of how to manage the capability to conduct them (Harland, Knight, Lamming, and Walker, 2005).

The third gap is large and critical. Scholars and FM practitioners have recently examined the many effects of FM outsourcing on the stakeholders, but there is insufficient literature discussing the processual studies of outsourcing (Marshall *et al.*, 2004) and structured partnering and collaboration in the field of FM services

(Lehtonen and Salonen, 2005; Plane, and Green, 2012) for instance connections between the FM outsourcing relationship types and stakeholders in the built environment. The effects of FM outsourcing types on clients and service providers have been underestimated and overlooked. After extensive research, a major knowledge gap has been identified. There are researchers who have initiated studies on the evolution of a generic outsourcing process (Fagan, 1991; Finizio et al., 2001; Kakabadse and Kakabadse, 2000; Lonsdale and Cox, 2000; Van Mieghem, 1999). In the field of IT, Kishore *et al.* (2003) determine outsourcing relationship types, but they have not undertaken detailed explorations of the effects of outsourcing relationship types on the performance of service providers. Ikediashi *et. al.* (2013) address that few studies have recognised the need to examine the hidden relationships between FM outsourcing risks variables and their impact on firm performance. Without doubt, business success can be related to the FM partnering and collaborative relationships between buyer and supplier (Plane, and Green, 2012). Nevertheless, there is still no examination on the hidden relationships between FM outsourcing success variables and their impact. Thus, a scientific investigation is significant and contributory to understand how the FM outsourcing relationship types operate between the FM stakeholders.

FM support services may lead to the deterioration of an organisation's business achievements. The outsourcing relationships may be acutely susceptible within the dynamic relationship between the clients, FM service providers and users as organisational upheaval moves through a company. In part, because of this perceived vulnerability, it is crucial to understand the outsourcing relationship types in FM. Thus, this study attempts to examine the outsourcing relationship

types and to understand the outsourcing strategies in a contingency approach from the clients and service providers' perspectives.

There are many reasons for the substandard performance of FM service providers. It is possible that it may be caused by the complicated interactions between outsourcing relationship types and the three FM stakeholders. A service provider's familiarity with the work environment and conditions of the installations may give them an advantage in cost estimation (Lai, Yik and Jones, 2008). However, poor performance by the outsourced service providers is always a possibility and there may be unseen challenges. Today, the effect of outsourcing relationship types on clients and service providers in FM is still obscure. The question is whether it is valuable to explore outsourcing relationship types in FM. Although there are some post-occupancy studies (Cohen *et al.*, 2001; Leaman and Bordass, 2001) and studies on outsourcing relationship types and their effect on clients, service providers and general users of buildings remain rare. Lam (2008) suggests the need for a best-value evaluation framework to assess the optimum use of resources in FM outsourcing by public managers.

An outsourcing relationships model which indicates the demand and supply on FM services of clients and service providers can connect the two stakeholders, i.e. client and service provider. The hidden problems of the outsourcing approaches can be identified and solved using a suitable model. A tailor-made FM outsourcing model could clearly identify the specific relationships between the client and service provider. The client could then review and improve the relationship with the service provider through relevant outsourcing strategies. Furthermore, any

latent shortcomings of the relationship could be systematically and logically identified by the model. It is important for clients to thoroughly and regularly review their relationships with their service providers. Understanding the relationships between the outsourcing types and the strategies in various FM contracts allows clients to improve and revise the related strategies.

The literature reveals that the outsourcing relationships are examined in various business sectors such as logistics, information technology, operation management and supply chain management. The relationships between outsourcing types and strategies have been discussed in previous studies including a study on the concept applied to the logistics industry by Boer *et al.* (2006); the identification of four types of outsourced-outsourcer relationships in different fields by Franceschini *et al.* (2003); an examination of outsourcing relationships management in the IT industry by Gottschalk and Solli-Sæther (2006); strategic outsourcing research in the operations and supply chain management field by Holcomb and Hitt (2007); and the creation of a four outsourcing relationship types framework in the IT industry by Kishore *et al.* (2003). This study finds that there is a need to investigate the applicability of the Four Outsourcing Relationship Types (FORT) model to the FM industry. It is important to identify the inter-relationships between various outsourcing modes/types and outsourcing relationship manoeuvres/strategic manoeuvres. The reasons for using the FORT model are discussed below.

Various outsourcing models, derived from various industries, have their own deficiencies. Models developed in the field of logistics use a prescriptive decision

concept that does not align effectively with outsourcing practice (Boer *et al.*, 2006). Outsourcing relationships management models developed in the IT field do not have a consistent understanding of relationships between vendors and clients at various stages (Gottschalk and Solli-Sæther, 2006; Kishore *et al.*, 2003). Furthermore, Franceschini *et al.* (2003) observed that there have been no indications of the evolution of outsourcing relationships into a four types' outsourced-outsourcer contingency relationship model. Comparison of the suggested outsourcing models is described in details in Chapter Three.

There are four types of outsourcing strategies available for FM provision: in-house, outsourcing, public-private partnership and total FM (Atkin and Brooks, 2002). Outsourcing is one way to procure building operation support services in FM. Although outsourcing FM technique has not been the normal and common manner of maintaining facilities in the higher education sector, outsourcing strategy is more efficient than in-house technique to solve FM strategic, tactical and operational problems (Adegoke and Adegoke, 2013). Although few authors had worked on FM in Hong Kong, yet, enough ground has not been covered on the application of FM services to higher education institutions. Hence, it is important to understand the outsourcing relationships between clients and service providers as there is also no empirical study on the efficiency of FM outsourcing used in higher education institutions in Hong Kong.

Currently, organisations are required to reduce costs. The education institutions in Hong Kong are no exception; they need to have a balanced budget and they can cut costs by outsourcing. The importance of FM as a means of encouraging

learning has been emphasised by the majority of higher education related FM studies (Amaratunga and Baldry, 1999; Price *et al.*, 2003; Fianchini, 2006; Lavy, 2008; etc.). Vidalakis *et al.* (2013) also indicate the potential of facilities management and maintenance to create value especially for the higher education institutions perhaps even greater than the construction of new high-profile facilities. The organisations can increase revenue by increasing user satisfaction on FM services, thus attracting more students. This study proposes that outsourcing manoeuvres can affect outsourcing relationship types and thus affect profits. This is the reason why establishing a Hong Kong model is important. The FORT model is applicable to FM; therefore, it is possible to build a tailor-made FORT model immediately. This research will be highly beneficial and regionally and nationally significant.

FM outsourcing service providers, working under various contracts, may have the same or different FM outsourcing relationships with the same client. Therefore, the nature of outsourcing relationship types and how they align with outsourcing strategies are examined. These relationships between the stakeholders are examined in the context of the higher education sector using a contingency model. Thus, this study also attempts to understand how the FM outsourcing relationship types are critically related to the outsourcing strategies that are embedded in various contracts.

1.4 Research hypothesis

This study tests whether the Four Outsourcing Relationship Types (FORT) model is applicable to the FM services of Hong Kong's higher education sector through characterising the FM outsourcing relationship types.

1.5 Research aim and objectives

The aim of this research is to characterise FM outsourcing relationship types in the FM industry. After defining the outsourcing relationship types and understanding the design of outsourcing relationships, this study finds out how they align with outsourcing strategies in FM outsourcing contracts and how this relationship affects the FM outsourcing performance of the service providers. This is distinct from the current outsourcing arrangements in the FM sector that adopt a contingent approach. The study has five specific objectives.

(i) To identify the outsourcing characteristics that FM client- and service provider-strategists agree shape the outsourcing categories of their current FM outsourcing contracts. (Testing corollary 1)

(ii) To examine the outsourcing strategies that FM client- and service provider-strategists apply in their FM outsourcing contracts. (Testing corollaries 2 - 8)

(iii) To improve outsourcing relationships using the outsourcing strategies (Testing corollaries 2 - 8)

(iv) To investigate the critical success factors for outsourcing strategies in the FM contracts on which FM client- and service provider-strategists determine

outsourcing relationships. (Testing corollary 9)

(v) To develop the Contingency Outsourcing Relationships (CORE) model (Testing corollary 9)

1.6 Research methodologies

This research uses quantitative and qualitative approaches. The quantitative approach is used in the questionnaire survey whilst the qualitative approach is represented in the two focus groups. Both ways were conducted during the research.

1.6.1 Literature review

A comprehensive literature review on outsourcing and outsourcing relationships, including the definitions, chronological development in different countries as well as the approaches for development, was carried out. The results of the desk study provided background information and knowledge for future study and development of the FM outsourcing relationships model.

1.6.2 Questionnaire surveys

Two kinds of questionnaire surveys were carried out to understand the FM outsourcing relationships of different FM outsourcing services contracts. These questionnaires were sent to the industry practitioners of clients and service providers to solicit their views and opinions regarding:

The weightings representing the relative importance of different categories (i.e. Inhouse, Service provider with commitment, service provider with technical

expertise and partner) in respect of FM outsourcing relationships, and the relative contribution to FM outsourcing relationships with reference to:

- outsourcing relationships dimensions (i.e. ownership, control, competitive position, long term plan);
- critical success factors for outsourcing manoeuvres (i.e. adequacy, competence, co-ordination and quality);
- criteria for outsourcing manoeuvres; and
- understandings on outsourcing manoeuvres.

The section D of two questionnaires were also analysed by using the methodology of Analytical Hierarchy Process (AHP), a mathematical model developed for decision making. AHP is used to determine the relative FM outsourcing relationships types of the current main FM outsourcing contracts in higher education sector.

1.6.3 Focus groups with industry practitioners

Two structured focus groups were carried out to obtain the views and opinions from industry practitioners regarding FM outsourcing relationships model in the Hong Kong context. The study covers the interpretation of the model, as well as the improvement, hindrance, advantages and disadvantages.

The findings of the questionnaire surveys and focus groups were used to understand the FM outsourcing relationships dimensions and FM outsourcing categories. With reference to the FORT framework, the FM outsourcing

relationships dimensions represent the relative capability of individual FM outsourcing relationships elements whilst outsourcing categories represent the relative types of different FM outsourcing relationships. The development of the FM outsourcing relationships dimensions and FM outsourcing categories will be detailed in Chapters Five to Nine.

1.7 Research structure

This thesis consists of an introductory chapter and nine further chapters. The chapters are organised as follows.

Chapter 2 Outsourcing Services

This chapter reviews the concepts of outsourcing in FM. It discusses the performance of service providers and the effect of performance on users, before providing a comprehensive overview of outsourcing.

After discussing the various definitions of outsourcing, the researcher explains why FM requires outsourcing and how outsourcing plays a key role in helping FM decision planners succeed in the business environment. This chapter demonstrates how outsourcing can be used as a “competitive advantage”. Simultaneously, it also shows how outsourcing has affected the performance of service providers with outsourcing arrangements. The final section of the chapter deals with outsourcing relationship management problems.

Chapter 3 Outsourcing Models

In Chapter 3, the researcher introduces the various types of outsourcing models and their related concepts. He explains the terms used in the various models. The second part of this chapter compares the strengths and weaknesses of the different outsourcing models.

Chapter 4 Outsourcing Success

Chapter 4 provides general background information about outsourcing success. The chapter starts with a profile of success in terms of FM drivers. This is followed by a description of the factors that are critical for successful FM strategies. Clients and service providers are investigated. The final section deals with outsourcing services specifically in the higher education sector.

The outsourcing quality of various contracts is measured according to four dimensions: adequacy of FM resources, co-ordination of FM resources, competence of FM service providers and quality of FM performance. Thirty-five critical success factors are identified for outsourcing strategies. This process results in two models. The first model illustrates the association between FM outsourcing relationship types and outsourcing success under various contracts from the client's point of view. The second illustrates the association between FM outsourcing relationship types and outsourcing success under various contracts from the service provider's point of view.

Chapter 5 Research Methodology

Chapter 5 describes and provides a justification for the empirical work of the study.

This includes a brief review of the adopted research philosophy and a justification of the methodology. The procedures related to the questionnaire, such as translation, piloting and selecting the study sample, are described in detail. Finally, the statistical methods used to analyse the data and test the hypotheses are presented.

Chapter 6 Empirical Data Analysis and Hypotheses Testing

Chapter 6 presents a general descriptive analysis of the data collected. It contains two main sections. The first provides a descriptive analysis of the characteristics of the respondents (clients and service providers), whereas the second tests the hypotheses. The research hypothesis and its nine corollaries are tested using various statistical tests such as the Kruskal-Wallis test, the Mann-Whitney U test and a Multi-nominal logistic regression.

Chapter 7 Analysis of Results

The main aim of this chapter is to discuss how the results affect our understanding of FM professional criteria, critical success factors for outsourcing strategies and outsourcing relationships between stakeholders. The intention is to develop and test theories that explain the variation in FM outsourcing relationship types and outsourcing strategies.

Chapter 8 Outsourcing Relationship Types

Chapter 8 discusses outsourcing relationship types based on the data collected. The discussion focuses on the most important outsourcing relationship types for different kinds of FM outsourcing contracts, according to the FM (CORE) Model.

Chapter 9 Validation of the CORE model

This chapter provides a comprehensive discussion of the four aspects of the CORE model: categories of outsourcing relationship types, focus group meetings, seminar discussions and questionnaire surveys.

Chapter 10 Conclusions and Recommendations

This chapter summarises the research findings and discusses their implications. The various types of FM outsourcing contracts require specific strategic designs to suit different outsourcing relationships. The outsourcing performance of each particular FM outsourcing contract is considered an indicator of the relationship. The main contribution of this study is its focus on specific outsourcing strategies and their limitations. The chapter concludes with some suggestions for future research.

1.8 Research limitations

The investigation of FM outsourcing relationship types is a new niche of research; at this early stage, this research only discusses FM outsourcing contracts in Hong Kong's higher education sector but not other business sectors and Asian Pacific cities. The credibility of the proposed model should be increased if more questionnaire samples can be obtained from practitioners, and more structured interviews can be undertaken with FM experts. The proposed model is only focused on four main FM outsourcing services in this study because of the dominant ratio of these four in all current outsourcing services in the higher

education sector. The non-parametric statistics is used to test the hypotheses and statistical measures are implemented to increase the robustness. This study also does not investigate the financial elements of the FM outsourcing contracts, as it is difficult to collect the highly confidential and sensitive financial data on the FM outsourcing contracts.

There is, however, considerable data available on FM outsourcing contracts in the local higher education environment, and the trend and contract value of these contracts are continuously rising in Hong Kong, making the local higher education sector a suitable area for the initial investigation.

CHAPTER 2 FACILITIES MANAGEMENT OUTSOURCING SERVICES IN HONG KONG

2.1 Introduction

This chapter reviews the concept of outsourcing in relation to FM, dealing with service providers' performance and its effect on clients before providing a comprehensive discussion of outsourcing. The researcher outlines various outsourcing-related definitions, explaining why FM requires outsourcing and its key role in helping FM decision planners succeed in business environments. This chapter demonstrates how outsourcing can be used as a "competitive advantage" to affect service providers' performance. The final section addresses the current outsourcing arrangements in Hong Kong.

2.2 Outsourcing services

Barrett (1995) state that facilities management focuses solely on the physical infrastructure (i.e. hardware assets) required to support the primary objectives of an organisation. In 2003, Barrett and Baldry made the additional observation that a workforce's effectiveness and behavioural patterns, along with the effectiveness of IT and communication systems, are of considerable significance in many organisations. Regarding the evolution of FM departments in international corporations over the past 80 years, Krumm (2001) argues that internationalisation, mergers, crises and reorganisation initiatives have forced corporations to review their in-house activities. Recently, the collaborative approach to facilities management has encompassed the procurement of expertise in managing resources, environmental factors and services to assist organisations' operations, and modifications to directly support key areas of facilities management and core business practice (Chotipanich, 2004, and Nutt,

1999). It is vital that organisations develop and apply new and innovative forms of contractual procurement, such as outsourcing, to support the evolving field of facilities management.

Outsourcing is clearly quite common in many companies around the world. Outsourcing (from 'out' and 'source', which together describe an external source) is a management approach that delegates to an external agent the operational responsibility for processes or services previously delivered by the enterprise itself. It can be defined as 'the purchase of a good or a service that was previously provided internally' (Baithélemy, 2003 [P. 92]; Elmuti and Kathawala, 2000 [P. 114]; Lankford and Parsa, 1999 [P. 312]; Smith *et al.*, 1996 [P. 168]; Swink, 1999 [P. 693]). However, there is much debate in the management literature regarding the definition of outsourcing (Gilley and Rasheed, 2000). Gilley and Rasheed (2000) resolve this confusion by providing a broad definition for outsourcing that includes the following arrangements and concepts: internal vs external sourcing (Scheuing, 1989); strategic make-or-outsource decisions (Virolainen, 1998); contracting out (Gustafsson, 1995); contractorisation (Hood, 1997); sub-contracting, purchasing and privatisation (Seidenstat, 1996); compulsory competitive tendering, market testing and liberalisation (Beaumont, 1991); and make-or-buy and focus decisions (Knight and Harland, 2000). Drion *et al.* (2012) assert that definitions related to the popular identity of FM outsourcing as a means of generating cost savings remain controversial.

The two main actors in the outsourcing process are the 'outsourced' and the 'outsourcer' (Saunders and Gebelt, 1997). The first, i.e. the 'customer' or 'client',

outsources its activities; and the second, the enterprise or service provider, delivers the required outsourced services. (The terms ‘supplier’ and ‘vendor’ are also used to refer to the service provider.) The process owner controls the organisational interface between the two enterprises during all of the outsourcing activities (Valentini, 1999). Franceschini *et al*. (2003) claim that outsourcing has evolved from a traditional into a strategic process over the last decade. In the traditional case, processes not considered ‘critical’ to the organisation are outsourced; these include activities that do not require specific competencies on the part of the supplier, such as canteen services or cleaning services. Strategic cases are those in which ‘companies outsource everything except those special activities in which they could achieve a unique competitive edge’ (Quinn and Hilmer, 1994 [P. 46]; Venka, 1992 [P. 8]; Willcocks and Choi, 1995 [P. 68]).

There is evidence that outsourcing practices are influenced by process type (Harland *et al*., 2005). For instance, Rao and Young (1994) note that most large multi-national enterprises use third-party logistics providers. This is also true of information systems: 40 per cent of US outsourcing activity in 1996 involved the outsourcing of IT and other services (Sharpe, 1997), and this practice has also become commonplace in public sectors in the UK, Australia and New Zealand (Graham and Scarborough, 1997; Currie, 1996). In the FM sector, many private-sector organisations outsource support services such as catering, cleaning, maintenance and security (Bailey *et al*., 2002). There is now a tendency for these arrangements to be made as part of a single FM contract. Kamaruzzaman and Zawawi (2010) observe that outsourcing is considered one of the best options for facilities management in Malaysia, where it is used by an increasing number of

companies, with more contracts tendered out in both public and private sectors. Over the past decades, outsourcing practices have also been adopted on an international scale for facility-related service provision (Cigolini *et. al.*, 2011).

2.3 Outsourcing in Facilities Management

The questions guiding outsourcing research

Outsourcing is the practice of 'contracting out' business processes to a third party or external source (Rodriguez and Diaz, 2008), and hence involves a transfer of responsibilities (Krell, 2006). Hätönen and Eriksson (2009) discover that there is an outsourcing revolution, which has changed the way firms compete in as diverse industries as automobiles, aerospace, telecommunications, computers, pharmaceuticals, chemicals, healthcare, financial services, energy systems and software. In terms of facilities management, outsourcing is the 'contracting out' of FM services to an external provider (Atkin and Brooks, 2009) for a fee over a given period of time, to increase organisational efficiency and effectiveness (Li and Choi, 2009; Hamzah *et al.*, 2010). Due to its rising profile as a management strategy for improving performance, outsourcing has become one of the most extensively researched areas in recent management studies (Ikediashi *et. al.*, 2012).

This section introduces the origins of outsourcing. Sia *et al.* (2008) state that outsourcing is now a strategic option that few organisations can afford to ignore. In the past few years, managers have become increasingly eager to understand and develop this approach for the ongoing benefit of their organisations. Hätönen and Eriksson (2009) underline the importance of understanding how outsourcing is

carried out, i.e. the outsourcing process (cf. Pettigrew, 1988). Accordingly, scholars have begun to tackle the outsourcing process (see Greaver, 1999; Momme, 2002; Momme and Hvolby, 2002; Franceschini *et al*., 2003; McIvor, 2000, 2005; Van Weele, 2005; Zhu *et al*., 2001), and have identified certain key phases of the process: planning, development, implementation and evaluation (Zhu *et al*., 2001). These phases are generally agreed to be common to domestic outsourcing, but the international context remains unexplored. Furthermore, while many studies have focused on the planning and preparation of outsourcing, the process as a whole is overlooked (see de Boer *et al*., 2006, 446). Therefore, many aspects of the outsourcing process require further study (Maskell *et al*., 2005).

Insights into the future of outsourcing

The current major trend in outsourcing is towards smaller and more strategic deals – the kinds that reflect businesses' strategies for realising their goals and objectives. Clients make sustainable savings by focusing on measures of end-to-end process efficiency, such as speed to market, and by evaluating their relationships with providers in terms of both costs and services. A service provider's skills base may be the key to a company's own strategy for growth and transformation. Service providers must also provide the industry insights, geographical diversity, technical innovations and high-value skills necessary for a firm to enter new markets and exploit opportunities (IAOP, 2012).

In the near future, there are many directions in which outsourcing research can be taken. It seems that the broad underlying managerial interest is to gain a greater understanding of the factors responsible for the success of outsourcing (Hätönen

and Eriksson, 2009; Ikediashi *et al.* 2012 and 2013). Adegoke and Adegoke (2013) find that outsourcing reduces risk due to reliance on experts and infusion on new technology in tertiary institutions. Correctly managing the outsourcing process is vital to ensure positive outsourcing outcomes. Hätönen and Eriksson's (2009) analysis offers two novel insights in this regard: (1) one of the current and future challenges facing managers is the establishment of versatile outsourcing-relationship portfolios; and (2) effort must be made to ensure that outsourcing decisions are correctly timed. This study focuses on Hätönen and Eriksson's (2009) first insight into the management of outsourcing relationships between modern organisations competing in a regional marketplace.

2.4 Contingency theory

In the past years, companies have taken various approaches to strategy building. Finch (2012) observes that the oil crisis of 1973 highlighted severe shortcomings in companies' planning capabilities, forcing members of upper management to redirect their strategic work towards analysis of the external world. More specifically, the historical data associated with individual firms were shown to be poor predictors of the future, because they described a continuous growth in demand without taking global events into account. At the very beginning of the twentieth century, this was probably not a serious problem for organisations: as global changes happened slowly, predicting the future correctly was not very important. However, the inability to predict change accurately is extremely detrimental to the management of today's international firms, especially given the rapid developments in computing and Internet technology over the past two decades. Information can now be communicated rapidly and conveniently across

continents by advanced electronic means. Organisations are not only affected by internal organisational problems, but also, critically, by sudden and unexpected instances of external conflict. Firms must therefore restructure their prediction strategies to ensure their survival in this era of economic and socio-political difficulties.

Researchers' early work on contingency theory and systems theory grew in significance after the oil crisis of 1973. Kourteli (2000) finds that organisations are open systems and must interact with their surroundings to survive. This assertion is similar as the main theme of contingency theory. It is widely understood, therefore, that organisations are dependent on their external environment. He contends that the external environment within which an organisation chooses to function, determines the internal structure, and overall procedures of the specific organisation, highlighting that collecting large amounts of external data is problematic, as it is difficult to find relevance in such data. The mismanagement of data often leads to incorrect decisions regarding changes within organisations. It is very important for organisations to collect relevant and accurate data and undertake comprehensive data analysis in the interests of future planning. However, he criticises the excessively 'mechanistic' approach of contingency theory, which considers the departments of an organisation separately without addressing the significance of communication between them. Finch (2012) proposes five interdependent categories as the basis for an analytical tool for facilities management: market and financial forces; attitudes and cultures; politics and government; environment and resources; and research and development. These factors can externally affect organisations' operation. However, it is difficult

for facilities managers to gain full acceptance from the upper management of an organisation's core business. This poses many foreseen and unforeseen challenges to the future development of facilities management.

For the past ten years, there were quantities of IT researchers using the contingency theory in their studies taking some examples (Andres and Zmud, 2001; Barki *et al.,* 2001; Chang *et al.,* 2003; Chin *et al.,* 2003; Croteau and Raymond, 2004; Giaglis *et al.,* 2002; Irma and Sabherwal, 2001; Khazanchi, 2005; Lee *et al.,* 2004; Panagiotis and Paul, 2005; Seliem *et al.,* 2003; Sugumaran and Arogyaswamy, 2003; Teo, 2003; Umanath, 2003 and Zhu, 2002). Why is the contingency theory prevalent in the field of IT? Answering this question, it is necessary to understand the working mechanism of contingency model. There are many forms of contingency theory. Historically, contingency theory has sought to formulate broad generalizations about the formal structures that are typically associated with or best fit the use of different technologies. This perspective originated with the work of Joan Woodward (1958), who argued that technologies directly determine differences in such organizational attributes as span of control, centralization of authority, and the formalization of rules and procedures. Contingency theories are a class of behavioral theory that there is no one best way of organizing / leading and that an organizational / leadership style that is effective in some situations may not be successful in others (Fiedler, 1964). The main independent factors are including strategy, technology, task, organizational size, structure, and culture. The main dependent factors are including efficiency and organizational performance. In other words, the optimal organization / leadership style is contingent upon various internal and external constraints.

Morgan (2007) derives that there are four important ideas of contingency theory. Firstly, there is no universal or one best way to manage. Secondly, the design of an organization and its subsystems must 'fit' with the environment. Thirdly, effective organizations not only have a proper 'fit' with the environment but also between its subsystems. Fourthly, the needs of an organization are better satisfied when it is properly designed and the management style is appropriate both to the tasks undertaken and the nature of the work group.

There are various outsourcing models in different fields and the details are discussed in Chapter Three. A contingency outsourcing model used in the IT industry is called the FORT framework. Is this FORT framework applicable to the FM sector? The contingency theory is considered to be suitable for various kinds of organisations. The characteristics of the FORT model are based on the contingency approach, according to which there is no single best solution to outsourcing; rather, the best approach is contingent on a number of factors. As discussed, this contingency approach has been widely used in the field of IT for several years. Finch (2012) also claims that firms must need to restructure their prediction strategies to survive and to develop. The four important ideas of contingency theory can reinforce the flexibility and adaptability of the modern organisations (Morgan, 2007). Moreover, this FORT model initiates to discuss the perspective of outsourcing relationships between the stakeholders in the IT field (Kishore *et al.*, 2003). This can also be applicable to the outsourcing services in the FM industry. Although there are drawbacks about contingency theory, this principle is considered to be suitable for more accurate prediction on the future FM outsourcing relationships and improvement on the quality of future FM outsourcing

services. This is the fundamental argument of this research. The details of FORT framework are also discussed in Chapter Three.

As Finch (2012) suggests, an organisation is not a closed entity, but open to and dependent on the external world. According to the contingency theory, factors from the outside world ultimately permeate individual organisations as local factors. The assertion of this theory is that external influences create complex structures of interdependent needs, as examined extensively by previous research on facilities management and entrepreneurship. Hence, a firm's facilities management must be compatible with the conditions of the market and other external factors. Hitherto this research seeks to map current outsourcing relationships in facilities management, and to predict future FM outsourcing relationships between clients and service providers in the local higher tertiary-education environment.

2.5 Theories for strategic manoeuvres of outsourcing relationships

Specifically, this section is to focus on manoeuvres that organisations can employ to achieve the four different dimensions of outsourcing relationships. In order to clearly understand the rationale of strategic manoeuvres in outsourcing relationships, there is a need to study the related theories at the first. Table 2.1 shows the outsourcing evolution from 1980 to 2000 onwards. According to this evolution, there are four theories at the three stages.

	Stage I	Stage II	Stage III
	Big bang	**Bandwagon**	**Barrierless organizations**
Time period	1980s to early 1990s	Early 1990s to early 2000	From early 2000 onwards
Prime motives	Cut costs	Cut costs, capability enhancement, process improvement	Organizational transformation
Buzzword	Outsourcing	Strategic outsourcing	Transformational outsourcing
Outs. location	Domestic	International	Global
Management of the outsourcing relations	Arms-length, transactions	Strategic alliances	Collaborative development
Organization	Efficient organization	Focused organization	Virtual organization
Core organizational competences	Management of key strategic business units (SBUs)	Key strategic competences (core competences)	Dynamic competences and network competences
Strategic rationalization	Profit maximizing	Strategic and competitive edge	Survival
Outsourcing objects	Structured and well defined turnkey manufacturing processes	Strategically important organizational process	Projects highly knowledge-intensive and creative in nature
Main theories	Transaction cost theory	Resource/competence-based view	Organizational theories

Source: Hätönen and Eriksson, 2009

Table 2.1 - The outsourcing (r)evolution

The theoretical underpinnings of outsourcing

Since the 1980s outsourcing as a corporate strategy has evolved from the

transactional approach to a more developmental form in which the outsourced process is co-developed with the outsourcing provider, and in which cost is rarely the primary rationale (Hätönen and Eriksson, 2009). In figure 2.1, they propose that it still remains unclear what the next big issue and phase in the outsourcing (r)evolution will be after 2007. The latest proposed definition of outsourcing is transformational outsourcing (Barthelemy, 2003). In order to further develop, it is necessary to understand the updated definition in details.

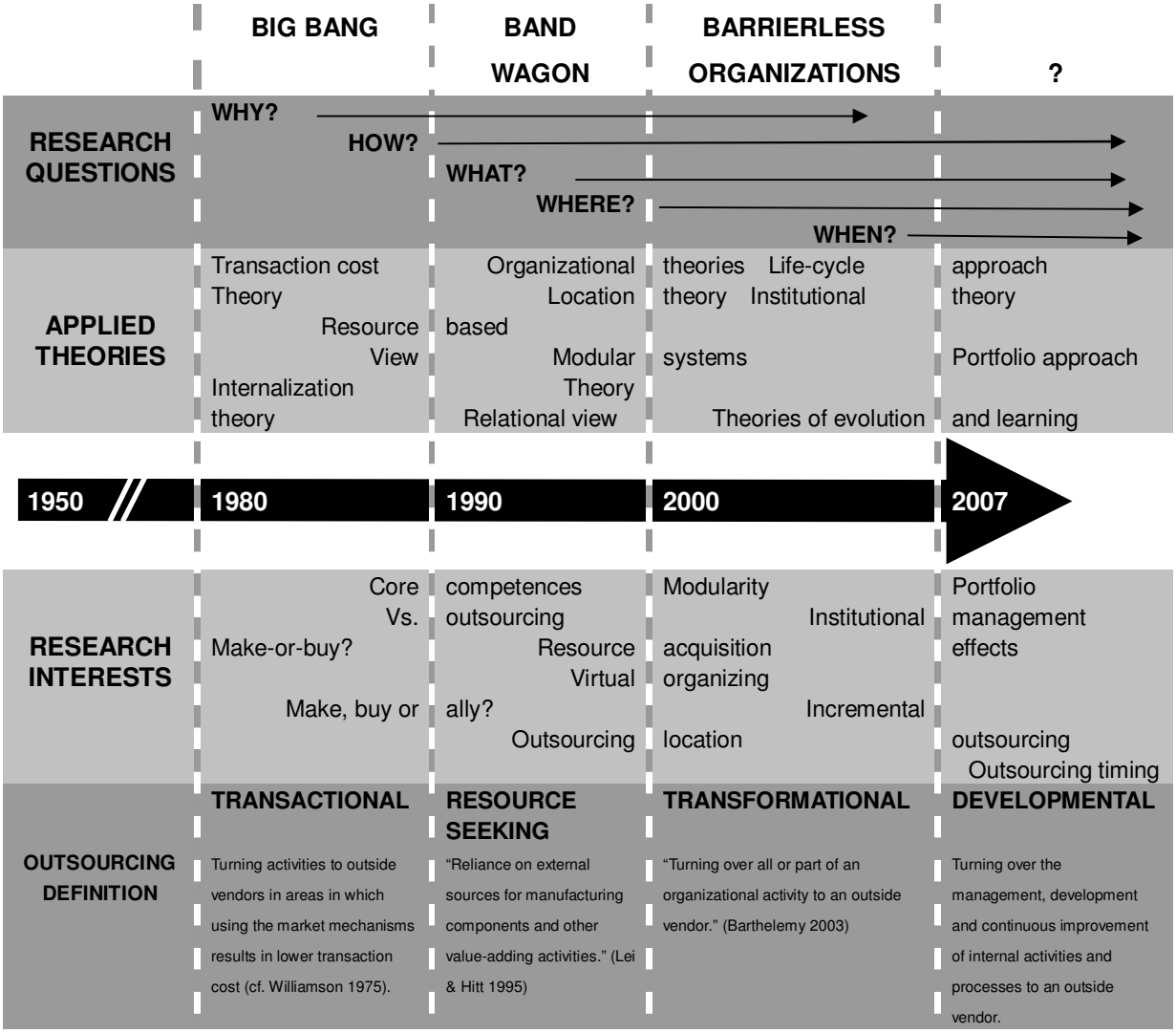


Figure 2.1 A review of the outsourcing research and future insights (Hätönen and Eriksson, 2009)

Hätönen and Eriksson (2009) note that the recently developed model of transformational outsourcing requires companies to adopt new organisational structures. As the aim of transformational outsourcing is to create an adaptive, modular organisation, researchers have considered modular systems theory as a possible theoretical foundation for the concept, basing their arguments on the early work of prominent systems theorists such as Simon (1962) and Alexander (1964). Moreover, the notion that transformational outsourcing is preceded by stages of incremental learning (e.g. Morgan, 2003) indicates that theories of evolution and learning (e.g. Nelson and Winter, 1982) should be used to capture the different stages of this progressive phenomenon.

With regard to transformational outsourcing, the attempt to establish virtual firms with flexible and dynamic structures has given rise to organisational forms such as the 'hollow corporation' (e.g. Pastin and Harrison, 1987), 'virtual organisations' (e.g. Davidow and Malone, 1992), 'network organisations' (e.g. Miles and Snow, 1986), 'modular organisations' (e.g. Tully, 1993), 'barrierless or boundaryless organisations' (e.g. Ashkenas *et al*., 1995), 'federated organisations' (Child and Faulkner, 1998) and 'shamrock organisations' (e.g. Morgan, 2003). In fact, all of these terms describe the replacement of a tightly integrated hierarchy with loosely coupled networks of organisational actors (Schilling and Steensma, 2001). According to Buckley and Lessard (2005), this concept of virtual firms derives from resource-based theories, transaction-cost theory, internalisation theory and organisation theory. The task of managers responsible for transformational outsourcing is to decide on a company's point of focus and build around it a network of world-class suppliers.

Theoretical framework in this study

Hätönen and Eriksson (2009) note that the evolution of the practice that has complicated the theory base. They claim that transaction cost theory at stage I seen as the underlying theory behind outsourcing is insufficient in terms of explaining the extent of the updated phenomenon into which outsourcing has evolved. Insinga and Werle (2000) argue that one of the key concerns behind outsourcing research is to foster the most appropriate form of relationships between a company and service providers. Moreover, Hätönen and Eriksson (2009) observe that several theories, such as transaction cost theory, network theory, the resource-based view, and theories of evolution and learning are built on the need to explain the management of inter-organizational relations, most of which today extend beyond markets and hierarchies into relationships, or so-called quasi-integration or quasi-relationships (e.g., Thorelli,1986). Indeed, they address that the way in which outsourcing relations should be managed has become one of the key concerns of researchers, who draw on various relationship theories and on principal-agent (principal-agency) theory for answers (Eisenhardt, 1989 and Logan, 2000). In addition, previous research on modular systems has found embedded modularity to significantly aid the coordination of outsourcing decisions (e.g. Baldwin and Clark, 1997), thereby providing insight into the management of outsourcing relations. This approach has its roots in the systems theory developed by Simon (1962) and Alexander (1964).

Theoretical background behind the different aspects of the outsourcing phenomenon is rather versatile (Hätönen and Eriksson, 2009). Accordingly,

adopting a singe theoretical view would most probably lead to an oversimplified analysis, especially given the intention to address the five questions of what, why, where, how and when. Hence, it is imperative to select five theories from the three stages for the theoretical framework in this study. Figure 2.2 indicates the five selected theories for five key outsourcing questions in this study. This describes a holistic view. Table 2.2 shows the summary on five theories applying in outsourcing relationships and their functions.

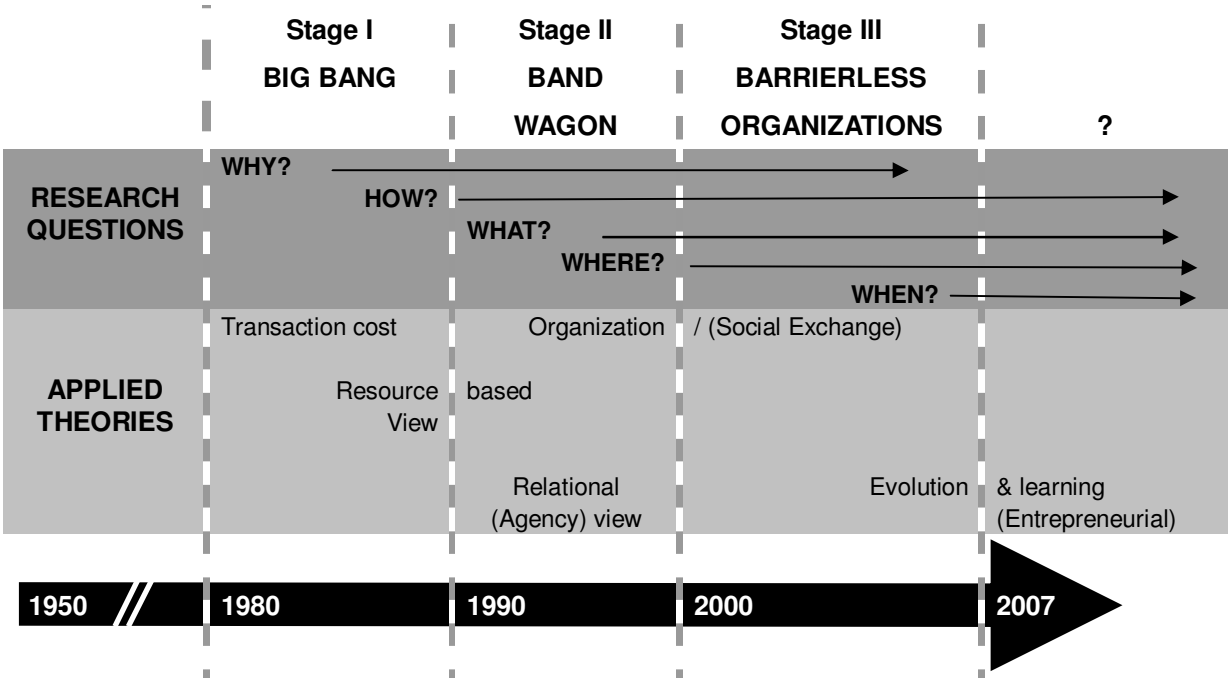


Figure 2.2 - An overview of the five theories in this study

Theory	Definitions	Functions
Transaction Cost Economics	Organizational effectiveness depends on choosing the appropriate governance structure (internal vs. external), so as to minimize production costs and transaction costs. The level of transaction costs incurred depends on three key transaction attributes—asset specificity, uncertainty, and frequency (Williamson, 1985).	Structuring of outsourcing contracts
Agency Cost Theory	All contracts involve a principal–agent relationship that is characterized by goal incongruence between the principal and the agent. This results in agency costs, specifically, bonding costs (to achieve incentive alignment), monitoring costs (to reduce information asymmetry), and residual loss (due to risk aversion) (Jensen & Meckling, 1976).	
Resource Dependency Theory	Firms are dependent on their external environment for resources. Resources that the firm cannot generate internally must be acquired through external acquisition. Firms must therefore actively manage the environment and their resource flow, to minimize dependence (Pfeffer & Salancik, 1978).	Addressing ease of exit
Entrepreneurial Actions	Entrepreneurship is an organizational capability that drives economic growth. Entrepreneurial actions, as a process of creative destruction, involve proactive efforts to discover and exploit market opportunities for innovation (Schumpeter, 1936).	Continuous relationship management and information feedback
Social Exchange Theory	Interorganizational relationships involve not only legal exchanges between the parties, but also social exchanges based on reciprocity. This requires cooperation and give and take between the parties (Blau, 1964).	

Table 2.2 - Summary on five theories in outsourcing relationships

1980s to early 1990s (Big Bang) - Transaction Cost Economics

Transaction cost economics (TCE), first introduced by Coase (1937) and further developed by Williamson (1985), considers the relative advantages of handling transactions through internal (hierarchy) or external (market) organizational forms. Outsourcing offers an organizational solution that can reduce production costs by leveraging on market economies, though this must be balanced against associated transaction costs. The ideas of Coase and Williamson on the transaction cost theory are often referred to as the prominent ideas behind outsourcing (Hätönen and Eriksson, 2009). During this stage, companies outsourced noncore business processes basically to cut operational costs. Outsourcing which was a tool to make organizations more efficient economic units for profit maximization mainly occurred domestically. The relationships were managed in an arms-length manner, relying on contracts. The level of transaction costs incurred depends on characteristics of the outsourced activities, in particular, asset specificity, uncertainty, and transaction frequency. Specifically, TCE recommends that activities that are highly asset specific, involve high uncertainty, and occur frequently are more appropriate for internal organization. In fact, many local organizations continue to outsource complex operations, as evidenced in the growth of FM-enabled business process outsourcing, which typically involves high-frequency transactions and mission-critical applications.

It is arguable that minimizing customization should enhance the organization's relationship in terms of ownership, control, competitive position and long term plan. Adhering to a vendor's standard offerings enables the organization to leverage on the vendor's economies of scale and scope for scalability, thus enhancing

ownership and control. Minimal customization also reduces competitive position and long term plan efforts, since the vendor needs to make only the necessary competition and plan based on its existing platform instead of having to maintain a continuous understanding of the client organization's unique requirements and specific past customization.

Early 1990s (Big Bang to Bandwagon) - Resource Dependency Theory

Positive experiences from early outsourcing cases prompting in companies instigated the era of the Bandwagon in the outsourcing history (Lacity and Hirschheim, 1993). At that time, the seminal article "The core competence of the corporation" by Hamel and Prahalad (1990) introduced a new management approach about competitive edge to replace the strategic business unit thinking. As a result, companies started to seek external skills, competences and knowledge to provide value to more complex and strategically important organizational processes. Strategic outsourcing emerged (Alexander and Young, 1996b; Quinn and Hilmer,1994). More strategic functions were now being outsourced and thus firms started building closer relationships and stretched their boundaries with their vendors to gain competitive advantage through outsourcing. In early 1990s firms did not only primarily search knowledge base and resources from domestic markets, but also began viewing the international resource pools as accessible.

Resource dependency theory (RDT) argues that all organizations are dependent, to varying degrees, on some elements in their external environments (Pfeffer & Salancik, 1978). This dependence arises from the control these external

environments have on resources needed by the firm. By outsourcing, client organizations become dependent on their vendors who have control over the business services provided and the resources required in producing these services. RDT stresses the necessity of adapting to environmental uncertainty and actively managing resource flows, because the external vendors providing these scarce and critical resources acquire power in the exchange relationship. The primary concern of RDT in managing outsourcing relationship is, therefore, to mitigate the possibility of overdependence on vendors, arising from the small number of alternative suppliers and the high cost of switching suppliers. This perspective suggests two relationship manoeuvres organizations can use – multiple sourcing and vendor interoperability (Pfeffer & Salancik, 1978).

This perspective suggests two relationship manoeuvres organization can use – multiple sourcing and vendor interoperability. The argument of multiple sourcing is not intended to augment outsourcing relationship in terms of ownership and control; but rather, its primary focus is to enhance competitive position and long term plan.

Similarly, vendor interoperability contributes to outsourcing relationship by reducing switching costs. The argument is that high vendor interoperability may not lead to increased ownership and control, because the underlying resources for enabling vendor operability are still “externally” controlled. Thus, like multiple sourcing, vendor interoperability as a relationship manoeuvre only offers a position to gain competitive position and long term plan.

Early 1990s to early 2000s (Bandwagon) - Agency Cost Theory

Agency cost theory (Jensen & Meckling, 1976), on the other hand, focuses on the principal–agent relationship inherent in any contract, its associated problems (adverse selection and moral hazard/shirking), and the resulting agency costs (bonding costs, monitoring costs, and residual loss). Outsourcing can be conceived as a principal–agent relationship that involves a client (principal) delegating the performance of services to an external vendor (agent), thereby introducing agency costs that need to be managed through different control mechanisms (Jensen & Meckling, 1976).

Beyond flexible pricing, this theory suggests that organizations can achieve outsourcing relationship - in particular, by managing monitoring costs through increased process maturity, and managing residual loss through retaining in-house competence. A mature process with established practices and parameterized workflow tends to be more ownership and controllable. The knowledge embedded in a mature process helps the organization to challenge any vendor reluctance to scale or control existing operations on the pretext of configuration complexity. In addition, greater process maturity makes it easier for a process to achieve competitive position and long term plan.

Typically, manoeuvres involve a team of in-house employee performing task similar to those outsourced; this help the organization abreast of process knowledge and stay on top of changing technology. While retaining these internal resources may be cost inefficient, it address potential vendor non-performance issues, since these resources are controllable by the organizations and can be

readily deployed to enable ownership, control, competitive position and long term plan.

Early 2000s (Bandwagon to Barrierless organizations) - Social Exchange Theory

By turn of the millennium, the popularity of outsourcing had become a norm (Lawton and Michaels, 2001). Global access to vendors, falling interaction costs, and improved information technologies and communication links provided all companies to a possibility to restructure their business (Doig *et al.*, 2001). The global resource pool had come available for all companies regardless of their industry, geographical location or the size. Such developments led to the phase of era of Barrierless Organizations in the outsourcing history (Hätönen and Eriksson, 2009). This era traces an increasing trend towards organizational structures, in which the boundaries have become blurry and fading. Accordingly, where outsourcing used to be a tool for streamlining internal operations, it has recently become a tool for transforming firms towards flexible organizational forms whereby the role of tightly integrated hierarchy is supplanted by loosely coupled networks of organizational actors (Schilling and Steensma, 2001). Hätönen and Eriksson (2009) also address that outsourcing has evolved to a stage where firms can achieve operational flexibility without incurring the costs associated with bureaucracy.

Social exchange theory argues that interorganizational exchanges are embedded in social relationships (Blau, 1964). The enforcement of obligations, promises, and expectations occurs through social processes that are based on reciprocity, and

involve cooperation and give and take between the parties. An outsourcing arrangement can similarly be considered as a social relationship between the client and the vendor (Kishore *et al.*, 2003), requiring frequent communication, development of shared goals, and cultivation of mutual respect (Gupta & Goyal, 1989; Gittell, 2002). A strong client–vendor relationship in outsourcing positively impacts the willingness of the parties to adjust to changing demands (Poppo & Zenger, 2002).

From early 2000s onwards (Barrierless organizations) - Entrepreneurial Actions

Entrepreneurial action, as a theoretical perspective, stems from early work by economist Joseph Schumpeter (1883–1950) who argued that the main agents of economic growth are the entrepreneurs who introduce new products, new methods of production, and other innovations that stimulate economic activities (Schumpeter, 1936). He described entrepreneurship as a process of "creative destruction," in which the entrepreneur continually displaces or destroys existing products or methods, replacing them with new ones. As a behavioral phenomenon, entrepreneurship has been conceptualized as an organizational capability in many studies, for example, 3M with its long history of entrepreneurial initiatives (Covin & Slevin, 1988). The concept is consistent with notions such as "alertness to opportunity" or "proactive learning" (Miller, 1983; Sambamurthy, Bharadwaj, & Grover, 2003).

Extending the concept of entrepreneurial actions into the context of outsourcing, Sia *et al.* (2008) argue that entrepreneurial actions refer to proactive efforts by

client organizations to discover and exploit market opportunities for outsourcing innovation. The premise is that client organizations often possess imperfect knowledge and information about the real market opportunities available to them (Kirzner, 1973). The entrepreneurial action perspective thus suggests that organizations should beef up their ability to proactively sense the dynamics of the external environment. Organizations can develop such capabilities through their executives' intuition and experience in seeking variation and applying such foresights to the specific outsourcing contexts through selective retention (Campbell, 1965).

Proactive sensing emphasizes the continuous scanning and assimilation of early feedback, and quick learning (Miller, 1983). In searching for meaningful signals, managers systematically look for early indications of new ideas, capabilities, or trends in the outsourcing market. They can nurture continuous innovation in outsourcing by exerting market pressure, or leveraging the competitive landscapes of the outsourcing vendors (e.g., benchmarking) to strengthen their negotiating power. Organizations may also attempt to redefine market uncertainty by championing and partnering with outsourcing vendors to develop new service capabilities or technical advancements (Eardley *et al.*, 1997).

Vigilance allows organizations to tap the business intelligence to anticipate market discontinuities and the corresponding need to create competitive position as well as to keep abreast with dynamics in the vendor market and alternative opportunities to develop long term plan. The strategic and external orientations of proactive sensing as a manoeuvre, however, are not expected to significantly

enhance ownership and control as it tends to focus on information feedback outside routine operation in outsourcing.

Attainment of these various dimensions of outsourcing relationship would contribute to outsourcing success in today's dynamic business environment. Closer relationship implies greater ability to cope with the inevitable changes in the environment, thus ensuring continuous effectiveness in an organization's outsourcing strategy.

2.6 Current content of facilities management outsourcing in Hong Kong

The International FM Association found that the contracting-out services in US most often outsourced is building maintenance, architectural design and engineering (International FM Association, 1993). Back to Asia where support services were outsourced, the companies generally tended to comprise core services such as computer integrated facility management, cleaning, catering, move management, project management (major/minor works), services installation (mechanical, electrical, etc.), maintenance and management (Moore and Finch, 2004). The nature of outsourcing has grown increasingly complex on three crucial areas such as highly mission-critical business processes, strategic resources and capabilities and global cost and talent advantage. (Sia, *et.al.*, 2008) The organizations generally outsourced the need for cost reduction, works being non-core business and the need for specialist expertise. Locally, housing maintenance and management services are commonly contracted out; however, there is a question that the service providers can offer quality service at a competitive price (Price Waterhouse Coopers, 1999). This part discusses the

types and characteristics of FM outsourcing services in seven kinds of local common major premises.

Sophisticated technological park

There are generally two kinds of outsourcing service procurements in these parks. In the Hong Kong Science Park, Stewart and Yuk Hee (2007) reported that one is campus IT service support outsourcing to a technology service operator by the campus management and the other is building operation support outsourcing to another facility management service operator or provider. It has become popular in the commercial market that the management of building and IT services are under outsourcing models which impose some implications to IT services management implementation. In this case, the service operator is selected either through strategic partnership or competitive tender bidding on a year-based contract term. The relationship between the company and the employer organization is built on the contract itself.

Large and dense private residential estates

Field practice of outsourced building management of these residential estates is prevalent (Hui, 2005). General outsourcing services are included cleaning, security and property maintenance in these residential estates. Hui (2005) also claims that useful information is vital to effectively implement building management for building owners and service providers. Today, local high rise residential buildings generally are more than fifty storeys. Thus, there are many technical and administrative challenges waiting for the professional facilities or estate managers in those high density areas.

Public housing estates

In recent decade, the Hong Kong Housing Authority (the biggest public sector landlord in Hong Kong) decided to privatize its professional housing management and maintenance services for a portfolio of more than 600,000 flats. The Authority assesses outsourcing tenders for services covering housing management and maintenance and contractor services for cleaning, security, horticulture, lift maintenance and minor works (Hong Kong Housing Department, 2001, 2005). There has been a growing trend of outsourcing services in the public sector by privatization since 1999. Boyne (1998) suggests that theory of public choice generates market competition, which in turn improves efficiency and quality in the public sector through better working methods, better organisational structure and elimination of waste under market pressure. In 1996, the housing management service of three public rental housing estates were outsourced to the property service agents through a pilot scheme to release the great financial burden on maintenance and improvements of public housing (HKHA, 1997). A number of key stakeholders believe that privatization can improve the productive efficiency and effectiveness in the use of resources (Audit Commission, 2005; Hong Kong Housing Department, 2001; Price Waterhouse Coopers, 1999; Choi, 1999; Farnham and Horton, 1996). Currently, more than half of Hong Kong Housing Authority's public rental housing estates are outsourced to property service agents (HKHA, 2010). This kind of professional outsourcing service includes architectural design, building surveying, quantity surveying, building services engineering, structural engineering, geotechnical engineering and civil engineering. Importantly, the external consultants have been engaged on improving cost and service quality and hence community satisfaction with government performance (Lam, 2008). Lo

et al. (2013) state that outsourcing of property management services is in line with the Government's Audit Commission, 2007 which promotes the involvement of the private sector to serve the community.

Typical commercial buildings

Optimum mix of in-house and outsourced O&M services is needed to achieve (e.g. Barrett and Owen, 1993; Barrett and Bayley, 1993). For commercial buildings typically installed with air-conditioning system, power supply, lighting, elevator, and so on, their operation and maintenance are typically undertaken by a hybrid of in-house and outsourced resources (Lai *et al.*, 2004). Operation and maintenance work in offices is generally running in outsourcing procurement. The significance of outsourcing is to reduce costs in terms of scale and expenditure. In past decade, many private and public building owners hire specialist or registered contractors through total or phased outsourcing to relieve the financial burdens (Yik and Lai, 2005). Lai *et al.* (2008) report that landlord or the management company provides building tenants and the major cost elements are energy costs, wages of in-house staff and costs for outsourced services and replacements of deteriorated installations as FM services. Nevertheless, they report that amount of cost saving in outsourcing would be smaller than that of energy cost. A commercial building owner is willing to outsource if it would lead to a net benefit, which could be an increase in rental income or a reduction in the O&M cost. Lai *et al.* (2008) also compared cost saving between outsourcing and energy consumption, but did not discuss link of outsourcing relationships to user satisfaction.

Hotels

Many professional maintenance works such as maintenance of the generator, chiller, boiler are needed to outsource (Chan, 2008). In some cases like licensing or renewal of license in Hong Kong, for example, lift / escalator installations registered by Electrical and Mechanical Services Department and fire protection systems registered by Fire Services Department; there is no choice but to outsource. In addition, the senior management in hotels have to manage effectively and efficiently these 'infrastructures' like air-conditioning, mechanical ventilation, fire services, lift / escalators, plumbing / drainage, lighting, laundry and catering installations, to deliver quality services and mitigate any breakdowns. Chan (2008) also suggests that local hospitality enterprises can re-engineer the current strategies of costing for improving competitive edges and outsource some functions, for example, maintenance works critically consideration on performance in terms of technical knowledge, skill, equipment, speed, flexible manpower shuffling of specialised contractors. Further study between outsourcing relationships and clients' satisfaction is necessary.

Hospitals

Yik *et al.* (2012) find that medical and healthcare services in modern hospitals can be adequately delivered with the support of hospital engineering services such as physical facilities and also operation, maintenance and repair services for improvement and upgrading works. These essential support services are outside to hospitals' core business. Outsourcing for non-core services from specialized services providers, which has become a common means of FM for enhancing cost effectiveness of operations of organizations (Kakabadse and Kakabadse, 2000; Heikkila and Cordon, 2002; Efficiency Unit, 2003; Booty, 2009). Whereas full

outsourcing of FM services for hospitals can be successful (Powell, 2002), hospitals with high occupancy levels require the availability of internal work sources for corrective maintenance (Rees, 1997, 1998). Facility managers have to strike a proper balance between in-house provision and outsourcing of FM services (Shohet and Lavy, 2004), and may need to be equipped with adequate tools to support decision-making (Lavy and Shohet, 2007).

In Hong Kong, Hospital Authority is the responsible organization to run public hospitals, clinics and the related facilities. Under this authority, there are two categories of hospitals, namely Schedule 1 hospitals which were government hospitals, and Schedule 2 hospitals which were sub-vented hospitals, before the two groups of hospitals came under the common umbrella of HA since its establishment in 1990 (Hospital Authority, 2008). The Electrical and Mechanical Services Department of the Hong Kong Government used to provide operation, maintenance, repair and professional services for hospital engineering services in Schedule 1 hospitals (Wan, 1999). At present, these works are rendered by the Electrical and Mechanical Services Trading Fund, which is the department's trading arm providing services to various customer departments within the government as well as other organisations, such as Hospital Authority (Electrical and Mechanical Services Department, 2008). Hospital Authority and Electrical and Mechanical Services Department have established a cooperative partnership relation since 1996, which led to the adoption of Service Level Agreements to define the performance targets and mutually agreed repair and maintenance time and cost rates for hospital engineering services in the hospitals (Wan, 1999).

Yik *et al.* (2012) report that the reasons for outsourcing maintenance and repair services for the trades of hospital engineering services include involving proprietary products and as a regulatory requirement on the maintenance work undertaken by qualified or registered contractors. With a view to enhancing the cost effectiveness of services delivery in its hospitals, Hospital Authority has initiated a review of the methods for procurement of the services, including the potential of outsourcing those services from private sector services providers (Yik *et al.*, 2012).

Universities and tertiary institutions

Generally, there are some benefits on application of outsourcing in the higher education sector (Adegoke and Adegoke, 2013). The growing demand of FM supporting services at the local universities in past years was accompanied by advising deployment of outsourcing approach (University Grants Committee, 2010). Although FM outsourcing services at such institutions are increasing, very little local empirical research has been conducted into the proportion of outsourcing services in such institutions. As for the kinds of diversified outsourcing services at the local institutions, there are high risk waste management, landscaping and horticulture, information technology, capital project, cleaning, campus security, catering, maintenance for the building facilities, minor alteration and addition work of premises.

2.6.1 Facilities management outsourcing services in the higher-education sector

Given that the share of universities' income from tuition fees paid by students has

increased radically over the last 30 years (Carpentier, 2004) the recruitment of students becomes particularly vital. From a FM perspective, Vidalakis *et al.* (2013) investigate the extent to which the quality of facilities can influence student decision to join a particular higher education institution because of students' purchase behaviour as an essential determinant of the university marking positioning strategy. Indeed, higher education institutions facilities and learning spaces are, not as important as the course itself but, certainly one of the main aspects that students consider when deciding to join a university (Maringe, 2006; Price *et al.,* 2003; Reynolds and Cain, 2006). Reynolds and Cain (2006) further discover that a quality built environment is not a sufficient, but necessary condition to recruit and retain students. Given the continuous and increasing pressure on higher education funding, it is imperative to understand the maintenance and procurement on construction of new or refurbishment of existing facilities (Vidalakis *et al.*, 2013).

A variety of sourcing strategies are available to facilities managers: in-house provision, outsourcing, public-private partnerships and total facilities management (Atkin and Brooks, 2002). In the wake of the Asian economic recession, many regional FM outsourcing services appeared in the built-environment sector. Locally, housing maintenance and management services are commonly contracted out; however, the question of whether service providers can offer quality services at a competitive price remains pressing (PricewaterhouseCoopers, 1999). A survey conducted by Moore and Finch (2004) in Hong Kong offers valuable insights into general FM outsourcing services, including computer-integrated facility management, catering/vending, move management,

project management (major/minor works), service installation (mechanical, electrical, etc.), cleaning and security. There are three main reasons for the urgent need to build on this pioneering study of FM outsourcing services, particularly in the local higher-education sector. First, outsourcing is one of the procurement approaches used to provide building operation support services in facilities management (Atkin and Brooks, 2009). Although outsourcing services may not be the best means of solving the typical strategic and operational problems encountered by facilities managers, use of this sourcing strategy in the higher-education sector was scarce but more efficient (Adegoke and Adegoke, 2013). Second, very little empirical research has been conducted in this area. Vidalakis *et al.*, (2013) claim that further research is required to reveal the strategic aspects of FM and defines the role of facilities as part of the organisational strategy and culture on improvement of value for money. Third, organisations currently need to adopt outsourcing to take care of built environment in their tertiary institutions because they want to save money (Ferris and Graddy, 1991). Hong Kong's institutions of higher education are no exception. They too need to balance their budgets, and outsourcing allows them to reduce costs. Expenditure on estates and facilities is the second largest cost item after salaries (Universities UK, 2009). Although the students consider good quality buildings a credit to the university, students' needs can be met relatively simply, revealing the increased potential of making best use of buildings and facilities to create value (Vidalakis *et al.*, 2013). The quality of the estate is also crucial in creating added value by enhancing the university's marketability by strengthening university identity and facilitating the recruitment of quality staff and students (CABE, 2005; Alessandri *et al.*, 2006; Barnett and Temple, 2006). Boosting student satisfaction

attracts more students, which in turn increases revenue. This study proposes that outsourcing can influence satisfaction, thus affecting clients' profits. There is a clear need to enhance our knowledge and understanding of the problems that afflict the relationships between local higher-education clients and service providers in FM outsourcing.

Recently, the senior managements of local universities and tertiary institutions have been advised to outsource FM support services in the campuses (University Grants Committee, 2010). Table 2.3 shows the grants on the University Grants Committee (UGC) - funded institutions for the past ten years. According to the figure of capital grants from 2008/09 to 2012/13, the expenditure on the capital works projects and Alterations, Additions, Repairs and Improvements (AA&I) projects are substantially increasing from 5.2% to more than 25%. The highest level of capital grants on the UGC-funded institutions occurring on the year 2011/12 is 25.3%. However, the ratios from the 2003/04 to 2007/08 are just around 5% on average. This reflects UGC-funded institutions urgently requiring substantial new and improvement works in the institutions' campuses on recent years. In addition, total government expenditures on education on the UGC-funded institutions generally are more than 20%. This also reflects that The Hong Kong Special Area Region Government has a great financial burden on higher education of those UGC-funded institutions.

	Financial Year									
	2003 /04	2004 /05	2005 /06	2006 /07	2007 /08	2008 /09	2009 /10	2010 /11	2011 /12	2012 /13[1]
Grants for UGC-funded Institutions[2] ($m)	14628	12487	12978	12540	12479	12808	12816	14228	16335	18920
Capital Grants[3]	6.2%	5.1%	5.9%	4.4%	4.5%	5.2%	11.6%	14.5%	25.3%	17.8%
Total Government Expenditure[2] ($m)	243213	242235	233071	226863	234815	312412	289025	301360	364037	380615
Total Amount of Grants as % of Total Government Expenditure[4]	6.0%	5.2%	5.6%	5.5%	5.3%	4.1%	4.4%	4.7%	4.5%	5.0%
Total Amount of Grants as % of Total Government Expenditure on Education[4]	25.5%	22.9%	23.9%	24.1%	23.2%	17.1%	22.0%	23.4%	24.1%	24.3%

Notes:

1. To tie in with the implementation of the new academic structure, UGC-funded institutions have admitted two cohorts of students under the old and new academic structures in the 2012/13 academic year.
2. The figures on Grants to UGC-funded Institutions and Total Government Expenditure refer to the financial year of the Government from April to March.
3. The figures on Capital Grants cover both grants for capital works projects and Alterations, Additions, Repairs and Improvements (AA&I) projects.
4. The figures on Total Government Expenditure and Total Government Expenditure on Education are extracted from The Budget.

Source: University Grants Committee of Hong Kong

Table 2.3 - Statistics on Grants for University Grants Committee-funded Institutions as a whole, 2003-04 to 2012-13

Notably, each institution outsources a different proportion of these services. Facilities-management outsourcing services in the local education sector have particular characteristics. Service contractors provide professional services such as routine cleaning services, campus security, and maintenance work for building facilities and minor alterations and extensions of premises. In general, if the performance of these providers is satisfactory, their outsourcing contracts will be

renewed. As for the relationship between the quality of educational facilities and resultant educational achievement, there is a growing body of scientific evidence (Duyar, 2010; Fram, 2010; Tanner, 2009; Uline and Tschannen-Moran, 2008). Kok, *et al.* (2011) note that the facility services have a major and direct affect on academic achievement such as natural lighting, lighting systems, heating, ventilating and air conditioning, acoustic systems, design and configuration of classrooms, audio-visual / IT equipment, cleaning and maintenance. Other facility services such as building design, physical layout and fitting out of buildings, internal decorations, plants, catering and security have a more indirect influence on the educational process but do affect staff and student satisfaction and the organisations image. Proof of influence on academic achievement for spatial characteristics is clear, but extent of influence on academic achievement of the other facility services such as catering, distribution and security is still obscure. Kok, *et al.,* (2011) contend that the more facility services directly affect the educational process, the higher they expect the services' potential contribution to the educational achievement will be. Although effect of facility services on academic achievement is still limited, the FM strategists are suggested to pay attention on how to add value on the facility services in the higher education sector through outsourcing.

2.7 Performance of service providers and client satisfaction

This section considers the relationship between FM outsourcing and client satisfaction. Barrett and Baldry (1995) claim that facilities management emphasises the physical infrastructure of an organisation, i.e. its hardware assets. In 2003, Barrett and Baldry further reviewed the breadth and scope of facilities

management in integrating management issues with the development of a range of services contributing to organisations' primary business objectives, including software assets. Facilities management addresses both hardware (buildings and their systems) and software (the development, co-ordination and management of all of the non-core specialist services that support an organisation's strategic objectives) (Moore and Finch, 2004). Nevertheless, Frapin-Beaugé *et al.* (2008) note that balancing 'hard' facilities management (asset management in terms of physical construction and maintenance) and 'soft' facilities management (managing assets to suit the needs of users) is difficult.

In the process of FM outsourcing, service providers have a dominant role in professional decision making (Wekerie *et al.*, 1980). The provision of professional services should satisfy the demands of both corporate clients and general users. It is thus crucial to understand the effect of outsourcing on client satisfaction. Lee and Lee (2000) find customer satisfaction to depend on service quality. The concept of service quality is used extensively in the hospitality and service-marketing industries (Douglas and Connor, 2003; Lee and Lee, 2000). Nevertheless, few investigations have addressed the effect of FM service quality on client satisfaction. To ensure complete customer satisfaction, Encon (2005) proposes that the quality of services be measured according to five criteria: tangibles, reliability, responsiveness, assurance and empathy. Stewart and Yuk Hee (2007) note that there is a lack of research on the correlation between the respective effects of users and businesses on service management in the arena of outsourced facilities management. Moreover, Coenen *et al.* (2010) argue that FM corporations should work on managing profitable customer relationships to ensure

outsourcing success. Understanding the importance of outsourcing relationship types between client and service provider thus plays a valuable role in improving service efficiency in specific areas of business.

2.8 The relationship between outsourcing arrangements and the performance of service providers

Following the publication of a number of seminal studies on facilities management in recent decades, researchers have undertaken many significant explorations of outsourcing. The literature focuses mainly on the reasons for outsourcing, its pros and cons and its critical success factors, and on determining which activities tend to be outsourced in particular industries (Lieb and Randall, 1996; Boyson *et al*., 1999). However, these studies fail to examine the link between outsourcing arrangements and the performance of service providers. Although outsourcing has been discussed from many perspectives in different fields, some firms continue to be disadvantaged by the unsatisfactory performance of their outsourcing service providers. According to the International Association of Outsourcing Professionals (2011), global outsourcing is presently worth over $1 trillion annually. As more organisations made the transition to outsourced FM services, the number of reported cases of failure was also increasing (Brown, 2002; Copeland, 2001; Chan, 2008; Crocker, 1999; James, 2000; Van der Werf, 2000). Baithélemy (2003) address seven common problems for most failed outsourcing efforts. Plane and Green (2012) also explain that the relationships between clients and contractors did not always prosper as anticipated. Hence, there is still at least a hidden problem on outsourcing failure not yet be observed and solved. Kavčič and Tavčar (2008) claim that outsourcing can increase an

organisation's short-term gains, especially in financial terms. However, it may also ruin the company's reputation and success due to poor-quality performance and hidden difficulties. Such problems can exceed the short-term benefits of outsourcing. Kavčič and Tavčar (2008) also state that trust, based on the mutual long-term interest of both participants, is an important factor determining the success of the relationship between an outsourcing company and an outsourcer. Poor management of the relationship between outsourcers and stakeholders is one possible reason for outsourcing failures; however, no detailed investigations of this topic have recently been undertaken. Moreover, Marshall *et al.* (2004) report that process studies of outsourcing are rare. It is important to use a structured procedure capable of controlling the evolution of a generic outsourcing process (Fagan, 1991; Finizio *et al*., 2001; Kakabadse and Kakabadse, 2000; Lonsdale and Cox, 2000; Van Mieghem, 1999). However, there is only limited research on structured partnerships in the field of FM services (Lehtonen and Salonen, 2005). This suggests that our existing knowledge of best-fit FM outsourcing with reference to service providers, clients and users is inadequate and under-developed. It is necessary not only to develop new skills for managing outsourcing relationships, but also to develop the capability to utilise these skills effectively (Harland, Knight, Lamming and Walker, 2005). The relationship between the company and the service provider should be taken into account when addressing facility-related services (Cigolini *et. al*., 2011). According to Plane and Green (2012), facility managers seeking to establish successful outsourcing practices should also recognise the importance of determining relationship objectives and the benefits of such relationships in the context of FM procurement, for which partnering and collaboration are essential.

Some researchers consider only the two main outsourcing parties and neglect the needs of general users. Gottschalk and Solli-Sæther (2006) observe that managing successful IT outsourcing relationships depends on an accurate understanding of the nature and development of these relationships. If the relationship is at the cost-estimation stage, then both clients and vendors must accept a cost focus. It would be damaging to the relationship if the vendor were to become alliance-focused while the client was still cost-focused. To ensure a successful relationship, both parties must agree when and how to move on to higher stages of the relationship (Lee *et al*., 2004). However, it remains unclear whether corporate clients and general building users are unanimous in their preference for particular modes of outsourcing relationships with service providers in facilities management. Moreover, Harland, Knight, Lamming and Walker (2005) claim that the failure to manage outsourcing relationships properly, perhaps as a result of insufficient service-level agreement, may have a negative effect on customer service and reduce levels of control and customer contact. It is thus important both to examine the relationship between clients and service providers and to consider the needs of general users.

The performance of service providers can affect the quality of FM services, which in turn influences client satisfaction. There is a knowledge gap concerning the link between outsourcing arrangements and service provider performance or client satisfaction (Cigolini, *et al*., 2011, Jensen, *et al.* 2012, Lehtonen and Salonen, 2005; Plane, and Green, 2012). The objective of this study is to close this gap. Good relationship management, collaboration and trust-building activities are

shown to be just as important as delivering the agreed FM services (Jensen *et al*., 2012; Kadefors, 2008). The drive towards partnering and collaborative working practices continues to gain pace. For example, the PAS 11000 standard for collaborative business relationship management was introduced as a formal British Standard in December 2010 (British Standards Institute, 2010), and is described in an *FM World* article as being 'perfectly logical for the FM sector' (FM World, 2010). Hence, thorough examination of the relationship between outsourcing modes and the performance of FM service providers is needed. Lok *et al.* (2010) agree that outsourcing practices can affect outsourcing-relationship types and thus the profit equations of organisations. It is imperative that clients thoroughly and regularly review their relationships with service providers.

2.9 Outsourcing relationship management problems

In this section, the literature on application areas for outsourcing and the difficulties of managing outsourcing relationships are discussed. Since the publication of seminal FM studies in recent decades, researchers have initiated a number of significant investigations into outsourcing relationships. Clients often cannot understand the unsatisfactory performance of the service providers in a specific FM outsourcing contract. The research rationale is to test a possible causal link between FM outsourcing relationship types and outsourcing performance, indicating that the existing knowledge of service provider performance management remains inadequate and under-developed.

Key application areas

The concept of outsourcing is noted and discussed in an extensive array of

subject areas (Boer, Gaytan, and Arroyo, 2006). Some evaluations of outsourcing, favourable (e.g. Sharpe, 1997) and unfavourable (e.g. Stein, 1997), are founded on “ideology” and management “fashion” (Hendry, 1995; Alexander and Young, 1996). The strategic management and purchasing and supply literatures focus on the outsourcing process (McFarlan and Nolan, 1995; Krause et al., 1998; Gunasekaran and Ngai, 2005). Examples of these strands of literature include transaction cost economics (e.g. Williamson, 1975), the resource-based view (e.g. Richardson, 1972), strategic management (e.g. Quinn and Hilmer, 1994), sustaining competitive advantage (e.g. Barney, 1991, 1997) and evolutionary economics (e.g. Mahnke, 2001). Furthermore, in the literature on specific functional or technical areas, outsourcing has become an established theme (Boer, Gaytan, and Arroyo, 2006). Examples can be found in the literature on ICT (e.g. Grover et al., 1994; Kakabadse and Kakabadse, 2000), human resource (HR) management (e.g. Lever, 1997) and logistics (e.g. Andersson and Norrman, 2002; Rabinovich et al., 1999; Boyson et al., 1999; Bolumole, 2001). In-depth studies have been proposed to explore economic and financial aspects, with great attention paid to cost analysis, especially concerning hidden costs and moral hazards (Kippenberger, 1997a, b; Fill and Visser, 2000). Harland et al. (2005) observe that research on outsourcing has focused on particular support services, notably FM, logistics and IT provision. Generally speaking, outsourcing is becoming less extraordinary in business environments.

a) Neglect of outsourcing relationships

Given the vast amount of literature dedicated to outsourcing and its undisputed economic significance, it is somewhat surprising that the number of practical, prescriptive contributions remains relatively small (McIvor, 2000). The bulk of the

literature seems to focus on the reasons for outsourcing, its pros and cons, critical success factors and which activities are primarily outsourced in certain industries (Lieb and Randall, 1996; Boyson et al., 1999). Processual studies of outsourcing are rare (Marshall et al., 2004), and despite its large diffusion through business cases and electronic or paper documentation, there is a need for a structured procedure to govern the evolution of a generic outsourcing process (Fagan, 1991; Finizio et al., 2001; Kakabadse and Kakabadse, 2000; Lonsdale and Cox, 2000; Van Mieghem, 1999).

b) Poor risk management in outsourcing relationships

Outsourcing relationship management problems are perceived from a strategic vantage that emphasises the risks and advantages that can arise from the practice of outsourcing to highlight the importance of contract management (Graham, 1993; Lonsdale, 1999; McIvor, 2000; Udo, 2000; Zhu et al., 2001). The organisational and methodological aspects have been treated in most cases (White and James, 1998; Embleton and Wright, 1998; Hines and Rich, 1998; May, 1998; Udo, 2000). Nevertheless, risk management in outsourcing relationships is still lacking. Harland et al. (2005) observe that there is little research evidence to assess whether outsourcing is a mechanism for failing to solve internal problems, moving risk out of the firm, or exploring the mixed insourcing and outsourcing models. A more holistic view of outsourcing is needed, one that links local and organisational issues with sector-level actions through a conceptual framework for outsourcing.

c) Insufficient relationship management skills

An overall lack of skills and expertise exists among organisations that must master strategic and collaborative relationship management (Harland et al., 2005). Lonsdale (1999) and Cox (1996) highlight this deficiency while Marshall (2001) reveals the significant shortage of management approaches.

d) Inefficient practices and processes in FM services

Imbalances in the allocation of FM resources creates waste. Two main problems are highlighted in the literature. The first involves negligence. Krumm et al. (1998) point to the absence of a substantial body of empirical research into the link between FM's knowledge of resources and their practices and processes. This link remains unclear. Organisations lack the internal data or tools to effectively collect the data required to align the real estate strategy with the overall business objectives (Acoba and Foster, 2003). Furthermore, Nutt (2000) discovers that facility design and management knowledge is undeveloped. The interface between FM knowledge and facility design knowledge at the strategic level must be addressed, and it is vital that the effect of management on design, and that of design on management, be fully understood. The existing conceptual models of FM practices and processes do not include a structural method. The procedures also lack decision criteria for positioning FM in different circumstances (Barrett, 2000; Chotipanich, 2004; Krumm et. al., 1998).

The second issue deals with communicative obstacles. FM practice can only be effectively implemented through close interactions between the FM function and the operational and strategic levels. However, communication between senior management clients and FM practice groups may be obstructed (Acoba and

Foster, 2003; Barrett, 2000). Thus, the outsourcing services might operate in a handicapped manner due to the lack of an efficient two-way channel. This may lead to discrepancies between the expected and actual performance of FM service providers in the outsourcing process due to unclear client guidance. For instance, Krumm et al. (1996) note that organisations may internally meet novel hardships in the corporate alignment process. When decentralisation cannot be solved, such communication gaps will inevitably be discovered.

2.10 Chapter summary

This chapter discusses outsourcing services holistically. First, it presents the definition of outsourcing and future of outsourcing, followed by a discussion of the importance of contingency theory and theories of strategic management. It also describes the current situation of FM outsourcing in Hong Kong, and provides a detailed description of the factors affecting client satisfaction. The chapter concludes with a discussion of the effect of outsourcing relationships on the performance of service providers and outsourcing relationship management problems. To investigate FM outsourcing relationships further, the next chapter addresses contemporary outsourcing models in various business sectors.

CHAPTER 3 OUTSOURCING MODELS

3.1 Introduction

This section discusses various kinds of outsourcing models used in the business environment. There are five models discussed in this section. The models are critically analysed in terms of their advantages and disadvantages.

3.2 Outsourcing models

The strategic outsourcing model) Although research in supply chain management has expanded substantially, only limited applications of transaction cost theory (TCT) and the resource based view (RBV) are available (Holcomb and Hitt, 2007). They presented a strategic outsourcing model to the strategic outsourcing concept in operations and supply chain management research using both transaction-based and resource-based or capability-based logics to examine a firm's decision to outsource.

Earlier conceptualizations of outsourcing based on economizing conditions, such as asset specificity, small numbers bargaining, and technological uncertainty, to include factors that influence the selection and integration of capabilities from intermediate markets (Argyres and Liebeskind, 1999; Jacobides and Winter, 2005). Holcomb and Hitt (2007)'s model consider four important conditions that establish a resource-based context for strategic outsourcing. The firms evaluate internally accessed capabilities and external capabilities available to produce the greatest value by integration. They argue that strategic outsourcing allows firms not only to reduce costs, but also to enhance their portfolio of capabilities and value creation potential. Table 3.1 indicates the characteristics of the strategic outsourcing model.

	Model	Type	Field	Innovator
Year 2007	Theoretical model	strategic outsourcing research	Operations and supply chain management	Holcomb and Hitt
Theory applied	Transaction cost theory (TCT) : Asset specificity, small numbers bargaining, and technological uncertainty Resource based view (RBV): Complementarity of capabilities, strategic relatedness, relational capability-building mechanisms, and cooperative experience			
Concept	1) Transaction-based perspectives typically confine outsourcing to more specialized, repetitive activities e.g. manufacturing, logistics, and FM 2) Resource-based theory provides a context to explain strategic outsourcing arrangements for more visible and potentially sensitive functions such as research and development (R&D), engineering design, and customer support.			

Table 3.1 - Strategic outsourcing model

The outsourcing relationships model) Stages of growth models have been used widely in both organizational research and IT management research (Nolan, 1979; Earl, 2000; Housel and Bell, 2001; Gottschalk, 2005). According to King and Teo (1997), these models describe a wide variety of phenomena – the organizational life cycle, product life cycle, biological growth, and so forth. These models assume that predictable patterns (conceptualized in terms of stages) exist in the growth of organizations and in the growth of relationships among organizations.

Gottschalk and Solli-Sæther (2006) suggest a maturity model for IT outsourcing relationships based on organizational theories and outsourcing practices, which

identify cost stage, resource stage and partnership stage. In the second stage, the value generation potential of an outsourcing relationship consists of three factors: client characteristics, the vendor-client relationship and vendor characteristics. A key client characteristic is an understanding of how to manage resources that a firm does not own. A key in the vendor-client relationship is a formal (contractual) aspect of the relationship. The third factor shaping the outsourcing value proposition is the vendor's own capabilities. Important vendor characteristics include capabilities such as technical competence, understanding the customer's business and relationship management. Table 3.2 indicates the characteristics of the outsourcing relationships model.

	Model	**Type**	**Field**	**Innovator**
Year 2006	Growth stage of maturity	Outsourcing Relationships management	IT	Gottschalk and Solli-Sæther
Theory applied	Three management theories: 1) 1st stage - cost stage based on transaction cost theory, neoclassical economic theory, contractual theory, theory of firm boundaries and agency theory 2) 2nd stage - resource stage based on core competencies theory and resource-based theory 3) 3rd and final stage - partnership stage based on partnership and alliance theory, relational exchange theory, stakeholder theory, and social exchange theory			
Concepts	1) A three-stage model for evolution of an outsourcing relationship 2) Understanding the current situation in the relationship in terms of a specific stage and to develop strategies for moving to a higher stage in the future 3) First, relationships focus on economic benefits, then there are concerns about access to competence, and finally the development of norms and alliance management are the main focus.			

	4) Benchmark variables for each stage are suggested. A theory-based stage model on long-term IT outsourcing relationship will shift focus as it matures 5) Future research might apply this framework to empirically test the evolution of IT outsourcing relationships.

Table 3.2 - Outsourcing relationships model

The values of benchmark variables indicate the most likely theoretical characteristics of each stage of integration. The benchmark variables are adapted from Gottschalk and Solli-Sæther (2005). Based on extensive literature review of outsourcing theories, they identify and empirically test eleven critical success factors for IT outsourcing relationships. These factors are used as the basis for development of benchmark variables. Figure 3.1 shows the development of cost stage, resource stage and partnership stage of the outsourcing relationships model.

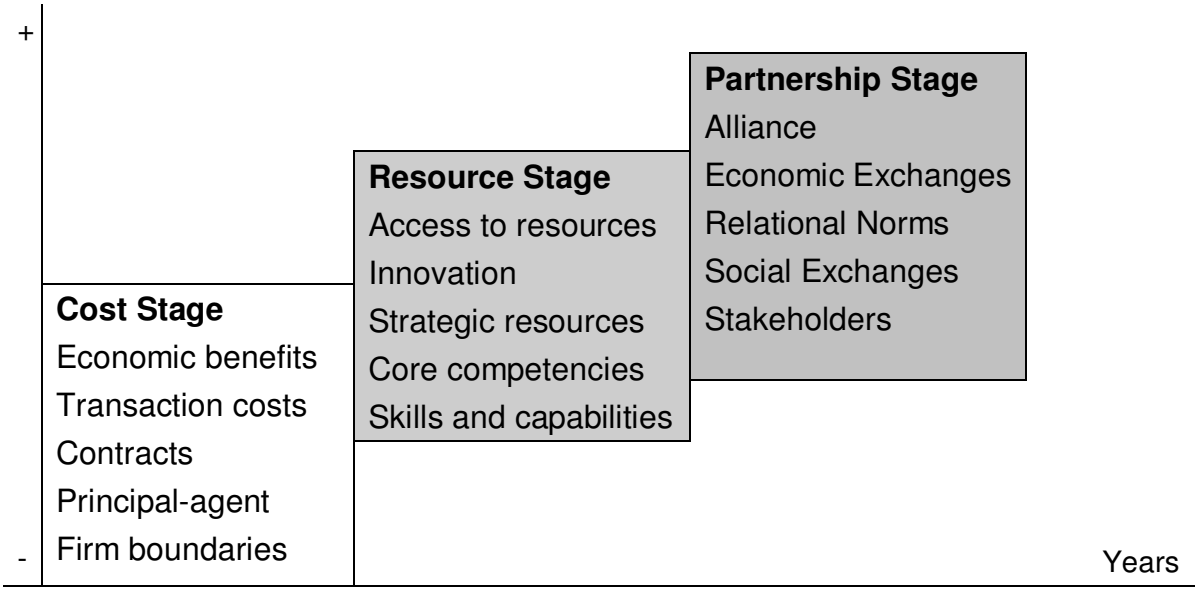


Figure 3.1 - Critical issues in each stage of maturity to outsourcing relationships by Gottschalk and Solli-Sæther (2006)

The conceptual decision model) Boer et al. (2006) provides an overview of existing prescriptive decision models for outsourcing based on literature review. They contrast these models with empirical accounts of outsourcing including two case-studies of outsourcing of logistics activities and develop a conceptual decision model based on the principles of satisficing. There are few prescriptive and practical models for guiding outsourcing decision processes. This is true for outsourcing in general and outsourcing of logistics activities in particular.

Most models basically consist of a limited number of steps (Boer et al., 2006). According to the findings, there are common aspects appearing in similar steps and/or in all models. (1) Definition of core competences and strategy; (2) assessment of integral costs; and (3) analysis of suppliers and competitors. They summarize ten prescriptive outsourcing models in steps. Table 3.3 indicates the characteristics of the conceptual decision model.

	Model	**Type**	**Field**	**Innovator**
Year 2006	Prescriptive decision	Concept	Logistics	Boer, Gaytan, and Arroyo
Theory applied	1) A conceptual decision model based on the principles of satisficing 2) A useful explanation of these discrepancies and useful design principles for developing more realistic prescriptive outsourcing decision models			
Concepts	1) Explaining discrepancies between existing outsourcing decision models and outsourcing processes in practice in particular regarding the practice of outsourcing of logistics activities. 2) Offering the basis for realistic decision guidance in outsourcing processes 3) One of first presenting an outsourcing model explicitly			

	incorporating satisficing principles 4) Very useful principles for developing and operational zing outsourcing decision models

Table 3.3 - Conceptual decision model

The four types of outsourced-outsourcer relationships model) Franceschini, *et al.* (2003) propose a new model for managing outsourcing processes in strategic decisions, economic factors and human resources application in different fields. In table 3.4, this model is to organize in four main steps including internal benchmarking analysis, external benchmarking analysis, contractual negotiation and outsourcing management. Figure 3.2 indicates the working mechanism of the four types of outsourced-outsourcer relationships.

	Model	**Type**	**Field**	**Innovator**
Year 2003	Contingency	Four types outsourced-outsourcer Relationship	Different fields	Franceschini, Galetto, Pignatelli and Varetto
Theory applied	The model is organized in four main steps: Internal benchmarking analysis, external benchmarking analysis, contract negotiation and outsourcing management			
Concepts	1) There are two levels of evaluation, low and high, defining each characteristic. The combination of the two characteristics gives rise to four types of relationships. 2) They investigate all the interactions between “outsourced” and “outsourcers” from selection up to the strategy of relationship management.			

Table 3.4 - The four types of outsourced-outsourcer relationships model

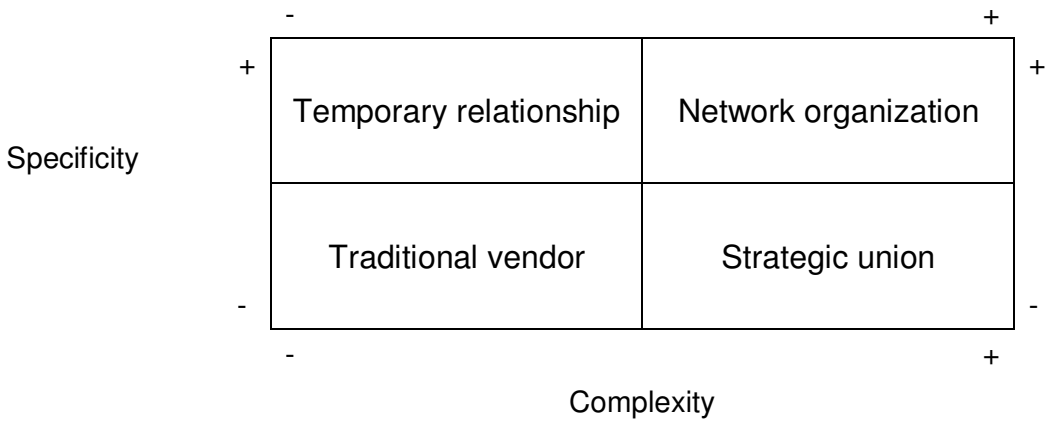


Figure 3.2 - Scheme of the four types of outsourced-outsourcer relationships based on different level of complexity and specificity by Franceschini, Galetto, Pignatelli and Varetto (2003)

The Four Outsourcing Relationship Types model) Kishore et al. (2003) propose a model for the evolution of IT outsourcing relationships. Their earlier research develops a framework that classifies client-provider outsourcing relationships into Four Outsourcing Relationship Types, (a framework called FORT.) In figure 3.3, they discuss the four relationship types in terms of the competencies and monitoring mechanisms required for effectively managing them, and then trace the movement of client-vendor relationships within and across relationship cells over time. By understanding the principal characteristics of an outsourcing relationship, the model helps in understanding this change. Table 3.5 indicates the characteristics of the Four Outsourcing Relationship Types model.

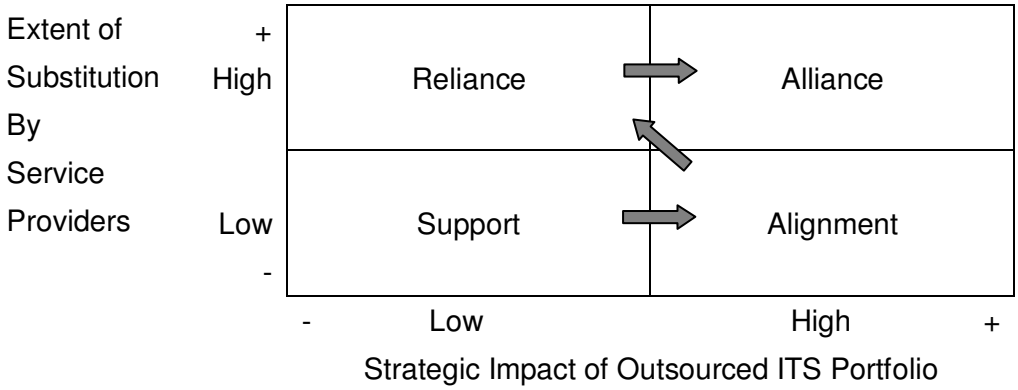


Figure 3.3 - Generic client – provider outsourcing relationships types by Kishore et al. (2003)

Year	Model	Type	Field	Innovator
2003	Contingency	Four Outsourcing Relationship Types Framework	IT	Kishore et al.
Theory applied	The four resulting types of outsourcing relationships: Support, alignment, reliance and alliance.			
Concepts	1) The contingency model can shows the evolution of IT outsourcing relationships of the companies. 2) There are two dimensions most germane to outsourcing relationships. One is to deal with the extent of ownership substitution by outsourcing service providers. i.e. degree to which ownership and/or control of various ITS assets to service providers 3) The other is to deal with the strategic impact of outsourced ITS portfolio. i.e. a firm's competitive positioning and its long-term strategy			

Table 3.5 - The Four Outsourcing Relationship Types model

3.3 Critical analysis of the outsourcing models

In general, there are seven problems for the outsourcing failures (Baithélemy, 2003). Perhaps, this is because of the unknown and complicated interactions

between outsourcing relationships types and FM stakeholders. Outsourcing models are used to connect two stakeholders, such as clients and service providers. Significantly, hidden problems in the outsourcing process can be identified and solved using the relevant model. If one bespoke model is available for each kind of FM outsourcing process, specific relationships between the client and the service provider can be identified clearly. The client can review and improve its relationship with the service provider through appropriate outsourcing strategies. Next, the latent shortcomings of the relationship can be systematically and logically identified using the relevant outsourcing model. It is important that clients thoroughly understand and regularly review their relationships with service providers. Furthermore, they can improve and revise their own outsourcing strategies by understanding the effects of outsourcing-relationship types on outsourcing performance.

Outsourcing activities to a service provider can obviously benefit companies in terms of cost estimation, due to the service provider's familiarity with the work environment and conditions of the installations (Lai, Yik and Jones, 2008). However, the poor performance of outsourced service providers cannot be eliminated, and this may pose unforeseen challenges. The effect of different types of outsourcing relationship on clients' satisfaction in the field of facilities management remains unclear. The question is whether it is valuable to explore types of outsourcing relationships in relation to facilities management. With a greater emphasis placed on post-occupancy studies (Cohen *et al.*, 2001; Leaman and Bordass, 2001), studies of outsourcing-relationship types and their effects on clients, service providers and the general users of buildings in facilities

management are rare. Wekerie *et al*. (1980) describe three approaches to building management and maintenance in terms of resident participation: a resident-focused mode, a professional mode and the intermediate form, a partnership mode. In general, FM outsourcing is an example of the professional mode, with service providers' taking the leading role in professional decision making. Scholars continue to debate the question of why so many outsourcing failures are reported if the professional mode constructs the optimal relationship between clients and service providers.

Is it necessary to establish a specific outsourcing-relationship model for facilities management? Before answering this question, it is important to discuss the various possible kinds of outsourcing failures. Baithélemy (2003) claims that one or more of seven problems are responsible for most failed outsourcing efforts, and that firms are generally reluctant to report outsourcing failures. According to Baithélemy (2003), the seven problems are as follows: (1) outsourcing activities that should not be outsourced; (2) selecting the wrong vendor; (3) writing a poor contract; (4) overlooking personnel issues; (5) losing control of the outsourced activity; (6) overlooking the hidden costs of outsourcing; and (7) failing to plan an exit strategy (e.g. a vendor switch or the reintegration of an outsourced activity). According to Hätönen and Eriksson (2009), the dynamics and management of outsourcing relationships are very important issues to have become a key managerial interest. The management of the relationships with key suppliers is likely to become increasingly important (Kakabadse and Kakabadse, 2002). The question of how the outsourcing process is carried out is connected to the relationship between the outsourcer and the provider. For example, studying the

process in an international context (and thus combining the questions of how and where outsourcing takes place) may shed new light on the outsourcing strategy. Harland *et al*. (2005) claim that the management of outsourcing relationships, along with the outsourcing process itself, is one of the essential themes of outsourcing research (Insinga and Werle, 2000). However, insufficient attention has been paid to outsourcing failures from the perspective of outsourcing hidden relationships in the entrepreneurial environment (Ikediashi *et. al.*, 2012 and 2013). Establishing a specific outsourcing-relationship model for facilities management may not be the final answer, but it can at least help us to explain and interpret the unseen and complicated scenarios involved.

As discussed in the previous section, there are five suggested conceptual outsourcing models: one drawn from the logistics industry by Boer *et al.* (2006); four types of outsourced-outsourcer relationships in different fields proposed by Franceschini *et al.* (2003); a model of outsourcing relationship management in the IT industry presented by Gottschalk and Solli-Sæther (2006); research on strategic outsourcing in the field of operations and supply-chain management by Holcomb and Hitt (2007); and a framework of four types of outsourcing relationships in the IT industry proposed by Kishore *et al.* (2003). In short, the five outsourcing models are updated in various industries such as logistics, different fields, IT, operations management and supply-chain management, but each of which has its own deficiencies. Table 3.6 indicates the limitations of the suggested models. The problems afflicting the relationships between clients and service providers can be summarised in the following business scenarios. In the field of logistics, prescriptive models of decision making cannot be accurately aligned with

outsourcing practice (Boer *et al.*, 2006). In the field of IT, the outsourcing relationship management model does not accommodate all of the relationships between vendors and clients at different stages of the framework (Gottschalk and Solli-Sæther, 2006; Kishore *et al.*, 2003). As Franceschini *et al.* (2003) observe, the model of four outsourced-outsourcer relationship types does not reflect the evolution of outsourcing relationships.

Year	Model	Type	Field	Limitations
2007	Theoretical model	strategic outsourcing research	Operations and supply chain management	1) Despite the dramatic increase in strategic outsourcing in recent years, few systematic studies of strategic outsourcing have been completed (Gilley and Rasheed, 2000). 2) There is only limited exposure in the fields of healthcare management (e.g. Billi et al., 2004; Roberts, 2001), economics (e.g. Chen et al., 2004a; Shy & Stenbacka, 2003) & strategic management (e.g. Fine & Whitney, 1999; Quinn, 1999; Quinn & Hilmer, 1994). 3) TCT generally involve a set of restrictive assumptions: Ignoring the potential influence of a firm's extant governance forms, its portfolio of exchange transactions, and other firm-specific capabilities on value created through value chain activities.
2006	Growth stage of maturity	Outsourcing Relationships management	IT	1) Successful IT outsourcing relationships require a consistent understanding of maturity stage between vendor and client. 2) The stages of growth are sequential in nature, occurring as a hierarchical progression which is not easily reversed, and involving a broad range of organizational activities and structures (King and Teo, 1997). 3) Progressing unidirectional through a series of predictable stages overly simplistic 4) There are other missing stages in an IT outsourcing relationship. 5) The issues important in each stage are not sufficient to develop and explain. 6) There are no sufficient theoretical and empirical contributions on the prior literature in the area.

2006	Prescriptive decision	Concept	Logistics	1) Satisficing as a typical behavourial model of organizational decision-making fitting is close with observations from the outsourcing practice. 2) It is necessary to project the core ideas of satisficing onto the prescriptive outsourcing models indicating how models align more effectively with the outsourcing practice.
2003	Contingency	Four types outsourced-outsourcer Relationship	Different fields	1) Only two characteristics i.e. specificity and complexity are available for analysis of the four outsourcing relationships. 2) No clear indications of the evolution of the outsourcing relationships
2003	Contingency	Four Outsourcing Relationship Types Framework	IT	1) The firms should have clear plans to consider the costs and difficulties of moving from one quadrant to another in the evolution process of the contingency model. 2) The firms need to consider multiple movements from one cell to other cells in the matrix through selective outsourcing. 3) Outsourcing should be considered more as a management of relationship with service providers rather than as a simple subcontract for IS commodities. The firms must need to have a clear plan for their future movement within the FORT framework.

Table 3.6 - Limitations of the five suggested outsourcing models

The aim of this research is to apply the most suitable model's rationale to the FM sector. The FORT model which is used in the IT industry to provide insight into the types of outsourcing relationships exist between clients and service providers. The most interesting trait of this model is that it examines the evolution of companies' outsourcing relationships. Outsourcing relationships are not static; they are liable to change and evolve over time due to changes in the external environment and in clients' internal requirements (Kishore *et al*., 2003). Unlike the FORT model, other models are not dynamic in nature and do not explore the development of companies' outsourcing relationships.

Consequently, this study examines the FORT model in the specific context of the FM industry. This model is suitable and original because the proposed model covers the relationships between outsourcing types and outsourcing practices. Further arguments are provided to support the model of four outsourcing-relationship types. Every outsourcing model has its own advantages, due to its particular characteristics and theoretical underpinnings, but also its own disadvantages. Determining which model is generally best, therefore, is rather a complicated process.

Benefits of the FORT model

Lok and Finch (2012) state that the FORT model is particularly applicable to the FM sector on account of the specific advantages.

- The model operates like an x-ray machine. It clearly explains and interprets the invisible and complicated scenarios related to outsourcing relationships in an FM contract, and also identifies each stage between the contractual

parties.

- The model is efficient in the differentiation of contracts. It can interpret several kinds of FM contracts simultaneously according to the four relationship types.
- The model is easy to handle. It can simultaneously check the degree of responsibility and the strategic effect on the service providers' outsourced portfolio.
- The model is effective. It can check and update the outsourcing relationships between clients and service providers for each specific FM contract.
- The model is versatile. Although it originated in the IT field, it can be conveniently applied in other industries.
- The model is user-friendly, and easy to understand and apply.
- The model is flexible. No time constraints on contracts are required.
- The model is the most reliable. It is the oldest of the five models identified, and is commonly applied in the IT industry.

The FORT model in facilities management

In the context of the IT industry, the FORT framework is contingent in nature. Finch (2012) explains that outsourcing relationships have increasingly come to entail processes of mutual support and nurturing. Such a relationship may undergo significant change within the life of an individual contract as the service provider acquires an increasing diversity of professional capabilities.

The vertical axis measures the extent of responsibility or ownership substitution on the part of an outsourcing service provider as a result of substitution strategies.

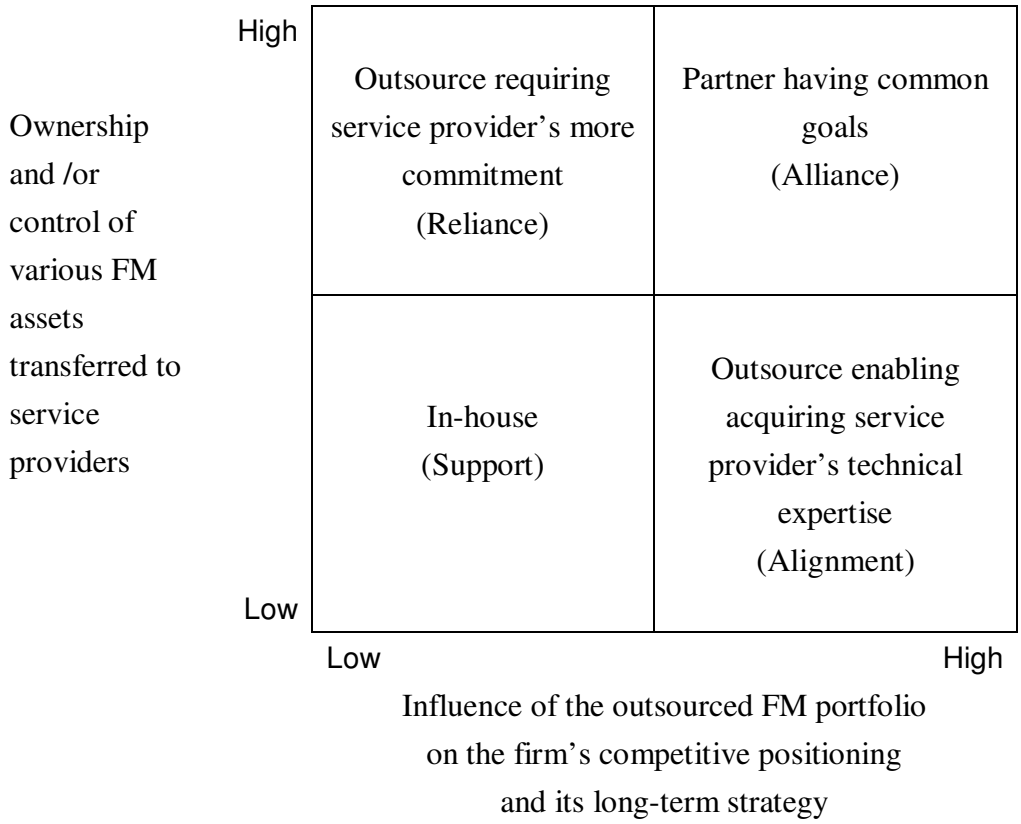
The horizontal axis measures the strategic effect of an outsourced FM portfolio due to impact strategies. Finch (2012) explains further that the first of these dimensions describes the amount of hardware (physical assets) and software (processes, intellectual know-how and expertise) that has been transferred to the provider, including 'asset-specific' knowledge. The second dimension concerns the extent to which the outsourced portfolio adds value to key business processes. This may include the enhancement of customer relations, improved supplier relationships and the improvement of product or service offerings.

Information Technology	**Facilities Management**		
Four Relationship types (FORT) model	**Contingency Outsourcing Relationship (CORE) model**	**Four Dimensions Relationships**	
Four Relationship types	**Four Relationship types**	Degree on vertical axis	Degree on horizontal axis
(1) Support	(1) Inhouse	low	low
(2) Alignment	(2) Outsource enabling acquiring service provider's technical expertise	low	High
(3) Reliance	(3) Outsource requiring service provider's more commitment	high	low
(4) Alliance	(4) Partner having common goals	high	high

Remarks: **Vertical axis:** i) degree of ownership substitution and /or ii) control of various FM assets transferred to service providers **Horizontal axis:** Strategic importance of the outsourced services and influence of the outsourced FM portfolio on the firm's iii) competitive positioning and iv) its long-term strategy

Table 3.7 - Framework of the four outsourcing relationships between service providers and clients in IT and FM industries

Figure 3.4 indicates the FORT Framework applicable to the FM industry. This new tailor-made proposed FM framework is called Contingency Outsourcing Relationship (CORE) model.



Remarks:

(IT dimension): e.g. (Support)

FM dimension: e.g. In-house

Figure 3.4 - The FORT Framework suitable for FM industry (The CORE model)

Kishore *et al*. (2003) explain the mechanism of the FORT model when the level of service-provider involvement is low. In the case of support and alignment relationships, clients make little investment in service provider specific assets. In such cases, client-provider relationships usually operate in the short term and are fairly specific to outsourced projects and services. Hence, there is little need for incentives and penalties to be specified in detail. However, when the level of

service-provider involvement is high, clients make large investments in service provider specific assets. For example, clients become more committed to financing service providers' equipment, technology, systems and skills as part of reliance and alliance connections, which leads to a locked-in relationship. Williamson (1981) describes this phenomenon as 'small numbers opportunism'. Within the alliance relationship, trust is an important mechanism for ensuring that service providers' interests coincide with clients' interests (Sabherwal, 1999).

Limitations of the FORT model

In this research, the FORT model is used as an instrument to identify the four FM outsourcing relationships between clients and service providers. The FORT model is designed to identify and examine the four kinds of client-service provider relationships in the outsourcing contracts (Kishore *et al.*, 2003), However, the concept of the evolution of the outsourcing relationships types has its limitation if companies and public bodies have their own subsidiary property management firms or hire service providers for fixed client-service provider relationships at the outset. It is also possible that the pace of FM practices nationally differ between western and eastern countries. FM is a relatively new and fast developing profession in the service industry (Hui, *et al.*, 2013). The new concept of evolution of outsourcing relationships between the FM stakeholders is relatively innovative to the local FM professionals in the Asian Pacific regions. The local clients and service providers at Hong Kong do not only have sufficient knowledge on the management of FM outsourcing relationships, but they also cannot understand the importance on evolution of those relationships on the FM contracts. This study

thus tests the applicability of the FORT model in the FM outsourcing sector to find out the specific outsourcing relationship type.

3.4 Chapter summary

This chapter discusses outsourcing models in various business sectors, such as operations and supply-chain management, IT and logistics. The chapter first introduces outsourcing models, then provides a critical discussion of their limitations and characteristics. The chapter concludes by describing the benefits and limitations of the model of four outsourcing-relationship types to the FM industry. The next chapter discusses the critical success factors involved in FM outsourcing strategies.

CHAPTER 4 OUTSOURCING RELATIONSHIPS

4.1 Introduction

This chapter reviews the concept of outsourcing success in facilities management. It outlines various critical success factors relating to FM outsourcing, and explains why the design of FM outsourcing strategies must take critical success factors into account. It shows the importance of understanding these critical success factors in the context of Hong Kong's current outsourcing arrangements. It introduces the four dimensions of outsourcing relationships. The chapter emphasizes the strategic manoeuvres for outsourcing relationships.

4.2 The importance of outsourcing success

The success of outsourcing depends on the effective provision of services by service providers. Although outsourcing is gaining popularity, and clients expect a satisfactory performance from service providers, the number of reported cases of failure is increasing (Brown, 2002; Copeland, 2001; Chan, 2008; Crocker, 1999; James, 2000; Van der Werf, 2000). Organisations should thus take care when deciding upon outsourcing arrangements. To execute outsourcing processes effectively, FM professionals in clients and service providers should be skilled in negotiation, finance and interpersonal communication. Two of the most important drivers of outsourcing decisions are cost efficiency and production reorganisation (Franceschini *et al.*, 2003). Companies should focus their efforts on core business, medium- or long-term targets and diversification opportunities (Kippenberger, 1997a,b; Linder *et al.*, 2002; Underdown and Talluri, 2002).

The literature suggests that outsourcing strategies arise from the desire to focus on fewer, more manageable core activities, as Skinner (1969) observes. Companies aim to improve their efficiency by outsourcing non-core activities to specialist providers (Harland, Knight, Lamming and Walker, 2005). This resonates with observations made by Prahalad and Hamel (1990) and Hendry (1995). Corporations, public sectors and nations are advised to formulate strategies for outsourcing to minimise the risk of long-term disadvantages due to the cumulative

effect of poor outsourcing decisions, such as those identified by Bettis *et al*. (1992).

Facilities-management drivers

Strategic planning plays a significant role in aligning real-estate portfolios with corporate real-estate services and capabilities (Acoba and Foster, 2003). In this study, four facilities-management drivers focus on two areas, FM resources and FM practices and processes respectively. There are two drivers in FM resources involving adequacy and coordination whilst there are two other drivers in FM practices and processes involving competence of service providers and quality of performance. Adequacy of facilities-management resources includes people, budgets, systems and coordination of facilities management resources includes information and organisational structures. Competence of service providers in FM practices and processes includes planning, design and quality of performance in FM practices and processes includes construction and maintenance operations.

i) Adequacy of facilities management resources

Grimm (1994) argues that smart FM practices and processes arise from the smooth operation of an organisation. The adequate provision of facilities plays a vital role in some business service oriented sectors such as hotel, commercial mixed-use premises and leisure facilities. In these industries, services should be tailor-made to satisfy the needs of specific customers. To determine the adequacy of FM resources, the efficiency of resource deployment can be measured by the costs of practices and processes and the spaces they occupy. Alignment occurs when the resources required to deliver FM services (in the form of practices and processes) are sufficient in terms of number of personnel, budget size, plant equipment, inventory size, etc. Under- or over-provision represents a mismatch (Grimshaw, 2003; Jensen *et al.*, 2012; Leifer, 2003; Nutt, 2004; Varcoe, 2000).

The significance of strategic plans for the optimal deployment of an organisation's resources is addressed as follows. Usage of space has been proposed as an important measure of resource efficiency (Bon *et al.*, 2002; Pugsley and Haynes, 2002). Portfolio statements provide a general evaluation of resource usage,

including measurements of the cost and location of space, capacity analysis of the amount of space and number of personnel used, and space requirements, including methods of providing space (Kessler-Park and Butler, 2002; Osgood, 2003). However, FM resources are still used inefficiently in the corporate context, according to some strategic plans. Acoba and Foster (2003) note that the inappropriate allocation of already scarce human and capital resources is due to a lack of internal and external strategic planning, and that this difficulty is exacerbated by longer lead times before implementing programmes. There is, thus, a need to emphasise the importance of strategic planning and to improve the design of such plans to optimise resource allocation.

ii) Competence of facilities management service providers

Bon *et al*. (2002) state that facilities management will be one of the key corporate real-estate management skills in the future. Competence is considered one of the crucial components of business success (Becker, 2000; Krumm *et al*., 1998; Price, 2004). In some organisations, emphasis has been placed on FM executives (facilities directors with greater authority than facilities managers) and the development of business skills such as marketing, human resource management and contracting (Alexander, 2003). It is imperative that FM service providers develop both generic and specific forms of competence.

Generic external FM competencies, and competence in the provision of FM support services, are basic requirements for the effective deployment of FM resources. The International Facility Management Association (1992) identifies generic competencies in the following areas: real-estate and strategic planning, operations and maintenance, human and environmental factors, planning and project management, facility function, financial management, quality assessment, innovation and communication. Combining strategic focus with operational efficiency is becoming more and more important as facilities managers take on hybrid roles, diversifying their skill-sets to reflect the new business-service environment and encourage relationships among users and providers (Alexander, 2003; Barrett, 2000; Robertson, 2000).

Furthermore, contemporary facilities managers should have certain basic intrinsic characteristics. For example, a corporate real-estate manager with important skills such as the ability to think innovatively, listen and negotiate and act proactively and cogently is not only able to foster a productive working environment and promote strategic alliances, but to think for and with the customer (Schaaf and Puy, 2001). Facilities managers can bring vital information to the process which informs decision making at critical stages (Smith and Jackson, 2000). The generic management skills, knowledge and experiences of executives in FM organisations have also been investigated in terms of the management of customers, services, working environments and assets (Alexander, 2003; Barrett, 2000; BIFM, 1996; Nutt, 2000).

To increase a company's competitive advantage, a competency framework is crucial to support both headquarters staff and support personnel in sharpening and developing their communication and leadership skills, and cultivating productive client-organisation relationships (Osgood, 2003, Roberts, 2001). Skilled facilities managers with special entrepreneurial skills, thorough knowledge of the core organisation and the ability to co-coordinate diverse activities provide the means by which an organisation delivers and sustains a satisfactory relationship between 'hardware' and 'software' management. Such managers create an appropriate working environment and establish the service-provision relationships necessary to meet the organisation's strategic needs in a cost-effective way (Alexander, 2003; Amaratunga and Baldry, 2002; Duffy, 2000).

Brown *et al*. (2001) observe that facilities managers must be capable of improving quality and ensuring optimal service delivery and performance during the project-management process. In their words, the core skills of the contemporary facilities manager are maintenance management, outsourcing and contract management, post-occupancy evaluation, space planning, life-cycle costing and process mapping.

Specialised facilities such as hospitals and factories may require specific skill-sets over and above these generic competencies (Barrett, 2000). It is crucial to deliver

positive outcomes and develop specific knowledge regarding the management of such technical areas as property and asset management and the promotion of health and safety in the workplace (Roberts, 2001). In addition, Brown *et al*. (2001) propose that the FM role be extended to include responsibility for project delivery. In other words, facilities managers with core skills in managing operational building assets are capable of combining project management and facilities management.

The most effective measure of the competence of FM service providers is their performance. Companies' trust in service providers is directly related to the latter's performance. For example, Alexander (2003) observes that the individuals most proficient in facilities management are empowered within organisations. Chotipanich (2004) finds that the conditions and capacity of the FM market, in terms of service availability, supplier capability and available technology, can affect decision making and the choice of service-delivery methods on a global scale.

iii) Coordination of facilities management resources

Chotipanich (2004) states that the key factors determining FM practice can be categorised into two groups: internal factors, which include organisational characteristics, the features of the relevant facilities and the business sector to which the organisation belongs; and external factors, which include economic, social and environmental conditions, legislations and regulations, the context of the FM market and the local culture and context. The co-ordination of resources is important to an organisation's FM practice. Proper coordination and integration between IT systems, people, processes and places greatly increase efficiency and maximise cost relief for various stakeholders. The challenge is to meet the needs of the business in a consistent fashion, and to achieve this goal through the optimal use of resources (Bodrozic, 2005; Green and Jack, 2004).

Co-ordination is necessary to both design and operation. At the operational level, Barrett (2000) proposes a generic model of interactions within the FM organisation between the facilities manager and various functional units. According to this

model, the role of the facilities manager is that of coordinator. Regarding the human resource trail, for example, Nutt (2000) states that FM responsibilities may include arranging transport, providing support for communication and managing information exchange; they may also accommodate wider arrangements such as providing support for communities and families and arranging social and leisure activities.

At the design level, the efficient coordination of physical resources can increase staff efficiency in facilities management. Regarding the design of the working environment, Duffy (2000) describes four practical conditions that affect the working relationship between designers and users/clients: (1) performance; (2) a willingness to demystify design by using data; (3) the use of a systemic design process that places equal weight on IT and resources belonging to the physical environment; (4) enthusiastic involvement in the design process as a whole. In addition, Allard and Barber (2003) observe that companies that excel in terms of teamwork are also those that promote efficient communication among executives through innovative workplace design.

Co-ordination is a significant driver of corporate success in facilities management. Corporations gain economies of scope when they align their resource usage and capabilities with the use and management of real-estate services. In other words, co-ordination enables them to gain a competitive advantage and to optimise their products and services (Green and Jack, 2004; Krumm, 1998).

iv) Quality of facilities management performance

It is important to investigate the ways in which FM professionals for whom resources are limited can manage a sophisticated and global real-estate portfolio in a highly decentralised corporation without sacrificing quality. This is understood to pose a significant challenge to FM practitioners. Osgood (2003) tries to solve the problem by introducing a strategy-alignment model based on the quality of space occupied by real estate. Chotipanich (2004) observes that the capacity of the FM market in terms of service availability, supplier capability and available technology can affect decision making and influence the choice of service-delivery

method. The quality of facilities management is affected by the performance of the various service providers involved in contract procurement. For example, the individuals most proficient in facilities management are empowered within organisations (Alexander, 2003).

Scholars continue to discuss the benefits of emphasising quality by engaging real-estate service providers at all levels of an organisation; to improve workplace design for the benefit of the company, for example, or to increase awareness of the need for social responsibility among the workforce by promoting ethical FM practice (Allard and Barber, 2003; Grimshaw, 2003). Zappile (2004) defines quality in terms of four absolutes: (a) conformance to requirements, (b) prevention, (c) zero defects and (d) price of non-conformance. Ultimately, he concludes that customer satisfaction plays a key role in the quality-based process, and that the efficiency with which limited in-house resources are utilised can be used to measure quality in the world of corporate real-estate management. Regularly reviewing quality is considered to be an effective means of ensuring ongoing improvement to an organisation's facilities management.

4.3 Critical success factors

Ikediashi *et al.* (2012) define outsourcing risk as the likelihood of the occurrence of uncertain, unpredictable and undesirable outcomes capable of jeopardising an outsourcing relationship between a principal (a client or its representatives) and agents (outsourcing vendors). The results of their (2012 [P. 301]) investigation indicate that 'poor quality of services' is the most critical risk factor associated with FM outsourcing, closely followed by lack of 'security' and 'inexperience', in that order. To achieve a holistic view of FM outsourcing, it is also imperative to understand the competitive advantages of outsourcing. To this end, a list of the critical success factors associated with FM outsourcing is used in this study to develop a measure of the quality of FM outsourcing strategies. The four outsourcing relationship types that comprise the FORT model are used to determine the proportion of service providers' responsibility and the strategic effect of a company's portfolio on clients. The relationships between critical

success factors and FM drivers can be derived as follows. Various weightings for the critical success factors can be connected to each of the possible FM drivers, from the client's perspective. Alternatively, other combinations of weightings can be connected to the same FM drivers from the service provider's perspective. Each of the four outsourcing relationship dimensions of the proposed CORE model (i.e. Substitution on ownership of FM assets, Substitution on control of FM assets, Outsourced FM portfolio on firm's competition position and its long term plan) are measured by evaluation on the four FM dimensions (i.e. four FM drivers) regarding the identified critical success factors by clients and service providers. The mechanism of this relationship is described in detail in Chapter 5 ('Research Methodology').

FM Drivers	No.	Critical success factors	Related literatures / Source
Adequacy dimension	1	Choice of mechanical and electrical plants	Acoba and Foster, 2003; Bon et al., 2002 Grimm, 1994; Grimshaw, 2003; Kessler-Park, and Butler, 2002; Leifer, 2003; Osgood, 2003; Pugsley and Haynes, 2002; Nutt, 2004 and Varcoe, 2000
	2	Choice of IT equipments	
	3	Choice of firm infrastructure systems	
	4	Flow of information	
	5	Design of organisation structure	
	6	Design of inventory list	
	7	Procurement strategies	
	8	Space measurement	
	9	Allocation of human resources	
	10	Allocation of capital resources	
Competence dimension	11	General FM competence	Alexander, 2003; Amaratunga, and Baldry, 2002; Barrett, 2000; Becker, 2000; BIFM, 1996; Bon *et al.*, 2002; Brown *et al.*, 2001; Chotipanich, 2004; Duffy, 2000; Krumm *et al.*, 1998; IFMA, 1992; Nutt, 2000; Osgood, 2003; Price,
	12	Specific FM competence required for specialist facilities	
	13	Core skills of facilities managers	
	14	IT enabling learning competence	
	15	Measurement on performance	

	16	Capability transfer on business knowledge and management processes	2004; Roberts, 2001; Robertson, 2000; Schaaf and Puy, 2001 and Smith and Jackson, 2000
Co-ordination dimension	17	Alignment of group/individual cultures within organisation	Allard and Barber, 2003; Barrett, 2000; Bodrozic, 2005; Chotipanich, 2004; Duffy, 2000; Green and Jack, 2004; Krumm, 1998 and Nutt, 2000
	18	Choice of on site communication method	
	19	Speed of off site electronic information infrastructural support	
	20	Co-ordination between the facilities manager and functional units on operational level	
	21	Collaboration of team-work among executives by innovative physical workplace design	
	22	FM practice and whole life cycle processes	
	23	Integration of work procedures with workplace design	
	24	Geographical spread of facilities (local, regional, international)	
	25	Resource sharing on people, budget, systems, information and organisation structure	
Quality dimension	26	Conformance to specification requirements of services	Alexander, 2003; Allard and Barber, 2003; Chotipanich, 2004; Grimshaw, 2003; Osgood, 2003; and Zappile, 2004
	27	Methods for defect rectification	
	28	Support on defect prevention	
	29	Cost of non-conformance work	
	30	Awareness of corporate social responsibility	
	31	Cost effectiveness	
	32	Value of customers satisfaction	
	33	Excellence of value-added	

		services	
	34	Design and availability of user oriented services	
	35	Measurement on quality of work	
Others	36	Client's objectives	Suggested by a FM service provider in Delphi study

Table 4.1 – A series of critical success factors for outsourcing strategies in local FM practice

4.4 Four dimensions of outsourcing relationships

Despite the growing importance of FM outsourcing, little systematic research has focused on this concept of outsourcing relationships. Kishore et al. (2003) suggested a framework delineating the dimensions of outsourcing relationships. Specifically, they highlighted four relationship dimensions in outsourcing: a) ownership, b) control, c) competitive position and d) long-term plan. In this research, the aforementioned dimensions are interpreted as follows. Ownership is the substitution of an outsourcing relationship to transfer the use of various FM assets wholly to service providers. Control is the substitution of an outsourcing relationship to transfer the management of various FM assets to service providers. Competitive position is the strategic effect of the outsourced FM portfolio's influence on the market. Long-term plan is the strategic effect of the outsourced FM portfolio's influence.

Understanding all four outsourcing relationship dimensions is important, as they differ in several ways. Ownership and control are about the extent of substitution by service providers, whereas competitive position and long-term plan are about the strategic effects of the outsourced FM portfolio. Observations also differ. Ownership and control are more obvious because they involve making changes related to existing services provided in the outsourcing contract. In contrast, competitive position and long-term plan require the acquisition of new skills and knowledge that differ substantially from the existing operating paradigm. Managing relationships in outsourcing thus requires conscious attention paid to all

four dimensions to achieve the highest possible degrees of ownership, control, achievement of competitive position and long-term plan.

Relationship Dimension	Meaning in Outsourcing	Description
Degree of ownership substitution that the service provider assimilates: Substitution of Ownership	Use of FM assets	The ability of outsourcing to substitute an outsourcing relationship to transfer the use of various FM assets wholly to service providers, e.g. routine day-to-day operations, hardware (Hard FM - The challenge of flexible facilities), software (Soft FM - The challenge of flexible relationships in service provision) and physical infrastructure.
Degree of ownership substitution that the service provider assimilates: Substitution of Control	Management of FM assets	The ability of outsourcing to substitute an outsourcing relationship to transfer the management of various FM assets to service providers, e.g. managerial control and decision making over operations, planning, development and implementation of facilities and personnel replacement in-house FM personnel
Strategic impact of the outsourced services: Competitive position	Business process improvement	The ability of outsourcing to strategically influence the outsourced FM portfolio (Managing multiple sites in various regions) on the market, e.g. competitive advantage, value points for leveraging FM portfolio and business process improvement.
Strategic impact of the outsourced	Long term strategic importance	The ability of outsourcing to strategically influence the outsourced

services: Long term plan		FM portfolio of the firm, e.g. long term competitiveness, a close partnership, strategic interorganisational relationship and new revenue.

Table 4.2 - Dimensions of relationship in FM outsourcing

Specifically, this study incorporates the perspectives of several theories including transaction cost theory, agency cost theory, resource dependency theory, entrepreneurial actions' theory, and social exchange theory to strongly anchor the relationship manoeuvres in a theoretical framework for this research. Not only do the various theoretical perspectives suggest the importance of different manoeuvres, but interestingly, they also focus on the distinctive relationship dimensions. For example, both transaction and agency cost theories advocate the careful advance structuring of FM outsourcing contracts. However, social exchange theory and entrepreneurial actions theory emphasise continuous relationship management and informational feedback; hence, they are more dynamic in adapting to change. The manoeuvres of higher dynamism can more effectively address radical shifts in external conditions (e.g. long-term plan). Similarly, resource dependency theory emphasises relationship issues outside the existing outsourcing relationship, which may make it more effective in addressing competitive positioning. Thus, this research leverages the richness provided by a multi-theoretic lens to develop an integrated framework for outsourcing relationships.

4.5 Strategic manoeuvres for outsourcing relationship: a conceptual framework

In the following sections, there is an analysis of outsourcing relationship from these theoretical perspectives to develop corollaries about the relationships between the strategic manoeuvres identified and the different dimensions of outsourcing relationship. There are nine corollaries in this research. Table 4.3 summarizes the theories discussed, the key concepts used, and the resulting corollaries developed.

Table 4.3 - Summary of corollaries on outsourcing relationship

Theory / Concept	Key concepts / Strategic Manoeuvres	Corollaries
Four FM outsourcing dimensions	FM strategists and types of FM outsourcing contract → FM outsourcing dimensions	(Clients and Service providers) C1a, C1b: Clients' and Service providers' evaluations regarding four outsourcing relationship dimensions rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.
Transaction Cost Economics	Reduced asset specificity by minimizing customization → outsourcing relationship	(Clients and Service providers) C2a, C2b: Clients' and Service providers' evaluations regarding minimizing customization rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.
Agency Cost Theory	Reduced monitoring cost by enhancing process maturity → outsourcing relationship Mitigation of residual loss by retaining in-house competence → outsourcing relationship	(Clients & Service providers) C3a, C3b: Clients' and Service providers' evaluations regarding enhancing process maturity rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts. (Clients and Service providers) C4a, C4b: Clients' and Service providers' evaluations regarding retaining in-house competence rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.
Resource Dependency Theory	Diluting supplier concentration through multiple sourcing → outsourcing relationship	(Clients and Service providers) C5a, C5b: Clients' and Service providers' evaluations regarding multiple sourcing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

	Reduced switching costs through vendor interoperability → outsourcing relationship	(Clients and Service providers) C6a, C6b: Clients' and Service providers' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.
Entrepreneurial Actions	Enhanced entrepreneurial capability through proactive sensing → outsourcing relationship	(Clients and Service providers) C7a, C7b: Clients' and Service providers' evaluations regarding proactive sensing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.
Social Exchange Theory	Building relational reciprocity through enhanced partnership quality → outsourcing relationship	(Clients and Service providers) C8a, C8b: Clients' and Service providers' evaluations regarding enhancing partnership quality rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.
The FORT model	Outsourcing relationship dimensions → outsourcing relationship types	(Clients and Service providers) C9: Outsourcing relationship dimensions (Ownership, Control, Competitive Position and Long Term Plan) is related to outsourcing relationship types and the strength of the relationships is moderated by those outsourcing types.

The characteristics of FM strategists (The first corollary**)**

(Client) C1a, C1b: Clients' evaluations regarding four outsourcing relationship dimensions rendered to them do not differ according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C1a, C1b: Service providers' evaluations regarding four outsourcing relationship dimensions rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Transaction Cost Economics and Outsourcing Relationships (The second corollary**)**

(Client) C2a, C2b: Clients' evaluations regarding minimizing customization rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C2a, C2b: Service provider s' evaluations regarding minimizing customization rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Agency Cost Theory and Outsourcing Relationships (The third and fourth corollaries**)**

(Client) C3a, C3b: Clients' evaluations regarding enhancing process maturity rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C3a, C3b: Service provider s' evaluations regarding enhancing process maturity rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Client) C4a, C4b: Clients' evaluations regarding retaining in-house competence rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C4a, C4b: Service providers' evaluations regarding retaining in-house competence rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Resource Dependency Theory and Outsourcing Relationships (The fifth and sixth corollaries**)**

(Client) C5a, C5b: Clients' evaluations regarding multiple sourcing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C5a, C5b: Service providers' evaluations regarding multiple sourcing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Client) C6a, C6b: Clients' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C6a, C6b: Service providers' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Entrepreneurial Actions and Outsourcing Relationships (The seventh corollary**)**

(Client) C7a, C7b: Clients' evaluations regarding proactive sensing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C7a, C7b: Service providers' evaluations regarding proactive sensing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Social Exchange Theory and Outsourcing Relationships (The **eighth** corollary**)**

(Client) C8a, C8b: Clients' evaluations regarding enhancing partnership quality rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

(Service provider) C8a, C8b: Service providers' evaluations regarding enhancing partnership quality rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Outsourcing Categories of the Outsourcing Relationship Types (The ninth corollary)

(Client and service provider) C9: The outsourcing relationship dimensions (ownership, control, competitive position and long-term plan) are related to the outsourcing relationship types, and the strength of the relationships is moderated by those outsourcing types.

4.6 Development of a conceptual model

With the aid of previous study, a research model was developed for this study. Sidwell (1982) noted that the technique of using models to represent or explain phenomena and relationships in the real world developed from their use in the formal sciences and is now being adopted more and more in the social sciences.

There are two parts composing the research model in this study. This first part is about outsourcing relationships and the second part is about outsourcing category. With the combination of two parts, a research model was developed for this study. It firstly sets out the relationships between the independent variable (outsourcing relationship manoeuvres) and dependent variable (four outsourcing relationship dimensions). It secondly sets out the relationships between the independent variable (four outsourcing relationship dimensions) and dependent variable

(outsourcing category). The interaction and combined effect of these independent variables will determine the value of the dependent variables for the two parts.

In the first part of the model, the factors perceived to be of principal relevance were discussed. Outsourcing relationships include two parts: extent of substitution and strategic importance or impact. The four relationship dimensions can be measured objectively and subjectively and they are inter-related and intra-related. These factors can form the dependent variables of this part. Outsourcing relationship manoeuvres are supported by five identified theories. These factors form the independent variables of this part. In the second part of the model, the factors perceived to be of principal relevance were discussed. Outsourcing category of a project includes in-house, service provider with commitment, service provider with technical expertise and partner. The factors can be measured objectively and subjectively and they are inter-related and intra-related. These factors can form the dependent variables of this part. Again, outsourcing relationships include two parts: extent of substitution and strategic importance or impact. The four relationship dimensions can be measured objectively and subjectively and they are inter-related and intra-related. These factors form the independent variables of this part. Figure 4.1 provides a graphic representation of the strategic manoeuvres and the theoretical perspectives from which they are derived.

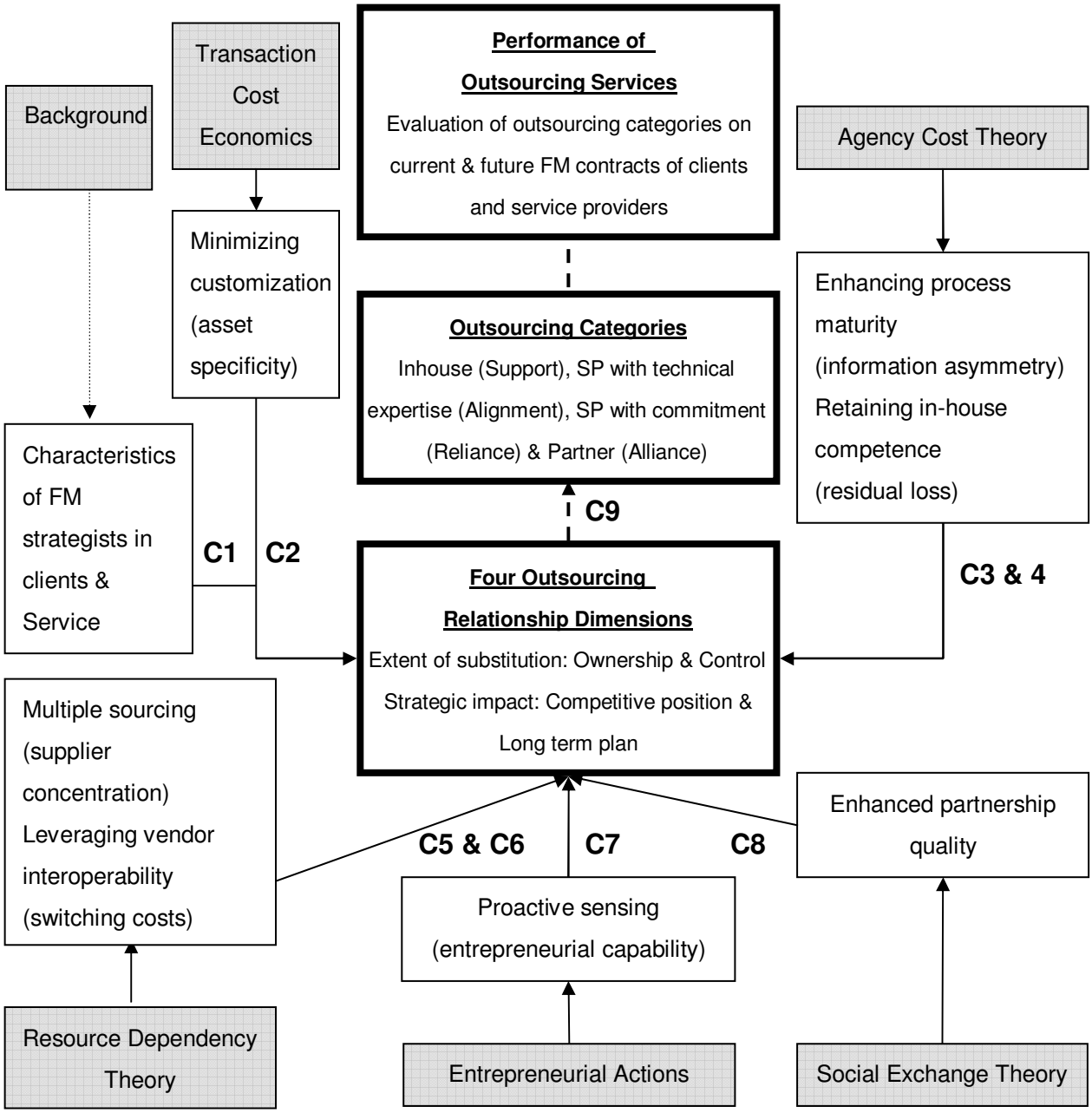


Figure 4.1: Research model on contingency model for outsourcing relationships in FM sector

4.7 Chapter summary

This chapter discusses the importance of outsourcing success. It first describes the drivers of facilities management, then discusses the adequate provision of FM resources, the necessary competencies of FM service providers, the coordination of FM resources and the quality of FM performance. The chapter also describes the critical success factors examined in this study. In general, the research focuses on thirty-six factors determining four main drivers of local FM practice. The chapter outlines by grouping these critical success factors with their corresponding FM drivers. It introduces the four dimensions of outsourcing relationships in terms of substitution of ownership, substitution of control, competitive position and long term plan. The chapter also addresses five strategic manoeuvres for outsourcing relationships. The chapter ends by development of a conceptual model. The following chapter introduces the research methodology of the study.

CHAPTER 5 RESEARCH METHODOLOGY

5.1 Introduction

Solving a problem or answer a question is through the procedures of collecting, organising and integrating data: research methodology. It is sometimes depicted as "a voyage of discovery during which the researcher learns much about research methodologies as well as about the subject being researched, and may even learn something of him or herself" (Remenyi *et al.*, 1998 [P. 27]). Although research methodology design is considered a very difficult task, it gives the researcher the ability to understand his or her research area, communication skills, and the ability to apply knowledge and experience to a new situation presented in a novel manner (Collis and Hussey, 2003). When a researcher is undertaking a detailed study, there are many approaches which need to be considered. Saunders et al. (2003) describe the research process as layers of an onion that need to be peeled away in order to reach a decision regarding the research philosophy, approach, strategy, time restrictions and the data collection methods.

The following section 5.6 provides an overall structure of this research. Section 5.7 deals with the research instruments and data collection methods. Section 5.8 provides a detailed description of the techniques of statistical analyses, hypotheses testing, issues of validity and reliability of the research. Section 5.9 discusses overall strengths and limitations of the specific research methods. Finally, the summary and conclusions are contained in section 5.10.

From chapter one of this thesis it can be seen that through its objectives and research question, this study tries to explain the substandard performance of FM outsourcing service providers, which means it seeks to explain and predict by searching for laws and regularities the causal relationships between the independent variables (i. e. four FM outsourcing relationship dimensions) and dependent variables (FM outsourcing categories). This study also tries to test nine corollaries by appropriate analytical tools. Subsequently, it emphasises the need to formulate the corollaries for verification. The Statistical Package for the Social Sciences (SPSS) acted as a major tool in analyzing data.

5.2 Research philosophy

Philosophy of research is very useful and imperative for researchers in threefold (Easterby-Smith *et al*, 2002). Firstly, it can help to clarify research designs to the research question or problem. Secondly, it helps the researcher to understand which designs will or will not work, so aiding in an appropriate selection of methodology. Thirdly, it may also help the researcher to discover and even generate designs, which could be outside his or her past experience. Thus, there is a need to thoroughly discuss the research philosophy of this study.

5.2.1 Positivism

There are generally two main traditional research paradigms or philosophies, positivism and phenomenology (Collis and Hussey, 2003; Easterby-Smith et al., 2002; Remenyi et al., 1998). The following is to discuss the two research paradigms in this study. Traditionally, the Positivist philosophy assumes that the researcher undertakes the role as an objective analyst, making detached interpretations about the data that has been collected (Al Khattab, 2005). This research is partially leaning towards the positivist philosophy because of the following reasons:

- In order to satisfy the research topic and objectives, the positivist approach is deductive; it seeks to explain causal relationships among the variables being studied, and links them to a certain theory (Gill and Johnson, 2002). It employs controls to allow the determination of relations between variables. This study seeks to explain the causal relationship between service providers' outsourcing relationship types and the standard and quality of the services provided to clients by third parties or outsourcers;

- Choice of methodology and methods of data collection. In this research, there are two questionnaire surveys for the service providers and FM staffs in the client organisations in order to collect the data on the relationships between FM outsourcing categories, FM outsourcing relationship dimensions, five outsourcing manoeuvres and performance of FM outsourcing services. Justifications on selection of the survey are summarised in Table 5.1;

Quantitative
- Concerned with hypothesis testing - Uses large sample - Data is highly specific - Reliability is high - Validity is low - Generalise from sample to population

Source: Collis and Hussey (2003: 55)

Table 5.1 - The main features of the quantitative approach

- Hypotheses testing. Positivist approach employs controls to allow the testing of hypotheses. There is a proposed hypothesis and nine corollaries which need to be tested, thus statistical tests have been used that utilise quantitative data such as Kruskal-Wallis test, Mann-whitney U test, Analytical Hierarchy Process and multi-nominal logistic regression;

- Generalisation. Positivist approach frequently utilizes quantitative data by large samples. The sample size of this study is quite large (See Section 5.7.5). In this context, Saunders et al. (2003 [P. 87]) have stated that "in order to be able to generalise about regularities in human social behaviour it is necessary to select samples of sufficient numerical size". In the same vein, Malhotra and Birks (2003) mention that the fundamental element of positivist research is the desire to generalise findings to a target population. Most targeted populations are so large that measurements of them can only be managed through representative sample surveys. This study can be established the reliability and generalisability of data by this approach;

- Resource limitation. The advantages of positivistic approach has been described as cost effective (questionnaire surveys), acceptable speed in data collection (questionnaire surveys) and ease of analysis (appropriate statistical analysis); and

- Some previous business studies in customer satisfaction have utilised the same quantitative methods as an appropriate way to achieve the required objectives (e. g. Abdelaziz, 2001; Al Khatib and Gharaibeh, 1998; Jabnoun and Al-Tamimi, 2003; Jamal and Naser, 2002; Joseph et al., 1999; McDougall and Levesque, 2000; Sathye, 1999; Yavas et al., 2004).

5.2.2 Phenomenology

The phenomenological paradigm has emerged as a result of dissatisfaction with the application of a positivistic approach in social science (Al Khattab, 2005). This approach is also partially appropriate in this study because of the following reasons:

- Method of Measurement. A phenomenological approach focuses on the subjective state of individuals by embracing the meaning rather than the measurement of social phenomena (Easterby-Smith *et al*., 2002). This subjective research approach is suitable to understand people's meaning. There are two rounds of Delphi survey for the local FM professionals in order to collect the critical success factors for outsourcing strategies of the four FM drivers. This subjective research method is suitable to collect those.

- Hypotheses testing. Phenomenological advocates the use of qualitative methods that focus on generating hypotheses in order to illustrate and explain the phenomenon in its context Easterby-Smith *et al*. (2002). This means that it focuses on the meaning which is about what people are thinking and feeling and it utilises qualitative data by small samples. The analysis on critical success factors for outsourcing strategies of the four FM drivers is suitable to use this qualitative approach with systematic structure to identify.

- Investigation in external causes and fundamental laws. The characteristic of this phenomenology is to understand and explain why people have different experiences, rather than searching for external causes and fundamental laws to explain their behaviour (Easterby-Smith *et al*., 2002). The critical success factors for outsourcing strategies can be measured by evaluation of the

relevant respondents in the Delphi study. Furthermore, the researcher is independent of what is being researched.

- Constraints. The weaknesses of phenomenology is that large samples are required if results are to have credibility, and this may be costly and time consuming (Remenyi *et al*., 1998; Easterby-Smith *et al*., 2002; Collis and Hussey, 2003; Saunders et al. 2003; Hair *et al*., 2003). However for the Delphi study, the capital cost can keep as low as possible through virtual meetings and the working period can keep as short as possible with two rounds surveys.

5.3 Research strategy

In researching the field of management, a researcher needs to adopt many strategies. Yin (2003) claims that a research strategy should be chosen as a function of the research situation. This section is to discuss the justification of selection on appropriate strategies in this study. The relevant key points are listed as the followings.

- **Importance on selection of suitable research strategy**

  There are different ways of collecting and analyzing empirical evidence of the research interest. Research strategy is a way of going about one's research, embodying a particular style and employing different research methods (Remenyi *et al*., 1998). In order to achieve the study aim and objectives, it is imperative to set optimum research strategy. However, there are a number of criteria needed in consideration such as scope and nature of data required for a particular methodology, resource constraints in terms of time and finance and researcher's personal experience, knowledge and skills (Remenyi *et al*., 1998; Saunders *et al*., 2003; Yin, 2003). In summary, the scope and nature of data of this study are based at the opinions from the general building users and clients. The research study period is are very tight and research budget is very limited. Researching experience of the researcher of this study is fresh.

- **Various types of research strategy**

There are many strategies including experiment, case study, survey, and ethnography (Remenyi *et al*., 1998; Leedy and Ormrod, 2001; Saunders *et al*., 2003; Sekaran, 2003; Yin, 2003; Hair *et al*., 2003). Each strategy has its own specific approach to collect and to analyse empirical data, and each one has its own specific advantages and disadvantages. However, most of these strategies are not suitably applied for the aim and objectives of this research.

i) As for experiments, two main features are manipulation and control but it is inappropriate to set up a laboratory to collect the data in this study. The reason is that experiments fall under the positivist research approach normally used in natural science studies and typically involve two or more experimental groups and a control group. One drawback of experiments is that a laboratory setting is often different from the real world (Collis and Hussey, 2003). The nature of this study is about business management but not natural science.

ii) As for case study, the researcher has `no control over events' and the questions relating to ‘why’, ‘what’, or ‘how’ deal with operational links needing to be traced over time (Yin, 2003). Again, this approach is inappropriate to conduct data collection in this study because the researcher can only focus on a contemporary phenomenon within a real-life context in frequency. In business studies, a common case is a company or parts of a company, but it can also be other things, such as a group of people or event. Some drawbacks of using this strategy include difficulties in finding organisations that are willing to participate in the study; it is difficult to understand the events in a particular period of time. The fact is that it is difficult to identify the suitable local organizations participating in the research as a case study. Moreover, the shortcoming of case studies is described as very time consuming and costly (Collis and Hussey, 2003; Saunders *et al*., 2003).

iii) Generally speaking, survey is one of the positivist approaches to research. Although this approach has some weaknesses such as low response rate and possible ambiguities in the questions, the benefits such as low cost, convenient access to respondents, mass production, high consistency of

research questions, no limitation on time of delivery of questionnaires and completion of questionnaires and fast dispatching of a survey strategy suggested that it was the appropriate methodology in this case. Indeed, surveys are the most popular and commonly used method in business and management research (Remenyi *et al*., 1998; Saunders *et al*., 2003). In survey, the researcher is presenting and sampling a population of potential respondents in order to generalize conclusions more widely (Jankowicz, 2000).

The advantages of a questionnaire survey strategy are considerable and are given in brief (Jankowicz, 2000; Collis and Hussey, 2003; Easterby-Smith *et al*., 2002; Leedy and Ormrod, 2001; Oppenheim, 1992; Saunders *et al*., 2003). The justifications for the research strategy chosen (i.e. questionnaire survey) are summarised as below.

- It is a highly economical way as a large amount of data can be collected from a large number of people (big population). It enables the researcher to collect a significant amount of data in an efficient manner;

- The survey method is a popular and common strategy in business research, as it allows for the collection of a certain amount of data from a sizable population;

- A standardised questionnaire is used to collect the data in the survey which is easy to make comparisons and statistical analysis; and

- It is easy for most people to understand.

In this study, the selected number of service providers and staffs in FM department of clients from the local tertiary institutes and universities in the questionnaire surveys are the sample to be taken as a representative of the whole population.

5.3.1 Research approaches

Generally, there are two types of logic of research approaches, inductive and deductive respectively. As for inductive research, one observes certain phenomena and on the basis of the observations one reaches certain conclusions involving moving from individual observation to statements of general patterns or laws (Collis and Hussey, 2003; Sekaran, 2003). The FM professionals were asked to find out the critical success factors for outsourcing strategies from own experiences through Delphi study. A deductive approach involves developing a theory and hypothesis (or hypotheses) and designing a research strategy to test the hypothesis on arriving at a reasonable conclusion (Saunders et al., 2003; Sekaran, 2003). It is also suggested to follow the deductive approach by developing the relevant hypothesis and nine corollaries to draw the conclusion moving from general to particular through questionnaire survey. Hence, this study is implemented a mixed method including qualitative and quantitative approaches.

The classification of the process of research is in quantitative or qualitative approach (Collis and Hussey, 2003). On one hand, this study involves a quantitative research method to collect the numerical data, which can be quantified to help answer research questions in the form of questionnaire surveys for service providers and clients. The surveys will be based on substantial samples from the local higher education sector. Moreover, a qualitative research method is based on methods of data generation, which are flexible and sensitive to the social context in which data are produced. The nature of reality is defined by the interaction of the researcher with the phenomenon under study and usually emphasises words. Thus, this method is suitable to identify the critical success factors for outsourcing strategies.

In summary, there are pros and cons for each of these research approaches. Table 5.2 shows the strengths and weaknesses of the positivist and phenomological philosophies.

Theme	Strengths	Weaknesses
Positivist (Quantitative paradigm)	- Can provide wide coverage of the range of situations. - Can be fast and economical. - Where statistics are aggregated from large samples, they may be of considerable relevance to policy decisions	- Methods used tend to be rather inflexible and artificial. - Not very effective in understanding processes or the significance that people attach to action. - Not very helpful in generating theories. - Because of a focus on what is, or what has been recently, it may be hard for policy makers to infer what changes and actions should take place in the future.
Phenomenological (Qualitative paradigm)	- Data-gathering methods seen as more natural than artificial. - Ability to look at change processes over time. - Ability to understand people's meaning. - Ability to adjust to new issues and ideas as they emerge. - Contribute to theory generation.	- Data collection can be tedious and require more resources. - Analysis and interpretation of data may be more difficult. - Harder to control the pace, progress and end-points of research process. - Policy-makers may give low credibility to results from the qualitative approach

Source: Amaratunga *et al*. (2002: 20)

Table 5.2 - The strengths and weaknesses of positivist and phenomenological philosophies

5.3.2 Research framework

This section is to discuss the overall framework of this FM outsourcing study. A comprehensive review of the literature was conducted, followed by document analysis, research model and two rounds of Delphi surveys for identification of the critical success factors for outsourcing strategies. The preliminary Delphi questionnaire was developed after reviewing the relevant literature and was distributed among the FM professionals for comment. Therefore, the Delphi survey not only provided in-depth, professional opinions regarding critical factors leading to the success of FM outsourcing, but also valuable input about drafting an empirical questionnaire based on the preliminary questionnaires for a second-stage study. Subsequent to the Delphi survey, the empirical questionnaires were finalised and sent out. Two focus groups were also organised at the same time. An analysis of the data in the completed questionnaires and focus groups were conducted and research findings were drawn. To ensure the accuracy of the findings, they were validated by a small-scale questionnaire survey and a statistical analysis. Following confirmation of the validity of the findings, the preliminary conclusions could finally be reported.

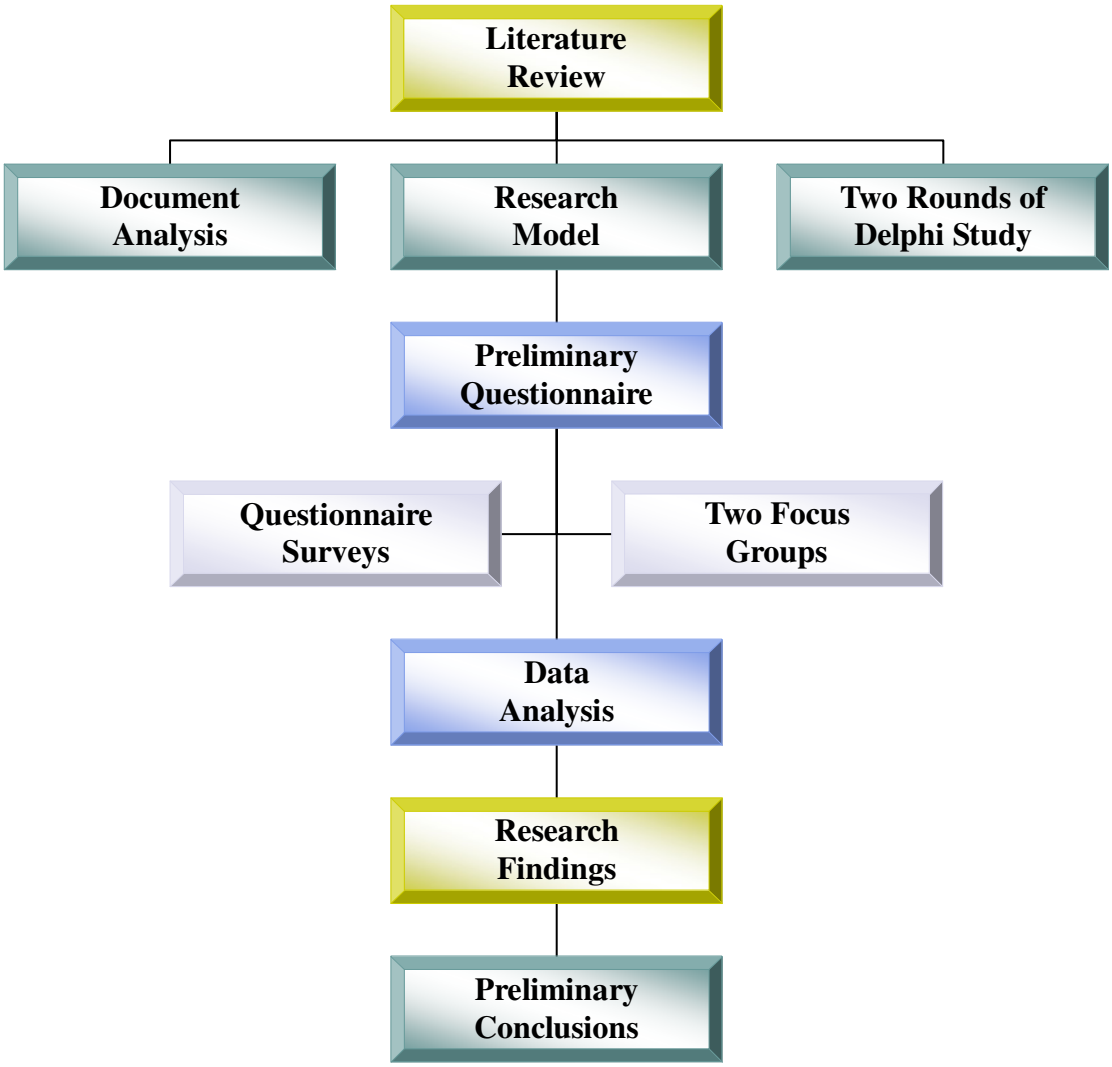


Figure 5.1 - Research framework

This research is to conceptualize outsourcing relationships within a set of four dimensions: ownership, control, competitive position and long term plan and propose a portfolio to manage relationships in FM outsourcing. The proposed framework is anchored by the strategic manoeuvres through a multitheoretic lens. It empirically validates the research propositions. This study examines the nature of outsourcing relationship types and how these align with outsourcing strategies. Such a relationship between the FM client or occupier and service providers is examined in the context of the higher education sector using a contingency approach. It is proposed that FM outsourcing relationship types are critically

related to the outsourcing manoeuvres that are embedded in various contracts. Finally, this study is to propose a more holistic approach for effective relationship management of FM outsourcing in the higher education industry.

5.4 Research design

This section outlines the research design, describing the methods of data collection and data sources, used to compile this thesis. The following sub-sections illustrate suitable research methods undertaking in the research. The methodology on first and second objective of this academic research study is to undertake a comprehensive literature review, document analysis, Delphi survey and pilot study.

5.4.1 Literature review

This study is to investigate into a wide literature survey and a comprehensive review of the published and unpublished work from secondary sources to date (e. g. books, journals, doctoral dissertations, magazines, government publications, FM reports, etc.) in the field of FM in general, outsourcing effectiveness and contingency models in particular. This work has been completed due to the following reasons: traditional research experience, foundation for theoretical framework, thorough understanding of the area and discovery of gaps in knowledge (Remenyi *et al*., 1998; Sekaran, 2003).

In the first step, the content includes the available background knowledge, theories and publications on outsourcing of FM from a range of published literatures. There is a discussion on five identified outsourcing models by previous literature. Then, it is explained that a review of performance of FM outsourcing particularly concerns the Four Outsourcing Relationship Types (FORT) model (Inshore, R. et al., 2003). Finally, Business performance on outsourcing success will also be discussed.

Originality of the research will be identified. This study bridges the gaps of outsourcing relationships among clients; FM services providers and users from the existing knowledge pool, and creates a possible route for systematic

development of knowledge. Furthermore, in order to have a holistic picture on the FM supply chain, it is crucial that FM resources and FM practice and processes will be explored in details in the following aspects such as organizational issue, strategical and operational issues, cultural issue and research & development.

5.4.2 Document analysis

Miles and Huberman (1984) stated that document analysis is an important technique for data collection. This technique could be applied to written documents (Annual reports from FM service providers running business in Hong Kong) and also non-written documents (pictures, figures, charts, etc.).

5.4.3 Pilot study

A pilot study was conducted to gain an understanding of the current FM outsourcing practice in Hong Kong. Walker (1997) concluded that 'a pilot study has proved to be a useful tool in providing a focus mechanism to establish the research direction more clearly'. It also provides relevant information for the development of the future questionnaire. Interviewing only one member of the project team could introduce an element of bias, self-justification, or post-rationalization that would bring the data gathered in the survey into question. Doing so could introduce problems with the validity of the data, which can be avoided by triangulation: collecting information about a single phenomenon from at least three different sources (Walker, 1997). Oppenheim (1992) argues that every aspect of the research survey should be piloted in order to make sure that it works as intended. A pilot study was conducted from March to April 2011 by the Delphi survey, by inviting 136 experts from clients, service providers and independent consultants or researchers and at last questioning 22 experts from clients and service providers in the local FM industry that are the subject of this research. The involvement of independent consultants or researchers is necessary because of their independent objective judgment and independent critical analysis without bias acting as a reference. Their opinions cannot only achieve a holistic picture for the current development of FM outsourcing relationships. As a new and young profession but also, the invitation and response of this category can have an understanding about their knowledge on the

mechanism of outsourcing relationships between clients and service providers. This number was chosen in order to cover the representative sample of the population. The aims of the two rounds of Delphi survey were to ensure what was important, relevant and appropriate regarding the topic of critical success factors for outsourcing manoeuvres or strategies; and to investigate which local high tertiary institutes would co-operate in helping the researcher to hold the main questionnaire survey, and also to identify key respondents and distribute the questionnaires.

The purpose of Delphi study was to ensure that the information sought in the questionnaire is relevant to the current FM practice about critical success factors for outsourcing strategies and that the respondents find the questions conveniently to answer. Therefore, apart from the industry participants, the preliminary questionnaire was also sent to some academics to ensure the quality of questionnaire. The questionnaire was refined a number of times based on feedback before it was 'finalized into an empirical questionnaire'.

5.4.4 Delphi survey

In order to identify the critical success factors for outsourcing strategies, the research technique called Delphi had been conducted to examine the Four Outsourcing Relationship Types (FORT) model in the FM industry. The FORT framework comprises four outsourcing relationship types namely support, alignment, reliance and alliance. The relationships types of the clients are determined by assessing the extent of substitution of FM services providers and strategic impacts of FM outsourced portfolio.

The Delphi study can be administered and focused to the FM professionals from service providers and local clients such as Hong Kong Special Administrative Region's Government, semi-public organization, i.e. universities, Vocational Training Council of Hong Kong, Hong Kong Cyber Port, Hong Kong Science and Technology Park and Hong Kong International Airport, and private sector respectively. Different kinds of clients from the local stock market can be selected from IT, banking, health care, engineering, property development, retail services

and so on. The data collection method is mainly based on the respondents' individual objective assessments while the design of pilot study will be formatted in a qualitative manner to the outsourcing strategies of the FORT framework. Interviews and site visits had been carried out to achieve more detailed and specific ideas from some respondents whenever is available.

5.4.4.1 Reasons for using Delphi technique

i. The reason for selecting the Delphi technique is that there was confirmation on quantities of experts to contribute and to comment the critical success factors in FM outsourcing. There is no need to prepare quantities of questionnaires on collection of information. Other selecting technique for example factor analysis is not necessary to be considered in the research. After consolidation of the invaluable opinions by Delphi, a questionnaire for users and other for clients can be prepared accordingly.

ii. Delphi technique was used to acquire corporate FM outsourcing strategies. It is necessary to identify the critical success factors for outsourcing strategies of The FORT model which are used to measure the four outsourcing relationships. Theoretical framework bases from The FORT model applicable in IT Industry. Evaluation on the outsourcing strategies can be conveniently reached from the FM professionals in clients and FM services providers through two rounds of Delphi survey.

iii. The Delphi method originated in a series of studies that the RAND Corporation conducted in the 1950s. Delphi is a method of providing members of a group with the ideas of others without a face-to-face meeting and an individual member writes down his thoughts on a problem and submits them to a coordinator (Delphi technique, 2010). The objective was to develop a technique to obtain the most reliable consensus of a group of experts through a series of questionnaires interspersed with controlled opinion feedback (Dalkey and Helmer, 1963; Rowe and Wright, 1991).

iv. In stage I of this study, Delphi technique as a systematic research tool will be

incorporated into this study acquiring the local FM professionals' ideas on outsourcing strategies but not focus group. There will be several major problems in the process if focus group is selected. They are listed as the following 1) unsuitable venue for holding the focus groups; 2) insufficient number of professional participants and 3) absence of experienced focus group trainer.

v. Okoli and Pawlowski (2004) explain that Delphi method is directly related to theory building in research process. This method can be used to rank the initial stages of theory development. Furthermore, it can also be applicable to identify the variables of interest and generation propositions. In this pilot study, FM strategists or decision makers are the respondents who are required to determine and formulate the outsourcing strategies of The FORT Model in FM industry. In test of the sub-sub-hypotheses, the two types of generation propositions are extent of ownership substitution by FM outsourcing service providers and strategic impacts of outsourced FM portfolio. Thus, Delphi is appropriate to build up the theory of tailor-made FM outsourcing strategies.

vi. Delphi technique as a challenging method is used to collect the ideas from FM experts. This method can provide rigorous guidelines on selection of proper experts participating into the study. Rowe and Wright (1999) indicate that the Delphi method is a systematic, interactive forecasting method which relies on a panel of experts converging towards the "correct" answer. Validity of the final outcome can be enhanced through the stratified and strategic steps in the whole process.

vii. As a method with group of experts, Delphi study most appropriately analyses the research hypothesis, rather than any individual expert’s responses. Delphi is desirable in that it does not require the experts to meet physically, which could be impractical for international experts (Okoli and Pawlowski, 2004). Moreover, a key advantage of the approach is that it avoids direct confrontation of the experts during the Delphi process (Dalkey and Helmer, 1963; Delphi technique, 2010). This method is most suitable to the busy FM

professionals working in long office hours places such as Hong Kong.

viii. Nowadays, the Delphi method which is a group decision mechanism requiring qualified experts who have deep understanding of the issues is a widely accepted forecasting tool in areas varying from technology forecasting to drug abuse (Delphi technique, 2010). Although the number of local experts is limited, the Delphi panel size requirements are modest and it would be practical to solicit up to four panels from 10 to 18 members in size (Paliwoda, 1983). In the Delphi survey of this study, there are two panels. Fourteen members formed the panel of client while eight members formed the panel of service provider. The details of selection of panel member are recorded at the part of procedures of Delphi technique. Studies have consistently shown that for questions requiring expert judgment, the average of individual responses is inferior to the averages produced by group decision processes; research has explicitly shown that the Delphi method bears this out (Okoli and Pawlowski, 2004). It is feasible to find out a quantity of groups of FM professionals regionally.

ix. A general population might not be sufficiently knowledgeable to answer the questions with high uncertainty and speculation accurately. However, a structured group of experts in Delphi study is capable to investigate those problems and to forecast accurately (Okoli and Pawlowski, 2004; Rowe and Wright, 2001). In use of forecasting, first applications of the Delphi method were in the field of science and technology and other forecast was also dealing with technology in education. Delphi has been successfully widely used for business forecasting with high accuracy and has certain advantages over another structured forecasting approach (Delphi technique, 2010; Green, Armstrong, and Graefe, 2007). For example, Basu and Schroeder (1977) reported that the Delphi method predicted the sales of a new product during the first two years with inaccuracy of 3–4% compared with actual sales. Quantitative methods produced errors of 10–15%, and traditional unstructured forecast methods had errors of about 20%. Thus, the reliability of this academic study can also be enhanced by Delphi accordingly.

x. Non-response is typically very low in Delphi surveys because researchers can personally obtain confirmation of responses from the experts. (Okoli and Pawlowski, 2004) Thus, Delphi technique can be considered as an efficient and effective research method for this study.

xi. The Delphi method is effective and efficient to find out the critical success factors for outsourcing. The respondents can just spend maximum 5 minutes to complete each questionnaire in the whole Delphi survey. This means that they do not need to put too much time in completing four questionnaires. After completion of the whole Delphi process, top-7 critical success factors can be identified to design a two-page precise and concise questionnaire. Causal relationship between the standard and quality of the service providers by third party or outsourcers and outsourcing relationships between service providers and clients can be tested. Thus, Delphi method is less time consuming because it is not necessary to prepare a lengthy and complicated questionnaire to test the hypothesis if factor analysis is selected.

xii. Delphi can finally draw the sound results after a pre-defined stop criterion (e.g. number of rounds, achievement of consensus, stability of results) by the mean or median scores of the final rounds (Rowe and Wright, 1999). Delphi can also collect opinions from the professionals and finally narrow down into some consensus.

xiii. The Delphi study is flexible in its design, and amenable to follow-up interviews. Richer data collected from Delphi can lead to a deeper understanding of the fundamental research sub-hypothesis (Delphi technique, 2010; Okoli and Pawlowski, 2004). This is because the professional opinions from the experts are updated and comprehensive.

xiv. There is paucity of secondary data. Delphi technique (2010) notes that usually all participants maintain anonymity and their identity is not revealed even after the completion of the final report. Respondents are always

anonymous to each other, but never anonymous to the researcher. This gives the researchers more opportunity to follow up for clarifications and further qualitative data (Okoli and Pawlowski, 2004). Thus, the data collected can be further investigated.

5.4.4.2 Procedures of the Delphi technique

There are total seven procedures for the design of Delphi survey.

The first procedure) Delphi method is applied in this research.

The second procedure) The purpose of this step is to determine the critical success factors for outsourcing strategies of The FORT Model operated in FM industry.

The third procedure) In design of this experiment, an appropriate quantity of FM experts was selected and was qualified to contribute invaluable comments and ideas in the study. This procedure includes two parts as follows: design on panel structure (two Delphi panels i.e. client and service provider) and identification of FM experts (multiple-step iterative approach).

Design on panel structure

Initially, experts were divided into panels. Their size and constitution depends on the nature of the research question and the dimensions along which the experts will probably vary. Two categories of experts have trustworthy and valuable knowledge about outsourcing of FM. They are respectively such as clients and services providers. The two groups probably would have somewhat different perspectives. Since it is a goal to obtain a reasonable degree of consensus, it would be best to have panels that separate these groups. This design also permits comparison of the perspectives of the two stakeholder groups. Following recommendations from Delphi literature, there are 10 to 18 people in each panel. (Okoli and Pawlowski, 2004) Thus, there will be 10 to 18 FM experts in each Delphi panel i.e. client and service provider in this study. Within each panel, the goal is that all members actually work in the field of FM. This structure will obtain a sufficient number of perspectives. The perspectives

of the respondents could be analyzed afterwards.

Identification of FM experts

Selection of FM experts will use a multiple-step iterative approach (five steps) to identify the experts. The purpose on application of this five-step process will ensure the identification and invitation of the most qualified experts available. The five steps are described as below.

1) Prepare a resource nomination worksheet (RNW)

The purpose of the Resource Nomination Worksheet is to help categorize the experts before identifying them, in order to prevent overlooking any important class of experts.

FM service provider	**Types of business client**
Local firm Overseas firm	Tertiary education, Building construction, Surveying, Industrial engineering, Vocational education, University, IT, Banking, Health care, Property development, Retail services, Operation and supply chain and logistics

Table 5.3 - An initial Resource Nomination Worksheet

The most appropriate local organizations which employ FM professionals coming from the International Facility Management Association (Hong Kong Chapter) will be identified. It is important to stay at a high level, first identifying classes of professionals.

2) Populating the RNW with names

After the RNW is completed, the following iterative procedure will be used to populate the categories with actual names of potential experts for the Delphi study. Each heading (disciplines and organizations) represents a different lens for identifying and considering experts, and it is expected that there will be a

very high degree of overlap of expert names between and within headings. However, this multiple-lens perspective is necessary to identify as many experts as possible. For the two categories, personal list of contacts will be first go through to fit as many names as possible on selection the appropriate category. This should be the baseline procedure. However, the personal contacts are limited and are biased to personal networks. Thus, the qualified experts were identified in the two categories from the International FM Association (Hong Kong Chapter). After beginning with personal contacts, each heading in the RNW will be gone through and be further populated the lists according to the categories.

3) First-round contacts—nominations for additional experts

At this point, the identified experts will be contacted and be asked to nominate others for inclusion on the list. A brief description of the Delphi study will be provided and explain that they have been identified as FM experts in this research. They will be told that biographical information is currently gathered. This is important because as much biographical information as possible is needed to obtain about their qualifications. Information will also be tracked about which contact refers which other experts, to facilitate the follow-up needed later. The first round of contacts aims primarily at extending the RNW to ensure that it will include as many FM professionals as can possibly be accessed.

For the organizations that the contacts provide, the procedures detailed in Step b will be followed to identify specific names to place in the RNW. Furthermore, basic biographical information will be needed to obtain for every expert on the list in order to determine what qualifications they possess to make them experts. For example, the type of data recorded will include the professionalism, working experience and the length of years in FM, etc. Adequate information on each professional is needed in order to rank their expertise for the next step. At the end of this step, a list of about around 50 experts will be expected to have.

4) Ranking experts by qualifications

At this step, the qualifications of those on the large list of experts will be compared and be ranked in priority for invitation to the study. First, three sub-lists: clients, consultants and service providers will be created. Based on their current working qualifications, experts will be categorized into the sub-lists. Next according to the person's degree of qualification, each sub-list will be independently ranked. The lists will be then come together to reconcile and to create the two sub-lists as ranked by qualifications. Eventually, the experts will be invited to participate in the study, stopping when reaching the required number.

5) Inviting experts to the study

Based on the rankings, one panel for each of the two categories will be created. Again, the target panel size is 18 (10 minimum) with at least half the members as middle or senior management level of the firms. Choosing the maximum number provides a buffer in case of attrition, even though participant drop-out tends to be very low when respondents have verbally assured their participation (contrast this with Brancheau et al., 1996). Each panelist will be communicated and be explained the subject of the study and the procedures required for it, including the commitment required. For this study, panelists will be asked to commit to completing up to four 5 minutes Delphi surveys about critical success factors and returning them within seven days of receipt, for a total of 20 minutes over a period 1 month. A limit of four questionnaires will be imposed so as not to tax the participants, and yet give them an honest appraisal of their time commitment.

Identification of FM experts in the Delphi survey is summarized in the Table 5.4. In this survey, participants will be required to have access to e-mail for receiving and returning questionnaires. Normally, this might be a serious biasing factor. Following the recommendation of Delbecq et al. 1975, the first questionnaire will be sent to each expert the same day they confirm their desire to participate. For each sub-list, panelist solicitation will begin by inviting the top nine experts who work as middle or senior management level of the

firms (half of target of 18). The experts will be invited one at a time until they reach the quota of nine. Next, the top nine experts in the remaining sub-list will be invited, whether or not they work as middle or senior management level of the firms.

Table 5.4 - Outlines of the five steps for selecting suitable practitioners in the Delphi survey

1) Prepare RNW	- Identify relevant disciplines or skills - Identify relevant organizations
2) Prepare RNW with names	- Write in names of individuals in relevant disciplines or skills - Write in names of individuals in relevant organizations
3) Nominate additional experts	- Contact experts listed in RNW - Ask contacts to nominate other experts
4) Rank experts	- Create three sub-lists, one for each category i.e. clients, consultants and service providers - Categorize experts according to appropriate list e.g. professionalism, working experience and the length of years in FM - Rank experts within each list based on their qualifications i.e. clients and service providers
5) Invite experts	- Invite experts for each panel, with the panels corresponding to each category - Invite experts in the order of their ranking within their category sub list - Each target size of Delphi panel is 10 -18 - Stop soliciting experts when each panel size is reached

The fourth procedure) During the process, the survey will be administered and

the responses will be analyzed.

The fifth procedure) Next, another survey based on the responses to the first one will be designed and be readministered, asking respondents to revise their original responses and/or answer other questions based on group feedback from the first survey.

The sixth procedure) This process will be reiterated until the respondents reach a satisfactory degree of consensus for this step.

The seventh procedure) The respondents are kept anonymous to each other (though not to the researcher) throughout the process.

5.4.4.3 Data collection and analysis method

There are three stages in the data collection and analysis method.

i) Mechanism for administering the surveys

The Delphi surveys will be administered using e-mail. It is a convenient method for the experts to response. Delbecq et al. (1975) estimated that the average Delphi study could take 45 days to 5 months. This assumes a scenario where the panelists are all in one country, and the researchers rely on the postal system to deliver and return the questionnaires. On one hand, postal system of this study utilizes the current convenient electronic e-mail system which can shorten the delivery time of questionnaires during the survey. However, there may be a case that the processing time can be prolonged by human factor.

Assuming that a panelist filled out and returned a survey immediately (probably an overly optimistic assumption), it would take about a month to receive the completed questionnaire for analysis, before the next one could be sent out. Considering that the researchers cannot send out the next questionnaire until all the results for a panel are in, such a lag time would be unreasonably long. (Okoli and Pawlowski, 2004)

ii) Administration procedure

This involved two phases:

Phase 1: Brainstorming critical success factors for FM outsourcing strategies;

Phase 2: a) Narrowing down the original list to a consolidated list; and
b) finalizing the factors

Phase 1: Initial collection of critical success factors for outsourcing strategies in FM industry (First round)

The first survey will be sent on the same day that an expert agrees to serve on a Delphi panel by e-mail. The Delphi questionnaires will be sent to all the experts without considering their panel at this phase and analyze the results from all experts together. The initial survey for a Delphi survey is very simple, since it consists of a list of critical success factors for outsourcing strategies in FM. To address the first part of the initial survey, this survey will ask the experts to identify the five to ten success factors. It is important that the correspondents give their unique comments. At this time, experts will be able to suggest additional items.

Phase 2a: Validation of critical success factors for outsourcing strategies and identification of the top success factors (Second round)

Since performing the consolidation of the lists before proceeding, a second questionnaire will be sent to validate the consolidated lists of success factors. This survey will list all the consolidated factors obtained from the first survey, counted in percentage. Furthermore, an exact copy of experts' responses to the first survey will be given to them. This second survey will ask experts to (a) verify the interpretation on their responses correctly; and (b) verify and refine the five to ten success factors as they choose in first part. This step is important for production of a valid and consolidated list. At this time, experts will be able to suggest additional items that they might not have considered initially. Based on their responses, the list will be further refined.

The phase treats the experts as three distinct panels. In brief, panels will narrow down success factors that reflect the perspectives of the constituent stakeholders, and they will then facilitate to achieve consensus (phase 2). Then, a questionnaire for a Delphi survey has to request the respondents to select the top critical success factors on which half or more than half of experts

selected in each panel. In the second phase that narrows down the list of factors, the target is to understand the outsourcing strategies in FM based on the differing perspectives of various stakeholder groups.

The complete consolidated lists of items will be then presented to each expert within each panel. Each panelist will be asked to review and to validate the lists that they consider important to local FM industry. When all of the panelists have returned their responses, each panel was analyzed separately.

This rigorous process assures that the items in the survey are the most important, and that the ratings are a valid indicator of the relative importance of the various items. Based on these results, theoretical observations from the literature will be able to be reassessed and critical success factors for outsourcing strategies in FM will be offered in propositions.

Phase 2b: Finalizing the critical success factors for outsourcing strategies and validation of the top success factors (Second round)

The goal of this final phase is to reach a consensus of the factors with the outsourcing strategies in FM within each panel. Studies have consistently found that it is difficult to reach consensus with Delphi groups; however, with a panel design it is less difficult to attain consensus because the researchers deliberately select panel members for their homogeneity (Okoli and Pawlowski, 2004). This phase of the procedure will involve each panel separately to give comments on the strategies on each of their distinct pared-down lists. In this phase, each expert will individually be requested to confirm the top critical success factors for outsourcing strategies.

Phase	Time Schedule (Total 2 weeks)	Steps
Phase 1: Brainstorming	**First Round** 1 week	1. For this phase only, treat experts as individuals, not panels 2. To collect five to ten critical success factors for outsourcing strategies in FM industry 3. To consolidate the data from all experts, regardless of panel
Phase 2: Narrowing down and finalizing	**Second Round** 1 week	1. Henceforth to treat experts as two distinct panels 2. To send consolidated lists to experts for validation of the critical success factors 3. To select the top critical success factors (Equal or more than 50% experts in selection in each panel) 4. To confirm the top critical success factors in outsourcing strategies in each panel

Table 5.5 - Delphi study administration process

iii) General survey design issues

Considering that a Delphi study, with its multiple steps and iterations, is considerably more time-intensive for the respondents than a traditional survey, one objective will be to ensure that no single survey should take more than 5 min to complete.

5.4.4.4 Analysis of respondents in the Delphi surveys

There are several reasons on which the respondents are willing to join the research team in the Delphi process.

1) They are confident that they are well familiar with the topic of outsourcing.

2) They are interested in the process of new innovative method such as Delphi technique.

3) They like to participate into academic research activity significantly.

4) They understand that series of research activities are long term investment for the sustainability and future development of FM.

5) They can afford a little bit of time to contribute in the research activities in their daily schedules.

6) Their current communication contacts are updated.

5.4.4.5 Analysis of non-respondents in the Delphi survey

There are several reasons on which the respondents did not join the research team in the Delphi process.

1) They considered that they were not suitable candidates or professionally capable of participating in the research. For example, some local FM professionals specialize only in out-tasking, not outsourcing. The response from independent consultants or researchers was low as majority of them are not well familiar with the topic of outsourcing relationships between clients and service providers in the FM service.

2) They were not confident concerning the complicated working procedures and questionnaire mechanisms in the Delphi process. Moreover, the professions of some were multi-disciplinary in nature, with the major part of their day spent on tasks outside the FM arena.

3) They considered research to be a time-consuming and unimportant activity. As busy professionals, they could not afford to spend the 10 minutes needed to complete the two rounds of the Delphi process.

4) They declined to participate in the research as no remuneration was offered.

5) They rejected any contact with the academic researcher, as they preferred to participate in immediate financial investments.

6) FM professionals have many issues to deal with on a daily basis, and they assigned this survey a low priority. Thus, they either forgot to confirm their participation in the first round of the Delphi survey or they had insufficient energy to participate at the end of the working day.

7) Some of them had left their current positions or changed their contact e-mail address without notifying the researcher.

5.4.4.6 Results and changes arising in the Delphi survey

In the beginning, there were three kinds of categories of target professionals inviting to join in the Delphi survey – clients, independent consultants or researchers and service providers accordingly. However, there was a need to make some change in the arrangement during the process because there were insufficient consultants or researchers willing to participate. The details of the results and changes arising are summarized in the following table.

In the category of clients, the fourteen experts are working in various kinds of organizations such as quasi-government organization, university, The Hong Kong Special Area Region Government, private public listed companies. Their job titles are professor, director, manager, surveyor, lecturer, teaching fellow, officer and project assistant. It is clear that there are three experts with more than 10 years' FM experience and two experts with more than 5 years' FM experience. However, FM experience of the remaining nine experts is estimated below 5 years.

As for the category of service providers, the eight experts are mainly working in two kinds of organizations such as private companies and university. Their job titles are director, senior manager, manager and senior facility officer. It is clear

that there are two experts with more than 10 years' FM experience and four experts with more than 5 years' FM experience. However, FM experience of the remaining two experts is estimated below 5 years.

Category	Total number of professionals invited	Results arising before transformation	Final Results arising
I) Clients	57	11	**14**
II)Independent Consultants / Researchers	51	3	**-**
III) Service Providers	28	8	**8**
			Total 22

Table 5.6 - Number of experts in the whole Delphi process

With reference to the Delphi design, there should be at least ten experts in each category for achieving optimum results. Round one of this Delphi survey lasted for a month. However, there was still no any positive progress to recruit two more service providers after four weeks' time. There was an obvious problem that it was rather difficult to add two more experts into the team. Thus, there is a need to propose a change arising in consideration of time constraint. Table 5.1 indicates the profile of experts in the whole Delphi process.

Reasons for changes arising:

1) The three confirmed consultants / researchers were needed to transfer into the expert list of clients as they previously worked in clients' firms. According to their comments, they can also answer to the questionnaires from the perspectives of clients. Thus, the number of clients in the Delphi questionnaire survey was changed to fourteen.

2) Total eight service providers confirmed to participate into the expert team for

four weeks' time. Waiting for two more experts joining the service provider team is rather time consuming. The number of actual respondents is just less two than the expected figure i.e. ten. Thus, eight experts are critically perhaps accepted to the team of service provider.

The following table indicates the exact figure of starting time and finishing time of each round of the whole Delphi survey.

Delphi Survey	Beginning	Completion	No. of Clients	No. of Service Providers	Duration
Round 1	March 14, 2011	April 8, 2011	14	8	Four weeks
Round 2	April 10, 2011	April 16, 2011	14	8	One week
					Total: Five weeks

Table 5.7 - Working schedule of the whole Delphi process

According to the principle of Delphi, two rounds of survey can sufficiently produce validated data from the completed well-structured questionnaires. (Okoli and Pawlowski, 2004) According to Table 5.7, four weeks' time were required to complete round one of the whole survey. The FM professionals were very busy and could not afford much effort on the time-consuming survey. After completion of round one, the respondents discussed the remaining length of the Delphi process. It was suggested to squeeze the length of the whole survey by conducting optimum number of rounds. Hence, the Delphi survey of this study was only designed to have two rounds which can still achieve validated data.

5.4.4.7 Limitations of using Delphi

Delphi technique (2010) describe that one of the initial problems of the method was its inability to make complex forecasts with multiple factors. Potential future outcomes were usually considered as if they had no effect on each other. Later on, several extensions to the Delphi method were developed to address this problem, such as cross impact analysis that takes into consideration the possibility that the occurrence of one event may change probabilities of other events covered in the survey. In this study of outsourcing strategies, there is no need to consider complex forecasts with multiple factors.

Arriving at a sound conclusion of the experiments, a quantity of experts is necessary to contribute their own professional comments in the study. The Delphi group size does not depend on statistical power, but rather on group dynamics for arriving at consensus among experts (Okoli and Pawlowski, 2004). Thus, a Delphi study could be considered a type of virtual meeting or as a group decision technique in this study, though it appears to be a complicated survey.

There are three problems during using Delphi technique.

Problem (1): Delphi technique (2010) suggests that, overall, the track record of the Delphi method is confused. There have been many cases when the method produced poor results. It must also be realized that degree of uncertainty is great in area of science and technology. Thus, correct predictions or forecasting are always impossible and there will be a high degree of error.

Solution: There are no perfect methods free of errors. After collection and analysis of the responses from Delphi, common and conflicting viewpoints can be identified. If consensus is not reached, the process continues through thesis and antithesis, to gradually work towards synthesis, and building consensus (Delphi technique, 2010). This approach can address this difficulty by elimination the errors through the process. Further, there is a need to illustrate clear and concise guidelines or instructions to the panel of experts for easy reference.

Problem (2): Another particular weakness of the Delphi method is that future developments are not always predicted correctly by consensus of experts. (Delphi technique, 2010) Firstly, the issue of ignorance is important. If panelists are misinformed about a topic, the use of Delphi may add only confidence to their ignorance.

Solution: In order to eliminate the ignorance of the panelists in the study, there is a need to illustrate comprehensive critical success factors for the outsourcing strategies to the experts as by assumption not all of them are well familiar with them.

Problem (3): Sometimes unconventional thinking of amateur outsiders may be superior to expert thinking. (Delphi technique, 2010)

Solution: Impact of the thinking of the amateur can be substantially eliminated by stringent control of the qualification of the experts participating in the study.

5.4.5 Questionnaire

After identification and consolidation of the outsourcing relationship manoeuvres and critical success factors for outsourcing manoeuvres by clients and service providers, two sets of questionnaires were distributed to staff in clients' FM departments and service providers of the local higher education institutes and universities by snowball sampling strategy. They are the decision makers on planning or senior executives on assisting to implement outsourcing strategies. A pilot questionnaire was sent after completion and analysis of the Delphi study. This pilot was used to provide feedbacks for preparation of the final version. In details, the piloting tested whether the questions were intelligible, easy to answer, whether the pilot questionnaire contained inapplicable or confusing statements, and in addition the researcher obtained good feedback as to where and when, the questionnaire should be distributed.

Before the questions were used, it is also important to identify the problems

through a pilot study. It also gave the researcher valuable experience in the relevant administrative procedures, contacting the respondents, explaining the purpose of the survey and timing each operation (Oppenheim, 1992).

Accordingly the results of this work can be summarised as the following:

- Making some alterations and adaptations that seemed necessary for the final questionnaire;
- The study included the HKSAR Government funded universities and tertiary institutes of the VTC. Hence, the total number of the universities and tertiary institutes which co-operate in this study was fixed at seven and ten respectively;
- The study concentrated on clients and FM service providers in the built environment and;
- It was decided that the survey should cover Hong Kong because of time and other constraints. The suitable time conducting the questionnaire survey was from end of May 2012 to middle of August 2012 in the Semester period of academic year. Hence, the final work took place 2.5 months after conducting the pilot study. During these months the researcher revised the results of this work with his supervisors, and reviewed recent literature, relating to the topic of the study and its objectives.

Sekaran (2003 [P. 236]) has defined a questionnaire as "a preformulated written set of questions to which respondents record their answers". Moreover, Hair *et al*. (2003 [P. 130]) also defined it as the "predetermined set of questions designed to capture data from the respondents". The questionnaire survey as the most commonly used strategy is a convenient data collection mechanism (Oppenheim, 1992; Sekaran, 2003; Saunders *et al*., 2003). As noted earlier, the survey strategy has been adapted to satisfy the objectives of the study and the need for a large sample to carry out the data analysis.

A questionnaire survey is generally broad in nature, focusing on scope rather than depth. Thus, it is well suited to collecting a large amount of data. This explains why questionnaires have been used extensively in quantitative studies aiming to

measure service quality and customer satisfaction. In order to collect the data, a research technique such as questionnaire survey can be used for collection of the primary data. The objective of conducting the survey is to identify the FM outsourcing relationships from viewpoints of clients and providers in tertiary education business environment. The outsourcing relationships between the stakeholders can be evaluated through four FM dimensions aligned with the agreed critical success factors for outsourcing manoeuvres/ strategies: adequacy, competence, co-ordination and quality respectively. The purpose of examination on FM outsourcing relationships is to critically understand the performance of the service provider in specific FM outsourcing contract. Thus, the objectives 1, 2 and 3 can be achieved through this approach.

In the survey, the respondents will be asked to consider the crucial local FM contracts generally in the local higher education environment such as building maintenance, catering, cleaning and security respectively. There are four kinds of outsourcing relationships such as support (in-house), alignment (Outsource enabling acquiring service provider's technical expertise), reliance (Outsource requiring service provider's more commitment) and alliance (Partner having common goals) between the clients and service providers.

Significance of the survey to the service providers

The services providers can more understand where they are now in the outsourcing contractual relationship with the current clients. The service providers can prepare to establish better relationships with the future potential clients through understanding the difficult scenarios of contractual relationships. In preliminary stage, a service provider can decide the strategies for the specific outsourcing contract. The provider can achieve the expected outsourcing relationship with the potential client through the preparation in advance. They can also improve their own strategic business management through understanding the formulation of outsourcing strategies. Hence, they can also prepare a good plan for establishment of future business relationships by deployment of resources and design of strategies.

Significance of the survey to the clients

Generally, the respondents are corporate clients who are expected to give comments on the performance of the staff of the service providers. They understand their routine business operation affected by the performance of the service providers in the education environment. However, they neglect their business performance possibly affected by the intangible relationships between themselves and the service providers. Thus, there is a need to raise the awareness of the clients in their daily operation by understanding their relationships with the service providers. After conducting the questionnaire survey and analyzing the data, it clearly understands the FM needs of clients in the higher education environment.

5.4.5.1 Population and sample research

A research population as any exactly defined set of people, or collection of items under investigation (Collis and Hussey, 2003). In the light of definition, the targeted population includes clients and service providers of local higher education institutes and universities in Hong Kong. An important point to be mentioned is that the population of this study was limited to Hong Kong's universities and tertiary institutes due to the following reasons:

- Generally speaking, there are total eight University Grant Council funded universities and there are total ten vocational tertiary institutes locally managed and administered by the Hong Kong SAR Government.
- The targeted universities and the tertiary institute have already covered a large and diverse population in the whole research.
- To extend the spectrum of data collection including all universities and tertiary institutes at Hong Kong, it would be prohibitively expensive in terms of time, effort and costs. Thus, the snowball sampling strategy for the respondents at those identified universities and tertiary institutes was used.

As noted in the introductory chapter, this study concentrated on feedbacks from the FM respondents at the universities and tertiary institutes that they are capable to represent the local higher education sector in terms of the clients and service

providers. Thus, two independent samples were targeted at the final questionnaire survey. One hundred and seventy-five questionnaires (175) were distributed to the study sample. The total number of usable questionnaires returned was 72 representing a 41% responsive rate. Firstly, 83 questionnaires were distributed to the study sample (service providers) and 34 questionnaires were returned. Of the 34 returned questionnaires, none had to be eliminated. The total number of usable and acceptable questionnaires was 34, which was a 41% response rate. Secondly, a total of 92 questionnaires were distributed to clients of the FM department under study. Received 38 questionnaires totaled and again all of them are usable and acceptable with a 41% response rate. To further supplement information gained from the questionnaire, the researcher met with staff in FM department of the clients to obtain more detailed information regarding the identified critical success factors for outsourcing strategies and the performance of the specific FM service providers in the campus.

Hair *et al*. (2003) stated that it is very important to determine the appropriate sample size prior to data collection, from either a large (infinite) population or a small (finite) population by referring to time available; budget and previous similar studies. In the same vein, Malhotra and Birks (2003) pointed out that sample size in business management research projects is influenced and determined by many factors, which can be summarized as follows:

- The average size of samples in similar studies;
- The nature of the research (e. g. in qualitative research, the sample size is typically small, meanwhile with quantitative research, larger samples are required);
- The nature of the analysis, (if sophisticated analysis of the data using multivariate techniques is required, the sample size should be larger); and
- Resource constraints, since any FM research project, money and time are limited.

Lehmann (1989) mentioned that sample sizes, which have been used by others conducting similar studies in the past is an acceptable approach. Generally,

quantitative methodologies are associated with large sample sizes, to obtain a high degree of accuracy and to ensure that findings are representative of the population being studied and unbiased (Collis and Hussey, 2003; Easterby-Smith *et al.*, 2002; Hair *et al.*, 2003; Remenyi *et al.*, 1998; Sekaran, 2003; Saunders *et al.*, 2003). As mentioned above, the sample in this research has been divided into two groups, staffs in clients and service providers. It is important to note that the staffs in clients were selected due to specific reasons. Firstly, the staffs in clients play a large part in shaping the factors which contribute to formulate the outsourcing strategies and to evaluate the performance of service providers critically. Secondly, it is the responsibility of staffs in clients to ensure that the service providers are professional, qualified, well-trained and knowledgeable about the range of FM services provided. Thirdly, the role of staffs in clients is crucial in managing the facilities effectively and efficiently. It is essential that daily face-to-face interaction between the general building users and built environment is carried out efficiently and closely to increase and enhance FM service. Accordingly, staffs in clients have been selected in this study.

5.4.5.2 Types of questionnaire

The questionnaire survey has been chosen as the appropriate research strategy. The next task is to determine the method of communication with the respondents. Saunders *et al.* (2003) have noted that the type of a questionnaire differs according to how it is administered and in particular, the amount of contact that the researcher has with the respondents. In their findings, they have classified the types of questionnaires into two, as follows:

- Self-administered, which includes e-questionnaire, delivery and collection questionnaire; and
- Interviewer administered, which include telephone questionnaire.

The e-questionnaires were used in this study due to acquiring high response rate from the targeted clients and service providers by sending the questionnaires through e-mails directly to the correspondents' electronic addresses. Regarding the telephone questionnaire, this is difficult to apply for several grounds. Firstly,

the traditional difficulties accompanying the use of the telephone in data collection can result in no or little cooperation with the speaker (interviewer). Secondly, a telephone interviewee may have some suspicions towards the character of the interviewer. Thirdly, the collected data may be inaccurate, since the quality of telephone conservation may be affected by the interviewee's surroundings. Fourthly, it is inefficient as the duration of interview is difficult to control. Fifthly, it has been seen as an inconvenient method for obtaining the desired data, since the interviewer does not have any idea about suitable times to call (when day / night; where, home / office and how, whether to use the land line or mobile phone). Therefore, it is also considered to be an inappropriate approach to collect the raw data in this research.

Because of the above difficulties, neither a mailed questionnaire (postal questionnaire) nor telephone questionnaires have been used in this study. In this study, self-administered questionnaires were considered to be as a suitable method to obtain data from the respondents by snowball sampling strategy. There are three advantages as follows:

- It enables the researcher to ensure that the respondent is whom she / he wants. In this study, the researcher tried to ensure that it was the clients and service providers who answered the questions;

- It can achieve a high and acceptable response rate. Response rates are between 10% and 50% for postal surveys and up to 90% for face-to-face interviews (Neuman, 2000). It is worth noting that the response rates in this study (staffs in clients) was 41% and the response rate of service providers was also 41%; and

- The researcher was afforded an opportunity to introduce the research topic and motivate the respondents to offer frank answers, and it also helped the researcher to collect all the complicated responses within a short period of time (Sekaran, 2003).

As regards the delivery and collection questionnaire, Oppenheim (1992 [P. 103]) has pointed out that "the self administered questionnaire is presented to the respondents by an interviewer or by someone in an official position". He also added that the purpose of the inquiry is explained, and then the respondent is left alone to complete the questionnaires, which will be picked up later. Sekaran (2003) noted that the main advantage of this method is to cover a wide geographical area. In this study, the researcher had to deliver the questionnaires to the parties directly, after reviewing them, and collected them after their completion by returning electronic mail. Then, the respondents were requested to introduce another potential capable and suitable practitioner(s) to join the surveys. This method also enables the respondents, to complete the questionnaires at their convenience and own pace. It is also less expensive and less time-consuming than conducting interviews. However, this method has some disadvantages, such as the possibly low response rate and the researcher cannot clarify any doubts about the questions included in the questionnaire. In spite of this, and in comparing the above methods about the advantages and disadvantages, it has been found that the most appropriate approach for this study is electronic questionnaire surveys to staffs in clients and service providers.

5.4.5.3 Design and pre-testing of the questionnaire

Sekaran (2003) has mentioned that the language of the questionnaire is one of the most important aspects of the questionnaire design; and it is essential to word questions in such a way so that they are understood by the respondents. He also suggested that the main benefit of questionnaire design relates to how the questions are worded and measured, and how the total questions are organized. However, having identified the questionnaire as the most appropriate research instrument for accessing the sample cohort, careful attention has been made to a number of basic rules and considerations, which are recommended by many researchers (Hair *et al*., 2003; Oppenheim, 1992; Saunders *et al*., 2003; Sekaran, 2003). These considerations are:

- Clear, simple, and precise wording of the questionnaires has been used in order to avoid any ambiguities or misleading questions or statements;

- Clear instructions for the completion of the questionnaire and directions for answering the questions in each section of the questionnaire were given;
- The length of each question was kept as short as possible in a way that did not affect the content and the intended meaning of the question;
- Double-barrelled and double negative questions have been avoided; and
- Simple explanations and definitions were given.

Researchers state that the questionnaires should be free from ambiguities, inappropriate wording or misleading questions (Collis and Hussey, 2003; Saunders *et al.*, 2003 and Sekaran 2003). Oppenheim (1992) emphasizes that it is essential to ensure this by piloting each question and every question sequence. He argues that even the questions that are taken from other surveys (studies) need to be piloted to ensure that they will work as required with the kind of respondents involved. Thus, the questionnaires were pre-tested and piloted. The pre-testing stage has been done by adopting and involving the following steps:

- Experts available in the University of Salford and The Hong Kong Polytechnic University including research supervisors, were involved in providing the researcher with the necessary guidelines;
- Research students of at the University of Salford, were asked to read the questionnaire and suggest and offer any additional comments or correction;
- PhD researchers of Chinese nationality at Hong Kong universities, namely The Hong Kong Baptist University and The Hong Kong University are invited to join. Their role was to give advice regarding the process and results of local practice; and
- The last step was conducted in Hong Kong, again. FM experts in western and eastern culture were involved.

Generally speaking, it is clear that the advantages of the pre-testing stage as follows.

- suitability of the questions in terms of gender
- clarity of the language;
- acquisition of some constructive comments and correction before finalization

of the questionnaire

The data collection method is mainly based on the respondents' individual objective assessments and the design of questionnaire will be in the format with ranking scales in a quantitative manner by assigning scores to the relevant categories. As for structure of the questionnaire, the key information can be collected from four sections.

1) Respondent
2) Category of client – service provider outsourcing relationship
3) Outsourcing relationships dimensions: ownership, control, competitive position and long term plan (Incorporation with four main identified dimensions on FM services such as adequacy, competence, co-ordination and quality. These four inter-related factors or variables are to be aligned with the FM business success factors or the agreed critical success factors for outsourcing manoeuvres/ strategies found from Delphi survey.) They can be further categorized into the following aspects:

   (i) Adequacy – quantity in number, demand and supply on business requirements and infrastructure & services, provision of space, allocation of human and capital resources;

   (ii) Competence – types of skills, specific and generic competence, common skills, core skills and learning organizations;

   (iii) Co-ordination – cultural alignment, communication problems and operational performance of monitoring facility impacts on people and operations, operational and design level, key factors, FM practice and processes, co-ordination and integration, transport and communication support arrangements, global dispersal of work, various departments, resource sharing and transfer;

   (iv) Quality – conformance to requirements, prevention, zero defects, price of non-conformance, awareness of social responsibility, money

saving, customers satisfaction and high-quality & value-added services, services availability, supplier capability, available technology and measurement of performance

4) Outsourcing relationship manoeuvres: Five theories

5.4.5.4 The final structure (layout) of the questionnaire(s)

As already indicated, there are two independent samples (FM staffs in clients and service providers). Accordingly, two questionnaires were distributed separately to them. The service providers' and clients' questionnaire includes four sections as follows: background information, outsourcing success, outsourcing relationship dimensions and outsourcing relationship manoeuvres (See Appendices III and IV). These two kinds of questionnaires will be discussed in more detail in the following paragraphs. Generally speaking, the final questionnaires used in this study were highly structured where most of the questions were fixed response alternative questions that required the respondents to select from responses which were located by using a five point Likert scale. The rationale for using multiple-item scales (Likert scale) for each variable was that they are more reliable than using single opinion items and can capture the whole domain of the construct (Oppenheim, 1992 and Sekaran, 2003). Oppenheim (1992) has stated that the layout of the questionnaire should be convenient for the respondents and for the researchers who will have to enter the data on their computers.

Thus, the majority of the questionnaire questions were on a five point Likert scale. Saunders *et al*. (2003) have stated that the Likert scale is the most common approach that researchers use to ask respondents how strongly they agree or disagree with a statement or series of statements. It includes both positive and negative statements in order to ensure that the respondent reads each one of them carefully and thinks about which box to be selected.

1	2	3	4	5
Very	Unimportant	Neutral	Important	Very

unimportant important

The main sources used to formulate the questions were previous empirical studies. The final structure of the questionnaires contained three sections split between three instruments that each measured respectively.

i) Category of client – service provider outsourcing relationship (Kishore *et. al.*, 2003);
ii) Outsourcing Relationship Dimensions
1. Ownership, Control, Competitive position and Long term plan – Inshore *et. al.*, 2003
Critical success factors for outsourcing manoeuvres
1. Adequacy - Acoba and Foster, 2003; Bon et al., 2002 Grimm, 1994; Grimshaw, 2003; Kessler-Park, and Butler, 2002; Leifer, 2003; Osgood, 2003; Pugsley and Haynes, 2002; Nutt, 2004 and Varcoe, 2000;
2. Competence - Alexander, 2003; Amaratunga, and Baldry, 2002; Barrett, 2000; Becker, 2000; BIFM, 1996; Bon *et al.*, 2002; Brown *et al.*, 2001; Chotipanich, 2004; Duffy, 2000; Krumm *et al.*, 1998; IFMA, 1992; Nutt, 2000; Osgood, 2003; Price, 2004; Roberts, 2001; Robertson, 2000; Schaaf and Puy, 2001 and Smith and Jackson, 2000;
3. Co-ordination - Allard and Barber, 2003; Barrett, 2000; Bodrozic, 2005; Chotipanich, 2004; Duffy, 2000; Green and Jack, 2004; Krumm, 1998 and Nutt, 2000;
4. Quality - Alexander, 2003; Allard and Barber, 2003; Chotipanich, 2004; Grimshaw, 2003; Osgood, 2003; and Zappile, 2004) and
iii) Outsourcing Relationship Manoeuvres (Sia *et. al.*, 2008)

The researcher used this tool to identify the roles of service provider because:
- It is well documented in previous study;
- Its strengths and weaknesses have been extensively discussed;
- It has been used and tested in the outsourcing services (Inshore *et. al.*, 2003);
- The focus of the present study is to investigate the FM outsourcing relationship

types between services providers and clients on the impact of performance of FM outsourcing service providers; and

- It has been used in IT industry of modern and developed country such as The United States of America.

In this study, the 'FORT' model which is applied in the FM industry was originated from the IT industry. It is important to note that when conducting a study in a different country or market environment to those of previous studies, it is often important to ensure that a new study replicates one previously conducted so as to capture the relationships between variables within the new population under investigation (Swinyard and Ghee, 1985).

As mentioned in previous sections, enormous efforts were invested (e. g., pilot study, pre-testing of the questionnaires) in designing the layout and the appearance of the questionnaires to encourage completion. The first page (covering letter) contained: the university name and a brief introduction about the purpose of the study and research title, coupled with a statement regarding the confidentiality of information and a statement indicating the importance of participation by the respondent to the success of the study. The covering letter ended with information about the researcher's contact, and thanked the respondents for their co-operation.

In the design of questionnaire for the service providers, the document (five pages, A4 size in length) was split into four sections as follows: (See Appendix IV).

Section one: (Service providers' profile) this contains seven questions.

This section was designed to obtain data about education level, mode of study, professional and working experience of the respondents. The purpose on designing and establishing this section is to measure the background of FM outsourcing providers from their own viewpoint in tertiary education business environment.

Section two: (Category of client – service provider outsourcing relationship) this

contains four questions. This section was designed to obtain data on the specific FM outsourcing relationships.

Section three: (FM outsourcing relationships dimensions) This section has been divided into four sub-sections. FM outsourcing relationships of the specific outsourcing service provider can be evaluated through four FM outsourcing relationships dimensions aligned with the agreed critical success factors for outsourcing manoeuvres / strategies: adequacy, competence, co-ordination and quality respectively. According to the Delphi survey on identification of the critical success factors for outsourcing strategies in the four FM dimensions, the outcome is that the FM service providers unanimously identified nine factors. In summary, there are two critical success factors in adequacy; two critical success factors in competence; three critical success factors in co-ordination and two critical success factors in quality.

Section four: (Criteria for outsourcing manoeuvre) this contains six questions. This section was designed to obtain data on the specific FM outsourcing relationships dimensions.

Section five: (Outsourcing relationship manoeuvres) This contains seven subsections. Then, outsourcing relationships manoeuvres can be collected. The purpose of examination on performance of the specific FM service provider is to understand FM outsourcing relationships.

Accordingly, the objectives 1, 2, 3, 4 and 5 of this study can be achieved. It is worth noting that this questionnaire has an open ended question which was used to let the respondents give their comments or any suggestions about the study in general and about the questionnaire in particular. The respondents are required to leave his/ her personal information for further processing.

The following tables are about the critical success factors for outsourcing manoeuvre or strategies and design of questionnaire for service providers in this study.

Service Providers: Critical success factors for outsourcing manoeuvre	**FM Drivers**	**FM areas**
Procurement strategies (i.e. details in contract administration)	Adequacy	Resources
Allocation of human resources (i.e. senior management to junior)		
Core skills of facilities managers (e.g. innovative thinking, listening and negotiating capacities, etc)	Competence	Practice and Processes
Measurement on performance (i.e. assessment on service providers)		
Co-ordination between the facilities manager and functional units on operational level	Co-ordination	Resources
FM practice and whole life cycle processes		
Resource sharing on people, budget, systems, information and organization structure		
Cost effectiveness (i.e. productivity)	Quality	Practice and Processes
Value of customers satisfaction		

Table 5.8 - Summary of identified nine critical success factors for outsourcing manoeuvres by service providers

	Variables	Operational definitions	Related literatures
1	Outsourcing Category	Outsourcing category in FM contract	Kishore *et. al.*, 2003
	OC1 – OC4	The degree to which client believes that he or she will rate the characteristics of service provider	
2	Substitution of Ownership	One of four relationship dimensions on FM service in this study	
	SO1	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: procurement strategies.	FM driver: Adequacy Acoba and Foster, 2003; Bon et al., 2002 Grimm, 1994; Grimshaw, 2003; Kessler-Park, and Butler, 2002; Leifer, 2003; Osgood, 2003; Pugsley and Haynes, 2002; Nutt, 2004 and Varcoe, 2000
	SO2 – SO4	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: FM practice and whole life cycle processes.	FM driver: Co-ordination Allard and Barber, 2003; Barrett, 2000; Bodrozic, 2005; Chotipanich, 2004; Duffy, 2000; Green and Jack, 2004; Krumm, 1998 and Nutt, 2000
	SO5	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: resource sharing.	
3	Substitution of Control	One of four relationship dimensions on FM service in this study	
	SC1 – SC3	The degree to which service provider believes that he or she will rate the critical success factor	FM driver: Co-ordination Allard and Barber, 2003; Barrett, 2000; Bodrozic,

		for outsourcing strategies: co-ordination between the manager and functional units on operational level.	2005; Chotipanich, 2004; Duffy, 2000; Green and Jack, 2004; Krumm, 1998 and Nutt, 2000
4	Competitive Position	One of four relationship dimensions on FM service in this study	
	CP1	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: procurement strategies.	FM driver: Adequacy Ditto
	CP2 - CP4	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: allocation of human resources.	FM driver: Adequacy Acoba and Foster, 2003; Bon et al., 2002 Grimm, 1994; Grimshaw, 2003; Kessler-Park, and Butler, 2002; Leifer, 2003; Osgood, 2003; Pugsley and Haynes, 2002; Nutt, 2004 and Varcoe, 2000
	CP5 – CP7	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: measurement on performance.	FM driver: Competence Alexander, 2003; Amaratunga, and Baldry, 2002; Barrett, 2000; Becker, 2000; BIFM, 1996; Bon *et al.*, 2002; Brown *et al.*, 2001; Chotipanich, 2004; Duffy, 2000; Krumm *et al.*, 1998; IFMA, 1992; Nutt, 2000; Osgood, 2003; Price, 2004; Roberts, 2001; Robertson, 2000; Schaaf and Puy, 2001 and Smith and Jackson, 2000
	CP8 – CP12	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: core skills of managers.	

	CP13 – CP14	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: co-ordination between the manager and functional units on operational level.	FM driver: Co-ordination Ditto
	CP15 – CP17	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: value of customers' satisfaction.	FM driver: Quality Alexander, 2003; Allard and Barber, 2003; Chotipanich, 2004; Grimshaw, 2003; Osgood, 2003; Zappile, 2004
5	Long Term Plan	One of four relationship dimensions on FM service in this study	
	LP1	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: procurement strategies.	FM driver: Adequacy Ditto
	LP2 – LP3	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: measurement on performance.	FM driver: Competence Ditto
	LP4 – LP8	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: cost effectiveness.	FM driver: Quality Alexander, 2003; Allard and Barber, 2003; Chotipanich, 2004; Grimshaw, 2003; Osgood, 2003; and Zappile, 2004
	LP9 – LP10	The degree to which service provider believes that he or she will rate the critical success factor for outsourcing strategies: value of customers' satisfaction.	

Table 5.9 - Variables and operational definitions for service providers

Table 5.10 - Questionnaire Items to Service Providers

Section	Construct	Questionnaire Items
II	Outsourcing Category (OC; 4 items)	*I will rate the preference on our characteristics.* OC1: We prefer to help the in-house team. OC2: We prefer having more commitment. OC3: We prefer contributing in more technical expertise. OC4: We prefer having common goals.
III	Relationship Dimension: Substitution of Ownership (SO; 5 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on Adequacy of Resources: Procurement strategies.* SO1: We consider availability of own equipment or machinery for competing job. *I will rate the importance of the critical success factor for outsourcing manoeuvre on co-ordination of service: FM practice and whole life cycle processes.* SO2: We can immediately help my customers if needed with professional knowledge. SO3: We were quick to respond and complete when my customers asked for help. SO4: We were capable to help customers until completion on work. *I will rate the importance of the critical success factor for outsourcing manoeuvre on co-ordination of service: resource sharing on people, budgets, systems, information and organization structure.* SO5: We can enhance resour e sharing on daily oper tions and processes.

III	Relationship Dimension: Substitution of Control (SC; 3 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on coordination of service: co-ordination between the manager and functional units on operational level.* 1) We completed the job with professional knowledge. 2) We can meet the deadlines. 3) We arrange co-ordination meeting(s) per month.
III	Relationship Dimension: Competitive Position (CP; 17 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on adequacy of resources: procurement strategies.* CP1: We consider financial capability for maintaining good relationship. *I will rate the importance of the critical success factor for outsourcing manoeuvre on adequacy of resources: allocation of human resources.* CP2: We consider deployment of human resources for maintaining good relationship. CP3: We could give help for my customers when they requested. CP4: We were there when my customers requested. *I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the service Provider: measurement on performance.* CP5: We were supported by increasing efficiency of department. CP6: We were supported by general productivity of its staffs. CP7: We were supported by sound techncial competence of its staff.

		I will rate the importance of the critical success factor for outsourcing manoeuvre on competence of support: core skills of managers. CP8: We listened to my customer when they were requesting a service. CP9: We cared about what our customers had to say. CP10: We conducted ourselves with competence in front of public. CP11: We were courteous. CP12: We understand what our customers want. *I will rate the importance of the critical success factor for outsourcing manoeuvre on coordination of service: co-ordination between the manager and functional units on operational level.* CP13: We can provide close service on each day. CP14: We finished our responsibilities within the stated time frame. *I will rate the importance of the critical success factor for outsourcing manoeuvre on quality of performance: value of customers satisfaction.* CP15: The quality of the way we treated my customers is high. CP16: My customers are satisfied with the way we treated them. CP17: The way we treated our customers met their expectations.
III	Relationship Dimension:	*I will rate the importance of the critical success factor for outsourcing manoeuvre on adequacy of resources: procurement strategies.*

	Long Term Plan (LP; 10 items)	LP1: We consider duration of the outsourcing contract period for competing job. *I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the service provider: measurement on performance.* LP2: We were supported by our policy. LP3: We were supported by sound environmental awareness of our staff. *I will rate the importance of the critical success factor for outsourcing manoeuvre on quality of performance: cost effectiveness.* LP4: We were satisfied with the way that we treated our work. LP5: We can fulfill requirement on safety. LP6: We can fulfill requirement on human resources. LP7: We can fulfill requirement on administration. LP8: We can fulfill requirement on quality. *I will rate the importance of the critical success factor for outsourcing manoeuvre on quality of performance: value of customers satisfaction.* LP9: We have high awareness of social responsibility to the public. LP10: We understand the significance of value-added services to customers.
IV	Criteria: Adequacy,	I will rate the criteria for outsourcing strategies of our contract. Ownership VS Control

	Competence Co-ordination and Quality	Ownership	VS	Competitive Position
		Ownership	VS	Long-term Plan
		Control	VS	Competitive Position
		Control	VS	Long-term Plan
		Competitive Position	VS	Long-term Plan
V	Minimizing Process customization	Compared to other organizations our outsourced process requires technical skills that are relatively unique. To provide outsourcing service external vendors would have to make substantial investments in their efforts to tailor to our needs. Extensive business knowledge that is specific to our business environment is required for our vendor to manage the outsourced operations. We requested the vendor to modify its process significantly to adapt to our unique operational routines and requirements.		
V	Process Maturity	Key procedures and business rules are documented and visible to parties involved. The process is well defined and institutionalized. The process boundary is clearly demarcated.		
V	Vendor Interoperability	The application platform provided by our outsourcing vendor offers a wide variety of information to end users through multiple channels. The software application provided by our outsourcing vendor is compatible and interoperable across multiple platforms.		

		The application platform provided by our outsourcing vendor is electronically linked and seamlessly connected with the end users in our organization. Software modules can easily be added to, modified, or removed from the application platform provided by our outsourcing vendor.
V	Multiple Sourcing	For the specified process we have a policy of contracting with multiple outsourcing vendors. We have partitioned the process and outsourced different components to different vendors. We have built up relationships with a few outsourcing vendors to contract out our process.
V	In-House Competence	We have a team of in-house staff who are able to replicate and expand the outsourced process if necessary. We continue to retain internal competence to backup the outsourced process. We can easily bring the outsourced process in-house if necessary.
V	Proactive Sensing	Our executives always update themselves about the dynamics of outsourcing vendor's market to take advantage of new opportunities. Our executives always initiate actions to which our outsourcing vendor responds. Our executives are quick to alert our outsourcing vendor when new products and services are offered in the marketplace. Our executives always encourage our outsourcing vendor to explore new opportunities and innovative ideas.
V	Partnership Quality	We and our outsourcing vendor make decisions that are mutually beneficial. We and our outsourcing vendor share the benefits and risks in our outsourcing arrangement. We and our outsourcing vendor have compatible cultures and policies. We and our outsourcing vendor perform our agreements and promises very well.

In the design of questionnaire for the staffs in clients, the document (four pages, A4 size in length) was also split into four sections as follows: (See Appendix III). The content of questionnaire is similar to the design for the service providers sections 1, 2 and 4.

Section one: (Clients' profile) this contains seven questions. This section was designed to obtain data about education level, mode of study, professional and working experience of the respondents. The purpose on designing and establishing this section is to measure the background of clients from their own viewpoint in tertiary education business environment.

Section two: (Category of client – service provider outsourcing relationship) this contains four questions. This section was designed to obtain data on the specific FM outsourcing relationships.

Section three: (FM outsourcing relationships dimensions) This section has been divided into four sub-sections. FM outsourcing relationships of the clients can be evaluated through four FM outsourcing relationships dimensions aligned with the agreed critical success factors for outsourcing manoeuvres / strategies: adequacy, competence, co-ordination and quality respectively. According to the Delphi survey on identification of the critical success factors for outsourcing strategies in the four FM dimensions, the outcome is that the clients unanimously identified four factors. In summary, there are two critical success factors in competence; one critical success factor in co-ordination and one critical success factor in quality.

Section four: (Criteria for outsourcing manoeuvre) this contains six questions. This section was designed to obtain data on the specific FM outsourcing relationships dimensions.

Section five: (Outsourcing relationship manoeuvres) This contains seven subsections. Then, outsourcing relationships manoeuvres can be collected. The purpose of examination on performance of the specific FM service provider is to understand FM outsourcing relationships.

Accordingly, the objectives 1, 2, 3, 4 and 5 of this study can be achieved. The following tables are about the critical success factors for outsourcing manoeuvre or strategies and design of questionnaire for clients in this study.

Clients: Critical success factors for outsourcing manoeuvre	**FM Drivers**	**FM areas**
Specific FM competence required for specialist facilities	Competence	Practice and Processes
Measurement on performance (i.e. assessment on service providers)		
Co-ordination between the facilities manager and functional units on operational level	Co-ordination	Resources
Cost effectiveness (i.e. productivity)	Quality	Practice and Processes

Table 5.11 - Summary of identified four critical success factors for outsourcing manoeuvres by clients

	Variables	Operational definitions	Related literatures
1	Outsourcing Category	Outsourcing category in FM contract	Kishore *et. al.*, 2003
	OC1 – OC4	The degree to which client believes that he or she will rate the characteristics of service provider	
2	Substitution of Ownership	One of four relationship dimensions on FM service in this study	FM driver: Competence Alexander, 2003; Amaratunga, and Baldry, 2002; Barrett, 2000; Becker, 2000; BIFM, 1996; Bon *et al.*, 2002; Brown *et al.*, 2001; Chotipanich, 2004; Duffy, 2000; Krumm *et al.*, 1998; IFMA, 1992; Nutt, 2000; Osgood, 2003; Price, 2004; Roberts, 2001; Robertson, 2000; Schaaf and Puy, 2001 and Smith and Jackson, 2000
	SO1 – SO5	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: specific FM competence.	
3	Substitution of Control	One of four relationship dimensions on FM service in this study	
	SC1 - SC4	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: specific FM competence.	FM driver: Competence Ditto
	SC5 – SC8	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: co-ordination on operational level.	FM driver: Co-ordination Allard and Barber, 2003; Barrett, 2000; Bodrozic, 2005; Chotipanich, 2004; Duffy, 2000; Green and Jack, 2004; Krumm, 1998 and

			Nutt, 2000
4	Competitive Position	One of four relationship dimensions on FM service in this study	
	CP1	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: specific FM competence.	FM driver: Competence Ditto
	CP2 – CP4	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: measurement on performance.	FM driver: Competence Same as specific FM competence
	CP5 – CP6	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: co-ordination on operational level.	FM driver: Co-ordination Ditto
5	Long Term Plan	One of four relationship dimensions on FM service in this study	
	LP1 – LP2	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: measurement on performance.	FM driver: Competence Same as specific FM competence
	LP3 – LP7	The degree to which client believes that he or she will rate the critical success factor for outsourcing strategies: cost effectiveness.	FM driver: Quality Alexander, 2003; Allard and Barber, 2003; Chotipanich, 2004; Grimshaw, 2003; Osgood, 2003; and Zappile, 2004

Table 5.12 - Variables and operational definitions for clients

Table 5.13 - Questionnaire Items to Clients

Section	Construct	Questionnaire Items
II	Outsourcing Category (OC; 4 items)	*I will rate the preference on our characteristics.* OC1: We prefer without the presence of service providers. OC2: We prefer the service provider having more commitment. OC3: We prefer the service provider having more technical expertise. OC4: We prefer the service provider having common goals.
III	Relationship Dimension: Substitution of Ownership (SO; 5 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the Service Provider: Specific FM competence.* SO1: Our service provider cared about our professional knowledge. SO2: Our service provider cared about our infrastructure technology. SO3: Our service provider cared about our computing system. SO4: Our service provider cared about our communication system. SO5: Our service provider cared about our efficiency of its equipment.
III	Relationship Dimension: Substitution of Control (SC; 8 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the Service Provider: Specific FM competence.* SC1: Our service provider cared about correct usage of materials. SC2: Our service provider cared about correct usage of equipments. SC3: Our service provider cared about deployment of suitable human resources. SC4: We were supported by its daily routine operation.

		I will rate the importance of the critical success factor for outsourcing manoeuvre on coordination of service: Co-ordination between the manager and functional units on operational level. SC5: Our service provider completed the job when expected. SC6: Our service provider can meet the deadlines. SC7: We were supported by arranged co-ordination meeting(s) per month. SC8: We were complained by few numbers per month.
III	Relationship Dimension: Competitive Position (CP; 6 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the Service Provider: Specific FM competence.* CP1: Our service provider cared about our specific competence. *I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the Service Provider: Measurement on performance.* CP2: We were supported by increasing efficiency of department. CP3: We were supported by general productivity of its staffs. CP4: We were supported by sound technical competence of its staff. *I will rate the importance of the critical success factor for outsourcing manoeuvre on coordination of service: Co-ordination between the manager and functional units on operational level.* CP5: Our service provider can provide close service on each day. CP6: Our service provider finished their responsibilities within the stated time frame.

III	Relationship Dimension: Long Term Plan (LP; 7 items)	*I will rate the importance of the critical success factor for outsourcing manoeuvre on competence on support from the Service Provider: Measurement on performance.* LP1: We were supported by its policy. LP2: We were supported by sound environmental awareness of its staff. *I will rate the importance of the critical success factor for outsourcing manoeuvre on quality of performance: cost effectiveness.* LP3: We were satisfied with the way the service provider treated its work. LP4: Our service provider can fulfill my requirement on safety. LP5: Our service provider can fulfill my requirement on human resources. LP6: Our service provider can fulfill my requirement on administration. LP7: Our service provider can fulfill my requirement on quality.
IV	Criteria: Competence Co-ordination and Quality	I will rate the criteria for outsourcing strategies of our contract. Ownership VS Control Ownership VS Competitive Position Ownership VS Long-term Plan Control VS Competitive Position Control VS Long-term Plan Competitive Position VS Long-term Plan
V	Minimizing Process	Compared to other organizations our outsourced process requires technical skills that are relatively

	customization	unique. To provide outsourcing service external vendors would have to make substantial investments in their efforts to tailor to our needs. Extensive business knowledge that is specific to our business environment is required for our vendor to manage the outsourced operations. We requested the vendor to modify its process significantly to adapt to our unique operational routines and requirements.
V	Process Maturity	Key procedures and business rules are documented and visible to parties involved. The process is well defined and institutionalized. The process boundary is clearly demarcated.
V	Vendor Interoperability	The application platform provided by our outsourcing vendor offers a wide variety of information to end users through multiple channels. The software application provided by our outsourcing vendor is compatible and interoperable across multiple platforms. The application platform provided by our outsourcing vendor is electronically linked and seamlessly connected with the end users in our organization. Software modules can easily be added to, modified, or removed from the application platform provided by our outsourcing vendor.
V	Multiple Sourcing	For the specified process we have a policy of contracting with multiple outsourcing vendors.

		We have partitioned the process and outsourced different components to different vendors. We have built up relationships with a few outsourcing vendors to contract out our process.
V	In-House Competence	We have a team of in-house staff who are able to replicate and expand the outsourced process if necessary. We continue to retain internal competence to backup the outsourced process. We can easily bring the outsourced process in-house if necessary.
V	Proactive Sensing	Our executives always update themselves about the dynamics of outsourcing vendor's market to take advantage of new opportunities. Our executives always initiate actions to which our outsourcing vendor responds. Our executives are quick to alert our outsourcing vendor when new products and services are offered in the marketplace. Our executives always encourage our outsourcing vendor to explore new opportunities and innovative ideas.
V	Partnership Quality	We and our outsourcing vendor make decisions that are mutually beneficial. We and our outsourcing vendor share the benefits and risks in our outsourcing arrangement. We and our outsourcing vendor have compatible cultures and policies. We and our outsourcing vendor perform our agreements and promises very well.

5.4.6 Focus group

The focus group method is chosen as it provides opportunity to explore and clarify the stakeholders' views in ways that would be less accessible with other methods like individual interviews and questionnaires (Morgan, 1988). The use of focus groups has a long history in market research, for obtaining opinions from a number of people in a cost effective manner (Morgan and Kreuger 1993). They are a means of enabling organised discussion, as a collective activity, where the resulting opinions are based on interaction within the group, so that triggers from individuals may spark comments by others (Kitzinger 1994; Powell et al. 1996). A group of individuals are selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research, also known as a discussion group (Flick 2006). It is a form of interviewing, but instead of using set questions, there is an open style of eliciting statements, through prompting from the facilitator and the respondents themselves. The idea is to draw upon the respondents' attitudes, feelings, beliefs, experiences and reactions to the topic, and elicit a multiplicity of views and emotions.

Focus groups are particularly useful when there are power differences between the participants and decision makers or other professionals, or when one wants to explore the degree of consensus on a given topic (Morgan and Kreuger 1993). This method is useful for gathering data relating to the feelings and opinions of a group of FM professionals who were involved in the engagement process of a project. In addition, this method was also used to generate group discussions on how the FM outsourcing relationships process with FM professionals was implemented along with the outsourcing practices at Hong Kong. The respondents for the two focus groups were Professor, departmental head, senior manager of clients and service providers, academic programme director and solicitor. Date gathered from the focus group provides this study with rich data that would not have otherwise been accessible without the interaction found in a group (Hussey et, al. 1997), in this study, the interaction with FM professionals. Respondents who participated in the focus groups are listed in Chapter 9. Data gathered from

the two groups was electronically recorded to enhance, validate and confirm the findings in this study.

Drawbacks of using focus groups include possible bias from the facilitator, who may pose leading questions, or in a way that begs a specific answer. Provided the facilitator is not the researcher this can be avoided, but the facilitator must know sufficient about the research topic to prompt for more detailed comments. In some cases a facilitator is not necessary if the dynamics of the group are trusted, as the group interacts to correct views that are not socially shared or correct, so statements are validated by the group (Flick, 2006:190). Focus groups, where members are self selected, are more likely to be comprised of people who are interested in the topic, than a representative sample, but again it is more important that respondents are articulate, and able to provide comments on a wide range of issues. Data from these will provide insight into a range of issues, but not the extent of the issues, which would have to be derived quantitatively. However, the ability for individuals to react to others provides for richer feedback than could be achieved through an individual interview (Williams, 2003). Errors in recording, transcribing and interpreting the comments made in a focus group session are possible. Even when tape recordings are taken of a session, utterances from respondents may be brief, and not in complete sentences, leading to misinterpretation by the researcher (Silverman, 2000:187).

5.5 Statistical analysis

In this part, there are totally three steps to be studied and analyzed by appropriate statistical analysis tools. The first stage is to test corollary 1. The second stage is to test corollaries 2 to 8. At last, the third stage is to test corollary 9.

5.5.1 Frequency distributions

Besides these statistical tests, it is imperative to note that frequency distributions were also used in this study. They were obtained for all the personal data or classification variables. They have been used to summaries the responses of each question and to produce descriptive information on the data collected such as means, standard deviations and frequencies of the responses. The mean (μ or

Al) is the sum (D of the scores (X) divided by the total number (N) of the scores. However, standard deviation (SD) is used to find out the extent to which the values for a variable differ from the mean. Thus, SD is a measure of how well the mean represents the data. Field (2003) has pointed out that the small SD indicates that data points are close to the mean, while, a large SD indicates that the data points are distance from the mean (i. e. the mean is not an accurate representation of the data). These statistical summaries, displayed in table format, will be useful to achieve two objectives.

The first objective is to show the general descriptive analysis of respondents. The second is to show the respondents' perceptions of several individual items of background information, outsourcing support services, factors to performance of FM service providers and roles of service providers.

5.5.2 Hypothesis testing

As discussed earlier in this dissertation, this study tends towards a positivist philosophy. Hypothesis testing is concerned with testing an existing theory (Collis and Hussey, 2003 and Saunders *et al*., 2003). A well formulated hypothesis can lead to stage of clear goal achievement. In summary, this study is to select hypothesis testing because of four main grounds.

- It aims to investigate the general patterns of outsourcing relationships between clients and service providers.
- It aims to investigate existed theoretical and empirical studies such as contractual outsourcing procurements between the parties in this study.
- It is a common theme and widely known in the literature about outsourcing relationships.
- It can explain the substandard performance of the FM outsourcing service providers.

Current outsourcing arrangements in the FM sector reflect a contingent approach. On one hand, current approaches to FM outsourcing reflect a growing appreciation of the contingent nature of the outsourcing decision process. But on

the other hand, current approaches to FM neglect the contingent nature of FM as reflected in the relationship types prevalent in the industry. Thus, a main testable hypothesis is more generally applied in different business sectors as the following.

5.5.3 Statistical analysis techniques

Non parametric tests, make no explicit assumption regarding the normality of distribution in the population and the type of data collected on a nominal or ordinal scale for example, likert-type scale (Hinton, 1995; Field, 2003; Malhotra and Birks, 2003; Pallant, 2003; Sekaran, 2003; Siegel and Castellan, 1988). There are three reasons to substantiate the non-parametric tests applied in this study for data analysis.

- Some research variables i.e. four FM relationship dimensions are not normally distributed and they require distribution-free tests, since such tests do not require many assumptions;
- In this study, the data were measured using an ordinal scale such as likert-type scale; and
- Non-parametric tests have some advantages, since they employ relatively simple formula for the analyses; easy to understand and relatively straightforward and quick to apply. However, the main disadvantage of non-parametric tests is that it is claimed that they are not as `robust' as the parametric tests (Pallant, 2003; Siegel and Castellan, 1988).

5.5.4 Nine testable corollaries

Research Hypothesis

This study tests whether the Four Outsourcing Relationship Types (FORT) model is applicable to the FM services of Hong Kong's higher education sector through characterising the FM outsourcing relationship types.

Nine testable corollaries have been arisen from the five theories as depicted in advance.

Corollary 1 (C1a and C1b): Clients' and Service providers' evaluations regarding four outsourcing relationship dimensions rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 2 (C2a and C2b): Clients' and Service providers' evaluations regarding minimizing customization rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 3 (C3a and C3b): Clients' and Service providers' evaluations regarding enhancing process maturity rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 4 (C4a and C4b): Clients' and Service providers' evaluations regarding retaining in-house competence rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 5 (C5a and C5b): Clients' and Service providers' evaluations regarding multiple sourcing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 6 (C6a and C6b): Clients' and Service providers' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 7 (C7a and C7b): Clients' and Service providers' evaluations regarding proactive sensing rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 8 (C8a and C8b): Clients' and Service providers' evaluations regarding enhancing partnership quality rendered to them are not different according to the background of construction professionals and types of current outsourcing contracts.

Corollary 9 (C9): Outsourcing relationship dimensions (Ownership, Control, Competitive Position and Long Term Plan) are related to outsourcing relationship types and the strength of the relationships is moderated by those outsourcing types.

Stage I

Clients

Clients have varying preferences regarding the critical success factors for the FM outsourcing strategies. This reflects a prevailing contingent approach (as characterised by the Four Outsourcing Relationship Types (FORT) of Kishore *et. al.* (2003). In the decision making process, intelligent clients are more aware of the importance of critical success factors of outsourcing strategies in various contracts.

Accordingly, the following is derived for testing:

Outsourcing relationship dimensions are dependent on the characteristics of the clients. (Testing C1)

Service providers

Service providers apply different preferences on the critical success factors for the FM outsourcing strategies reflecting a contingent approach that is client dependent.

The nature of FM outsourcing is dynamic and service providers should try to understand what requirements the clients' need. This preference is based on clients' actual and perceived requirements (Kaynak and whiteley, 1999).

Accordingly, the following is derived for testing:

Outsourcing relationship dimensions provided by service providers are not distinguishable on their characteristics. (Testing C1)

Stage II

Clients

Clients have various critical success factors for FM outsourcing strategies. This can be reflected by a prevailing contingent approach (as characterized by the Four Outsourcing Relationship Types (FORT) of Inshore (2003)). An understanding of external customers' needs through adequate assessment is essential to preventing a financial loss (Oldenboom and Abratt, 2000).

Accordingly, the following is derived for testing:

There is no reciprocal effect relationship between clients' outsourcing relationship manoeuvres and the characteristics of the clients. (Testing C2 – C8)

Service providers

Service providers have various critical success factors for FM outsourcing strategies. This can be reflected by a prevailing contingent approach being dependent of client (as characterized by the Four Outsourcing Relationship Types (FORT) of Inshore (2003)).

Accordingly, the following is derived for testing:

There is no reciprocal effect relationship between service providers' evaluations regarding the outsourcing relationship manoeuvres and their characteristics. (Testing C2 – C8)

Stage III

Clients

Clients require understanding the effects of outsourcing strategies under various FM contracts for pursuing outstanding FM performance. This reflects by a prevailing contingent approach (as characterized by the Four Outsourcing Relationship Types (FORT) of Kishore *et. al.*, 2003).

Accordingly, the following is derived for testing:

Clients' evaluation on the correlations of category of outsourcing relationships and the four outsourcing relationship dimensions are unknown. (Testing C9)

Service providers

Service providers apply different outsourcing strategies under various FM contracts reflecting a contingent approach that is client dependent.

Accordingly, the following is derived for testing:

Service providers' evaluation on the correlations of category of outsourcing relationships and the four outsourcing relationship dimensions are unknown. (Testing C9)

5.5.5 Research mechanism

This section describes the research design to test the hypothesis and nine corollaries. The mechanism of this research is designed and discussed in the following items.

i) Description and source of data of the variable
ii) Description and justification of the proposed analytical test
iii) Statistical result

Stage I

The research methodology is to select a quantitative approach for testing the corollary 1 from clients' and service provider's view.

i) Variable

Description: There are two kinds of data collected for this corollary by literature review, pilot study and Delphi survey.

* Comments on four relationship dimensions from critical success factors for

outsourcing strategies i.e. ownership, control, competitive position and long term plan

* Data on the background of construction professionals and types of current outsourcing contracts

Source of data:

* Comments on four relationship dimensions from critical success factors for outsourcing strategies can be extracted from the two kinds of questionnaires completed by the FM staff in client and staff in service provider.

* Data on the background of construction professionals and types of current outsourcing contracts can also be extracted from the two kinds of questionnaires completed by the FM staff in client and staff in service provider.

ii) Analytical test

Description:

A statistical analysis technique called Mann-Whitney U test is used to investigate the four outsourcing relationship dimensions according to the background of construction professionals whilst Kruskal-Wallis test is used to investigate the four outsourcing relationship dimensions according to the types of current outsourcing contracts from the clients' and service providers' perspectives. Both tests are non-parametric in nature.

Justification:

Mann-Whitney U test is suitable when there are only two groups of continuous variables in the background of construction professionals. Kruskal-Wallis test allows the researcher to compare the scores on some continuous variable for three or more groups in the types of current outsourcing contracts.

iii) Result

The test first converts the scores on the continuous variable to ranks and the mean rank for each group is compared. If the probability (p) of chi-square value is significant (i. e. $p \leq 0.05$), the result is significant and so there is a statistically significant difference across the groups on the basis of the measured variable

(Pallant, 2003; Siegel and Castellan, 1988). The results can be depicted as the followings. Clients' and Service providers' evaluations on four FM outsourcing relationship dimensions are same or different across categories of FM professions and types of FM contracts.

Validity: It is important to find out whether outsourcing relationship dimensions implemented by clients and evaluated by service providers are same or different across the professions and types of contracts. The Mann-Whitney U test and Kruskal-Wallis test are selected because the validity of this hypothesis can be tested by calculating the chi-square, degree of freedom and asymp. significance of the continuous variable i.e. measuring individual questions on the four outsourcing relationship dimensions in the questionnaire to the FM staff of client and staff of service provider rating by 5-point Linkert scale (ownership, control, competitive position and long term plan)

Reliability analysis: In order to ensure the instrument producing the same results on clients' and service providers' evaluation each time administering to the same person in the same setting, reliability analysis required to apply. The coefficient alpha or Cronbach's alpha (α) is used to measure the internal consistency of the instrument. Before conducting the internal consistency estimates of reliability, it is important to ensure that all items use the same metric (response scale for all items is 1 = very dissatisfied to 5 = very satisfied) and whether any items have to be reverse-scaled. The value of Cronbach's alpha (α) is between 0 and 1. Larger value of alpha is; more consistency for the respondents will be in the test.

Table 5.14 shows the Cronbach's Alphas for measurement scales in corollary 1 from clients' and service providers' perspectives. From the table, it can be seen that the variables scales have a range of coefficients of Cronbach's Alphas between 0.969 and 0.979, which are considered as reasonable (Hair et. al., 2003). This means that the respondents of clients and service providers are consistent on testing the corollary 1 regarding four outsourcing relationship dimensions.

Respondent	Variable	Number of items in the corresponding questionnaire (A)	(B)	(1)	(2)	(3)	(4)	Total	Cronbach's Alpha
Clients	Types of FM Contract	1		5	8	6	8	28	.969
	FM Profession		1	5	8	6	8	28	.975
Service provider	Types of FM Contract	1		5	3	17	11	37	.972
	FM Profession		1	5	3	17	11	37	.979

Remarks:
(A) - Types of FM Contract
(B) - FM Profession
(1) - Ownership of various FM assets
(2) - Control of various FM assets
(3) - Competitive position
(4) - Long term plan

Table 5.14 - Reliability analysis in corollary 1 from clients' and service providers' perspectives

Stage II

The research methodology is to select a quantitative approach for testing the corollaries 2 to 8 from clients' and service provider's view.

i) Variable

Description: There are two kinds of data collected for this corollary by literature review, pilot study and Delphi survey.

* Comments on strategic manoeuvres (Five theories)
* Data on the background of construction professionals and types of current outsourcing contracts

Source of data:
* Comments on strategic manoeuvres (Five theories) can be extracted from the two kinds of questionnaires completed by the FM staff in client and staff in service provider.
* Data on the background of construction professionals and types of current outsourcing contracts can also be extracted from the two kinds of questionnaires completed by the FM staff in client and staff in service provider.

ii) Analytical test
Description:
A statistical analysis technique called Mann-Whitney U test is used to investigate the strategic manoeuvres (Five theories) according to the background of construction professionals whilst Kruskal-Wallis test is used to investigate the strategic manoeuvres (Five theories) according to the types of current outsourcing contracts from the clients' and service providers' perspectives.
Both tests are non-parametric in nature.

Justification:
Mann-Whitney U test is suitable when there are only two groups of continuous variables in the background of construction professionals.
Kruskal-Wallis test allows the researcher to compare the scores on some continuous variable for three or more groups in the types of current outsourcing contracts.

iii) Result
The test first converts the scores on the continuous variable to ranks and the mean rank for each group is compared. If the probability (p) of chi-square value is significant (i. e. $p \leq 0.05$), the result is significant and so there is a statistically significant difference across the groups on the basis of the measured variable

(Pallant, 2003; Siegel and Castellan, 1988). The results can be depicted as the followings. Clients' and Service providers' evaluations on strategic manoeuvres (Five theories) are same or different across categories of FM professions and types of FM contracts.

Validity: It is important to find out whether understandings on strategic manoeuvres (Five theories) by clients and service providers are same or different across the professions and types of contracts. The Mann-Whitney U test and Kruskal-Wallis test are selected because the validity of this hypothesis can be tested by calculating the chi-square, degree of freedom and asymp. significance of the continuous variable i.e. measuring individual questions on the strategic manoeuvres in the questionnaire to the FM staff of client and staff of service provider rating by 5-point Linkert scale (Five theories)

Reliability analysis: In order to ensure the instrument producing the same results on clients' and service providers' evaluation each time administering to the same person in the same setting, reliability analysis required to apply. The coefficient alpha or Cronbach's alpha (α) is used to measure the internal consistency of the instrument. Before conducting the internal consistency estimates of reliability, it is important to ensure that all items use the same metric (response scale for all items is 1 = very dissatisfied to 5 = very satisfied) and whether any items have to be reverse-scaled. The value of Cronbach's alpha (α) is between 0 and 1. Larger value of alpha is; more consistency for the respondents will be in the test.

Table 5.15 shows the Cronbach's Alphas for measurement scales in corollaries 2 to 8 from clients' and service providers' perspectives. From the table, it can be seen that the variables scales have a range of coefficients of Cronbach's Alphas between 0.870 and 0.942, which are considered as reasonable (Hair et. al., 2003). This means that the respondents of clients and service providers are consistent on testing the corollaries 2 to 8 regarding the strategic manoeuvres (Five theories).

Respondent	Variable	Number of items in the corresponding questionnaire (A)	(B)	(1)	(2)	(3)	(4)	(5)	Total	Cronbach's Alpha
Clients	Types of FM Contract	1		4	6	7	4	4	26	.929
	FM Profession		1	4	6	7	4	4	26	.942
Service provider	Types of FM Contract	1		4	6	7	4	4	26	.870
	FM Profession		1	4	6	7	4	4	26	.919

Remarks:

(A) - Types of FM Contract

(B) - FM Profession

(1) – Transaction Cost Economics: Process Customization

(2) – Agency Cost Theory: Process Maturity and Inhouse Competence

(3) – Resource Dependency Theory: Vendor Interoperability and Multiple Sourcing

(4) – Entrepreneurial Actions: Proactive Sensing

(5) – Social Exchange Theory: Partnership Quality

Table 5.15 - Reliability analysis in corollaries 2 to 8 from clients' and service providers' perspectives

Stage III

The research methodology is to select the quantitative approach for testing Corollary 9 from clients' and service providers' view. To test the model of FM outsourcing, a survey design was chosen. A survey is to question people and record their responses for analysis. This type of design is adequate when the purpose of the study is to generalize from a sample to a population so that inferences can be made about some behaviour of this population (Creswell 1994).

A survey design helps in developing constructs for such variables through the use of multi-nominal logistic regression. Additional reasons for the adoption of a survey design are its economy and its advantage to collect data more easily (Creswell 1994, Cook and Campbell 1976). Even though the survey is cross-sectional (the survey information is collected at one point in time), the nature of the questions will allow the collection of clients' and service providers' past experiences.

Multi-nominal logistic regression is used to predict the category of FM outsourcing relationship types in the current FM outsourcing contracts on the perspectives of clients and service providers. The design on the constructs in the research model is mainly adopted from the related study conducted in the past (Kishore *et. al.*, 2003) with reference to the four outsourcing relationship types. Principles of compatibility, specificity and generality are applied to all constructs. A multi-item method is used to increase the accuracy of measurement, and each item is based on a five point Likert scale. Four dependent and twenty-seven independent measured variables are used to reflect the components of the contingency model (Four factors) for outsourcing relationships for clients while four dependent and thirty-six independent measured variables are used to reflect the components of the contingency model (Four factors) for outsourcing relationships for service providers.

Analytic hierarchy process (AHP) is used to find out the preferred category of FM outsourcing relationship types on the perspective of clients and the targeted category of FM outsourcing relationship types on the perspective of service providers in the FM outsourcing contracts. As a decision processing tool, the respondents ranked different outsourcing relationship types according to the degree of importance with respect to the four critical FM drivers such as co-ordination, quality, competence and adequacy.

i) Variable

The variables in the study will be implemented to find out how the proposed contingent model of FM outsourcing fits reality.

Factors: Types of FM Contract
In general, factors should be categorical variables for the types of FM outsourcing contract.

Dependent variables: FM Outsourcing Categories
In table 5.16, the dependent variables should be categorical in Multinomial Logistic Regression for the FM outsourcing categories.

Independent variables: FM Outsourcing Dimensions
Independent variables can be factors or covariates for the FM outsourcing dimensions.

Comparisons: Among criteria for outsourcing strategies and outsourcing relationship dimensions in analytic hierarchy process

Description: There are also four kinds of data collected for this objective by literature review and pilot study.
* Comments on the types of FM Contract
Building maintenance, Security, Cleaning and Catering

* Comments on the FM Outsourcing Categories
In-house team, Commitment, Technical expertise, Common goals

* Comments on criteria for outsourcing relationship dimensions
Ownership of FM assets, Control of FM assets, Influence on competitive position and Influence on long term plan

* Comments on comparison among criteria for outsourcing strategies in analytic hierarchy process
Co-ordination, quality, competence and adequacy

* Comments on comparison among criteria for outsourcing relationship dimensions in analytic hierarchy process

Type of Variable	Variables (Client)	Variables (Service Provider)	Definition
Dependent	OC1 – OC4	OC1 – OC4	Outsourcing category: In-house team, Commitment, Technical expertise, Common goals
Independent	SO1 – SO5	SO1 – SO5	Ownership of FM assets
Independent	SC1 – SC8	SC1 – SC3	Control of FM assets
Independent	CP1 – CP6	CP1 – CP17	Influence on competitive position
Independent	LP1 – LP8	LP1 – LP11	Influence on long term plan

Remarks: The value of Multi-Nominal Logistic Regression may be high (Likert Scale 4 or 5) or low (Likert Scale 1 or 2).

Table 5.16 - Summary of variables in Multi-Nominal Logistic Regression

Source of data:

* Comments on types of FM contract, outsourcing categories and four relationship dimensions from critical success factors for outsourcing strategies can be extracted from the two kinds of questionnaires completed by the FM staff in client and staff in service provider.

ii) Analytical test

Description:

The Multi-Nominal Logistic Regression is used to compute the probability that the decision makers will consider the degree of satisfaction of outsourcing category in the specific outsourcing contract. A multinomial logit model is fit for the full factorial model or a user-specified model. Parameter estimation is performed through an iterative maximum-likelihood algorithm. The Multinomial Logistic Regression procedure produces a model with the factor and covariate main effects.

The AHP measures the relative importance of different attributes through pairwise comparisons, relatively less complex than risk assessment or evaluations on

monetary terms. According to Saaty (1980), the AHP helps to decompose a complex and unstructured real world multiple criteria decision making problem into a set of elements in terms of variables organized in a multilevel hierarchical form. It also determines the overall priorities by quantifying information and provides subject judgments.

Assumptions

It is assumed that the odds ratios of any two categories are independent of all other response categories. This assumption states that the FM outsourcing dimensions of all outsourcing categories are affected proportionally equally. Also, given a covariate pattern, the responses are assumed to be independent multinomial variables.

Justification:

In order to more understand the demand of clients and supply of service providers on the types of FM outsourcing services, Multinomial Logistic Regression is useful for this study. This research analysis technique is able to classify subjects based on values of a set of predictor variables. This type of regression is similar to logistic regression, but it is more general because the dependent variable is not restricted to two categories.

In order to market FM outsourcing service more effectively, service providers want to predict what type of FM outsourcing relationship a client is likely to build in a particular kind of FM contract. By performing a Multinomial Logistic Regression, the service provider can determine the strength of influence a client's strategy on FM dimensions in terms of ownership, control, competitive position and long term plan has upon the type of outsourcing relationship they prefer. The service provider can then slant the strategy of a particular outsourcing contract toward the clients likely to plan.

Linear regression is not appropriate for the situations in which there is no natural ordering to the values of the dependent variable such as the four outsourcing categories in this study. In such case, multinominal logistic regression may be the

best alternative.

This method is important to complement the analysis. In this model, the dependent variable is about the degree of satisfaction of outsourcing category; in order words, it reflects the outsourcing relationship types of the specific FM outsourcing contract by measurement on the outsourcing relationship dimensions. The value of Multi-Nominal Logistic Regression may be high or low. If the criterion variable is qualitative, Multi-Nominal Logistic regression should be considered. Thus, this test is suitable to predict this unknown client's and service provider's point of view on outsourcing relationships.

AHP gained popularity in the field of construction and housing, of which decision-makers are often required to consider large number of objectives, attributes (both quantifiable and non-quantifiable), as well as benchmarking criteria before reaching consensus in a logical manner (Gilleard and Wong, 2004, Lo *et al.*, 2013). This study shows the application of AHP on property-related theme and resource allocation, as mentioned in Expert Choice (2002).

iii) Result

In this study, the respondents were asked to comment several outsourcing relationships in the FM outsourcing contracts according to their working experience and background. Using the multi-nomial logistic regression, service providers can refer profiles of clients who are most likely to be interested in the relationships and plan their outsourcing strategies accordingly. The current and future category of the outsourcing relationships of a specific FM outsourcing contract can be observed and predicted from the perspectives of clients and service providers. As for AHP, this technique can find out the preferred and the targeted category of FM outsourcing relationship types on the perspectives of clients and service providers on the FM outsourcing contracts respectively. All in all, Lo *et al.* (2013) claim that AHP allows for aggregating individual judgments and converts qualitative data into mathematical weightings. It is justifiable to adopt the methodology in fulfilling the research goal.

Validity: It is important to find out whether clients and service providers can understand the outsourcing relationships in the specific FM contract. The multi-nominal logistic regression is selected because the validity of this hypothesis can be tested by calculating the nonlinear relationship between factors (types of FM contract), independent variables (outsourcing relationship dimensions) and dependent variables (outsourcing categories) and maximum likelihood estimation in regression. The validity can be tested by the Hosmer-Lemeshow goodness-of-fit test giving a measure of the agreement between the observed outcomes and the predicted outcomes i.e. types of the outsourcing categories of a specific FM outsourcing contract between client and service provider. This statistic is a test of null hypothesis that the model is good and hence a good model is indicated by p values $\geqq$ 0.05.

Reliability analysis: In order to ensure the instrument producing the same results on client's and service provider's evaluation each time administering to the same person in the same setting, reliability analysis required to apply. The coefficient alpha or Cronbach's alpha (α) is used to measure the internal consistency of the instrument. Before conducting the internal consistency estimates of reliability, it is important to ensure that all items use the same metric (response scale for all items e.g. 1 = very dissatisfied to 5 = very satisfied) and whether any items have to be reverse-scaled. The value of Cronbach's alpha (α) is between 0 and 1. Larger value of alpha is; more consistency for the respondents will be in the test.

Table 5.17 shows the Cronbach's Alphas for measurement scales in corollary 9 from clients' and service providers' perspectives. From the table, it can be seen that the variables scales have a range of coefficients of Cronbach's Alphas between 0.888 and 0.962, which are considered as reasonable (Hair et. al., 2003). This means that the respondents of clients and service providers are consistent on testing the corollary 9 regarding four FM outsourcing categories.

Respondent	Variable	Number of items in the corresponding questionnaire (1)	(2)	(3)	(4)	Total	Cronbach's Alpha
Clients	FM Outsourcing types	1	1	1	1	4	.888
Service provider	FM Outsourcing types	1	1	1	1	4	.962

Remarks:
(1) - FM outsourcing category: In-house team
(2) - FM outsourcing category: Commitment
(3) - FM outsourcing category: Technical expertise
(4) - FM outsourcing category: Common goals

Table 5.17 - Reliability analysis in corollary 9 from clients' and service providers' perspectives

5.6 Overall strengths and limitations of the specific research methods

The outsourcing relationship modes and outsourcing categories can be formally specified in mathematical terms that lead to statistical models. A quantitative approach was applied to solve the research problems with the intention of quantifying these relationships on the basis of the available data and using statistical techniques to appropriately interpret, use or exploit the resulting outcomes. In such models, there is room for deviations from the strict theoretical relationships due to, for example, measurement errors, unpredictable behaviour, optimisation errors or unexpected events (Verbeek, 2004). The function of the statistical approach is to specify and quantify the relationships. It has also been

claimed that the quantitative approach is used to formulate hypotheses in terms of the parameters in the model, and to test their validity. Indeed, the number of techniques that can be used is numerous and their validity often depends crucially on the validity of the underlying assumptions. The assumptions in conducting the data collection process are as follows:

1) The interview and questionnaire respondents are independent, without interference from other external agents or parties.
2) The interview and questionnaire respondents fully understand the context of the research.

The applied research methods have several advantages. A reasonably well-fitting model can be found for the data. First, the quantitative research method will be deployed for measurement. Questionnaire surveys of clients and service providers will be used to collect primary raw data. Second, the collected data will be put into the multi-nominal regression analysis. The use of this regression suggests that the addition of one more independent variable will continue to produce a positive or negative effect on a continual basis. Nonlinear specifications might provide useful insight on an optimal level. This is a regression technique that includes dependent and independent variables, respectively. The former are the FM outsourcing categories and the latter are the FM outsourcing dimensions.

However, these research methods do have limitations. The use of the statistical analysis method means that the coefficients may be difficult to interpret. This can be overcome by studying the relative importance of each variable, rather than the application of the actual model. The study was undertaken in local higher education institutes and universities. Thus, the samples are localised in a single business environment, i.e. higher education. A substantial sample size is of paramount importance in this research. Therefore, the sample size of the survey group can be resorted to expand with the intention of including as many of the clients and service providers of the local tertiary institutes and universities as possible.

The findings, which highlight the perspectives of the responding education institutions, could be applied to the FORT found among other types of business environments. Generalising the results to other business environments will be rather difficult from an experiment with only one type of sample. The value or contribution of this study's findings lies in the methods and techniques used to identify the outsourcing relationship types influencing the independent variables. The analysis of FM service providers' performance by FORT in other business environments could be pursued through a similar approach.

In this study, the Delphi technique is used to extract the critical success factors rather than a factor analysis. The details of the Delphi technique are explained in the previous section. As for factor analytic techniques (Hair et al., 2006), they also pose some major limitations. The subjective aspects of factor analysis (i.e. deciding how many factors to extract, which technique should be used to rotate the factor axes, which factor loadings are significant) are all subject to many differences of opinion. The problem of reliability also exists.

5.7 Chapter summary

In this research, an exploratory Four Outsourcing Relationship Types model in FM was investigated in three main stages. The specific research methodologies have been employed to test the designated nine corollaries. Simple procedures of research method are listed as following sections.

This chapter sets out the research design and methodology adopted in the current study. The primary methods of collecting data were questionnaire surveys and focus groups. These two methods were related but they were designed to collect different kinds of data and were conducted separately. Prior to sending out questionnaires and conducting Delphi survey, pilot studies were carried out to identify possible areas for improvement. In this chapter, the research framework is first presented, followed by a discussion on the data collection process, development of the questionnaire, and the sample used. It concludes with a presentation of the methods used to analyse the data.

Despite various kinds of methodology, there is the appropriate one which is more or less useful, which can be employed in research projects to achieve their objectives (Sekaran, 2003 and Saunders *et al*., 2003). This chapter has described the instruments that have been employed in this study, and the rationale and justification behind the use of each instrument. In general, it has focused on the research design and methodology employed to achieve the research objectives. Again, decision and strategies regarding the population and sample selection were also illustrated. Usable questionnaires by 34 service providers and 38 FM staffs in clients were completed which represent a satisfactory response rate of 41% of service providers and 41% of FM staffs in clients. It has been found that the questionnaire is considered to be the most appropriate tool for data collection in this research.

Afterwards, a detailed description of the procedures conducted in the pre-testing stages, a pilot study and translating questionnaires (parallel blind technique), is provided. Hypotheses testing and statistical analysis techniques have been discussed in more detail, and the rationale for using such techniques has also been discussed. As for data analysis of this study, frequencies descriptions, non-parametric tests (Kruskal Wallis and Mann-whitney U test), and multi-nominal logistic regression analysis have been seen as the most appropriate statistical techniques. Finally, this chapter ended by discussing the crucial issues of validity and reliability.

The next two chapters will be dedicated to analyzing and interpreting the results obtained from the application of the research methodology detailed in this chapter.

CHAPTER 6 EMPIRICAL DATA ANALYSIS AND HYPOTHESES TESTING

6.1 Introduction

This chapter presents and analyses empirical data that is used to test the proposed hypothesis and nine corollaries. The discussion of respondents' characteristics will provide a full picture of the clients and service providers in the local higher tertiary institutes and universities investigated in this study. There are two main sections in this chapter. The first section describes the characteristics of the sample (clients and service providers), such as academic standard, learning and working experience in FM, chartered construction professionals and current outsourcing contracts. Frequency analysis has been used to distribute the respondents according to the many characteristics. The main objective of the second section is to test the nine corollaries. The statistical techniques that are employed for testing these hypotheses are Kruskal-Wallis test, Mann-Whitney U test, and multi-nominal logistic regression. At the end of this section, a summary table of these corollaries has been made that outlines which corollaries have been rejected and which accepted.

6.2 Data analysis of Delphi surveys

This research is to apply the Delphi technique for collection of the critical success factors of the outsourcing strategies in the perspectives of clients and service providers. This survey was conducted in April of 2011.

6.2.1 Result of round 1 of the Delphi questionnaire

The result of critical success factors in FM outsourcing in round 1 of the Delphi survey are figured out as the following tables. The total number of participated clients is fourteen while the total number of participated service providers is eight. The boxes in grey are the top four common critical success factors altogether agreed by the FM experts in the panels of clients and service providers in Round 1 of the Delphi experiment. More than 50% clients agree the importance of competence and cost. Around 40% clients consider the importance of allocation of resources, coordination and customer satisfaction.

Clients: Critical success factors for outsourcing strategies	**Total Frequency**	**Percentage**	**Rank**
Specific FM competence required for specialist facilities	9	64	1
Cost effectiveness (i.e. productivity)	7	50	2
Measurement on performance (i.e. assessment on service providers)	7	50	2
Allocation of capital resources (i.e. utilization of budget)	6	43	4
Co-ordination between the facilities manager and functional units on operational level	6	43	4
Allocation of human resources (i.e. senior management to junior)	6	43	4
Procurement strategies (i.e. details in contract administration)	5	36	7
Value of customers satisfaction	5	36	7
FM practice and whole life cycle processes	5	36	7
General FM competence (e.g. real estate and strategic planning, operations and maintenance, etc)	4	29	10
Conformance to specification requirements of services	4	29	10
Methods for defect rectification	4	29	10
Design of organisation structure (e.g. open or closed management)	3	21	13
Space measurement (i.e. space management)	3	21	13
Speed of off site electronic information infrastructural support	3	21	13
Core skills of facilities managers (e.g. innovative thinking, listening and negotiating capacities, etc)	3	21	13
Collaboration of team-work among executives by innovative physical workplace design	3	21	13
Geographical spread of facilities (local, regional, international)	3	21	13

Resource sharing on people, budget, systems, information and organisation structure	3	21	13
Support on defect prevention	3	21	13
Choice of IT equipments (e.g. computing hardware systems)	2	14	21
Flow of information (e.g. physical or non-physical delivery)	2	14	21
IT enabling learning competence	2	14	21
Integration of work procedures with workplace design	2	14	21
Cost of non-conformance work	2	14	21
Design and availability of user oriented services	2	14	21
Measurement on quality of work	2	14	21
Choice of mechanical and electrical plants (e.g. building services)	1	7	28
Choice of firm infrastructure systems (e.g. internet network)	1	7	28
Capability transfer on business knowledge and management processes	1	7	28
Alignment of group/individual cultures within organisation	1	7	28
Choice of on site communication method	1	7	28
Awareness of corporate social responsibility	1	7	28
Excellence of value-added services	1	7	28
Design of inventory list (i.e. a detailed report of assets)	0	0	35
Clients' objectives	0	0	35

Table 6.1 - Critical success factors for outsourcing strategies in round 1 Delphi survey (Clients)

More than 50% service providers agree the importance of core skills, co-ordination and procurement. 50% service providers agree the importance of performance, resources and customer satisfaction. Around 40% service providers consider the importance of practice, cost, organisation structure, competence,

defect rectification and value-added services.

Service Providers: Critical success factors for outsourcing strategies	**Total Frequency**	**Percentage**	**Rank**
Core skills of facilities managers (e.g. innovative thinking, listening and negotiating capacities, etc)	6	75	1
Co-ordination between the facilities manager and functional units on operational level	5	63	2
Procurement strategies (i.e. details in contract administration)	5	63	2
Measurement on performance (i.e. assessment on service providers)	4	50	4
Allocation of human resources (i.e. senior management to junior)	4	50	4
Value of customers satisfaction	4	50	4
FM practice and whole life cycle processes	3	38	7
Cost effectiveness (i.e. productivity)	3	38	7
Flow of information (e.g. physical or non-physical delivery)	3	38	7
Design of organisation structure (e.g. open or closed management)	3	38	7
Specific FM competence required for specialist facilities	3	38	7
Resource sharing on people, budget, systems, information and organisation structure	3	38	7
Methods for defect rectification	3	38	7
Excellence of value-added services	3	38	7
Allocation of capital resources (i.e. utilization of budget)	2	25	15
Measurement on quality of work	2	25	15
Space measurement (i.e. space management)	2	25	15
Alignment of group/individual cultures within organisation	2	25	15
Choice of on site communication method	2	25	15
Geographical spread of facilities (local, regional,	1	13	20

international)			
General FM competence (e.g. real estate and strategic planning, operations and maintenance, etc)	1	13	20
Choice of mechanical and electrical plants (e.g. building services)	1	13	20
Choice of IT equipments (e.g. computing hardware systems)	1	13	20
Integration of work procedures with workplace design	1	13	20
Conformance to specification requirements of services	1	13	20
Support on defect prevention	1	13	20
Clients' objectives	1	13	20
Choice of firm infrastructure systems (e.g. internet network)	0	0	28
Design of inventory list (i.e. a detailed report of assets)	0	0	28
IT enabling learning competence	0	0	28
Capability transfer on business knowledge and management processes	0	0	28
Speed of off site electronic information infrastructural support	0	0	28
Collaboration of team-work among executives by innovative physical workplace design	0	0	28
Cost of non-conformance work	0	0	28
Awareness of corporate social responsibility	0	0	28
Design and availability of user oriented services	0	0	28

Table 6.2 - Critical success factors for outsourcing strategies in round 1 Delphi survey (Service providers)

6.2.2 Result of round 2 of the Delphi questionnaire

The result of critical success factors in FM outsourcing in round 2 of the Delphi survey are figured out as the following tables. The total number of participated

clients is fourteen while the total number of participated service providers is eight. The boxes in grey are the top critical success factors selected for further study based on a criterion that at least 50% of experts selected them in this round. More than 60% clients agree the importance of competence and performance. Around 60% clients consider the importance of cost and coordination.

Clients: Critical success factors for outsourcing strategies	**Total Frequency**	**Percentage**	**Rank**
Specific FM competence required for specialist facilities	9	64	1
Measurement on performance (i.e. assessment on service providers)	9	64	1
Cost effectiveness (i.e. productivity)	8	57	3
Co-ordination between the facilities manager and functional units on operational level	8	57	3
Allocation of human resources (i.e. senior management to junior)	5	36	5
Procurement strategies (i.e. details in contract administration)	5	36	5
Value of customers satisfaction	5	36	5
FM practice and whole life cycle processes	5	36	5
General FM competence (e.g. real estate and strategic planning, operations and maintenance, etc)	5	36	5
Allocation of capital resources (i.e. utilization of budget)	4	29	10
Conformance to specification requirements of services	4	29	10
Methods for defect rectification	3	21	12
Design of organisation structure (e.g. open or closed management)	3	21	12
Space measurement (i.e. space management)	3	21	12
Speed of off site electronic information infrastructural support	3	21	12
Core skills of facilities managers (e.g. innovative	3	21	12

thinking, listening and negotiating capacities, etc)			
Collaboration of team-work among executives by innovative physical workplace design	3	21	12
Geographical spread of facilities (local, regional, international)	3	21	12
Flow of information (e.g. physical or non-physical delivery)	3	21	12
Resource sharing on people, budget, systems, information and organisation structure	2	14	20
Support on defect prevention	2	14	20
Choice of IT equipments (e.g. computing hardware systems)	2	14	20
IT enabling learning competence	2	14	20
Design and availability of user oriented services	2	14	20
Measurement on quality of work	2	14	20
Excellence of value-added services	2	14	20
Integration of work procedures with workplace design	1	7	27
Cost of non-conformance work	1	7	27
Choice of mechanical and electrical plants (e.g. building services)	1	7	27
Choice of firm infrastructure systems (e.g. internet network)	1	7	27
Capability transfer on business knowledge and management processes	1	7	27
Choice of on site communication method	1	7	27
Awareness of corporate social responsibility	1	7	27
Alignment of group/individual cultures within organisation	0	0	34
Design of inventory list (i.e. a detailed report of assets)	0	0	34
Clients' objectives	0	0	34

Table 6.3 - Critical success factors for outsourcing strategies in round 2 Delphi survey (Clients)

More than 80% service providers agree the importance of co-ordination. Around 60% to 70% service providers agree the importance of procurement and core skills. 50% service providers consider the importance of performance, resources, practice, cost and customer satisfaction.

Service Providers: Critical success factors for outsourcing strategies	**Total Frequency**	**Percentage**	**Rank**
Co-ordination between the facilities manager and functional units on operational level	7	88	1
Core skills of facilities managers (e.g. innovative thinking, listening and negotiating capacities, etc)	6	75	2
Procurement strategies (i.e. details in contract administration)	5	63	3
Measurement on performance (i.e. assessment on service providers)	4	50	4
Allocation of human resources (i.e. senior management to junior)	4	50	4
FM practice and whole life cycle processes	4	50	4
Cost effectiveness (i.e. productivity)	4	50	4
Value of customers satisfaction	4	50	4
Resource sharing on people, budget, systems, information and organisation structure	4	50	4
Flow of information (e.g. physical or non-physical delivery)	3	38	10
Specific FM competence required for specialist facilities	3	38	10
Excellence of value-added services	3	38	10
Design of organisation structure (e.g. open or closed management)	2	25	13
Allocation of capital resources (i.e. utilization of budget)	2	25	13
Methods for defect rectification	2	25	13
Measurement on quality of work	1	13	16
Space measurement (i.e. space management)	1	13	16

Alignment of group/individual cultures within organisation	1	13	16
Choice of on site communication method	1	13	16
General FM competence (e.g. real estate and strategic planning, operations and maintenance, etc)	1	13	16
Choice of mechanical and electrical plants (e.g. building services)	1	13	16
Choice of IT equipments (e.g. computing hardware systems)	1	13	16
Conformance to specification requirements of services	1	13	16
Clients' objectives	1	13	16
Integration of work procedures with workplace design	0	0	25
Support on defect prevention	0	0	25
Geographical spread of facilities (local, regional, international)	0	0	25
Choice of firm infrastructure systems (e.g. internet network)	0	0	25
Design of inventory list (i.e. a detailed report of assets)	0	0	25
IT enabling learning competence	0	0	25
Capability transfer on business knowledge and management processes	0	0	25
Speed of off site electronic information infrastructural support	0	0	25
Collaboration of team-work among executives by innovative physical workplace design	0	0	25
Cost of non-conformance work	0	0	25
Awareness of corporate social responsibility	0	0	25
Design and availability of user oriented services	0	0	25

Table 6.4 - Critical success factors for outsourcing strategies in round 2 Delphi survey (Service providers)

The identified critical success factors from clients and service providers are used to measure the four FM outsourcing relationship dimensions for the design of questionnaires. It is important that identification on those factors can examine the design of outsourcing strategies from the two stakeholders.

6.3 Study sample description

This section is mainly concerned with presenting a descriptive analysis of the sample. It aims to give a brief description of the clients and service providers of the Hong Kong's tertiary institutes and the universities participating in this study. To further supplement information gained from the questionnaire, the researcher held a focus group to meet with the FM experts to obtain more detailed information regarding the local FM practice and outsourcing practice. This study includes ten tertiary campuses under the Vocational Training Council of Hong Kong and eight local universities respectively. According to the distribution of local Governmental funding, those institutes and universities totally represent more than around 90% in the local higher education sector.

6.3.1 Client sample description according to academic standard, learning and working experience in FM

Table 6.5 shows variables with regard to academic standard. The category at least having higher diploma represented 11% and at least having bachelor's degree represented 15%, while the category at least having master's degree represented 74%. In short, the sample was biased towards the master's degree category, which represented 74% of the total, and had fewer representatives of both higher diploma and bachelor's degree categories. On one hand, the 60% of the FM professionals were less represented as a considerable portion of this group were not studied any course with FM related module(s), and consequently did not have related academic and learning experience. But on the other hand, the 40% of the FM professionals were much represented as a considerable portion of this group were studied any course with FM related module(s), and consequently had related academic and learning experience.

This difference can be due to various reasons. The first reason is that the development of the profession of FM practice still grows in the embryonic stage in Hong Kong. In the past decade, there were no many experienced FM strategists studied FM related subjects. In full time study, they generally studied the building related courses. Secondly, the local tertiary institutes and universities have also focused to launch the building and architectural related courses mainly in past decade. This reflected lacking the comprehensive development and organization for degree and master courses of FM locally.

		No. of FM professionals involved	Percentage
Academic standard	Having Higher Diploma	4	11
	Having Bachelor's degree	6	15
	Having Master's degree	28	74
Learning experience	Studied course with FM related module(s)	15	40
	Studied course without FM related module(s)	23	60
Working experience in FM	Less than three years	15	40
	Equal or more than three years	23	60

Table 6.5 - The sample distribution according to academic standard, learning and working experience in facilities management of clients' sample

Table 6.5 also shows that 40% of the FM professionals in clients' side have FM related experience less than 3 years while FM professionals in clients' side have FM related experience equal or more than 3 years accounted for 60%. In summary with regard to respondents' educational level, Table 6.7 shows that the majority of FM strategists in clients are master holders (74%), with 15% of bachelor degree holders, while higher diploma holders represented 11%.

6.3.2 Client sample description according to chartered construction professionals, types of FM and construction professionals

In terms of nature of professionals, it can be seen from Table 6.6 that chartered builder represented 18% and chartered surveyor and Chartered building services engineer represented 10% while certified facility manager had 7% and registered professional housing manager had 5% respectively. Others were including for 10%.

		No. of FM professionals involved	Percentage
Chartered construction professionals	Chartered builder	7	18
	Chartered surveyor	4	10
	Chartered building services engineer	4	10
FM professionals	Certified facility manager	3	7
	Registered professional housing manager	2	5
Others	Professionalism in built environment	4	10
	No profession	14	40

Table 6.6 - The sample distribution according to nature of professionals of clients' sample

As shown in Table 6.6 the chartered builder ranks top in terms of number of respondents 18%. This is due to it being ranked first in terms of the number of professionals, followed by the chartered surveyor and chartered building services engineer (10%). The certified facility manager ranks third (7%). Although the percentage of the registered professional housing manager was 5%, which is the lowest percentage, it is worth mentioning that this low percentage is due to the low

response rate from the few housing managers in clients.

6.3.3 Client sample description according to types of current outsourcing contracts

Table 6.7 shows variables with regard to the types of current outsourcing contract in the client's organisations. The building maintenance category represented 31%, the security category represented 28%, and the cleaning category represented the respondents at 25%. While the catering category and above represented 10%. The other categories include capital project, IT, landscaping and horticulture and high risk waste management representing 1%, 1%, 3% and 1% respectively.

		No. of FM professionals involved	Percentage
Types of general outsourcing contracts	Building maintenance	26	31
	Security	23	28
	Cleaning	21	25
	Catering	8	10
Types of special outsourcing contracts	Capital project	1	1
	IT	1	1
	Landscaping and horticulture	2	3
	High risk waste management	1	1

Table 6.7 - The sample distribution according to types of current outsourcing contracts of clients' sample

6.3.4 Service provider sample description according to academic standard, learning and working experience in FM

Table 6.8 shows variables with regard to academic standard. The category at least having higher diploma represented 12% and at least having bachelor's degree

represented 24%, while the category at least having master's degree represented 64%. In short, the sample was biased towards the master's degree category, which represented 64% of the total, and higher diploma and bachelor's degree categories had fewer representatives of 12% and 24%. On one hand, the 41% of the FM professionals were less represented as a considerable portion of this group were not studied any course with FM related module(s), and consequently did not have related academic and learning experience. But on the other hand, the 59% of the FM professionals were much represented as a considerable portion of this group were studied any course with FM related module(s), and consequently had related academic and learning experience.

This difference can be due to various reasons. The first reason is that the development of the profession of FM practice still grows in the embryonic stage in Hong Kong. In the past decade, there were no many experienced FM strategists studied FM related subjects. In full time study, they generally studied the building related courses. Secondly, the local tertiary institutes and universities have also focused to launch the building and architectural related courses mainly in past decade. This reflected lacking the comprehensive development and organization for degree and master courses of FM locally.

		No. of FM professionals involved	Percentage
Academic standard	Having Higher Diploma	4	12
	Having Bachelor's degree	8	24
	Having Master's degree	22	64
Learning experience	Studied course with FM related module(s)	20	59
	Studied course without FM related module(s)	14	41
Working experience in FM	Less than three years	7	20
	More than three years	27	80

Table 6.8 - The sample distribution according to academic standard, learning and working experience in FM of service providers' sample

Table 6.8 shows that 20% of the FM professionals in service providers' side have FM related experience less than 3 years while FM professionals in service providers' side have FM related experience equal or more than 3 years accounted for 80%. With regard to respondents' educational level, Table 6.10 shows that the majority of FM strategists in service providers are master's degree holders (64%), with 12% of higher diploma holders, while bachelor's degree service providers represented 24%.

6.3.5 Service provider sample description according to chartered construction professionals, types of FM and construction professionals

In terms of nature of professionals, it can be seen from Table 6.9 that chartered builder and chartered surveyor both represented 15%. Chartered building services engineer represented 6% while certified facility manager and registered professional housing manager had 12% respectively. Others were including professionalism in built environment for 18%.

		No. of FM professionals involved	Percentage
Chartered construction professionals	Chartered builder	5	15
	Chartered surveyor	5	15
	Chartered building services engineer	2	6
FM professionals	Certified facility manager	4	12
	Registered professional housing manager	4	12
Others	Professionalism in built environment	6	18
	None	8	22

Table 6.9 - The sample distribution according to nature of professionals service providers' sample

As shown in Table 6.9 the professionalism in built environment ranks top in terms of number of respondents 18%. This is due to it being ranked first in terms of the number of professionals, followed by the chartered builder and chartered surveyor (15%). The certified facility manager and registered professional housing manager rank third (12%). Although the percentage of the chartered building services engineer was 6%, which is the lowest percentage, it is worth mentioning that this low percentage is due to the low response rate from the facilities strategists in service providers.

6.3.6 Service provider sample description according to types of current outsourcing contracts

Table 6.10 shows variables with regard to the types of current outsourcing contract in the client's organisations. The building maintenance category represented 39%, the security category represented 25%, and the cleaning and catering categories represented 17%. While the landscaping and horticulture category represented 2%.

		No. of FM professionals involved	Percentage
Types of general outsourcing contracts	Building maintenance	23	39
	Security	15	25
	Cleaning	10	17
	Catering	10	17
Types of special outsourcing contracts	Landscaping and horticulture	1	2

Table 6.10 - The sample distribution according to types of current outsourcing contracts service providers' sample

Lastly, as mentioned previously, higher educational sector covered by this study

ranging from tertiary campuses under the Vocational Training Council of Hong Kong to local Government funded universities. The distributions of respondents according to the types of current outsourcing contracts were shown in Table 6.7 and Table 6.10 which indicate that the distributions in clients and service providers are similar in that the smallest and largest groups are almost the same. The building maintenance contract ranked top (31%), followed by the security contract (28%), followed by the cleaning contract (25%), followed by the catering contract (10%) while other contract was the smallest group representing 6% of the sample.

The above discussion has shown and described the study sample (clients and service providers) characteristics. It has been found that the sample was biased towards the master's degree holders, where the percentage of respondents having equal or more than three FM related experience (clients and service providers) was very high (60% and 80%) respectively. Furthermore, it can be seen from the previous discussion that the study sample are well-educated. Finally, and regarding the nature of professionals in the two stakeholders, it was indicated that almost 18% of the respondents from clients are the chartered builder, while the percentage of the respondents from service providers who are the other professionalism in built environment was also 18%.

6.4 Testing the hypothesis and corollaries

The main objective of this section is to test the nine corollaries concerning the determinants of outsourcing relationship dimensions, strategic manoeuvres, clients' and service providers' evaluation regarding outsourcing category and outsourcing relationship types. The statistical techniques employed for testing these corollaries 1 to 8 are the Mann-Whitney U test (only two groups of continuous variables in the background of construction professionals) and Kruskal-Wallis test (continuous variable for three or more groups in the types of current outsourcing contracts) and corollary 9 is Multi-nominal Logistic Regression (similar to logistic regression, but more general as the dependent variable not restricted to two categories in four outsourcing categories). The justification of these techniques is reported on section 5.5 of chapter 5. Nine main corollaries have been tested as follows.

6.4.1 Testing the corollary 1

As seen earlier, researchers and practitioners have found that IT clients consider four dimensions in their assessments of outsourcing category between clients and service providers (Kishore et. al., 2003).

* Support: requiring assistance
* Alignment: technical expertise
* Reliance: service commitment
* Alliance: common goals

Client C1 (a)

The Mann-Whitney test has been used to test for differences between two independent groups on a continuous measure. It can be seen from the following table that there is no statistical significant difference with a two-tailed p value. The probability value (p) is not less than or equal to 0.05, that to say there is no statistically significant difference in the perceived four outsourcing relationship dimensions rendered to two kinds of FM strategists.

Result on Nonparametric Tests (Clients): Mann-Whitney U Test comparing four FM outsourcing relationship dimensions in FM professions of building and building services

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Ownership (professional knowledge) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.025	Reject the null hypothesis.
2	The distribution of Ownership (infrastructure technology) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.068	Retain the null hypothesis.
3	The distribution of Ownership (computing system) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.642	Retain the null hypothesis.
4	The distribution of Ownership (communication system) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.153	Retain the null hypothesis.
5	The distribution of Ownership (efficiency of equipment) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.027	Reject the null hypothesis.
6	The distribution of Control (infrastructure) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.036	Reject the null hypothesis.
7	The distribution of Control (equipment) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.035	Reject the null hypothesis.
8	The distribution of Control (human resources) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.097	Retain the null hypothesis.
9	The distribution of Control (daily routine operation) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.138	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Control (job) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.482	Retain the null hypothesis.
11	The distribution of Control (deadlines) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.334	Retain the null hypothesis.
12	The distribution of Control (co-ordination meeting) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.154	Retain the null hypothesis.
13	The distribution of Control (expense) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.281	Retain the null hypothesis.
14	The distribution of Competitive position (competence) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.075	Retain the null hypothesis.
15	The distribution of Competitive position (accuracy) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.120	Retain the null hypothesis.
16	The distribution of Competitive position (productivity) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.131	Retain the null hypothesis.
17	The distribution of Competitive position (technical competence) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.129	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
18	The distribution of Competitive position (comprehensive service) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.045	Retain the null hypothesis.
19	The distribution of Competitive position (time frame) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.187	Retain the null hypothesis.
20	The distribution of Long-term plan (policy) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.019	Reject the null hypothesis.
21	The distribution of Long-term plan (plan) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.028	Reject the null hypothesis.
22	The distribution of Long-term plan (work) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.056	Retain the null hypothesis.
23	The distribution of Long-term plan (safety and health) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.055	Retain the null hypothesis.
24	The distribution of Long-term plan (human resources) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.343	Retain the null hypothesis.
25	The distribution of Long-term plan (administration) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.152	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
26	The distribution of Long-term plan (quality) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.075	Retain the null hypothesis.
27	The distribution of Long-term plan (environmental protection) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.091	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

(Client) C1 (b)

To test the validity of this hypothesis, the Kruskal-Wallis test was used to examine the differences of FM strategists' evaluation of the four outsourcing relationship dimensions rendered to them in different types of current outsourcing contracts. There is no statistical significant difference with a p value. The probability value (p) is not less than or equal to 0.05. It can be seen from the following table that there are no significant statistical differences in FM strategists' evaluation of the four outsourcing relationship dimensions rendered to them in different types of current outsourcing contracts. This means that all types of profession render the same perceived four outsourcing relationship dimensions from the FM strategists' point of view, in terms of the outsourcing contracts.

Result on Nonparametric Tests (Clients): Kruskal-Wallis Test comparing four FM outsourcing relationship dimensions in four FM Outsourcing contracts (Building maintenance, Security, Cleaning and Catering)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Ownership (professional knowledge) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.451	Retain the null hypothesis.
2	The distribution of Ownership (infrastructure technology) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.859	Retain the null hypothesis.
3	The distribution of Ownership (computing system) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.937	Retain the null hypothesis.
4	The distribution of Ownership (communication system) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.700	Retain the null hypothesis.
5	The distribution of Ownership (efficiency of equipment) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.252	Retain the null hypothesis.
6	The distribution of Control (infrastructure) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.907	Retain the null hypothesis.
7	The distribution of Control (equipment) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.864	Retain the null hypothesis.
8	The distribution of Control (human resources) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.976	Retain the null hypothesis.
9	The distribution of Control (daily routine operation) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.789	Retain the null hypothesis.
10	The distribution of Control (job) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.939	Retain the null hypothesis.
11	The distribution of Control (deadlines) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.727	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of Control (co-ordination meeting) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.968	Retain the null hypothesis.
13	The distribution of Control (expense) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.604	Retain the null hypothesis.
14	The distribution of Competitive position (competence) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.
15	The distribution of Competitive position (accuracy) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.840	Retain the null hypothesis.
16	The distribution of Competitive position (productivity) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.761	Retain the null hypothesis.
17	The distribution of Competitive position (technical competence) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.706	Retain the null hypothesis.
18	The distribution of Competitive position (comprehensive service) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.730	Retain the null hypothesis.
19	The distribution of Competitive position (time frame) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.658	Retain the null hypothesis.
20	The distribution of Long-term plan (policy) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.446	Retain the null hypothesis.
21	The distribution of Long-term plan (plan) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.339	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Long-term plan (work) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.590	Retain the null hypothesis.
23	The distribution of Long-term plan (safety and health) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
24	The distribution of Long-term plan (human resources) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.839	Retain the null hypothesis.
25	The distribution of Long-term plan (administration) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.647	Retain the null hypothesis.
26	The distribution of Long-term plan (quality) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.754	Retain the null hypothesis.
27	The distribution of Long-term plan (environmental protection) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.509	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Service Provider C1 (a)

Service providers' evaluations regarding four outsourcing relationship dimensions rendered to them are not different according to the background of construction professionals.

The Mann-Whitney test has been used to test for differences between two independent groups on a continuous measure. It can be seen from the following table that there is no statistical significant difference with a two-tailed p value. The probability value (p) is not less than or equal to 0.05, that to say there is no statistically significant difference in the perceived four outsourcing relationship dimensions rendered to two kinds of FM strategists.

Result on Nonparametric Tests (Service provider): Mann-Whitney U Test comparing four FM outsourcing relationship dimensions in FM professions of building and building services

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Ownership (equipment or machinery) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.665	Retain the null hypothesis.
2	The distribution of Ownership (professional knowledge) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.803	Retain the null hypothesis.
3	The distribution of Ownership (completion on request) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.385	Retain the null hypothesis.
4	The distribution of Ownership (capability) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.
5	The distribution of Ownership (resources) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.421	Retain the null hypothesis.
6	The distribution of Control (professional knowledge) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.875	Retain the null hypothesis.
7	The distribution of Control (finishing on time) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.754	Retain the null hypothesis.
8	The distribution of Control (coordination meeting) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.
9	The distribution of Competitive position (financial capability) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.835	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Competitive position (human resources) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.865	Retain the null hypothesis.
11	The distribution of Competitive position (assistance) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.840	Retain the null hypothesis.
12	The distribution of Competitive position (capability) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.554	Retain the null hypothesis.
13	The distribution of Competitive position (accuracy) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.500	Retain the null hypothesis.
14	The distribution of Competitive position (productivity) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.281	Retain the null hypothesis.
15	The distribution of Competitive position (technical competence) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.765	Retain the null hypothesis.
16	The distribution of Competitive position (focus) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.379	Retain the null hypothesis.
17	The distribution of Competitive position (responsibility) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.879	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
18	The distribution of Competitive position (conduct) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.
19	The distribution of Competitive position (courteousness) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.553	Retain the null hypothesis.
20	The distribution of Competitive position (understanding) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.754	Retain the null hypothesis.
21	The distribution of Competitive position (comprehensive service) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.646	Retain the null hypothesis.
22	The distribution of Competitive position (responsibilities) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.655	Retain the null hypothesis.
23	The distribution of Competitive position (quality) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.839	Retain the null hypothesis.
24	The distribution of Competitive position (satisfaction) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.
25	The distribution of Competitive position (expectation) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
26	The distribution of Long-term plan (Competing job) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.787	Retain the null hypothesis.
27	The distribution of Long-term plan (policy) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.118	Retain the null hypothesis.
28	The distribution of Long-term plan (plan) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.736	Retain the null hypothesis.
29	The distribution of Long-term plan (work) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.959	Retain the null hypothesis.
30	The distribution of Long-term plan (safety and health) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.769	Retain the null hypothesis.
31	The distribution of Long-term plan (human resources) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.702	Retain the null hypothesis.
32	The distribution of Long-term plan (administration) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.572	Retain the null hypothesis.
33	The distribution of Long-term plan (quality) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.843	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
34	The distribution of Long-term plan (social responsibility) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.234	Retain the null hypothesis.
35	The distribution of Long-term plan (value-added services) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.726	Retain the null hypothesis.
36	The distribution of Long-term plan (environmental management) is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.559	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Service Provider C1 (b)

Service providers' evaluations regarding four outsourcing relationship dimensions rendered to them are not different according to the types of current outsourcing contracts.

To test the validity of this hypothesis, the Kruskal-Wallis test was used to examine the differences of FM strategists' evaluation of the four outsourcing relationship dimensions rendered to them in different types of current outsourcing contracts. There is no statistical significant difference with a p value. The probability value (p) is not less than or equal to 0.05. It can be seen from the following table, that there are no significant statistical differences in FM strategists' evaluation of the four outsourcing relationship dimensions rendered to them in different types of current outsourcing contracts. This means that all types of profession render the same perceived four outsourcing relationship dimensions from the FM strategists' point of view, in terms of the outsourcing contracts.

Result on Nonparametric Tests (Service provider): Kruskal-Wallis Test comparing four FM outsourcing relationship dimensions in four FM Outsourcing contracts (Building maintenance, Security, Cleaning and Catering)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Ownership (equipment or machinery) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.992	Retain the null hypothesis.
2	The distribution of Ownership (professional knowledge) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.906	Retain the null hypothesis.
3	The distribution of Ownership (completion on request) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.542	Retain the null hypothesis.
4	The distribution of Ownership (capability) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.712	Retain the null hypothesis.
5	The distribution of Ownership (resources) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.611	Retain the null hypothesis.
6	The distribution of Control (professional knowledge) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.870	Retain the null hypothesis.
7	The distribution of Control (finishing on time) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.856	Retain the null hypothesis.
8	The distribution of Control (coordination meeting) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.701	Retain the null hypothesis.
9	The distribution of Competitive position (financial capability) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.564	Retain the null hypothesis.
10	The distribution of Competitive position (human resources) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.528	Retain the null hypothesis.
11	The distribution of Competitive position (assistance) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.685	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of Competitive position (capability) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.839	Retain the null hypothesis.
13	The distribution of Competitive position (accuracy) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.944	Retain the null hypothesis.
14	The distribution of Competitive position (productivity) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.475	Retain the null hypothesis.
15	The distribution of Competitive position (technical competence) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.941	Retain the null hypothesis.
16	The distribution of Competitive position (focus) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.800	Retain the null hypothesis.
17	The distribution of Competitive position (responsibility) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.983	Retain the null hypothesis.
18	The distribution of Competitive position (conduct) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.994	Retain the null hypothesis.
19	The distribution of Competitive position (courteousness) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.957	Retain the null hypothesis.
20	The distribution of Competitive position (understanding) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.817	Retain the null hypothesis.
21	The distribution of Competitive position (comprehensive service) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.219	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Competitive position (responsibilities) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.691	Retain the null hypothesis.
23	The distribution of Competitive position (quality) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.328	Retain the null hypothesis.
24	The distribution of Competitive position (satisfaction) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.858	Retain the null hypothesis.
25	The distribution of Competitive position (expectation) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.973	Retain the null hypothesis.
26	The distribution of Long-term plan (Competing job) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.761	Retain the null hypothesis.
27	The distribution of Long-term plan (policy) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.770	Retain the null hypothesis.
28	The distribution of Long-term plan (plan) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.959	Retain the null hypothesis.
29	The distribution of Long-term plan (work) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.923	Retain the null hypothesis.
30	The distribution of Long-term plan (safety and health) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.467	Retain the null hypothesis.
31	The distribution of Long-term plan (human resources) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.497	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Long-term plan (administration) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.558	Retain the null hypothesis.
33	The distribution of Long-term plan (quality) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.697	Retain the null hypothesis.
34	The distribution of Long-term plan (social responsibility) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.863	Retain the null hypothesis.
35	The distribution of Long-term plan (value-added services) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.641	Retain the null hypothesis.
36	The distribution of Long-term plan (environmental management) is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

6.4.2 Testing corollaries 2 to 8

Client

(Client) C2a: Clients' evaluations regarding minimizing customization rendered to them do not differ according to the background of construction professionals.

(Client) C3a: Clients' evaluations regarding enhancing process maturity rendered to them do not differ according to the background of construction professionals.

(Client) C4a: Clients' evaluations regarding retaining in-house competence rendered to them do not differ according to the background of construction professionals.

(Client) C5a: Clients' evaluations regarding multiple sourcing rendered to them do not differ according to the background of construction professionals.

(Client) C6a: Clients' evaluations regarding leveraging on vendor interoperability rendered to them do not differ according to the background of construction

professionals.

(Client) C7a: Clients' evaluations regarding proactive sensing rendered to them do not differ according to the background of construction professionals.

(Client) C8a: Clients' evaluations regarding enhancing partnership quality rendered to them do not differ according to the background of construction professionals.

The Mann-Whitney test has been used to test for differences between two independent groups on a continuous measure. It can be seen from the following table that there is no statistical significant difference with a two-tailed p value. The probability value (p) is not less than or equal to 0.05, that to say there is no statistically significant difference in the perceived strategic manoeuvres (Five theories) rendered to two kinds of FM strategists.

Result on Nonparametric Tests (Clients): Mann-Whitney U Test comparing strategic manoeuvres (Five theories) in FM professions of building and building services

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.734	Retain the null hypothesis.
2	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.433	Retain the null hypothesis.
3	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.467	Retain the null hypothesis.
4	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.501	Retain the null hypothesis.
5	The distribution of Agency Cost Theory (Process Maturity) - b1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.456	Retain the null hypothesis.
6	The distribution of Agency Cost Theory (Process Maturity) - b2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.542	Retain the null hypothesis.
7	The distribution of Agency Cost Theory (Process Maturity) - b3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.504	Retain the null hypothesis.
8	The distribution of Agency Cost Theory (In-House Competence) - e1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.703	Retain the null hypothesis.
9	The distribution of Agency Cost Theory (In-House Competence) - e2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.316	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Agency Cost Theory (In-House Competence) - e3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.392	Retain the null hypothesis.
11	The distribution of Resource Dependency Theory (Vendor Interoperability) - c1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.962	Retain the null hypothesis.
12	The distribution of Resource Dependency Theory (Vendor Interoperability) - c2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.964	Retain the null hypothesis.
13	The distribution of Resource Dependency Theory (Vendor Interoperability) - c3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.433	Retain the null hypothesis.
14	The distribution of Resource Dependency Theory (Vendor Interoperability) - c4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.265	Retain the null hypothesis.
15	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.209	Retain the null hypothesis.
16	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.507	Retain the null hypothesis.
17	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.684	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
18	The distribution of Entrepreneurial Actions (Proactive Sensing) - f1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.565	Retain the null hypothesis.
19	The distribution of Entrepreneurial Actions (Proactive Sensing) - f2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.831	Retain the null hypothesis.
20	The distribution of Entrepreneurial Actions (Proactive Sensing) - f3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.445	Retain the null hypothesis.
21	The distribution of Entrepreneurial Actions (Proactive Sensing) - f4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.709	Retain the null hypothesis.
22	The distribution of Social Exchange Theory (Partnership Quality) - g1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.237	Retain the null hypothesis.
23	The distribution of Social Exchange Theory (Partnership Quality) - g2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.918	Retain the null hypothesis.
24	The distribution of Social Exchange Theory (Partnership Quality) - g3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.546	Retain the null hypothesis.
25	The distribution of Social Exchange Theory (Partnership Quality) - g4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.674	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Client

(Client) C2b: Clients' evaluations regarding minimizing customization rendered to them do not differ according to the types of current outsourcing contracts.

(Client) C3b: Clients' evaluations regarding enhancing process maturity rendered to them do not differ according to the types of current outsourcing contracts.

(Client) C4b: Clients' evaluations regarding retaining in-house competence rendered to them do not differ according to the types of current outsourcing contracts.

(Client) C5b: Clients' evaluations regarding multiple sourcing rendered to them do not differ according to the types of current outsourcing contracts.

(Client) C6b: Clients' evaluations regarding leveraging on vendor interoperability rendered to them do not differ according to the types of current outsourcing contracts.

(Client) C7b: Clients' evaluations regarding proactive sensing rendered to them do not differ according to the types of current outsourcing contracts.

(Client) C8b: Clients' evaluations regarding enhancing partnership quality rendered to them do not differ according to the types of current outsourcing contracts.

To test the validity of this hypothesis, the Kruskal-Wallis test was used to examine the differences of FM strategists' evaluation of the strategic manoeuvres (Five theories) rendered to them in different types of current outsourcing contracts. There is no statistical significant difference with a p value. The probability value (p) is not less than or equal to 0.05. It can be seen from the following table, that there are no significant statistical differences in FM strategists' evaluation of the strategic manoeuvres (Five theories) rendered to them in different types of current outsourcing contracts. This means that all types of profession render the same perceived strategic manoeuvres (Five theories) from the FM strategists' point of view, in terms of the outsourcing contracts.

Result on Nonparametric Tests (Clients): Kruskal-Wallis Test comparing strategic manoeuvres (Five theories) in four FM Outsourcing contracts (Building maintenance, Security, Cleaning and Catering)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.815	Retain the null hypothesis.
2	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.993	Retain the null hypothesis.
3	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.827	Retain the null hypothesis.
4	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.674	Retain the null hypothesis.
5	The distribution of Agency Cost Theory (Process Maturity) - b1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.982	Retain the null hypothesis.
6	The distribution of Agency Cost Theory (Process Maturity) - b2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.984	Retain the null hypothesis.
7	The distribution of Agency Cost Theory (Process Maturity) - b3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.932	Retain the null hypothesis.
8	The distribution of Agency Cost Theory (In-House Competence) - e1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.844	Retain the null hypothesis.
9	The distribution of Agency Cost Theory (In-House Competence) - e2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.886	Retain the null hypothesis.
10	The distribution of Agency Cost Theory (In-House Competence) - e3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.680	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
11	The distribution of Resource Dependency Theory (Vendor Interoperability) - c1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.871	Retain the null hypothesis.
12	The distribution of Resource Dependency Theory (Vendor Interoperability) - c2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.558	Retain the null hypothesis.
13	The distribution of Resource Dependency Theory (Vendor Interoperability) - c3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.917	Retain the null hypothesis.
14	The distribution of Resource Dependency Theory (Vendor Interoperability) - c4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.998	Retain the null hypothesis.
15	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.873	Retain the null hypothesis.
16	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.689	Retain the null hypothesis.
17	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.981	Retain the null hypothesis.
18	The distribution of Entrepreneurial Actions (Proactive Sensing) - f1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.977	Retain the null hypothesis.
19	The distribution of Entrepreneurial Actions (Proactive Sensing) - f2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.988	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
20	The distribution of Entrepreneurial Actions (Proactive Sensing) - f3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.941	Retain the null hypothesis.
21	The distribution of Entrepreneurial Actions (Proactive Sensing) - f4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.522	Retain the null hypothesis.
22	The distribution of Social Exchange Theory (Partnership Quality) - g1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.347	Retain the null hypothesis.
23	The distribution of Social Exchange Theory (Partnership Quality) - g2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.546	Retain the null hypothesis.
24	The distribution of Social Exchange Theory (Partnership Quality) - g3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.746	Retain the null hypothesis.
25	The distribution of Social Exchange Theory (Partnership Quality) - g4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.912	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Service Provider

(Service provider) C2a: Service provider s' evaluations regarding minimizing customization rendered to them do not differ according to the background of construction professionals.

(Service provider) C3a: Service provider s' evaluations regarding enhancing

process maturity rendered to them do not differ according to the background of construction professionals.

(Service provider) C4a: Service providers' evaluations regarding retaining in-house competence rendered to them do not differ according to the background of construction professionals.

(Service provider) C5a: Service providers' evaluations regarding multiple sourcing rendered to them do not differ according to the background of construction professionals.

(Service provider) C6a: Service providers' evaluations regarding leveraging on vendor interoperability rendered to them do not differ according to the background of construction professionals.

(Service provider) C7a: Service providers' evaluations regarding proactive sensing rendered to them do not differ according to the background of construction professionals.

(Service provider) C8a: Service providers' evaluations regarding enhancing partnership quality rendered to them do not differ according to the background of construction professionals.

The Mann-Whitney test has been used to test for differences between two independent groups on a continuous measure. It can be seen from the following table that there is no statistical significant difference with a two-tailed p value. The probability value (p) is not less than or equal to 0.05, that to say there is no statistically significant difference in the perceived strategic manoeuvres (Five theories) rendered to two kinds of FM strategists.

Result on Nonparametric Tests (Service provider):

Mann-Whitney U Test comparing strategic manoeuvres (Five theories) in FM

professions of building and building services

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.613	Retain the null hypothesis.
2	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.365	Retain the null hypothesis.
3	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.372	Retain the null hypothesis.
4	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.372	Retain the null hypothesis.
5	The distribution of Agency Cost Theory (Process Maturity) - b1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.485	Retain the null hypothesis.
6	The distribution of Agency Cost Theory (Process Maturity) - b2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.457	Retain the null hypothesis.
7	The distribution of Agency Cost Theory (Process Maturity) - b3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.380	Retain the null hypothesis.
8	The distribution of Agency Cost Theory (In-House Competence) - e1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.687	Retain the null hypothesis.
9	The distribution of Agency Cost Theory (In-House Competence) - e2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.401	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Agency Cost Theory (In-House Competence) - e3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.788	Retain the null hypothesis.
11	The distribution of Resource Dependency Theory (Vendor Interoperability) - c1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.434	Retain the null hypothesis.
12	The distribution of Resource Dependency Theory (Vendor Interoperability) - c2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.583	Retain the null hypothesis.
13	The distribution of Resource Dependency Theory (Vendor Interoperability) - c3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.458	Retain the null hypothesis.
14	The distribution of Resource Dependency Theory (Vendor Interoperability) - c4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.625	Retain the null hypothesis.
15	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.687	Retain the null hypothesis.
16	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.662	Retain the null hypothesis.
17	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.158	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
18	The distribution of Entrepreneurial Actions (Proactive Sensing) - f1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.523	Retain the null hypothesis.
19	The distribution of Entrepreneurial Actions (Proactive Sensing) - f2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.637	Retain the null hypothesis.
20	The distribution of Entrepreneurial Actions (Proactive Sensing) - f3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.
21	The distribution of Entrepreneurial Actions (Proactive Sensing) - f4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.628	Retain the null hypothesis.
22	The distribution of Social Exchange Theory (Partnership Quality) - g1 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.362	Retain the null hypothesis.
23	The distribution of Social Exchange Theory (Partnership Quality) - g2 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	1.000	Retain the null hypothesis.
24	The distribution of Social Exchange Theory (Partnership Quality) - g3 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.574	Retain the null hypothesis.
25	The distribution of Social Exchange Theory (Partnership Quality) - g4 is the same across categories of FM Profession.	Independent-Samples Mann-Whitney U Test	.367	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Service Provider

(Service provider) C2b: Service provider s' evaluations regarding minimizing customization rendered to them do not differ according to the types of current outsourcing contracts.

(Service provider) C3b: Service provider s' evaluations regarding enhancing process maturity rendered to them do not differ according to the types of current outsourcing contracts.

(Service provider) C4b: Service providers' evaluations regarding retaining in-house competence rendered to them do not differ according to the types of current outsourcing contracts.

(Service provider) C5b: Service providers' evaluations regarding multiple sourcing rendered to them do not differ according to the types of current outsourcing contracts.

(Service provider) C6b: Service providers' evaluations regarding leveraging on vendor interoperability rendered to them do not differ according to the types of current outsourcing contracts.

(Service provider) C7b: Service providers' evaluations regarding proactive sensing rendered to them do not differ according to the types of current outsourcing contracts.

(Service provider) C8b: Service providers' evaluations regarding enhancing partnership quality rendered to them do not differ according to the background types of current outsourcing contracts.

To test the validity of this hypothesis, the Kruskal-Wallis test was used to examine the differences of FM strategists' evaluation of the strategic manoeuvres (Five theories) rendered to them in different types of current outsourcing contracts.

There is no statistical significant difference with a p value. The probability value (p) is not less than or equal to 0.05. It can be seen from the following table, that there are no significant statistical differences in FM strategists' evaluation of the strategic manoeuvres (Five theories) rendered to them in different types of current outsourcing contracts. This means that all types of profession render the same perceived strategic manoeuvres (Five theories) from the FM strategists' point of view, in terms of the outsourcing contracts.

Result on Nonparametric Tests (Service provider):

Kruskal-Wallis Test comparing strategic manoeuvres (Five theories) in four FM Outsourcing contracts (Building maintenance, Security, Cleaning and Catering)

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.916	Retain the null hypothesis.
2	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.973	Retain the null hypothesis.
3	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.551	Retain the null hypothesis.
4	The distribution of Transaction Cost Economics (Minimizing Process Customization) - a4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.414	Retain the null hypothesis.
5	The distribution of Agency Cost Theory (Process Maturity) - b1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.735	Retain the null hypothesis.
6	The distribution of Agency Cost Theory (Process Maturity) - b2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.708	Retain the null hypothesis.
7	The distribution of Agency Cost Theory (Process Maturity) - b3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.495	Retain the null hypothesis.
8	The distribution of Agency Cost Theory (In-House Competence) - e1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.844	Retain the null hypothesis.
9	The distribution of Agency Cost Theory (In-House Competence) - e2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.692	Retain the null hypothesis.
10	The distribution of Agency Cost Theory (In-House Competence) - e3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.773	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
11	The distribution of Resource Dependency Theory (Vendor Interoperability) - c1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
12	The distribution of Resource Dependency Theory (Vendor Interoperability) - c2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.341	Retain the null hypothesis.
13	The distribution of Resource Dependency Theory (Vendor Interoperability) - c3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.884	Retain the null hypothesis.
14	The distribution of Resource Dependency Theory (Vendor Interoperability) - c4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.175	Retain the null hypothesis.
15	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.991	Retain the null hypothesis.
16	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
17	The distribution of Resource Dependency Theory (Multiple Sourcing to vendors) - d3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.857	Retain the null hypothesis.
18	The distribution of Entrepreneurial Actions (Proactive Sensing) - f1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.887	Retain the null hypothesis.
19	The distribution of Entrepreneurial Actions (Proactive Sensing) - f2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
20	The distribution of Entrepreneurial Actions (Proactive Sensing) - f3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.945	Retain the null hypothesis.
21	The distribution of Entrepreneurial Actions (Proactive Sensing) - f4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.787	Retain the null hypothesis.
22	The distribution of Social Exchange Theory (Partnership Quality) - g1 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
23	The distribution of Social Exchange Theory (Partnership Quality) - g2 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.639	Retain the null hypothesis.
24	The distribution of Social Exchange Theory (Partnership Quality) - g3 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.886	Retain the null hypothesis.
25	The distribution of Social Exchange Theory (Partnership Quality) - g4 is the same across categories of Types of FM contract.	Independent-Samples Kruskal-Wallis Test	.325	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

6.4.3 Testing corollary 9

(Client & Service provider) C9: Outsourcing relationship dimensions (Ownership, Control, Competitive Position and Long Term Plan) is related to outsourcing relationship types and the strength of the relationships is moderated by those outsourcing types.

Data

Types of Variable	Variables (Client)	Variables (Service Provider)	Definition
Factors	Y1 – Y4	Y1 – Y4	Types of FM Contract Y1: Building maintenance Y2: Security Y3: Cleaning Y4: Catering
Dependent	OC1 – OC4	OC1 – OC4	FM Outsourcing Categories In-house team, Commitment, Technical expertise, Common goals
			FM Outsourcing Dimensions
Independent	SO1 – SO5	SO1 – SO5	Ownership of FM assets
Independent	SC1 – SC8	SC1 – SC3	Control of FM assets
Independent	CP1 – CP6	CP1 – CP17	Influence on competitive position
Independent	LP1 – LP8	LP1 – LP11	Influence on long term plan

Table 6.11 - Factors, dependent variables and independent variables in Multi-Nominal Logistic Regression

Dependent variable: A categorical variable that record whether the strategist was satisfactory. The value of mulit-Nominal logistic regression may be high (Likert Scale 4 or 5) or low (Likert Scale 1 or 2). For example, the value “1” indicates the high degree of satisfaction of the specific outsourcing category, while the value “0”

indicates the low degree of satisfaction of the specific outsourcing category on contingent approaches of the specific FM outsourcing contract.

In this research, the multi-nominal logistic regression and descriptive statistics in chapter 7 are used to analyse the categories of FM outsourcing relationship types from clients and service providers. Table 6.12 shows the difference on data analysis of the two approaches in this study.

	Multi-nominal logistic regression	Descriptive statistics (Mean)
Test	Non-parametric test	Frequency distributions
Factors	Types of FM contract	Types of FM contract
Dependent variables	FM outsourcing categories	FM outsourcing categories
Independent variables	FM outsourcing dimensions	Nil
Function	Observation and prediction	Observation

Table 6.12 - Difference of data analysis between multi-nominal logistic regression and descriptive statistics (Mean) on FM outsourcing study

Category of outsourcing relationship of a specific kind of outsourcing contract between client and service provider

Client

To predict the category of the outsourcing relationships, the Mulit-Nominal Logistic Regression was used to determine the different types of current crucial outsourcing contracts between the clients and service providers from the perspective of clients. The types of outsourcing category on clients' point of views will be investigated by applying the FM outsourcing relationship dimensions in four FM outsourcing contracts through mulit-Nominal Logistic Regression. Table 6.13 indicates the details of data from this Regression. There are total 188 valid cases and 14 missing cases from the clients' respondents.

		Number of case	Marginal Percentage
Types of outsourcing category	Inhouse	46	24.5%
	Service commitment	41	21.8%
	Technical expertise	**63**	**33.5%**
	Common goals	38	20.2%
Measurement of Ownership of various FM assets transferred by you	low	80	42.6%
	high	108	57.4%
Measurement of Control of various FM assets transferred by you	low	56	29.8%
	high	132	70.2%
Measurement of influence of the outsourced FM portfolio on our competitive position	low	75	39.9%
	high	113	60.1%
Measurement of influence of the outsourced FM portfolio on our long-term plan	low	62	33.0%
	high	126	67.0%
	Valid	188	100.0%
	Missing	14	
	Total	202	
	Subpopulation	25[a]	

a. The dependent variable has only one value observed in 2 (8.0%) subpopulations.

Table 6.13 - Case Processing Summary (Clients)

According to the case processing summary, the model category is Technical

Expertise, with 33.5% of the cases. Thus, the null model classifies correctly 33.5% of the time. This classification table shows the practical results of using the multinomial logistic regression model.

	Chi-Square	df	Sig.
Pearson	17.803	57	**1.000**
Deviance	19.588	57	1.000

Table 6.14 - Goodness-of-Fit (Clients)

If the significance value is small (less than 0.05), then the model does not adequately fit the data. In this case, its value is greater than 0.1, so the data are consistent with the model assumptions.

The Pearson residual is a measure of the difference between the observed and predicted values. Large Pearson residuals can indicate covariate patterns that are not well fit by the model. In classification and validation, cross tabulating observed response categories with predicted categories helps to determine how well the model identifies clients' preferences.

Table 6.15 indicates the observed and predicted frequencies on category of FM outsourcing relationship types from clients. On prediction of the type of future building maintenance, security, cleaning and catering contracts, there is an inclination to the types of inhouse and technical expertise. In summary, degree of importance on the types of inhouse and technical expertise outsourcing categories is the highest to the four FM outsourcing contracts.

Table 6.15 - Observed and Predicted Frequencies on category of FM outsourcing relationship types from clients

Major types of FM outsourcing contract in the questionnaire survey	Influence of the outsourced FM portfolio on our long-term plan	Influence of the outsourced FM portfolio on our competitive position	Control of various FM assets transferred by you	Ownership of various FM assets transferred by you	Types of outsourcing category	Frequency			Percentage	
						Observed	Predicted	Pearson Residual	Observed	Predicted
Building maintenance	low	low	low	low	Inhouse	3	3.100	-.065	21.4%	22.1%
	low	low	high	high	Service commitment	0	.035	-.189	.0%	1.8%
	high	high	high	low	Technical expertise	1	.908	.110	25.0%	22.7%
	high	high	high	high	Common goals	6	5.374	.291	15.8%	14.1%
Security	low	low	low	low	Inhouse	3	3.082	-.053	21.4%	22.0%
	low	low	high	high	Service commitment	0	.030	-.175	.0%	1.5%
	high	high	high	low	Technical expertise	1	.977	.027	25.0%	24.4%
	high	high	high	high	Common goals	3	3.979	-.531	11.1%	14.7%
Cleaning	low	low	low	low	Inhouse	3	2.401	.437	27.3%	21.8%
	low	low	high	high	Service commitment	0	.026	-.163	.0%	1.3%
	high	high	high	low	Technical expertise	1	1.567	-.527	16.7%	26.1%
	high	high	high	high	Common goals	3	3.668	-.379	12.5%	15.3%
Catering	low	low	low	low	Inhouse	2	1.295	.699	33.3%	21.6%
	low	low	high	high	Service commitment	0	.022	-.151	.0%	1.1%
	high	high	high	low	Technical expertise	2	2.224	-.177	25.0%	27.8%
	high	high	high	high	Common goals	0	.158	-.433	.0%	15.8%

The percentages are based on total observed frequencies in each subpopulation.

Service Provider

To predict the category of the outsourcing relationships, the Mulit-Nominal Logistic Regression was used to determine the different types of current crucial outsourcing contracts between the clients and service providers from the perspective of service provider. The types of outsourcing category on service provider's point of views will be investigated by applying the FM outsourcing relationship dimensions in four FM outsourcing contracts through mulit-Nominal Logistic Regression. Table 6.16 indicates the details of data from this Regression. There are total 160 valid cases and 3 missing cases from the service providers' respondents.

		Number of case	Marginal Percentage
Types of outsourcing category	**Inhouse**	**47**	**29.4%**
	Service commitment	41	25.6%
	Technical expertise	40	25.0%
	Common goals	32	20.0%
Measurement of Ownership of various FM assets transferred by you	low	10	6.3%
	high	150	93.8%
Measurement of Control of various FM assets transferred by you	low	16	10.0%
	high	144	90.0%
Measurement of Influence of the outsourced FM portfolio on our competitive position	low	10	6.3%
	high	150	93.8%
Measurement of Influence of the outsourced FM portfolio on our long-term plan	low	10	6.3%
	high	150	93.8%
	Valid	160	100.0%
	Missing	3	
	Total	163	
	Subpopulation	10[a]	

a. The dependent variable has only one value observed in 1 (10.0%) subpopulations.

Table 6.16 - Case Processing Summary (Service provider)

According to the case processing summary, the model category is Inhouse, with 29.4% of the cases. Thus, the null model classifies correctly 29.4% of the time.

This classification table shows the practical results of using the multinomial logistic regression model.

	Chi-Square	df	Sig.
Pearson	**3.902**	**18**	**1.000**
Deviance	4.659	18	.999

Table 6.17 - Goodness-of-Fit (Service providers)

If the significance value is small (less than 0.05), then the model does not adequately fit the data. In this case, its value is greater than 0.1, so the data are consistent with the model assumptions.

The Pearson residual is a measure of the difference between the observed and predicted values. Large Pearson residuals can indicate covariate patterns that are not well fit by the model. In classification and validation, cross tabulating observed response categories with predicted categories helps to determine how well the model identifies service providers' preferences.

Table 6.18 indicates the observed and predicted frequencies on category of FM outsourcing relationship types from service providers. On prediction of the future building maintenance, security, cleaning and catering contracts, there is an equally inclination to the type of inhouse outsourcing category. In summary, degree of importance on the types of inhouse and common goals outsourcing categories is the highest to the four FM outsourcing contracts.

Table 6.18 - Observed and Predicted Frequencies on category of FM outsourcing relationship types from service providers

Major types of FM outsourcing contract in the questionnaire survey	Influence of the outsourced FM portfolio on our long-term plan	Influence of the outsourced FM portfolio on our competitive position	Control of various FM assets transferred by you	Ownership of various FM assets transferred by you	Types of outsourcing category	Frequency			Percentage	
						Observed	Predicted	Pearson Residual	Observed	Predicted
Building maintenance	low	low	low	low	Inhouse	2	1.999	.001	50.0%	50.0%
	high	high	high	high	Common goals	12	11.066	.311	20.0%	18.4%
Security	low	low	low	low	Inhouse	1	1.000	.000	50.0%	50.0%
	high	high	high	low	Technical expertise	1	.833	.200	20.0%	16.7%
	high	high	high	high	Common goals	6	6.552	-.239	17.1%	18.7%
Cleaning	low	low	low	low	Inhouse	1	1.000	-.001	50.0%	50.0%
	high	high	high	high	Common goals	4	4.370	-.197	17.4%	19.0%
Catering	low	low	low	low	Inhouse	1	1.001	-.001	50.0%	50.0%
	high	high	high	high	Common goals	5	5.012	-.006	19.2%	19.3%

The percentages are based on total observed frequencies in each subpopulation.

6.5 Chapter summary

Chapter 6 has been divided into two main sections. Section 6.2 presents a general description of the study sample. The local Government funded vocational training institutes and seven universities in this study represent more than 90% of the FM industry in Hong Kong's higher educational sectors. The total number in the study sample was 38 FM respondents from clients and 34 FM respondents from service providers who participated in this study. The main outputs of frequency analysis reveal that the study sample was biased towards the master degree holders, where the percentage of those FM professionals (clients and service providers) was very high being 74% and 64% respectively, and the study sample was well educated. With regard to the FM working experience of the respondents, it has been indicated that almost 60% of the clients' respondents had equal or more than three years; the percentage of service providers' respondents who had equal or more than three years was 80%.

Section 6.3 has dealt with nine main hypotheses. These hypotheses were designed to fulfill the objectives of this research, in terms of the relationship between FM strategists, FM outsourcing contracts, FM outsourcing dimensions, strategic manoeuvres and outsourcing relationships for clients and service providers. Non-parametric statistics such as Mann-Whitney test and Kruskal-Wallis test and multi-nominal logistic regression were used for examining hypotheses. The results of these hypotheses are shown from table 6.19 to 6.21.

6.5.1 Summary of the results of hypotheses testing (clients)

Table 6.19 summarises the results of analysis on the types of outsourcing category on the FM relationship from clients. According to the evaluations of clients' construction professionals on the ownership of various FM assets transferred, infrastructure technology, computing system and communication system rendered to them are same, but professional knowledge and efficiency of equipment rendered to them are different. As for the types of current outsourcing contracts on the same dimension, professional knowledge, infrastructure technology, computing system, communication system and efficiency of

equipment rendered to the clients are same.

According to the evaluations of clients' construction professionals on the control of various FM assets transferred, human resources, daily routine operation, job, deadlines, co-ordination meetings and expense are same, but infrastructure and equipment rendered to them are different. As for the types of current outsourcing contracts on the same dimension, infrastructure, equipment, human resources, daily routine operation, job, deadlines, co-ordination meetings and expense rendered to the clients are same.

According to the evaluations of clients' construction professionals and types of current outsourcing contracts on the influence of the outsourced FM portfolio on competitive position, competence, accuracy, productivity, technical competence, comprehensive service and time frame rendered to the clients are same.

According to the evaluations of clients' construction professionals on the influence of the outsourced FM portfolio on our long-term plan, policy and plan rendered to them are different. As for the evaluations of clients' construction professionals and types of current outsourcing contracts on the same dimension, policy, plan, work, safety and health, human resources, administration, quality and environmental protection, minimizing process customization, enhancing process maturity, retaining in-house competence, multiple sourcing, leveraging on vendor interoperability, proactive sensing, enhancing partnership quality rendered to the clients are same.

Hypotheses	Results	Questionnaire
Ownership of various FM assets transferred		
C1a: Clients' evaluations regarding ownership (professional knowledge and efficiency of equipment) rendered to them are not different according to the background of construction professionals.	Rejected	SO1, SO5
C1a: Clients' evaluations regarding ownership	Accepted	SO2, SO3, SO4

(infrastructure technology, computing system and communication system) rendered to them are not different according to the background of construction professionals.		
C1b: Clients' evaluations regarding ownership (professional knowledge, infrastructure technology, computing system, communication system and efficiency of equipment) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	SO1, SO2, SO3, SO4, SO5
Control of various FM assets transferred		
C1a: Clients' evaluations regarding control (infrastructure and equipment) rendered to them are not different according to the background of construction professionals.	Rejected	SC1, SC2
C1a: Clients' evaluations regarding control (human resources, daily routine operation, job, deadlines, co-ordination meetings and expense) rendered to them are not different according to the background of construction professionals.	Accepted	SC3, SC4, SC5, SC6, SC7, SC8
C1b: Clients' evaluations regarding control (infrastructure, equipment, human resources, daily routine operation, job, deadlines, co-ordination meetings and expense) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	SC1, SC2, SC3, SC4, SC5, SC6, SC7, SC8
Influence of the outsourced FM portfolio on competitive position		
C1a: Clients' evaluations regarding competitive position (competence, accuracy, productivity, technical competence, comprehensive service and time frame) rendered to them are not different according to the background of construction professionals.	Accepted	CP1, CP2, CP3, CP4, CP5, CP6
C1b: Clients' evaluations regarding competitive position (competence, accuracy, productivity,	Accepted	CP1, CP2, CP3, CP4, CP5, CP6

technical competence, comprehensive service and time frame) rendered to them are not different according to the types of current outsourcing contracts.		
Influence of the outsourced FM portfolio on our long-term plan		
C1a: Clients' evaluations regarding long-term plan (policy and plan) rendered to them are not different according to the background of construction professionals.	Rejected	LP1, LP2
C1a: Clients' evaluations regarding long-term plan (work, safety and health, human resources, administration, quality and environmental protection) rendered to them are not different according to the background of construction professionals.	Accepted	LP3, LP4, LP5, LP6, LP7, LP8
C1b: Clients' evaluations regarding long-term plan (policy, plan, work, safety and health, human resources, administration, quality and environmental protection) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	LP1, LP2, LP3, LP4, LP5, LP6, LP7, LP8
C2a: Clients' evaluations regarding minimizing process customization rendered to them are not different according to the background of construction professionals.	Accepted	Section E a) 1 - 4
C2b: Clients' evaluations regarding minimizing customization rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E a) 1 - 4
C3a: Clients' evaluations regarding enhancing process maturity rendered to them are not different according to the background of construction professionals.	Accepted	Section E b) 1 - 3
C3b: Clients' evaluations regarding enhancing process maturity rendered to them are not different according to the types of current outsourcing	Accepted	Section E b) 1 - 3

contracts.		
C4a: Clients' evaluations regarding retaining in-house competence rendered to them are not different according to the background of construction professionals.	Accepted	Section E e) 1 - 3
C4b: Clients' evaluations regarding retaining in-house competence rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E e) 1 - 3
C5a: Clients' evaluations regarding multiple sourcing rendered to them are not different according to the background of construction professionals.	Accepted	Section E d) 1 - 3
C5b: Clients' evaluations regarding multiple sourcing rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E d) 1 - 3
C6a: Clients' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the background of construction professionals.	Accepted	Section E c) 1 - 4
C6b: Clients' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E c) 1 - 4
C7a: Clients' evaluations regarding proactive sensing rendered to them are not different according to the background of construction professionals.	Accepted	Section E f) 1 - 4
C7b: Clients' evaluations regarding proactive sensing rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E f) 1 - 4
C8a: Clients' evaluations regarding enhancing partnership quality rendered to them are not different according to the background of construction professionals.	Accepted	Section E g) 1 - 4
C8b: Clients' evaluations regarding enhancing partnership quality rendered to them are not different	Accepted	Section E g) 1 - 4

according to the types of current outsourcing contracts.		

Table 6.19 - Analysis on the types of outsourcing category on the FM relationship by clients

6.5.2 Summary of the results of hypotheses testing (service providers)

Table 6.20 summarises the results of analysis on the types of outsourcing category on the FM relationship from service providers. According to the evaluations of service providers' construction professionals and the types of current outsourcing contracts on the ownership of various FM assets transferred, equipment or machinery, professional knowledge, completion on request, capability, resources, rendered to them are same.

According to the evaluations of service providers' construction professionals and the types of current outsourcing contracts on the control of various FM assets transferred, professional knowledge, finishing on time and co-ordination meetings rendered to them are same. According to the evaluations of service providers' construction professionals and the types of current outsourcing contracts on the influence of the outsourced FM portfolio on competitive position, financial capability, human resources, assistance, capability, accuracy, productivity, technical competence, focus, responsibility, conduct, courteousness, understanding, comprehensive service, responsibilities, quality, satisfaction and expectation rendered to them are same.

According to the evaluations of service providers' construction professionals and the types of current outsourcing contracts on the influence of the outsourced FM portfolio on our long-term plan, competing job, policy, plan, work, safety and health, human resources, administration, quality, social responsibility, value-added services, environmental protection, minimizing process customization, enhancing process maturity, retaining in-house competence, multiple sourcing, leveraging on vendor interoperability, proactive sensing and enhancing partnership quality

rendered to them are same.

Hypotheses	Results	Questionnaire
Ownership of various FM assets transferred		
C1a: Service providers' evaluations regarding ownership (equipment or machinery, professional knowledge, completion on request, capability and resources) rendered to them are not different according to the background of construction professionals.	Accepted	SO1, SO2, SO3, SO4,SO5
C1b: Service providers' evaluations regarding ownership (equipment or machinery, professional knowledge, completion on request, capability and resources) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	SO1, SO2, SO3, SO4,SO5
Control of various FM assets transferred		
C1a: Service providers' evaluations regarding control (professional knowledge, finishing on time and co-ordination meetings) rendered to them are not different according to the background of construction professionals.	Accepted	SC1, SC2, SC3
C1b: Service providers' evaluations regarding control (professional knowledge, finishing on time and co-ordination meetings) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	SC1, SC2, SC3
Influence of the outsourced FM portfolio on competitive position		
C1a: Service providers' evaluations regarding competitive position (financial capability, human resources, assistance, capability, accuracy, productivity, technical competence, focus, responsibility, conduct, courteousness, understanding, comprehensive service, responsibilities, quality, satisfaction and	Accepted	CP1 – CP17

expectation) rendered to them are not different according to the background of construction professionals.		
C1b: Service providers' evaluations regarding competitive position (financial capability, human resources, assistance, capability, accuracy, productivity, technical competence, focus, responsibility, conduct, courteousness, understanding, comprehensive service, responsibilities, quality, satisfaction and expectation) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	CP1 – CP17
Influence of the outsourced FM portfolio on our long-term plan		
C1a: Service providers' evaluations regarding long-term plan (competing job, policy, plan, work, safety and health, human resources, administration, quality, social responsibility, value-added services and environmental protection) rendered to them are not different according to the background of construction professionals.	Accepted	LP1 - LP11
C1b: Service providers' evaluations regarding long-term plan (competing job, policy, plan, work, safety and health, human resources, administration, quality, social responsibility, value-added services and environmental protection) rendered to them are not different according to the types of current outsourcing contracts.	Accepted	LP1 - LP11
C2a: Service providers' evaluations regarding minimizing process customization rendered to them are not different according to the background of construction professionals.	Accepted	Section E a) 1 - 4
C2b: Service providers' evaluations regarding	Accepted	Section E a) 1 -

minimizing customization rendered to them are not different according to the types of current outsourcing contracts.		4
C3a: Service providers' evaluations regarding enhancing process maturity rendered to them are not different according to the background of construction professionals.	Accepted	Section E b) 1 - 3
C3b: Service providers' evaluations regarding enhancing process maturity rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E b) 1 - 3
C4a: Service providers' evaluations regarding retaining in-house competence rendered to them are not different according to the background of construction professionals.	Accepted	Section E e) 1 - 3
C4b: Service providers' evaluations regarding retaining in-house competence rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E e) 1 - 3
C5a: Service providers' evaluations regarding multiple sourcing rendered to them are not different according to the background of construction professionals.	Accepted	Section E d) 1 - 3
C5b: Service providers' evaluations regarding multiple sourcing rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E d) 1 - 3
C6a: Service providers' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the background of construction professionals.	Accepted	Section E c) 1 - 4
C6b: Service providers' evaluations regarding leveraging on vendor interoperability rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E c) 1 - 4

C7a: Service providers' evaluations regarding proactive sensing rendered to them are not different according to the background of construction professionals.	Accepted	Section E f) 1 - 4
C7b: Service providers' evaluations regarding proactive sensing rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E f) 1 - 4
C8a: Service providers' evaluations regarding enhancing partnership quality rendered to them are not different according to the background of construction professionals.	Accepted	Section E g) 1 - 4
C8b: Service providers' evaluations regarding enhancing partnership quality rendered to them are not different according to the types of current outsourcing contracts.	Accepted	Section E g) 1 - 4

Table 6.20 - Analysis on the types of outsourcing category on the FM relationship by service providers

6.5.3 Analysis on matching the results of clients and service providers

Corollary 9

(Client) C9: The outsourcing relationship dimensions (ownership, control, competitive position and long term plan) are related to the outsourcing relationship types and the strength of the relationships is moderated by those outsourcing types.

(Service provider) C9: The outsourcing relationship dimensions (ownership, control, competitive position and long term plan) are related to the outsourcing relationship types and the strength of the relationships is moderated by those outsourcing types.

A key to analysis is to identify which types of outsourcing relationships have impact on the standard and quality of the outsourcing services in the major FM

outsourcing contracts such as building maintenance, security, cleaning and catering in the Hong Kong's higher education industry. From the result, the clients can obtain an understanding of their predicted percentage of the FM outsourcing relationship type for the specific type of FM contract. The service provider can also evaluate the 'future' possible performance in the specific outsourcing contract.

The Pearson residual is a measure of the difference between the observed and predicted values. Small Pearson residuals can indicate covariate patterns that are well fit by the model. The types of outsourcing category for the specific types of FM contract are based by two variables which are the optimum predicted percentage and the small Pearson residuals. The following table indicates the outsourcing relationship type with the predicted highest degree of importance of the specific critical FM outsourcing contract from clients and service providers. Predicted good FM outsourcing performance on the specific outsourcing contract is achieved by matching the predicted type of outsourcing category from client and relevant service provider. In summary, degree of importance on the type of inhouse outsourcing category is the highest to the future building maintenance, security, cleaning and catering contracts. On further prediction of these four FM outsourcing contracts, there is also an inclination to the type of technical expertise outsourcing category from clients but to the type of common goals outsourcing category from service provider.

Table 6.21 - Predicted FM outsourcing relationship types of the FM outsourcing contracts survey in the current Hong Kong's higher education sector

Major types of FM outsourcing contract in the questionnaire survey	Influence of the outsourced FM portfolio on long-term plan	Influence of the outsourced FM portfolio on competitive position	Control of various FM assets transferred	Ownership of various FM assets transferred	Types of outsourcing category	Clients Percentage		Service Provider Percentage	
						Observed	Predicted	Observed	Predicted
Building maintenance	Low	low	low	low	Inhouse	21.4%	22.1%	50.0%	50.0%
	High	high	high	low	Technical expertise	25.0%	22.7%	-	-
	high	high	high	high	Common goals	-	-	20.0%	18.4%
Security	low	low	low	low	Inhouse	21.4%	22.0%	50.0%	50.0%
	high	high	high	low	Technical expertise	25.0%	24.4%	-	-
	high	high	high	high	Common goals	-	-	17.1%	18.7%
Cleaning	low	low	low	low	Inhouse	27.3%	21.8%	50.0%	50.0%
	high	high	high	low	Technical expertise	16.7%	26.1%	-	-
	high	high	high	high	Common goals	-	-	17.4%	19.0%
Catering	low	low	low	low	Inhouse	33.3%	21.6%	50.0%	50.0%
	high	high	high	low	Technical expertise	25.0%	27.8%	-	-
	high	high	high	high	Common goals	-	-	19.2%	19.3%

CHAPTER 7 ANALYSIS OF RESULTS

7.1 Introduction

As described in chapter 6, a general descriptive analysis of the study sample has been made and the nine man hypotheses have been tested. In order to complete the analysis begun in the previous chapter, more in-depth discussion will be conducted in this chapter, which is divided into five sections. For section 7.2 the researcher used means to indicate what the outsourcing characteristics are on which FM strategists in clients and service providers agree the outsourcing categories of their current FM outsourcing contracts. The main objective of section 7.3 is to investigate the critical success factors for outsourcing strategies in the FM contracts on which FM strategists in clients and service providers determine the outsourcing relationships. These sections followed by FM strategists in clients' and service providers' point of view with respect to the design for outsourcing strategies in the FM outsourcing contracts (section 7.4). The last section provides a brief summary and the main findings of this chapter.

7.2 Outsourcing categories of current FM outsourcing contracts

There is no research clearly to discuss the relationships between the various types of FM outsourcing contracts and the specific outsourcing categories. After a detailed review of the literature, four FM outsourcing categories relating to the clients and service providers have been chosen, as follows respectively from (i) client's point of view: (1) We need help from service providers, (2) The service provider has service commitment to our company and customers, (3) The service provider has qualified technical expertise and (4) The service provider has common goals with us and (ii) service providers' point of view: (1) We support the in-house team, (2) We have commitment to our customers, (3) We have qualified

technical expertise and (4) We have common goals with our customers.

The respondents were asked to indicate on a five-point scale the degree to which they had selected their FM outsourcing contracts in each of the four areas. The relative importance of the each of the investigated attributes in the selection of outsourcing categories of current FM outsourcing contracts in clients and service providers are shown in the Tables 7.1 and 7.2. For each statement, respondents were asked to indicate the extent to which they agreed along a five-point Likert-type scale, ranging from 1 = “Strongly disagree” to 5 = “Strongly agree”. The clients’ respondents, on average, rated the four items in a range between “3.68” to “4.11”. The service providers’ respondents, on average, rated the four items in a range between “3.82” to “4.06”. It is important to note that there is significant link between outsourcing categories and current FM outsourcing contracts, as seen in the previous chapter. This section is structured by types of FM outsourcing contracts to investigate how importance of these factors from the point of view of each type of FM outsourcing contracts and clients’ and service providers’ opinions towards outsourcing categories factors. Types of FM outsourcing contract has been taken as a main criterion to conduct this section. This is because it is significant to find out the clients’ and service providers’ preferred outsourcing categories to their current outsourcing contracts. Thus, there is a need to have a full discussion below, with respect to each type of FM outsourcing contract.

Clients

Types of FM Outsourcing Contracts		Outsourcing Categories OC1	OC2	OC3	OC4
(i) Building Maintenance	Mean	3.92	3.96	4.12	3.77
N=26	Std. Deviation	0.93	0.96	0.82	0.86
(ii) Security	Mean	3.83	3.74	4.13	3.7
N=23	Std. Deviation	0.94	0.86	0.76	0.76
(iii) Cleaning	Mean	3.9	3.86	4.24	3.86
N=21	Std. Deviation	0.83	0.91	0.7	0.79
(iv) Catering	Mean	3.75	3.63	4.13	3.88
N=8	Std. Deviation	0.89	0.74	0.83	0.83
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.92	3.87	4.11	3.68
Total N=83	Std. Deviation	0.91	0.91	0.8	0.84

Remarks: (OC1) We need help from service providers; (OC2) The service provider has service commitment to our company and customers; (OC3) The service provider has qualified technical expertise and (OC4) The service provider has common goals with us

Table 7.1 - Agreement on outsourcing categories of clients' FM outsourcing contracts

Clients' FM outsourcing building maintenance contract

Table 7.1 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing building maintenance contract. This is "OC3: The service provider has qualified technical expertise (Mean = 4.12)". The mean for the agreeable characteristics in this category is "OC4: The service provider has common goals with us (Mean = 3.77)". As mentioned previously, this type of FM outsourcing contract was the biggest one in terms of respondent numbers. This result indicates that the clients prefer the service provider having qualified technical expertise in this type of FM outsourcing contract, since the building maintenance contracts require the service providers having related professional

building technology and management knowledge and skills to undertake this contract.

Clients' FM outsourcing security contract

Table 7:1 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing security contract. This is "OC3: The service provider has qualified technical expertise (Mean = 4.13)". The mean for the agreeable characteristics in this category is "OC4: The service provider has common goals with us (Mean = 3.7)". As mentioned previously, this type of FM outsourcing contract was the second biggest one in terms of respondent numbers. This result indicates that the clients also prefer the service provider having qualified technical expertise in this type of FM outsourcing contract, since the security contracts require the service providers having related professional building security and management knowledge and skills to undertake this contract.

Clients' FM outsourcing cleaning contract

Table 7:1 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing cleaning contract. This is "OC3: The service provider has qualified technical expertise (Mean = 4.24)". The means for the agreeable characteristics in this category are "OC2: The service provider has service commitment to our company and customers (Mean = 3.86) and OC4: The service provider has common goals with us (Mean = 3.86)". As mentioned previously, this type of FM outsourcing contract was the third biggest one in terms of respondent numbers. This result indicates that the clients also prefer the

service provider having qualified technical expertise in this type of FM outsourcing contract, since the cleaning contracts also require the service providers having related professional cleaning and management knowledge and skills to undertake this contract.

Clients' FM outsourcing catering contract

Table 7:1 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing catering contract. This is "OC3: The service provider has qualified technical expertise (Mean = 4.13)". The mean for the agreeable characteristics in this category is "OC2: The service provider has service commitment to our company and customers (Mean = 3.63). This result indicates that the clients also prefer the service provider having qualified technical expertise in this type of FM outsourcing contract, since the catering contracts also require the service providers having related professional catering and management knowledge and skills to undertake this contract.

Service providers

Types of FM Outsourcing Contracts		Outsourcing Categories			
		OC1	OC2	OC3	OC4
(i) Building Maintenance	Mean	4.00	4.00	4.00	3.85
N=23	Std. Deviation	0.80	0.80	0.80	0.54
(ii) Security	Mean	4.20	4.07	3.87	3.87
N=15	Std. Deviation	0.77	0.80	0.83	0.52
(iii) Cleaning	Mean	4.10	4.10	4.10	3.80
N=10	Std. Deviation	0.74	0.88	0.99	0.92
(iv) Catering	Mean	4.20	4.20	4.10	4.10
N=10	Std. Deviation	0.79	0.92	0.99	0.74
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	4.03	4.06	4.03	3.82
Total N=59	Std. Deviation	0.76	0.78	0.80	0.67

Remarks: (OC1) We support the in-house team; (OC2) We have commitment to our customers; (OC3) We have qualified technical expertise and (OC4) We have common goals with our customers

Table 7.2 - Agreement on outsourcing categories of service providers' FM outsourcing contracts

Service providers' FM outsourcing building maintenance contract

Table 7.2 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing building maintenance contract. This is "OC1: We support the in-house team, OC2: We have commitment to our customers and OC3: We have qualified technical expertise. (Mean = 4)". The mean for the agreeable characteristics in this category is "OC4: We have common goals with our customers. (Mean = 3.85)". As mentioned previously, this type of FM outsourcing contract was the biggest one in terms of respondent numbers. This result indicates that the service providers emphasize having qualified technical expertise in this type of FM outsourcing contract, since they need to have related professional and updated building technology and management knowledge and skills to undertake this contract.

Service providers' FM outsourcing security contract

Table 7.2 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing security contract. This is "OC1: We support the in-house team. (Mean = 4.20)". The mean for the agreeable characteristics in this category is "OC3: We have qualified technical expertise and OC4: The service

provider has common goals with us (Mean = 3.87)". As mentioned previously, this type of FM outsourcing contract was the second biggest one in terms of respondent numbers. This result indicates that the service providers emphasize to support the clients' in-house team in this type of FM outsourcing contract, since they cam provide further support to the staff of clients on the routine service.

Service providers' FM outsourcing cleaning contract

Table 7.2 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing cleaning contract. This is "OC1: We support the in-house team, OC2: We have commitment to our customers and OC3: We have qualified technical expertise. (Mean = 4.1)". The mean for the agreeable characteristics in this category is "OC4: We have common goals with our customers. (Mean = 3.8)". As mentioned previously, this type of FM outsourcing contract was the third biggest one in terms of respondent numbers. This result indicates that the service providers emphasize having qualified technical expertise in this type of FM outsourcing contract, since they need to have related professional and updated cleaning and management knowledge and skills to undertake this contract.

Service providers' FM outsourcing catering contract

Table 7.2 shows the most agreeable characteristics influencing the outsourcing category for the FM outsourcing catering contract. This is "OC1: We support the in-house team and OC2: We have commitment to our customers (Mean = 4.2)". The means for the agreeable characteristics in this category is "OC3: We have qualified technical expertise and OC4: The service provider has common goals

with us (Mean = 4.1)". This result indicates that the service providers emphasize to support the clients' in-house team in this type of FM outsourcing contract, since they cam provide further support to the staff of clients on the routine service.

7.3 Critical success factors for outsourcing strategies

The critical success factors for outsourcing strategies have been discussed in more detail in Chapter 4 in terms of features and criticisms. The FORT model described four outsourcing relationship dimensions (Kishore, 2003). As mentioned earlier, four dimensions (i.e. ownership of FM assets, control of FM assets, competitive position and long-term plan) have been employed to measure the critical success factors. In this study, the respondents were asked to provide opinions and to evaluate with regard to the four outsourcing relationship dimensions for the strategies. A five point Likert scales has been used ranging from 1 = very bad to 5 = very good. The descriptive statistics of the items in each category are discussed in the following paragraphs.

Clients

Types of FM Outsourcing Contracts		Ownership of various FM assets transferred by clients (a)	(b)	(c)	(d)	(e)
(i) Building Maintenance	Mean	3.73	3.69	3.38	3.62	3.85
N=26	Std. Deviation	0.87	0.93	1.02	0.9	0.97
(ii) Security	Mean	3.61	3.52	3.22	3.39	3.57
N=23	Std. Deviation	0.78	0.95	1.09	0.84	0.84
(iii) Cleaning	Mean	3.67	3.67	3.24	3.33	3.62
N=21	Std. Deviation	0.73	0.91	1.18	0.97	0.8
(iv) Catering	Mean	3.25	3.5	3.25	3.38	3.13
N=8	Std. Deviation	0.89	1.07	1.16	0.92	0.99
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.66	3.53	3.16	3.39	3.66

Total N=83	Std. Deviation	0.81	0.86	0.97	0.92	0.94

Remarks: (a) Professional knowledge; (b) Infrastructure technology; (c) Computing system; (d) Communication system and (e) Efficiency of equipment

Table 7.3 - Selection of critical success factor regarding ownership of various FM assets transferred by clients for outsourcing strategies

Ownership of various FM assets transferred by clients:

It can be seen from the results presented in Table 7.3 that the means of respondents range from 3.16 to 3.66 on the various items relating to ownership of various FM assets transferred by clients. In other words, the study sample has similar perceptions towards the statements relating to ownership of various FM assets. A comparison of means revealed that the ownership of various FM assets does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Efficiency of equipment” (Mean = 3.85), while the lowest mean was indicated by the FM outsourcing security contract regarding the item “Computing system (Mean = 3.22)”

Types of FM Outsourcing Contracts		Control of various FM assets transferred by clients							
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(i) Building Maintenance N=26	Mean	3.5	3.5	3.35	3.77	3.5	3.38	3.62	3.19
	Std. D.	1.07	0.91	1.06	1.07	0.95	1.24	1.13	1.13
(ii) Security N=23	Mean	3.35	3.35	3.26	3.57	3.39	3.35	3.52	3.3
	Std. D.	0.98	0.78	0.96	0.99	0.89	1.11	1.16	1.18
(iii) Cleaning N=21	Mean	3.48	3.43	3.38	3.67	3.48	3.38	3.62	3.43
	Std. D.	1.03	0.81	0.86	0.86	0.75	0.97	1.07	1.16
(iv) Catering N=8	Mean	3.38	3.25	3.25	3.5	3.38	3	3.5	2.88
	Std. D.	0.92	0.71	1.04	0.76	0.74	0.93	0.93	0.99
[(i)+(ii)+ (iii)+(iv)+ others] Total N=83	Mean	3.5	3.5	3.34	3.82	3.55	3.45	3.68	3.34
	Std. D.	0.98	0.86	0.94	0.95	0.83	1.11	1.07	1.07

Remarks: (a) Infrastructure; (b) Equipment; (c) Human resources; (d) Daily routine operation; (e) Job; (f) Deadlines; (g) co-ordination meetings and (h) expense

Table 7.4 - Selection of critical success factor regarding control of various FM assets transferred by clients for outsourcing strategies

Control of various FM assets transferred by clients:

It can be seen from the results presented in Table 7.4 that the means of respondents range from 3.34 to 3.82 on the various items relating to control of various FM assets transferred by clients. In other words, the study sample has similar perceptions towards the statements relating to control of various FM assets. A comparison of means revealed that the control of various FM assets does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Daily routine operation” (Mean = 3.77), while the lowest mean was indicated by the FM outsourcing catering contract regarding the item

"Deadlines (Mean = 3)"

Types of FM Outsourcing Contracts		Influence of the outsourced FM portfolio on clients' competitive position					
		(a)	(b)	(c)	(d)	(e)	(f)
(i) Building Maintenance	Mean	3.31	3.38	3.62	3.35	3.5	3.38
N=26	Std. D.	1.05	1.17	1.1	1.09	1.21	1.2
(ii) Security	Mean	3.09	3.22	3.48	3.35	3.35	3.35
N=23	Std. D.	0.9	1.04	0.99	1.07	1.15	1.15
(iii) Cleaning	Mean	3.1	3.29	3.52	3.38	3.38	3.33
N=21	Std. D.	0.89	1.06	0.98	1.07	1.16	1.11
(iv) Catering	Mean	2.75	3	3.13	2.88	3	2.75
N=8	Std. D.	1.04	1.2	0.99	0.99	1.07	1.28
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.26	3.45	3.68	3.5	3.63	3.53
Total N=83	Std. D.	0.92	1.01	0.96	1.06	1.08	1.06

Remarks: (a) Competence; (b) Accuracy; (c) Productivity; (d) Technical competence; (e) Comprehensive service and (f) Time frame

Table 7.5 - Selection of critical success factor regarding influence of the outsourced FM portfolio on clients' competitive position for outsourcing strategies

Influence of the outsourced FM portfolio on clients' competitive position:

It can be seen from the results presented in Table 7.5 that the means of respondents range from 3.26 to 3.68 on the various items relating to influence of the outsourced FM portfolio on clients' competitive position. In other words, the study sample has similar perceptions towards the statements relating to influence of the outsourced FM portfolio on clients' competitive position. A comparison of means revealed that the influence of the outsourced FM portfolio on clients' competitive position does not differ among different kinds of FM outsourcing

contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Productivity” (Mean = 3.62), while the lowest mean was indicated by the FM outsourcing catering contract regarding the item “Competence" (Mean = 2.75)

Types of FM Outsourcing Contracts		Influence of the outsourced FM portfolio on clients' long-term plan							
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(i) Building Maintenance N=26	Mean	3.35	3.46	3.23	3.5	3.35	3.27	3.31	3.31
	Std. D.	1.09	1.14	0.95	1.14	0.98	0.96	1.29	1.12
(ii) Security N=23	Mean	3.22	3.26	3.26	3.3	3.17	3.35	3.22	3.09
	Std. D.	1.04	1.1	0.96	1.11	0.94	0.98	1.13	1
(iii) Cleaning N=21	Mean	3.24	3.29	3.29	3.29	3.24	3.38	3.24	3.1
	Std. D.	1.04	1.1	0.96	1.1	0.94	0.97	1.14	1
(iv) Catering N=8	Mean	2.63	2.63	2.75	2.75	3	2.88	2.75	2.63
	Std. D.	1.06	1.06	1.04	0.89	0.93	0.99	1.04	0.92
[(i)+(ii)+ (iii)+(iv)+ others] Total N=83	Mean	3.45	3.53	3.37	3.5	3.39	3.39	3.45	3.34
	Std. D.	1.01	1.03	0.88	1.01	0.86	0.89	1.11	0.97

Remarks: (a) Policy; (b) Plan; (c) Work; (d) Safety and health; (e) human resources; (f) Administration; (g) Quality and (h) Environmental protection

Table 7.6 - Selection of critical success factor regarding influence of the outsourced FM portfolio on clients' long-term plan for outsourcing strategies

Influence of the outsourced FM portfolio on clients' long-term plan:

It can be seen from the results presented in Table 7.6 that the means of respondents range from 3.34 to 3.53 on the various items relating to influence of the outsourced FM portfolio on clients' long-term plan. In other words, the study sample has similar perceptions towards the statements relating to influence of the

outsourced FM portfolio on clients' long-term plan. A comparison of means revealed that the influence of the outsourced FM portfolio on clients' long-term plan does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item "Plan" (Mean = 3.46), while the lowest mean was indicated by the FM outsourcing catering contract regarding the item "Policy, Plan and Environmental protection" (Mean = 2.63)

Service Providers

Types of FM Outsourcing Contracts		Ownership of various FM assets transferred to service providers				
		(a)	(b)	(c)	(d)	(e)
(i) Building Maintenance	Mean	3.54	3.96	4.04	4.08	3.58
N=23	Std. Deviation	0.58	0.77	0.6	0.89	0.7
(ii) Security	Mean	3.53	4	4.07	3.93	3.73
N=15	Std. Deviation	0.83	0.76	0.7	1.03	0.7
(iii) Cleaning	Mean	3.5	4	4.3	4	3.7
N=10	Std. Deviation	0.71	0.82	0.67	1.25	0.67
(iv) Catering	Mean	3.6	4.1	4.3	4.2	3.8
N=10	Std. Deviation	0.84	0.88	0.67	1.23	0.63
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.62	4.06	4.12	4.09	3.65
Total N=59	Std. Deviation	0.7	0.74	0.64	0.87	0.69

Remarks: (a) Equipment or Machinery; (b) Professional knowledge; (c) Completion on request; (d) Capability and (e) Resources

Table 7.7 - Selection of critical success factor regarding ownership of various FM assets transferred to service providers for outsourcing strategies

Ownership of various FM assets transferred to service providers:

It can be seen from the results presented in Table 7.7 that the means of respondents range from 3.62 to 4.12 on the various items relating to ownership of

various FM assets transferred to service providers. In other words, the study sample has similar perceptions towards the statements relating to ownership of various FM assets transferred to service providers. A comparison of means revealed that the ownership of various FM assets transferred to service providers does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning and catering contract regarding the item “Completion on request” (Mean = 4.3), while the lowest mean was indicated by the FM outsourcing cleaning contract regarding the item “Equipment or machinery" (Mean = 3.5)

		Control of various FM assets transferred to service providers		
Types of FM Outsourcing Contracts		(a)	(b)	(c)
(i) Building Maintenance	Mean	4.08	3.92	4.08
N=23	Std. D.	0.69	0.84	0.89
(ii) Security	Mean	4.07	3.93	3.93
N=15	Std. D.	0.8	0.88	0.8
(iii) Cleaning	Mean	4.1	4.2	4.3
N=10	Std. D.	0.88	0.79	0.67
(iv) Catering	Mean	4.2	4.2	4.2
N=10	Std. D.	0.92	0.63	0.63
[(i)+(ii)+(iii)+(iv)+others]	Mean	4.12	3.97	4.09
Total N=59	Std. D.	0.69	0.8	0.83

Remarks: (a) Professional knowledge; (b) Finishing on time and (c) Co-ordination meetings

Table 7.8 - Selection of critical success factor regarding control of various FM assets transferred to service providers for outsourcing strategies

Control of various FM assets transferred to service providers:

It can be seen from the results presented in Table 7.8 that the means of respondents range from 3.97 to 4.12 on the various items relating to control of various FM assets transferred to service providers. In other words, the study sample has similar perceptions towards the statements relating to control of various FM assets transferred to service providers. A comparison of means revealed that the control of various FM assets transferred to service providers does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning contract regarding the item “Co-ordination meetings” (Mean = 4.3), while the lowest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Finishing on time" (Mean = 3.92)

Types of FM Outsourcing Contracts		Influence of the outsourced FM portfolio on clients' competitive position							
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(i) Building Maintenance N=23	Mean	3.81	3.69	4	3.92	3.88	3.81	3.65	4.12
	Std. D.	0.69	0.68	0.8	0.74	0.82	0.63	0.63	0.86
(ii) Security N=15	Mean	3.87	3.93	4	4	4	3.93	3.67	4.07
	Std. D.	0.64	0.7	0.85	0.76	0.85	0.7	0.82	0.88
(iii) Cleaning N=10	Mean	3.6	3.9	4.2	3.9	4	4.1	3.7	4.1
	Std. D.	0.52	0.57	0.92	0.88	0.82	0.57	0.67	1.1
(iv) Catering N=10	Mean	3.6	4	4.2	4.1	3.9	4.1	3.7	4.3
	Std. D.	0.52	0.47	0.92	0.88	0.88	0.57	0.67	1.06
[(i)+(ii)+ (iii)+(iv)+ others] Total N=59	Mean	3.88	3.76	4.12	4	3.88	3.85	3.74	4.18
	Std. D.	0.69	0.65	0.81	0.78	0.77	0.61	0.71	0.83

Remarks: (a) financial capability; (b) human resources; (c) assistance; (d) capability; (e) accuracy; (f) productivity; (g) technical competence and (h) focus

Table 7.9 - Selection of critical success factor regarding influence of the outsourced FM portfolio on clients' competitive position (1) for outsourcing strategies

Influence of the outsourced FM portfolio on clients' competitive position (1):

It can be seen from the results presented in Table 7.9 that the means of respondents range from 3.74 to 4.18 on the various items relating to influence of the outsourced FM portfolio on clients' competitive position (1). In other words, the study sample has similar perceptions towards the statements relating to influence of the outsourced FM portfolio on clients' competitive position (1). A comparison of means revealed that the influence of the outsourced FM portfolio on clients' competitive position (1) does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing catering contract regarding the item "Focus" (Mean = 4.3), while the lowest mean was indicated by the FM outsourcing cleaning and catering contract regarding the item "Financial capability" (Mean = 3.6)

Types of FM Outsourcing Contracts		Influence of the outsourced FM portfolio on clients' competitive position								
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
(i) Building Maintenance N=23	Mean	4	4.04	4.04	4.08	3.77	3.85	3.88	3.96	3.92
	Std. D.	0.69	0.53	0.72	0.69	0.71	0.67	0.71	0.6	0.56
(ii) Security N=15	Mean	4.07	4	4.07	4.2	3.93	3.8	3.93	4.07	4
	Std. D.	0.59	0.65	0.7	0.56	0.7	0.68	0.7	0.59	0.65
(iii) Cleaning N=10	Mean	4.1	3.9	4.1	4.1	4	3.9	4.2	3.9	4
	Std. D.	0.74	0.88	0.74	0.74	0.67	0.74	0.63	0.74	0.67
(iv) Catering N=10	Mean	4.1	4	4.2	4.3	4.3	4.1	4.3	4.1	4
	Std. D.	0.74	0.67	0.63	0.67	0.48	0.57	0.67	0.74	0.67
[(i)+(ii)+(iii)+(iv)+ others] Total N=59	Mean	3.97	3.94	4.06	4.12	3.82	3.88	3.94	4	3.94
	Std. D.	0.72	0.65	0.74	0.69	0.72	0.73	0.74	0.65	0.6

Remarks: (a) Responsibility; (b) Conduct; (c) courteous; (d) understanding; (e) Service; (f) Time; (g) Quality; (h) Satisfaction and (i) Expectation

Table 7.10 - Selection of critical success factor regarding influence of the outsourced FM portfolio on clients' competitive position (2) for outsourcing strategies

Influence of the outsourced FM portfolio on clients' competitive position (2):

It can be seen from the results presented in Table 7.10 that the means of respondents range from 3.82 to 4.12 on the various items relating to influence of the outsourced FM portfolio on clients' competitive position (2). In other words, the study sample has similar perceptions towards the statements relating to influence of the outsourced FM portfolio on clients' competitive position (2). A comparison of means revealed that the influence of the outsourced FM portfolio on clients' competitive position (2) does not differ among different kinds of FM outsourcing

contracts. However, the highest mean was indicated by the FM outsourcing catering contract regarding the item “Understanding, Time and Quality” (Mean = 4.3), while the lowest mean was indicated by the FM outsourcing building and maintenance contract regarding the item “Service" (Mean = 3.77)

Types of FM Outsourcing Contracts		Influence of the outsourced FM portfolio on clients' long-term plan (a)	(b)	(c)	(d)	(e)	(f)
(i) Building Maintenance	Mean	4.08	3.62	3.85	3.88	3.92	3.77
N=23	Std. D.	0.8	0.75	0.73	0.65	0.89	0.59
(ii) Security	Mean	3.93	3.73	3.87	4	3.93	3.8
N=15	Std. D.	0.7	0.88	0.74	0.76	0.96	0.56
(iii) Cleaning	Mean	3.9	3.7	3.9	3.9	4.2	4
N=10	Std. D.	0.57	0.95	0.74	0.88	0.92	0.47
(iv) Catering	Mean	4.1	3.9	4	3.9	4.3	4
N=10	Std. D.	0.57	0.88	0.67	0.88	0.95	0.47
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	4.06	3.65	3.82	3.94	4	3.76
Total N=59	Std. D.	0.78	0.73	0.72	0.65	0.85	0.55

Remarks: (a) Competing job; (b) policy; (c) plan; (d) work; (e) safety and health and (f) human resources

Table 7.11 - Selection of critical success factor regarding influence of the outsourced FM portfolio on clients' long-term plan (1) for outsourcing strategies

Influence of the outsourced FM portfolio on clients' long-term plan (1):

It can be seen from the results presented in Table 7.11 that the means of respondents range from 3.65 to 4.06 on the various items relating to influence of the outsourced FM portfolio on clients' long-term plan (1). In other words, the study sample has similar perceptions towards the statements relating to influence of the outsourced FM portfolio on clients' long-term plan (1). A comparison of

means revealed that the influence of the outsourced FM portfolio on clients' long-term plan (1) does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing catering contract regarding the item "Safety and health" (Mean = 4.3), while the lowest mean was indicated by the FM outsourcing building and maintenance contract regarding the item "Policy" (Mean = 3.62)

Types of FM Outsourcing Contracts		Influence of the outsourced FM portfolio on clients' long-term plan (a)	(b)	(c)	(d)	(e)
(i) Building Maintenance	Mean	3.85	4	3.88	4	3.85
N=23	Std. D.	0.61	0.75	0.95	0.8	0.92
(ii) Security	Mean	4	4.2	3.93	4.2	4
N=15	Std. D.	0.65	0.77	1.1	0.68	0.85
(iii) Cleaning	Mean	4.1	4.2	4.1	4.3	4.1
N=10	Std. D.	0.57	0.79	0.99	0.67	0.74
(iv) Catering	Mean	4.1	4.3	4.1	4.3	4.3
N=10	Std. D.	0.57	0.67	1.1	0.67	0.67
[(i)+(ii)+ (iii)+(iv)+others]	Mean	3.88	4	3.91	4.12	3.97
Total N=59	Std. D.	0.59	0.74	0.9	0.77	0.87

Remarks: (a) administration; (b) quality; (c) social responsibility; (d) value-added services and (e) environmental protection

Table 7.12 - Selection of critical success factor regarding influence of the outsourced FM portfolio on clients' long-term plan (2) for outsourcing strategies

Influence of the outsourced FM portfolio on clients' long-term plan (2):

It can be seen from the results presented in Table 7.12 that the means of respondents range from 3.88 to 4 on the various items relating to influence of the outsourced FM portfolio on clients' long-term plan (2). In other words, the study sample has similar perceptions towards the statements relating to influence of the

outsourced FM portfolio on clients' long-term plan (2). A comparison of means revealed that the influence of the outsourced FM portfolio on clients' long-term plan (2) does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning and catering contract regarding the item "Value-added services" (Mean = 4.3), while the lowest mean was indicated by the FM outsourcing building and maintenance contract regarding the item "Administration and Environmental Protection" (Mean = 3.85)

7.4 Design for outsourcing strategies

The outsourcing manoeuvres have been discussed in more detail in Chapter 2 in terms of features and criticisms. As mentioned earlier, five theories (i.e. Theory of Transaction cost economics, Agency cost theory, Resource dependency theory, Theory of Entrepreneurial actions, and Social exchange theory) have been employed to measure the outsourcing manoeuvres.

In this study, the respondents were asked to provide opinions and to evaluate with regard to the five outsourcing theories for design of the strategies. A five point Likert scales has been used ranging from 1 = very unimportant to 5 = very important. The descriptive statistics of the items in each theory are discussed in the following paragraphs.

Client

Types of FM Outsourcing Contracts		Minimizing Process Customization			
		(a)	(b)	(c)	(d)
(i) Building Maintenance	Mean	3.38	3.65	3.46	3.69
N=26	Std. D.	0.9	0.98	0.99	1.01
(ii) Security	Mean	3.48	3.7	3.52	3.61
N=23	Std. D.	0.73	0.82	0.73	0.84
(iii) Cleaning	Mean	3.52	3.67	3.48	3.57
N=21	Std. D.	0.68	0.86	0.75	0.87
(iv) Catering	Mean	3.63	3.75	3.75	4
N=8	Std. D.	0.52	0.71	0.46	0.76
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.58	3.66	3.58	3.68
Total N=83	Std. D.	0.79	0.88	0.92	0.93

Remarks: (a) Own unique technical skills; (b) Providing outsourcing service external vendors to make substantial investments; (c) Extensive business knowledge specific to our business environment and (d) Requesting the vendor to modify its process significantly

Table 7.13 - Selection of design regarding Theory of Transaction cost economics on clients' outsourcing strategies

Theory of Transaction cost economics:

It can be seen from the results presented in Table 7.13 that the means of respondents range from 3.58 to 3.68 on the various items relating to minimizing process customization. In other words, the study sample has similar perceptions towards the statements relating to minimizing process customization. A comparison of means revealed that the minimizing process customization does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing catering contract regarding the item "Requesting the vendor to modify its process significantly" (Mean =4), while the

lowest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Own unique technical skills" (Mean = 3.38)”

Types of FM Outsourcing Contract		Process Maturity			In-House Competence		
		(a)	(b)	(c)	(d)	(e)	(f)
(i) Building Maintenance N=26	Mean	4.08	3.81	3.73	3.42	3.58	3.19
	Std. D.	0.89	0.9	0.92	1.17	1.03	1.02
(ii) Security N=23	Mean	4	3.74	3.7	3.43	3.43	3
	Std. D.	0.85	0.86	0.88	1.08	0.84	0.9
(iii) Cleaning N=21	Mean	4.1	3.81	3.81	3.33	3.38	2.9
	Std. D.	0.77	0.81	0.81	1.2	0.86	1
(iv) Catering N=8	Mean	4.13	3.75	3.63	3	3.38	3.25
	Std. D.	0.83	0.89	0.74	1.2	1.06	1.16
[(i)+(ii)+ (iii)+(iv)+others] Total N=83	Mean	4.16	3.89	3.79	3.45	3.61	3.16
	Std. D.	0.79	0.8	0.78	1.08	0.95	0.97

Remarks:(a) Documented and visible Key procedures; (b) Well defined and institutionalized process; (c) Clearly demarcated process boundary; (d) team of in-house staff; (e) internal competence to backup and (f) Easily bring the outsourced process in-house

Table 7.14 - Selection of design regarding Agency cost theory on clients’ outsourcing strategies

Agency cost theory:

It can be seen from the results presented in Table 7.14 that the means of respondents range from 3.16 to 4.16 on the various items relating to process maturity and in-house competence. In other words, the study sample has similar perceptions towards the statements relating to process maturity and in-house competence. A comparison of means revealed that the process maturity and in-house competence does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Documented and visible Key

procedures and business rules" (Mean =4.13), while the lowest mean was indicated by the FM outsourcing cleaning contract regarding the item "Easily bring the outsourced process in-house" (Mean =2.9)"

Types of FM Outsourcing Contracts		Vendor Interoperability				Multiple Sourcing to vendors		
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
(i) Building Maintenance	Mean	3.46	3.31	3.12	3.23	3.5	3.42	3.69
N=26	Std. D.	1.03	1.05	1.07	0.95	0.81	0.9	0.88
(ii) Security	Mean	3.26	2.96	3	3.17	3.3	3.17	3.65
N=23	Std. D.	0.92	0.88	0.95	1.03	0.7	0.89	0.83
(iii) Cleaning	Mean	3.29	3	3	3.19	3.29	3.19	3.76
N=21	Std. D.	0.9	0.89	0.95	0.98	0.72	0.87	0.77
(iv) Catering	Mean	3.25	3.13	2.75	3	3.38	3.38	3.75
N=8	Std. D.	1.16	0.99	1.16	1.31	0.52	0.74	0.71
[(i)+(ii)+(iii)+(iv)+others]	Mean	3.45	3.21	3.13	3.29	3.5	3.45	3.79
Total N=83	Std. D.	0.95	0.96	0.99	0.93	0.8	0.86	0.81

Remarks:(a) offering a wide variety of information; (b) Compatible and interoperable software application; (c) Electronically linked and seamlessly connected platform; (d) Software module easily; (e) policy of contracting with multiple outsourcing vendors; (f) Outsourced different components and (g) Building up relationships with a few outsourcing vendors

Table 7.15 - Selection of design regarding Resource dependency theory on clients' outsourcing strategies

Resource dependency theory:

It can be seen from the results presented in Table 7.15 that the means of respondents range from 3.13 to 3.79 on the various items relating to vendor interoperability and multiple sourcing to vendors. In other words, the study sample has similar perceptions towards the statements relating to vendor interoperability

and multiple sourcing to vendors. A comparison of means revealed that the vendor interoperability and multiple sourcing to vendors do not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning contract regarding the item “Building up relationships with a few outsourcing vendors” (Mean =3.76), while the lowest mean was indicated by the FM outsourcing catering contract regarding the item “Electronically linked and seamlessly connected application platform provided by our outsourcing vendor" (Mean =2.75).

Types of FM Outsourcing Contracts		Proactive Sensing			
		(a)	(b)	(c)	(d)
(i) Building Maintenance	Mean	3.46	3.42	3.5	3.58
N=26	Std. D.	0.95	0.95	0.95	0.99
(ii) Security	Mean	3.35	3.39	3.39	3.26
N=23	Std. D.	0.88	0.84	0.84	0.96
(iii) Cleaning	Mean	3.38	3.38	3.33	3.19
N=21	Std. D.	0.86	0.86	0.97	1.03
(iv) Catering	Mean	3.25	3.25	3.38	3.25
N=8	Std. D.	1.04	1.04	1.19	1.39
[(i)+(ii)+ (iii)+(iv)+others]	Mean	3.39	3.47	3.45	3.55
Total N=83	Std. D.	0.89	0.86	1.01	0.95

Remarks: (a) Updating about the dynamics of outsourcing; (b) Initiating actions to which outsourcing vendor responds; (c) Quick to alert outsourcing vendor when new products and services and (d) Outsourcing vendor to explore new opportunities and innovative ideas

Table 7.16 - Selection of design regarding Theory of Entrepreneurial actions on clients’ outsourcing strategies

Theory of Entrepreneurial actions:

It can be seen from the results presented in Table 7.16 that the means of

respondents range from 3.39 to 3.55 on the various items relating to proactive sensing. In other words, the study sample has similar perceptions towards the statements relating to proactive sensing. A comparison of means revealed that the proactive sensing does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Our executives always encouraging our outsourcing vendor to explore new opportunities and innovative ideas” (Mean =3.58), while the lowest mean was indicated by the FM outsourcing cleaning contract regarding the item “Our executives always encouraging our outsourcing vendor to explore new opportunities and innovative ideas" (Mean =3.19).

Types of FM Outsourcing Contracts		Partnership Quality			
		(a)	(b)	(c)	(d)
(i) Building Maintenance N=26	Mean	3.96	3.85	3.38	3.81
	Std. D.	0.72	0.61	0.85	0.85
(ii) Security N=23	Mean	3.91	3.7	3.43	3.74
	Std. D.	0.73	0.63	0.73	0.69
(iii) Cleaning N=21	Mean	3.9	3.76	3.43	3.81
	Std. D.	0.7	0.62	0.75	0.75
(iv) Catering N=8	Mean	3.38	3.5	3.13	3.63
	Std. D.	0.74	0.53	0.64	0.52
[(i)+(ii)+ (iii)+(iv)+ others] Total N=83	Mean	3.92	3.76	3.39	3.84
	Std. D.	0.75	0.59	0.79	0.75

Remarks: (a) Mutually beneficial decisions;(b) Sharing the benefits and risks (c) Having compatible cultures and policies and (d) agreements and promises very well

Table 7.17 - Selection of design regarding Social exchange theory on clients’ outsourcing strategies

Social exchange theory:

It can be seen from the results presented in Table 7.17 that the means of respondents range from 3.39 to 3.92 on the various items relating to partnership quality. In other words, the study sample has similar perceptions towards the statements relating to partnership quality. A comparison of means revealed that the proactive sensing does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing building maintenance contract regarding the item “Mutually beneficial decisions to us and our outsourcing vendor” (Mean =3.96), while the lowest mean was indicated by the FM outsourcing catering contract regarding the item “Having compatible cultures and policies to us and our outsourcing vendor" (Mean =3.13).

Service Provider

Types of FM Outsourcing Contracts		Minimizing Process Customization			
		(a)	(b)	(c)	(d)
(i) Building Maintenance	Mean	3.46	3.54	3.62	3.65
N=23	Std. D.	0.8	0.75	0.84	0.87
(ii) Security	Mean	3.4	3.47	3.33	3.8
N=15	Std. D.	0.71	0.72	0.6	0.54
(iii) Cleaning	Mean	3.6	3.5	3.6	4
N=10	Std. D.	0.8	0.81	0.66	0.45
(iv) Catering	Mean	3.6	3.4	3.8	4
N=10	Std. D.	0.8	0.66	0.75	0.45
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.53	3.59	3.68	3.76
Total N=59	Std. D.	0.81	0.73	0.87	0.81

Remarks: (a) Own unique technical skills; (b) Outsourcing service external vendors to make substantial investments; (c) Extensive business knowledge (d) Modify its process significantly

Table 7.18 - Selection of design regarding Theory of Transaction cost economics on service providers’ outsourcing strategies

Theory of Transaction cost economics:

It can be seen from the results presented in Table 7.18 that the means of respondents range from 3.53 to 3.76 on the various items relating to minimizing process customization. In other words, the study sample has similar perceptions towards the statements relating to minimizing process customization. A comparison of means revealed that the minimizing process customization does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning and catering contracts regarding the item “Requesting to modify its process significantly” (Mean =4), while the lowest mean was indicated by the FM outsourcing security contract regarding the item “Extensive business knowledge specific to clients’ business environment " (Mean = 3.33).

Types of FM Outsourcing Contracts		Process Maturity			In-House Competence		
		(a)	(b)	(c)	(d)	(e)	(f)
(i) Building Maintenance	Mean	3.96	3.81	3.73	3.31	3.19	3.19
N=23	Std. D.	0.76	0.88	0.9	0.95	0.96	0.88
(ii) Security	Mean	4	3.6	3.6	3.33	3.13	3
N=15	Std. D.	0.73	0.8	0.8	0.79	0.81	0.89
(iii) Cleaning	Mean	4.2	3.9	4	3.4	3.3	3.2
N=10	Std. D.	0.6	0.54	0.63	0.8	0.78	0.98
(iv) Catering	Mean	4.2	3.9	4	3.3	3.3	3
N=10	Std. D.	0.6	0.54	0.45	0.78	0.78	0.77
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.97	3.79	3.76	3.38	3.29	3.24
Total N=59	Std. D.	0.71	0.8	0.84	0.87	0.89	0.88

Remarks:(a) Documented and visible Key procedures; (b) Well defined and institutionalized process; (c) Clearly demarcated process boundary; (d) team of in-house staff; (e) internal competence to backup & (f)Easily bring the outsourced process in-house

Table 7.19 - Selection of design regarding Agency cost theory on service providers’ outsourcing strategies

Agency cost theory:

It can be seen from the results presented in Table 7.19 that the means of respondents range from 3.24 to 3.97 on the various items relating to process maturity and in-house competence. In other words, the study sample has similar perceptions towards the statements relating to process maturity and in-house competence. A comparison of means revealed that the process maturity and in-house competence does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning and catering contracts regarding the item "Documented and visible Key procedures and business rules" (Mean =4.2), while the lowest mean was indicated by the FM outsourcing security and catering contracts regarding the item "Clients easily bringing the outsourced process in-house" (Mean =3).

Types of FM Outsourcing Contracts		Vendor Interoperability				Multiple Sourcing to vendors		
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
(i) Building Maintenance N=23	Mean	3.42	3.35	3.46	3.35	3.62	3.5	3.46
	Std. D.	0.74	0.92	0.93	0.96	0.68	0.75	0.84
(ii) Security N=15	Mean	3.2	3.4	3.27	3.13	3.33	3.4	3.33
	Std. D.	0.75	0.95	1	1.02	0.7	0.71	0.79
(iii) Cleaning N=10	Mean	3.4	3.7	3.2	3.2	3.8	3.6	3.9
	Std. D.	0.66	0.78	0.87	1.08	0.6	0.66	0.54
(iv) Catering N=10	Mean	3.4	3.6	3.2	3.2	3.8	3.7	3.9
	Std. D.	0.66	0.66	0.75	0.98	0.6	0.64	0.54
[(i)+(ii)+ (iii)+(iv)+others] Total N=59	Mean	3.44	3.38	3.38	3.32	3.56	3.5	3.5
	Std. D.	0.74	0.94	0.91	0.93	0.74	0.78	0.85

Remarks:(a) offering a wide variety of information; (b) Compatible and interoperable software application; (c) Electronically linked and seamlessly connected platform; (d) Software module easily; (e) policy of contracting with multiple outsourcing vendors; (f) Outsourced different components and (g) Building up relationships with a few outsourcing vendors

Table 7.20 - Selection of design regarding Resource dependency theory on service providers' outsourcing strategies

Resource dependency theory:

It can be seen from the results presented in Table 7.20 that the means of respondents range from 3.32 to 3.56 on the various items relating to vendor interoperability and multiple sourcing to vendors. In other words, the study sample has similar perceptions towards the statements relating to vendor interoperability and multiple sourcing to vendors. A comparison of means revealed that the vendor interoperability and multiple sourcing to vendors do not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing cleaning and catering contracts regarding the item "Clients building up relationships with a few outsourcing vendors" (Mean =3.9), while the lowest mean was indicated by the FM outsourcing security contract regarding the item "Offering a wide variety of information" (Mean = 3.2); FM outsourcing cleaning and catering contracts regarding the item "Electronically linked and seamlessly connected application platform provided by us & Software module easily be added to, modified, or removed" (Mean = 3.2)

Types of FM Outsourcing Contracts		Proactive Sensing			
		(a)	(b)	(c)	(d)
(i) Building Maintenance	Mean	3.12	3.58	3.08	3.69
N=23	Std. D.	0.93	0.63	0.92	0.82
(ii) Security	Mean	3.2	3.4	3.13	3.93
N=15	Std. D.	0.83	0.61	0.81	0.68
(iii) Cleaning	Mean	3	3.3	3.2	3.7
N=10	Std. D.	0.89	0.64	0.98	0.64
(iv) Catering	Mean	3.3	3.5	3.3	3.7
N=10	Std. D.	0.78	0.5	0.9	0.64
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.21	3.53	3.18	3.71
Total N=59	Std. D.	0.9	0.61	0.89	0.79

Remarks: (a) Updating about the dynamics of outsourcing; (b) Initiating actions to which outsourcing vendor responds; (c) Quick to alert outsourcing vendor when new products and services and (d) Outsourcing vendor to explore new opportunities and innovative ideas

Table 7.21 - Selection of design regarding Theory of Entrepreneurial actions on service providers' outsourcing strategies

Theory of Entrepreneurial actions:

It can be seen from the results presented in Table 7.21 that the means of respondents range from 3.18 to 3.71 on the various items relating to proactive sensing. In other words, the study sample has similar perceptions towards the statements relating to proactive sensing. A comparison of means revealed that the proactive sensing does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing security contract regarding the item "Clients' executives always encouraging us to explore new opportunities and innovative ideas" (Mean =3.93), while the lowest

mean was indicated by the FM outsourcing building maintenance contract regarding the item “Clients’ executives quick to alert us when new products and services" (Mean =3.08).

Types of FM Outsourcing Contracts		Partnership Quality			
		(a)	(b)	(c)	(d)
(i) Building Maintenance	Mean	3.96	3.85	3.73	4
N=23	Std. D.	0.94	0.95	0.81	0.68
(ii) Security	Mean	4	4.07	3.93	4.13
N=15	Std. D.	0.82	0.77	0.57	0.5
(iii) Cleaning	Mean	4.2	4.1	3.9	4.4
N=10	Std. D.	0.75	0.83	0.7	0.49
(iv) Catering	Mean	4.2	4.3	3.9	4.3
N=10	Std. D.	0.75	0.46	0.7	0.64
[(i)+(ii)+ (iii)+(iv)+ others]	Mean	3.88	3.82	3.65	4
Total N=59	Std. D.	0.9	0.92	0.76	0.64

Remarks: (a) Mutually beneficial decisions; (b) Sharing the benefits and risks; (c) Having compatible cultures and policies and (d) agreements and promises very well

Table 7.22 - Selection of design regarding Social exchange theory on service providers’ outsourcing strategies

Social exchange theory:

It can be seen from the results presented in Table 7.22 that the means of respondents range from 3.65 to 4 on the various items relating to partnership quality. In other words, the study sample has similar perceptions towards the statements relating to partnership quality. A comparison of means revealed that the proactive sensing does not differ among different kinds of FM outsourcing contracts. However, the highest mean was indicated by the FM outsourcing catering contract regarding the item “Perform our agreements and promises very

well" (Mean =4.3), while the lowest mean was indicated by the FM outsourcing building maintenance contract regarding the item "Having compatible cultures and policies to us and our clients" (Mean =3.73).

7.5 Chapter summary

This chapter is concerned with providing the research analysis to fulfill the objectives that have been mentioned in chapter 1. It has been divided into three main sections and in each one, several findings have been reached, which gave a clear picture about the characteristics on outsourcing categories of the current FM outsourcing contracts and how the clients and service providers regard their facilities in the buildings in terms of critical success factors and design for outsourcing strategies.

The findings of outsourcing categories of current FM outsourcing contracts are summarized as the followings. On clients' point of view, it has been found that the main agreeable characteristics influencing the outsourcing category in the four FM contracts is service providers' qualified technical expertise. However, the agreeable characteristics influencing kinds of contracts is common goals with service providers. As for service providers' point of view, it has been found that the main agreeable characteristics influencing the outsourcing category in the four FM contracts is service providers' further support to the in-house team of clients. However, the agreeable characteristics influencing kinds of contracts is common goals with clients.

The findings of critical success factors for outsourcing strategies of current FM

outsourcing contracts are summarized as the followings. On clients' point of view, the results reveal that that the main good factor influencing the outsourcing strategies in the four FM contracts is daily routine operation in control of various FM assets transferred by clients. However, the neutral factor influencing the outsourcing strategies is to take responsibility by competent service providers in outsourced FM portfolio on clients' competitive position. As for service providers' point of view, the results also reveal that the main good factor influencing the outsourcing strategies in the four FM contracts is to focus a service the outsourced FM portfolio on clients' competitive position. However, the neutral factor influencing outsourcing strategies is to consider availability of own equipment or machinery for competing jobs in ownership of various FM assets transferred to service providers.

The findings of design for outsourcing strategies of current FM outsourcing contracts are summarized as the followings. On clients' point of view, the results reveal that that the main important design influencing the outsourcing strategies in the four FM contracts relates to key procedures and business rules in process maturity of Agency cost theory. However, the neutral design influencing the outsourcing strategies is the application platform in vendor interoperability of Resource dependency theory. As for service providers' point of view, the results also reveal that the important design influencing the outsourcing strategies in the four FM contracts relates to key procedures and business rules in process maturity of Agency cost theory. However, the neutral design influencing outsourcing strategies is updating the dynamics of outsourcing vendor's market to take advantage of new opportunities in proactive sensing of Theory of

Entrepreneurial actions. The research conclusions are presented in the next chapter.

In conclusion, the final results reveal outsourcing categories of current FM outsourcing contracts that clients and service providers have different point of views on main agreeable characteristics influencing the outsourcing category in the four FM contracts. However, they have same point of views on agreeable characteristics influencing kinds of contracts. As for critical success factors for outsourcing strategies of current FM outsourcing contracts, the results also show that clients and service providers have different point of views on main good factor influencing the outsourcing strategies in the four FM contracts. At the same time, they also have different point of views on neutral factor influencing the outsourcing strategies. Lastly about design for outsourcing strategies of current FM outsourcing contracts, the clients and service providers have same point of views on main important design influencing the outsourcing strategies in the four FM contracts relates to key procedures and business rules in process maturity of Agency cost theory. Nevertheless, they have different point of views on neutral design influencing the outsourcing strategies.

CHAPTER 8 OUTSOURCING RELATIONSHIP TYPES OF FM OUTSOURCING RELATIONSHIPS DIMENSIONS

8.1 Introduction

In this chapter, a series of structured questions is addressed to categorise the structure of the client-provider outsourcing relationship. The survey design and measures operationalising the constructs allow the use of the Analytic Hierarchy Process (AHP), a technique that tests FM outsourcing in a contingent approach such as a decision processing model. In the questionnaire surveys, FM experts used the AHP methodology to rank different outsourcing relationship types according to importance with respect to the four critical FM drivers.

8.2 Analytic Hierarchy Process

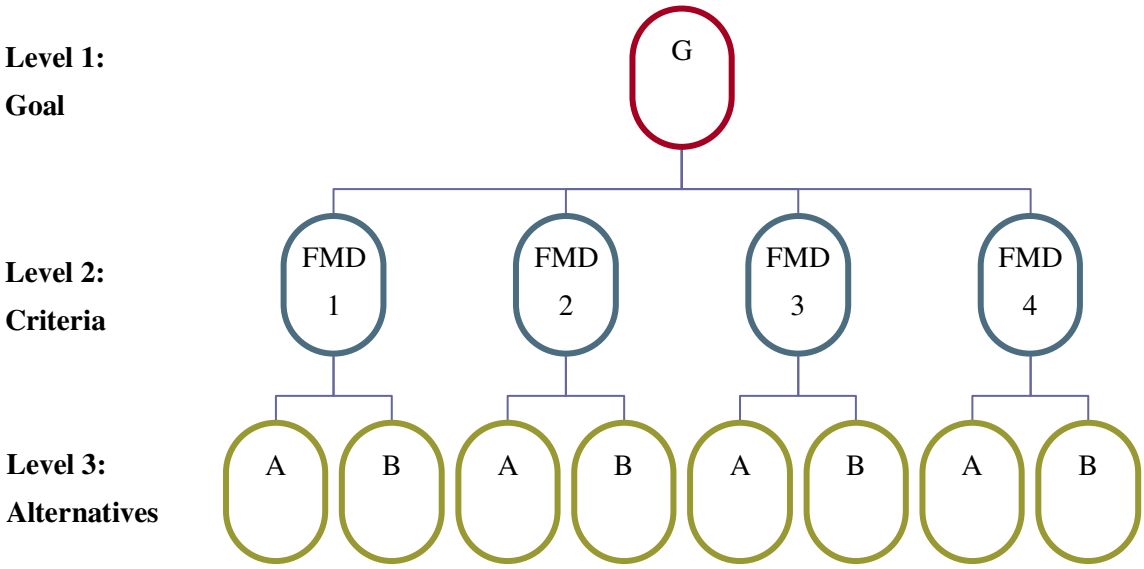
The Analytic Hierarchy Process (AHP), which was developed by Professor Thomas Saaty, is an analytical tool using a deductive approach (Wong and Wu, 2002). The technique structures a decision problem into a hierarchy of criteria, sub-criteria and alternatives, followed by a series of pairwise comparisons to derive prioritised scales. Consistency Ratios are computed for measuring the consistency of judgments. The use of the AHP basically serves 2 purposes: (i) assigning weights to a set of predetermined criteria or measures; and (ii) prioritising or ranking elements to identify the key elements (Cheng and Li, 2002). For the building and construction industries, the AHP method has been widely applied in various fields such as facility management benchmarking (Gilleard and Wong, 2004), asset management (Tran, *et al.*, 2003), selection of demolition techniques (Abdullah and Anumba, 2002), priority setting for home purchase (Wong and Wu, 2002), dispute resolution (Cheung, *et al.*, 2002), procurement selection (Khalil, 2002; Cheung, *et al.*, 2001), contractor selection (Mahdi, *et al.*, 2002; Fong and Choi, 2000), project management (Al-Harbi, *et al.*, 2001) and

maintenance management (Shen, *et al.*, 1998).

AHP was used to categorise of FM outsourcing relationships types with respect to the FM drivers as identified in Section 8.3. Numerical fractions of unity were generated, representing the relative FM drivers of each outsourcing relationship dimension to one another. By ranking the relationship dimensions according to the fractions, categories of FM outsourcing relationships types can thus be established. These relationships types are used to categories by applying them to the client-service provider relationships in any given contract.

There are 3 basic principles upon which AHP is based: decomposition, comparative judgments and hierarchical composition or synthesis of priorities (Forman and Selly, 2001).

Figure 8.1 shows an example to demonstrate how category of the client-provider outsourcing relationship for outsourcing relationship dimensions is generated by using AHP. First, the decision is structured into a hierarchy of goals, criteria and alternatives. In the structure, the goal is set as “Category of FM Outsourcing Relationships Types”, which is then decomposed into a number of criteria for the selection, namely, the four FM drivers. Next, the alternatives of outsourcing relationship dimensions A and B are put immediately underneath the layer of criteria.



Legend:

G: Selecting the category for FM Outsourcing Relationships Types

FMD: FM Drivers (1 to 4)

Client: (Co-ordination, Quality and Competence)

Service provider: (Co-ordination, Quality, Competence and Adequacy)

A and B: Outsourcing Relationship Dimensions

Figure 8.1 - AHP decision hierarchy of goal, criteria and alternatives for category of FM Outsourcing Relationships Types

Having structured the problem, pairwise comparisons are carried out among all the criteria with respect to the goal. These comparisons will derive the local priority ratios as proxy of the priority vectors for the criteria. According to Saaty (1994), the priority vectors can be calculated by multiplying the “n” judgments in each row and taking the nth root, followed by normalising the resulting numbers. Table 8.1 is the matrix of pairwise comparisons among the criteria for respondent 2.

Client	Co-ordination	Quality	Competence	Priority vector
Co-ordination	1	3	1	0.416
Quality	1/3	1	1/4	0.126
Competence	1	4	1	0.458
Total	2.3	8	2.25	1.000

(Note: the fractions represent reciprocal relationships)

Table 8.1 - Matrix of pair-wise comparisons among the FM drivers from clients (Respondent No.2)

Service provider	Co-ordination	Quality	Competence	Adequacy	Priority vector
Co-ordination	1	1	1/2	1/7	0.289
Quality	1	1	1/7	1/7	0.211
Competence	2	7	1	1	0.289
Adequacy	7	7	1	1	0.211
Total	11	16	2.64	2.29	1.000

Table 8.2 - Matrix of pair-wise comparisons among the FM drivers from service provider (Respondent No.1)

Calculations of the priority vectors for the FM drivers are detailed in Table 8.3 and Table 8.4.

	Pairwise comparison matrix			**Priority vector**		
Co-ordination	$(1 \times 3 \times 1)^{1/3}$	=	1.44	1.44 / 3.47	=	**0.416**
Quality	$(1/3 \times 1 \times 1/4)^{1/3}$	=	0.44	0.44 / 3.47	=	**0.126**
Competence	$(1 \times 4 \times 1)^{1/3}$	=	1.59	1.59 / 3.47	=	**0.458**
	Total	=	3.47	Total	=	**1**

Table 8.3 - Calculation of priority vector from the pairwise comparison matrix from clients (Respondent No.2)

	Pairwise comparison matrix			Priority vector		
Co-ordination	$(1 \times 1 \times 1/2 \times 1/7)^{1/4}$	=	0.52	0.52 / 1.79	=	**0.289**
Quality	$(1 \times 1 \times 1/7 \times 1/7)^{1/4}$	=	0.38	0.38 / 1.79	=	**0.211**
Competence	$(1/2 \times 1/7 \times 1 \times 1)^{1/4}$	=	0.52	0.52 / 1.79	=	**0.289**
Adequacy	$(1/7 \times 1/7 \times 1 \times 1)^{1/4}$	=	0.38	0.38 / 1.79	=	**0.211**
	Total	=	1.79	Total	=	**1**

Table 8.4 - Calculation of priority vector from the pairwise comparison matrix from service provider (Respondent No.1)

Similarly, the alternatives, i.e. outsourcing relationship dimensions A and B will go through the pairwise comparison process with respect to each of the criteria, i.e. the FM drivers. A scale of priority of the alternatives will be formed under each criterion. Finally, for each criterion, a global priority for each alternative will be worked out by multiplying the alternative's priority and the criterion's local priorities. Adding up these global priorities for the 4 criteria produces an overall priority for each alternative. The ranking of alternatives, outsourcing relationship dimensions, is derived based on the overall priorities.

A Consistency Ratio is generated for each prioritised scale upon completion of carrying out pairwise comparisons. It is used to determine the consistency of the judgments. Consistency Ratio is defined as the Consistency Index for a particular set of judgments divided by the average Random Index (Saaty, 1982). Perfectly consistent judgments would be represented by a Consistency Index of 0, same as

the Consistency Ratio. In contrast, Consistency Ratio being equal to or greater than 0.1 indicates inconsistency of the judgments.

8.3 Structured questionnaire survey with FM experts

Because any FM driver is primarily constituted of various outsourcing relationship dimensions, the combinations of outsourcing relationship dimensions should have an effect on the overall outsourcing relationship types. This questionnaire survey was intended to help develop an understanding of the extent to which the common outsourcing relationship dimensions contribute to outsourcing relationship types. The AHP was used to conduct questionnaire surveys and derive the priority ratios of FM drivers based on how the experts ranked the different outsourcing relationship dimensions. The list of outsourcing relationship dimensions for various outsourcing relationship types, i.e. the extent of substitution and strategic impact, was drawn up with reference to the FORT model (Kishore, 2003).

In the questionnaire survey, background information and the purpose of the research were introduced to the experts. The criteria of the outsourcing strategy definition were explained to ensure that the interviewees understood the interpretation of outsourcing strategy. In addition, the four FM drivers were introduced to the respondents in Section D of the questionnaire, which was designed for carrying out the AHP exercise. An example of how to perform pairwise comparisons was shown to the respondents to enhance their understanding of the questions. Then, the industry experts were asked to make pairwise comparisons (i) among the four FM drivers (as identified in Section 8.2); and (ii) of the outsourcing relationship dimensions, with respect to each of the FM

drivers. For example, regarding the category of FM outsourcing relationship types, the interviewees were asked to compare “ownership and control” with “long-term plan and competitive position” with respect to each of the FM drivers, such as “Co-ordination”.

The decision-making iterations of the AHP in the category of FM outsourcing relationship types are shown in Figure 8.2. This hierarchy which is used to find out the current preferred and targeted outsourcing relationship types with respect to the specific FM outsourcing contracts from clients and service providers respectively relates to corollary 9 of this study. The hierarchy of such a decision typically takes the following form:

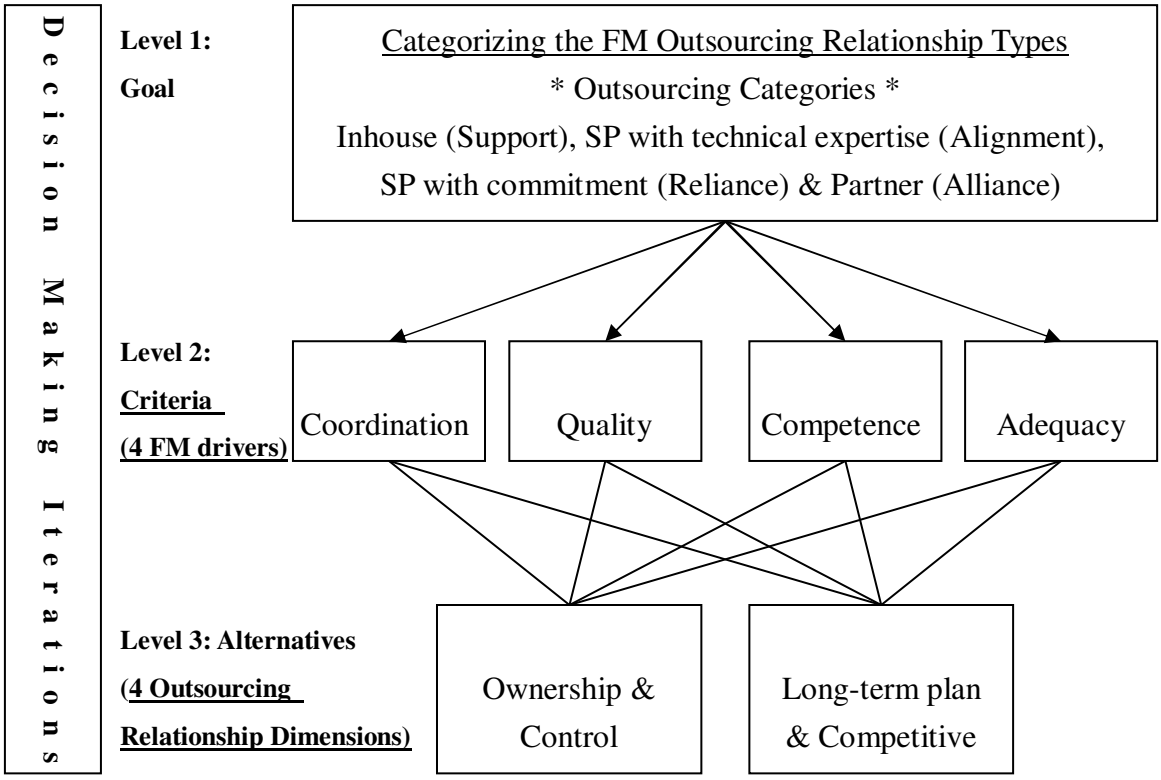


Figure 8.2 - The AHP decision hierarchy for FM outsourcing relationship types

On the level 2 of criteria, there are four components used to categorize the FM outsourcing relationship types. On the level 3 of alternative, the various alternatives relationship dimensions are put from which they will choose. A typical analytic hierarchy for allocating resources either by measuring performance or by measuring capability will often be stratified roughly as follows. The top level will include the overall objective of the system. Performance – capability criteria may appear in the next level. A sub-ordinate level may further clarify these criteria in the context of the particular problem by itemizing specific tasks which are to be accomplished at some level of performance. This is followed by the relative impacts of the specific tasks. (Saaty, 1982)

Importance	Likelihood	Preferredness	Numerical Value (Relative intensity)	Explanation
Equally important	Equally likely	Equally preferred	**1**	Two activities contribute equally to the objective
Moderately more important	Moderately more likely	Moderately more preferred	**3**	Experience and judgment slightly favor one activity over another
Strongly more important	Strongly more likely	Strongly more preferred	**5**	Experience and judgment strongly favor one activity over another
Very Strongly more important	Very Strongly more likely	Very Strongly more preferred	**7**	An activity is strongly favored and its dominance is demonstrated in practice
Extremely more important	Extremely more likely	Extremely more preferred	**9**	The evidence favoring one activity over another is of the highest possible order of affirmation.
Intermediate values between the two adjacent judgments	Intermediate values between the two adjacent judgments	Intermediate values between the two adjacent judgments	**2, 4, 6, 8**	When compromised is needed.
If an activity has one of the above numbers assigned to it when compared with a second activity, Then the second activity has the reciprocal value when compared to the first.			Reciprocals of above non-zero numbers	

Table 8.5 – Scale of Measurement for the AHP

The computer application software Expert Choice (EC - 2004 edition), which was developed by Expert Choice Inc. (EC, 2006) in accordance with the principles of

AHP, was used for calculating the results. When all expert respondents made iteration of decisions, the results were typed into the software, which then generated a prioritised scale of the FM drivers as well as rankings for different outsourcing relationship dimensions towards outsourcing relationship types. The Consistency Ratios for all the experts' judgements were monitored and corrections were prompted to ensure that they were lower than 0.1.

Two questionnaire surveys to clients and service providers were carried out with experienced industry practitioners from May to August in 2012 in Hong Kong. The prospective respondents were located from various sources including the universities, tertiary institutes, private companies, quasigovernment organisations and professional institutions of FM. Next, questionnaires were sent out to the suitable correspondents by electronic approach. Brief introduction of the project and description of the expected contributions from the respondents was also enclosed with each electronic letter. In total, 175 letters with the questionnaires were electronically posted 92 letters to clients and 83 letters to service providers. On clients' side, there were 38 respondents returning the completed questionnaires representing 41.3% of response rate. On service providers' side, there were 34 respondents returning the completed questionnaires representing 41% of response rate.

From figure 8.3 to 8.8, the profile of respondents of FM clients and service providers are classified into three main areas such as years of FM related working experience, professions and types of FM Contracts. Figure 8.3 to 8.5 indicate 38 respondents in the questionnaire survey of clients. Each respondent may indicate more than one current FM outsourcing contract in the questionnaire and the total number of contracts is 83. Similarly, figure 8.6 to 8.8 indicate 34 respondents in the questionnaire survey of service providers. Each respondent may also indicate more than one current FM outsourcing contract in the questionnaire and the total number of contracts is 59.

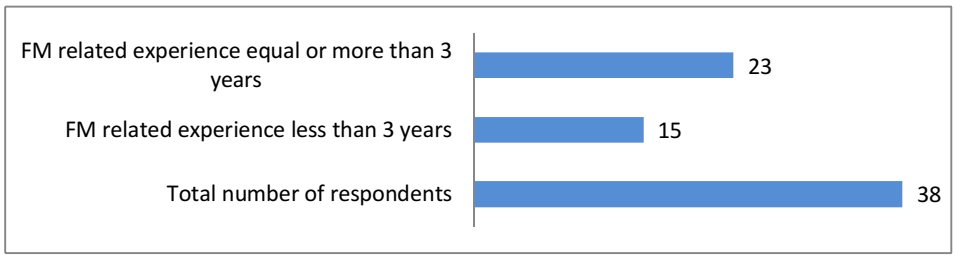


Figure 8.3 - Profile of FM related experience on respondents from clients (AHP)

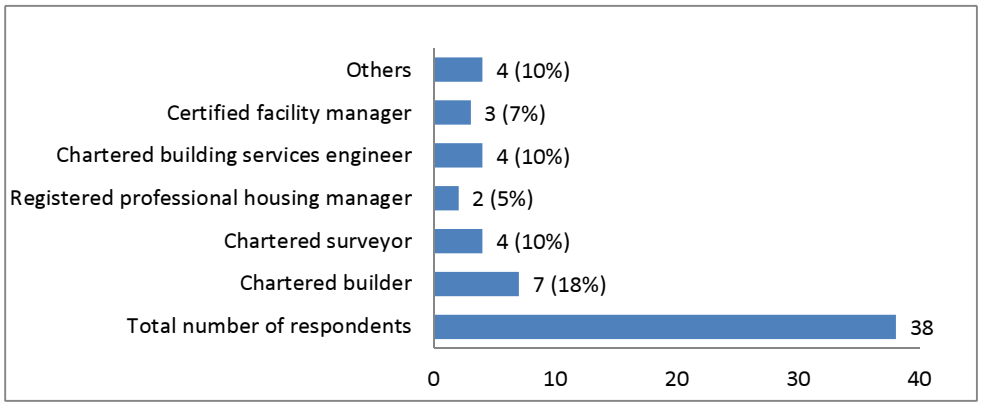


Figure 8.4 - Profile of professions on respondents from clients (AHP)

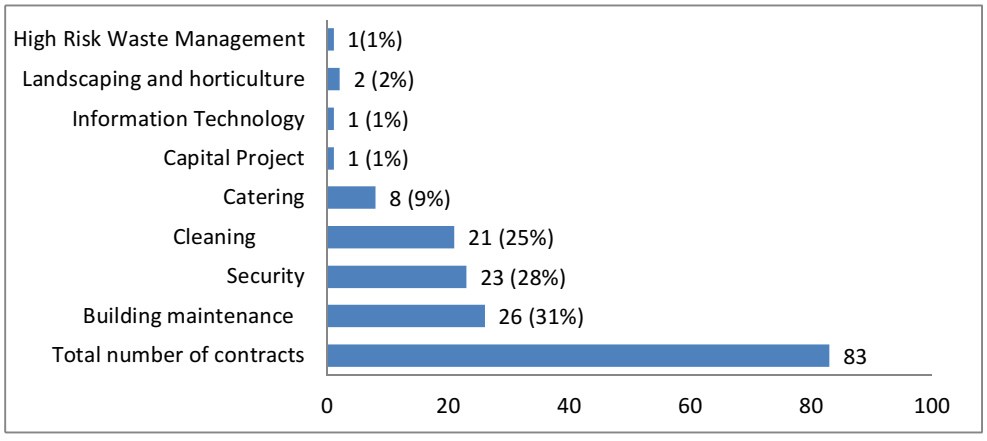


Figure 8.5 - Profile of types of FM Contracts on Respondents from clients (AHP)

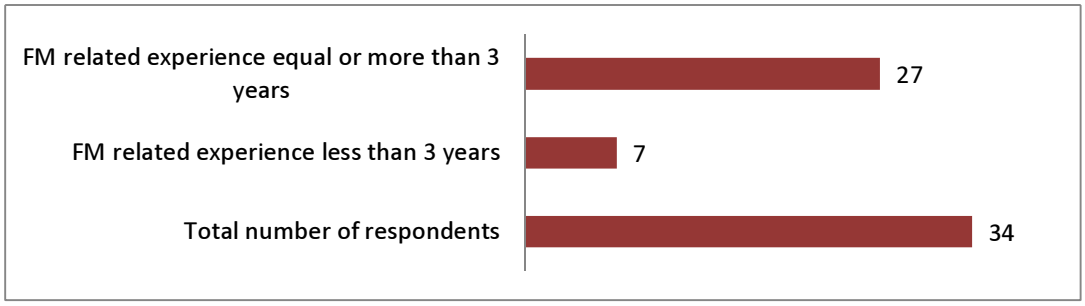


Figure 8.6 - Profile of FM related experience on respondents from service providers (AHP)

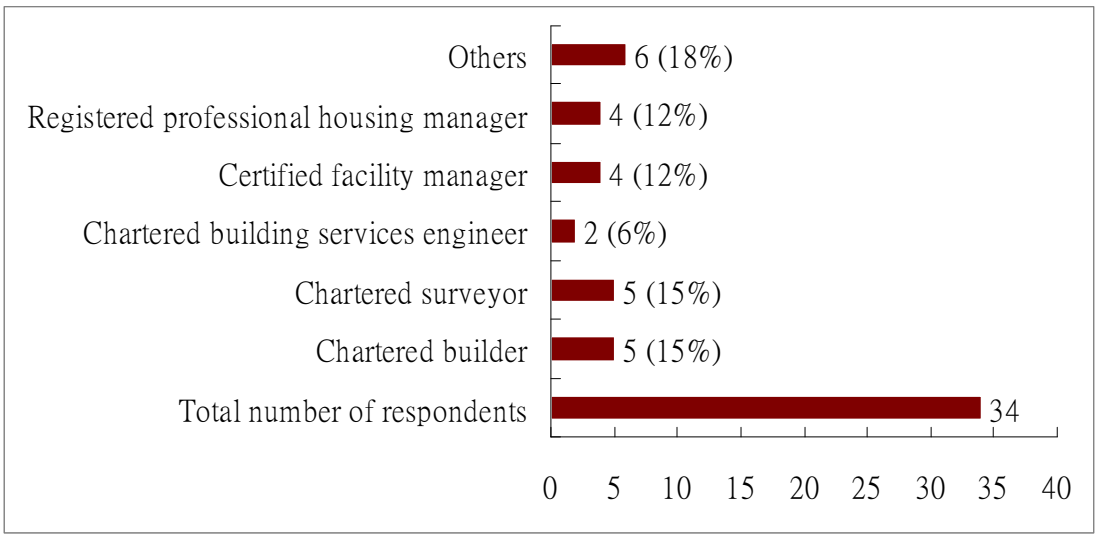


Figure 8.7 - Profile of professions on respondents from service providers (AHP)

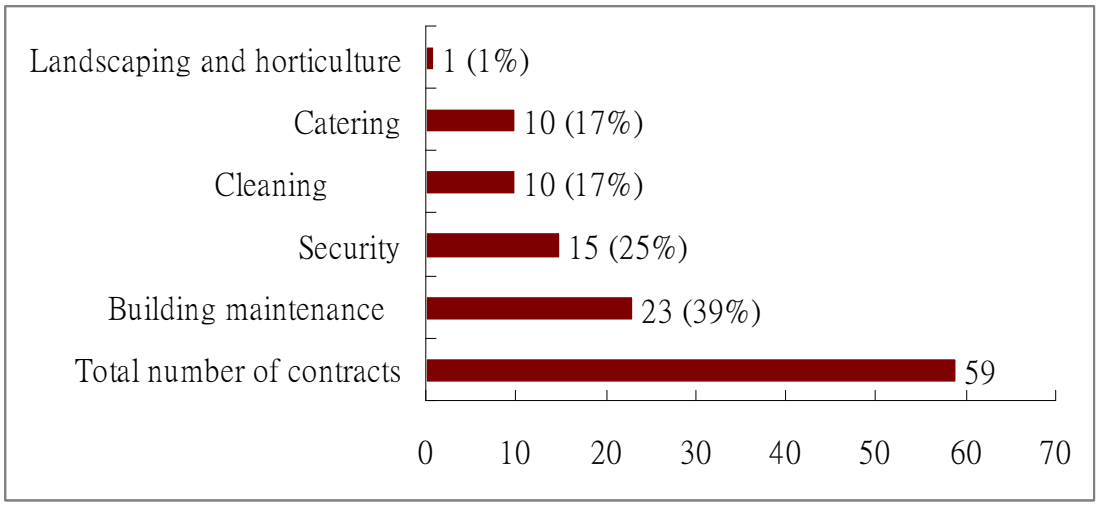


Figure 8.8 - Profile of types of FM Contracts on Respondents from service providers (AHP)

In this AHP study, all respondents are local or overseas experienced FM practitioners.

Years of FM Experience

About 60% of respondents from clients have equal or more than 3 years of FM related experience and only 7% less than 3 years of FM related experience. About 70% of respondents from service providers have equal or more than 3 years of FM related experience and only 6% less than 3 years of FM related experience.

Professions

With regard to FM professions from the clients, 18% of them are chartered builders. For chartered surveyors and chartered building services engineer and others, all of these three kinds of professions accounted for 10%. With regard to FM professions from the service providers, 15% of them are chartered builders and chartered surveyors respectively and 18% of them are others. For registered professional housing manager and certified facility manager, all these two kinds of professions accounted for 12%.

Types of FM Contracts

According to the findings, building maintenance, security and cleaning of FM contracts from clients are ranging on 31%, 28% and 25% respectively while 9% of FM contract are the catering. As for the findings from service providers, building maintenance and security of FM contracts from clients are ranging on 39% and 25% respectively while 17% of FM contracts are cleaning and catering.

8.4 Findings of questionnaires

This Section discusses the rankings of the FM drivers and outsourcing relationship dimensions towards outsourcing relationships types respectively as derived by the AHP. By averaging the individual results from the clients and service providers, the overall rankings of the FM drivers and the outsourcing relationships types rankings of outsourcing relationship dimensions for different parts of a FM outsourcing contract are established (Table 8.6 to 8.12). After completion on the Delphi study of the critical success factors for outsourcing manoeuvres, respondents of clients considered that adequacy of FM resources of the FM drivers was unimportant. In table 8.6, there are only four factors identified as follows; one for quality, one for co-ordination and two for competence.

FM Drivers	Priority Ratios (Overall)	Priority Ratios (Maintenance)	Priority Ratios (Security)	Priority Ratios (Cleaning)	Priority Ratios (Catering)
Quality	0.314	0.325	0.301	0.313	0.372
Co-ordination	0.303	0.313	0.281	0.281	0.355
Competence	0.382	0.362	0.418	0.405	0.272

Table 8.6 - Priority ratios of FM Drivers as derived by the AHP from clients

FM Drivers	Priority Ratios (Overall)	Priority Ratios (Maintenance)	Priority Ratios (Security)	Priority Ratios (Cleaning)	Priority Ratios (Catering)
Quality	0.264	0.265	0.264	0.264	0.265
Co-ordination	0.283	0.311	0.3	0.328	0.314
Competence	0.235	0.211	0.217	0.232	0.243
Adequacy	0.218	0.213	0.219	0.179	0.178

Table 8.7 - Priority ratios of FM Drivers as derived by the AHP from service providers

In this study, Analytical Hierarchy Process (AHP) is a decision tool for identification of the outsourcing relationship dimensions of a specific kind of outsourcing contract between client and service provider. The decisions to categorize the FM outsourcing relationship types are based on the FORT model originated by Kishore *et. al.* on 2003. The details of working mechanism are shown at the following table.

Outsourcing Relationships Dimensions	Working mechanism of FORT Model (Kishore *et. al.*)		Working mechanism of Contingency Outsourcing Relationships (CORE) Model in FM industry	
Priority Ratio of Ownership & Control in AHP	less than 0.5	higher than 0.5	less than 0.5	higher than 0.5
Extent of service provider involvement: Competitive position and long-term strategy (X – axis of the model)	Low	High	Low	High
Extent of Outsourcing Relationship Dimensions: Ownership and Control (Y – axis of the model)	Low	High	Low	High
Outsourcing Relationships types between clients and service providers	Support and Alignment	Reliance and Alliance	In-house and service provider's Technical Expertise	Service provider's Commitment and Common Goals

Table 8.8 - FORT Model VS Contingency Outsourcing Relationships (CORE) Model in FM

The working mechanism of FORT (Kishore *et. al.*)

Low extent of service provider involvement (Low ownership and control)

- Support and alignment relationships
- The definition of low ownership and control in this research study is that priority ratio of Ownership & Control is less than 0.5.

High extent of service provider involvement (High ownership and control)

- More committed to SP's equipment, technology, systems and skills in the reliance and alliance cells by clients

- The definition of high ownership and control in this research study is that priority ratio of Ownership & Control is higher than 0.5.

i) Outsourcing relationship dimensions of a specific kind of outsourcing contract (client)

This part is to make judgment that the decision makers in clients will select the outsourcing relationship dimensions for the specific outsourcing contract.

Current FM outsourcing contracts	Outsourcing relationship dimensions	Priority Ratios (i.e. outsourcing relationships types)	Totals
Overall	Ownership & Control	0.488	
	Long-term plan & Competitive	0.512	1.000
Building Maintenance	Ownership & Control	0.482	
	Long-term plan & Competitive	0.518	1.000
Security	Ownership & Control	0.494	
	Long-term plan & Competitive	0.506	1.000
Cleaning	Ownership & Control	0.520	
	Long-term plan & Competitive	0.480	1.000
Catering	Ownership & Control	0.529	
	Long-term plan & Competitive	0.471	1.000

Table 8.9 - Outsourcing relationships types of outsourcing relationship dimensions as derived by the AHP from clients

The outsourcing relationships between the clients and service providers of specific FM outsourcing contracts can be derived from the Contingency Outsourcing Relationships (CORE) Model in FM industry. The following table indicates the results of Analytical Hierarchy Process (AHP) from clients' perspective.

Current FM outsourcing contracts	Extent of Outsourcing relationship dimensions on Ownership & Control	Preferred Outsourcing Relationships type according to FM (CORE) Model
Overall	Low	In-house and service provider's Technical Expertise
Building Maintenance	Low	In-house and service provider's Technical Expertise
Security	Low	In-house and service provider's Technical Expertise
Cleaning	High	Service provider's Commitment and Common Goals
Catering	High	Service provider's Commitment and Common Goals

Table 8.10 - Outsourcing relationships types of current FM outsourcing contracts from clients' perspectives

ii) Outsourcing relationship dimensions of a specific kind of outsourcing contract (Service providers)

This part is to make judgment that the decision makers in service providers will select the outsourcing relationship dimensions for the specific outsourcing contract.

Current FM outsourcing contracts	Outsourcing relationship dimensions	Priority Ratios (i.e. outsourcing relationships types)	Totals
Overall	Ownership & Control	0.481	
	Long-term plan & Competitive	0.519	1.000
Building Maintenance	Ownership & Control	0.487	
	Long-term plan & Competitive	0.514	1.000
Security	Ownership & Control	0.546	
	Long-term plan & Competitive	0.454	1.000
Cleaning	Ownership & Control	0.602	
	Long-term plan & Competitive	0.398	1.000
Catering	Ownership & Control	0.612	
	Long-term plan & Competitive	0.388	1.000

Table 8.11 - Outsourcing relationships types of outsourcing relationship dimensions as derived by the AHP from service providers

The outsourcing relationships between the clients and service providers of specific FM outsourcing contracts can be derived from the Contingency Outsourcing Relationships (CORE) Model in FM industry. The following table indicates the results of Analytical Hierarchy Process (AHP) from service providers' perspective.

Current FM outsourcing contracts	Extent of Outsourcing relationship dimensions on Ownership & Control	Targeted Outsourcing Relationships type according to FM (CORE) Model
Overall	Low	In-house and service provider's Technical Expertise
Building Maintenance	Low	In-house and service provider's Technical Expertise
Security	High	Service provider's Commitment and Common Goals
Cleaning	High	Service provider's Commitment and Common Goals
Catering	High	Service provider's Commitment and Common Goals

Table 8.12 - Outsourcing relationships types of current FM outsourcing contracts from Service providers' perspectives

8.5 Chapter summary

Firstly, the findings of the structural survey tap the insights of 38 FM experts into clients using the AHP methodology. In overall FM, building maintenance and security outsourcing contracts, the results of this series of structured surveys indicate that the FM strategists of clients in the higher education sector prefer the low extent of outsourcing relationship dimensions related to ownership and control of service provider involvement. In other words, the preferred outsourcing relationship type, according to the FM (CORE) model, is in-house and service providers' technical expertise. Regarding FM cleaning and catering outsourcing contracts, the results of this series of structured surveys indicate that the FM

strategists of clients in the higher education sector prefer the high extent of outsourcing relationship dimensions related to ownership and control of service provider involvement. The preferred outsourcing relationship type, according to the FM (CORE) model, is the service providers' commitment and common goals.

Secondly, the findings of the structural survey tap the insights of 34 FM experts into service providers also using the AHP methodology. In FM overall, building maintenance outsourcing contracts, the results of this series of structured surveys indicate that the FM strategists of service providers in the higher education sector prefer the low extent of outsourcing relationship dimensions related to ownership and control of their involvement. In other words, the preferred outsourcing relationships type, according to FM (CORE) model, is in-house and their technical expertise. Regarding FM security, cleaning and catering outsourcing contracts, the results of this series of structured surveys indicate that the FM strategists of service providers in the higher education sector prefer the high extent of outsourcing relationship dimensions related to ownership and control of own involvement. The preferred outsourcing relationships type, according to FM (CORE) model, is their commitment and common goals.

In this chapter, the priority ratios of outsourcing relationship dimensions for different FM outsourcing contracts as derived by the AHP (Table 8.6 and 8.7) have been discussed by clients' and service providers' points of views. A consolidation of the survey results from the FM clients and service providers in Hong Kong's higher education industry reveals that the latter can understand the needs of the former in FM outsourcing contracts, including building maintenance,

cleaning and catering. Hence, the service providers' expected outsourcing performance will be good in these contracts. However, FM service providers do not understand the needs of FM clients in the FM outsourcing security contracts. Thus, the service providers' expected outsourcing performance in such contracts will be poor. The results of the analysis are summarised in Table 8.13. To improve the outsourcing relationships between the FM stakeholders, service providers must understand their clients' needs to develop appropriate outsourcing strategies. In the next chapter, The CORE model will be validated accordingly.

Type of FM contract	Clients Preferred outsourcing relationship type	Service providers Targeted outsourcing relationship type	Outsourcing relationship	Expected outsourcing result
Building maintenance	In-house clients and service providers' technical expertise	In-house clients and service providers' technical expertise	Matched	Good
Security	In-house clients and service providers' technical expertise	Service providers' commitment and common goals	Unmatched	Not Good
Cleaning	Service providers' commitment and common goals	Service providers' commitment and common goals	Matched	Good
Catering	Service providers' commitment and common goals	Service providers' commitment and common goals	Matched	Good

Table 8.13 - Outsourcing result of the four major FM outsourcing contracts illustrated by the CORE model in Hong Kong's higher education sector.

CHAPTER 9 VALIDATING THE CONTINGENCY OUTSOURCING RELATIONSHIPS (CORE) MODEL

9.1 Introduction

Upon the establishment of the contingency outsourcing relationship (CORE) model, validations were conducted to verify its efficacy. The validation approaches included categorising the outsourcing relationships of various kinds of FM outsourcing contracts, a focus group meeting with experienced FM practitioners, seminar discussions with members of FM professional institutions in Hong Kong and the United States and two questionnaire surveys conducted among clients and service providers on the implementation of the CORE model. Refinements have been made where necessary to ensure that the CORE model reflects the outsourcing relationships of any given FM outsourcing contract.

9.2 Categorising the contingency outsourcing relationships in FM contracts

The categorisation of outsourcing relationships for FM outsourcing contracts can be divided into two parts. The first involves soliciting implementation information from target contracts for assessment using the CORE model. The second entails conducting questionnaires among professional FM practitioners to solicit their expert opinions on the perceived outsourcing relationships for FM contracts compared with the four relationship types suggested by the CORE model.

Once the CORE model had been devised, questionnaire surveys designed to collect implementation information were sent to the stakeholders of the FM contracts. The FM service contracts selected for validation were identified based on the types of contracts managed by the FM professionals currently or previously working at the local tertiary institutes and universities. A total of 136 FM contracts

were selected for validation. On the clients' side, the projects were selected to reflect the variety of types, including 26 building maintenance, 21 cleaning, 23 security and 8 catering. Similarly, on the service providers' side, there were 23 building maintenance, 10 cleaning, 15 security and 10 catering.

These FM projects were distributed among the campuses of the local government-funded tertiary institutes and universities in Hong Kong. Based on the information collected, the preferred outsourcing categories were identified using the CORE model, as summarised in Table 9.1. The categories ranged from in-house to common goal.

Types of FM contract	(Clients) Preferred Outsourcing Relationship type according to FM (CORE) Model	(Service providers) Targeted Outsourcing Relationship type according to FM (CORE) Model
Building maintenance	In-house and service provider's Technical Expertise	In-house and service provider's Technical Expertise
Security	In-house and service provider's Technical Expertise	Service provider's Commitment and Common Goals
Cleaning	Service provider's Commitment and Common Goals	Service provider's Commitment and Common Goals
Catering	Service provider's Commitment and Common Goals	Service provider's Commitment and Common Goals

Table 9.1 - Outsourcing categories for the four major FM outsourcing contracts in Hong Kong's higher education sector

9.2.1 FM client perspectives

Regarding the CORE model, the decision makers among the FM clients preferred to use the outsourcing relationship as the in-house and technical expertise categories in FM contracts for building maintenance and security; that is, the clients preferred to select a low extent of service provider involvement in ownership and control for various FM assets, and the low or high influence of the outsourced FM portfolio on the clients' competitive positioning and long-term strategy for these two types of FM contracts.

However, the decision makers among the clients preferred to use the outsourcing relationship as the commitment and common goals categories in the FM contracts for cleaning and catering; that is, the clients selected a high extent of service provider involvement in the ownership and control of various FM assets, but the low or high influence of the outsourced FM portfolio on their competitive positioning and long-term strategy regarding the service providers for these two types of FM contracts.

9.2.2 Perspectives of FM service providers

With reference to the CORE model, the decision makers among the service providers preferred to use the outsourcing relationship as the in-house and technical expertise categories in the FM contracts for building maintenance; that is, the service providers selected a low extent of involvement in the ownership and control of various FM assets and the low or high influence of the outsourced FM portfolio on the clients' competitive positioning and long-term strategy for this type of FM contract.

However, the decision makers among the service providers preferred to use the outsourcing relationship as the commitment and common goals categories in the FM contracts for security, cleaning and catering; that is, the service providers selected a high extent of service provider involvement in the ownership and control of various FM assets, but the low or high influence of the outsourced FM portfolio on their competitive positioning and long-term strategy regarding the service providers for these three types of FM contracts.

9.3 Validation by Delphi survey

Two rounds of Delphi questionnaire surveys were conducted to validate the proposed CORE model. In the two questionnaires, the FM practitioners' views and the opinions of FM clients and service providers were also solicited for any possible critical success factors of outsourcing strategies. The questionnaires included a section about critical success factors in the design of FM outsourcing strategies. Table 6.1 in chapter 6 summarises the respondents' profiles from the two surveys.

There were about 14 client participants and 8 service provider participants. About 23% of both together were practitioners with more than 10 years of FM experience while approximately 27% had more than 5 years of FM experience. About 50% had below 5 years of experience. A sample questionnaire is provided in Appendix II.

9.3.1 Survey findings

The outsourcing strategies are evaluated against various critical success factors. In the questionnaires, the respondents were asked to rate the factors accordingly. The clients selected factors such as FM competence, measurement on performance, cost effectiveness and co-ordination. The service providers, meanwhile, selected factors such as core skills, co-ordination, procurement strategies, measurement on performance, allocation of human resources, FM practice, cost effectiveness, customers' satisfaction and resource sharing.

9.4 Validation by questionnaire surveys

In addition to the above, a questionnaire survey was conducted to validate the proposed CORE model. In the two questionnaires, the FM practitioners' views and opinions were solicited to identify possible critical success factors of outsourcing strategies from the industry that might improve the outsourcing relationships by using the model. The questionnaire comprises four sections: (i) category of FM outsourcing, (ii) critical success factors of outsourcing strategies in outsourcing relationships, (iii) criteria for outsourcing strategies and (iv) design of outsourcing strategies for improving outsourcing relationships using the CORE model.

The questionnaire was sent with a summary depicting the CORE model to each member of the two focus groups and the respondents of the previous questionnaire surveys regarding the development of the model. The participants of the focus meeting (as described in Section 9.5) were also invited to complete the questionnaire. Ultimately, 72 completed questionnaires were received. The

Cronbach's alpha coefficient was 0.923, indicating that the 5-point Likert scale used was very reliable and internally consistent. A sample questionnaire on implementing the CORE model is given in Appendix III and IV.

Table 6.5 and 6.8 summarise the respondents' profiles from the survey. About 53% of the respondents were clients and the other 47% were service providers. Approximately 70% of both together were practitioners with equal to or more than 3 years of FM-related experience and about 30% had less than 3 years of FM-related experience. The majority of the respondents was chartered builders (17%) and chartered surveyors (13%). The rest were certified facility managers (10%), registered professional housing managers (8%) and chartered building service engineers (8%). The study included 142 FM outsourcing contracts. The majority of the major FM outsourcing contracts were in the fields of building maintenance (35%), security (27%), cleaning (22%) and catering (13%).

9.4.1 Survey findings

The CORE model is evaluated against various attributes. A 5-point Likert Scale (i.e. a value of 5 denotes absolutely agree and a value of 1 denotes absolutely disagree) was adopted. Space was provided in the questionnaire for respondents to insert comments and suggest additional items that they thought appropriate. A number of attributes were used to judge whether the CORE model was suitably designed. Regarding outsourcing categories, the clients' most agreeable attribute was service providers' qualified technical expertise, whereas the service providers' most agreeable attribute was commitment to customers.

Regarding the critical success factors of outsourcing strategies in outsourcing relationships, the clients' most agreeable attributes in each FM outsourcing dimension were professional knowledge (ownership), efficiency of equipment (ownership), daily routine operation (control), productivity (competitive position) and plan (long-term plan). Regarding the same factors, the service providers' most agreeable attributes were completion on request (ownership), professional knowledge (control), assistance (competitive position), understanding (competitive position) and value-added services (long-term plan). The critical success factors of outsourcing strategies were believed by some to improve outsourcing relationships by implementing the CORE model.

In addition, a list of outsourcing strategy designs for improving outsourcing relationships using the CORE model was formulated to solicit the respondents' rankings of their usefulness. The clients' most agreeable designs included significantly modifying vendors' processes (theory of transaction cost economics), documenting visibly key procedures and business rules (agency cost theory), building relationships with a few outsourcing vendors (resource dependency theory), encouraging outsourcing vendors to explore new opportunities and innovative ideas (theory of entrepreneurial actions) and making mutually beneficial decisions (social exchange theory). The service providers' most agreeable designs included requesting to modify the process significantly (theory of transaction cost economics), documenting visibly key procedures and business rules (agency cost theory), having a policy of contracting with multiple outsourcing vendors (resource dependency theory), exploring new opportunities and innovative ideas (theory of entrepreneurial actions) and successfully performing

agreements and promises (social exchange theory).

9.5 Validation by focus group meeting

Focus group meetings use small group discussions to address specific topics. The purpose of such meetings is to collect data from several people simultaneously through interactions between the participants (Berg, 2007). Focus groups can be used to acquire a general background on a topic, generate hypotheses and impressions of products, stimulate ideas, diagnose the potential for problems, learn how respondents talk about the phenomenon of interest and interpret previously obtained qualitative results (Berg, 2007). The advantages of using a focus group to validate the CORE model include: (i) it provides a venue for the collection of information from a group of people in a relatively shorter time than required to conduct individual interviews, (ii) it makes probing and clarifying the participants' comments easier (Edmunds, 1999) and (iii) more insights into and creative thoughts about the topics can be generated through interactive discussion in an environment that encourages the eager expression of views.

The prospective participants of the focus group meeting were identified through different sources, including interested participants from the International Facility Management Association (Hong Kong) chapter and personal FM professional network (Section 9.6). In particular, the practitioners who participated in the previous two questionnaire surveys for this research were invited. The introductory information on the CORE model and the meeting arrangements were e-mailed to 72 potential practitioners. Ultimately, 8 practitioners attended the two

meetings. Table 9.2 provides their respective profiles.

Date of meeting	Sector	Current role	Company	Years of FM related experience
12 July 2012 (Thursday)	Academic	Associate Programme Director	A continuing education institution under a major local university	More than 10
	Client	Facilities Management Manager	A major local non-profitable organisation	More than 20
	Service Provider	Assistant Facilities Management Manager	An international FM consultant firm	Nearly 10
	Independent party	Facilities Management Consultant	An international FM consultant firm	More than 10
	Legal consultant	Registered Solicitor at Hong Kong	A local registered solicitors' firm	Nearly 10
21 July 2012 (Saturday)	Academic	Principal / Professor	A private Asian Built Environment Institute	More than 30
	Client	Head of Health, Safety and Environment Affairs	A regional Government funded University	More than 30
	Service Provider	Facilities Management Director	An international FM consultant firm	More than 30
	Legal consultant	Registered Solicitor at Hong Kong	A local registered solicitors' firm	Nearly 10

Table 9.2 - Profiles of focus group participants

As shown, the 8 focus group participants were experienced FM practitioners in

their capacities as client, consultant, service provider, educator and solicitor, respectively. Their views therefore reflected a comprehensive representation of the parties involved in the local FM industry's outsourcing practices. The interactive discussions generated by the focus group meetings were expected to further establish the CORE model's validity. More details about the meeting are given in Appendix V.

An introduction to the CORE model was provided in the focus group meeting, before discussion commenced. It covered the research methodology and the assessment mechanism for outsourcing relationships. What followed was a one-and-a-half hour discussion for each meeting. The following questions were provided to stimulate ideas and thoughts:

- In what aspects do you think the model is best designed?
- Do you think that wide use of the model would lead to the overall improvement of outsourcing relationships in Hong Kong's FM industry?
- Does the model require any improvements?
- Do you think that the model should be used in our higher education FM industry?
- Do you expect any hindrance/barrier(s) in using the model in Hong Kong?
- What strategies should be adopted to overcome the abovementioned hindrance/barrier(s)?
- What are the model's advantages?
- What are the model's disadvantages?

Meanwhile, the participants were encouraged to contribute their views and opinions on the use of the CORE model outside the scope of the above questions.

9.5.1 Findings of the focus group meeting

The experts highlighted several crucial things about the model at the beginning of the meeting.

1) Scope of work:

   The FORT was applied to all IT hardware and software; thus, the CORE model can also apply to all FM services. However, the scope of work can be broadened even further.

2) Confidential or secret data:

   Confidential data can only pass to the in-house staff of the organisations.

3) Working environment:

   The proposed CORE model in FM can be applied to Hong Kong's working environment.

4) The two parts of the model:

   Part I is designed to handle the transfer of confidential or sensitive information from the organisations to the in-house staff. Part II is designed to handle the organisations' general issues, wholly passing them to the service providers.

9.5.1.1 Merits of the CORE model

One of the virtues of outsourcing relationships is their ability to serve as an outsourcing reference in the FM industry. The CORE model was appreciated because it quantifies and categorises the abstract concepts of outsourcing

relationships, indicating the degree to which FM outsourcing contracts can be conducted in an easy and efficient manner. The effects of improved outsourcing relationships would thus become apparent. The CORE model measures the extent of ownership and control of FM assets and the influence of outsourced FM portfolios on strategies to convince the industry to make a greater effort to improve outsourcing relationships.

The CORE model, which emphasises the importance of outsourcing relationships, also helps address some of the industry's existing problems, including FM service providers' tendency to maximise their respective interests on the FM contracts without emphasising the importance of the outsourcing relationships with the clients. Overall, the service providers generally do not understand the outsourcing relationships with the clients. Furthermore, interpretations of outsourcing relationships can differ from person to person, making objective measurements and comparisons difficult.

The CORE model was considered simple and easy to operate. Deemed precise and concise, it takes less than half a day to complete the assessment. The calculation can be further accelerated and fine-tuned if it is done by an FM stakeholder at the senior management level who is very familiar with the project and has access to all of the available relevant data.

As for the benefits of improved outsourcing relationships, the model can indicate the evolution of the outsourcing processes and relationships between the contractual parties. It is important because its nature is to focus on the specific

sophisticated types of unknown outsourcing relationships between the clients and service providers, rather than on the simple issues of core and non-core FM services.

In the long run, when the CORE model is widely used in various business sectors such as education, computing and banking, the participants expressed that they would welcome the opportunity to formulate outsourcing relationship benchmarks for various types of FM contracts in different modernised buildings. These benchmarks would provide remarkable performance standards for senior FM professionals to meet and beat.

This bespoke model is applicable to local FM industry and particularly suitable in low technology areas. It can improve plans for the management of FM resources and create closer co-operation and collaboration between clients and service providers to achieve win-win situations for all FM stakeholders, regionally and internationally. Eventually, the overall outsourcing performance of the FM industry would be enhanced.

9.5.1.2 Overall contributions of the CORE model in the Hong Kong FM industry

Overall, this model supports FM services. The participants considered that the model can verify the current outsourcing relationships between the contractual parties in the FM contracts and increase the daily operational efficiency of the organisations while providing updated information that allows the service providers to develop their own services and performance. The service providers'

loyalty and reputations can be reviewed throughout the contract. The working mechanism of the model also improves the flexibility of the outsourcing relationships between the stakeholders.

The accurate evaluation of service providers' current performance and the prediction of their future performance throughout the FM services are problematic. Before the completion of the FM contract, clients generally must evaluate the risk over the whole period due to the possibility that there will be a gradual deterioration in service providers' performance in the current FM contract. It is unfortunate that the clients cannot easily terminate the service provider for reasons of poor performance until the end of the contract, and a new contract will not be renewed with a provider who exhibits bad performance. The proposed model can overcome this problem with a detailed investigation of the evolution of outsourcing relationships during the contractual period.

Understanding the model's working mechanism; the FM service providers can thoroughly understand their clients' needs and review their own FM service performance. The service providers can maintain their strengths and improve their weaknesses by understanding the outsourcing relationships. Moreover, they can identify outsourcing strategy problems by applying the outsourcing relationship models between the clients and service providers. The loyalty of an experienced staff can be improved throughout the contract as the quality of FM service is enhanced.

Outsourcing relationships can be improved by evaluating the performance of the

service providers, providing all parties with a holistic perspective from which to assess their current relationships and predict the optimum future outsourcing relationships with reference to the specific FM contract. The local FM industry can be improved through the application of the proposed model, such as in security service and the management of lift. However, more explanation is required to further improve the model's accuracy.

9.5.1.3 Improvements to the CORE model

The participants opined that the CORE model should be regularly updated to reflect the new developments and technologies in the FM industry.

i) Working mechanism:

The model is too simple. More sophistication could be achieved by incorporating additional variables and explanations for more accurate measurement in terms of service quality and working capital. Additionally, the model is not detailed enough. It can be rendered more specific by diversifying the types of industries, contracts and building assets it is applied to.

The model should also be broken down because it is too generic. For example, the model could be further divided according to the sizes of the FM companies and authorities, and the classifications of contracts such as cleaning, security, building maintenance and landscape. The model should be used in the long-term plan. Generally, the FM contracts in Hong Kong are designed to last from 1 to 5 years. The model can be divided into two parts. The first part would treat the daily basic FM operations while the second addresses the confidential and special FM

operations.

Moreover, the model can be improved by reconsidering the legal terminology, such as the 'liability' of the service provider, used in the contract. Some factors are also suggested to achieve more accurate measurement of aspects such as trust between the clients and service providers, authority of the clients, diligence of the service providers and key performance indicators.

ii) FM dimensions:

The influence of the rating on the measurement of the ownership and control of various FM assets and firms' competition and long-term strategy requires further clarification. The high and low levels of both FM dimensions are needed to clearly indicate the detailed scale.

The two proposed FM dimensions cannot holistically reflect the actual working mechanism in the FM industry. To achieve a more accurate evaluation of the outsourcing relationships between the FM stakeholders, more valuable FM dimensions must be introduced into the model for measurement.

iii) Descriptions in the model:

Word use in the new proposed FORT framework remains unclear. For example, the term 'commitment' does not clearly indicate the relationships between the FM stakeholders. The term 'trust' is suggested as a replacement. The term 'in-house' is also ambiguous in describing the specific type of relationship. A more suitable word should be chosen.

In summary, FM stakeholders will be well prepared to understand the CORE model through the following enhancements.

- An explanation of the model's details
- The details of the application of each outsourcing relationship category
- The details of the evolution of each outsourcing relationship category
- The establishment of mutual contractual agreements between the stakeholders
- Fair FM service contractual terms
- The revision of the financial terms used in the FM service contracts

9.5.1.4 Use of the CORE model in the FM industry

When asked whether the proposed model should be used on a voluntary or enforced basis, the participants favoured a voluntary approach. It was deemed unnecessary to compulsorily enforce the model in the initial stage. Generally, the model is acceptable to the FM professionals and can be used in the local higher education environment, such as local tertiary institutes and universities.

The model can also be applied to the FM sectors in the higher education FM environment. The classification of building asset distribution types among the campuses of tertiary institutes and universities is important. One type is responsible for all of the buildings centralised within a campus environment, whereas the other type is responsible for all of the buildings that are diversely located within a campus environment.

Regarding centralised buildings, the daily FM operation of a university is the same as that of a power plant. The building assets of both environments are centralised. If a local power company attempts to organise and operate its FM services in the centralised built environment with an outsourcing model, success would indicate that it is also possible to apply the outsourcing model to the FM services of centralised buildings on several local university campuses. Regarding diverse campus buildings in higher education environments, the model can also be applied to campuses with diverse tertiary institutional buildings.

Two factors affect the operation of the model.

i) Identification of the size of the building assets in the higher education sector.

ii) Identification of the distribution of the location of the building assets of universities and tertiary institutes.

Poor outsourcing relationships cause imminent hazards for the FM stakeholders. There is no urgency to enforce mandatory use of the CORE model. It will take time for the industry to become familiar with the model and understand its merits. It is thus better to initially implement the CORE model on a voluntary basis. From a managerial perspective, the model is applicable to the higher education environment with close monitoring. Subsequently, if the CORE model is found to be effective, the management of outsourcing relationships will prove easier than before.

9.5.1.5 Hindrances and barriers

i) New concept

The participants discussed a number of hindrances and barriers. As a new concept, attracting industry practitioners to make use of the CORE model could be difficult. In this regard, more FM projects should be collected to establish the relationship between outsourcing contracts and outsourcing categories from the local tertiary institutes and universities.

ii) Model use

The question of who would use the CORE model was also raised. The FORT model was originated by Kishore et al. in 2003 and would need to be updated for current use before application. The two FM dimensions and technical terms of the CORE model should be clearly explained and interpreted to achieve accurate results. Proper client size classification is important to achieve efficient operation because the various sizes and capabilities of clients will produce varied operational approaches for the outsourcing model. The four types of outsourcing relationships are too conventional and simple, so further details are required to clarify the model.

iii) Nature and purpose of the model

The IT model is required to modify the CORE model for use in the FM industry.

The CORE model should also incorporate the financial terms of the FM contracts.

iv) Service provider problems

The clients may apply late payments to substandard service providers, thus the loyalty of the service providers will be adversely affected by unfair practice.

Some employees are generally reluctant to participate in the operation of outsourcing procurement in their organisations for fear of losing their jobs in the process. The security of work is lowered through the application of outsourcing. Thus, the application of the CORE model was not supported in their companies. From a managerial perspective, client support is crucial to the successful implementation of the outsourcing model in the FM industry.

9.5.1.6 Strategies for overcoming hindrances and barriers

A number of strategies were proposed by the participants to overcome the aforementioned hindrances and barriers. In the long-term, it was thought that the industry would use the CORE model. Therefore, to implement it, its beneficial improvement of outsourcing relationships should be showcased by setting up a database of outsourcing relationships for plentiful real projects. Such a database, with correlations to improved outsourcing relationships and other benefits, is imperative for promoting the CORE model for use in the industry.

i) New concept

The clients' requirements are the crucial factors in improving the mechanism of the model. The model should be narrowed to achieve more specificity, as previously described. It could then be specifically applied to the FM environments of individual business sectors. Each model would only concentrate on a specific business FM environment.

ii) Model use

Some FM dimensions can be added to increase the value and accuracy of the

model including type of contract, contract sum, procurement strategy, performance indicators, insurance, FM stakeholder responsibilities and the legal terms in the binding contracts.

iii) Nature and purpose of the model

To increase the validity and reliability of the model, it is also suggested that more case studies be conducted for further development. An updated investigation is important to achieve a validated and reliable model.

iv) Service provider problems

Suitable, specific training can be provided for the relevant technical and administrative staff working in each specific business environment. In addition, the clients must consider improvements in the contractual terms, mutual trust and a long contractual period to achieve good quality. Mutual trust between the clients and service providers is very important. The service providers' management should increase the staff's sense of security in the work environment. Long-term relationships are suggested to link to the stakeholders in the FM contracts. For example, the clients can introduce the service contracts with the providers for a minimum of three years. The parties should maintain a balance between quality and safety for the FM contracts.

Advantages	Disadvantages
Workable	Too simple
Applicable in the local higher education environment	Does not clearly identify the characteristics of the specific FM contracts
Easy and convenient to use	Too general
Explains the evolution of the outsourcing relationships between the clients and service providers	Not detailed enough in an FM context
Develops partnerships between the stakeholders	Does not have sufficient information to show the actual operation of the FM service provider and the characteristics of current outsourcing contracts
Monitors the outsourcing relationship between the clients and service provider for various contracts	Does not consider the legal responsibilities and risk elements of the contractual parties
User friendly	Does not consider client type and size classifications
Applicable during different times of the contractual period	Does not consider the timing factor during the contractual period

Table 9.3 - Advantages and disadvantages of the CORE model

9.6 Validation by seminar discussion

Apart from the questionnaire surveys and the two focus group meetings, over 110 local and international FM practitioners participated in two seminars to tap into more industry feedback on the proposed CORE model. The following paragraphs report on the processes and results of these two seminars.

9.6.1 Regional conference of FM practitioners in Hong Kong

The twenty-minute conference presentation attracted over 70 of Hong Kong's FM and property management professionals at the Hong Kong Polytechnics University on October of 2010. A visual presentation covered the background of the study, introduced the FORT model, the objectives of establishing a contingency FM outsourcing model and the current FM outsourcing services in Hong Kong. After the presentation, the participants were encouraged to raise questions and comment on the application of the FORT model, which was invented in the IT sector and transferred to the FM sector.

9.6.2 International conference of FM practitioners in the United States

The one-hour seminar attracted over 30 IFMA members. A visual presentation covered the background of the study, the objectives of establishing the CORE model in the FM industry, the research methodology, the importance of FM outsourcing relationship types and the assessment mechanisms of FM outsourcing relationships for different FM outsourcing contracts. After the presentation, the participants were encouraged to raise questions and suggest areas for improvement.

9.7 Research results and implications

A survey was conducted with two independent samples to achieve the research objectives. The first sample was drawn from 38 FM client staff members who were willing to participate in the research. The second sample was drawn from among the 34 FM service provider staff members under investigation. Among the clients,

92 potential respondents were targeted and 38 usable replies were received. This constituted a 41% response rate. Among the service providers, 83 potential respondents were targeted and 34 usable replies were received, also constituting a 41% response rate.

9.7.1 Characteristics of outsourcing categories

Objective 1: To identify the outsourcing characteristics that FM client- and service provider-strategists agree shape the outsourcing categories of their current FM outsourcing contracts. (Testing corollary 1)

FM Client Survey Results

The building maintenance, security, cleaning and catering contracts indicated the same main agreeable characteristics influencing outsourcing categories, such as service providers' qualified technical expertise. The respondents of building maintenance, security and cleaning contracts also mentioned service providers' common goals. This indicates that service providers' expertise plays an important role in FM outsourcing contracts for building maintenance, security, cleaning and catering.

Identifying agreeable outsourcing category attributes will help clients to develop appropriate FM outsourcing strategies. As noted, specific outsourcing category attributes have been found to be crucial in specific FM outsourcing contract types. Indeed, the characteristics that received the highest degree of agreement in the outsourcing category process related to service providers' qualified technical expertise. "The service provider has qualified technical expertise" was the most

important characteristic, with a score of 4.11. This high score reveals that qualified technical expertise is becoming a strong trend and clients are requiring high technical standards from service providers to manage increasingly technologically complicated buildings. “OC4: The service provider has common goals with us” had a mean score of 3.68. This can be addressed by awarding short-term contracts to the service providers.

It is worth noting that the above discussion concentrates on the ‘most agreeable’ and ‘agreeable’ characteristics in terms of outsourcing category criteria. Other characteristics lying between those two groups (most agreeable and agreeable characteristics) are considered to be of secondary agreement and their means were ranked, respectively, as OC1 – We need help from service providers (Mean = 3.92) and OC2 – The service provider has service commitment to our company and customers (Mean = 3.87).

FM Service Provider Survey Results

The respondents involved in contracts involving building maintenance, security, cleaning and catering indicated that the main agreeable characteristic influencing outsourcing categories was service providers’ support of in-house clients. Respondents involved in contracts involving building maintenance, security and cleaning also noted that service providers share common goals with clients. This indicates that service providers’ support of in-house clients plays an important role in FM outsourcing contracts for building maintenance, security, cleaning and catering.

Identifying agreeable outsourcing category attributes helps service providers to develop appropriate FM outsourcing strategies. Specific outsourcing category attributes are crucial in specific FM outsourcing contract types. The characteristic "OC2: We have commitment to our customers" received the highest degree of agreement in the outsourcing category process with a score of 4.06, which indicates that supporting the in-house team is becoming a strong trend in the management of modern buildings. "OC4: We have common goals with our customers" had a mean score of 3.82. This can be addressed by awarding short-term outsourcing contracts. These characteristics and their means were ranked, respectively, as "OC1 – We support the in-house team", and "OC3 – We have qualified technical expertise" (Mean = 4.03).

9.7.2 Strategies in outsourcing contracts

Objective 2: To examine the outsourcing strategies that FM client- and service provider-strategists apply in their FM outsourcing contracts. (Testing corollaries 2 - 8)

FM Client Survey Results

The following was observed regarding the influence of outsourcing strategy design. Transaction cost economics theory indicated that the important factor was modification of process while the neutral factor was unique technical skills. Agency cost theory suggested that the important factors were key procedures and business rules while the neutral factor was outsourced process in-house. Resource dependency theory noted that the important factor was building up relationships while the neutral factor was a connected application platform

provided by the outsourcing vendor. Entrepreneurial actions theory specified that the important and neutral factor was encouraging the exploration of new opportunities and innovative ideas. Social exchange theory denoted that the important factor was mutually beneficial decisions while the neutral factor was compatible cultures and policies.

This suggests that modification of process, key procedures and business rules, building up relationships, new opportunities and innovative ideas and mutually beneficial decisions all play important roles in the design of outsourcing strategies.

The factor “Process Maturity: Key procedures and business rules are documented and visible to parties involved” received the highest degree of experience among the design of outsourcing strategies related to key procedures and business rules, with a score of 4.16. This high score indicates that key procedures and business rules are becoming increasingly important for clients to develop a good mutual understanding of the daily routines involved in managing contemporary buildings.

“Vendor interoperability: The application platform provided by our outsourcing vendor is electronically linked and seamlessly connected with the end users in our organisation” had a mean score of 3.13. This can be addressed by emphasising the importance of physical operations. The previous paragraphs in this section focused on the important and neutral factors in terms of design. Other factors between those two groups (important and neutral) are considered of secondary agreement. The means of these factors range between 3.13 and 4.16.

FM Service Provider Survey Results

The following was observed regarding the factors influencing the design of outsourcing strategies. Transaction cost economics theory indicated that the important factor was modification of process, while the neutral factor was extensive business knowledge. Agency cost theory noted that the important factor was key procedures and business rules, while the neutral factor was outsourced process in-house. Resource dependency theory specified that the important factor was building up relationships, while the neutral factor was a connected application platform provided by the outsourcing vendor. Entrepreneurial actions theory denoted that the important factor was encouraging the exploration of new opportunities and innovative ideas, while the neutral factor was quick alerts regarding new products and services. Social exchange theory suggested that the important factor was performing good agreements and promises, while the neutral factor was compatible cultures and policies.

This indicates that modification of process, key procedures and business rules, building up relationships, new opportunities and innovative ideas, and good agreements and promises all play important roles in the design of outsourcing strategies. The factor “Process Maturity: Key procedures and business rules are documented and visible to parties involved” received the highest degree of experience among the design of outsourcing strategies related to key procedures and business rules, with a score of 3.97. This high score reveals that key procedures and business rules are becoming a strong building management trend.

"Proactive Sensing: Our executives always update themselves about the dynamics of outsourcing vendors' markets to take advantage of new opportunities" had a mean score of 3.21. This can be addressed by noting the pace of change in local outsourcing markets. The previous paragraphs have concentrated on the important and neutral factors in terms of design. Other factors lying between those two groups (important and neutral) are taken to be of secondary agreement. The means of these factors range between 3.21 and 3.97.

9.7.3 Outsourcing relationships

Objective 3: To improve outsourcing relationships using the outsourcing strategies (Testing corollaries 2 - 8)

The findings regarding the design of outsourcing strategies for current FM outsourcing contracts related to key procedures and business rules are summarised as follows. From the clients' perspective, the main important design is the process maturity of agency cost theory. However, the neutral design is the application platform for the vendor interoperability of resource dependency theory. From the service providers' perspective, the important design is the process maturity of agency cost theory. However, the neutral design is an update of the dynamics of the outsourcing vendors' markets to take advantage of new opportunities through the proactive sensing of the entrepreneurial actions theory.

9.7.4 Critical success factors for outsourcing strategies

Objective 4: To investigate the critical success factors for outsourcing strategies in the FM contracts on which FM client- and service

provider-strategists determine outsourcing relationships. (Testing corollary 9)

FM Client Survey Results

Regarding the good factors influencing the outsourcing strategies, ownership of FM assets transferred by clients indicated professional knowledge and efficiency of equipment, control of FM assets transferred by clients suggested daily routine operation, outsourced FM portfolios on clients' competitive positions indicated productivity, and outsourced FM portfolios on clients' long-term planning indicated planning.

Regarding the neutral factors influencing the outsourcing strategies, ownership of FM assets transferred by clients suggested computing systems, control of FM assets transferred by clients indicated deadlines, outsourced FM portfolios on clients' competitive positions specified competence, and outsourced FM portfolios on clients' long-term planning noted environmental protection.

This suggests that professional knowledge, efficiency of equipment, daily routine operation, productivity and planning all play important roles as critical success factors for outsourcing strategies. The factor "SC4: Our service provider can support our daily routine operation" received the highest degree of experience among the factors related to daily routine operation with a score of 3.82, which suggests that daily routine experience is becoming a strong trend and clients are requiring high guidance and experience from service providers in the management of state-of-the-art buildings. "CP1: Our service provider is keen to

take responsibility for our competence" had a mean score of 3.26. Clients can address this by taking responsibility for their own competence.

The above discussion concentrated on the good and neutral factors in outsourcing strategy criteria. Other factors between those two groups (good and neutral) are taken to be of secondary agreement. The means of these factors range between 3.26 and 3.82.

FM Service Provider Survey Results

Regarding the good factors influencing outsourcing strategies, ownership of FM assets transferred to service providers indicated completion on request, control of FM assets transferred to service providers suggested professional knowledge, outsourced FM portfolios on clients' competitive positions indicated focus, and outsourced FM portfolios on clients' long-term planning specified value-added services.

Regarding the neutral factors influencing outsourcing strategies, ownership of FM assets transferred to service providers indicated equipment and machinery, control of FM assets transferred to service providers noted finishing on time, outsourced FM portfolios on clients' competitive positions suggested technical competence, and outsourced FM portfolios on clients' long-term planning specified policy. This suggests that completion on request, professional knowledge, focus and value-added services are all critical success factors for outsourcing strategies.

The factor “CP8: We listen to our customers when they request a service” received the highest degree of experience among the critical success factors related to a service, with a score of 4.18. This suggests that daily routine experience has become important and service providers need significant skill in managing today’s technologically advanced buildings. “SO1: We consider the availability of our own equipment or machinery for competing jobs” had a mean score of 3.62. This can be addressed by highlighting the importance of technical competence.

The above discussion has concentrated on the good and neutral factors in outsourcing strategy criteria. Other factors between those two groups (good and neutral) are taken to be of secondary agreement. The means of these factors range between 3.62 and 4.18.

9.7.5 Contingency Outsourcing Relationships (CORE) model

Objective 5: To develop the Contingency Outsourcing Relationships (CORE) model (Testing corollary 9)

The CORE model was validated by using four approaches: (i) two rounds of Delphi questionnaire surveys, (ii) two structured questionnaire surveys, (iii) two focus group meetings, and (iv) two seminar discussions. Clients and service providers can improve their current and future FM outsourcing performance by applying the CORE model to investigate the related relationships.

The practical application of the CORE model is to find out the current outsourcing

result and to predict the future outsourcing relationships between the clients and service providers of the specific FM outsourcing contract. Both clients and service providers are required to complete their own specific questionnaires to understand and to analyse their current and future FM outsourcing relationships. Expected outcome of the current outsourcing performance of the specific FM outsourcing contract can be attained as follows. Firstly, the CORE model can find out current FM outsourcing relationship types of the FM stakeholders in the specific FM outsourcing contracts. Then, the current relationships of both parties can be analysed in order to understand current FM outsourcing performance of the contracts by using the technique of AHP. The model can explain the preference of outsourcing relationship type of clients and target of outsourcing relationship type of service providers in the specific FM outsourcing contract. As for the future FM outsourcing relationships of both parties in specific FM outsourcing contract, the model is also capable to predict these by using the multi-nominal logistic regression. The working mechanism for the CORE model is illustrated in Table 9.4.

Four FM outsourcing relationship types: in-house team, commitment, technical expertise and common goals.						
Case I: Self-evaluation	**Demand on service Client**			**Supply on service Service Provider**		
	Current relationship	vs.	Predicted relationship	Current relationship	vs.	Predicted relationship

	Now			**Future**		
Case II: Cross comparison	**Client** Preference of Current relationship	vs.	**Service Provider** Target of Current relationship	**Client** Predicted relationship	vs.	**Service Provider** Predicted relationship

Table 9.4 - Working mechanism for the FM outsourcing strategies using the CORE model.

The categorisation of the FM outsourcing relationship types in the specific FM outsourcing contracts is based on effective ownership, the control of FM assets transferred to service providers and the competitive positioning and long-term strategies of the outsourced FM portfolio on the clients' firms. The evaluation of the two different outsourcing relationship components or dimensions simultaneously defines the category of the specific outsourcing relationship type for the specific FM outsourcing contract from both the clients' and service providers' perspectives. In the final stage of the analysis, the CORE model is developed and refined to ensure that the model accurately reflects the categorisation of the FM outsourcing relationships.

9.8 Chapter summary

The validation process, which included two rounds of Delphi surveys, two questionnaire surveys conducted with clients and service providers, two focus group meetings and two seminars (local and international) has been detailed in this chapter. This multi-approach validation of the established Contingency Outsourcing Relationships (CORE) model connected with over 110 local and international FM industry practitioners, and refinements have been made to the CORE model in response to the suggestions generated (please refer to Appendices II to V).

As a result, the CORE model has proven to be representative of FM outsourcing relationships. In the next chapter, final conclusions will be drawn for improving the FM outsourcing relationships between FM stakeholders using the CORE model.

CHAPTER 10 SUMMARY AND CONCLUSIONS

10.1 Introduction

In 2011, the past president of the Hong Kong chapter of the International Facility Management Association (IFMA) highlighted the unsatisfactory outsourcing situation in the local facilities management (FM) industry. It was difficult that the FM service providers could offer quality service in the contractual period (Lee and Lee, 2000; Price Waterhouse Coopers, 1999). In fact, outsourcers understand their performance directly related to the quality of outsourcing services, but the number of reported cases of failure is still increasing (Brown, 2002; Copeland, 2001; Chan, 2008; Crocker, 1999; James, 2000; Van der Werf, 2000). Hence, it is necessary to understand this problem from a new perspective.

The critical and independent introduction of the proposed strategic best-fit or contingency model between clients and service providers can improve the FM of the local higher education service sector in terms of FM outsourcing services and business performance. This study helps to improve the quality of working life by investigating the effects of FM outsourcing relationships on the service provided to the FM stakeholders. In addition, the proposed CORE model provides a yardstick to compare FM outsourcing relationships among different FM outsourcing contracts, thereby serving as an incentive for FM outsourcing relationship enhancement in Hong Kong. Eventually, the study provides recommendations for the implementation of the CORE model; in the long run, this will increase productivity, enhance the service and performance of FM service providers, meet the needs of the people in the organisation and save on manpower requirements for maintaining the building assets of local higher educational institutions.

This study addresses the effects of FM outsourcing relationships on clients and service providers in the context of Hong Kong's higher education sector. This chapter presents the findings and discusses the study's contributions. This chapter is divided into five sections. Section 10.2 summarises the main conclusions. Section 10.3 presents this study's contribution to knowledge development. Section 10.4 and 10.5 respectively note the limitations of the study and offers suggestions for future research.

10.2 Major conclusions

After the data analysis, there are three main conclusions in this study.

10.2.1 Understanding on FM outsourcing relationships in Higher Education Sector

The analysis of the simultaneous relationships between FM outsourcing relationship types and dimensions (substitution of ownership, substitution of control, competitive position and long-term planning) enhances the overall understanding of FM outsourcing relationships. The empirical investigation reveals a significant relationship between FM outsourcing relationship types and services in the context of Hong Kong's higher education sector. Clients and service providers have indicated that applying the FM outsourcing relationship types improves the quality of the services. Meanwhile, the results of the hypotheses testing indicate that FM outsourcing relationship types are used in related services; that is, the outsourcing categories of a specific FM outsourcing contract will be achieved through prediction at the level of substitution of ownership, substitution of control, competitive positions and long-term planning.

This research establishes a link between 'high quality FM outsourcing service' and potential increases in substitution of ownership, substitution of control, competitive positions and long-term planning. The relationship between FM outsourcing relationship types and service is statistically significant. The majority of previous FM outsourcing studies has discussed the causes of service providers' substandard outsourcing performance without considering the relationships among the four FM outsourcing relationship dimensions in FM outsourcing contracts. This research investigates these relationships from both the clients and the service providers' perspectives, with regard to FM outsourcing relationship categories and services.

10.2.2 Factors affecting FM outsourcing service contract categories in higher education sector

The study contributes to the FM outsourcing services literature by providing insights into the factors affecting FM outsourcing service contract categories. From the higher education FM clients' perspective, the results suggest that a low extent of outsourcing relationship dimensions on ownership and control of service provider involvement are the critical factors influencing building maintenance and security outsourcing contracts. The preferred outsourcing relationship type, according to the CORE model, is in-house clients and service providers' technical expertise. However, the results also suggest that a high extent of the same is the critical factor influencing cleaning and catering outsourcing contracts. The preferred type according to the CORE model is the service providers' commitment and common goals.

From the higher education FM service providers' perspective, a low extent of outsourcing relationship dimensions on ownership and control of service provider involvement is the critical factor influencing building maintenance outsourcing contracts. The preferred outsourcing relationship type, according to the CORE model, is in-house clients and service providers' technical expertise. The results also suggest that a high extent of the same is the critical factor influencing security, cleaning and catering outsourcing contracts. The preferred type, according to the CORE model, is the service providers' commitment and common goals.

The findings indicate a match in the preference for the extent of outsourcing relationship dimensions on the ownership and control of service provider involvement on outsourcing contracts for building maintenance, cleaning and catering in Hong Kong's higher education FM industry. They also strongly suggest that FM outsourcing relationship type categories play an important role in the higher education FM industry with regard to outsourcing contracts. Identifying the important selection attributes helps service providers to develop an appropriate outsourcing strategy. For example, the most important factor influencing clients' choice of overall FM outsourcing contract is in-house clients and service providers' technical expertise.

10.2.3 Matching the demand and supply of FM outsourcing services in higher education sector

This study discusses to the FM outsourcing relationship literature (higher education sector) by providing significant empirical evidence that the demand and

supply of FM services plays a major role in the FM outsourcing success of local universities and tertiary institutions. The examination of current and prediction of future outsourcing relationships between clients and service providers to match the demand and supply of FM services significantly influence FM outsourcing success. The effect of this matching process has not previously been realised. Previous studies have not paid attention to the demand and supply of FM services in terms of outsourcing relationship categories and how other aspects, besides services and relationship types, might affect the clients and service providers, especially in the higher education sector of an international Asian city. FM strategists must start thinking about the importance of matching the demand and supply of FM outsourcing services.

10.3 Contribution to knowledge development

This study explores a wide range of FM outsourcing services and the relationships between the clients and service providers in Hong Kong's higher education sector. One contribution is the improvement in the quality of life enjoyed by people who work in contemporary buildings that results from understanding the influence of FM outsourcing relationships on the service of FM stakeholders. This particularly relates to the FM outsourcing relationship categories and the major areas to which this study contributes.

i) the examination of current FM outsourcing relationships,

ii) the prediction of future FM outsourcing relationships,

iii) matching the current and future FM outsourcing relationships, and

iv) the importance of the CORE model.

10.3.1 FM outsourcing relationship categories

Given the introduction of FM outsourcing services in Hong Kong's tertiary institutes and universities, this research makes a number of contributions to the FM outsourcing service literature in general, and to FM outsourcing higher education services in particular. Previous studies conducted within the FM practice and processes context (see Chapter 5) have been arguably more limited in scope than the present study.

* Focusing, in terms of scope and survey methodology, on FM practices and processes for the alignment of corporate business strategies (Osgood, 2003);

* Investigating the alignment of FM resources, practices and processes, but not comprehensively (Krumm et al., 1998);

* Lacking an understanding of the FM capacity and capability alignment of FM organisations and business clients (Barrett, 2000);

* Concentrating exclusively on FM practices and processes (PCA, 2001; Then et al., 2004);

* Exploring the development of new skills for the management of outsource relationships and conduct capabilities (Harland, Knight, Lamming and Walker, 2005);

Clearly, the abovementioned studies have been selected from among many. Nevertheless, most have neglected outsourcing relationships, which is why such relationships became the focus of the present study. Accordingly, the significance of this study is that it is the first to examine the effects of FM outsourcing relationship types on such relationships' categories in the higher education sector. This sector includes seven government-funded universities and ten vocational tertiary institutes in Hong Kong, representing over 90% of the total government-funded higher education sector. It incorporates both clients' and service providers' perspectives regarding FM outsourcing relationship types and services as an important environmental variable, their use in the higher education sector and their relationships with substitution of ownership, substitution of control, competitive positions and long-term planning. This study facilitates a better understanding of the measurement of FM outsourcing relationship types and services, specifically in an international, Asian Pacific setting. As the first study of its kind, it provides significant insight into the development and understanding of FM outsourcing services in Hong Kong's higher education sector.

10.3.2 Understanding the demand and supply of FM outsourcing services

FM outsourcing success can be evaluated by the demand and supply of related services. Regarding both current and future projects, the clients report that they do not benefit from the services if the service providers do not understand and match them to the specific relationships. The clients will be satisfied with the service providers' performance, provided that the services fulfil the clients' needs.

In terms of demand and supply for the FM services, clients' demands can be

fulfilled by the service providers' supply according to the FM contracts for the four outsourcing relationships. The strategies for improving FM outsourcing relationships and performance using the CORE model are introduced in the findings of objective 3.

10.4 Study limitations

While this study meets the proposed objectives and expands our knowledge of the relationship between FM outsourcing relationship types and categories, it has its limitations, and there is great potential for future research along these lines. The choice of population was limited to a single industry, higher tertiary education, which has a tendency to constrain the generalisability of the findings in the context of other industries. The roles that FM outsourcing relationship types play in the related dimensions must be clarified from different industry perspectives.

Geographically, this study was limited to the government-funded tertiary institutes and universities in Hong Kong, which is only one international city in the vast Asian Pacific area. An interesting line of enquiry would be to replicate this research across the corporate sector of the FM industry. Other Asian Pacific studies in a similar context would provide valuable comparative data for FM managers and academics about the cross-fertilisation of FM outsourcing relationship types with the related relationships and categories.

The approach used to achieve the research objectives was limited to two methods of data collection (questionnaire surveys and focus groups), due to the constraints mentioned in the methodology chapter. For example, more sufficient and

comprehensive data for AHP analysis can be achieved by further conducting a series of structured interviews to the FM clients' and service providers' staffs. Furthermore, substitution of ownership, substitution of control, competitive positions and long-term planning were measured using only clients and service providers' perceptions, rather than exploring the difference (gap) between expectations and perceptions. This limitation, however, has been justified in Chapters 3 and 7.

The statistical methods (non-parametric statistics) used to test the hypotheses have been described as less robust than parametric tests. However, Leedy and Ormrod (2001) state that the 'robustness' of using a particular statistic lies in whether its assumptions are met, and if so, the statistic test yields generally valid results. In addition, Rees (2001) notes that "parametric tests are generally preferred if the assumptions of these tests can be shown to be valid". Despite this, non-parametric tests have some advantages over their parametric counterparts, and descriptive statistics and means have been used to decrease this limitation.

This study does not investigate the financial elements of FM outsourcing contracts because it is difficult to collect adequate quantities of highly confidential financial data on such contracts from the clients and service providers. As for the chosen area, there is a considerable number of FM outsourcing contracts in the local higher education environment and the trends and contract sums continuously increase. This lends significance to the importance of solving the problem in the FM local higher education sector.

10.5 Future research directions

Although the focus of this study is the importance of FM outsourcing relationship types and dimensions in Hong Kong's higher education sector, and their centrality has been confirmed, the researcher believes that the demand and supply of FM services will play a major role in the future of the higher education industry. As previously noted, universities' financial costs have recently increased, which means that the FM client-strategists must plan updated FM strategies to solve the current and future financial problems. As a result, further research is required to explore the relationships among critical FM outsourcing contracts.

Finally, it is not possible for any single study to cover every aspect of a topic, and this study is no exception. The 'evolution and revolution' of FM outsourcing relationship types and dimensions will continue, and thus the topic deserves further investigation. For instance, it is important to investigate how clients and service providers can manage the financial aspects of FM outsourcing contracts to efficiently improve overall FM outsourcing performance services. These concepts might also be applied to other advanced building assets in other business sectors, such as contemporary office buildings, airports, hotels and hospitals.

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Appendices

Appendix I – Bibliography

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Appendix II - Delphi Questionnaire

DELPHI STUDY FOR

FM OUTSOURCING RESEARCH

The Delphi Documentation provided to be experts

FM Researcher: Mr. Lawrence Lok

E-mail contact: K.L.Lok@edu.salford.ac.uk

Introduction

I am a Professional committee member of IFMA (HK Chapter). Currently, I am pursuing my PhD research study on the area of facilities management at the School of Built and Environment of University of Salford, UK with my strongest interest and curiosity. Professor (Facilities Management) Edward Finch of School of Built and Environment of University of Salford, UK is my research supervisor and Associate Professor (Construction Financing) Dr. Y. H. Chiang of Department of Building and Real Estate of The Hong Kong Polytechnics University is my local advisor. It is my pleasure to invite all local Hong Kong facilities management strategists and decision makers to join this pilot research group.

FM professional should consider joining this study for two main reasons. On the personal level, it is good for every FM professional to thoroughly analyze and evaluate the company's outsourcing strategies and to compare them with other competitors. At the level of the organization, it is also important for every company to closely follow the recent trends and developments in good FM practice.

This study investigates the performance of the outsourcing service providers in Hong Kong's FM industry. It is crucial to discuss cause and effect between outsourcing modes and user satisfaction. In our proposed pilot study, we intend to accurately describe the critical success factors for outsourcing strategies currently being used in the Hong Kong's FM industry. In order to produce a robust understanding of current trends in outsourcing (both qualitatively and quantitatively), this research will use a research instrument known as the Four Outsourcing Relationships Types (FORT) Model. This model which is used as a reference tool to examine the causal relationship can examine the evolution of outsourcing relationships types with the clients and users. Your comments are very important for us to prepare innovative outsourcing strategies for local FM practice with reference to the FORT model. If you decide to contribute to this project, your professional feedback will be used confidentially and considered seriously.

Title: A study of outsourcing of Facilities Management in business environment

Sub-title: An exploratory model linking FM outsourcing performance to business performance

Background

In the past decades, the need for integrated resources planning (i.e. people, property and technology) in facilities management has been increasing. It is generally believed that usage of optimal facilities can solve business problems in the built and human environment. Nowadays, outsourcing is prevalent in various industries of the sophisticated business world. This procurement is possibly one of the effective and efficient solutions to deploy resources. However, business people have neglected the impact of outsourcing performance of the service providers on business success.

Without doubt, effective facilities management can contribute to effective business. Thus, there is an urgent need to investigate the FM outsourcing relationship types to building clients satisfaction in the business sectors between general building users and FM service providers. An outsourcing model - Four Outsourcing Relationships Types (FORT) model has been used in the information technology industry for several years. In this framework, there are four outsourcing relationship types: support, alignment, reliance and alliance. It can also be applied to the facilities management industry. It is believed that this study can contribute to the existing research on facilities management; it will also be beneficial to real life outsourcing scenarios in the entrepreneurial environment. Thus, it can add academic, theoretical, and practical value in the field.

Keywords – facilities management, outsourcing relationships types, outsourcing, user satisfaction

I would be very grateful if you could be a member of the expert panelists and participate in this Delphi Survey which will be possibly conducted a series of 4 questionnaires. Each expert can spend less than 5 minutes to complete each questionnaire. Now, what you need to do is to complete the Resource Nomination Worksheet (RNW) for my data consolidation. I will immediately send the first questionnaire to you when you agree to serve on a Delphi panel as an expert.

Resource Nomination Worksheet

Please complete the following table for data collection of suitable professional FM practitioners in the research.

Category 1: Client [ ]
Category 2: Service provider [ ]
Category 3: Researcher [ ]

a) Prepare RNW	1. Position: _____ 2. Discipline / professionalism: _____ 3. Skills: _____ 4. Working experience in facilities management:_____years 5. Organization: _____
b) Prepare RNW with names	1. Name of expert: _____ 2. Name of organization: _____
c) Nominate additional experts	1. Contact of expert by e-mail: _____ 2. Nomination of other experts: _____ _____ _____ _____

Pls. return your completed form to the following contact on or before 28, Feb. 2011:

Name: Mr. Lawrence Lok

E-mail address: K.L.Lok@edu.salford.ac.uk

Round One Delphi Survey

A survey of developing a series of critical success factors to prepare outsourcing strategies for local FM practice

Guidance on completion

Thank you very much for participating in this research survey by making the best use of your expertise in providing valuable opinions. The aim of this survey is to identify critical success factors to prepare outsourcing strategies for local FM practice. Below are the 35 success factors identified from previous research studies and you are encouraged to insert additional attributes in the last row if deemed appropriate. Please select **a minimum of 5 to a maximum of 10 factors** by giving ticks in the appropriate spaces, which you believe are the most important factors to prepare outsourcing strategies for local FM practice. Before completing this questionnaire, the following note on success factors may act as a useful reference.

Note: Critical success factors

The purpose of critical success factors is to enable measurement of outsourcing strategies for local FM practice.

Round One Delphi survey (Please select a minimum of 5 but a maximum of 10 success factors by giving ticks in the appropriate spaces)

Name of Respondent: _____ (Optional)
Position in your organization: _____ (Optional)

	Critical success factors for outsourcing strategies	**Your options Put a "√"**
1	Choice of mechanical and electrical plants (e.g. building services)	
2	Choice of IT equipments (e.g. computing hardware systems)	
3	Choice of firm infrastructure systems (e.g. internet network)	
4	Flow of information (e.g. physical or non-physical delivery)	
5	Design of organisation structure (e.g. open or closed management)	
6	Design of inventory list (i.e. a detailed report of assets)	
7	Procurement strategies (i.e. details in contract administration)	
8	Space measurement (i.e. space management)	
9	Allocation of human resources (i.e. senior management to junior)	
10	Allocation of capital resources (i.e. utilization of budget)	
11	General FM competence (e.g. real estate and strategic planning, operations and maintenance, etc)	
12	Specific FM competence required for specialist facilities	

13	Core skills of facilities managers (e.g. innovative thinking, listening and negotiating capacities, etc)	
14	Information technology enabling learning competence	
15	Measurement on performance (i.e. assessment on service providers)	
16	Capability transfer on business knowledge and management processes	
17	Alignment of group/individual cultures within organisation	
18	Choice of on site communication method	
19	Speed of off site electronic information infrastructural support	
20	Co-ordination between the facilities manager and functional units on operational level	
21	Collaboration of team-work among executives by innovative physical workplace design	
22	FM practice and whole life cycle processes	
23	Integration of work procedures with workplace design	
24	Geographical spread of facilities (local, regional, international)	
25	Resource sharing on people, budget, systems, information and organisation structure	
26	Conformance to specification requirements of services	
27	Methods for defect rectification	
28	Support on defect prevention	
29	Cost of non-conformance work	
30	Awareness of corporate social responsibility	
31	Cost effectiveness (i.e. productivity)	
32	Value of customers satisfaction	
33	Excellence of value-added services	
34	Design and availability of user oriented services	
35	Measurement on quality of work	
	Others (Please specify)	

Round Two Delphi Survey

A survey of developing a series of critical success factors to prepare outsourcing strategies for local FM practice

Guidance on completion

Below are the results of Round 1 of the above study. The average percentage score of all experts is given in column (2). Your Round 1 option selections are given in column (3). It is of interest to the research study to learn whether, with further thought, you would make any changes to your Round 1 option selections. Hence I would be most grateful if you would gain select a minimum of 5 to a maximum of 10 critical success factors which you believe are the most important to prepare outsourcing strategies for local FM practice.

Round Two Delphi survey (Please select a minimum of 5 but a maximum of 10 success factors by giving ticks in the appropriate spaces)

Name of Respondent: _____ (Optional)

Position in your organization: _____ (Optional)

Column 1 Critical success factors for outsourcing strategies	Column 2 % of experts in Round One	Column 3 Your options in Round One	Column 4 Your options in Round Two Put a "*"
1 Choice of mechanical and electrical plants (e.g. building services)			
2 Choice of IT equipments (e.g. computing hardware systems)			
3 Choice of firm infrastructure systems (e.g. internet network)			
4 Flow of information (e.g. physical or non-physical delivery)			
5 Design of organisation structure (e.g. open or closed management)			
6 Design of inventory list (i.e. a detailed report of assets)			
7 Procurement strategies (i.e. details in contract administration)			
8 Space measurement (i.e. space management)			
9 Allocation of human resources (i.e. senior to junior)			
10 Allocation of capital resources (i.e. utilization of budget)			

11	General FM competence (e.g. real estate and strategic planning, operations and maintenance, etc)			
12	Specific FM competence required for specialist facilities			
13	Core skills of facilities managers (e.g. innovative thinking, listening and negotiating capacities, etc)			
14	Information technology enabling learning competence			
15	Measurement on performance (i.e. assessment on service providers)			
16	Capability transfer on business knowledge and management processes			
17	Alignment of group/individual cultures within organisation			
18	Choice of on site communication method			
19	Speed of off site electronic information infrastructural support			
20	Co-ordination between the facilities manager and functional units on operational level			
21	Collaboration of team-work among executives by innovative physical workplace design			
22	FM practice and whole life cycle processes			
23	Integration of work procedures with workplace design			
24	Geographical spread of facilities (local, regional, international)			
25	Resource sharing on people, budget, systems, information and organisation structure			
26	Conformance to specification requirements of services			
27	Methods for defect rectification			
28	Support on defect prevention			
29	Cost of non-conformance work			
30	Awareness of corporate social responsibility			
31	Cost effectiveness (i.e. productivity)			
32	Value of customers satisfaction			
33	Excellence of value-added services			
34	Design and availability of user oriented services			
35	Measurement on quality of work			
36	Clients' objectives			
	Others (Please specify)			

Appendix III

Questionnaire survey to clients

Appendix III - Questionnaire Survey for Client: A study on Outsourcing in Facilities Management

This questionnaire aims to design your outsourcing strategies in the higher education sector. All the data collected will remain confidential.

Please complete and return this questionnaire to: Mr. Lawrence Lok at k.l.lok@edu.salford.ac.uk

Section A: Your background information

Having Higher Diploma ☐ Having Bachelor's Degree ☐ Having Master's Degree ☐

Course with FM related module(s) ☐ Course without FM related module(s) ☐

FM related experience less than 3 years ☐ FM related experience equal or more than 3 years ☐

Chartered builder ☐ Chartered surveyor ☐

Chartered building services engineer ☐ Certified facility manager ☐

Registered professional housing manager ☐

Others _____

Current outsourcing contract: Building maintenance ☐ Securi ☐ Clean ☐ Cate g ☐ Others: _____

Section B: The following items relate to your preference on the characteristics of the service providers. Please specify HOW SATISFACTORY these items are to you in your experience. [B]

1=Very unsatisfactory; 2=unsatisfactory; 3=Neutral; 4=satisfactory; 5=Very satisfactory

Outsourcing Category

OC1: We need help from service providers.	☐	1☐	2☐	3☐	4☐
OC2: The service provider has service commitment to our company and customers.	☐	1☐	2☐	3☐	4☐
OC3: The service provider has qualified technical expertise.	☐	1☐	2☐	3☐	4☐
OC4: The service provider has common goals with us.	☐	1☐	2☐	3☐	4☐

Section C: The following items relate to the the critical success factor for outsourcing strategies of your contract. Please rate HOW GOOD these items are to you in your experience. [C]

1=Very bad; 2=bad; 3=Neutral; 4=good; 5=Very good

a) Ownership of various FM assets transferred by you

SO1: Our service provider is keen to take responsibility for our professional knowledge.	☐	1☐	2☐	3☐	4☐
SO2: Our service provider is keen to take responsibility for our infrastructure technology.	☐	1☐	2☐	3☐	4☐
SO3: Our service provider is keen to take responsibility for our computing system.	☐	1☐	2☐	3☐	4☐
SO4: Our service provider is keen to take responsibility for our communication system.	☐	1☐	2☐	3☐	4☐
SO5: Our service provider is keen to take responsibility for efficiency of our equipment.	☐	1☐	2☐	3☐	4☐

b) Control of various FM assets transferred by you

SC1: Our service provider is keen to take responsibility for correct usage of our infrastructure. (E.g. time, specification and instruction) ☐ 1☐ 2☐ 3☐ 4☐

SC2: Our service provider is keen to take responsibility for correct usage of our equipment. ☐ 1☐ 2☐ 3☐ 4☐

SC3: Our service provider is keen to take responsibility for deployment of suitable human resources. ☐ 1☐ 2☐ 3☐ 4☐

SC4: Our service provider can support our daily routine operation. ☐ 1☐ 2☐ 3☐ 4☐

SC5: Our service provider completes the job as expected. ☐ 1☐ 2☐ 3☐ 4☐

SC6: Our service provider can meet our deadlines. ☐ 1☐ 2☐ 3☐ 4☐

SC7: We are supported by arranged co-ordination meeting(s) regularly. ☐ 1☐ 2☐ 3☐ 4☐

SC8: Our service provider is keen to take responsibility for control of expense. ☐ 1☐ 2☐ 3☐ 4☐

c) Influence of the outsourced FM portfolio on our competitive position

CP1: Our service provider is keen to take responsibility for our competence. ☐ 1☐ 2☐ 3☐ 4☐

CP2: The accuracy of our service is enhanced. ☐ 1☐ 2☐ 3☐ 4☐

CP3: Our service provider can increase our general routine productivity. ☐ 1☐ 2☐ 3☐ 4☐

CP4: Our service provider can increase our technical competence. ☐ 1☐ 2☐ 3☐ 4☐

CP5: Our service provider can provide comprehensive service each day. ☐ 1☐ 2☐ 3☐ 4☐

CP6: Our service provider finishes their responsibilities within the stated time frame. ☐ 1☐ 2☐ 3☐ 4☐

d) Influence of the outsourced FM portfolio on our long-term plan

LP1: Our service provider can support our policy. ☐ 1☐ 2☐ 3☐ 4☐

LP2: Our service provider can support our long term plan. ☐ 1☐ 2☐ 3☐ 4☐

LP3: We are satisfied with the work of the service provider. ☐ 1☐ 2☐ 3☐ 4☐

LP4: Our service provider can fulfill our requirements on safety and health. ☐ 1☐ 2☐ 3☐ 4☐

LP5: Our service provider can fulfill our requirements on human resources. ☐ 1☐ 2☐ 3☐ 4☐

LP6: Our service provider can fulfill our requirements on administration. ☐ 1☐ 2☐ 3☐ 4☐

LP7: Our service provider can fulfill our requirements on quality. ☐ 1☐ 2☐ 3☐ 4☐

LP8: Our service provider can fulfill our requirements on environmental protection. ☐ 1☐ 2☐ 3☐ 4☐

Section D: The following items relate to the criteria for outsourcing strategies of your contract. Please rate THE LEVEL OF IMPORTANCE when these items are compared. [D]

Criteria for outsourcing strategies : i) Competence ii) Co-ordination iii) Quality

1=Equally important; 3=Moderately more important; 5=Strongly more important; 7=Very Strongly more important; 9=Extremely more important; 2, 4, 6, 8=Intermediate values between the two adjacent judgments

Comparisons among two criteria

Example: Co-ordination VS Quality

☐ 9 ☐ ☐ 7 ☑ ☐ 4 ☐ 2 ☐ 1 ☐ ☐ ☐ ☐ 5 ☐ ☐ ☐ 9

Explanation: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, it is perceived that "Co-ordination" is Strongly More Important than "Quality"

Question 1: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Co-ordination VS Quality

9 7 4 2 1 2 5 9

Question 2: In designing outsourcing strategies, when "Co-ordination" and "Competence" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Co-ordination VS Competence

9 7 4 2 1 2 5 9

Question 3: In designing outsourcing strategies, when "Quality" and "Competence" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Quality VS Competence

9 7 4 2 1 2 5 9

Outsourcing Relationship Dimensions:

i) Ownership & Control - Ownership & Control of various FM assets transferred to service provider

ii) Competitive Position & Long-term Plan - Influence of the outsourced FM portfolio on our competitive position & long-term plan

Comparisons among two Outsourcing Relationship Dimensions

Example: Ownership & Control VS Long-term plan & Competitive position

9 7 4 2 1 2 5 9

Explanation: In respect to "Co-ordination", it is perceived that "Ownership & Control" is Moderately More Important than "Long-term plan & Competitive Position".

Question 4: In respect to "Co-ordination", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

9 7 4 2 1 2 5 9

Question 5: In respect to "Competence", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

9 7 4 2 1 2 5 9

Question 6: In respect to "Quality", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

9 7 4 2 1 2 5 9

Section E: The following items relate to the design of outsourcing strategies of your contract. Please rate HOW IMPORTANT these items are to you in your experience. [e]

1=Very unimportant; 2=unimportant; 3=Neutral; 4=important; 5=Very important

a) Minimizing Process Customization

1: Compared to other organizations our outsourced process requires technical skills that are relatively unique. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: To provide outsourcing service external vendors would have to make substantial investments in their efforts to tailor our needs. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: Extensive business knowledge that is specific to our business environment is required for our vendor to manage the outsourced operations. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

4: We request the vendor to modify its process significantly to adapt to our unique operational routines and requirements. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

b) Process Maturity

1: Key procedures and business rules are documented and visible to parties involved ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: The process is well defined and institutionalized. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: The process boundary is clearly demarcated. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

c) Vendor Interoperability (Services exchanged enabling to operate effectively together)

1: The application platform provided by our outsourcing vendor offers a wide variety of information to end users through multiple channels. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: The software application provided by our outsourcing vendor is compatible and interoperable across multiple platforms. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: The application platform provided by our outsourcing vendor is electronically linked and seamlessly connected with the end users in our organization. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

4: Software modules can easily be added to, modified, or removed from the application platform provided by our outsourcing vendor. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

d) Multiple Sourcing to vendors

1: For the specified process we have a policy of contracting with multiple outsourcing vendors. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: We have partitioned the process and outsourced different components to different vendors. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: We have built up relationships with a few outsourcing vendors to contract out our process. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

e) In-House Competence

1: We have a team of in-house staff who are able to replicate and expand the outsourced process if necessary. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: We continue to retain internal competence to backup the outsourced process. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: We can easily bring the outsourced process in-house if necessary. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

f) Proactive Sensing

1: Our executives always update themselves about the dynamics of outsourcing vendor's market to take advantage of new opportunities. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: Our executives always initiate actions to which our outsourcing vendor responds. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: Our executives are quick to alert our outsourcing vendor when new products and services are offered in the marketplace. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

4: Our executives always encourage our outsourcing vendor to explore new opportunities and innovative ideas. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

g) Partnership Quality

1: We and our outsourcing vendor make decisions that are mutually beneficial. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

2: We and our outsourcing vendor share the benefits and risks in our outsourcing arrangement. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

3: We and our outsourcing vendor have compatible cultures and policies. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

4: We and our outsourcing vendor perform our agreements and promises very well. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

~ End of questionnaire ~

Any further comments you may wish to make:

_____

_____

_____

Optional Information: If you kindly indicate your name and contact details, we would send you a copy of the research findings.

Name: _____

Tel. No: _____

E-mail: _____

Percentage of completion

100%

THANK YOU VERY MUCH FOR YOUR CONTRIBUTION!

Appendix IV

Questionnaire survey to service providers

Appendix IV - Questionnaire Survey for Service Provider: A study on Outsourcing in

This questionnaire aims to design your outsourcing strategies in the higher education sector. All the data collected will remain confidential.

Please complete and return this questionnaire to: Mr. Lawrence Lok at k.l.lok@edu.salford.ac.uk

Section A: Your background information

Having Higher Diplom ☐ Having Bachelor's Degree ☐ Having Master's Degree ☐

Course with FM related module(s) ☐ Course without FM related module(s) ☐

FM related experience less than 3 ☐ FM related experience equal or more than 3 ☐

Chartered builder ☐ Chartered surveyor ☐

Chartered building services engine ☐ Certified facility manager ☐

Registered professional housing manag ☐ r

Others _____

Current outsourcing contract: Building mainten ☐ ce Secu ☐ y Cle ☐ ing Ca ☐ ring Others: _

Section B: The following items relate to preference on your characteristics. Please specify HOW SATISFACTORY these items are to you in your experience. [b]

1=Very unsatisfactory; 2=unsatisfactory; 3=Neutral; 4=satisfactory; 5=Very satisfactory

Outsourcing Category

OC1: We support the in-house team. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

OC2: We have commitment to our customers. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

OC3: We have qualified technical expertise. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

OC4: We have common goals with our customers. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section C: The following items relate to the the critical success factor for outsourcing strategies of your contract. Please rate HOW GOOD these items are to you in your experience. [c]

1=Very bad; 2=bad; 3=Neutral; 4=good; 5=Very good

a) Ownership of various FM assets transferred to you

SO1: We consider availability of own equipment or machinery for competing jobs. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SO2: We can immediately help our customers if needed with professional knowledge ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SO3: We are quick to respond and complete when our customers asked for help. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SO4: We are capable to help customers until completion of work. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SO5: We can share resources on daily operations and processes. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

b) Control of various FM assets transferred to you

SC1) We complete the job with professional knowledge. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SC2) We can meet the deadlines. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SC3) We arrange coordination meeting(s) regularly. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

c) Influence of the outsourced FM portfolio on client's competitive position

CP1: We consider financial capability for maintaining good relationship. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP2: We can efficiently deploy our human resources for maintaining good relationship ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP3: We could give help to our customers when they requested. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP4: We are there when our customers requested. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP5: We can enhance the accuracy of our customer's service. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP6: We can increase our customer's general routine productivity. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP4: We can increase our customer's technical competence. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP8: We listen to our customer when they were requesting a service. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP9: We are keen to take responsibility for what our customers had to say. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP10: We conduct ourselves with competence in front of public. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP11: We are courteous. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP12: We understand what our customers want. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP13: We can provide comprehensive service each day. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP14: We finish our responsibilities within the stated time frame. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP15: The quality of the way we treat our customers is high. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP16: My customers are satisfied with the way we treated them. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

CP17: The way we treat our customers meeting their expectations. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

d) Influence of the outsourced FM portfolio on client's long-term plan

LP1: We consider duration of the outsourcing contract period for competing jobs. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP2: We can support by our customer's policy. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP3: We can support our customer's long term plan. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP4: Our customer are satisfied with the work that we treated. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP5: We can fulfill our customer's requirements on safety and health. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP6: We can fulfill our customer's requirements on human resources. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP7: We can fulfill our customer's requirements on administration. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP8: We can fulfill our customer's requirements on quality. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP9: We care about our social responsibility to the public. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP10: We care about our value-added services to the customers. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

LP11: We can fulfill our customer's requirement on environmental management. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section D: The following items relate to the criteria for outsourcing strategies of your contract. Please rate THE LEVEL OF IMPORTANCE when these items are compared. [d]

Criteria for outsourcing strategies : i) Competence ii) Co-ordination iii) Quality iv) Adequacy

1=Equally important; 3=Moderately more important; 5=Strongly more important; 7=Very Strongly more important; 9=Extremely more important; 2, 4, 6, 8=Intermediate values between the two adjacent judgments

Comparisons among two criteria

Example: Co-ordination VS Quality

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☑ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Explanation: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, it is perceived that "Co-ordination" is Strongly More Important than "Quality"

Question 1: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Co-ordination VS Quality

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 2: In designing outsourcing strategies, when "Co-ordination" and "Competence" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Co-ordination VS Competence

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 3: In designing outsourcing strategies, when "Co-ordination" and "Adequacy" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Co-ordination VS Adequacy

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 4: In designing outsourcing strategies, when "Quality" and "Competence" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Quality VS Competence

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 5: In designing outsourcing strategies, when "Quality" and "Adequacy" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Quality VS Adequacy

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 6: In designing outsourcing strategies, when "Competence" and "Adequacy" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important.

Competence VS Adequacy

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Outsourcing Relationship Dimensions:

i) Ownership & Control - Ownership & Control of various FM assets transferred to us

ii) Competitive Position & Long-term Plan - Influence of the outsourced FM portfolio on clients' competitive position & long-term plan

Comparisons among the Outsourcing Relationship Dimensions

Example: Ownership & Control VS Long-term plan & Competitive position

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☑ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Explanation: In respect to "Co-ordination", it is perceived that "Ownership & Control" is Moderately More Important than "Long-term plan & Competitive Position".

Question 7: In respect to "Co-ordination", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 8: In respect to "Competence", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 9: In respect to "Quality", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Question 10: In respect to "Adequacy", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important.

Ownership & Control VS Long-term plan & Competitive position

☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Section E: The following items relate to the design of outsourcing strategies of your contract. Please rate HOW IMPORTANT these items are to you in your experience. [e]

1=Very unimportant; 2=unimportant; 3=Neutral; 4=important; 5=Very important

a) Minimizing Process Customization

1: Compared to other organizations our outsourced process requires technical skills that are relatively unique. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: To provide outsourcing service external vendors would have to make substantial investments in our efforts to tailor to clients' needs. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: Extensive business knowledge that is specific to our business environment is required for us to manage the outsourced operations. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4: We are requested to modify its process significantly to adapt to unique operational routines and requirements. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

b) Process Maturity

1: Key procedures and business rules are documented and visible to parties involved. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: The process is well defined and institutionalized. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: The process boundary is clearly demarcated. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

c) Vendor Interoperability (Services exchanged enabling to operate effectively together)

1: The application platform provided by us offers a wide variety of information to end users through multiple channels. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: The software application provided by us is compatible and interoperable across multiple platforms. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: The application platform provided by us is electronically linked and seamlessly connected with the end users' organization. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4: Software modules can easily be added to, modified, or removed from the application platform provided by us. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

d) Multiple Sourcing to vendors

1: For the specified process the clients have a policy of contracting with multiple outsourcing vendors. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: The clients have partitioned the process and outsourced different components to different vendors. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: The clients have built up relationships with a few outsourcing vendors to contract out process. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

e) In-House Competence

1: The clients have a team of in-house staff who are able to replicate and expand the outsourced process if necessary. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: The clients continue to retain internal competence to backup the outsourced proces ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: The clients can easily bring the outsourced process in-house if necessary. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

f) Proactive Sensing

1: The clients' executives always update themselves about the dynamics of outsourcing vendor's market to take advantage of new opportunities. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: The clients' executives always initiate actions to us for respondence. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: The clients' executives are quick to alert us when new products and services are offered in the marketplace. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4: The clients' executives always encourage us to explore new opportunities and innovative ideas. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

g) Partnership Quality

1: The clients and we make decisions that are mutually beneficial. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2: The clients and we share the benefits and risks in our outsourcing arrangement. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3: The clients and we have compatible cultures and policies. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4: The clients and we perform our agreements and promises very well. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

~ End of questionnaire ~

Any further comments you may wish to make:

_____

_____

_____

Optional Information: If you kindly indicate your name and contact details, we would send you a copy of the research findings.

Name: _____

Tel. No: _____

E-mail: _____

Percentage of completion

100%

THANK YOU VERY MUCH FOR YOUR CONTRIBUTION!

Appendix V

Focus group

Date: XX June 2012

Dear Sir/Madam,,

Focus Group Meeting - A Contingency Model for Outsourcing Relationships in Hong Kong's FM sector

This study is to investigate into the outsourcing relationships between the clients and service providers in the local FM industry especially in the tertiary sectors and universities. I am a PhD candidate in the subject of facilities management at the Salford University. At the stage of finalizing our works, we should like to cordially invite you to join our Focus Group Meeting, which is designed to acquire more insights and opinions about the developing model. The meeting is used to confirm the validity of the model. Your professional opinions are very important to this research.

The details of the meeting are as follows:

Date: 12/7/2012 **(Thursday)**
Time: 7:00pm – 9:30pm (Sandwiches and drinks will be served)
Venue: IVE (Morrison Hill), Wanchai, Hong Kong

The tentative arrangement of the meeting is enclosed for your reference.

Again, your support is very critical to the success of the project which can lead to improvement of outsourcing relationships in Hong Kong's FM sector especially the higher educational environment.

Please kindly reply to me your availability for the meeting on or before **XX June 2012**.

We look forward to receiving your early reply.

Yours sincerely,

Lawrence

Encl.:

1. Tentative arrangement of the focus group meeting

2. Introductory Sheet on Contingency Outsourcing Relationships Model (CORM) for in FM sector

Date: XX June 2012

Dear Sir/Madam,

Questionnaires Survey - A Contingency Model for Outsourcing Relationships in Hong Kong's FM Higher Educational sector

This academic study is to investigate into the outsourcing relationships between the clients and service providers of the local FM industry in the higher educational sector. At the stage of finalizing our works, we should like to cordially invite you to join our questionnaire survey, which is designed to acquire more insights and opinions about the developing model. The survey is used to confirm the validity of the model. Your professional opinions are very important to this research.

Again, your support is very critical to the success of the project which can lead to improvement of outsourcing relationships in Hong Kong's FM higher educational sector. We look forward to receiving your return.

According to your own professional experience, you can complete ONLY (1) / (2) or BOTH attached questionnaires.
(1) Questionnaire for client
(2) Questionnaire for service provider

You are also absolutely welcome to forward this e-mail and two questionnaires to your FM colleagues and friends.

Thank you very much for your help and support.

Best wishes,
Lawrence Lok
FM Researcher

Contingency Outsourcing Relationships (CORE) Model in FM sector

Present:	**Facilitator** Mr. Lawrence Lok Dr. Franky Wong **Focus group participants** Four industry practitioners A: Principal / Professor of a Asia Built Environment Institute (Academic) B: Head of Health, Safety and Environment Affairs of a University (Client) C: Facilities Management Director (Service Provider) D: Hong Kong Registered Solicitor (Independent party)
Date:	21 July 2012 (Saturday)
Time:	2:00pm – 4:30pm
Venue:	Rm 367 Project Room, Hong Kong Institute of Vocational Education (HKIVE, Morrison Hill)

Lawrence will give a round 20 minutes presentation on the **CORE** to the audience, followed by a one-and-half-hour discussion.

Discussion Notes

Remarks by A:

1) Scope of works of the proposing model: FORT applied to all IT hardware and software; thus the CORE model also applying to all FM services. The scope of works can be broadening.
2) How to handle the confidential or secret data? Only passing that information to the inhouse staff of the organisations.
3) The CORE model in facilities management is applied into Hong Kong's environment.

Remarks by C:

1) There are two parts for handling the model.
2) Part I is designed for the handling the confidential or sensitive information of the organizations to the inhouse staff.
3) Part II is designed for the handling the general issues of the organizations wholly passing to the service providers.

1) In what aspects do you think the Model is best designed?	
A	- Suitable at low facilities management technology - Clear cut contract (Airport) - Easy for labour arrangement or good plan on resources management
B	- Simple model - Easy understandings - Easy to operate - Suitable to low technology of facilities management - Suitable application into the outsourcing procurements of FM services such as the local Hong Kong's universities - Create co-operation and collaboration between the clients and service providers - Achieve win-win situation to the FM stakeholders
C	- Suitable application into the facilities management industry of various kinds of business sectors such as education, computing, banking and so on when the Hong Kong's companies or international companies are ready
2) Do you think that wide use of the Model would lead to overall improvement of outsourcing relationships in the Hong Kong facilities management industry?	
A	Scenario: Before the end of completion of the FM contract, clients generally need to evaluate the risk because of gradual deterioration of the performance of serviced provider in the old FM contract. It is because the new contract may be renewed by a new service provider. Unfortunately, the clients cannot terminate the service provider with poor performance until the end of the contract. Nevertheless, this model can overcome this problem through investigation of the outsourcing relationships through evolution.
B	- Loyalty of the experienced staff in service providers can be reviewed throughout the contract - More explanation be required to further improve the model - The quality of FM service can be enhanced
C	- It is believed that the local facilities management industry can be improved by the application of the model for example the security service and management of lift. - The working mechanism of the model can improve the flexibility of outsourcing relationships between the stakeholders - Loyalty and reputation of the service providers can be reviewed throughout the contract - More explanation be needed before application of the model
3) Are there any improvements needed for the Model?	
A	- More explanation to be required to improve the workability because the model is too simple - Breaking down of the model to be required because the model is too generic. For example, sizes of the FM companies, authorities and classifications of contract such as cleaning, security, building maintenance, landscape
B	- Trust between the clients and service providers should be considered - Authority of the clients should be considered - Diligence of the service providers should be considered - Key performance indicators should be considered - Payment methods should be considered
C	More aggressive clients will outsource the FM services to the small service providers with tight time constraint. Thus,

	the following improvements are necessary before the application of the model. - More explanation on the application be required - More details on the application be required - More discussions on the application of each category be required - More details on the application of each category be required - More details on the evolution of each category be required - Justification of the details of the model to be required
D	- Setting up mutual contractual agreements between the stakeholders are crucial in order to apply the model effectively - Fair FM service contract terms are important to both parties - The financial terms in the FM service contracts should not be too low.
4) Do you think that the Model should be used in our higher educational facilities management industry?	
A	- The model can be applied to the FM sectors in the higher educational facilities management environment. Classification of the types of distribution of building assets in the campuses of tertiary institutes and universities are important. One type is about all buildings centralized in campus environment, but the other type is buildings diverse in campus environment. - Centralized buildings in campus of the higher educational environment: The daily FM operation of a university is same as that of the power plant operation. Building assets of both environments are centralized. A local power company is attempting to organize and operate the FM services in the centralized built environment with an outsourcing model. If the attempt will be successful, this is also possible to apply the outsourcing model to the FM services of centralized buildings in several local campuses of the universities. - Diverse buildings in campus of the higher educational environment: The model can also be attempted to apply in the campuses with diverse buildings of the tertiary institutes.
B	- Identification of the size of the universities or tertiary institutes - Identification of the types of distribution of the building assets of the universities or tertiary institutes
C	- The model is applicable to the higher educational environment with close monitoring.
D	- The model is applicable to the higher educational environment on management point of view.
5) Do you expect any hindrance / barrier(s) in using the Model in Hong Kong?	
A	- Classification of the size of clients is important. Sizeable clients can operate the outsourcing model more effectively. On the contrary, the weak clients in monetary terms can fail to operate the outsourcing procurements. - Human errors can affect the normal operation of outsourcing.
B	- If some FM services of the organizations are outsourcing, there are still some in-house staffs working in the organizations. However, the problem of the inhouse staff is aging. - The clients may apply late payment terms to the service providers. The loyalty of the service providers will be adversely affected.
C	- The four types of the outsourcing relationships are too conventional and simple. Further explanation or details are required to make the model clear. - Employees are generally reluctant to the operation of outsourcing procurement in their organizations as they are afraid of losing jobs during outsourcing. The security of work will be lowered by application of this procurement.
D	- At management point of view, support by the clients is crucial to implement successful operation of the outsourcing model.
6) What strategies should be adopted to overcome the above mentioned hindrance / barrier(s)?	
A	- Consideration on improvement of the contractual terms - Consideration on improvement of mutual trusts - Consideration on long contractual period on achieving good quality
C	- Mutual trust between the clients and service providers are very important. The management of the service provider should increase the sense of security to the staff in the working environment. - Long term relationship is suggested to link to the stakeholders in the FM contracts. For example, the clients can introduce the service contracts with the providers for minimum three years. - The parties should keep balance on both quality and safety for the FM contracts.
D	- A local company is owned by the Hong Kong Special Area Region Government. The "Link" has it own strategy to improve the relationship between the stakeholders.
7) What are the advantages of the model?	
C	- The model is applicable to the local FM industry. - The model can develop partnership between the stakeholders. - The model can develop a system to monitor the outsourcing relationship between the clients and service provider for various contracts.
8) What are the disadvantages of the model?	
C	- The model does not consider the classification on the types of clients. - The model does not consider the classification on the sizes of clients.
D	- The model should clearly consider the timing factor during the contract period.

After the discussion, participants completed the questionnaires on the implementation of the Model.

Contingency Outsourcing Relationships Model (CORM) in FM sector

Persons present:	**Facilitator** Mr. Lawrence Lok Dr. Franky Wong **Focus group participants** Five industry practitioners BC: Associate Programme Director (Academic) SW: Facilities Management Manager (Client) ES: Assistant Facilities Management Manager (Service Provider) JY: Facilities Management Consultant (Independent party) K: Hong Kong's Registered Solicitor (Legal consultant)
Date:	12 July 2012 (Thursday)
Time:	7:00pm – 9:30pm
Venue:	Rm 367 Project Room, Hong Kong Institute of Vocational Education (HKIVE, Morrison Hill)

Lawrence will give a round 20 minutes presentation on the **CORM** to the audience, followed by a one-and-half-hour discussion.

Discussion Notes

1) In what aspects do you think the Model is best designed?	
BC	- The model is precise and concise.
SW	- The model is easy to understand. - The model is important and significant because the nature of this model discusses the specific sophisticated types of outsourcing relationships between the clients and service providers more than the simple issues of core and non-core FM services.
ES	- The model is applicable to local FM industry.
JY	- The model is simple. - It is a good start to understand the unknown outsourcing relationships between the clients and service providers. - The model can indicate the evolution of the outsourcing process or relationships between the contractual parties.
K	- The model is basically acceptably applied to the local FM industry.
2) Do you think that wide use of the Model would lead to overall improvement of outsourcing relationships in the Hong Kong facilities management industry?	
BC	- The model can verify the current outsourcing relationships between the contractual parties. Thus, the parties can have more information to assess their current relationships and to predict the optimum future outsourcing relationships. - The model can improve the daily operational efficiency of the organizations.
SW	- The model can provide more information for the service providers to improve their own services and performance. - The service providers can thoroughly understand their clients' necessities and review their performance in the FM services.
ES	- Outsourcing relationships can be improved by evaluation of the performance of the service providers. - This model is supportive to the overall FM services.
JY	- The service providers can continue to keep on their strengths and to improve their weaknesses through understanding the outsourcing relationships. - The service providers can find out their own problems in the outsourcing strategies by application of the outsourcing relationship models between the clients and service providers.
K	- The model can improve all outsourcing relationships.
3) Are there any improvements needed for the Model?	
BC	- The model is too simple. It is suggested to be become a more sophisticated model by incorporation with more variables for exact measurement in the terms of service quality and working capital.
SW	- Use of the words in the new proposed FORT framework is not clear enough. For example, the term "commitment" cannot clearly indicate the relationship between the clients and service providers. The term "trust" is suggested to replace. Again, the term "inhouse" is also ambiguous to describe the specific relationships. Improvement is required.
JY	- The indication of the rating on the measurement of ownership and control of various FM assets and

	firms' competition and long-term strategy is not clear. The high and low level of both FM dimensions are required to indicate clearly. - The two FM dimensions cannot realistically reflect the actual working mechanism in the FM industry. In order to achieve more accurate evaluation on the outsourcing relationships between the FM stakeholders, it is necessary to introduce more valuable FM dimensions into the model for measurement. - The model is not detailed enough and is too general. It is suggested to improve the model to be more specific by diversification on the industries, type of contracts and various kinds of building assets. - The model should be used in the long term plan. Generally, the FM contracts in Hong Kong are designed from one year to five years. - The model can be divided into two parts. One part of the model is to treat the daily basic FM operations. The other part of the model is to treat the confidential and special FM operations.
K	- The model can be improved by consideration on the legal term such as liability of the service provider in the contract.
4) Do you think that the Model should be used in our higher educational facilities management industry?	
BC	- Generally, the model is acceptable.
ES	- Generally, the model is applicable.
JY	- The model can be used in the local higher educational environment.
K	- The model can be applied in the local tertiary institutes and universities.
5) Do you expect any hindrance / barrier(s) in using the Model in Hong Kong?	
SW	- The FORT model was originated by Kishore *et. al.* on 2003. Perhaps, the model is needed to revise and update for usage before application. - The FM dimensions of the model should be clearly explained and interpreted.
ES	- The technical terms of FM model should be clearly explained and interpreted.
JY	- The IT model may be required to modify for tailor-made use in FM industry. - The model can also be incorporated with financial terms of the FM contracts.
6) What strategies should be adopted to overcome the above mentioned hindrance / barrier(s)?	
BC	- In order to increase the validity and reliability of the model, it is also suggested to have case studies for further development.
SW	- The updated investigation is important to achieve a validated and reliable model.
ES	- On consideration, the clients' requirements are also the factors to improve the mechanism of the model.
JY	- In short term strategy, the model should be narrow down to be more specific as described beforehand. The model can be specifically applied into the FM environment of the individual business sectors. Each model is only concentrated on the specific business FM environment. - In long term strategy, some FM dimensions can be added in order to increase the value and accuracy of the model by types of contract, contract sum, procurement strategy, performance indicators, insurance, responsibilities of the FM stakeholders and legal terms on the binding contracts. - In the service provider, suitable tailor-made training can be provided to the relevant staff working in the specific business environment.
7) What are the advantages of the model?	
BC	- The model is workable. - The FORT framework can be applied into contracts of local IT industry for the IT hardware maintenance and infrastructure installation works. It is believed that the model can be applied in the local higher educational environment.
SW	- The model is easy and convenient to use.
ES	- The nature of the IT model is applicable in FM industry.
JY	- The model is fantastic that it shows the evolution of the outsourcing relationships between the clients and service providers.
8) What are the disadvantages of the model?	
BC	- The model is too simple.
SW	- The model cannot clearly identify characteristics of the specific FM contracts. It is too general.
ES	- The model is not detailed in FM context.
JY	- The model does not have sufficient information to show the actual operation of the FM service provider and characteristics of current outsourcing contracts.
K	- The model should consider the legal responsibilities and risks elements for the contractual parties.

After the discussion, participants completed the questionnaires on the implementation of the Model.

Appendix V - Focus Group Meeting – Programme

Date	**:**	12 July 2012 (Thursday)
Time	**:**	7:00 p.m. – 7:20 p.m. (20 minutes) Reception (Sandwiches and drinks will be served) 7:20 p.m. – 7:40 p.m. (20 minutes) – Brief introduction of the Contingency Outsourcing Relationships Model (CORE) in local higher educational FM sector 7:40 p.m. – 8:00 p.m. (20 minutes) – Q & A 8:00 p.m. – 09:25 p.m. (85 minutes) – discussion 9:25 p.m. – 9:30 p.m. – Closing
Venue	**:**	Rm 367 Project Room, Hong Kong Institute of Vocational Education (HKIVE, Morrison Hill)

Preparation: Buying drinks / sandwiches / biscuits
Arrangement: Photo-taking and recording

Reception (7:00pm – 7:20pm)
- Serving sandwiches and drinks
- Distributing Meeting programme / Introductory sheet / Pen and few pieces of papers

Introduction of the meeting (7:20pm – 7:40pm)
- Introduction of CORM
- Starting Powerpoint
- Greeting and purpose of focus group / this focus group
- Checking materials
- Introduction of the programme of focus group meeting
- Introduction of recording (too many people / to avoid missing important points / identifies won't release to outsiders, only for academic purpose) -> recording

Q & A (7:40pm – 8:00pm)
- Invitation of questions and answering questions
- At the end, distributing questionnaires

Discussion session (8:00pm – 9:25pm)
- Showing 8 questions on the Powerpoint
  - In what aspects do you think the Model is best designed?
  - Do you think that wide use of the Model would lead to overall improvement of outsourcing relationships in the Hong Kong facilities management industry?
  - Are there any improvements needed for the Model?
  - Do you think that the Model should be used in our higher educational facilities management industry?
  - Do you expect any hindrance / barrier(s) in using the Model in Hong Kong?
  - What are the advantages of the model?
  - What are the disadvantages of the model?
  - What strategies should be adopted to overcome the above mentioned hindrance / barrier(s)?

Closing(9:25pm – 9:30pm)
- Collecting completed questionnaires

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Focus Group Meeting:
Contingency Outsourcing Relationships (CORE) Model in FM

Date : 21 July 2012 (Thursday)

Time : 2:00 p.m. – 2:20 p.m. (20 minutes): Reception (Sandwiches & drinks will be served)
2:20 p.m. – 2:40 p.m. (20 minutes): Brief introduction of the CORE in local higher educational FM sector
2:40 p.m. – 3:00 p.m. (20 minutes): Q & A
3:00 p.m. – 4:25 p.m. (85 minutes): Open Discussion
4:25 p.m. – 4:30 p.m. (5 minutes): Closing

Venue : Rm 367 Project Room, Hong Kong Institute of Vocational Education (HKIVE, Morrison Hill)

See you in the meeting! Have a Nice sharing and enjoy the event! ☺

University of Salford MANCHESTER

Focus Group Meeting: Contingency Outsourcing Relationships (CORE) Model in FM

What is a Focus Group Meeting?

Focus group is a small group discussion to address specific topics. The purpose of running focus group meeting is to collect information from several professionals simultaneously through interactions between the participants.

What is the aim of running this Focus Group Meeting?

The aim of running this Focus Group Meeting is to collect information from a group of experience practitioners about the use of Contingency Outsourcing Relationships Model ("the Model") in facilities management industry. In the meeting, probing and clarification of the participants' comments with one another becomes easier. Furthermore, under the environment which encourages eager expression of views, more insights and creative thoughts about the topics can be generated by means of interactive discussion.

See you in the meeting! Have a Nice sharing and enjoy the event!

University of Salford MANCHESTER

Focus Group Meeting:
Contingency Outsourcing Relationships (CORE) Model in FM

What should I prepare for the meeting?

Since there is an introductory presentation about the Model before start of discussion, the participants do not have to prepare any for the meeting. Yet, if time is available, the attached informative sheet may be helpful in understanding more about the Model before the meeting.

What should I do in the Meeting?

In the meeting, after a brief introduction of the Model, discussion will start.

Participants can contribute their ideas on the use of the model in facilities management industry on their own initiatives. Meanwhile, questions will be thrown out by the organiser for stimulating ideas and thoughts throughout the whole process.

See you in the meeting! Have a Nice sharing and enjoy the event!

University of Salford MANCHESTER

Focus Group Meeting:
Contingency Outsourcing Relationships (CORE) Model in FM

What are the topics likely to be addressed?

3:00 p.m. – 4:25 p.m. (85 minutes): Open Discussion

The followings are some example questions to be addressed in the meeting:

- In what aspects do you think the Model is best designed?
- Do you think that wide use of the Model would lead to overall improvement of outsourcing relationships in the Hong Kong facilities management industry?
- Are there any improvements needed for the Model?
- Do you think that the Model should be used in our higher educational facilities management industry?
- Do you expect any hindrance / barrier(s) in using the Model in Hong Kong?
- What strategies should be adopted to overcome the above mentioned hindrance / barrier(s)?
- What are the advantages of the model?
- What are the disadvantages of the model?

See you in the meeting! Have a Nice sharing and enjoy the event!

University of Salford MANCHESTER

Focus Group Meeting:
Contingency Outsourcing Relationships (CORE) Model in FM

Closing Remarks

Thank You Very Much!

See you in the meeting! Have a Nice sharing and enjoy the event!

Appendix VI

Pilot Study for the two questionnaires

Appendix VI - Formal record on Pilot Study for the two questionnaire surveys for FM clients and service providers (Outsourcing Relationships)

Pilot Study 6/5/2012 to 25/5/2012
3 Respondents
The identification of the experts in the pilot study is similar as the method in Delphi survey in this study.

1. To create three sub-lists, one for each category i.e. clients, consultants and service providers
2. To categorize experts according to appropriate list e.g. professionalism, working experience and the length of years in facilities management
3. To rank experts within each list based on their qualifications i.e. clients and service providers

No. of experts	Role	Number of years of FM related working experience	Professionalism	Highest academic background	Working title	Duration of completion on the questionnaire (s) (minute)	Remarks
1	Service provider	Around 15 years	Chartered Building Services Engineer	Master	Senior Facilities Manager	Around 20 minutes on both	After office hour
2	Client	Around 8 years	Surveying	PhD	Programme Manager	Around 20 minutes on both	After office hour
3	Client and Service provider	More than 20 years	Chartered builder and construction manager	Bachelor Degree	Facilities Management Director	Around 20 minutes on both	During office hour

Client's side

i) The first respondent's comments on the questionnaire:

1) Comment on Section A. "Having Bachelor Degree" should be written as "Having Bachelor's Degree". "Having Master Degree" should be written as "Having Master's Degree". "Building services engineer" should be written as "Chartered Building services engineer". "Certified facilities manager" should be written as "Certified facility manager". "Chartered property manager" should be written as "Registered professional housing manager".

2) Comment on Section C.

a) There are unequal numbers of items in the four subsections.

b) In the title of this section, it is not clear about the word "outsourcing maneuver of your contract. Proposed revision on the title: "outsourcing strategies of your contract"

c) What is the meaning of "correct usage of our infrastructure" in SC1? Proposed revision on SC1: Our service provider is keen to take responsibility for correct usage of our infrastructure. (E.g. time, specification and instruction)

d) Generally, safety and health are discussed simultaneously in LP4. Proposed revision on LP4: Our service provider can fulfill our requirement on safety and health.

3) Comment on Section E.

a) In the title of this section, it is not clear about the word "outsourcing maneuver of your contract. Proposed revision on the title: "outsourcing strategies of your contract"

b) It is difficult to understand the meaning of "Vendor interoperability". Further explanation is required. Vendor interoperability can be further explained by the following statement as services exchanged enabling to operate effectively together.

c) It is difficult to understand the meaning of "Multiple Sourcing". Further explanation is required. Multiple sourcing can be further explained by the following statement as multiple sourcing to vendors.

Action taken on the revision of questionnaire:

1) Revision as according to the suggested items.

2) Comment on Section C.

a) The numbers of the items in the four subsections are depending on the identified critical success factors for outsourcing maneuver of the four criteria: adequacy, competence, co-ordination and quality. Thus, it is not important achieving equal number of the items.

b) Revision as according to the suggestion.
c) Revision as according to the suggestion.
d) Revision as according to the suggestion.

3) Comment on Section E.

a) Revision as according to the suggestion.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.

ii) The second respondent's comments on the questionnaire:

1) Comments on Section D
Comparisons among two criteria

a) "The following items relate to the criteria for outsourcing strategies of your contract. Please rate HOW IMPORTANT these items are to you in your experience." should be written as "Section D: The following items relate to the criteria for outsourcing strategies of your contract. Please rate THE LEVEL OF IMPORTANCE when these items are compared."
b) "Explanation: Experience and judgment strongly favor Co-ordination over Quality." should be written as "Explanation: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, it is perceived that "Co-ordination" is Strongly More Important than "Quality".
c) Suggestion to put down the following as the header for each question from one to three. For example: "Question 1: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important."

Outsourcing Relationship Dimensions

a) "Ownership & Control - Ownership of various FM assets transferred & Control of various FM assets transferred to service provider" should be simplified as "Ownership & Control - Ownership & Control of various FM assets transferred to service provider".
b) "Competitive Position & Long-term Plan - Influence of the outsourced FM portfolio on our competitive position & Influence of the outsourced FM portfolio on long-term plan" should be written as "Competitive Position & Long-term Plan - Influence of the outsourced FM portfolio on our competitive position & long-term plan".
c) "Explanation: Experience and judgment strongly favor Ownership & Control over Long-term plan & Competitive position with respect to Co-ordination." should be written as "Explanation: In respect to "Co-ordination", it is perceived that "Ownership & Control" is Moderately More Important than "Long-term plan & Competitive Position".
d) Suggestion to put down the following as the header for each question from four to six. For example: "Question 4: In respect to "Co-ordination", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important."

Action taken on the revision of questionnaire:

1) Comment on Section D

Comparisons among two criteria

a) Revision as according to the suggestion.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.

Outsourcing Relationship Dimensions

a) Revision as according to the suggestion.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.
d) Revision as according to the suggestion.

iii) The third respondent's Comments on the questionnaire:

1) Comment on Section A.
Unclear indication on the selection of current outsourcing contract.
"Current outsourcing contract: Building maintenance / Security / Cleaning / Catering/ Others _____"
2) Comment on Section B.
Unclear indication on the description of the ratings.
It is inappropriate to measure the level of importance in this part.
"1=Very unimportant; 2=unimportant; 3=Neutral; 4=important; 5=Very important"
3) Comment on Section C.
Unclear indication on the description of the ratings.
It is inappropriate to measure the level of importance in this part.
"1=Very unimportant; 2=unimportant; 3=Neutral; 4=important; 5=Very important"

Action taken on the revision of questionnaire:

1) Comment on Section A.
   Revision as according to the suggested items.
   Revision on the individual outsourcing contract by clear indication.
   "Current outsourcing contract: Building maintenance □ Security □ Cleaning □ Catering □ Others _____"
2) Comment on Section B.
   Revision as according to the suggested items.
   Revision on the indication on the description of the ratings.
   It is suggested to measure the level of satisfaction in this part.
   "1=Very unsatisfactory; 2=unsatisfactory; 3=Neutral; 4=satisfactory; 5=Very satisfactory"
3) Comment on Section C.
   Revision as according to the suggested items.
   Revision on the indication on the description of the ratings.
   It is suggested to measure the level of goodness in this part.
   "1=Very bad; 2=bad; 3=Neutral; 4=good; 5=Very good"

Service provider's side

i) The first respondent's comments on the questionnaire:

1) Comment on Section A. "Having Bachelor Degree" should be written as "Having Bachelor's Degree". "Having Master Degree" should be written as "Having Master's Degree". "Building services engineer" should be written as "Chartered Building services engineer". "Certified facilities manager" should be written as "Certified facility manager". "Chartered property manager" should be written as "Registered professional housing manager".
2) Comment on Section C.
a) There are unequal numbers of items in the four subsections.
b) In the title of this section, it is not clear about the word "outsourcing maneuver of your contract. Proposed revision on the title: "outsourcing strategies of your contract"
c) Generally, safety and health are discussed simultaneously in LP5. Proposed revision on LP5: Our service provider can fulfill our requirement on safety and health.
3) Comment on Section E.
a) In the title of this section, it is not clear about the word "outsourcing maneuver of your contract. Proposed revision on the title: "outsourcing strategies of your contract"
b) It is difficult to understand the meaning of "Vendor interoperability". Further explanation is required. Vendor interoperability can be further explained by the following statement as services exchanged enabling to operate effectively together.
c) It is difficult to understand the meaning of "Multiple Sourcing". Further explanation is required. Multiple sourcing can be further explained by the following statement as multiple sourcing to vendors.

Action taken on the revision of questionnaire:

1) Revision as according to the suggested items.
2) Comment on Section C.
a) The numbers of the items in the four subsections are depending on the identified critical success factors for outsourcing maneuver of the four criteria: adequacy, competence, co-ordination and quality. Thus, it is not important achieving equal number of the items.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.
3) Comment on Section E.
a) Revision as according to the suggestion.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.

ii) The second respondent's comments on the questionnaire:

1) Comments on Section D
   Comparisons among two criteria
a) "The following items relate to the criteria for outsourcing strategies of your contract. Please rate HOW IMPORTANT these items are to you in your experience." should be written as "Section D: The following items relate to the criteria for outsourcing strategies of your contract. Please rate THE LEVEL OF IMPORTANCE when these items are compared."
b) "Explanation: Experience and judgment strongly favor Co-ordination over Quality." should be written as "Explanation: In designing outsourcing strategies, when "Co-ordination" and "Quality" are compared, it is perceived that "Co-ordination" is Strongly More Important than "Quality".
c) Suggestion to put down the following as the header for each question from one to six. For example: "Question 1: In designing outsourcing strategies, when "Co-ordination" and

"Quality" are compared, do you think which criterion is more important? You may choose "1" if you think they are equally important."

Outsourcing Relationship Dimensions

a) "Ownership & Control – "Ownership of various FM assets transferred & Control of various FM assets transferred to us" should be simplified as "Ownership & Control - Ownership & Control of various FM assets transferred to us".
b) "Competitive Position & Long-term Plan - Influence of the outsourced FM portfolio on clients' competitive position & Influence of the outsourced FM portfolio on long-term plan" should be simplified as "Competitive Position & Long-term Plan - Influence of the outsourced FM portfolio on clients' competitive position & long-term plan".
c) "Explanation: Experience and judgment strongly favor Ownership & Control over Long-term plan & Competitive position with respect to Co-ordination." should be written as "Explanation: In respect to "Co-ordination", it is perceived that "Ownership & Control" is Moderately More Important than "Long-term plan & Competitive Position".
d) Suggestion to put down the following as the header for each question from seven to ten. For example: "Question 7: In respect to "Co-ordination", do you think which outsourcing relationship dimension is more important? You may choose "1" if you think they are equally important."

Action taken on the revision of questionnaire:

1) Comment on Section D

Comparisons among two criteria

a) Revision as according to the suggestion.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.

Outsourcing Relationship Dimensions

a) Revision as according to the suggestion.
b) Revision as according to the suggestion.
c) Revision as according to the suggestion.
d) Revision as according to the suggestion.

iii) The third respondent's Comments on the questionnaire:

1) Comment on Section A.
   Unclear indication on the selection of current outsourcing contract.
   "Current outsourcing contract: Building maintenance / Security / Cleaning / Catering/ Others _____"
2) Comment on Section B.
   Unclear indication on the description of the ratings.
   It is inappropriate to measure the level of importance in this part.
   "1=Very unimportant; 2=unimportant; 3=Neutral; 4=important; 5=Very important"
3) Comment on Section C.
   Unclear indication on the description of the ratings.
   It is inappropriate to measure the level of importance in this part.
   "1=Very unimportant; 2=unimportant; 3=Neutral; 4=important; 5=Very important"

Action taken on the revision of questionnaire:

4) Comment on Section A.
   Revision as according to the suggested items.
   Revision on the individual outsourcing contract by clear indication.
   "Current outsourcing contract: Building maintenance □ Security □ Cleaning □ Catering □ Others _____"
5) Comment on Section B.
   Revision as according to the suggested items.
   Revision on the indication on the description of the ratings.
   It is suggested to measure the level of satisfaction in this part.
   "1=Very unsatisfactory; 2=unsatisfactory; 3=Neutral; 4=satisfactory; 5=Very satisfactory"
6) Comment on Section C.
   Revision as according to the suggested items.
   Revision on the indication on the description of the ratings.
   It is suggested to measure the level of goodness in this part.
   "1=Very bad; 2=bad; 3=Neutral; 4=good; 5=Very good"

Appendix VII

International Scholarship Awards

IFMA FOUNDATION
WWW.IFMAFOUNDATION.ORG
EDUCATION • RESEARCH • SCHOLARSHIPS

Building the Future of FM

Lawrence Lok Ka Leung

Has been awarded a scholarship in the amount of

$1500.00

For studies in Facilities Management

By the IFMA Foundation

and the

ISS Scholarship

Presented Thursday, November 1st, 2012

IFMA's World Workplace Conference and Exposition

San Antonio, TX, USA

Roger W. Peterson, Jr.
IFMA Foundation Chair 2011-2012

IFMA FOUNDATION
WWW.IFMAFOUNDATION.ORG
EDUCATION • RESEARCH • SCHOLARSHIPS

Lok Leung

Has been awarded a scholarship in the amount of

$1500.00

For studies at

University of Salford

By the

Southeast Wisconsin Chapter of IFMA

Presented Thursday, October 27th, 2011

World Workplace Conference and Exposition

Phoenix, Arizona, USA

Roger W. Peterson, Jr.
IFMA Foundation Chair, 2011 - 2012

IFMA FOUNDATION
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Appendix VIII

Statistical results

Appendix VIII - Statistical result

Observed and Predicted Frequencies on category of FM outsourcing relationship types from clients

						Frequency			Percentage	
(a)	(b)	(c)	(d)	(e)	(f)	Observed	Predicted	Pearson Residual	Observed	Predicted
Building maintenance	low	low	low	low	**(i)**	**3**	**3.100**	**-.065**	**21.4%**	**22.1%**
					(ii)	2	1.854	.115	14.3%	13.2%
					(iii)	5	4.647	.200	35.7%	33.2%
					(iv)	4	4.398	-.229	28.6%	31.4%
				high	**(i)**	0	.460	-.773	.0%	23.0%
					(ii)	0	.200	-.471	.0%	10.0%
					(iii)	1	.897	.147	50.0%	44.8%
					(iv)	1	.444	.946	50.0%	22.2%
			high	high	**(i)**	1	.820	.258	50.0%	41.0%
					(ii)	**0**	**.035**	**-.189**	**.0%**	**1.8%**
					(iii)	1	1.017	-.024	50.0%	50.9%
					(iv)	0	.127	-.369	.0%	6.4%
	high	low	low	high	**(i)**	1	.177	2.048	50.0%	8.9%
					(ii)	1	1.114	-.162	50.0%	55.7%
					(iii)	0	.198	-.469	.0%	9.9%
					(iv)	0	.511	-.828	.0%	25.5%
			high	low	**(i)**	1	1.297	-.317	25.0%	32.4%
					(ii)	1	1.111	-.123	25.0%	27.8%
					(iii)	1	.709	.380	25.0%	17.7%
					(iv)	1	.883	.141	25.0%	22.1%
		high	high	low	**(i)**	1	.868	.160	25.0%	21.7%
					(ii)	1	1.469	-.487	25.0%	36.7%
					(iii)	**1**	**.908**	**.110**	**25.0%**	**22.7%**
					(iv)	1	.754	.314	25.0%	18.9%
				high	**(i)**	9	9.093	-.035	23.7%	23.9%
					(ii)	12	11.166	.297	31.6%	29.4%
					(iii)	11	12.367	-.473	28.9%	32.5%
					(iv)	**6**	**5.374**	**.291**	**15.8%**	**14.1%**
Security	low	low	low	low	**(i)**	**3**	**3.082**	**-.053**	**21.4%**	**22.0%**
					(ii)	2	1.622	.315	14.3%	11.6%
					(iii)	5	4.821	.101	35.7%	34.4%
					(iv)	4	4.475	-.272	28.6%	32.0%
				high	**(i)**	0	.454	-.766	.0%	22.7%
					(ii)	0	.173	-.436	.0%	8.7%
					(iii)	1	.924	.108	50.0%	46.2%
					(iv)	1	.449	.934	50.0%	22.4%
			high	high	**(i)**	1	.803	.284	50.0%	40.2%
					(ii)	**0**	**.030**	**-.175**	**.0%**	**1.5%**
					(iii)	1	1.039	-.055	50.0%	51.9%
					(iv)	0	.128	-.369	.0%	6.4%
	high	low	high	low	**(i)**	1	1.324	-.344	25.0%	33.1%
					(ii)	1	.998	.003	25.0%	24.9%
					(iii)	1	.756	.312	25.0%	18.9%
					(iv)	1	.923	.092	25.0%	23.1%
		high	high	low	**(i)**	1	.895	.126	25.0%	22.4%
					(ii)	1	1.333	-.353	25.0%	33.3%
					(iii)	**1**	**.977**	**.027**	**25.0%**	**24.4%**
					(iv)	1	.795	.256	25.0%	19.9%
				high	**(i)**	7	6.578	.189	25.9%	24.4%
					(ii)	7	7.109	-.048	25.9%	26.3%

					(iii)	10	9.335	.269	37.0%	34.6%
					(iv)	**3**	**3.979**	**-.531**	**11.1%**	**14.7%**
Cleaning	low	low	low	low	**(i)**	**3**	**2.401**	**.437**	**27.3%**	**21.8%**
					(ii)	1	1.112	-.112	9.1%	10.1%
					(iii)	4	3.919	.051	36.4%	35.6%
					(iv)	3	3.568	-.366	27.3%	32.4%
				high	**(i)**	0	.447	-.759	.0%	22.4%
					(ii)	0	.150	-.403	.0%	7.5%
					(iii)	1	.950	.071	50.0%	47.5%
					(iv)	1	.452	.925	50.0%	22.6%
			high	high	**(i)**	1	.786	.310	50.0%	39.3%
					(ii)	**0**	**.026**	**-.163**	**.0%**	**1.3%**
					(iii)	1	1.060	-.086	50.0%	53.0%
					(iv)	0	.128	-.369	.0%	6.4%
	high	low	high	low	**(i)**	1	1.346	-.366	25.0%	33.6%
					(ii)	1	.893	.129	25.0%	22.3%
					(iii)	1	.802	.248	25.0%	20.0%
					(iv)	1	.960	.047	25.0%	24.0%
		high	high	low	**(i)**	1	1.377	-.366	16.7%	22.9%
					(ii)	2	1.804	.174	33.3%	30.1%
					(iii)	**1**	**1.567**	**-.527**	**16.7%**	**26.1%**
					(iv)	2	1.252	.751	33.3%	20.9%
				high	**(i)**	6	5.924	.036	25.0%	24.7%
					(ii)	6	5.635	.176	25.0%	23.5%
					(iii)	9	8.773	.096	37.5%	36.6%
					(iv)	**3**	**3.668**	**-.379**	**12.5%**	**15.3%**
Catering	low	low	low	low	**(i)**	**2**	**1.295**	**.699**	**33.3%**	**21.6%**
					(ii)	1	.528	.680	16.7%	8.8%
					(iii)	1	2.206	-1.021	16.7%	36.8%
					(iv)	2	1.970	.026	33.3%	32.8%
				high	**(i)**	0	.440	-.751	.0%	22.0%
					(ii)	0	.130	-.373	.0%	6.5%
					(iii)	1	.974	.036	50.0%	48.7%
					(iv)	1	.455	.918	50.0%	22.8%
			high	high	**(i)**	1	.768	.337	50.0%	38.4%
					(ii)	**0**	**.022**	**-.151**	**.0%**	**1.1%**
					(iii)	1	1.082	-.116	50.0%	54.1%
					(iv)	0	.128	-.370	.0%	6.4%
		high	low	low	**(i)**	0	.143	-.408	.0%	14.3%
					(ii)	0	.115	-.361	.0%	11.5%
					(iii)	1	.465	1.073	100.0%	46.5%
					(iv)	0	.277	-.619	.0%	27.7%
	high	high	high	low	**(i)**	2	1.872	.106	25.0%	23.4%
					(ii)	2	2.160	-.127	25.0%	27.0%
					(iii)	**2**	**2.224**	**-.177**	**25.0%**	**27.8%**
					(iv)	2	1.743	.220	25.0%	21.8%
				high	**(i)**	0	.249	-.576	.0%	24.9%
					(ii)	0	.208	-.513	.0%	20.8%
					(iii)	1	.385	1.265	100.0%	38.5%
					(iv)	**0**	**.158**	**-.433**	**.0%**	**15.8%**

The percentages are based on total observed frequencies in each subpopulation.

Remarks:
(a) - Major types of FM outsourcing contract in the questionnaire survey
(b) - Influence of the outsourced FM portfolio on our long-term plan
(c) - Influence of the outsourced FM portfolio on our competitive position
(d) - Control of various FM assets transferred by you
(e) - Ownership of various FM assets transferred by you
(f) - Types of outsourcing category
(i) - Inhouse
(ii) - Service commitment
(iii) - Technical expertise
(iv) - Common goals

Observed and Predicted Frequencies on category of FM outsourcing relationship types from service providers

						Frequency			Percentage	
(a)	(b)	(c)	(d)	(e)	(f)	Observed	Predicted	Pearson Residual	Observed	Predicted
Building maintenance	low	low	low	low	**Inhouse**	**2**	**1.999**	**.001**	**50.0%**	**50.0%**
					Service commitment	1	.414	.962	25.0%	10.4%
					Technical expertise	0	.000	.000	.0%	.0%
					Common goals	1	1.587	-.600	25.0%	39.7%
	high	high	low	high	Inhouse	1	.498	1.004	100.0%	49.8%
					Service commitment	0	.170	-.453	.0%	17.0%
					Technical expertise	0	.167	-.448	.0%	16.7%
					Common goals	0	.165	-.445	.0%	16.5%
			high	high	Inhouse	15	16.095	-.319	25.0%	26.8%
					Service commitment	16	16.627	-.181	26.7%	27.7%
					Technical expertise	17	16.212	.229	28.3%	27.0%
					Common goals	**12**	**11.066**	**.311**	**20.0%**	**18.4%**
Security	low	low	low	low	**Inhouse**	**1**	**1.000**	**.000**	**50.0%**	**50.0%**
					Service commitment	0	.201	-.473	.0%	10.1%
					Technical expertise	0	.000	.000	.0%	.0%
					Common goals	1	.799	.290	50.0%	39.9%
	high	high	low	high	Inhouse	2	2.502	-.449	40.0%	50.0%
					Service commitment	1	.830	.204	20.0%	16.6%
					Technical expertise	**1**	**.833**	**.200**	**20.0%**	**16.7%**
					Common goals	1	.835	.198	20.0%	16.7%
			high	high	Inhouse	11	9.471	.582	31.4%	27.1%
					Service commitment	10	9.498	.191	28.6%	27.1%
					Technical expertise	8	9.478	-.562	22.9%	27.1%
					Common goals	**6**	**6.552**	**-.239**	**17.1%**	**18.7%**
Cleaning	low	low	low	low	**Inhouse**	**1**	**1.000**	**-.001**	**50.0%**	**50.0%**
					Service commitment	0	.195	-.465	.0%	9.8%
					Technical expertise	0	.000	.000	.0%	.0%
					Common goals	1	.804	.282	50.0%	40.2%
	high	high	high	high	Inhouse	6	6.278	-.130	26.1%	27.3%
					Service commitment	6	6.111	-.053	26.1%	26.6%
					Technical expertise	7	6.241	.356	30.4%	27.1%
					Common goals	**4**	**4.370**	**-.197**	**17.4%**	**19.0%**

Catering	low	low	low	low	**Inhouse**	**1**	**1.001**	**-.001**	**50.0%**	**50.0%**
					Service commitment	0	.190	-.458	.0%	9.5%
					Technical expertise	0	.000	.000	.0%	.0%
					Common goals	1	.810	.274	50.0%	40.5%
	high	high	high	high	Inhouse	7	7.156	-.069	26.9%	27.5%
					Service commitment	7	6.763	.106	26.9%	26.0%
					Technical expertise	7	7.069	-.030	26.9%	27.2%
					Common goals	**5**	**5.012**	**-.006**	**19.2%**	**19.3%**

The percentages are based on total observed frequencies in each subpopulation.

Remarks:

(a) - Major types of FM outsourcing contract in the questionnaire survey

(b) - Influence of the outsourced FM portfolio on our long-term plan

(c) - Influence of the outsourced FM portfolio on our competitive position

(d) - Control of various FM assets transferred by you

(e) - Ownership of various FM assets transferred by you

(f) - Types of outsourcing category