

**DETERMINING THE BEST OPTIONS FOR FACILITIES
MANAGEMENT (FM) SERVICE DELIVERY IN UK
SHOPPING CENTRES**

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**A thesis submitted in partial fulfilment of the requirements of Liverpool
John Moores University for the degree of Doctor of Philosophy**

DECEMBER 2011

Determining the best options for facilities management (FM) services delivery in UK shopping centres
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PhD Thesis, Liverpool John Moores University, 2011

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ACKNOWLEDGEMENT

Firstly, praise and thanks be to Allah, and peace and blessings be upon the Prophet Mohammed. This Research has been carried out on a full-time basis since December 2007 and would not have been made possible without the support and cooperation from various parties. Firstly, my appreciation goes to the University of Malaya and Ministry of Higher Education, Malaysia for sponsoring my doctoral study at the Liverpool John Moores University, in the United Kingdom. I am grateful to a number of people for their assistance and encouragement, but in particular I would like to express a special "Thank you" to my supervisor Dr David Bryde, who gave me the guidance for this study, for his inspiration and support. Dr Bryde's professional and constructive criticism throughout added a much needed and valuable contribution to my work. I would also like to take this opportunity to express my gratitude to my previous supervisor Professor Dr. Michael Pitt, who also gave me the opportunity to become his PhD student, and encouraged and guided me to start writing up articles for journal publications during my PhD studies. Not forgetting Dr. Matthew Tucker as well, for his help and words of encouragement in enabling me to finish this work.


I would especially like to record my sincere thanks and appreciation to Michael Green, Chief Executive of British Council of Shopping Centres (BCSC) for giving me the opportunity to participate in the BCSC's conferences and workshops and most importantly giving me the opportunity to meet and acquaint myself with several UK shopping centres managers. It was an honour to meet them all. There are several colleagues of who have become my "office" family and I wish to record my thanks to these individuals, which have directly assisted me in making this research possible. In deepest gratitude to thank Dr Sukulpat Khumpaisal and Mr. Rizal Baharum, my "PhD-mate" during the last three years, not forgetting Mr. Abdul Ghani Sarip and Mr. Zulkifli Esha, for all the encouragement, motivation and inspiration in achieving our dream of getting this PhD

I am deeply indebted to my parents (Mrs. Ramlah Harun and Mr. Mohd Yusop Abdullah), my parent's in-law (Mr and Mrs Abu Bakar), my sisters and brother in-law, and friends for their cheerfulness for, which have made my study stress less difficult. I have been privileged with the love and unconditional support from my wife Fariza Abu Bakar whose kind understanding, patience, and caring has kept me going through some of the hardest times of the research "I'm lucky to have you". I thank all of you for your fullest support and to whom this thesis is dedicated. Alhamdulillah.

DECLARATION

This is to certify that

- 1. This thesis embodies the author's research**
- 2. The originality and contribution to knowledge rests solely with the author**

Signature : 

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ABBREVIATIONS

AHP	Analytical Hierarchy Process
BCSC	British Council of Shopping Centres
BOMI	Building Operation Maintenance Institution
CCTV	Closed-Circuit Television
CIOB	The Chartered Institute of Building
FM	Facilities Management
FMOSS	Facilities Management Outsourcing Selection System
GLA	Gross Leasable Area
HVAC	Heating Ventilation and Air-Conditioning
ICSC	International Council of Shopping Centres
IFMA	International Facilities Management Association
MANOVA	Multivariate Analysis of Variance
MCDM	Multi Criteria Decision-Making
M & E	Mechanical and Electrical
REIT	Real Estate Investment Trust
RICS	Royal Institution of Chartered Surveyors
SPSS	Statistical Package for the Social Science
TFM	Total Facilities Management
WSM	Weighted Sum Model

ABSTRACT

There are a number of FM service delivery models ranging from in-house provision to total outsourcing, operating in the UK market. The portfolio of FM services and the range of options relating to the various combinations of service delivery have sparked many discussions and debates over the merits of certain modes of service delivery. Underpinning this circumstance, this research attempted to understand and explore how facilities management services in UK shopping centres have been managed and services delivered. This includes looking at how shopping centre managers determined the best options of FM service delivery in the shopping centres. As the research identified the dilemma of shopping centre managers, it aimed to develop an effective decision-making framework for assisting the shopping centre managers to select the best options of FM service delivery prior to the tendering process.

This research adopted a quantitative approach to investigating facilities management services in UK shopping centres as well as determining the best options of FM service delivery. A questionnaire survey was used to investigate the current practiced of FM service delivery in UK shopping centres. Apart from that, it will also investigate shopping centres managers' perceptions towards the factors and criteria in assessing the best options of FM service delivery. Meanwhile, in developing the decision-making framework, this research introduced the Analytical Hierarchy Process (AHP) as an alternative decision-making model as providing a basis of methodological framework for the selection of the best options of FM service delivery in UK shopping centres which is known as Facilities Management Outsourcing Selection System (FMOSS). The implementation and validation of this decision-making framework has been carried through the series of evaluation by using the pair wise comparison in the Expert Choice system and evaluation form. Those evaluations have been carried out by the selected shopping centres managers.

The main findings of this research have identified that in UK shopping centres the current provisions of FM services in the majority are practicing outsourcing. In the meantime, the current options available of FM service delivery being practiced are single service contracts and bundled service contract. Based on FMOSS decision-making framework the results indicated that bundled service contract is the best option of FM service delivery in UK shopping centres. This is because bundled service contracts have resulted more in potential benefits and less in potential risks when compared to single service contracts. The factors that influenced the decision-making are favourable on cost and financial factors.

Finally, this research has achieved the aim and the objectives of the study. This research has significance in helping the facilities management industry to understand more about the perceptions of shopping centres industry and their requirements towards FM services in shopping centres in order to deliver quality, innovative, cost effective and best in value services.

As a side of that, the FMOSS decision-making framework has significance in assisting the shopping centres managers in making the best selection of FM service delivery in shopping centres prior to tendering process; it also provides the basis for a methodological framework for selecting the best options of FM service delivery in UK shopping centres and gives management of shopping centres an alternative approach to determine the best options of FM service delivery as well as improving their existing decision making process.

This framework is identified as an original contribution of this research and would be beneficial to the shopping centres managers in making better decisions.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter provides an introduction which highlights the research background and problems, the research hypothesis and questions, its aims and objectives, the research design and methodologies, its scope and limitations and the significances of the research. In addition, this chapter also provides an outline of the thesis's structure.

1.2 Research Background

One significant aspect in managing a shopping centre is its property. This includes the building and its facilities. Without a proper strategy, the building and facilities will affect the quality of the shopping environment, operational cost and overall success of the core business delivery. The shopping centre management team is responsible to ensure the overall success or failure of their shopping centre. Understanding the role of the shopping centre as a business place, a property and as an investment are essential qualities in successful management (Musa and Pitt, 2009). Morgan and Walker (1988) perceived that the quality of shopping centres' management is one of the most important factors which can affect the success or failure of a shopping centre.

David (2010) reported that there are four main detrimental factors affecting the success of shopping centres (See Figure 1);

- 1) Lack of investment
- 2) Poor asset management
- 3) Failure of a number of national retailers, and
- 4) Poor due diligence at the time of purchase

This report has shown that 83% of those interviewed mentioned that poor asset management was one of the reasons affecting the success of shopping centres. The report also identified that some investors, especially private investors, have been severely exposed by having little or no retail or commercial property experience. This has been reflected in their poor asset management.

Figure 1: Detrimental factors affecting shopping centres

In addition, because of poor asset management their management of the infrastructure and facilities services was also affected. This was where Willis (2003) reported that many investors in shopping centres were not getting the anticipated level of facilities management service, or at costs originally sought. Retailers also felt that their service charges did not necessarily equate to the level and quality expected. Cant (2005) identified the problem occurs due to the way shopping centres have been operated and managed. He explains that most of retail shopping centres in UK have been managed via in-house management teams in a relatively static and standard fashion.

Moreover, keeping all activities in-house is apparently a not very cost effective option. With the traditional 'managing agent' led method in the retail shopping centre coming under increasing pressure, Cant (2005) suggests that there is a significant opportunity to consider changing the way centre infrastructure is managed and service delivered. Meanwhile, facilities management is a relatively young industry; however, since the late 1980s, it has gradually increased in momentum as a credible discipline within the property and construction industry (Tay and Ooi, 2001).

Much has been written on meeting these sector-based demands, but one area that has received relatively little attention is the retail sector (Willis, 2003). This is because facilities management services initially were not completely understood within the shopping centre industry. Therefore, the perceptions and expectations of many investors and retailers were not fully cascaded into the FM provider market (Cant, 2005).

In practice, facilities management can cover a wide range of services, including real estate management, financial management, change management, human resource management, health and safety and contract management, in addition to building maintenance, utilities suppliers and domestic services - that is cleaning and security (Atkin and Brooks, 2005). Beside that facilities management offers the integration and alignment of the non-core services, including those relating to premises, required to operate and maintain a business to fully support the core objectives of the organisation (Tucker and Pitt, 2008).

Kincaid (1994) suggests that the integration of facility management as an effective function for an organisation can be achieved by recognising three key characteristics:

- 1) Facility management is a support role within an organisation, or a support service to an organisation.
- 2) Facility management must link strategically, tactically, and operationally to other support activities and primary activities to create value.
- 3) Within facility management, managers must be equipped with knowledge of facilities and management to carry out their integrated support role.

In shopping centres, facilities management services are seen as non-core services that include mechanical and electrical engineering, cleaning, waste management, security, landscape, energy management, etc. (Cant, 2005). Even though facilities management services are non-core services in nature, if managed correctly, they should have a strategic importance to add value to the shopping centre's core business delivery. Moreover, by having a core business as a retail property investment, shopping centres may require facilities management services to support the operations of this property at cost effective and best value basis.

Today, many shopping centres in the UK operate their facilities management services through outsourcing to various contractors. These facilities management services have been managed and the services delivered through single service contracts by various individual or specialist contractors. Even though many shopping centres currently operate this way, and while technically it gives them the maximum amount of choice, it also involves a huge amount of management time due to management of the vast array of reports, budgets and invoices that result from it (Price, 2006).

Meanwhile, the growth of the facilities management market shows there is a new development and innovation in FM service delivery. Aside from single service contracts, FM service providers are developing multi-services delivery and offer as a bundle service contracts that benefit their customers in term of economies of scale, e.g., cost reduction (Bogle, 1999). However, not many shopping centres are willing to take this opportunity to change the way their facilities management services are managed and delivered. Mines (1999) perceived that people have outsourced facilities management services for a long time, but the bundling of overall facility operations into a single source is relatively new to the shopping centre industry. Moreover, some but not all of their perceptions are still not fully integrated into the FM service provider market. This is because they feel that FM is still an industry in its infancy. These concerns triggered a debate about shopping centre management at a conference in Edinburgh on the 3rd March 2011), where about the question of facilities management- is it a gain or a pain was discussed? Ferris (2011), Director, Head of Shopping Centre Management, Colliers International stated that it is the 'age old' dilemma that Shopping Centre Managers and Managing Agents face every time they tender FM services in their Shopping Centres on whether to go for expertise of the specialist in the field, or to save money by putting all under one provider.

This always becomes a dilemma for shopping centres' managers as they have no clear decision-making framework for determining the best options of facilities management service delivery in UK shopping centres. By having a little knowledge on facilities management the decision to make the best decision on the best options of facilities management service delivery this will be affected.

1.3 Key Research Problems

Following the research background above, this research has identified three (3) key research problems with FM service delivery in UK shopping centres:

1. Not all shopping centres are willing to take risks to change the way the centre infrastructure is managed and service delivered, as they feel that FM is still an industry in its infancy. However, this is the time for shopping centre management to take a fresh look, and perhaps consider the best options of FM service delivery that will benefit and add value to the core business delivery.
2. There are no clear guidelines on specific decision-making framework to be practiced in determining the best options of FM service delivery in UK shopping centres prior to tendering process. Therefore, different shopping centres might have different ways to determine the best options.
3. It is obvious that cost saving is the key factor that mostly influences shopping centre manager in making decisions for the selection of the best options of FM service delivery. Therefore, by leaving out other equally important key factors in their decision making, shopping centre managers fail to achieve optimum benefits from FM functions.

1.4 Research Questions

Main Research Question:

“Which option is the best facilities management (FM) service delivery in UK shopping centres?”

The research is being carried out with the following research key questions:

- Q1. What is the current option of FM service delivery in UK shopping centres?
- Q2. What are the management’s perceptions towards the potential benefits and potential risks of FM service delivery in UK shopping centres?
- Q3. Are there any significant differences between size of shopping centres and the potential benefits and potential risks of FM service delivery?

Q4. What are the existing management decision-making tools in determining the best options of FM service delivery in UK shopping centres?

Q5. What is an alternative decision-making model that can be employed in developing the framework for the selection of the best options of FM service delivery in UK shopping centres?

Q6. What are the important factors that influence the selection of the best options of FM service delivery in UK shopping centres?

1.5 Research Aim and Objectives

This research aims to develop an effective decision-making framework for determining the best options of facilities management (FM) service delivery in UK shopping centres. In order to achieve this aim, the objectives are:

1. To investigate the current options of FM service delivery in UK shopping centres.
2. To investigate the management perception towards the potential benefits and the potential risks of FM service delivery in UK shopping centres
3. To identify the different relationship between size of shopping centres and the potential benefits and potential risks of FM service delivery.
4. To investigate the existing management decision-making tools in determining the best options of FM service delivery.
5. To introduce analytical hierarchy process (AHP) model as a basis in developing the decision-making framework for selecting the best options of FM service delivery in UK shopping centres.
6. To identify the important factors in selecting the best options of FM service delivery in UK shopping centres.

1.6 Research Design and Methodology

According to the philosophical consideration employed in Chapter 4, this research has adopted a quantitative method as being appropriate to investigate facilities management services in UK shopping centres as well as determining the best options of FM service delivery. This is because the research uses data that are structured in the form of numbers or that can be immediately transported into numbers, and objectivity, deductiveness, generalisability and numbers are features often associated with quantitative research. Briefly, this research adopted the following design including four phases:

1) Phase 1: Literature reviews

Firstly, literature reviews are used to identify the information with regards to facilities management services in UK shopping centres. This information will provide an understanding of the types of facilities management services, the provision of the services, types of facilities management service delivery and existing decision-making tools in UK shopping centres.

Secondly, literature reviews are used to identify the assessment criteria for determining the best options of FM service delivery in UK shopping centres. Most of the previous research in outsourcing either in general areas or specifically in facilities management area, suggested that benefits/advantages and risks/disadvantages of outsourcing were always used in consideration of selection. Therefore, this research will identify the potential benefits/advantages or risks/disadvantages of an assessment criteria for determining the best options of FM service delivery.

2) Phase 2: Questionnaire Survey

The aim of this survey is to investigate the current information with regards to facilities management services in UK shopping centres. This investigation is significant in finding out the current practices of FM service delivery in UK shopping centres. This includes the types of FM services, current FM service provision, the current options of FM service delivery and existing decision-making tools.

Apart from that, it also aims to investigate shopping centres managers' perceptions towards these identified criteria as well as to validate the applicability of these criteria as assessment criteria in determining the best options of FM service delivery. The purpose of this survey is to generalise from a sample to a population so that inferences can be made regarding this population.

3) Phase 3: Development of Decision-making Framework

This research aims to develop an effective decision-making framework for determining the best options of facilities management service delivery in UK shopping centres. The development of this framework is based on Analytical Hierarchy Process (AHP) methodology and Expert Choice system as supporting tools in the development process.

4) Phase 4: Validation of Decision-making Framework

This phase aims to validate the applicability of this decision-making framework in determining the best options of FM service delivery in UK shopping centres. In achieving this aim, structured interviews were chosen and conducted with two purposes. Firstly, the purpose is to ask interviewees to do pair-wise comparison with assessment criteria, where the hierarchy framework has already developed in the Expert Choice software at the Phase 3. Secondly, the purpose is to ask interviewees to evaluate the proposed decision-making framework in terms of its capability, applicability and validity.

Finally, the data are analysed with aid of SPSS windows (Statistical Package for Social Science). These include descriptive statistics, chi-square test and Multivariate Analysis of Variance (MANOVA).

1.7 Research Scope and Limitation

The scope of this research is focused on facilities management services in UK shopping centres. Under this scope, this study will investigate the current options of FM service delivery, management perceptions towards FM's potential benefits and potential risks and management decision-making tools in determining the best options of FM service delivery.

This research is limited to the demand side of points of view. In other words, this study is carried out but limited to the shopping centres' management perspectives only towards FM services in UK shopping centres. This is not including the perspectives of FM service providers as a supply side. The development of the decision-making framework is also limited to UK shopping centres as this research has taken into account the background and characteristic of the UK shopping centres' industry. This limitation also considers the time and cost in carrying out this research.

1.8 Significances of the Research

The significance of this research has been identified as follows:

1. This research is imperative in helping the facilities management industry to understand more about the perceptions of the shopping centres' industry and their requirements towards FM services in shopping centres in order to deliver quality, innovative, cost effective and best in value services.
2. This research will assist the shopping centres' managers in making the best selection of FM service delivery in shopping centres prior to the tendering process.
3. This research will provide the basis for a methodological framework for selecting the best options of FM service delivery in UK shopping centres.
4. This research will also give the management of shopping centres an alternative approach to determine the best options of FM service delivery as well as improving their existing decision-making process.

1.9 Structure of the Thesis

The thesis is comprised of nine chapters, as follows:

Chapter 1: This chapter is the introduction, which highlights the research background, research problems, research hypothesis and questions, research aim and objectives, research design and methodology, research scope and limitation and significances of research.

Chapter 2: This chapter provides the literature reviews on a background of shopping centres and their management system. It begins with an introduction to the shopping centres by looking at their definitions, concept evaluation, classifications and key parties that are vital to the shopping centre industry. Aside from that, the important role of shopping centres will be described as well as the business of shopping centres. Finally, the discussion will continue to describe about the management of shopping centres and their decision-making tools.

Chapter 3: This chapter begins with an introduction to facilities management, in order to provide an understanding about its concepts, scope, importance, functions and classification of tasks. As outsourcing is synonymous with facilities management's business function, therefore outsourcing concepts and its benefits/advantages and risks/disadvantages are also described in this chapter. In addition to that, the various types of outsourcing arrangement and the various types of facilities management service delivery models are also discussed. Finally, this chapter will look into facilities management services in shopping centres and its service delivery options that have been practiced.

Chapter 4: This chapter provides a research design and methodology of the research undertaken. Research design is developed to show the overall strategy to achieve the aim and objectives of this research. Aside from research design, different research methods will also be discussed in order to achieve the research's aim and objectives. In discussing this research methodology, there are three major dimensions that have been considered, namely the research philosophy, reasoning of the research and data.

This is because a philosophical stance of the researcher will strongly influence the reasoning of the research and both will influence the data required by the research and analysis of the data.

Chapter 5: This chapter provides the results from the questionnaire survey that was conducted to investigate the current facilities management (FM) services that have been practiced in UK shopping centres and also to investigate shopping centres' management's perceptions towards the potential benefits and risks criteria. The postal questionnaire was used as a method in order to investigate this research problem. The data obtained from this survey was analysed with the SPSS package. The results were shown in the form of descriptive statistics, chi-square test and multivariate of variance (MANOVA).

Chapter 6: This chapter provides a development of the decision-making framework for determining the best options of FM service delivery in UK shopping centres. The development of this framework is based on Analytical Hierarchy Process (AHP) methodology and it is supported with the Expert Choice 11 software. Expert Choice system is used as a development tool of this framework and also to facilitate the decision-making process during the selection of the best options. Assessment criteria used in this framework is basically obtained from the literature review. These criteria are based on the potential benefits and the potential risk of outsourcing that results from several studies in outsourcing.

Chapter 7: This chapter provides the results from the applicability of Facilities Management Outsourcing Selection System (FMOSS) framework for UK shopping centres. The validation process was carried out through structured interview with the selected shopping centres' managers. There were five interviewees selected for this purpose as they are involved in managing both options of FM service delivery. The results were based on pair-wise comparison by five selected interviewees. Interviewees were asked to do the pair-wise comparison in accordance to the proposed decision-making framework. The AHP methodology is employed to carry out the process. This process is facilitated with Expert Choice software in order to determine the interviewees' selection.

Chapter 8: This chapter provides discussion of the research findings in relation to the existing knowledge. It also highlights how this research reflects, differs from and extends current knowledge of the area in which the research has been carried out.

Chapter 9: This chapter provides the conclusion of the research undertaken and recommendations for further studies. Aside from that this chapter provides the research hypothesis verification, answering the key research questions as well as giving an evaluation of the research aim and objectives. In addition, this chapter also includes the summary of research findings, research contribution and research limitation.

1.10 Summary

This chapter has described the focus of research undertaken. These include the research background and problems, the research hypothesis and questions, its aims and objectives, the research design and methodologies, its scope and limitations and the significances of the research.

CHAPTER 2: THE BACKGROUND OF SHOPPING CENTRES AND THEIR MANAGEMENT SYSTEM

2.1 Introduction

This chapter provides the literature review on the background of shopping centres and their management systems. It begins with an introduction and definition of the shopping centre, its concept, evaluation, classifications and key parties that are vital to the shopping centre industry. The importance of the role of shopping centres will be described together with the business of shopping centres. Finally, the discussion will continue to describe the management of shopping centres and their decision-making tools.

2.2 An Introduction to Shopping Centres

2.2.1 Evolution of the Concept

Today, shopping centres have become firmly established as an important component of the retail environment and represent a very important concept for shoppers, retailers and investors. Muhlebach and Alexander (2005) emphasised that the concept of the shopping centre dates back to the earliest days of trade in the marketplace. They found that in Europe and elsewhere, the centre of town was used as a marketplace where one farmer would exchange vegetables for another farmer's grain, and townspeople could barter their "wares" (e.g. pottery) for agricultural products. The centre of town was chosen as the marketplace because it was a prominent, visible location and it offered access to most people in the area.

Muhlebach and Alexander (2005) further explained that the farmers and merchants understood that by gathering together they could offer a variety of goods and services that would attract more shoppers than any of them could attract individually. Permanent shops were established around the town square to take advantage of the traffic and to offer goods and services the farmers did not provide. Eventually, the town square or main street became the central business district of a bustling city. The market area became not only a place to buy and sell goods but also a social occasion and a gathering place for the community.

Therefore, the concepts of location, visibility, access and demographics that the merchants found to be critical to their success thousands of years ago remain the foundation of a successful retail location today.

Moreover, shopping centres have become the third option as a place to go to aside from their home and workplace for people because they provide a venue for shopping and dining as well as a centre for recreational, educational, and community activities (Muhlebach and Alexander, 2005).

2.2.2 Definitions

It must be mentioned that the term “shopping centre” has been evolving since the early 1950s. The earliest definition found was from The Urban Land Institute (1977), followed by Martin (1982) and The International Council of Shopping Centres (2004). The Urban Land Institute defined the shopping centre as “a collection of shops planned and managed as a unit” (McKeever et al., 1977). However, the previous definition was revised and defined as a group of architecturally unified commercial establishments built on a site that is planned, developed, owned and managed by an operating unit related in its location, size, and type of shops to the trade area that it serves (Beyard & O’Mara, 1999).

Meanwhile, Martin (1982), in his book entitled Shopping Centre Management has defined the shopping centre as a single architectural unit, occupied by two or more retailing organisations, providing facilities, both physical and by way of services, to those retailers in common and to the public patronising those retailers. This range of definitions has been developed for shopping centres often to show the fact that the industry was evolving. However, in simple terms, the shopping centre can be defined as a building that contains many units of shops and it is managed as a single property. However, shopping centres today are more complex in terms of size, type and characteristics. This situation has contributed to the confusion of the shopping centre identities.

Delisle (2007) later shows that over the years, shopping centre formats have taken on a confusing array of identities, with names that include such descriptors as centres, commons, crossings, hybrids, lifestyle centres, malls, markets, marts, mega-malls, mixed-use, outlets, parkways, places, plazas, promenades, shops, strips, squares, super centres, town centres, urban retail, vertical and villages. The reason behind the existence of these descriptors is because of the maturity of the industry; numerous types of centres currently exist that go beyond the standard definitions.

Table 2: ICSC Shopping Center Definitions–U.S.

TYPE OF SHOPPING CENTER	CONCEPT	SQUARE FEET (INCLUDING ANCHORS)	ACREAGE	TYPICAL ANCHOR(S)		ANCHOR RATIO*	PRIMARY TRADE AREA**
				NUMBER	TYPE		
MALLS							
Regional Center	General merchandise; fashion (mall, typically enclosed)	400,000–800,000	40–100	2 or more	Full-line department store; jr. department store; mass merchant; discount department store; fashion apparel	50–70%	5–15 miles
Superregional Center	Similar to regional center but has more variety and assortment	800,000+	60–120	3 or more	Full-line department store; jr. department store; mass merchant; fashion apparel	50–70%	5–25 miles
OPEN-AIR CENTERS							
Neighborhood Center	Convenience	30,000–150,000	3–15	1 or more	Supermarket	30–50%	3 miles
Community Center	General merchandise; convenience	100,000–350,000	10–40	2 or more	Discount department store; supermarket; drug; home improvement; large specialty/ discount apparel	40–60%	3–6 miles
Lifestyle Center	Upscale national chain specialty stores; dining and entertainment in outdoor setting.	Typically 150,000-500,000, but can be smaller or larger.	10-40	0-2	Not usually anchored in the traditional sense but may include book store; other large-format specialty retailers; multi-plex cinema; small department store.	0-50%	8-12 miles
Power Center	Category-dominant anchors; few small tenants	250,000–600,000	25–80	3 or more	Category killer; home improvement; discount department store; warehouse club; off-price	75–90%	5–10 miles
Theme/Festival Center	Leisure; tourist-oriented; retail and service	80,000–250,000	5–20	N/A	Restaurants; entertainment	N/A	N/A
Outlet Center	Manufacturers' outlet stores	50,000–400,00	10–50	N/	Manufacturers' outlet stores	N/A	25–75 miles

* The share of a centre's total square footage that is attributable to its anchors; ** the area from which 60-80% of the centre's sales originate.

Source: International Council of Shopping Centres, 2004

The International Council of Shopping Centres (1994) has standardised the definition for the shopping centres' industry which originally offered four basic terms: neighbourhood, community, regional and super-regional centres. However, as the industry has grown and changed more types of centres have evolved and these four classifications are no longer adequate.

Being aware that the industry has evolved, The International Council of Shopping Centres (2004) has revised the definition towards the current market circumstances and defined the shopping centre as a group of retail and other commercial establishment that is planned, developed, owned and managed as a single property, with on-site parking provided.

In addition to that, the market generally determines the centre's size and orientation, characteristics of the trade area served by the centre. The three main physical configurations of shopping centres are malls, open-air centres, and hybrid centres. Within that, there are eight principal shopping centres types have been identified according to the US market (see Table 2.0). This definition is meant to provide guidelines for understanding major differences between the basic types of shopping centres.

At the end of 2005, ICSC Research published a study that reviewed national definitions currently used to describe shopping centres throughout Europe with the goal of refining the common centre types and their characteristics into a Pan-European International Standard. Lambert (2006) pointed out this new international framework does not replace any existing national definitions. As a working definition, the study defines a European shopping centre as a retail property that is planned, built and managed as a single entity, comprising units and "communal" areas, with a minimum gross leasable area (GLA) of 5,000 square metres (m²).

Based on the reviews of several definitions above, this research has developed a new definition of shopping centres that suitable with the research undertaken. The research defines a shopping centre as a retail property investment that contains many units of retail space with the facilities and services provided and managed as a single entity through either outsourcing options or in-house provision, and it can be classified by size or retailing types.

2.2.3 Classification

Based on International Council of Shopping Centres Research (ICSC) 2005, shopping centres are classified according to the two different markets that have been used as a guideline for defining any types of shopping centres in other countries of the world. Those markets are;

1) Classification by US Market

a) Mall

The most common design mode for regional and super regional centres is often referred to as a “shopping mall.” The walkway or “mall” is typically enclosed, climate-controlled and lit, flanked on one or both sides by storefronts and entrances. On-site parking, usually provided around the perimeter of the centre, may be surface or structured.

b) Open-Air Centre

An attached row of stores or service outlets managed as a unit, with on-site parking usually located in front of the stores with common areas that are not enclosed, is often referred to as an “open-air centre.” Open canopies may connect the storefronts, but an open-air centre does not have enclosed walkways linking the stores. The most common variations of this configuration are linear, L-shaped, U-shaped, Z-shaped, or cluster. The linear form is often used in neighbourhood and community centres. The cluster form and its variations have lent themselves to the emergence of new classes of centres such as the lifestyle centre, in which the physical layout and open feel are differentiating features. Historically, the open-air configuration has been referred to as a “strip centre,” though the strip centre got its name from the linear form, where stores sit side-by-side in a long and narrow row of stores.

c) Hybrid Centre

This is a centre that combines elements from two or more of the main shopping centre types. Common hybrids include value-oriented mega-malls (combining mall, power centre, and outlet elements), power-lifestyle centres (combining power centre and lifestyle centre elements), and entertainment-retail centres (combining retail uses with megaplex movie theatres, theme restaurants, and other entertainment uses).

Within the basic configurations, there are eight major types: neighbourhood centres, community centres, regional centres, super-regional centres, fashion/speciality centres, power centres, themes/festival centres and outlet centres.

The neighbourhood centre includes between 15 to 20 stores and is designed to provide convenience shopping for customers within a 1.5-mile radius. This type of centre generally has a 50,000 square foot gross leasable area (GLA), although actual size may range from 30,000 to 100,000 square feet (Kyle, 2000). Meanwhile a community centre includes stores between 20 to 70 stores and usually has a junior department store plus other convenience outlets and draws customers from a five mile radius. Ranging from 100,000 square feet to 450,000 square feet of gross leasable area, it is usually about 150,000 square feet (Graham, 1992).

A regional centre can vary greatly in size (from 70 to 225 stores), but all have at least one major department store as their anchor tenant. Customers typically come from 10 to 50 miles to take advantage of a full range of merchandise and services offered by the major stores. It typically contains 450,000 gross square feet of leasable area and ranges from 300,000 to 850,000 square feet (Kyle, 2000; Graham et. al., 1992). A super regional centre however provides for an extensive variety of general merchandise, apparel, and furniture and home furnishings. However to be considered a super regional centre, it must contain three or more department stores of 100,000 square feet or greater. The gross leasable area is typically 800,000 square feet, but can range from 600,000 square feet to 1,500,000 square feet (Graham, 1992).

The fashion/speciality centre is composed mainly of upscale apparel shops, boutiques and craft shops carrying selected fashion or unique merchandise of high quality and price. These centres need not be anchored, although sometimes restaurants or entertainment can provide the draw of anchors. The physical design of the centre is very sophisticated, emphasising a rich décor and high quality landscaping. These centres are usually found in trade areas having high income levels (The International Council of Shopping Centres, 2004).

Not to be forgotten are the Power centres which are usually dominated by several large anchors, including discount department stores, off-price stores, warehouse clubs or stores that offer tremendous selection in a particular merchandise category at low prices. Some of these anchors can be freestanding (unconnected). The centre has only a minimum amount of small speciality tenants (The International Council of Shopping Centres, 2004).

Theme or festival centres on the other hand typically employ a unifying theme that is carried out by the individual shops in their architectural design and, to an extent, in their merchandise. The biggest appeal of this centre is to tourists; it can be anchored by restaurants and entertainment facilities. The centre is generally located in an urban area, tends to be adapted from an older, sometimes historic, building and can be part of a mixed-use project (The International Council of Shopping Centres, 2004). The Outlet centre meanwhile is usually located in a rural or occasionally in a tourist location. An outlet centre consists mostly of manufacturers' outlet stores selling their own brands at a discount. An outlet centre typically is not anchored. A strip configuration is most common, although some are enclosed malls, and others can be arranged in a village cluster (The International Council of Shopping Centres, 2004).

2) Classification by UK and European Market

On the other hand, in the UK and European market, a framework was created after extracting common elements from centre types throughout Europe. This new framework classifies shopping centres into 11 broad based international types of centres, which can be grouped into two broader categories, i.e. traditional and specialised as shown in Table 2.1 (ICSC, 2005).

Table.2.1: Pan-European Centre Standard

International Standard for European Shopping Centre Types			
Format	Type of Scheme		Gross Leasable Area (GLA)
Traditional	Very Large		80,000 m ² and above
	Large		40,000 – 79,999 m ²
	Medium		20,000 – 39,999 m ²
	Small	Comparison-Based	5,000 – 19,999 m ²
		Convenience-Based	5,000 – 19,999 m ²
Specialised	Retail Park	Large	20,000 m ² and above
		Medium	10,000 – 19,999 m ²
		Small	5,000 – 9,999 m ²
	Factory Outlet Centre		5,000 m ² and above
	Theme-Oriented Centre	Leisure-based	5,000 m ² and above
Non-Leisure-Based		5,000 m ² and above	

Source: ICSC Research, 2005

According to the Pan-European Centre Standard (2005) the types of shopping centre are as follows:

1) A Traditional Centre

A traditional centre is an all-purpose scheme that could be either enclosed or open-air and is classified by size, i.e. very large, large, medium and small. There are two types of small traditional centres: comparison-based and convenience-based. Comparison-based centres include retailers typically selling fashion apparel and shoes, home furnishings, electronics, general merchandise, toys, luxury goods, gifts and other discretionary goods.

Table 2.2: Examples of Retail Properties According to Pan-European Centre Standard

PAN-EUROPEAN STANDARD		EXAMPLES BY COUNTRY	
Format	Type of Scheme	United Kingdom	
Traditional	Very Large	Bluewater(Kent); Bullring (Birmingham); MetroCentre (Gateshead); The Trafford Centre (Manchester)	
	Large	The Bentall Centre (Kingston Upon Thames); Buchanan Galleries (Glasgow); Golden Square Shopping Centre (Warrington); The Harlequin (Watford); West Quay (Southampton)	
	Medium	Cascades Shopping Centre (Portsmouth); Castle Court (Belfast); Ocean Plaza (Southport); Princess Quay (Hull); Two Rivers (Staines)	
	Small	Comparison-Based	Cathedral Lanes (Conventry); St. John Centres (Leeds); The Triangle (Manchester); Victoria Quarter (Leeds)
		Convenience-Based	Arndale Centre (Leeds); Chalfont Square (Reading); Chineham Centre (Basingstoke)
Specialised	Retail Park	Large	The Brewery (Romford); The Fort (Birmingham); Roaring Meg (Stevenage)
		Medium	Boulevard (Peterborough); Central Retail Park (Manchester); Forbury Retail Park, Reading Riverside Retail Park (Norwich)
		Small	Kew Retail Park (Richmond); Lady Bay (Nottingham); Taunton Retail Park (Taunton)
	Factory Outlet Centre	Bicester Village (Bicester); Freeport Fleetwood (Fleetwood); MacArthurGlen Designer Outlet Cheshire Oaks (Ellesmere Port); MacArthurGlen Designer Outlet (Livingstone); Sterling Mills Designer Outlet Village (Tillicoultry)	
	Theme-Oriented Centre	Leisure-based	O2 Centre (Finceley, London); Printworks (Manchester); Tower Park Centre (Poole)
Non-Leisure-Based			

Source: ICSC Research, 2005

Comparison-based centres are often part of larger retail areas, most likely found in city centres and not anchored. Convenience-based centres include retailers that sell essential goods (those items consumer buy on a regular basis) and are typically anchored by a grocery store (supermarket or hypermarket). Additional stores usually found in convenience-based centres include chemists (drugstores); convenience stores; and retailers selling household goods, basic apparel, flowers and pet supplies. Those centres are typically located at the edge of or out of town.

2) *Specialised Centres*

Specialised centres include specific purposed-built retail schemes or shopping centres that are typically open-air and could be further classified by size. There is Retail Park: also known as a power centre, it is a consistently designed, planned and managed scheme that comprises mainly medium and large scale specialist retailers (big boxes or power stores). Meanwhile Factory Outlet Centre is a consistently designed, planned and managed scheme with separate store units, where manufacturers and retailers sell merchandise at discounted prices that may be surplus stock, prior-season or slow selling.

Theme-Oriented Centre however is a consistently designed, planned and managed scheme that can either be leisure-based or non-leisure based. This scheme includes some retail units and typically concentrates on a narrow but deep selection of merchandise within a specific retail category. On the other hand a Leisure-Based Centre is usually anchored by a multiplex cinema and includes restaurants and bars with any combination of bowling, health and fitness and other leisure-concept uses; while a Non-Leisure-Based Centre concentrates on a niche market for fashion/apparel or home furnishings or can target specific customers such as passengers at airports. Examples of retail properties according to the Pan-European Centre Standard are shown in Table 2.2.

2.2.4 Key Parties

The dynamic of retail properties such as shopping centres are identified as three dimensional, while those of most other real property types are two dimensional. London (1999) pointed out that the reasoning behind the comparison is that most non-retail properties such as office, apartment and warehouse are based upon a simple landlord-tenant relationship.

However, shopping centres and other retail property types are based upon a more complex dynamic which includes the same two parties plus consumers (or shoppers), who must patronise the tenants' (or retailers) shops in order for the process to work and thus create a three-party process. London (1999) identified the key parties that are fundamental to shopping centres as:

1. Shopping centre owners or landlords and operators (operators- if different from a shopping centre's owners – are those parties managing and operating a shopping centre from day to day)
2. Tenants (or Merchants/Retailers) who occupy space in the shopping centres, paying rent for such space.
3. Consumers (or shoppers) who are patrons of the shopping centre and its tenants.
4. Lenders, who provide much of the capital needed by shopping centre owners to build, purchase or finance a centre.

London (1999) concludes that the shopping centre business could be summarised as revolving around the interactions of the three parties identified plus one additional party that is not exceptional to shopping centres: Lenders.

2.2.5 The Business of Shopping Centres

It is a common misconception that retailing is the core business of shopping centres, however, retailing is not the business of shopping centres. It often seems like the retailers businesses in the shopping centres are overshadowed by the actual business of the shopping centres. The core business of the shopping centres should of course be the business of owners of shopping centres i.e. business in a real estate investment or retail property investment.

a) Core Business

The background of owners of shopping centres' core business is varied. They are probably developers, life insurance companies, multinational corporations, local authority, properties companies and also joint ventures owners (Flynn, 1984; London, 1999; Muhlebach and Alexander, 2005). However, when the owners invest in developing or buying a shopping centre, they are making a business in a real estate investment or retail property investment.

This is because the owners invest to develop or buy this commercial property to provide the business place which includes retail space/units, facilities and services to the potential retailers.

In addition to their investment, the owners of shopping centre always interested in improving the market share, the sales productivity, the bottom line return and the long-term residual by (Whitmore, 1996):

- Making dated centres contemporary, physically attractive, and shopper friendly
- Repositioning the centre competitively through remerchandising the tenant mix that matches the trade areas' changing demographics so that growth and income niches are addressed.
- Expanding the centre and its anchors to increase market penetration.
- Correcting declining occupancy or flat sales due to lifecycle conditions.
- Staying current with fresh retailing concepts, shopper amenities, and design innovations.

Also, they expect the professional property manager to optimise the return from the productive resource of the property; extend the productive life of the building; and preserve and enhance the capital value of the centre (Hines, 1988). Those are the aims of the owners to secure a future stream of income in return for their capital investment. Therefore, leasing or marketing the space and managing the tenant mix becomes a main concern to the core business of shopping centres.

Predominantly, having a good tenant mix is crucial to the core business of shopping centres. It was pointed out by McGoldrick and Thomson (1992) that tenant mix has been identified as a critical factor in the success or failure of purpose-built shopping centres. Therefore in managing tenant mix of a retail property, such as a shopping centre, managers need to develop an effective business model for tenant location, tenant selection, and the structure of lease agreements so as to create value, increase the brand value of the property rentals, and achieve long-term stability in the value of discounted cash flows given various uncertainties.

b) Non-Core Business

Meanwhile the non-core business of a shopping centre is known as a supporting function to its core business. It is not to generate the income but in incurring cost to ensure the effectiveness of the supporting function. The non-core business of shopping centre can be divided into three aspects. This includes managing property, managing service operation and managing facilities (Musa and Pitt, 2009). It must be remembered that one significant function in managing the property is maintenance.

Maintenance is a necessary part of the shopping centre business. Management, through maintenance, is to ensure that the centre's systems are running effectively in order to enhance the customer and tenant environment as well as preserve the owner's investment.

Therefore, management needs to develop strong maintenance staffs that understand how the shopping centre functions and its inter-relationship with retail tenants, customers, community, and environment. Maintenance in the shopping industry is more than just repairing equipment, fixing roof leaks and checking broken tiles. It is about securing the future of the asset, the shopping centre, through a planned maintenance programme (Paul, 1999).

Services in shopping centre are varied. Among them are the administration and support services, cleaning services, security services, Mechanical & Electrical (M&E) services, maintenance services, waste management, health and safety services, etc. Managing service operation can be seen as encompassing the processes to do with the management of the space that supports organisational activities. This includes the activities that maintain the physical infrastructure and the support services that operate within the space that support those services. Managing those kind of services are important to ensure the quality and effectiveness of service delivery is guaranteed to the customers (Musa and Pitt, 2009).

Facilities also vary according to the types of building. In shopping centres, facilities provided to the customers (tenants, consumers or owners) are typically parking spaces, toilets, signage, utilities, HVAC systems, lifts and escalators, public phones, cash machines, etc. These facilities provided by shopping centres apparently facilitate and attract the tenants and consumers to occupy and visit the shopping centre.

Therefore, it is important for the shopping centre management to ensure those facilities are managed efficiently. This will keep the tenants and also consumers happy with the facilities provided and it is a good indicator for an efficient business (Musa and Pitt, 2009).

2.3 The Role of Shopping Centres

2.3.1 Role as a Place of Business

Shopping centres have been developed to provide a business place which includes retail spaces, facilities and services to the retailers. As a place of business, the location factor is very important (Howard, 2001). This is because the location factor typically attracts successful retailers to become tenants in the shopping centres in the first instance. Aside from a good location, accessibility also creates demand from patrons to visit and shop at the shopping centres.

The National Retail Planning Forum (2000) reported that most of the shopping centres in the UK were developed in town centres. It shows that a suitable town centre site seems to offer the best opportunities for a business. In another perspective, a good design for shopping centres is predominantly crucial to portray its image as a business place. The design attraction is considered a pull factor that attracts the retailers and patronage. Shopping centre design is a synthesis of many demands, including physical constraints, market forces, management needs and local authority requirements, out of which is created the physical form to support the shopping activity. It embraces the mechanics of vehicle manoeuvring, the skills of image-making and an understanding of the centre's construction. But above all these it is the creation of a sense of place, somewhere people want to be, the transformation of the everyday experience of shopping into one of enjoyment and fulfilment (Morgan and Walker, 1988).

Almost all shopping centres consist of a site, that is comprised of land that it occupies and some types of building, which houses tenant or merchants offering goods and/or services. The space occupied and leased by tenants is measured in square feet (sq.ft.) or square meter (sq.m) and a shopping centre's total leasable space is known as its gross leasable area (GLA) (London, 1999).

Shopping centres usually include a range of retail tenants, with department stores, supermarkets, apparel stores, and entertainment and leisure facilities being considered fairly standard tenants (Abratt et al., 1985; McGoldrick and Thompson, 1992).

Traditionally, department stores, supermarkets and variety stores dominated the tenant mix of the larger shopping centres (Carlson, 1991; Oosthuizen, 1981; Urban Land Institute, 1983). The largest stores within shopping centre are usually known as anchor tenants. The anchor tenant of the shopping centre is typically a department store that occupies space with a range size of 50,000 to 300,000 square feet. One of the underlying principles of shopping centres is the idea that anchors are the main attraction for shoppers (London, 1999). The role of shopping centres as a business place is to provide a better place for retailers in terms of attractiveness of schemes with big catchment populations, the importance of location in schemes with a strong retail offer which dominate the town and the catchment, accessibility, parking and the quality of shopping environment (The National Retail Planning Forum, 2000).

2.3.2 Role as a Property

Shopping centres as properties are seen as buildings that contain physical structures, spaces, facilities, and are managed as a single property. As a property, it needs to be managed and maintained to ensure its value is increased. Howard (1997) has pointed out the excellence of performance or the worth of a shopping centre is generally assessed in terms of its value in the property market. Therefore, the management effort should be directed to the maintenance and improvement of this value.

As a property, shopping centres cannot run from the fact that their building will deteriorate. It will show signs of physical deterioration. Physical deterioration is a deterioration of the physical fabric of the building as a function of use and the action of the elements. Depreciation is considered as a loss in the real existing use value of property (Baum, 1991). To overcome this problem, a strategic maintenance operation is needed (See Figure 2). Needless to say, maintenance is a necessary part of the shopping centre's business.

Maintenance in the shopping centre is more than just repairing equipment, fixing roof leaks and checking broken tiles. It is about securing the future of the asset, the shopping centre, through a planned maintenance programme. Paul (1999) suggests that a well-run maintenance programme is needed to address the following points:

- Maintains a proactive maintenance programme
- Provides cross training of maintenance employees to provide more flexibility in responding to centre problems
- Emphasises constant communication among all centre operations, management and marketing departments, as well as ownership.
- Constantly strives to identify areas in which greater efficiency and productivity can be achieved.
- Plans and develops a crisis maintenance management plan to be implemented in conjunction with the overall scope of the shopping centre's master plan.

Figure 2: Maintenance Strategies

The role of shopping centres as a property, through maintenance is to ensure that the shopping centre's systems are running effectively in order to enhance the customer and tenant environment as well as preserve the owner's investment. If the significance of the role of maintenance is disregarded, this will eventually affect the income and value of the shopping centres and also overall success of the business.

2.3.3 Role as an Investment

Shopping centres were built by developers, often managed by the same or specialised organisations and were sold to the institutional investment community. Most of the institutions are life insurance and multinational corporations (Okubo, 1999). According to London (1999), most of the history, the ownership, of most shopping centres has traditionally passed to pension funds and insurance companies. Howard (1997) added that local authorities and property companies are also prominent owners.

The owners' aims are typically to secure a future stream of income in return for their capital investment. Martin (1982) summarises the owner's objectives as: a requirement for immediate income; an emphasis on future income; enhancing the centre's capital value; and realising capital. According to BOMI (2001) the income streams of shopping centres are:

- Typically, the largest of these is percentage rent. Such leases generally provide for payment of a fixed minimum rental computed against a percentage of sales. Generally, the percentage of sales is negotiated as part of the original leasing process.
- Common area maintenance charges pass on to each tenant a pro-rata share for exterior maintenance, certain utility costs, and other related to areas used by tenants' retail customers.
- Advertising funds and merchants' associations: often controlled by the tenants of major retail centres, active merchants' associations and advertising funds provide a benefit to the retail centre through customer recognition and increased traffic flow. The presence of these entities may provide both revenue and expenses to the property manager.
- Income derived from seasonal or temporary activities might include kiosk rental, gift wrapping or sidewalk sales during warm weather.

- **Retail pad rents:** a retail pad is a freestanding parcel of property generally within the confines of a larger project parcel. It is generally developed for use by such businesses as banks and restaurants.

Howard (1997) identified that the retail and other property investment offers long-term security and a reliable income stream to investors. It does this largely because of the nature of the most common form of leasing of retail units. Shopping centre leases generally follow the pattern of all other landlord and tenant leases. Leases in the shopping centres tend to be long term, 20 or 25 years, or even up to 99 years (larger tenants are those who have sought the very long terms) (Howard, 1997). The shopping centre lease covenants are subject to the length of term; rent reviews; rental payments; user clauses; assignments; sale notices; projecting signs; and shop fronts (Northen, 1984).

However, the recent growth of REITs has changed the shopping centre's nature as an investment. The majority of historical investors appear to favour investment through the REITs rather than direct ownership. The secondary effects of these current trends are reducing the long standing emphasis on value enhancement in favour of cash flow to serve the needs of the public markets. The REIT era has also brought a significant focus on redevelopment of existing centres (London, 1999).

Shopping centres as an investment show the ability of the property in generating the future income stream that attracts many investors. However, the quality of management in managing the shopping centre is an important factor which can affect the success or failure of the shopping centre (Morgan and Walker, 1988). This portrays how important the role of shopping centre management is to secure a future stream of income in return for owners' capital investment. It does not make sense to spend tens of millions of pounds designing and building shopping centres only to hand them over to an inadequate management.

2.4 The Management of Shopping Centres

2.4.1 Types of Management

The management of a shopping centre is vital to its success. Hines (1988) identified that shopping centre is a management-intensive process. Understanding the roles of shopping centre as a business place, a property and an investment are essential qualities in successful management (Musa and Pitt, 2009). Morgan and Walker (1988) perceived that the quality of shopping centre management is one of the most important which can affect the success or failure of a shopping centre.

In practice, the management of shopping centres can be established either through management by owner or management by managing agent. According to Flynn (1984) the methods employed in the management of shopping centres vary widely but can be divided into two categories;

1. Controlled directly by the owner, employing his personal attention in smaller centres or via his employees in larger ones.
2. Operated on contractual arrangement, management services provided on a fee basis by a property manager (either individual or a real estate company).

Carlson (1996) pointed out that management by an owner is seen as an option and it depends upon the owner having the time, the knowledge, the skills, the interest and the contacts necessary to oversee these challenging activities leading toward the achievement of stated objectives.

Meanwhile, in comparison, Carlson (1996) argue that management by managing agent is far better and at its best offers to shopping centre owners a spectrum of desirable qualification for a fee. Until today, many owners find comfort in the breadth of services that property management companies offer and conclude the results are worth the fees paying. The fees are generally tied to the effective income so there is built-in motivation for the property manager to do its best to increase that income.

2.4.2 Management Agreement

If management by managing agent is employed to manage the shopping centre, the management agreement will detail the shopping centre manager's responsibilities between the management firm and the shopping centre owner. It is a legal contract between ownership and management that establishes the shopping centre's duties, authority, and compensation and states the owner's obligations to insure the shopping centre, provide sufficient funds for its operation, and ensure its compliance with building and construction codes and environmental regulations (Muhlebach and Alexander, 2005).

Typically, a management agreement is for one year, and for the management services provided the shopping centre manager is compensated with a management fee that is usually defined in the agreement as a percentage of the gross rental income of the property. A minimum monthly fee may also be stated to ensure compensation for management regardless of the level of rental income. Calculation of this fee should take into account the full range of duties and activities to be undertaken by the shopping centre manager or the management firm and, if not otherwise specifically provided, the wages and benefits paid to employees who work as on-site management staff. Provisions may be appropriate for additional specific fees to compensate the shopping centre manager for services such as supervising renovations, tenant improvements, and major maintenance repairs (Muhlebach and Alexander, 2005).

The management agreement also covers other particulars related to the legal arrangements for the management of a shopping centre. The specific property to manage and the names of the parties to the agreement (ownership and management) should be stated, along with the authority of the parties to enter into the arrangement. These agreements usually cover a specified period and are subject to renewal by mutual agreement. The beginning and ending dates of term and conditions of renewal should be specified. Provisions for termination of the agreement other than at the expiration of the term and for compensation to the parties if such termination occurs may also be included (Muhlebach and Alexander, 2005).

2.4.3 The Establishment of Management Systems in Shopping Centres

Regardless of the property manager is employed as under the owner's organisation or on a contract arrangement, he or she has the responsibility to achieve the success of the shopping centre. Their roles are imperative in contributing to the success of the management and operation of shopping centres. Okubo (1999) points out that the most important role of property managers is to achieve the shopping centre's goal and objectives. Therefore, to accomplish the many facets of management and operation of shopping centre, Kaye (1989a) states that the property manager has to be capable of assembling a team who will be able to produce a first class standard in the basics of housekeeping, maintenance and security, at acceptable cost.

Typically, the owners of shopping centres will be appointing letting agents and managing agents to carry out the tasks (See Figure 2.1). Letting agents and managing agents are basically appointed from the same property company who offers both services. Otherwise, in some practices a different company is appointed for letting agent and managing agent services. Mostly, the letting agent services are outsourced. The role of the letting agent is important to market the space or lease a vacant space and search for the potential tenants to be part of the shopping centres' tenant mix.

Figure 2.1: Establishment of Management System in Shopping Centres

Meanwhile, the managing agent is responsible of setting up the management systems and recruiting the management teams for the shopping centres on behalf of the owners. Shopping centres' management teams have the important role of managing the shopping centres. This role includes a thorough development of decision-making, managerial creativity, and the art of management. Management functions such as planning, organizing, staffing, directing, and controlling are treated as basic guides to effective management.

Management teams in shopping centres may vary from one shopping centre to another. This is because they seek and attempt to establish the right teams who are best positioned to face the challenges in managing the shopping centres in the environment it is in today. When defining the facets of management challenges, Musa and Pitt (2009) classified the management of shopping centres as encompassing three main aspects: property, facilities and tenant mix. Thus, centre management teams are responsible to operate and manage those aspects according to the owner's objectives.

Musa and Pitt (2009) conclude that the management and operation of shopping centres may vary from one shopping centre to another. This is because of differences in the structure of the organisation, size of the centre, management strategy and facilities provided. Therefore, it is important to establish how the system would be from the beginning to ensure the quality and effectiveness at the end of the day.

2.4.4 Key Management Personnel

Muhlebach and Alexander (2005) stated that the success of any shopping centre depends on two critical factors:

1. The relationship between the landlord and the tenants; and
2. The acceptance of the shopping centre by the community.

To achieve good results in both areas requires effective management of the shopping centre by certain key personnel, i.e. the asset manager, the shopping centre manager, and the marketing director.

1) Asset Manager

In the context of shopping centre management, the asset manager assumes the role of the landlord and authorises the expenditure of funds. Institutional owners commonly appoint an asset manager to oversee the financial management and operation of the shopping centre. The asset manager acts as the representative for the institutional owner and may be responsible for several shopping centre holdings (Alexander et.al., 1983)

Asset management has eight key functions; each represents a way in which the value of a property is increased during the period of ownership (Muhlebach and Alexander, 2005):

- Acquisition includes the review of candidate properties (particularly their operating expenses and revenue potential) and performance projections as well as the assessment of future opportunities for tenancing and rehabilitation.
- Property management includes the supervision of property management companies, authorisation of operating expenditures, review and approval of leases, and monitoring of conditions in the local market.
- Performance monitoring and control involves generation of management information at regular periods (monthly, quarterly, annually), periodic visits to the site, strategic review of the property's potential, preparation of long-term capital budgets, and analysis (and sometimes appeal) of property tax assessments.
- Re-tenancing and rehabilitation involves design and execution of planned programmes.
- Peripheral development includes the review of assets for existing expansion opportunities, preparation of development plans, and implementation of necessary additional construction, or selling or leasing part of a property to generate cash.
- Refinancing involves monitoring the national financial market and current techniques for restructuring debt, renewing mortgages at more attractive terms, and securing new financing as a means to reduce equity or to fund improvements.
- Restructuring of ownership considers transfer of partial ownership via sale or lease of a portion of a property or evaluates buyout options in a joint venture.
- Disposition involves the monitoring of the life-cycle position of a property to identify an optimum time for sale, consideration of a sale if the local market position is threatened, and evaluation of all unsolicited offers to buy.

The asset manager selects and hires the property management firm and works directly with the shopping centre manager. Because asset managers' schedules usually do not allow them to visit an individual property frequently, day-to-day management, operations and leasing responsibilities are assigned to the shopping centre manager. However, some of the duties and responsibilities of the asset manager and the shopping centre manager overlap as they work together to enhance the value of the property (Alexander et.al., 1983; Muhlebach and Alexander, 2005).

2) Shopping Centre Manager

The shopping centre manager has a duty to implement the plans of the asset manager/landlord and works directly with the tenants to create the property income.

Martin (1982) summarises the manager's duties to include public relations, responsibility for rent reviews, redecorations, lease renewals and the follow-up action thereon, custody of and responsibility for original documents, particularly leases, service contracts, recording drawings, guarantees, recruitment and discharge of staff, power to engage contractors for cleaning, refuse disposal, security, etc.

Once the centre manager has made the commitment to manage a shopping centre, they have committed themselves to perform the duties in accordance with the owner's expectations (Okubo, 1999). The shopping centre manager has six areas of responsibility: administrative, financial, operations, tenant relations, leasing, and marketing and promotions (see Table 2.3). Many of the specific duties of management are delegated to administrative or operations staff (Muhlebach and Alexander, 2005).

According to Kaye (1989b), a first class manager can work wonders with an indifferent centre; a mediocre manager cannot achieve excellence however good the centre he is given to manage. Cowper (1992) suggests that an effective and experienced centre manager should be able to make the task of shopping centre management more efficient.

3) Marketing Director

One of the key members on the management staff of a large shopping centre is the marketing director. This individual has the creative skills to develop and implement programmes to effectively promote the shopping centre to consumers.

Table 2.3: Areas responsibilities of Shopping Centre Manager

Lovick (1999) stated that the role of marketing director needs strong observational and analytical skills because the marketing director will be called on to help evaluate the competition and promote the shopping centre to prospective tenants. This person works closely with the shopping centre manager and with the tenants in the operation of the marketing fund.

The responsibilities of the marketing and promotions director include (Muhlebach and Alexander, 2005):

- Communicating with retailers via a newsletter that is mailed, emailed, or delivered by the security guards.
- Conducting periodic market research
- Preparing annual advertising and marketing calendars
- Developing a public relations programme
- Implementing advertising, marketing, and public relations programmes
- Maintaining rapport with the media.
- Developing an annual marketing budget.
- Reviewing and approving invoices for marketing expenses and funds' management.
- Developing and operating the accounting system for the marketing programme
- Visiting periodically with retailers
- Maintaining a close working relationship with the managers of major stores
- Directing the retailers' association or managing the marketing fund meetings
- Adhering to the bylaws or rules and regulations of the retailers' association.
- Hiring, training and supervising marketing staff

In some instances, the marketing director may have a dual role, combined with centre management duties. In other cases, a single marketing director may be assigned responsibility for a group of smaller centres in one geographic area. In larger centres, the marketing director may supervise a marketing secretary, an intern and/or one or more assistants (Lovick, 1999).

4) Management Staffing

The proper level of management staffing is critical to the success of any shopping centre. If it has too much staff, the shopping centre is overloaded with the cost of excess personnel; if it has too little, essential issues may be overlooked. Regional and super regional malls have large, experienced staff (Alexander et.al., 1983). Generally, a regional mall has a general manager, an assistant manager, one or two administrative assistants, a marketing director, a chief of security, and a director of operations.

Additionally, if accounting is handled on-site, the shopping centre has an accounting supervisor, and if there is a food court, it has a food court supervisor. A regional mall also has security guards, janitorial staff, landscaping staff and food court service staff.

Other on-site staff may include a leasing agent and a speciality leasing or temporary tenant leasing person (Muhlebach and Alexander, 2005). Speciality shopping centres tend to have on-site shopping centre managers because they have a tremendous number of smaller retailers and extensive marketing programmes. Lifestyle and outlet shopping centres operate with a shopping centre manager as well as administrative and marketing staff on-site. Community shopping centres tend to be operated by off-site staff, as do most neighbourhood and strip shopping centres (Carneghi, 1981).

Depending on the shopping centre type, size, and number of tenants, an experienced shopping centre manager can handle 6 to 10 neighbourhood shopping centres from off-site. Having strong staff backup is essential to effective management. The shopping centre manager should consider the distance between the shopping centres, as timely travel between them to handle any problems that arise could be difficult (Muhlebach and Alexander, 2005).

2.4.5 Management Duties and Responsibilities

The duties and responsibilities of the shopping centre management can be divided into two aspects;

1) Managing Tenant Mix

McGoldrick and Thomson (1992) pointed out that tenant mix is a critical factor in the success or failure of purpose-built shopping centres. Muhlebach and Alexander (2005) confirmed that having a good tenant mix is a crucial to the business of shopping centres. This is because a good tenant mix that can work together will enhance the centre's performance and operate successfully as individual business (Greenspan, 1987).

Greenspan further explained that these descriptions of tenant mix stress the underlying objective of maximising shopping centre profitability and are, therefore, investor-oriented. The key to maximising profitability is relying on maximisation of sales through the optimum service to the community, i.e. shoppers.

Kaylin (1973) defined that tenant mix refers to the combination of business establishments occupying space in a shopping centre to form an assemblage that produces optimum sales, rents, service to the community and financiability of the shopping centre venture.

The concept of tenant mix design therefore involves provision of a range of merchandise and services, carefully chosen to appeal to the catchment shopping population, as described by Bruwer (1997). These services may include restaurants and other catering outlets, and increasingly they also include leisure facilities such as cinemas (Abratt et al 1985; Yap 1996; Roberts and Melvin 1999). In discussions of tenant mix, the provision of different types of merchandise is almost always replaced by a proxy — namely various categories of retailer — in order to classify the merchandise on offer. Classifications focus on characteristics such as price and quality, appeal to different lifestyle groups, and service levels.

Lists of tenant mix rules identify the importance not only of selecting a balanced variety of tenants, but of locating them carefully within the centre, both in relationship to the centre's layout and in relationship to each other (CALUS 1975). Abratt et al (1985) put across the idea for creating a maximal pedestrian flow in order to ensure a full hundred percent location for all tenants with a logical layout of shops while suggesting that developers seem to neglect this aspect of mix. Several authors note the problems of achieving optimum location plans, due to market weakness and larger retailers demanding specific locations (Abratt et al 1985; Kirkup and Rafiq 1994; Brouwer 1997).

The location of anchor tenants and main space users are critical decisions, drawing people through the centre from the access points, and avoiding areas of low pedestrian flow where few retailers can thrive. Tenant mix policy: the investor/developer may engage an asset manager, who in turn may appoint an on-site centre manager, who is the day-to-day point of contact with the retail occupiers. One or more letting agents may also be involved. All three management layers, and potentially others, are involved to a greater or lesser extent in the management of tenant mix.

2) Monitoring Tenant Mix

The prerequisite for successful management of retail tenant mix in any centre is to monitor its performance - that is, the level of profit achieved by its retailers and the implications for the centre's rental income and capital value. Greenspan (1987) advocated the constant monitoring of sales performance, competition and demographics for this purpose. She suggested continual manager-tenant communication to allow managers to understand tenants' business needs.

In the USA the use of turnover rents informs and facilitates this dialogue, but in the UK the usual market rent practice is a barrier to such necessary communication. With the exception of Greenspan (1987), who describes demographic monitoring, the literature says little about the methods and practice of monitoring retail tenant mix evolution, diagnosing problems and spotting opportunities. The most obvious indicator of the need for tenant mix change is the failure of a retailer. This may result in an unexpected vacancy and a request to assign or sub-let the lease.

In a strong retail market the landlord is likely to benefit from re-letting a vacant unit and has no interest in keeping a retailer whose business is not thriving. In a weak market, however, the landlord may protect its income stream by enforcing the retailers' covenant to pay rent until the end of the lease. Tenant mix normally changes incrementally over the life of a centre (Thomson 1999) in response to vacancies on liquidation, at lease termination, by agreement with the landlord or by assignment. Each vacancy presents an opportunity for the landlord to modify the tenant mix within the constraints of the market and the characteristics of the vacant unit (Kirkup and Rafiq 1994).

3) Proactive Management

Greenspan (1987) advocates proactive management of tenant mix, rather than relying on changes instigated by retailers. This can involve negotiations for surrender of leases, possibly involving a payment to the retailer. More radically, a centre may be wholly or partially refurbished and the tenant mix repositioned towards a changed demographic or competitive environment.

4) *The Pressure for Tenant Mix Change*

Retail formats are continually changing and, with the growth of retailing via the internet and interactive television, can be expected to do so at an accelerating rate. Greenspan (1987) stresses that a successful tenant mix needs to respond to such changes, and suggested that this requires the action on the part of the manager to continuous monitoring and evaluating. Kirkup and Rafiq (1994) suggest three reasons for the increased difficulty in maintaining a successful tenant mix:

- heightened competition between centres, arising from their proliferation and consumers' greater mobility, has created pressures for differentiation between centres by means of tenant mix
- a difficult retail market, such as that suffered in the UK in the early 1990s and again in middle-market fashion in 1999/2000, will result in falls in retailers' space needs and a reduction in landlords' flexibility in managing tenant mix
- ever-changing demographics, fashion and consumer demand, which lead to the decline of some older retailers and the brisk expansion of new ones, often with different space requirements

5) *Managing Property and Facilities Services*

The management of property and facilities services is basically involved with the total physical aspects of shopping centres. To ensure the property and facilities services operates at its best performance and condition, shopping centre managers and management teams need to develop their own management strategy in managing these physical aspects. Whether the management strategy is effective or not, however, depends on several issues that relate to the property and facilities services' of shopping centres that they need to consider:

a) *Signposting*

Signposting in the shopping centres is very important, particularly in larger shopping centres. The design and direction must be clear and unambiguous to facilitate people to find their destinations. However, over-designing, unclear signage, confusing and inconsistent information between directories and signposting, and not updating signage are amongst the issues (Cowper, 1992).

This is not a critical issue that needs immediate action from the management teams. Nevertheless, it could affect the centre's performance if it is not resolved. It is therefore the duty of the management teams to ensure the signposting system for the centre, both operational and directional, is carefully considered (Cowper, 1992).

b) Safety and security

Safety and security issues have become the main concern to the tenants and also the consumers of shopping centres. As shopping centres have evolved into town centres in many cities, they have become public gathering places for people of all types and ages. Shopping centres managers and management teams must balance the need for their facilities to be easily accessible public places with the need to keep out the dangerous elements that such places sometimes attract. Almost every shopping centre attracts some vagrants, homeless people, juveniles, and gangs that can disrupt ordinary operations. In many localities, shopping centres have become the centre of teenage social activities - raising the potential for increased security problems. Violent crime has become an even more frequent occurrence at some shopping centres. The worst scenario was in 1996 at The Arndale Shopping Centre, Manchester, UK, which suffered a bombing by the Provisional Irish Republican Army (IRA).

Even though gunplay is not common, the potential exists, as evidenced by a gun battle between rival gangs in a shopping mall outside Los Angeles (Overstreet and Clodfelter, 1995). Shopping centre managers will need to determine the impact of such activities on customers' feelings of safety and their shopping behaviour. Violent crime at shopping centres gets a lot of attention, but a previous research study by Overstreet and Clodfelter shows that the types of crime receiving the most attention - carjacking, kidnapping, arson, rape, and other serious crimes - are the least likely to happen. Results of the survey indicated that by far the greatest security problem for shopping centres was shoplifting. Incidents of disorderly conduct were the second most frequently reported problem, followed by a third category which included trespassing, vagrancy, and panhandling. Vandalism was the fourth most reported crime, followed by automobile break-ins (Overstreet and Clodfelter, 1995).

Every shopping centre has developed its own approach to handling security problems, ranging from the passive to the preventive. Most shopping centres have their own security officers whether they are in-house staff or outsourced to ensure the safety environment of the centres. Besides that, closed-circuit television technology (CCTV) is a popular tool used in many shopping centres. The purpose of using CCTV is to identify and record incidents. However, Overstreet and Clodfelter (1995) suggest that shopping centre managers and management teams should continue to focus efforts on addressing the security concerns of customers while they are outside the centre, and continue to focus on appropriate levels of visible security, and investigate the possibility that actual incidents are more frequent than previously thought.

c) Mechanical and Electrical Equipment

Energy use and installation of mechanical and electrical equipment are also becoming main concerns to shopping centres management. In the UK, the environmental criteria for an efficient shopping centre air-handling system should be mainly directed towards producing efficient ventilation and cooling system. It is important to ensure, therefore, that the mechanical and electrical specification is no more or less than is required to provide a comfortable environment for the people in the shopping centres. This is because mechanical and electrical running and maintenance costs can become an issue for the service charge.

According to the Department of Environment, Transport and the Regions' (1997) report shopping centres pay, on average, GBP 13/m² per year for the energy they use in common areas. In many centres that is more than 10% of the service charge. Whatever the figure is, this issue become a continual challenge to the centre manager and management teams in order to optimise energy costs. Whatever the approaches they use, it worth for them to consider the guidelines for energy efficiency in shopping centres, published by the Department of Environment, Transport and the Regions.

This Guide is designed by the Department as a starting point to help managers of shopping centres reduce their energy costs, and may be very useful to the centre management teams in developing or improving their own energy efficiency systems. In addition, it shows the ways to achieve immediate energy use savings in the shopping centres without incurring major costs. Most of the measures will, in fact, cost nothing and some of them will cut the maintenance costs as well.

d) Car Parking

Parking spaces were important to the car-borne shopper of shopping centres but not essential to the success of the scheme. Most of the shopping centres in the UK have car park facilities but the number of spaces provided is limited. This is because most of the shopping centres were developed in the town centres, which have a limited area to provide more spaces, or it may be that the developer/owner wants to fulfil at least the minimum requirement from the planning consent. Nevertheless, the public transportation networks in the town centres are good and reliable for many shoppers. Moreover, some of town centres have provided multi-storey parking spaces to the public, managed by the Local Authority.

Typically, the main issues with regards to car park facilities are safety and security. Therefore, the car park management must have as its paramount objective the comfort and security of the car-borne shopper, particularly the latter. However, to tackle this issue the car park should be maintained by the centre management either as part of its in-house operation or through a management agreement with a car park operator, so that it can control opening hours, security, cleaning, maintenance and tariffs (Morgan and Walker, 1988).

The parking tariffs need to be considered carefully and must be reasonable. Morgan and Walker (1988) suggest that the pricing policy which is adopted by centre management should be compatible with the needs and requirements of the centre, the number of available spaces and the rates applicable in other car parks in the town. However, priorities should be therefore, first, to provide a service to the centre and, second, to make a profit.

e) Waste

Waste in the shopping centres is varied and mostly produced from the retailers' business. Envirowise (2002) has identified the waste generated from the retail sector as including:

- damaged or obsolete stock;
- discarded packaging;
- the time and effort spent handling waste, e.g. crushing and moving single use packaging;
- the time and effort spent managing waste, e.g. storing and processing damaged goods;
- excessive or inefficient use of water and energy.

Even though, the retail sector is a major contributor to the UK economy with sales of £225 billion in 2001, the sector also produces large amounts of waste - an estimated 12 million tonnes/year at a cost of over £360 million/year (Envirowise, 2002). Moreover, shopping centre management in the UK currently spends about £15 million/year on waste disposal and this cost was forecast to rise to £18 million/year by 2004 (Envirowise, 2002). With regards to the figures, there is a strong business case for taking action to prevent and reduce waste. This apparently shows that the weakness of shopping centres management in managing waste or in establishing the waste minimisation system in shopping centres.

Today, many UK shopping centres are attempting to achieve significant cost and other benefits through waste minimisation while maintaining high levels of service. Although concerns regarding the increasing waste disposal costs are expressed by managers, conversely what may be lacking is an innovative and proactive response to waste and waste contract management. Therefore, the application of new multiple contract management practices that drive innovative solutions, creativity in contract delivery and service, and general good service is badly needed in this industry (Pitt, 2005).

f) Maintenance Services

The day a shopping centre is complete, its physical plant begins to depreciate. Shopping centres are often high traffic properties run with sophisticated plants, especially as they approach square footages above 500,000 square feet, are enclosed, or have escalators, elevators, alarm systems, etc (Paul, 1999).

It is incumbent upon the shopping centre manager to delay the deterioration of the shopping centre with a good maintenance management programme. The shopping centre manager may choose to develop an in-house maintenance programme or outsource for these services. The daily appearance of a shopping centre must be consistent to foster a positive perception in the minds of customers. Every customer gains a feeling about the shopping centre on each visit; should it appear unkempt or neglected the customer may never come back. Keeping the shopping centre in first class condition at all times should be a primary goal of every effective shopping centre manager (Muhlebach and Alexander, 2005).

The operation of a shopping centre goes beyond the maintenance of specific areas and equipment. The shopping centre manager's operational responsibilities include the provision of security to protect the property and the people in it (tenants and shoppers), development of procedures for rapid (and appropriate) responses to emergency situations, disposal of trash and waste materials generated on the property, and conservation of energy (Paul, 1999)

An effective maintenance programme is important for several reasons. The economic life of a building is a consequence of its physical condition. Value diminishes when a property is neglected and maintenance is deferred. Good maintenance extends a building's physical life. Most maintenance problems get worse if they are not addressed immediately. For example, cracks in a parking lot are easy to repair early on, but if they are not repaired when they first occur, a larger problem will ensue, eventually requiring removal and replacement of the asphalt. The landlord has a responsibility to the tenants and the community to provide a well-maintained facility. Pride of ownership is another reason to have a maintenance management programme, but the most important reason is to assure the safety of shoppers and tenants (Paul, 1999; Muhlebach and Alexander, 2005)

An effective maintenance management programme assures a high quality shopping environment while preserving and upgrading the condition of the shopping centre and enhancing its value. The programme includes custodial, corrective, and preventive maintenance.

Custodial maintenance is the ongoing cleaning and upkeep of a property that includes janitorial activities as well as daily activities such as mowing the lawn, sweeping the parking lot, handling snow removal, etc (Alexander et.al., 1983)

Corrective maintenance refers to the ordinary repairs that must be made to a building and its equipment on an ongoing basis. Preventive maintenance refers to a programme of regular inspection and care that prevents or identifies potential problems early on and facilitates the proper maintenance activities before major repairs become necessary. It includes routine servicing of major equipment – e.g., the heating, ventilation, and air-conditioning (HVAC) system – to assure its smooth, continued operation and help control the cost and frequency of repairs (Alexander et al., 1983; Paul, 1999).

Excellent software programs are available to assist the shopping centre manager in the administration of a maintenance management programme. Many of the programmes can track major functions and details of a maintenance programme. They can even remind the proper staff of inspection dates, keep track of maintenance requests, and alert the user when a work order is not closed out.

The programmes can assist the shopping centre manager in keeping track of stock on hand and maintaining a list of approved contractors. The system can produce printouts to track past calls, which can help the shopping centre manager identify trouble areas that may require special attention (Muhlebach and Alexander, 2005).

In developing a maintenance management programme, one of the shopping centre manager's earliest decisions is whether to contract for maintenance services or establish an in-house maintenance staff. Each approach has its advantages and disadvantages, so each should be weighed to determine the most efficient and cost-effective approach for a particular shopping centre. Two variables that affect the decision to contract or have an in-house maintenance programme are the size of the shopping centre and its location (Muhlebach and Alexander, 2005).

2.5 Management Decision-Making Tools

2.5.1 The Owner's Goals and Objectives

One of the most consistent challenges in shopping centre management has been to identify, understand, and meet the ongoing needs of consumers, retailers and owners (London, 1999). Without a proper approach, shopping centres cannot be managed to their full potential.

To establish this quality and effectiveness of the management system, shopping centre managers must understand the owner's objectives and implement them through an effective management plan and an operations manual. Muhlebach and Alexander (2005) identified that the management plan and the operations manual as meaningful decision-making tools for the individual or entity that owns the shopping centre and for the shopping centre manager who runs it.

2.5.2 The Management Plan

The management plan provides an organised collection of information about the shopping centre that guides decisions about day-to-day operations and prepares the shopping centre manager to meet the challenges of a changing business environment. To ensure its flexibility as a decision-making tool, the management plan should be updated at least annually and as is necessary to reflect changes in the local market and in local and national economies (Muhlebach and Alexander, 2005). The management plan should consist of the following aspects: market survey, property analysis, rental rate analysis, budget planning, operations, analysis of alternatives, challenges, opportunities, and recommendations (Alexander et al, 1983; Muhlebach and Alexander, 2005). Therefore, the successful management of a shopping centre depends on a thorough management plan that states the objectives and financial projections of the investment and provides short and long range recommendations for achieving them.

2.5.3 The Operations Manual

Meanwhile, the operations manual should provide a ready reference to answer most of the operating and management questions that arise on a daily basis. This operations manual should consist of the following information: a site plan showing the locations and names of all tenants; design plans that indicate the locations of essential features, fixtures, and controls; a list of key people to contact for each tenant (shop owner, shop manager) with shop phone numbers, their home addresses and emergency phone numbers; a lease summary sheet for each tenant; a list of property files and their contents; a list of employees

that include the management staff, their positions, home addresses and phone numbers; a list of maintenance and service contractors, including company and individual names, addresses, and business and emergency phone numbers; and emergency procedures for disasters such as fire, flood or earthquake (Alexander et al, 1983; Muhlebach and Alexander, 2005).

The operations manual contains information about the shopping centre for situations that demand quick decisions. It is a separate document, but it serves many of the same purposes as some parts of the management plan. Typically, both documents (management plan and operations manual) are developed concurrently (Muhlebach and Alexander, 2005).

2.6 Facilities Management Services in Shopping Centres

Facilities management is a relatively young industry; however, since the late 1980s, it has gradually increased in momentum as a credible discipline within the property and construction industry (Tay and Ooi, 2001). Initially, facilities management services were not completely understood within the shopping centre industry. Evidently, much has been written on meeting these sector-based demands, but one area that has received relatively little attention is the retail sector (Willis, 2003). This is because the perceptions and expectations of many investors and retailers were not cascaded fully into the FM provider market.

It is increasingly more challenging for FM service providers to deliver FM services in the shopping centres. This is due to the fact that the FM service provider needs to consider some provisions when working within the retail sector, and provide FM solutions in the retail environment with the specific requirements. These challenges include (Willis, 2003):

- Maintaining a healthy and safe environment with large numbers of the general public present and considerable risk of litigation.
- The need to match support service activity with the footfall that varies daily, weekly and seasonally - without affecting service levels.
- The dual-funding mechanism, whereby asset repair and maintenance is supported through the service charge, but asset enhancement and replacement is funded through developer investment.

Failure to consider the provisions stated would affect the successfulness of service agreements. This issue has been recognised by many of the major retail players in this market. Therefore, they perceive the delivered solutions to be wanting. In addition, innovation and expertise is what they need, not a blinkered or single solution focus. Meanwhile, the challenges are relatively different between providing FM services to a single retailer as against providing the full range of support services to a 100,000 m² retail centre, with 150- 200 retail units and 4,000 parking spaces.

Willis (2003) reported that many shopping centre investors were not getting the level of facilities management service anticipated, or at costs originally sought. Retailers also felt that their service charges did not necessarily equate to the level and quality expected.

Consequently, this concern has probably changed their perceptions and expectations towards the facilities management provider market. Today, the retail sector has long been a happy hunting ground for facilities management services providers. It has also been subject to major change as the economy fluctuates according to financial health, spending patterns and many other influences. Therefore, delivering facility services to the shopping centres requires particular skills and systems that meet the needs of a public access facility and maintain critical services that affect public safety and business success, all within a constant downward pressure on costs in a volatile retail environment.

Footfall through a shopping centre is a key metric for services providers as, the more shoppers there are, the more facilities need to be cleaned and the more waste is generated (Fenwick, 2007). However, facilities management services in UK shopping centres vary in accordance to the shopping centres' management needs. This is because different shopping centres have required a different facilities management service (see Table 2.4).

Table 2.4: Some of the FM Service Provider in UK Shopping Centres

FM SERVICE PROVIDERS	FM SERVICES	SHOPPING CENTRES	FM SERVICE DELIVERY MODEL
Europa Facility Services	Cleaning, total waste management, recycling, pest control, hygiene services.	Bullring, Birmingham	Bundle Service Contract
	All housekeeping, waste management, security, customer service support.	Metro Centre, Gateshead, Eldon Square, Victoria Centre, The Potteries, Chapel field.	Bundle Service Contract
Incentive FM	Security, cleaning, housekeeping operations, repairs maintenance and engineering, car park management, waste and environmental, health and safety	Bluewater	Single service Contract
Interserve	Security, cleaning and waste management	Crowngate	Single Service Contract

Source: Service Providers Website, 2010

In shopping centres, facilities management services are seen as non-core services that include mechanical and electrical engineering, cleaning, waste management, security, landscape, energy management, etc. (Cant, 2005). Even though facilities management services are non-core services in nature, if managed correctly, they should have a strategic importance to adding value to the shopping centre's core business delivery. Moreover, by having a core business as a retail property investment, shopping centres may require facilities management services to support the operations of this property at cost effective and best value basis.

2.7 Introducing Analytical Hierarchy Process (AHP) as an Alternative Decision Making Tools

2.7.1 Analytical Hierarchy Process (AHP) Background

AHP is a methodology for structuring, measurement and synthesis. It has been applied to a wide range of problem situations such as selection among competing alternatives in a multi-objective environment, allocation of scarce resources, and forecasting.

AHP is based on the well-defined mathematical structure of consistent matrices and their associated right-eigenvector's ability to generate true or approximate weights (Saaty, 1980). The primary use of AHP is to obtain the best alternative of choice in a multi-criteria environment. In this mode, its methodology includes comparisons of objectives and alternatives in a natural, pair wise manner.

The term "analytic" means separating a material or abstract entity into its constituent elements. Analysis is the opposite of synthesis, which involves combining parts into a whole (Saaty, 1980). To understand the meaning of the term "hierarchy", assume that large organisations are divided into units that are subdivided into smaller units, which in turn are further subdivided and so on. Hierarchical subdivision is not a characteristic that is peculiar to human organisations. Hierarchy is the adaptive form for finite intelligence to assume in the face of complexity. Meanwhile, the term "process" is a series of actions, changes, or functions that bring about an end or result (Forman & Selly, 2001).

AHP, developed by Saaty (1996), is a decision-making method for prioritising alternatives when multiple criteria must be considered. This approach allows the decision-maker to structure problems in the form of a hierarchy or a set of integrated levels such as the goal, criteria, and alternatives. The primary advantage of AHP is its use of pair wise comparisons to obtain a ratio scale of measurement. Ratio scales are a natural means of comparison among alternatives; they enable the measurement of both tangible and intangible factors. Another important advantage of AHP is that it allows for inconsistency in judgement.

AHP is based on well-established and theoretically sound techniques such as structuring problems into hierarchies, reducing complex judgements into a series of pair wise relative comparisons, using redundant judgements to assess participant consistency, and using an eigenvector method for deriving weights (Bodin and Gass, 2003).

2.7.2 AHP Principle

AHP provides a tool for quantifying the qualitative trade-off between various objectives to extract a single set of weights that reflect the level of importance of each activity in the overall decision-making system (Saaty, 1980). AHP converts individual preferences into ratio-scale weights that are combined into linear additive weights for the associated alternatives (Bodin and Gass, 2003).

These resultant weights are used to rank the alternatives and thus assist the decision maker in making a choice or forecasting an outcome.

AHP is based on three basic principles for problem solving: decomposition, comparative judgements, and hierarchic composition or synthesis of priorities (Saaty, 1994). The decomposition principle is applied to structure a complex problem into a hierarchy that represents a complex problem on a number of clusters, sub-clusters, sub-sub clusters, and so on (Figure 2.2). The hierarchy structure is beneficial to a decision maker as it provides an overall view of the complex relationships inherent in the situation and judgement process (Saaty, 1994)

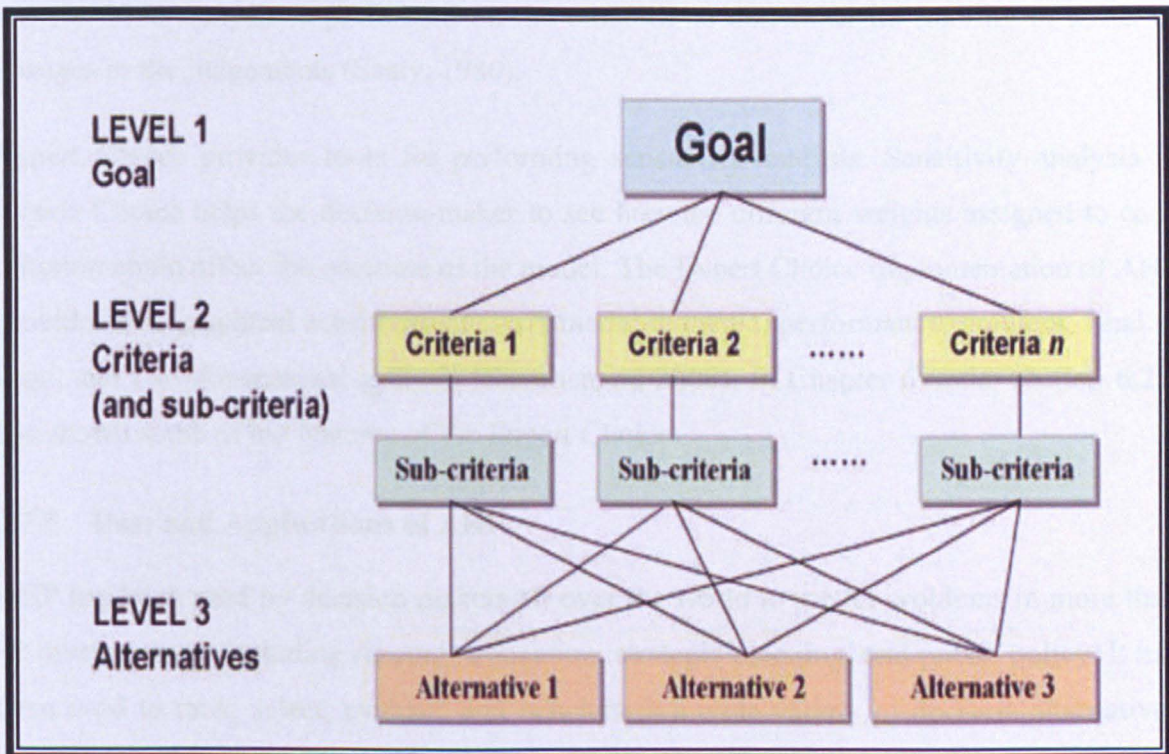


Figure 2.2: The Hierarchy Framework

2.7.3 The Use of Pair wise Comparison

The second principle of comparative judgements is applied to construct pairwise comparisons of all combinations of elements in a cluster with respect to its parent. These pair wise comparisons are used to establish priorities among the elements at each level of hierarchy. First pair wise comparisons of the relative preference for the alternatives are made with respect to each criterion, and subsequently for the relative importance of the top-level criteria with respect to the goal (Saaty, 1994).

For each set of pair wise comparisons, relative important is mathematically calculated to check the judgemental consistency (Saaty, 1994). The third principle of hierarchic composition or synthesis is applied to commute a composite weight for each alternative based on preferences identified through the comparison matrix. The composite weight is then used to obtain the relative priority of each alternative (Saaty, 1994).

2.7.4 Sensitivity Analysis

Sensitivity analysis allows one to verify the results of the decision and it is formed to determine the alternatives' level of sensitivity toward change with the importance of the criteria. This analysis is performed on the outcome to determine its stability in terms of changes in the judgements (Saaty, 1980).

Expert Choice provides tools for performing sensitivity analysis. Sensitivity analysis in Expert Choice helps the decision-maker to see how the different weights assigned to each criterion could affect the outcome of the model. The Expert Choice implementation of AHP provides five graphical sensitivity analysis mode: dynamic, performance, gradient, head to head, and two-dimensional analysis (Shvartsman, 2000). In Chapter 6 under section 6.2.4 has shown some of the features of the Expert Choice.

2.7.5 Uses and Applications of AHP

AHP has been used by decision makers all over the world to model problems in more than 30 diverse areas, including resource allocation, strategic planning, and public policy. It has been used to rank, select, evaluate and benchmark a wide variety of decision alternatives (Shahin & Mahbod, 2007).

Table 2.5: Application of the AHP in Construction Industry

Authors	Year	Research Areas	Application
Al-Harbi	2001	Contractor selection	Construction
Chen et al.	2010	Value engineering workshops	Construction
Cheng & Li	2001	Recourse allocation	Construction
Chin & Choi	2003	Success factors for the implementation of ISO 9000	Construction
Choi et al	2009	Outsourcing testing and inspection activities	Construction
Dey	2002	Risk management	Construction
Fong & Choi	2000	Contractor selection	Construction
Georgy	2005	Engineering performance	Construction
Gilleard & Yat-lung	2004	Benchmarking facility management	Construction
Ho et al	2005	Quality	Building
Jaskowski et al	2010	Bidding criteria	Construction
Khalil	2002	Project delivery methods	Construction
Lai et al	2008	Construction project budgets	Construction
Nieto-Morote & Ruz-Vila	2011	Risk assessment	Construction
Pan	2008	Bridge construction method	Bridge
Pastor-Ferrando et al	2010	Bidding criteria	Construction
Tan & Lu	1995	Quality of construction design	Construction
Wang et al	2008	Bridge risks	Bridge
Wiguna & Scott	2006	Risk and performance	Building
Wong & Li	2008	Intelligent building system	Building
Wu et al	2007	The priority of the building accessibility criteria	Building
Yang & Lee	1997	Facility location selection	Construction
Zayed et al	2008	Risk management	Highways
Zeng et al	2007	Risk factors	Building
Zhu et al	2003	Construction suitability evaluation	Construction

Also, AHP has been applied in a wide range of applications within the construction sector. Table 2.5 Reviews the literature on the applications of AHP in construction. The wide applicability of AHP is due to its simplicity, ease of use, and great flexibility (Liedtka, 2005). Moreover, it can stand alone or can be integrated with other techniques (Ho, 2008)

2.8 Summary

Generally, it must be remembered that the shopping centre industry moved at a very fast rate since the early 1950s, as mentioned earlier. In fact, during the past fifty-eight years of growth, shopping centres have become very important and remain a challenge for shopping centre management. Since the 19th century, one of the most consistent challenges in shopping centre management has been to identify, understand and meet the on-going needs of consumers, retailers and owners. These key parties are fundamental to any shopping centre in the world. In addition to that, shopping centres' infrastructure and facilities services also added into the challenges for shopping centre management in order to manage effectively and provide the security and quality of the shopping environment.

Making the wrong decision in managing the infrastructure and facilities services will affect the operational cost and quality of the shopping environment, and violate some regulations imposed such as Health And Safety and Environmental Acts. Today, shopping centres are becoming more complex in terms of size, type and characteristics. This illustrates the whole picture about the challenging role, which demands all the skills of the shopping centre management teams. It is sometimes important to the owner/developer to establish excellence management teams in order to face the challenges.

Aside from the importance of having an excellence management team, the challenges continue on how to ensure the success of the shopping centres later on. Without a proper system, shopping centres have not been managed to their full potential. This portrays the importance of the role of shopping centre management. The reality of it is that all shopping centres have to compete with others shopping centres in towns or a new development coming in.

Today, the competition comes from other new and changing format of shopping centres, for instance, the power centres, hypermarket, outlet centres, lifestyle centres, etc. Another challenge is that the internet shopping services have also given some impact to the shopping centres because this has changed how the shoppers behaviour. Therefore, it is critical to understand how shopping centre management currently operates today and how they are managing the challenges while maintaining the success of the centres.

It is a time for shopping centre to have a fresh look on focusing their core business and also considering the best options of facilities management (FM) service delivery to all their non-core services to the FM service provider for better services and cost effective.

CHAPTER 3: FACILITIES MANAGEMENT, ITS CONCEPTS AND SERVICE DELIVERY OPTIONS IN SHOPPING CENTRES

3.1 Introduction

This chapter begins with an introduction to facilities management, in order to provide an understanding about its concepts, scope, important functions and classification of tasks. As outsourcing is synonymous with facilities management business functions, therefore outsourcing concepts and its benefits/advantages and risks/disadvantages are also described in this chapter. In addition, the various types of outsourcing arrangement and the various types of facilities management service delivery models are also discussed. Finally, this chapter will look into facilities management services in shopping centres and how its service delivery options have been practiced.

3.2 Introduction to Facilities Management

3.2.1 The Various Concepts and Definitions of Facilities Management

Facilities Management (FM) is a relatively young industry; however since the late 1980s, it has gradually gained a grip as a discipline and profession within the property and construction industry (Tay and Ooi, 2001). Over the years, researchers and practitioners alike have provided many definitions that specify the objectives and scope of facilities management. Thus, the term “facilities management” or “FM” covers different disciplines and it is used to describe different activities.

From the perspective of support services, Alexander (1996) defined that FM is the process by which an organisation ensures that its buildings, systems and services support core operation and processes as well as contribute to achieving strategic objectives in changing conditions. Likewise, Barret and Baldry (2003) described that FM offers an integrated approach to maintaining, improving and adapting the buildings and other infrastructure of an organisation in order to create an environment that strongly supports the primary objectives of the organisation.

This also served to reinforce the definitions made by Tucker and Pitt (2008) that facilities management is the integration and alignment of the non-core services, including those relating to premises, required to operate and maintain a business to fully support the core objectives of the organisation. When defining the objective of service delivery, the Centre for Facilities Management (1992) observes FM as the process by which an organisation delivers and sustains a quality working environment and quality support services to meet the strategic needs and organisation's objectives at best cost.

Hinks (1996) argues that FM is indeed a means of contributing to the multidimensional enhancement of business competitiveness through the strategic management of the built asset, rather than the cost efficient management of the built asset for the benefits of the business. However, Spedding and Holmes (1994) believed that besides optimising the running costs of buildings, FM aims to increase the effectiveness of the management of space and related assets for people and processes, in order to ensure that the mission and goals of the organisation may be achieved with the best combination of efficiency and cost.

Looking at the professionalism point of view, The International Facilities Management Association (2006) describes FM as a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology. Similarly, The British Institute for Facilities Management (2008) defines facilities management as the integration of multi-disciplinary activities within the built environment and the management of their impact upon people and the workplace.

From a strategic management perspective, Nutt (2000) identified two levels of strategic objectives for FM: macro and micro levels. At macro level, the purpose is to provide an improved infrastructure and logistics to businesses of different types and across sector. At micro level, the objective is to effectively manage the facility resources and services in such a way that supports the core business of an organisation and its employees. On the other hand, Nutt (2004) observes that FM is the prime source for management of infrastructure resources and services with the focus to support and sustain the operational strategy of the organisation over time.

In term of managerial perspective, the American Library of Congress (1989) observes FM as the practice of coordinating the physical workplace with the people and work of an organisation, integrating the principles of business administration, architecture, and the behavioural and engineering services. Then (1999) emphasised that the practice of FM is concerned with the delivery of an enabling workplace environment – the functional space that supports the business processes and human resources. In addition, FM is described as the management of premises and services required to accommodate and support core business activities of the client organisation, while constantly adding value to the stakeholders (Alexander, 1999; Williams, 1999). Also, FM can be defined as integrated management of the workplace to enhance the performance of the organisation (Tay and Ooi, 2001).

Amaratunga et al. (2000) perceived FM as an umbrella term under which a broad range of property and user-related functions may be sought together for the benefit of the organisation and its employees as a whole. With dynamic facilities policy in accordance with corporate values may be persistently generated, leading to efficient response to issues covering space allocation and charging, environmental control and protection as well as direct and contract employment. Thus, FM provides greater bearing for the organisation in establishing values for users of facilities particularly the corporation, operating units, clients, individual employees and the public. As a result, the enormous growth in FM activities worldwide results in a diverse and highly competitive marketplace of the following distinctive related individuals such as FM contractors, in-house FM teams, FM suppliers, FM consultants and professional FM institutions (Nutt, 1999; Tay and Ooi, 2001).

Taking into account the asset management and operations perspective, Becker (1990) refers to FM as buildings in-use and involving planning, design, and management of occupied buildings and their associated building systems, equipment and furniture to enhance the organisation's ability to compete successfully in a rapidly changing world. In this light, facility management enhances organisational effectiveness. Thus, FM can be outlined as creating an environment that is conducive to carrying out the organisation's primary operations, taking an integrated view of the services' infrastructure, and using this to deliver customer satisfaction and best value through support and enhancement of the core business (Atkin and Brooks, 2005).

In addition, Atkin and Brooks (2005) suggest that a holistic definition of FM should emphasise the importance of integrative, interdependent disciplines whose overall purpose is to sustain an organisation in the pursuit of its business or objectives. They perceived that the FM service should aim to accomplish the following;

- Support people in their work and other activities
- Enhance individual well being
- Enable the organisation to deliver effective and responsive services
- ‘Sweat’ the physical assets to make them highly cost effective
- Allow for the future change in the use of space
- Provide competitive advantage to the organisation’s core business
- Enhance the organisation’s culture and image

Those definitions show that facilities management encompasses a wide-range of activities. This is because FM could mean different things to different parties, and scopes of services vary between organisations or departments. Tay and Ooi (2001) argue that these definitions give a lot of confusion regarding the identity and the scope of facilities management. Bridge and Baldry (1996) pointed out that it has been accepted that facilities management is rapidly developing and that definitions are, therefore, likely to come under pressure as circumstances change, and also may be lacking in one or more aspects. Although this is true, however, these definitions have significant contributions to make to the theoretical development in facilities management.

Based on the reviews of several definitions above, this research has developed a new definition of facilities management that suitable with the research undertaken. The research defines that facilities management is the integration and arrangement of the non-core services through the best service delivery options in order to support and sustain the core business of the organisation at the best cost.

3.2.2 The Scope of Facilities Management Services

In defining the scope of FM services, Thomson (1990) had some success in getting practitioners to agree with his representation of a generic facilities area. Thomson then describes a generic FM area which he considers as having four primary functions:

1) Real estate and building construction

This is concerned with buildings as much as surveyors, property managers and project managers.

2) Building operations and maintenance

This is concerned with the performance of the building shell and services as engineering/technical professionals.

3) Facility planning

This is concerned with the use of buildings, their capacity and ability to cope with changing demands through time.

4) General/office services

This is concerned with the administrative activities that support the operations of buildings and their occupants

However, in 1993 the RICS FM Skills Panel considered facilities management to consist of three distinct but interrelated areas (Clark and Hinxman 1999):

- 1) The management of support services
- 2) The management of property (including the property as an asset and the building services)
- 3) The management of information technology

In addition, The Chartered Institute of Building (CIOB) has taken a particular view of facilities management which is highlighted in the areas of built asset management; strategic property management; organisation – people and processes; valuations; and contract procedures. These five main groupings of activity take place within the practice environment of facilities management, which also relates to the organisation's business environment, and encompasses all the particular processes of facilities management, many of which are made more efficient by the use of information technology (Spedding and Holmes 1994).

Figure 3: The scope of facilities management

When examining the scope of facilities management, Alexander (1991) and Barrett (1995) suggested the principal components of FM can be described as (see Figure 3):

- 1) The premises
- 2) The support services
- 3) The information services/information technology

By taking Alexander's three principal components of FM, Barrett (1995) proposed to express FM, tying in to it the concepts of core and non-core business. He suggests that in some organisations there is some component expressed as part of core business and in others as part of non-core business. According to Barrett, FM can be described as three of the four components supporting the core business (Figure 3.1).

Figure 3.1: FM supporting the organisation's core-business

On the other hand, Alexander (1996) also believed that the scope of FM discipline covers all aspects of property and space management, environmental control, health and safety and support services, and requires that appropriate monitoring and control centres are established in the organisation. In a similar perspective, Atkin and Brooks (2005) pointed out that the scope of facilities management in practice can cover a wide range of activities and services, including real estate management, financial management, change management, human resource management, and health and safety and contract management, in addition to building maintenance, utilities' suppliers and domestic services, that is cleaning and security.

In term of FM's practice, IFMA (2006) developed the broad categories of facilities management functions in its competency framework, which identifies nine key competencies required of a certified professional facilities manager. In this context, the scope of facilities management has been broadly categorised into operations and maintenance, real estate, health and environmental management, planning and project management, leadership and management, finance, quality assessment and innovation, communication and technology.

In spite of a wide range of activities and services in facilities management, Tay and Ooi (2001) conclude that there is no definitive list to the scope of FM, and it varies from organisation to organisation.

3.2.3 The Important Functions of Facilities Management

Becker (1990) views FM as a function or series of linked activities involving the coordination of all efforts relating to the planning, design and management of an organisation's physical resources. In this regard, 'physical' includes spatial, environmental, human and financial resources. Nutt (1992) stated that FM's

- Focus is on 'post-occupancy' rather than 'pre-occupancy' issues;
- Central rationale is management decision and implementation;
- Responsibilities cover all of the five primary types of resource: physical, spatial, environmental, human and financial;
- Concern is with an integrated approach and does not concentrate on any particular part of the problem field.

FM's aim is organisational effectiveness by helping the organisation to allocate its resources in a way that allows it to flourish in competitive and dynamic markets (Becker, 1990). Then and Akhlagi (1992) have shown (see Figure 3.2) how FM applies these resources to achieve its policy of supporting the delivery of the organisation's core business. The resources show the physical input required, whilst application indicates the management input required. Meanwhile, the policy is related to the process of delivery.

In terms of FM's supporting role, Kincaid (1996) identifies three distinctive characteristics of facilities management:

1. FM is a support role within an organisation, or support service to an organisation
2. FM must link strategically, tactically, and operationally to other support activities and primary activities to create value
3. Managers must be equipped with knowledge of facilities and management to carry out their integrated support role.

Figure 3.2: Facilities Management Context

The role of facilities management aims to achieve the following objectives (Hamilton, 2004):

- To communicate well at all levels
- To establish procedures, schedules, programmes, benchmarking and feedback
- To lead and be pro-active
- To identify and provide the services essential to the organisation and consider contracting out/partnering for others
- To utilise existing expertise and be able to delegate and trust staff

Alexander (1996) and Hamilton (2004) provide the following additional roles of facilities management:

- Creating a facilities policy that expresses corporate values
- Giving authority to the facilities business unit to improve service quality
- Developing facilities to meet business objectives, recognising the value that facilities add to the business
- Being essentially strategic and business directed, with a focus on what the organisation requires in the future
- Maximising value and gaining competitive advantage

- Control and sustainability of computerised integrated management systems; in order to achieve more informed decision-making from the vast amount of facilities data to be recorded
- Management outsourcing and partnership agreements
- Environmental control
- Energy management
- Identifying customer needs and how to satisfy them

On the other hand, Spedding and Holmes (1994) suggested that the generic FM mission can be achieved through the provision of effective working environment, and optimisation of service quality and cost, as well as maximising and sustaining property value. However, they realised that the aim of facilities management should not just be to optimise running costs of buildings, but to raise the efficiency of the management of space and related assets of people and processes, in order that the firm's mission and goals might be achieved by the best combination of efficiency and cost.

Overall, the vital function of FM is to support the organisation's core business or activities for improved economic outcomes. FM organisation is responsible to manage the infrastructure/facilities and property in order to achieve optimum productivity, constant quality improvement, cost reduction and risk minimisation, and ultimately improve value for money. The proper application of facilities management techniques enables organisations to provide the right environment for conducting their core business on a cost-effective and best value basis.

3.2.4 The Classification of Facilities Management Tasks

Then and Akhlagi (1992) have classified facilities management tasks into three distinctive groups (Table 3.1);

1. Strategic Facilities Management

This involves integrating the FM into the overall business plan of the organisation. It is important to gain an understanding of the business organisation in order to provide the right services at the right time, cost and in the right place.

2. Tactical Facilities Management

This includes providing an infrastructure within the organisation to support the management of service delivery and laying down policies for service delivery

3. Operational Facilities Management

This is the process of service delivery.

The classification in Table 3 provides a matrix for classifying tasks that are associated with the property-related aspects of facilities management, in which the vertical divisions reflect increasing strategic involvement as they move from a project task role to an executive responsibility role, and where the horizontal divisions reflect the strategic, tactical and operational management levels (Then and Akhlagi, 1992; Then and Fari, 1992).

At the strategic management level, Alexander (1996) argues that the strategic FM role entails the following:

- Formulating and communicating a facilities policy
- Planning and designing for continuous improvement of service quality
- Identifying business needs and user requirements
- Negotiating service level agreements
- Establishing effective purchasing and contract strategies
- Creating service partnerships
- Systematic service appraisal, quality, value and risk

Table 3: Classification of FM Tasks

Meanwhile, at the tactical management level, Alexander (1996) perceived that facilities management works are basically emphasised on the organisation and administration procedures. This involves monitoring, controlling and managing the operational facilities management services in order to ensure that the operations are well performed in accordance with the organisation's requirements or standards as well as implementing the policy, strategy and plan. At the operational management level, he stated that the scope of operational FM tasks covers all types of daily and routine services on the workplace. This is also concerned with the effectiveness of the service functionality in an organisation.

According to Then and Fari (1992) the range of tasks covered within the matrix may be carried out in an organisation either by a facilities manager or by any individual who may not be recognised as being facilities-related. Then and Akhlagi (1992) noted that every item of the FM tasks represents a category of decisions that have to be made at various management levels with skills required to make and implement them or to access their effectiveness and performance.

Figure 3.3: How Facilities Management Works

On the other perspectives, Barrett (1995) classifies facilities management work according to its implementation in the management functions and operational functions of an organisation. Figure 3.3 attempts to show how management can be divided into strategic, tactical and supervision; and how supervision ties in with the implementation aspects of operational.

According to Barrett, management functions comprise the “thinkers”: the managers, and planners, the consultants, etc., with activities ranging from organising and strategic planning to staffing, directing and controlling. Meanwhile, operational or implementation functions comprise the “doers”, who may be thought of as the craftsmen, artisans, contractors, technicians or industrial staff, i.e., they cover the operational and implementation aspects of service provision. For each management function, a reciprocal operational function is determinable.

Figure 3.4: How Facilities Management is Carried Out

Also, Barrett (1995) found out that the split between 'management' and 'operational' in an FM context is reflected in the way 'suppliers' approach FM (Figure 3.4). Professional firms of consultants in the FM marketplace tend to approach matters from a consultancy viewpoint. FM contractors tend to approach matters from an Implementation or Operational Function viewpoint. For either to become truly Total FM providers there is the need to add the other half of the equation. For example, to manage a shopping mall, Europa TFM still need to add estates managers, M&E engineers, etc., to plan, control, direct, etc.; whilst a management consultant would have to add Operational Functions to their service to offer Total FM. They would probably do this by sub-contracting, e.g. for cleaning, security, fleet hire, etc.

3.3 Outsourcing in Facilities Management

3.3.1 Outsourcing Concepts

Outsourcing is not a new concept (Winkleman et al., 1993; Huff, 1991; Moran and Taylor, 1988). There are several theories that have been developed in various disciplines, which are frequently, if not constantly referred to, summarised and discussed in today's published research on outsourcing. Busi and McIvor (2008) identified a top-10 list of the ten theories which they came across most frequently in a lot of research on outsourcing. These are; Transaction cost theory; Resource-based view; Principal agent theory; Vertical integration theory; Strategic management; Evolutionary economics; Relationship market/view; Industrial economics; Strategic alignment theory; and Core competence theory. Busi and McIvor (2008) found out that the knowledge roots of outsourcing stretch back to almost 70 years ago.

However, this concept has been practised dating back to eighteenth-century England and has been in continuous use in numerous industry sectors since it received impetus in the latter half of the 1980s and 1990s in the emerging service sector (Whang, 1992; Ang and Straub, 1998). Outsourcing is a term invented at the end of the 1980s for subcontracting information systems. In the past, most subcontracted services referred to component manufacture or to information system, although in recent years, many other functions in different sectors have been outsourced, e.g., administration services, human resources activities, telecommunications, catering services, customer services, security, logistics, etc (Greaver, 1999). The word "outsourcing" is used in many cases to be synonymous with the decision to externalise or externalisation. It is understood as a natural result of specialisation and the decision as to whether an organisation should 'make or buy' to ensure the supply of goods or services necessary for a firm's operation (Moran and Taylor, 1998).

Gilley and Rasheed (2000) point out that outsourcing is not just a simple decision to make or buy, since all companies acquire goods or services outside; they believe that outsourcing means refusing to carry out an activity in-house. To be specific, outsourcing basically consists of contracting from a supplier an activity previously carried out internally, or even new activities.

Franceschini et al (2003) perceived that outsourcing is a management approach that allows the delegation to an external agent of operational responsibility for processes or services previously delivered by an enterprise. However, Sanders and Locke (2005) emphasise that the basic concept of outsourcing is unambiguous: it involves choosing a third party or outside service provider to perform a function or tasks supporting that function in order to incur business benefits.

In contrast, doing everything in-house might be comfortable, but it is not always effective or efficient (Reuvid, 2005). There are several primary reasons why an organisation considers outsourcing. According to McCarthy (1996) the reasons are:

- Outsourcing allows companies to refocus their resources on their core business.
- Corporations can buy technology from a vendor that would be too expensive for them to replicate internally.
- Outsourcing lets companies re-examine their benefit plans, making them more efficient, and saving time and money, while improving efficiencies.
- Companies outsource to improve the benefits plan service level to their employees by making the information more consistent and more available.
- A final possible reason is to reduce costs, certainly over the longer term.

Typically, the decision to outsource was traditionally based on cost reduction. However, the motives for organisations to outsource have changed, and now include others related to operational objectives, such as quality, flexibility and service (Rodriguez and Robaina, 2004). Furthermore, many organisations believe that there is a need for outsourcing to provide the following crucial drivers that lead to change in the business environment: competitive pressures of global economy, swiftly changing technologies, niche rivals that can change industries overnight, high demands of institutional investors, and governments' demand for improved services and less taxes (Outsourcing Institute, 2005; Greaver, 2007).

The need to respond to market changes on a daily basis and the difficulty of predicting the direction of such changes mean that organisations must focus on their core competences and capabilities (Rodriguez and Robaina, 2004). To focus, according to Kanter (1990) is to make companies aware of their goals and concentrate on the products and activities they know best, eliminating parallel activities which waste energy.

Pagnoncelli (1993) agreed with Kanter and states that outsourcing is the strategic decision to concentrate on the business it knows best, seeking quality, productivity and competitiveness, and not only reducing costs and staff.

This leads to outsourcing in those areas that can be improved by specialist companies, in other words, turning to external sources to achieve the desired objective. However, it will be difficult to reach the objective of any business if there is no co-operation. This is because the more complex the task, the greater the necessity of partnership. Therefore, the companies should look for partnership everywhere: with clients, suppliers, unions, employees, government, research centres, universities, and even competitors (Pagnoncelli, 1993).

Today, the utilisation of outsourcing approach is rapidly developing in the United States, Europe and in Asian countries (Outsourcing Institute, 2005). In fact, outsourcing is growing rapidly as an industry and as a business model, covering a widening range of services and processes (Reuvid, 2005). In spite of its growth, Busi and McIvor (2008) provide another top-10 list (Cited in Busi and McIvor, 2008) of the current knowledge of outsourcing in research (See Table 3.1).

Table 3.1: The Current Knowledge of Outsourcing in Research

The last decade of this concept has showed an evolution in outsourcing processes from traditional to strategic. Outsourcing is considered traditional if a process not considered “critical” for the organisation is outsourced, e.g., catering services or cleaning services. Strategic outsourcing is “when companies outsource everything except those special activities in which they could achieve a unique competitive edge” (Franceschini et. al., 2003).

3.3.2 Types of Outsourcing

It has been mentioned that the need for outsourcing has changed and has evolved from traditional to strategic outsourcing. Reuvid (2005) found out that the range of outsourcing arrangements has evolved to match these needs. The level of value created by outsourcing is significantly different in each case and the relationship and governance issues are substantially different (Figure 3.5).

Figure 3.5: Key Types of Outsourcing

Reuvid (2005) classifies outsourcing practice into three key types of outsourcing. These include:

- **Conventional/Traditional Outsourcing**

This traditional outsourcing is about doing the same task at lower cost, or doing it better for the same money. It is about sweating assets. The client/outsourcer achieves this through economies of scale, spreading resources and assets, and by applying best practice tools and processes. Typically non-core or 'chore' activities are outsourced, purely with cost reduction in mind. However, there are other initiatives being offered by outsourcers/service providers that do offer other means to reduce costs.

- **Problem-solving Outsourcing**

This problem-solving outsourcing allows organisations to gain control, in terms of cost and operations, of certain troublesome business functions. Typically, these solutions are considered for business areas that are unable to meet service demands satisfactorily, culminating in workload backlogs and potentially incurring unbudgeted spend, such as acquiring additional resources.

Justifying this outsourcing approach is usually a combination of tangible benefits, such as cost control and improved measurable service quality, and intangible benefits, such as customer satisfaction through stability of service.

- **Transformational Outsourcing**

This transformational outsourcing offers the ability to use outsourcing to bring about a step-change in the organisation. It focuses on three main areas: technology, business and financial. The essence of transformational outsourcing is the strength of a wide-ranging outsourcing supplier that can take on existing services, implement new technology and business processes and bundle these initiatives into a commercially attractive package.

However, Rodriguez and Robaina (2004) have distinguished different types of outsourcing depending on the degree of decision analysis, the range, the degree of integration, the property relationship, the level of administrative control, and ownership (see Table 3.2). For examples, if the outsourcing is dependent on the classification criterion of the degree of decision analysis, there are two types of outsourcing that meet this criterion: tactical and strategic.

The analysis made in the case of tactical outsourcing is very simple, since the decision is often taken intuitively and is based on costs, with no consideration of the other benefits and risks involved in that decision. However, the analysis made in strategic outsourcing is more detailed, involves all managers and follows a rational process of decision-taking. Strategic and tactical outsourcing differ in that in the former it is possible to outsource activities essential to the company that are not core competencies, leading to medium or long-term co-operation with the supplier.

Table 3.2: Types of outsourcing

On the other hand, Sanders and Locke (2005) have based their research on outsourcing experiences' perspectives and have categorised the outsourcing arrangements into four groups (Figure 3.6);

1. Out-tasking

This is a specific assigned to an outside service provider. The task is limited in scope, and the service provider's responsibility is confined and specific. Generally, the service provider is charged with reporting problems in those areas but not assuming ownership of solutions to those problems; that responsibility remains with the customer. When activities are out-tasked, the business risks from substandard service provider performance are fairly minor.

2. Co-managed services

The scope of the work performed by the service provider is greater, but the overall project remains under the client's direct control. The client and the service provider share responsibility for managing the tasks and assets, and in many cases, they work collaboratively. Although the overall function can have strategic impact, the service provider typically carries out the tasks that have less strategic significance. For the most part, shared aspect of co-managed outsourced services means that the service provider has access to and handles some of the management of the client's assets. Risks associated with poor service provider performance are still relatively small as the service provider usually works on less strategic tasks in collaboration with the client.

Figure 3.6: Characteristics of the Four Outsourcing Options

3. Managed services

The service provider is responsible for design, implementation and management of an end to end solution for a complete function. In a managed relationship, the service provider is responsible for all aspects of the function, including equipment, facilities, staffing, software, implementation, management and ongoing improvement. In this type of relationship, clients generally expect the service provider to have deep industry knowledge; they also will hold the service provider accountable for meeting applicable rulings and standards.

A managed-service arrangement can offer significant benefits. Clients can not only farm out noncore activities but also tap into the service providers' unique talents and skills. However, managed services relationships carry far greater business risk because of the new dependencies on the service provider's performance.

4. Full outsourcing

The client assigns total responsibility to the service provider for the design, implementation, management and often the strategic direction of the function, operation or process. The services are almost always highly customised to the client's business needs. The service provider usually owns the assets that support the services. With full outsourcing, the service provider is charged not only with day to day execution but with ongoing development of the tools and staff that support the business process.

Figure 3.7: Scheme of the four types of outsourced-outsourcer relationships based on different levels of complexity and specificity.

In terms of the types of relationships between “outsourced” and “outsourcer”, Downey (1995) found out that there is many different types of outsourcing relationship may be considered. Franceschini et. al. (2003) analyse them through investigating it in according two main characteristics: “specificity” and “complexity”. Specificity refers to the level of reutilisation of the considered goods/process for many different uses. It can depend on physical location or unique skills in terms of resources and techniques. Complexity refers to the difficulty of monitoring and defining contract terms and conditions of the outsourcing process. Two levels of evaluation, low and high, define each characteristic. The combination of the two characteristics gives rise to four types of relationships: Traditional vendor; Temporary relationship; Strategic union; and Network organisation (Figure 3.7).

A detailed map of the main characteristics of “outsourced” – “outsourcer” relationships is reported and summarise in Table 3.3.

Table 3.3: Main characteristics of different types of outsourced-outsourcer relationships

The decision to outsource and choosing the right options can be made subjectively or objectively by an organisation. This is because different organisations have different needs on practicing outsourcing. However, decision to outsource basically leads to both advantages and disadvantages.

3.3.3 Advantages and Disadvantages of Outsourcing

1) Advantages of Outsourcing

Most organisations agree that outsourcing creates competitive advantage when products or services are produced more effectively and efficiently by outside suppliers. This lends credence to the observations of Gilley and Rasheed (2000), that organisations are increasingly turning to outsourcing in an attempt to enhance their competitiveness. This is because the firms that outsource may achieve long-run advantages compared to firm relying on internal production. Pagnoncelli (1993) found out the main benefits of managed outsourcing are:

- Greater capacity to adapt to changes;
- Concentration of efforts on products or services which the company knows best;
- Simplifying the production process;
- Improving quality of the product or services;
- Improving productivity to achieve better competitiveness;
- Reducing costs and property;
- Creating space;
- Creating a suitable environment for any innovations which occur;
- Establishing new small and medium-sized businesses;
- Widening the market for small and medium sized companies already established;
- Professional value (utilising employees in the programme);
- Forming partnerships;
- Reducing the dependence of some communities in relation to the company, and vice versa.

Additionally, Lankford and Parsa (1999) observe that the advantages in outsourcing can be operational, strategic or both. Operational advantages usually provide short-term trouble avoidance, while strategic advantages offer long-term contributions in maximising opportunities. Perhaps this lends credence to Quinn's (1992) remarks that "virtually all staff and value chain activities are activities that an outside entity, by concentrating specialists and technologies in the area, can perform better than all but a few companies for whom that activity is only one of many". A much better reason is the specialised knowledge that the contractor can provide (Davies, 1995).

Cutting costs and cost efficiency are the foremost benefit gained from outsourcing. All businesses, including those competing through differentiation, need to achieve low cost. Outsourcing can produce an immediate cost reduction by decreasing the capital investment required to improve processes. So, the objective cost reduction is achieved by the supplier taking advantage of economies of scale (Rodriguez and Robaina, 2004).

Bettis et. al. (1992) concur that outsourcing firms often achieve cost advantages relative to vertically integrated firms. Moreover, the decision to outsource enables an organisation to achieve cost reduction, expand services and expertise, improve employee productivity and morale, as well as achieve greater potential towards sharpening corporate image (Fill and Visser, 2000). Fill and Visser also note that outsourcing allows companies to better weather market downturns while accepting only slightly lower earnings during favourable economic periods. The short-run cost improvement swiftly reinforces the outsourcing decision (Bettis et. al., 1992). Blumberg (1998) considers that outsourcing can generate economic advantages that may reduce costs by between 20% and 40 %.

Furthermore, Gilley and Rasheed (2000) observe that firms focusing on outsourcing can switch suppliers as new, more cost effective technologies become available. On the other hand, in-house production increases organisational commitment to a specific type of technology and may constrain flexibility in the long run (Harrigan, 1985). Indeed, outsourcing has helped companies ameliorate competitive pressures that squeeze profit margins and eliminate investments in fixed infrastructure, which allows for improved quality and efficiency; increased access to functional expertise; and offers potential for creating strategic business alliances and fewer internal administrative problem (Fill and Visser, 2000). In addition, outsourcing allows for a quick response to changes in environment (Dess et. al., 1995) in ways that do not increase costs associated with bureaucracy (D'Aveni & Ravenscraft, 1994).

An increased focus on an organisation's core competencies is another crucial benefit associated with outsourcing (Dess et. al.,1995; Kotabe & Murray, 1990; Quinn, 1992; Venkatraman, 1989). Outsourcing non-core activities allows the firm to increase managerial attention and resource allocation to those tasks that it does best and to rely on management teams in other organisations to oversee tasks at which the outsourcing firm is at a relative disadvantage (Gilley and Rasheed, 2000).

Outsourcing has some non-financial benefits. Kotabe & Murray (1990) observe that it promotes competitive among outsider suppliers, thereby ensuring availability of higher quality goods and services in the future. Dess et. al., (1995) and Quinn (1992) add to the non-financial advantages of outsourcing: quality improvements may also be realised by outsourcers because they can oftentimes choose suppliers whose products or services are considered to be among the best in the world.

Outsourcing also spreads risk. This is because by using outside suppliers for products or services, an outsourcer is able to take advantage of emerging technology without investing significant amounts of capital in that technology. Hence, the outsourcer is able to switch suppliers when market conditions demand.

Blumberg (1998) provides a fresh perspective to the list of potential benefits gained from outsourcing: effective means of reducing costs by contracting with a third party who can provide better service and high quality at lower cost, improvement of operating efficiency, increased return on assets and improved profitability.

Wise (2007) provides further benefits of outsourcing:

1. Current business trends indicate that outsourcing is the way to go (especially in IT functional areas)
2. Results of short-term financial analysis usually support outsourcing rather than in-house options
3. Outsourcing enables the organisation to pick the best service provider in terms of experience, quality, speed and efficiency.

In a broader perspective, Greaver (2007) perceived the priority of outsourcing depends on which chair one sits. Outsourcing requires professional and strategic approach as it has long term inferences. In this context, the significant reasons for outsourcing can be listed as shown in Table 3.4.

Table 3.4: Reasons to outsource and related benefits

In summary, the Outsourcing Institute (2005) pointed out that a successful outsourcing approach or implementation may evolve in the balance of the two notable elements: infusing and implementing best practices and methodologies, with unit cost savings, truly value-added services and guaranteed service-level commitments and culture, language, relationship and empathy.

2) Disadvantages of Outsourcing

Even though outsourcing offers several advantages, however if it is not adopted in an organised way, it may present several disadvantages. These include becoming dependent on outside suppliers for services, failing to realise the purported hidden cost savings to outsourcing, losing control over critical functions, having to face the prospect of managing relationships that go wrong and lowering the morale of permanent employees (Currie and Wilcocks, 1997; Kliem, 1999). Moreover, outsourcing can generate new risks, such as the loss of critical skills or developing the wrong skills, the loss of cross-functional skills, and the loss of control over suppliers (Quinn and Hilmer, 1994; Domberger, 1998). These risks are especially pertinent when the supplier's priorities do not match client needs.

On the other hand, Bettis et. al (1992) and Kotabe (1992) note that reliance on outside suppliers is likely to lead to a loss of overall market performance. One of the most serious threats resulting from a reliance on outsourcing is declining innovation by the outsourcer (Gilley and Rasheed, 2000). Additionally, outsourcing can lead to a loss of capacity for and benefits of long-run research and development (R&D) (Teece, 1987). This is because it is all too easy to use outsourcing as a substitute for innovation. As a result, firms that outsource are likely to lose touch with technological breakthroughs that offer opportunities for product and process innovations (Kotabe, 1992).

From the business perspective, outsourcing vendors may gain knowledge of the product being manufactured and in fact use the knowledge to begin marketing the product on their own (Prahalad & Hamel, 1990). Gilley and Rasheed (2000) cite an instance where many Asian firms have made their initial entrance into the U.S. markets by first entering supplier arrangements with U.S. manufacturers and subsequently aggressively marketing their own brands. Therefore, many Asian firms have achieved market dominance over their U.S. rivals.

In this context, Coilings (2007) lists the problems experienced with outsourcing to include the following:

1. Outsourcing vendor unable to deal with volume of activities.
2. Variance in work ethic between organisation and outsourcing vendor.
3. Outsourcing vendor unable to perform task in specified time and fails to produce contractual results.
4. Inadequate contract performance measures and penalties
5. Lack of capability to deal with time management when associating with outsourcing vendor.
6. Lack of flexibility
7. Contract solely focuses on costs cutting issues.

3.3.4 Facilities Management Outsourcing

The facilities management (FM) industry evolved during the 1980s as businesses outsourced activities such as the management and maintenance of workplaces (WME magazines, 2007). Over the past ten years, there has been significant shift toward the outsourcing of facility and real estate services in both public and private sectors (Price and Akhlaghi, 1999; Jones, 2000; Roberts, 2001). This is because in times of economic recession, non-core activities become the focus for cost-saving exercises. As a result, outsourcing of non-core activities to third parties has become a popular trend with many organisations, both from the public and the private sector (Johnson, 1997).

Moreover, by having to contract one or more organisation's FM business processes to an outside service provider to help increase shareholder value, will primarily reduce operating cost and focus more on core competencies (HRO Today, 2003). In addition to that, an organisation also can leverage its financial resources, share its financial risk and allow management to concentrate more fully on core business activities. According to Atkin and Brooks (2000) FM services are also mostly quite simple, and for most clients they represent non-core support services. In contemplating the mix of support services needed by a company, such as cleaning, security, real estate maintenance, as well as mechanical and electrical maintenance, it is easy to see the diversity of the tasks involved.

Salonen (2004) argues that owing to the simplicity of the FM services, organisations in the FM service market usually have no chance to gain a competitive advantage by standing out from the rest by technical differentiation. Today, facilities management outsourcing extends beyond traditional activities, such as maintenance, landscaping and security, to include diverse functions such as human resources, website technology and all aspects of facility management responsible for the sophisticated systems that are an integral part of today's buildings.

In some cases, facility management has been combined with overall property portfolio management (Langston and Kristensen, 2002). With the extensiveness of the facilities management role, outsourcing becomes the ideal prospect and valuable source for the demanding FM due to the restricted internal resources (Practical FM, 2006).

Blumberg (1998) lists the viable circumstances for which the FM functions are suitable for outsourcing:

- Clients are concerned with the outcome of the functions performed and pay little attention to the process
- Capabilities are readily available in the mass market and proximity or access to the customer is not an issue
- The technology to perform the function is very stable
- World class performance is a critical success factor
- External service providers are clearly more competent

However, the key to deciding what to outsource rests with those elements that differentiate the organisation, especially in the areas of value and quality (Fill and Visser, 2000). Each organisation may develop its own view as to the services it wishes to outsource, depending on its definitions of core and non-core business. Hui and Tsang (2004) emphasised that there are a number of FM outsourcing options available when in-house FM is out of the question.

There are four basic FM outsourcing options identified:

1. A diverse range of services are contracted out piecemeal by a range of managers from various parts of the organisation. Although on the face of it this appears to lack a co-ordinated strategic approach, it may in fact represent a pragmatic view for some types of organisation.
2. A centralised control of outsourced service contracts has, however, become a much more common approach and has many benefits in terms of achieving value for money from the exercise. Centralised monitoring of service quality fosters the development of expertise and better evaluation, with the potential to draw comparisons and even engage in internal benchmarking exercises and co-ordinated and shared data.
3. The grouping together of a number of contracts is referred to as 'bundling'. This approach begins to move the organisation seriously towards a much more strategic view in terms of decision-making. There are various levels of bundling. At one extreme the collection of services having similar characteristics may occur to form a number of 'bundles'.
4. Total FM places all service contracts under the direct control of an FM company. This creates an environment that has the potential to deliver very efficiently but clearly has attendant risks. To manage such a service requires sophisticated control and monitoring systems and requires a service provider with lightly developed management skills. There is obviously a large amount of trust implicit in this approach, and partnering arrangements, particularly in the public sector, are becoming commonplace. The provider is unlikely to be able to offer the complete package of services in-house and some elements may be subcontracted. This has the potential to create complications, particularly in respect of accountability.

To understand the importance of decision-making in choosing sourcing strategy in facilities management, Hui and Tsang (2004) developed a decision matrix that provides guidance for making a sourcing decision (Figure 3.8).

Figure 3.8: A decision Matrix for selecting a service delivery option

Based on Kakabadse and Kakabadse's (2000) perspectives, this decision matrix framework is takes into account both the scope and the purpose of sourcing. According to this decision matrix, if a service is regarded as essential and the purpose of sourcing is for maintaining or developing a capability, the activity will be classified as core and, in the decision matrix, it should be in-sourced.

Although the decision to outsource was traditionally based on cost reduction, however, the motives for organisations to outsource have changed, and include others related to operational objectives, such as quality, flexibility and service (Slack, 1993). In addition to that, cost, quality, motivation, flexibility and availability of skills are all practical reasons why out-sourcing may work to the core business advantage for the organisation (William, 1999).

In making the right decision to outsource FM services,, Atkin (2003) suggests the process that should be taken into account, is:

- Organisation should identify the key characteristics of services they require so that a balanced view of needs is established as the basis for evaluating available options as part of the decision to retain in-house or to outsource.

- Organisation should define their own evaluation criteria with respect to these attributes of service so that the importance or weight given to options is truly reflective of the organisation's real estate and facilities management strategies and policies.
- Attention should be paid to direct and indirect costs of both in-house and contracted service provision made on like-for-like basis to enable decisions to be taken on best value grounds.
- Support services should represent the best value, on the basis of affordability, in the implementation of the objectives of the organisation's strategic plan, irrespective of the cost of those services.
- Evaluation criteria for the sourcing decision must embrace hard and soft measures and compare all costs with the required quality
- Roles and skills must be defined from the services to be provided, with specialist skills highlighted.
- Since the factors affecting the choice of in-house or outsourced facilities management may change, the route by which services are procured should be reviewed at appropriate intervals and in an appropriate manner.

Consequently, Atkin (2003) foresees that there will be advantages or disadvantages to providing FM services either in-house or by outsourcing. Nevertheless, there are no hard and fast rules concerning what should be kept in-house and what should be contracted out (Barrett, 2005). Likewise, Atkin (2003) also argues that there is no general rule in this regards, rather a need to define the thinking, practice and procedures that will lead to best value for the organisation.

3.3.5 Advantages and Disadvantages of FM Outsourcing

1) Advantages of FM outsourcing

The advantages of the outsourcing of FM services are mainly due to economies of scale (Krumm et al., 1998). It is possible to take advantage of the economics of scale by bundling either a mix of different services or site under one contract. A "site" here is understood as a single building or a complex of adjacent buildings.

By bundling services regionally, cost advantages are created, which service providers can convert into corresponding lower prices or higher service levels, novel technologies or the creation of new and innovative structures and procedures (Meneghetti and Chinese, 2002). In addition, advantages are created when economies of scale and speed are combined with administrative co-ordination (Anderson and Matsgard, 1996). The effect of forming larger service packages is that it reduces the number of potential providers.

On the other hand, Hassanain and Al-Saadi (2005) have listed the advantages of FM outsourcing, along with the rated priority of each to the municipal organisation as perceived by the senior management staff who answered the survey. The advantages and the rated priority from the study have shown in Table 3.5.

From the users' or customers' perspectives, Barret and Baldry (2003) have listed the perceived advantages of FM outsourcing in Table 3.6. They rank the advantages in ranking order in accordance with the research that has shown them to be most frequently occurring in the literature on this subject.

Table 3.6: User perceived advantages of Outsourcing in ranking order

In seeking the benefits of outsourcing arrangement, Burdon and Bhalla (2005) have categorised the advantages of FM outsourcing arrangement into essential, primary benefits, secondary benefits and 'nice to have'. According to their study, the advantages of FM outsourcing in accordance to the categories are shown in Figure 3.9;

Figure 3.9: Categories of FM outsourcing advantages

2) Disadvantages of FM Outsourcing

Studies on FM outsourcing tend to highlight on the advantages rather than the disadvantages of outsourcing in facilities management. Price (2006) highlighted this issue, pointing out that facilities management has become a hot topic in today's business environment and considerable attention is being paid to the benefits that can be achieved.

However, in 1993, the International Facility Management Association (IFMA) conducted a survey of various companies to get their feedback with regards to the early involvement of the facilities management profession in FM outsourcing. Johnson (1997) reported the results of this survey, which show that companies recorded disappointments with FM outsourcing. These disadvantages and the percentages are shown in Table 3.7.

Table 3.7: Disadvantages for FM outsourcing/out-tasking

In addition, Barret and Baldry (2003) have provided several risks or disadvantages associated with FM outsourcing. These potential disadvantages are summarised and ranked in Table 3.8

Table 3.8: User perceived disadvantages of outsourcing in ranking order

Another attempt to record the disadvantages of FM outsourcing was made by Hassanain and Al-Saadi (2005) in their research on FM outsourcing in municipal organisations. The study listed the disadvantages of FM outsourcing, along with the rated significance of each, as perceived by the senior management staff who responded to the survey. The disadvantages and the rated significance from the study are shown in Table 3.9.

Table 3.9: Disadvantages of FM outsourcing and their perceived severity

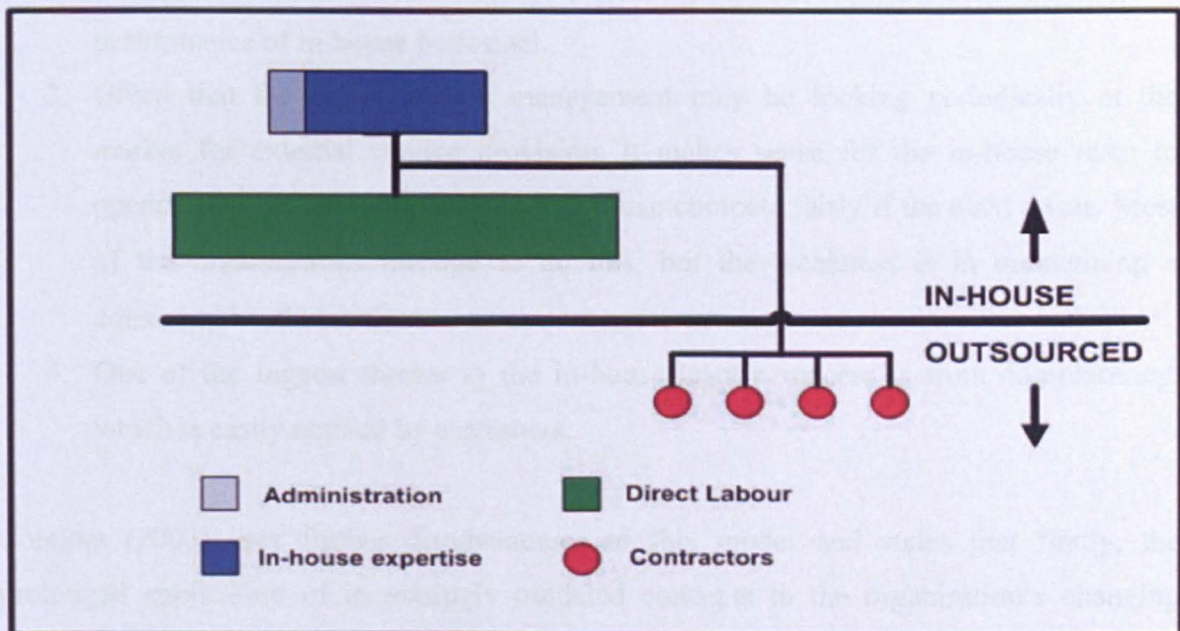
3.4 Facilities Management Service Delivery Models

According to Atkins and Brooks (2005), there is no universal approach to managing facilities. Each organisation will have different needs even within the same sectors. Understanding those needs is the key to effective facilities management measured in terms of providing best value. Payne (2000) found out that the portfolio of services and the range of options relating to the various combinations of service delivery have sparked discussion and debate over the merits of certain modes of service delivery. William (2003) identified that there is a number of FM service delivery models ranging from in-house provision to total outsourcing operating in the UK market. The various models of FM service delivery are described below.

3.4.1 Direct Labour Organisation – minimal outsourcing

The first model, Direct Labour Organisation at Figure 3.10, represents an organisation which delivers FM services predominantly with in-house, directly employed staff. The structure's model is known as a traditional approach, where in early days, there were many organisations that directly employed all the staff needed to run and maintain premises and business support services. These organisations only buy in specialist services such as mechanical and electrical (M&E) and lift maintenance as needed.

Barret and Baldry (2003) observed that this model typically is provided by dedicated resources directly employed by the client organisation, where monitoring and control of performance is normally conducted under the terms of a conventional/employee relationship, although internal service-level agreements may be employed as regulating mechanisms. Williams (1999) note that many in-house set-ups may be uncompetitive in financial and performance terms. He further observes that cost, quality, motivation, flexibility and availability of skills are all practical reasons why outsourcing may work better for the core business advantage of the organisation than in-sourcing. Williams (2003) argues that it is possible that one or two examples of 100% in-house operation still exist, but probably not on a large scale.



Source: Adopted from Williams, 2003 and modified by Musa

Figure 3.10: Direct Labour Organisation

Wise (2007) provides insight to the benefits of this model:

1. People who are in-house own their work. In-house employees usually will perform better than outsourced employees who make decisions based on how they will affect their own employers, not the people for whom they are working by proxy.
2. Results of long-term financial analysis usually support in-house rather than outsourcing options.
3. The in-house option has been found to result to improved employee satisfaction as well as improved customer satisfaction at the same time.
4. In-house offers the company the opportunity to grow people instead of hiring from outside, and so provide career prospects that reduce staff turnover.
5. Outsourcing could enable the organisation to pick the best service provider in terms of experience, quality, speed and efficiency. However, these may be quick fixes which are not sustainable in the long run.

Meanwhile, Atkin and Brooks (2005) provide further insight on the disadvantages of this model:

1. A poorly defined scope will lead, almost inevitably, to problems in the management of the service with higher supervision costs and lowering of customer satisfaction. Consultation with all stakeholders is essential.
2. Without delineation of roles and responsibilities, it can be difficult to measure the performance of in-house personnel.
3. Given that the organisation's management may be looking periodically at the market for external service provision, it makes sense for the in-house team to operate in a business-like way so that it can compete fairly if the need arises. Most of the organisations manage to do this, but the weakness is in maintaining a consistent level over time.
4. One of the biggest threats to the in-house team's success is from complacency, which is easily noticed by customers.

Connors (2003) sees further disadvantages of this model and states that firstly, the prolonged application of increasingly outdated concepts to the organisation's changing requirements. Secondly, well-managed in-house departments frequently run up costs of facilities way above the outsourced norm simply by over-providing quality of service.

Finally, in-house teams sometimes do not have the authority to take on temporary relief staff as easily as their external counterparts.

3.4.2 Partial Outsourcing of Single Service Contracts

In the partial outsourcing model in Figure 3.11, FM service providers concentrate on providing one specialist service to the client, for example, cleaning, building maintenance, or lifts. The client organisation would have both an in-house team providing some FM services, and a host of single service contracts to manage.

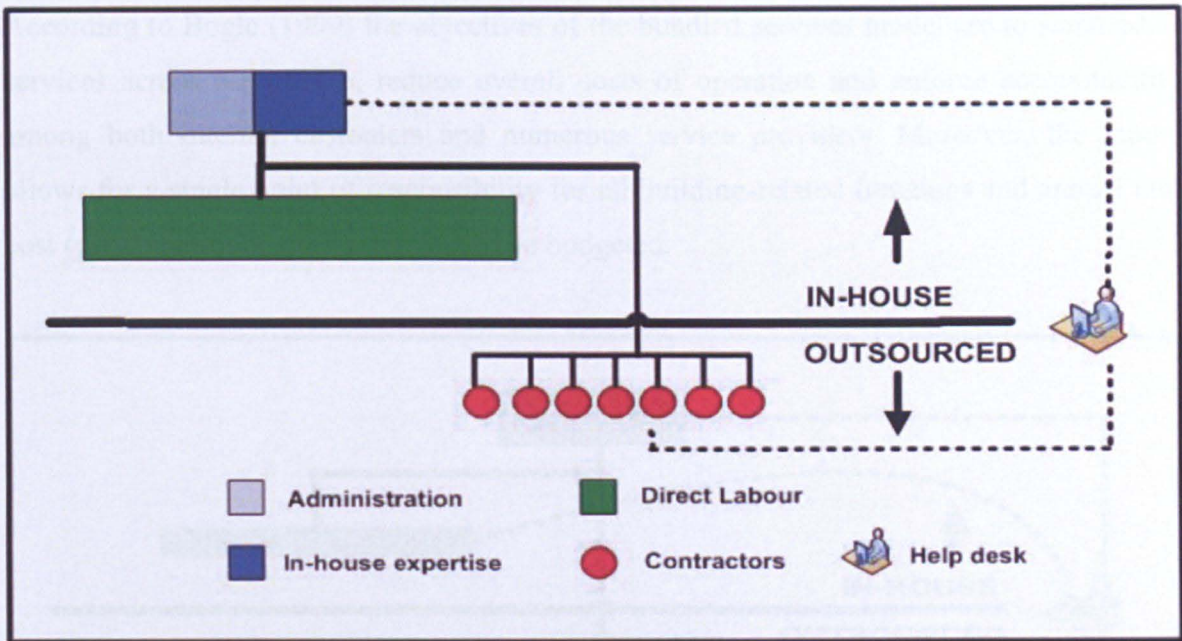
Williams (1999) perceived that this arrangement has three main advantages:

1. Specialist contractors can do their work without the need for dedicated in-house supervision
2. In-house maintenance teams can respond quickly to emergency service requirements
3. The core in-house management teams can shed its 'blue-collar' image by replacing technicians/technologists with non-specialist administrators.

Price (2006) saw the drawback to this model, and it has always been so, that important economies of scale can be missed. It can also become complex and time-consuming to manage a large number of contracts when multiple services are being purchased.

Costantino and Pellegrino (2010) conducted their study on choosing between single and multiple sourcing based on supplier default risk and found out there are advantages and disadvantages in choosing this model with multiple services being purchased as a single service contract. The advantages are:

- Alternative sources of materials in case of delivery stoppage by a supplier
- Reduced probability of bottlenecks due to insufficient production capacity to meet peak demand
- Increased competition among suppliers leading to better quality, price, delivery, product innovation and buyer's negotiation power
- More flexibility to react to unexpected events that could endanger supplier's capacity



Source: Adopted from William, 2003 and modified by Musa

Figure 3.11: Partial Outsourcing of Single Service Contracts

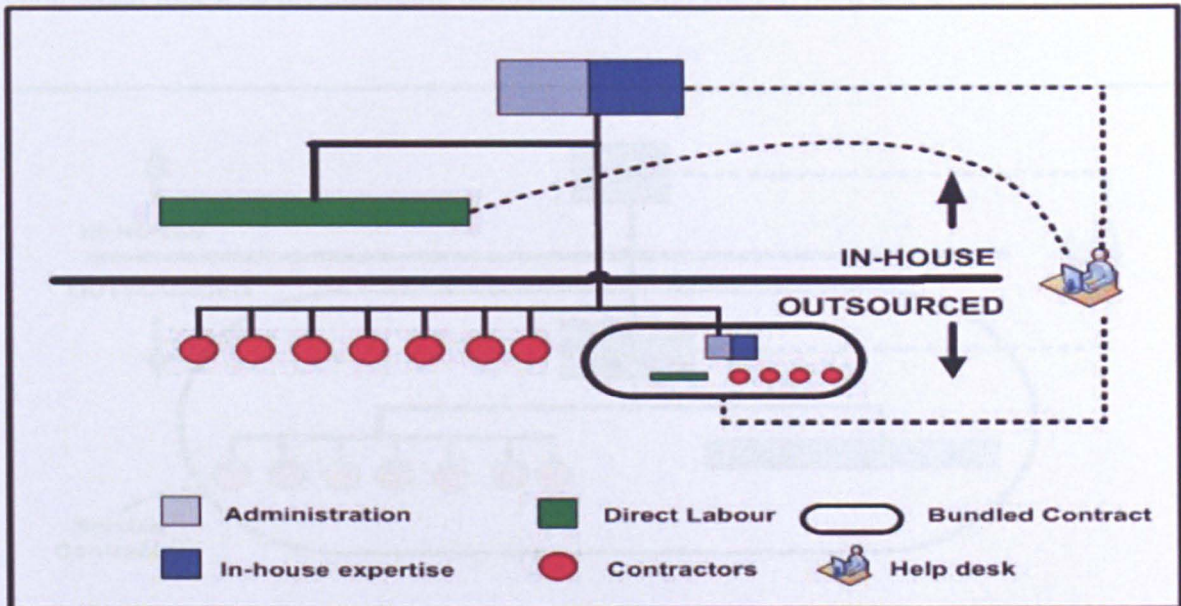
In contrast, the disadvantages are:

- Reduced efforts by supplier to match buyer's requirements
- Higher costs for the purchasing organisation (greater number of orders, telephone calls, records and so on)
- Increased risk of supply/service interruption, especially for asset specific products

3.4.3 Outsourcing as Bundled or Package Service Contracts

Like bread and butter, some services have a natural affinity. With bundled or package contracts in figure 3.12, FM service providers draw together a number or range of different services to offer to clients. For example, a security company may offer manned guarding, burglar alarm maintenance and electronic entry systems. Payne (2000) believed that an effective way of adding value to the facilities service provision is to package the service in order to give best effect, maximise flexibility and gain economies of scale.

According to Bogle (1999) the objectives of the bundled services model are to standardise services across a portfolio, reduce overall costs of operation and enforce accountability among both internal customers and numerous service providers. Moreover, the model allows for a single point of responsibility for all building-related functions and annual unit cost (per square foot, per employee) to be budgeted.



Source: Adopted from William, 2003 and modified by Musa

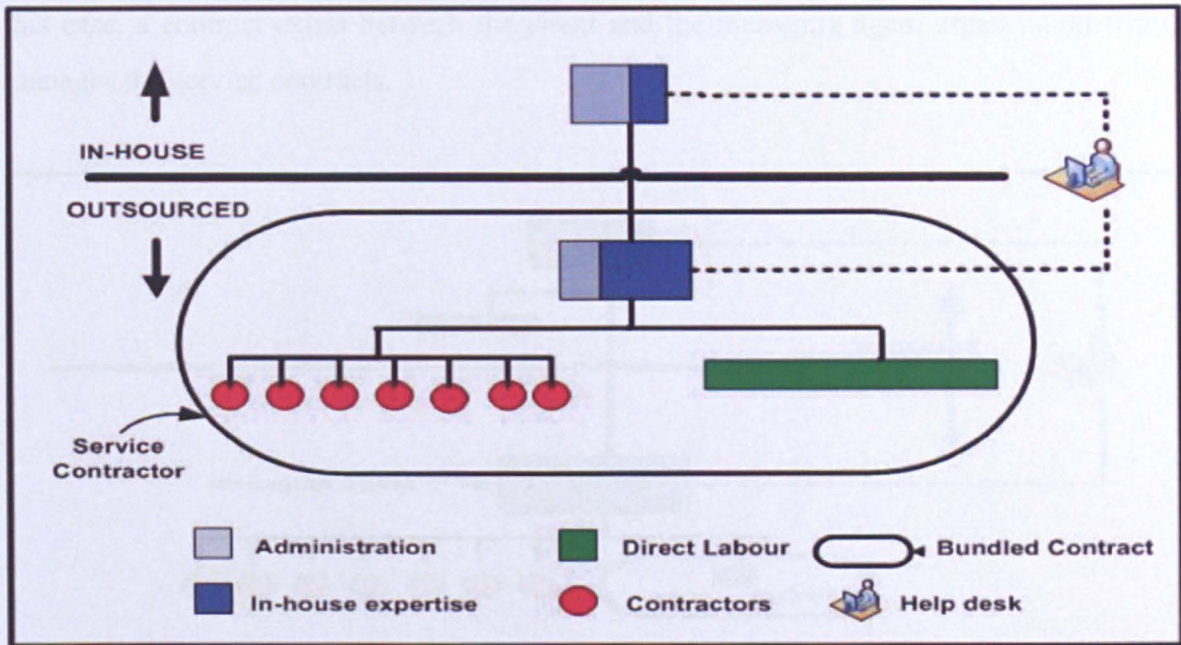
Figure 3.12: Outsourcing as Bundled or Package Service Contracts

Willcocks and Oshri (2009) provide the major advantages experienced with bundling included:

- Simplifies and expedites procurement and contracting (sole-source v. tendering)
- Reduces duplicate management layers, processes, and costs
- Reduces operating risk by limiting points of failure
- Can achieve operational synergies across business processes and between a business process and supporting IT arrangement.
- Standardises and simplifies operations
- Mitigates delivery risk through simplified points of contact
- Reduces service provider costs/prices through simplified management and scale economies

3.4.4 Outsourcing on a Commercial Contract or Management Contracting

These service providers provide both delivery and management functions, but tend to focus on a small number of service types. The client organisation still retains overall control of management (Williams, 1999). Under this model arrangement, a contract exists between the client and the managing contractor (See Figure 3.13). Subcontractors have a direct contractual link with the managing contractor, not the client (Atkin and Brooks, 2005).



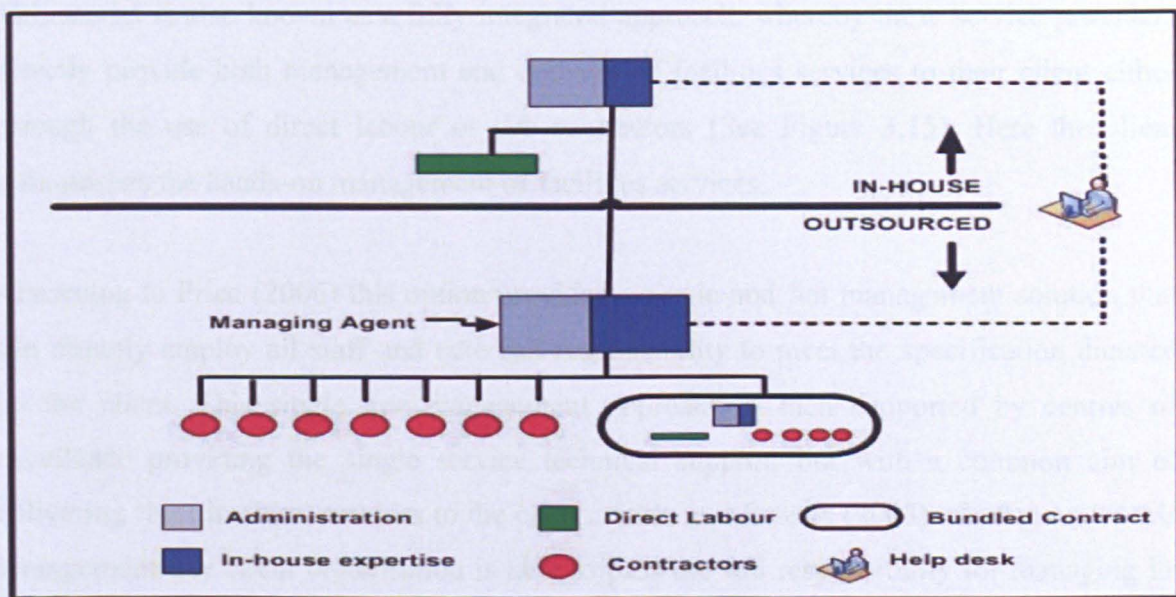
Source: Adopted from William, 2003 and modified by Musa

Figure 3.13: Outsourcing on a Commercial Contract or Management contracting

This means that the client has a single point of contact with the contractor on all matters pertaining to service provision. By using a managing contractor to undertake some or all of the work, with the support of subcontractors, the organisation is able to mitigate much financial risk (Atkin and Brooks, 2005). In contrast, the managing contractor's model may result in poor performance by the subcontractor and, therefore, poor service to the client's organisation. In addition, flexibility may be reduced, unless provision is built into the contract for variations, as it will be more difficult to add services or terminate the agreement without significant disruption (Johnson, 1997).

3.4.5 Outsourcing on a Management Agent Contract

These services are usually provided by consultants who provide management-only services on behalf of their clients (see Figure 3.14). According to Atkin and Brooks (2005), this arrangement is adopted when the organisation has determined that it does not wish to hand over control of its facilities to a contractor, yet does not have the skill or expertise with which to manage them efficiently and effectively. By bringing in an external organisation to manage the facilities, the organisation is essentially appointing a client representative. In this case, a contract exists between the client and the managing agent organisation which manages the service contracts.



Source: Adopted from William, 1997 and modified by Musa

Figure 3.14: Outsourcing on Management Agent Contract

Johnson (1997) has identified the possible advantages and disadvantages of this model. Possible advantages are:

- A modular contract structure offers maximum flexibility - individual contracts may be altered without the need to alter others
- Competition on a value-for-money basis is maximised with open competition both for the management role and the works or service subcontracts
- If the employer is dissatisfied with the performance of the managing agent, the contract may be renegotiated without the need to cancel out, assign or otherwise jeopardise the various contracts between the customer and the works or service providers.

In contrast, the possible disadvantages are:

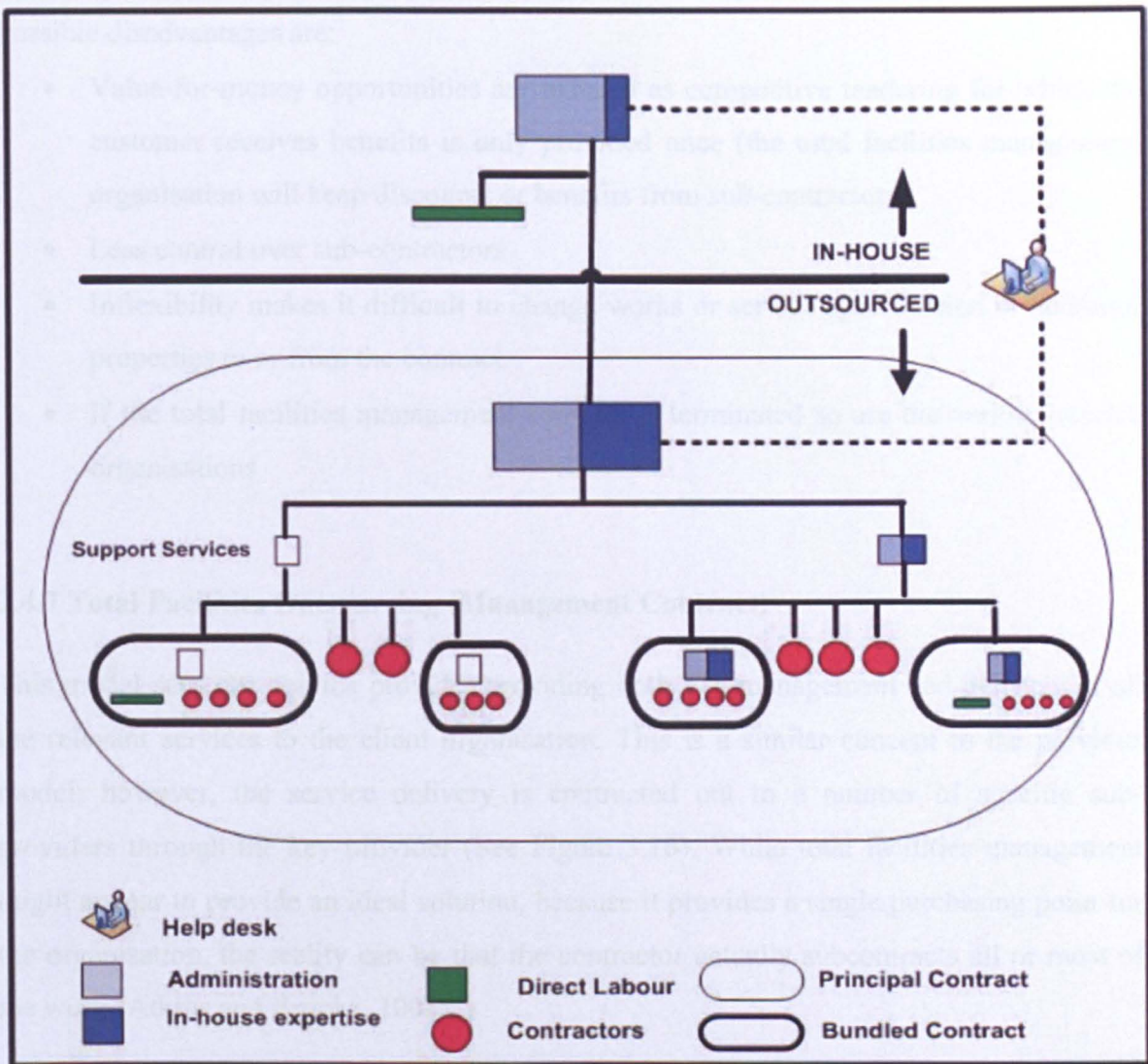
- Gaps may exist between the provisions of different packages – technical specifications must try to avoid letting this happen.
- Although the managing agent will carry out most of the contract letting and administration, there is usually more paperwork with separate contracts and separate monthly payments.

3.4.6 Total Facilities Outsourcing

This model is also known as a fully integrated approach, whereby these service providers directly provide both management and delivery of facilities services to their client either through the use of direct labour or sub-contractors (See Figure 3.15). Here the client relinquishes the hands-on management of facilities services.

According to Price (2006) this option provides a single and flat management solution that can directly employ all staff and take full responsibility to meet the specification dictated by the client. This single line management approach is then supported by centres of excellence providing the single service technical support, but with a common aim of delivering ‘best in class’ services to the client. Atkin and Brooks (2005) add that under this arrangement, the client organisation is able to pass the full responsibility for managing its facilities to a single organisation for a fixed price.

This does, however, require the organisation to provide the service provider with sufficient scope to be able to manage the various services efficiently. In this case, instead of works or services contracts being provided in separate packages by individual contractors, the client puts out tenders only for the primary contract.



Source: Adopted from William, 2003 and modified by Musa

Figure 3.15: Total Facilities Outsourcing

Laird (1994) perceived that the attraction of total facilities management is becoming increasingly common as forward-looking organisations are beginning to ask FM companies to provide objective, strategic and commercially-oriented consultancy and the skills and expertise to implement such strategies, once agreed.

Johnson (1997) has provided the possible advantages and disadvantages of this model. Possible advantages are:

- A single point of contact for the customer
- The total facilities management contractor must ensure no gaps exist between specifications
- A single contract with management reducing administration to a minimum

Possible disadvantages are:

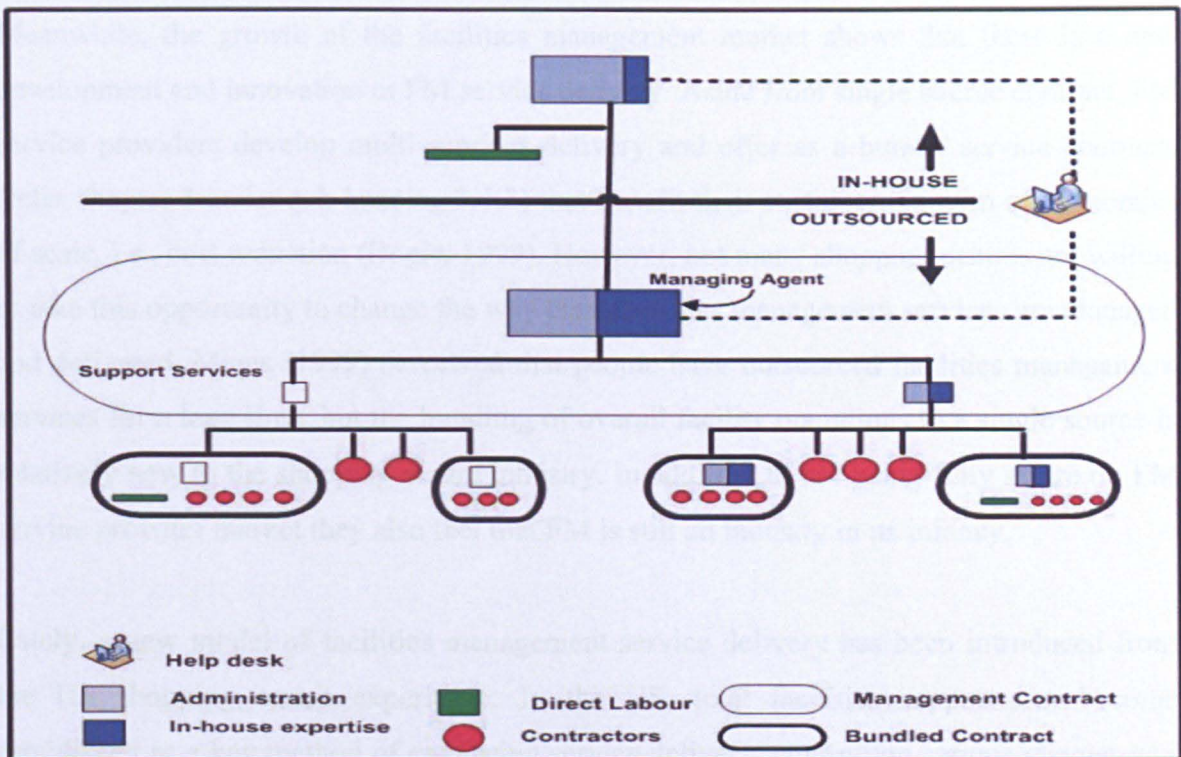
- Value-for-money opportunities are reduced as competitive tendering for which the customer receives benefits is only provided once (the total facilities management organisation will keep discounts or benefits from sub-contractors).
- Less control over sub-contractors
- Inflexibility makes it difficult to change works or service specification or add/omit properties to or from the contract
- If the total facilities management contract is terminated so are the various service organisations

3.4.7 Total Facilities Outsourcing (Management Contract)

This model sees one service provider providing both FM management and delivery of all the relevant services to the client organisation. This is a similar concept to the previous model; however, the service delivery is contracted out to a number of specific sub-providers through the key provider (See Figure 3.16). While total facilities management might appear to provide an ideal solution, because it provides a single purchasing point for the organisation, the reality can be that the contractor actually subcontracts all or most of the work (Atkins and Brooks, 2005).

Price (2006) argue that, with this level of engagement, the FM partners will work hard to understand the needs of the client and perhaps even share performance targets based on its objectives. This type of arrangement is contractually and operationally more complex to set up, so that agreements will typically be longer.

In practice, this model has been highly successful even though there can remain an element of doubt as to where the final responsibility should rest – should it be the provider, the FM agent or the client? It can also be difficult to align a group of contractors, each with their own needs and aspirations, with the objectives of the host organisation (Price, 2006).



Source: Adopted from William, 2003 and modified by Musa

Figure 3.16: Total Facilities Outsourcing (Management Contract)

3.5 Facilities Management Service Delivery in Shopping Centres

In the past, most facilities management services in shopping centres have been managed and serviced through in-house management (Mines, 1999). Cant (2005) argues that keeping all activities in-house is apparently not a very cost effective option and seems to be a relatively static and standard fashion (refer chapter 3 under sub-heading 3.4.1).

Since then, the trend has changed from in-house provisions into outsourcing to various contractors. These facilities management services have been managed and the services delivered through single source contracts by various individual or specialist contractors (refer chapter 3 under sub-heading 3.4.2).

Today, many shopping centres in UK are used to operating their facilities management services through this option. Even though many shopping centres currently operate this way, and while technically it gives them the maximum amount of choice, it also involves a huge amount of management time due to management of the vast array of reports, budgets and invoices that result from this (Price, 2006).

Meanwhile, the growth of the facilities management market shows that there is a new development and innovation in FM service delivery. Aside from single source contract, FM service providers develop multi-services delivery and offer as a bundle service contracts (refer chapter 3 under sub-heading 3.4.3) that benefit their customers in term of economies of scale, i.e., cost reduction (Bogle, 1999). However, not many shopping centres are willing to take this opportunity to change the way their facilities management services are managed and delivered. Mines (1999) perceived that people have outsourced facilities management services for a long time, but the bundling of overall facility operations to a single source is relatively new to the shopping centre industry. In addition to not being fully aware on FM service provider market they also feel that FM is still an industry in its infancy.

Lately, a new model of facilities management service delivery has been introduced from the US shopping centre experience. In the US, total facilities support has become established as a key method of enhancing service delivery, controlling service charges and creating new revenue streams (Fenwick, 2007). Total facilities support provides economies of scale and a single service provider (refer chapter 3 under sub-heading 3.4.6).

Fenwick (2007) claimed that this option will free up centre managers to become business managers focusing on maximising revenue from tenants and the profitability of the centre, including a new potential revenue stream for service provision. However, this option is still new and at its infancy stage for FM service delivery in UK shopping centres. It is encouraging to know that FM service delivery in UK shopping centre has evolved. Their perceptions towards FM services have previously fallen behind market expectation and are now increasingly becoming more challenged (Cant, 2005).

It is important that shopping centre management takes a fresh look, and perhaps considers the best options for the management and delivery of FM services that benefit and adds value to the core business delivery.

3.6 The Potential Benefits and The Potential Risks of FM Service Delivery

The potential benefits and the potential of risks of facilities management (FM) service delivery have been identified from literature reviews and are grouped into five factors in accordance to Greaver (2007) categorisation of outsourcing reasons, namely, financial, cost, performance, organisational and other added factors is physical (See Table 3.10 & Table 3.11). Those potential benefits and the potential risks are described as follow;

1) Financial factor

Outsourcing is done in accordance to a financially driven reason when its goal is to reduce investments in assets, to liberate resources for other purposes and to generate cash by transferring assets to the service provider (Greaver 2007; 1999). Greaver (2007) found that saving money on non-core activities and opportunity to reduce investment in asset are the potential benefits of outsourcing in financial aspects.

However, Johnson (1997) found that outsourcing also carries some potential risks of being unable to save money on non-core activities and the opportunity to increase investment in assets.

2) Cost factor

According to Greaver (2007; 1999), outsourcing is always a cost-driven factor when for any organisations wanting to reduce current costs and to turn fixed costs into variables costs. This is because a service provider often has a better cost structure in carrying out a task than an organisation's internal function could have. Under this factor, the potential benefits of FM service delivery can be assessed in accordance to the following criteria;

- To obtain cheaper services – According to Meneghetti and Chinese (2002), outsourcing can create cost advantages, which service providers can convert into corresponding lower prices and offer cheaper services.
- For operational cost to be reduced – According to several studies, outsourcing can reduce cost. These include; reduce costs through superior provider performance and the provider's lower cost structure (Greaver, 2007); Reduce cost of services delivered in the long term (Hassanain and Al-Saadi, 2005);

Reducing costs (Burdon and Bhalla, 2005); Reduce costs/economies of scale (Barret and Baldry (2003).

- To provide cost effective services – According to Blumberg (1998) a third party can provide better services and high quality at lower cost. Cant (2005) argued that outsourcing is a very cost effective option if compared to keep all activities in-house.
- To control service charges – According to Fenwick (2007), outsourcing has become established as a key method of enhancing service delivery, controlling service charges and creating new revenue streams.

Aside from the potential benefits of FM service delivery in cost aspects, there are also some potential risks of outsourcing identified in cost that need to be considered.

They are

- The difficulty to obtain cheaper services – According to Constantino and Pellegrino (2010), outsourcing also can incur higher price for the purchasing organisation. This is because the organisation fails to realise the purported hidden cost saving to outsourcing.
- Unable to reduce operational cost- According to Johnson (1997), outsourcing can increase costs in operations. These costs include greater number of orders, telephone calls, records and so on.
- Unable to provide cost effective services – Barret and Baldry (2003) found out that outsourcing has claimed savings on forecast hopes and it is not always cost effective.
- Unable to control service charges – Willis (2003) reported that investors of shopping centres were not getting the level of service anticipated and at cost originally sought. Unable to control the cost from the service provided, this was affecting the level and quality expected from the service charges paid by retailers.

3) Performance factor

In many organisations the resources allocated for support functions are often limited. The changes carried out in an organisation are improvement-driven or performance-driven when the acquiring and obtaining of a high level of operating performance in support functions is done through outsourcing (Greaver, 2007;1999). By outsourcing to specialist organisations services not generated by core competences, organisations can see an improvement in their organisational performance (Bettis et al., 1992).

Under this factor, the potential benefits of FM service delivery can be assessed in accordance to the following criteria;

- Improve operating performance – According to Greaver (2007) an organisation can benefit improving the level of performance of its support functions by using an outside service provider's.
- Enable to obtain expertise, skills and technologies – According to Greaver (2007) an organisation can obtain expertise, skills and technologies, which would not otherwise be available in-house. Likewise, Hassanain and Al-Saadi (2005) also found out that with outsourcing an organisation can obtain the specialist expertise and skills that are not available in-house.
- Enable to improve service quality – Several studies have been carried out in outsourcing depicted the results of this benefits. Hassanain and Al-Saadi (2005) perceived that 'improve quality of service' as an advantage in outsourcing and as rated as a higher priority in municipal organisation. Burdon and Bhalla (2005) categorised that improving quality is a primary benefit in outsourcing. Pagnoncelli (1993) found out that one of the main benefits of managed outsourcing is improving quality of the product or services.
- Increase customer satisfaction – Johnson (1997) perceived that the suppliers' knowledge can be transferred to an organisation opting for outsourcing, since, with their abilities, processes or technology, they will be especially able to satisfy the needs of customers. According to Greaver (2007) in order to increase customer satisfaction that is quality that creates long-term success for an organisation.

In terms of the potential risks, FM service delivery can be assessed in accordance to the following criteria;

- Unable to improve operating performance – Coilings (2007) found out that outsourcing vendor, who unable to deal with volume of activities and unable to perform task in specified time as well as fail to produce contractual results are unable to improve organisation's operating performance.
- Difficult to obtain expertise, skills and technologies – According Barret and Baldry (2003), in outsourcing there is a possibility in selecting a poor service provider and can be difficult to obtain expertise, skills and technologies required when service providers market are being incompetent.
- Unable to improve service quality – According to Johnson (1997), in outsourcing there is a possibility of service quality reduced and having low level of services from service providers. In this case, an organisation unable to improve service quality required.
- Increase risks of service interruption – Costantino and Pellegrino (2010) found out that there is a possibility in increasing risk of service interruption, especially when service providers fail to deliver services in specified time.

4) Organisational factor

The reasons of outsourcing are organisationally driven when an organisation needs to enhance its performance through organisational changes. When outsourcing non-core support functions, the management and the rest of the personnel can concentrate better on the core competence areas (Greaver, 2007; 1999).

Under this factor, the potential benefits of FM service delivery can be assessed in accordance to the following criteria;

- Free up management time to focus on core activities – Barret and Baldry (2003), identified that concentration on core business as a potential benefit of outsourcing and this benefit has ranked in second best place to overall benefits. Hassanain and Al-Saadi (2005) perceived that 'free up management time to concentrate on higher priorities' as an advantage in outsourcing and as rated as a higher priority in municipal organisation.

- Enhance management effectiveness – According to Greaver (2007), an organisation can enhance effectiveness by focusing on what the organisation do best. Outsourcing the non-core services has potential to achieve this benefit.
- Improve management capability – Hassanain and Al-Saadi (2005) perceived that ‘strengthen the organisation’s performance’ as an advantage in outsourcing and as rated as a higher priority in municipal organisation. By strengthen the organisation performance, this can improve management capability.
- Reduce management burden- Barret and Baldry (2003), perceived that reduce management burden as a potential benefit in outsourcing and this benefit has ranked in ninth place to overall benefits.

In terms of the potential risks, FM service delivery can be assessed in accordance to the following criteria;

- Lost of management time on non-core activities – According to Hassanain and Al-Saadi (2005); Barret and Baldry (2003) and Johnson (1997), outsourcing the non-core activities will lose management control over the non-core activities. In addition to that management also can lose of in-house skills/expertise and capability over an extended period.
- Lost of management focus on core activities – Cant (2005) perceived that outsourcing too many services to numerous third party suppliers will lost of management focus on core activities. This is because the focus has been distracted in managing the non-core services.
- Complex and time consuming to manage – Price (2006) perceived that outsourcing too many services to numerous third party suppliers will also complex and time consuming to manage. This is because a huge amount of management time due to management of the vast array of reports, budgets and invoices that result from this.
- Increase management burden – Price (2006) perceived that a huge amount of management time in managing the vast array of reports, budgets and invoices from numerous third party suppliers employed will increase management burden. Barret and Baldry (2003) found out that outsourcing can also bring to the new management problems if it’s failed to deliver the services.

5) Physical factor

The reasons of outsourcing are physically driven when an organisation needs to enhance its asset performance through infrastructure management (Cant, 2005). In shopping centres, service providers need to match the quality of the design/building and retail experience to meet the expectation of up to 10,000 visitors per day, within an 'open and publicly visible' environment (Cant, 2005). Under this factor, FM service delivery can be assessed in accordance to the following criteria;

- **Improve centre physical image -** According to Greaver (2007), an organisation can improve credibility and image by associating with superior providers. Cant (2005) stated that the infrastructure technology and physical management needs to support a wide variety of retailers and visitors expectation.
- **Improve the quality shopping environment –** Willis (2003) stated that FM service provider need to provide FM solutions in the retail environment as maintaining or improving a healthy and safe environment with large numbers of the general public present.
- **Enable to match support service activity with footfall -** Willis (2003) stated that FM service provider need to match support service activity with footfall that varies daily, weekly and seasonally without affecting service levels.

In terms of the potential risks, FM service delivery can be assessed in accordance to the following criteria;

- **Less effort by suppliers to improve centre physical image –** Willis (2003) stated that there is possibility of less efforts by suppliers to provide full range of support services to a 100,000 m² retail centre, with 150 – 200 retail units and 4,000 parking spaces.
- **Difficult to improve the quality of shopping environment –** Willis (2003) perceived that there is difficult to maintain or improve the quality of shopping environment with large numbers of the general public present. Fenwick (2007) stated that the more shoppers there are, the more facilities need to be cleaned and the more waste is generated.
- **Less efforts by supplier to match buyer's requirements –** According to Costantino and Pellegrino (2010), there is possibility of reduced efforts by supplier to match buyer's requirement. This is because of pressure on cost in a volatile retail environment.

Table 3.10: Lists of Potential Benefits Criteria

No	Factor(s)	Abv.	Criteria	Code	References
1)	Financial	FI	Save money on non-core activities	PBFI 1	Greaver, M. (2007)
			Opportunity to reduce investment in asset	PBFI 2	Greaver, M. (2007)
2)	Cost (CO)	CO	Enable to obtain cheaper services	PBCO 1	Meneghetti and Chinese (2002)
			Enable operational cost to be reduced	PBCO 2	Greaver, M. (2007); Hassanain and Al-Saadi (2005); Barrett and Baldry (2003); Burdon and Bhalla (2005)
			Enable to provide cost effective services	PBCO 3	Blumberg (1998); Cant (2005)
			Enable to control service charges	PBCO 4	Fenwick (2007)
3)	Performance	PF	Improve operating performance	PBPF 1	Greaver, M. (2007)
			Enable to obtain expertise, skills and technologies	PBPF 2	Greaver, M. (2007); Hassanain and Al-Saadi (2005)
			Enable to improve service quality	PBPF 3	Pagnoncelli (1993); Hassanain and Al-Saadi (2005); Burdon and Bhalla (2005)
			Increase customer satisfaction	PBPF 4	Greaver, M. (2007)
4)	Organisational	OR	Free up management time to focus on core activities	PBOR 1	Barrett and Baldry (2003); Hassanain and Al-Saadi (2005)
			Enhance management effectiveness	PBOR 2	Greaver, M. (2007)
			Improve management capability	PBOR 3	Hassanain and Al-Saadi (2005)
			Reduce management burden	PBOR 4	Barrett and Baldry (2003)
5)	Physical	PH	Improve centre physical image	PBPH 1	Greaver, M. (2007), Cant (2005)
			Improve the quality shopping environment	PBPH 2	Wills (2003)
			Enable to match support service activity with footfall	PBPH 3	Willis (2003)

Table 3.11: Lists of Potential Risks Criteria

No	Factor(s)	Abv.	Criteria	Code	References
1)	Financial	FI	Unable to save money on non-core activities	PRFI 1	Johnson (1997)
			Opportunity to increase investment in asset	PRFI 2	Johnson (1997)
2)	Cost	CO	Difficult to obtain cheaper services	PRCO 1	Costantino and Pellegrino (2010)
			Unable to reduce operational cost	PRCO 2	Johnson (1997);
			Unable to provide cost effective services	PRCO 3	Barret and baldry (2003)
			Unable to control service charges	PRCO 4	Willis (2003)
3)	Performance	PF	Unable to improve operating performance	PRPF 1	Coilings (2007)
			Difficult to obtain expertise, skills and technologies	PRPF 2	Barret and baldry (2003)
			Unable to improve service quality	PRPF 3	Johnson (1997)
			Increase risks of service interruption	PRPF 4	Costantino and Pellegrino (2010)
4)	Organisational	OR	Lost of management time on non-core activities	PROR 1	Hassanain and Al-Saadi (2005); Barret and baldry (2003); Johnson (1997)
			Lost of management focus on core activities	PROR 2	Cant (2005)
			Complex and time consuming to manage	PROR 3	Price (2006)
			Increase in management burden	PROR 4	Price (2006); Barret and baldry (2003)
5)	Physical	PH	Less efforts by supplier to improve centre physical image	PRPH 1	Fenwick (2007); Willis (2003)
			Difficult to improve the quality of shopping environment	PRPH 2	Willis (2003); Fenwick (2007)
			Less efforts by supplier to match buyer's requirements	PRPH 3	Costantino and Pellegrino (2010)

3.7 Summary

In conclusion, the development of facilities management has moved away from a technical base towards a general management base. In addition to that, the scope of facilities management is also developing to cover a wide range of activities and services, which includes real estate management, financial management, change management, human resource management, and health and safety and contract management, in addition to building maintenance, utilities suppliers and domestic services, that is cleaning and security. Clearly, the vital function of FM is to support the organisation's core business or activities for improved economic outcomes in accordance to integrate and align a wide range of activities and services. The application of facilities management can be implemented either at strategic, tactical or operational levels. By having a proper application of facilities management techniques organisations are enabled to provide the right environment for conducting their core business on a cost-effective and best value basis. Today, facilities management is proven to deliver business advantages and many organisations believe that there is a need for outsourcing facilities management to provide the lead to the changing of business environment.

The primary reasons to outsource facilities management may differ from one organisation to another. However, the decision to outsource will lead organisations to the advantages and disadvantages of facilities management outsourcing. In facilities management outsourcing, there are several types of facilities management service delivery models that have been practiced and provided in the market. These models have their own potential benefits and risks. Various debates over the best way to engage external service providers will exacerbate in making the right decision over the best models. In shopping centres, facilities management is seen as non-core services to the overall business operation of shopping centres. However, the role of facilities management is important in supporting the business of this property and providing a good quality of shopping environment at a cost-effective and best value basis.

Most shopping centres have outsourced their facilities services either in single service contracts or a bundled service contract. A primary reason for outsourcing their facilities services is cost-saving. This factor is identified as the most influential in their decision-making towards the best options of FM service delivery. However, by leaving out other important factors, shopping centres will not optimise the values from their FM functions.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

This chapter provides a research design and methodology of the research undertaken. Research design is developed to show the overall strategy to achieve the aim and objectives of this research. Aside from research design, different research methods also have been discussed in order to achieve the research's aim and objectives.

In discussing this research methodology, there are three major dimensions that have been considered, namely the research philosophy, reasoning of the research, and data. This is because a philosophical stance of the researcher will strongly influence the reasoning of the research and both will influence the data required by the research and analysis of the data.

4.2 Research Philosophy and Consideration

It is essential to clarify the research strategy, and philosophy and methodology, prior the whole research progress. A research strategy will be discussed based on three philosophical stances, which are ontology, epistemology, and reasoning. This research itself, is regularly based on the quantitative research stance, because of it is intent to generalise results from a sample to a population so that inferences can be made of this population. It is also associated with deductive characteristics and focus especially on determining the best options of FM service delivery in UK shopping (Creswell, 2007, Healy and Perry, 2000). Several quantitative data collection techniques are adopted, to strengthen the validity and reliability of this research.

Objectivism is considered as the appropriated ontological stance of this research. This is because determining the best options of FM service delivery will be emphatically defined as the phenomena, which is it become the 'age old' dilemma that Shopping Centre Managers and Managing Agents face every time they tender FM services in their Shopping Centres. In this research, "outsourcing in FM" is determined as "reality" and their best options of FM service delivery is needed to be discovered but not constructed.

Positivism is identified as the appropriate epistemological stance of this research, due to the 'outsourcing in FM' can be observed, studied and even modelled. In this study, different types of FM service delivery options have been reviewed and observed from existing literature as well as their advantages and disadvantages. Based on its advantages and disadvantages, a researcher defines the factors and criteria that can be used to evaluate different types of FM service delivery options. In addition to that, the researcher will develop an effective decision-making framework for determining the best options of FM service delivery in UK shopping centres by using Analytical Hierarchy Process. Moreover, a researcher is independent from the research undertaken. Also, this study can be measured objectively by using a questionnaire as an instrument.

Based on the research paradigms discussions above, each paradigm has the reasoning of research to support the paradigm's continuum. In this regard, there are two common ways of reasoning, namely deductive and inductive (Sutrisna, 2009 and Ross, 2005). Ross (2005) summary the distinction between these two reasoning as (see Table 4.1):

Table 4: Deductive and Inductive Comparison

According to the nature of this research, it will rely on deductive reasoning, since it attempts to determine the best options of FM service delivery in UK shopping centres. It therefore describes the research that typically starts with the literature review and then identifies and states a single selected problem leading to the isolation of the major research question in which the existing knowledge may be inadequate.

It is also generate the quantitative data that gathered from postal questionnaire as to investigate the shopping centres management perception towards the potential benefits and the potential risks of FM service delivery in UK shopping centres. The research is associated with the structured data collection process to gain the information from the respondents, in regard to validate the identified assessment criteria for FM service delivery options. This research is categorised as the value-free stance, since the researcher's values are kept out of the study (Cresswell, 1994).

To sum up, the selected research philosophy, methodology and the supported reasons are summarised in the research continuum below (see Table 4.1):

Table 4.1: Summary of Research Continuum

Philosophical Stances	Paradigms	Reasons
<u>Ontological</u>	Objectivism	This research emphasise on determining the best options of FM service delivery as a phenomena in UK shopping centres.
<u>Epistemological</u>	Positivism	<p>Researcher is independent from the research undertaken as he has no background experience in regards with UK shopping centres.</p> <p>Outsourcing in FM is view as objective as it can be observed, studied and even modelled. The best options of FM service delivery are needed to be discovered in this current situation.</p>
<u>Reasoning</u>	Deductive	Researchers performing deductive research based on the current body of knowledge and then conduct data collection and data analysis to answer the research questions and generalise the findings in order to confirm or not to confirm with current body of knowledge.

4.3 Research Approach

Research approach refers to the approach or the methodology that has been adopted to conduct the research. The research method is generally divided into two major approaches, quantitatively and qualitatively; both methods have their own core and different characteristics (Creswell, 2007; Fellow and Liu, 2008). The differences between qualitative and quantitative method are summarised in Table 4.1:

Table 4.2: Comparison of qualitative and quantitative research methods

Thus, it could be concluded that the quantitative research attempts to make generalisations based on precisely measured quantities as well as encourages the researcher to make robust generalisations about the group being researched (Guy, 1987; Higgins, 1996; Field, 2005). This research also generates mathematic statistical data which could be derived from the numerical format, and involves gathering data from a large sample or population, usually via a survey questionnaire. The questionnaire survey techniques are employed to investigate the reality and used as the guiding principle to distil what the researcher needs to find out into the minimal number of questions with the large samples.

In comparison, qualitative research method is used to explore and understand people's beliefs, experiences, attitudes, behaviour and interactions. It allows the researcher to share the understandings and perceptions of others and explore the perceptions of homogenous and diverse groups of population. It is concerned with collecting in-depth information, that typically refers to a range of data collection and analysis techniques, which both produce and analyse text data, and allow for more in-depth analysis of social, political, and economic processes. Samples of this method tend to be smaller than for the quantitative approaches, thus in-depth interviews or group discussions are two common methods used for collecting qualitative information (Berg, 2009; Dudwick et al., 2006).

Using a qualitative approach not only allows the researcher to examine more deeply on the relevant issues of the research perspective, but enables a wider aspect of understanding, as this approach provides a standard to measure the raw data (in subjective, or abstract form) rather than using the statistical mathematical devices, since it allow the researcher to review all data thoroughly, and it also compels the researcher to concentrate on in-depth understanding of the data rather than judging or predetermining potential research findings only (Seng, 2010).

4.3.1 Selection of Research Method

According to the research philosophical stances and comparison of research methods above, this research selected a quantitative method as the appropriate method to investigate facilities management services in UK shopping centres. This is because the research is consider to be objective and the researcher can remain detached and objective in gaining, analysing and interpreting quantitative data from the research questionnaire survey. Also, this research seeks to gather factual data and to study the relationship between facts. The analysis of data yields quantified results and conclusions derived from evaluation of the results in the light of the theory and literature. This research is inclined to be deductive. In other words it tests theory or answered the research questions.

The design of this research tends to produce results that can be generalised and the results of the quantitative study tend to hold objective truth. This can be provided when the research is conducted in an appropriate manner using appropriate methods. Moreover, this research uses data that are structured in the form of numbers or that can be immediately transported into numbers. Therefore, objectivity, deductiveness, generalisability and numbers are features often associated with quantitative research undertaken.

4.5 Research Design

4.5.1 Preliminary Research

After defining the research topic, the first and most important step in the research design is formulating research questions or problems. The main function of formulating these research questions or problems is to decide what the researcher wants to find out about. This investigation is very important to obtain answers to the research questions or problems. The next step before investigation begins is to establish the research aim and objectives. The establishment of the objectives of this research will provide the direction to achieve the aim of this research. In this research the research hypothesis is “Which option is the best facilities management service delivery in UK shopping centres? This research hypothesis is brought to the establishment of research aims to develop an effective decision-making framework which will enable shopping centres’ managers to evaluate and select the best options of FM service delivery in shopping centres by taking into consideration their potential benefits and risks.

In addition, there are specific research questions formulated in accordance with objectives of the research as it is providing a direction towards investigation and achievement of the research aims. These include:

1. What is the current option of FM service delivery in UK shopping centres?

[This is to investigate the current option of FM service delivery in UK shopping centres]

2. What are the existing management decision-making tools in determining the best options of FM service delivery in UK shopping centres?

[This is to investigate the existing management decision-making tools towards the best options of FM service delivery]

3. What are the management's perceptions of the potential benefits and risks criteria of FM service delivery?

[This is to investigate the management perception towards the potential benefits and risks criteria of FM service delivery]

4. Are there any significant differences between the size of shopping centres and the potential benefits and potential risks of FM service delivery?

[This is to identify the significant differences between the sizes of shopping centres and the potential benefits and potential risks of FM service delivery in UK shopping centres]

5. What is an alternative decision-making model that can be employed in developing the framework for determining the best options of FM service delivery in UK shopping centres?

[This is to employ the AHP model in developing the decision-making framework for determining the best options of FM service delivery in UK shopping centres]

6. What are the important factors in selecting the best options of FM service delivery in UK shopping centres?

[This is to identify the important factors in selecting the best options of FM service delivery in UK shopping centres]

Having clear research questions, aim and objectives, the next step is to select the research methodologies. In order to investigate the identified aim and objectives of the research, and after taking into account the various practical and philosophical considerations of research methodology, this research adopted the following design including four phases, which can be further seen in Figure 4.

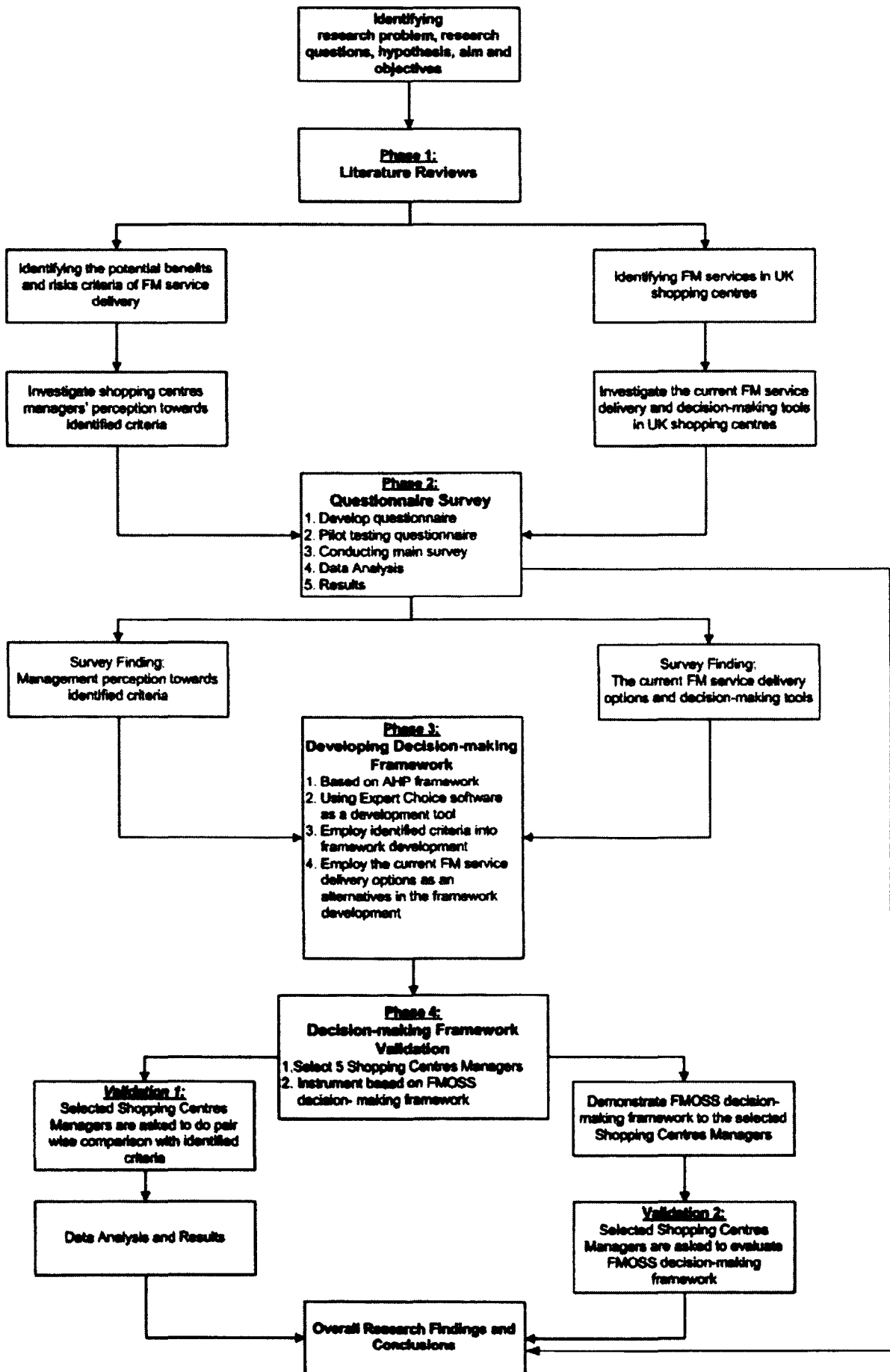


Figure 4: Research Design

4.5.2 Phase one: Literature reviews

The development of this decision-making framework requires two important components. There are assessment criteria and alternatives of selection. In addition to that, the research is focused on facilities management services in UK shopping centres. Firstly, literature reviews are used to identify the information with regards to facilities management services in UK shopping centres. This information will provide an understanding of the types of facilities management services, the provision of the services, types of facilities of management service delivery and existing decision-making tools in UK shopping centres. However, literature reviews sometimes provide information within certain periods of time. Therefore, the information needs to investigate the current information especially in this study, with regards to the current FM service delivery and decision-making tools in UK shopping centres. The current information will be investigated further in Phase 2.

Secondly, literature reviews are used to identify the assessment criteria for determining the best options of FM service delivery in UK shopping centres. Most of the previous research in outsourcing either in the general area or specifically in facilities management area, suggested that benefits/advantages and risks/disadvantages of outsourcing were always used in consideration of selection. For instance, in making a decision to provide the services either through in-house provision or outsourcing, the previous studies discussed both benefits/advantages and risks/disadvantages of both options in the evaluation.

Therefore, this research will identify the potential benefits/advantages or risks/disadvantages as an assessment criteria in determining the best options of FM service delivery. These identified criteria are selected and grouped into five. There is financial, cost, performance, organisational and physical factors (See Tables 3.11 and 3.12). Then, the next step is to investigate shopping centres managers' perceptions towards these identified criteria by giving some rating 1-5 in accordance to low and high benefits and low and high risks. This information will be investigated further in Phase 2.

4.5.3 Phase two: Questionnaire Survey

The aim of this survey is to investigate the current information in regards to facilities management services in UK shopping centres. This investigation is significant in finding out the current practices of FM service delivery in UK shopping centres. This includes the types of FM services, current FM service provision, the current options of FM service delivery and existing decision-making tools. Apart from that, it also aims to investigate shopping centres managers' perceptions towards these identified criteria and, indirectly, to validate the applicability of these criteria as assessment criteria in determining the best options of FM service delivery.

The purpose of this survey is to generalise from a sample to a population so that inferences can be made of this population. Girden (2001) emphasised that surveys are conducted with the specific intent of generalising the results, almost always quantitative, to the population of interest. In accordance with positivist stance, survey is the most appropriate approach to this study. This is because this approach is a relatively low cost and effective approach for gathering data from a large number of widely dispersed shopping centres. Another strength is that, because the researcher is not present while the respondents make their answers, data collected using questionnaires is free of any investigator effects. That is, the respondents cannot be influenced by the researcher and will not, consciously or unconsciously, try to answer in the way that they think the researcher wants them to. Also, it is flexible to cover a wide range of questions, i.e., what, who, where, how much, and how many.

This survey is designed in accordance with cross-sectional study. A cross-sectional study is simple to design. The researcher decides what to find out, identifies the study population, selects a sample and contacts respondents to find out the required information. The survey information is collected at one point in time. Kumar (2005) stated that such studies are cross-sectional with regards to both the study population and the time of investigation. In a survey, the form of data collection can be specified whether it is mailed to respondents in the sample, administered in an interview format face-to-face with individuals or gathered through telephone interview (Cresswell, 1994). This research chose to mail respondents in the sample as the form of data collection because it is costs less, is convenient and available.

1) *Population and sample selection*

According to ICSC Research (2008) the total population of shopping centres scheme in UK is about 1306. The total numbers includes the very large sized shopping centres (30), large sized shopping centres (48), medium sized shopping centres (133), small sized shopping centres (387), retail parks (607), factory outlet (19), and theme-oriented (82). These types of UK shopping centres are based on the classification from Pan-European Centre Standard (See Table 4.3).

Table 4.3: Pan-European Centre Standard

International Standard for European Shopping Centre Types			
Format	Type of Scheme		Gross Leasable Area (GLA)
Traditional	Very Large		80,000 m ² and above
	Large		40,000 – 79,999 m ²
	Medium		20,000 – 39,999 m ²
	Small	Comparison-Based Convenience-Based	5,000 – 19,999 m ² 5,000 – 19,999 m ²
Specialised	Retail Park	Large	20,000 m ² and above
		Medium	10,000 – 19,999 m ²
		Small	5,000 – 9,999 m ²
	Factory Outlet Centre		5,000 m ² and above
	Theme-Oriented Centre	Leisure-based Non-Leisure-Based	5,000 m ² and above 5,000 m ² and above

Source: ICSC Research, 2005

The sample size for this survey is focused on ‘traditional format’ of shopping centres that include very large, large, medium and small sized shopping centres. This is because the types of shopping centres under this format have the same characteristics in terms of management structure: building design, i.e., enclosed mall; and retailing format. Therefore, to generalise the results to the population, this selection sample is representative and consistent.

However, small sized shopping centres in this sample are excluded from the survey undertaken. This is because small sized shopping centres have a basic need for facilities management services compared to larger shopping centres. In small sized shopping centres, everything can be done by in-house provision and the decision-making process is simple. As this research is investigating FM outsourcing options, small size shopping centres do not fulfil the criteria of representative population.

Moreover, if this sample is included in the study it will result in bias as the number of small size shopping centres is greater than larger and medium size shopping centres. After taking some consideration on criteria of the sample, the final selection sample for this study is 211. This number includes 30 very large shopping centres, 48 large shopping centres and 133 medium size shopping centres.

2) *Survey Instrument and Questionnaire Design*

The questionnaire is used as a main survey instrument to carry out the investigation. This is because the questionnaire is simply a ‘tool’ for collecting and recording information about a particular issue of interest. It is mainly made up of a list of questions, but should also include clear instructions and space for answers or administrative details. Structured questionnaires are usually associated with quantitative research, i.e., research that is concerned with numbers.

In this study, the questionnaire is designed for a large scale survey and distributed to the similar type of respondents. It is aimed to verify all key aspects of the main survey questionnaire including an information accessible, design of the research instruments, validity and reliability of the gathered data. This questionnaire is designed and consists of 19 questions in five sections. The structure of the questionnaire survey is summarised in Table 4.4.

Table 4.4: The structure of questionnaire survey

Section	Questions No.	Descriptions
1. Respondents' details	1.1-1.4	Position, experience, type of shopping centre scheme and total number of tenants.
2. Facilities Management services	2.1-2.3	Types of facilities management services, criticality to business operations and current provision
3. Management decision-making	3.1-3.5	Decision-making role, framework, primary reasons to outsourcing, outsourcing options and decision-making tools
4. Outsourcing options of FM service delivery	4.1-4.2	Factors and criteria that influenced management decision towards the best options of FM service delivery.
5. General	5.1-5.5	Management awareness, intention and perceptions towards the best options of FM service delivery

All the questions are designed as closed format questions, to which a number of alternative answers are given, and the respondents are invited to select one or more relevant to themselves. The advantages of selecting this format are: easy to code, quick to answer and show no discrimination based on the articulate and inarticulate responses. The types of closed format questions employed in this study include single answer, multiple answers, numerical and Likert style.

The examples of the types of closed questions used in the questionnaire are shown as follows:

a) Single answer questions

1.1 What is your role in the shopping centre management teams?

[Please tick appropriate box]

- | | |
|--------------------------|--------------------------|
| <input type="checkbox"/> | Centre Director |
| <input type="checkbox"/> | Commercial Director |
| <input type="checkbox"/> | General Manager |
| <input type="checkbox"/> | Deputy General Manager |
| <input type="checkbox"/> | Centre Manager |
| <input type="checkbox"/> | Deputy Centre Manager |
| <input type="checkbox"/> | Director of Operations |
| <input type="checkbox"/> | Operations Manager |
| <input type="checkbox"/> | Group Operations Manager |
| <input type="checkbox"/> | Property Manager |
| <input type="checkbox"/> | Others (Please specify) |

b) Multiple answer questions

2.1 In your shopping centre, which of the following types of facilities management services do you have?

[Please tick all which apply]

- | | |
|--------------------------|--------------------------------------|
| <input type="checkbox"/> | M & E engineering services |
| <input type="checkbox"/> | Building & ground maintenance |
| <input type="checkbox"/> | Cleaning & housekeeping services |
| <input type="checkbox"/> | Energy & environmental management |
| <input type="checkbox"/> | Health & safety management |
| <input type="checkbox"/> | Information technology services (IT) |
| <input type="checkbox"/> | Waste management |
| <input type="checkbox"/> | Car park management |
| <input type="checkbox"/> | Customer services |
| <input type="checkbox"/> | Security services |
| <input type="checkbox"/> | Landscaping services |

c) Numerical questions

1.2 How long have you been working in the shopping centre management?

1.4 What is your total number of your tenants?

d) Likert style questions

FACTOR(S)/CRITERIA	Please tick the appropriate score				
	[1]Very low	[2]Low	[3]Moderate	[4]High	[5]Very high
FINANCIAL FACTOR	SINGLE SERVICE CONTRACT				
Save money on non-core activities	1	2	3	4	5
Opportunity to reduce investment in asset	1	2	3	4	5
Opportunity to create new revenue stream	1	2	3	4	5
COST FACTOR					
Enable to obtain cheaper service	1	2	3	4	5
Enable operational cost to be reduced	1	2	3	4	5
Enable to provide cost effective services	1	2	3	4	5
Enable to control service charges	1	2	3	4	5

3) Piloting the Questionnaire

Once the questionnaire design is completed, the next step is conducting a test for its ability to do the job which it is designed to perform. The pilot test to this newly designed questionnaire is important as it can highlight questions which may be ambiguous or difficult for the respondent to reply to. Also it will reveal weaknesses in questionnaire design in the context of its ability to collect information. According to Cooper and Schindler (1998), content validity is a measuring instrument to test whether the questionnaire provides adequate coverage of the topic under study, and it can be determined from a panel of persons to judge how well the questionnaire meets the standards.

The pilot testing conducted is focused on all aspects of this questionnaire design:

- Its overall appearance
- The covering letter
- The instructions
- The questions and their layout
- Time taken to complete

This questionnaire has been conducted for pilot testing on the particular experts. These experts include:

1. Supervisor and PhD students

The questionnaire is sent to supervisor of this study for his comments. Also, ten PhD students were chosen randomly to give comments on questionnaire design. Although they may not be representative of the target group nevertheless their experience will be invaluable in terms of designing the questionnaire.

2. Shopping centres' managers

This is the target group of this study and their understanding toward overall questions is important. Twenty questionnaires were randomly distributed to the shopping centres' managers during the shopping centres' management conference in Bournemouth, organised by British Council of Shopping Centres on 1st March - 3rd March 2010.

3. FM service providers

This is not the target group of this study but it is nice to have some insight from service providers' point of views. Only five service providers were identified during the shopping centre management conference in Bournemouth.

Overall, their comments were summarised in the Table 4.5. Their input is invaluable for finalising this final questionnaire design.

Table 4.5: Pilot Testing comments

Experts	Questionnaire Design		
	Overall appearance	Cover letter	
Supervisor/ PhD students	<ul style="list-style-type: none"> • Add LJMU logos • Add Reference no. 	<ul style="list-style-type: none"> • Poor wording • Grammar error • Insert mobile no • Stated duration date 	
Shopping centres' managers	<ul style="list-style-type: none"> • Font size smaller 	<ul style="list-style-type: none"> • Purpose of study not clear • Poor wording • No dateline 	
FM service providers	<ul style="list-style-type: none"> • Change font • Highlight and bold the instruction 	<ul style="list-style-type: none"> • Term "non- critical" used in the letter may be confusing • Grammar error 	
Experts	Questionnaire Design		
	Instructions	Questions and Layout	Time to complete (10-15 minutes)
Supervisor/ PhD students	<ul style="list-style-type: none"> • Some questions have no instructions • Make instructions simple 	<ul style="list-style-type: none"> • Some questions not necessary to ask • Some questions too long • Layout the questions in accordance to aim and objectives 	<ul style="list-style-type: none"> • reasonable
Shopping centres' managers	<ul style="list-style-type: none"> • Instructions missing • Some instruction not clear 	<ul style="list-style-type: none"> • Some questions confusing • Use simple or laypersons' terms in the questions; not too academic 	<ul style="list-style-type: none"> • fine
FM service providers	<ul style="list-style-type: none"> • Unclear instructions • Make it short 	<ul style="list-style-type: none"> • Put some clarification on single or bundled terms as used to avoid confusion. • Some questions can be shortened. 	<ul style="list-style-type: none"> • acceptable

Later, the questionnaire design is modified in accordance with comments received. The finalised questionnaire design is shown in Appendix II.

4) Conducting the survey

The survey was conducted using postal questionnaire methods to gather the overall perceptions of shopping centres' management in UK shopping centres towards the FM services in shopping centres. The addresses of the respondents were obtained from the British Council of Shopping Centres (BCSC). Two hundred and eleven (211) sets of

questionnaires were distributed to the participants in the particular studied area. This process was started at 02 May, 2010 and completed at 30 September, 2010.

Having understood that postal questionnaires can suffer from low response rates, the following steps were taken to help improve or maximising survey response rate. This study adopted the steps suggested by Cresswell (1994). This is known as 3 step procedure:

1. An initial mailing
2. A second mailing of the complete instrument after a month
3. A third mailing of a postcard as a reminder to complete and send in the questionnaire.

However, the researcher also adopted telephone calls and emails as another approach to send the reminder to the respondents. Each questionnaire was labelled with a unique reference number (FM/LJMU/01) so that reminders were only sent to non-respondents. It is quite possible that a subject may have lost their original questionnaire and so every reminder should be accompanied by another questionnaire and another pre-paid envelope. It is a good idea to label the reminder questionnaires with the reference number and prefix, for example, 'a', 'b' or 'i', 'ii', etc. This will allow the researcher to identify those instances where the first questionnaire that was completed has been delayed or lost in the post, and the subject has then been kind enough to complete a repeat questionnaire. In this study, the administration period covers a total of four months.

4.5.4 Phase 3: Developing Decision-Making Framework based on Analytical Hierarchy Process Methodology

This research aims to develop an effective decision-making framework for determining the best options of facilities management service delivery in UK shopping centres. The development of this framework is based on Analytical Hierarchy Process (AHP) methodology. The first step in the AHP is decomposition of a problem into a multi-level hierarchical structure of the decision problem's relevant attributes for comparing alternatives. The number of levels in any hierarchy depends on the amount of information requested by the decision makers to evaluate the system and complexity of the problem.

In this research, a three-level hierarchy was constructed in two models. The first model was developed based on potential benefits of FM service delivery. The second model was developed based on potential risks of FM service delivery. The top level of hierarchy

represents the overall goal of selecting the best options of FM service delivery in UK shopping centres. The first level represents the factors that will influence the decision. The second level represents the criteria of factors that also will influence the decision. Finally, third level represents the alternatives that might be shopping centres managers are looking for. The application of AHP model for this decision-making framework is shown in Figure 4.1 and Figure 4.2.

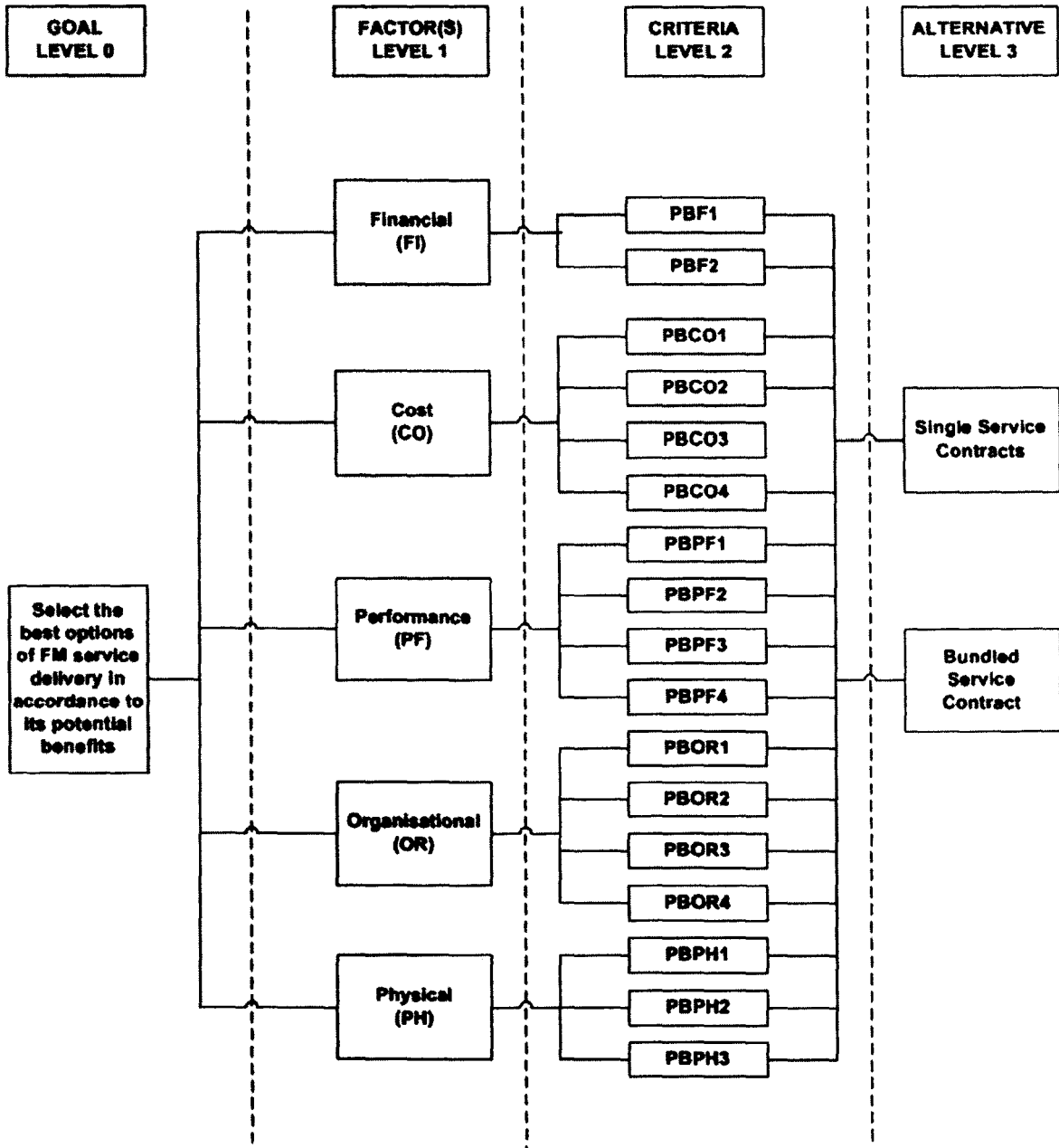


Figure 4.1: Hierarchy structure for FM service delivery options selection Model in accordance to its potential benefits

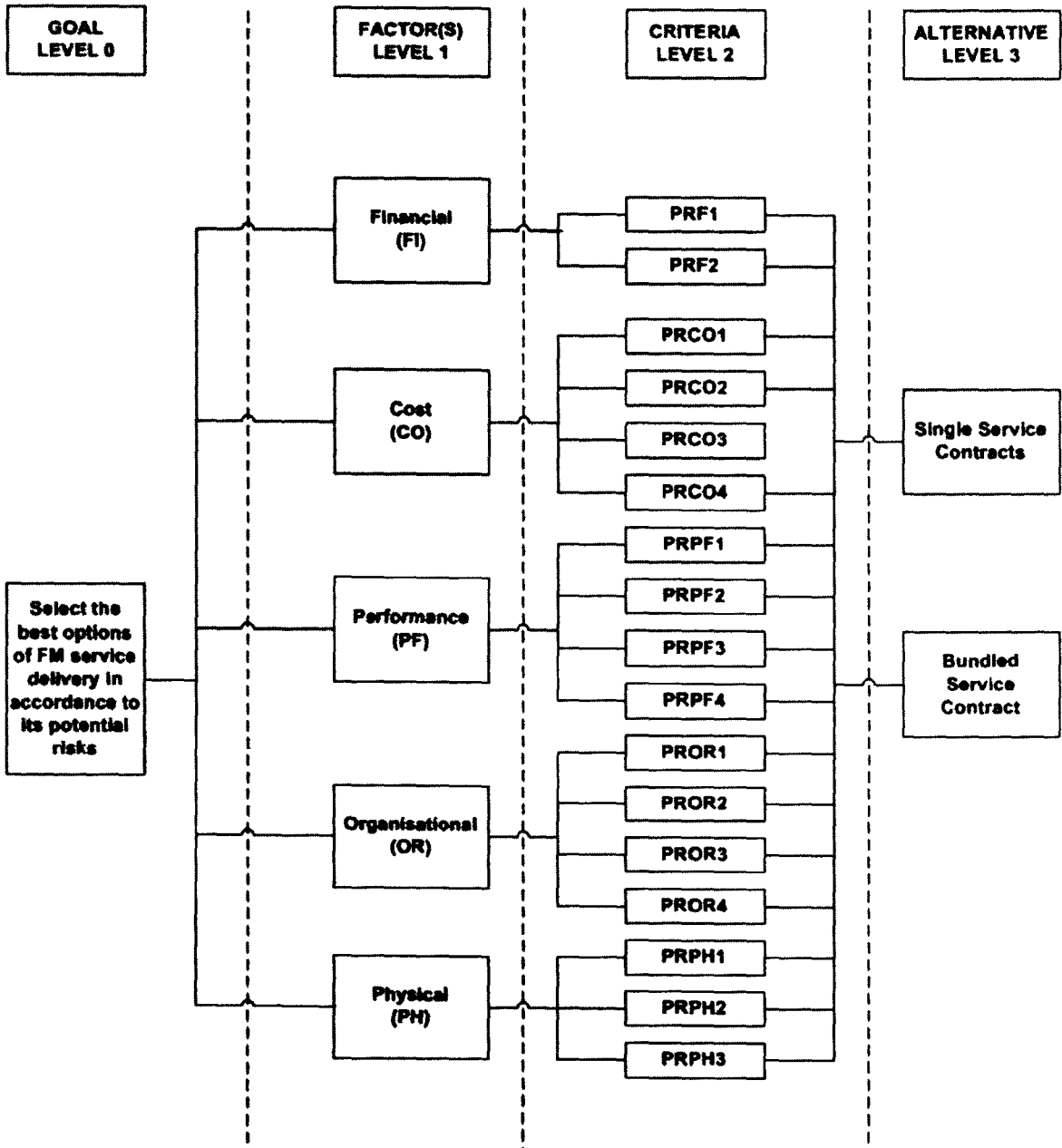


Figure 4.2: Hierarchy Structure for FM service delivery options selection Model in accordance to its potential risks

The application of analytical hierarchy process (AHP) model requires assessment criteria in order to evaluate the alternatives. Based on that requirement, the assessment criteria from this research are established earlier from Phase 1. In Phase 2, those criteria have been validated in term of their applicability in the questionnaire survey through the perceptions of shopping centres' managers. The development of this proposed decision-making framework used 17 criteria and is grouped into five factors. All criteria have been selected from the previous studies in outsourcing and most of them have been validated through the process of its studies. These factors and criteria are used as a measurement in evaluating and selecting the best options of facilities management service delivery in UK shopping centres.

The development of this proposed decision-making framework takes into account the current alternatives that have been practiced. Based on the information gathered from Phase 1, it identified that facilities management service delivery in UK shopping centres had practiced single service contracts and bundled service contract. However, there are no current studies to confirm whether either single service contract or bundled service contract are still being practised. The results from the survey in Chapter 5 indicate that majority of larger size shopping centres have practiced either single service contracts or bundled service contract. Therefore, those current facilities management service delivery options are employed into the development of this proposed decision-making framework.

4.5.5 Phase 4: Decision-Making Framework Validation

This phase aims to validate the applicability of the decision-making framework in determining the best options of FM service delivery in UK shopping centres. In achieving this aim, five shopping centres managers are selected for the validation and evaluation of the decision-making framework. These five selected shopping centres have been chosen in accordance to their experience in selecting the best options and as well as practicing both options in their shopping centres.

The validation process is conducted in two ways. Firstly, the selected shopping centres managers are asked to do a pair-wise comparison with assessment criteria, where the hierarchy framework has already been developed in the Expert choice software at Phase 3. Secondly, the selected shopping centres managers are asked to evaluate the proposed decision-making framework in terms of its capability, applicability and validity.

1) Shopping centres managers' selection

The numbers of the respondents were selected in accordance with returned questionnaires. This is because respondents from the questionnaire survey were asked to take part in a validation of the framework. The example of questions in the questionnaire survey is shown below:

6.1 Would you like to take part in a validation of the framework?

- Yes
- No
- Maybe

Out of 116 respondents in the survey, only five (5) respondents were chosen for the validation purposes. These five respondents were chosen from the larger sized shopping centres in the UK. This is because the survey findings indicate that larger sizes of shopping centres are mostly practicing both single service contracts and bundled service contract. The profiles of the selected shopping centres are summarised in the Table 4.6.

Table 4.6: Shopping Centres Managers Profiles

Shopping Centres Managers	Position	Experience	Size of shopping centres (m²)	Location
GC	Centre Manager	12 years	96, 700	Hampshire
TW	General Manager	7 years	124, 700	Birmingham
MN	Centre Manager	4 years	129, 561	Cardiff
PL	General Manager	5 years	133, 180	Essex
GB	Centre Manager	9 years	130, 060	Manchester

2) Validation Instrument

The first process of validation is using the FMOSS decision-making framework that is stored in the Expert Choice software as an instrument. The Expert Choice software facilitated the process of performing the pair-wise comparison by shopping centres managers. This instrument provides shopping centres managers with a questionnaire with scales to perform the pair-wise comparison (see Figure 4.3).

1 Financial	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Cost
2 Financial	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Performance
3 Financial	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organisational
4 Financial	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Physical
5 Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Performance
6 Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organisational
7 Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Physical
8 Performance	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organisational
9 Performance	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Physical
10 Organisational	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Physical

Figure 4.3: Example of questionnaire with scale for the pair wise comparison

Aside from the questionnaire, the pair-wise comparisons can also be performed numerically, verbally or graphically by using a different mode which is provided in this instrument. During the process, shopping centres managers are asked to perform pair-wise comparisons for all levels of hierarchy in the decision-making framework. By using this instrument, it not only assists the process of validation but is also quick, simple and structured. One advantage is that it greatly facilitates the processing data

3) *Conducting the Validation Process*

Once the numbers of respondents have been selected, the follow up letter will send to the particular respondents. In this study, the researcher sent 10 letters to particular respondents and only five respondents replied and agreed to take part in the validation process. All five represent larger size shopping centres but not medium sized shopping centres. This is because medium sized shopping centres are not practicing both options of FM service delivery, i.e. single or bundle service contract. The profile of selected shopping centres managers and dates of meeting are shown in Table 4.7.

Table 4.7: The profile of selected shopping centres managers with the dates of meeting

Shopping Centres Managers	Position	Experience	Size of shopping centres (m²)	Location	Dates of Meeting
G C	Centre Manager	12 years	96, 700	Hampshire	15/04/2011
T W	General Manager	7 years	124, 700	Birmingham	21/04/2011
M N	Centre Manager	4 years	129, 561	Cardiff	26/04/2011
P L	General Manager	5 years	133, 180	Essex	05/05/2011
G B	Centre Manager	9 years	130, 060	Manchester	09/05/2011

During the meeting, the researcher will brief respondents about the rationale of this research in which they are being asked to participate and thank them for giving up their valuable time. Respondents will be asked to complete the meeting consent form that is required by Liverpool John Moores University's Research Committee. Respondents also will be informed that their answers will be stored and their identity will be anonymous, as required by research etiquette; and that the information that they have given will be used for academic purposes only and it will be deleted once this is done.

For the first validation process the selected shopping centres managers are asked to do a pair-wise comparison with assessment criteria, where the hierarchy framework has already been developed in the Expert choice software.

At the end session of the first validation, once again shopping centres managers will be asked to evaluate the decision-making framework in order to validate its capability, applicability and results validity. The evaluation questions of FMOSS decision-making framework are shown in Table 4.8.

Table 4.8: FM Outsourcing Options Selection System (FMOSS) Evaluation Questions

FMOSS Evaluation Questions		Rating				
		1 (Poor)	2 (Fair)	3 (Satisfactory)	4 (Good)	5 (Excellent)
The Capability of the Framework						
1	How well was the selection technique process in the framework?					
2	How reliable was the assessment criteria employed in the framework?					
3	How helpful was the framework in supporting the decision process?					
4	How well did the framework reflect the decision-making process in a real situation?					
5	How useful was the Expert Choice software is employed in the framework?					
The Applicability of the Framework						
6	How relevant was the framework in the selection of the best options for FM service delivery?					
7	How appropriate was the assessment criteria used in the selection process?					
8	How appropriate was the framework as an alternative decision making for a supporting system?					
9	How relevant was the framework in improving the existing decision-making process?					
10	How relevant was the framework in term of speed, flexibility and consistency in the decision-making process?					
The Validity of the Results						
11	How convinced were you with the results produce by this framework?					
12	How confident are you in using the result as a selection making process in a real situation?					

4.6 Data Collection

Developing an effective decision-making framework require the use of a quantitative approach. This helps in determining the best options of FM service delivery in UK shopping centres. Quantitative data has been used in the context of primary as well as secondary data. In more detail, the use of quantitative data has been formulated as follows:

1. **Primary data:** this data has been recognised in relation to contextual data collected by the researcher. The primary data was obtained from the questionnaire survey and structured interviews with shopping centres' managers. The data collected from the main questionnaire survey will provide the information about the current options of FM service delivery in UK shopping centres and the assessment criteria verification through the perception of shopping centres' managers. Those findings are significant in the development of the decision-making framework. Meanwhile, the data collected from structured interviews will provide the applicability and validity of the decision-making framework in determining the best options of FM service delivery.
2. **Secondary data:** this data is based upon previous works (research, surveys, books, relevant journals and reliable web site, conference proceedings) in relation to their usefulness and adaptation to this research. The data collected from this literature has provided the information about facilities management service delivery models and the research gaps in regards to FM in the retail sector. It has also provided the list of assessment criteria from previous studies to be employed in assessing the best options of FM service delivery. Later, that information is used as the background of the study and in designing the questionnaire survey.

Overall, one hundred and sixteen (116) questionnaires were returned out of 211 sent out, and the final usable response rate was 55%, which were used for conducting a comprehensive statistical analysis in Chapter five, data analysis. Data collected from the questionnaires were compiled with SPSS and tables were generated.

4.7 Data Analysis

The data were analysed with aid of SPSS windows (Statistical Package for Social Science). The data obtained from this survey were analysed with the appropriate statistical tests based on the level of the measurement of the collected data. The statistical methods used in data analysis include:

4.7.1 Descriptive statistics

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. Descriptive statistics are typically distinguished from inferential statistics.

4.7.2 The Chi-square test

Fellows and Liu (2007) defined Chi-squared as the non-parametric statistical tests used for comparing the observed and expected frequencies of variables which fell into three or more categories and testing whether more than two population proportions can be considered to be equal. Moreover, this is a measurement of association of the independence between two variables consisting of nominal data, a table of observations concerned with two sets of variables constructed. Chi-square shall be used to measure the observed and expected frequencies, while using the cross-tabulation (aka crosstab) function, which will inform whether the null hypothesis (null H_0 is defined as the expected and actual patterns of distribution of the two variables of interest) are the same (McClelland, 2009; Drea, 2009). Davies (2001) supported that the confidence intervals provide different information from the hypothesis tests. Hypothesis testing produces a decision about any difference, either that it is statistically significant or that it is statistically non-significant.

4.7.3 Multivariate analysis of variance (MANOVA)

Multivariate analysis of variance (MANOVA) is an extension of analysis of variance for use when there is more than one dependent variable. These dependent variables should be related in some way, or there should be some conceptual reason for considering them together (Pallant, 2007). MANOVA compares the groups and indicates the mean differences between the groups on the combination of dependent variables likely to have occurred by chance.

In other words, MANOVA is a way to test the hypothesis that one or more independent variables, or factors, have an effect on a set of two or more dependent variables. MANOVA will indicate if there is a significant difference between groups and dependent variables. It also provides the univariate results for each dependent variables separately.

4.8 Summary

In conclusion, this research employed the philosophical stance of objectivism, positivism, deductive and value-free. This is because the concept of FM outsourcing is very objective, where it involves choosing external service provider to perform a function or task. This concept has been implemented by an organisation as well as shopping centres' management when it comes to make decision to outsourcing. In addition to that, the researcher views that the reality of this research can be observed, studied and even modelled. Therefore, the researcher aims to develop a decision-making framework for determining the best option of FM service delivery in UK shopping centres. Most importantly, the researcher is independent from the research undertaken and the researcher's values are kept out of the study. In achieving the research's aim and objectives, this research composed a hypothesis and research questions based on the current body of knowledge and then conducted data collection and data analysis to test them.

According to the philosophical consideration employed, this research has approached a quantitative method as an appropriate method to investigate facilities management services in UK shopping centres as well as determining the best options of FM service delivery. This is because the research uses data that are structured in the form of numbers or that can be immediately transported into numbers. Therefore, objectivity, deductiveness, generalisability and numbers are features often associated with quantitative research undertaken. This research has developed a research design that includes four phases. These phases represent the overall strategy of the research undertaken to achieve the research's aim and objectives. This research design also includes a discussion on the development of the proposed decision-making framework. The main data collection of this research is from a research survey and secondary data are based on various types of literature, e.g., journals, books, professional magazines, conference papers, etc. Finally, the data are analysed with aid of SPSS windows (Statistical Package for Social Science). These include descriptive statistics, Chi-square test and MANOVA.

CHAPTER 5: QUANTITATIVE DATA ANALYSIS AND RESULTS

5.1 Introduction

This chapter provides for the results from the questionnaire survey that was conducted to investigate the current facilities management (FM) services that have been practiced in UK shopping centres and also to investigate shopping centres' management perceptions towards the potential benefits and risks criteria. The postal questionnaire was used as a method in order to investigate this research problem. The data obtained from this survey was analysed with the SPSS package. The results were shown in the form of descriptive statistics, chi-square test and multivariate of variance (MANOVA).

5.2 Sample selection

The survey was conducted by using postal questionnaire methods. The addresses of the respondents were obtained from the British Council of Shopping Centres (BCSC). According to ICSC Research (2008) the total population of the shopping centres' scheme in the UK is about 1306. The total numbers includes the very large sized shopping centres (30), large sized shopping centres (48), medium sized shopping centres (133), small sized shopping centres (387), retail parks (607), factory outlet (19), and theme-oriented (82). These types of UK shopping centres are based on the classification from Pan-European Centre Standard (see Table 5).

Table 5: Pan-European Centre Standard

International Standard for European Shopping Centre Types			
Format	Type of Scheme		Gross Leasable Area (GLA)
Traditional	Very Large		80,000 m ² and above
	Large		40,000 – 79,999 m ²
	Medium		20,000 – 39,999 m ²
	Small	Comparison-Based Convenience-Based	5,000 – 19,999 m ² 5,000 – 19,999 m ²
Specialised	Retail Park	Large	20,000 m ² and above
		Medium	10,000 – 19,999 m ²
		Small	5,000 – 9,999 m ²
	Factory Outlet Centre		5,000 m ² and above
Theme-Oriented Centre	Leisure-based		5,000 m ² and above
	Non-Leisure-Based		5,000 m ² and above

Source: ICSC Research, 2005

5.3 Survey Design and data collection

The questionnaire was designed for a large scale survey and distributed to this similar type of respondents. It was aimed at verifying all key aspects of the main survey questionnaire including an information accessible, design of the research instruments, validity and reliability of the gathered data. The questionnaire was designed and consists of 19 questions in 5 sections. The structure of the questionnaire survey is summarised in Table 5.1.

Table 5.1: The structure of questionnaire survey

Section	Questions No.	Descriptions
1. Respondents' details	1.1-1.4	Position, experience, type of shopping centre scheme and total number of tenants.
2. Facilities Management services	2.1-2.3	Types of facilities management services, criticality to business operations and current provision
3. Management decision making	3.1-3.5	Decision-making role, framework, primary reasons to outsourcing, outsourcing options and decision-making tools
4. Outsourcing options of FM service delivery	4.1-4.2	Factors and criteria that influenced management decision towards the best options of FM service delivery.
5. General	5.1-5.5	Management awareness, intention and perceptions towards the best options of FM service delivery

5.4 Response rate and sample size

Two hundred and eleven (211) sets of questionnaires were distributed to the participants in the particular study area. These sets of questionnaires included thirty (30) very large sized shopping centres, forty-eight (48) of large sized shopping centres and one hundred and thirty three (133) medium sized shopping centres. The survey was started at 02 May, 2010 and completed on the 30 September, 2010. Overall, one hundred and sixteen (116) questionnaires were returned. This represented 67% from the very large sized shopping centres' population, 54% from the large sized shopping centres' population and 53% from the medium sized shopping centres' population. Overall, those represented the total of an effective 55% response rate (see table 5.2) and those data have been analysed with the SPSS package.

Table 5.2: Questionnaires Returned and Total Response Rate

Types of Shopping Centres	Questionnaires Sent	Questionnaires Returned	Total Response Rate
Very Large size (80,000 m ² and above)	30	20 (67%)	10%
Large size (40,000 m ² - 79,999 m ²)	48	26 (54%)	12%
Medium size (20,000 m ² -39,999 m ²)	133	70 (53)%	33%
Total	211	116 (55%)	55%

5.5 The descriptive statistic analysis

5.5.1 Respondents' background

Figure 5 shows the categories of respondents' role and their length of working experiences in shopping centre management. These roles encompass **centre director** (8), **general manager** (22), **centre manager** (85) and **director of operations** (1).

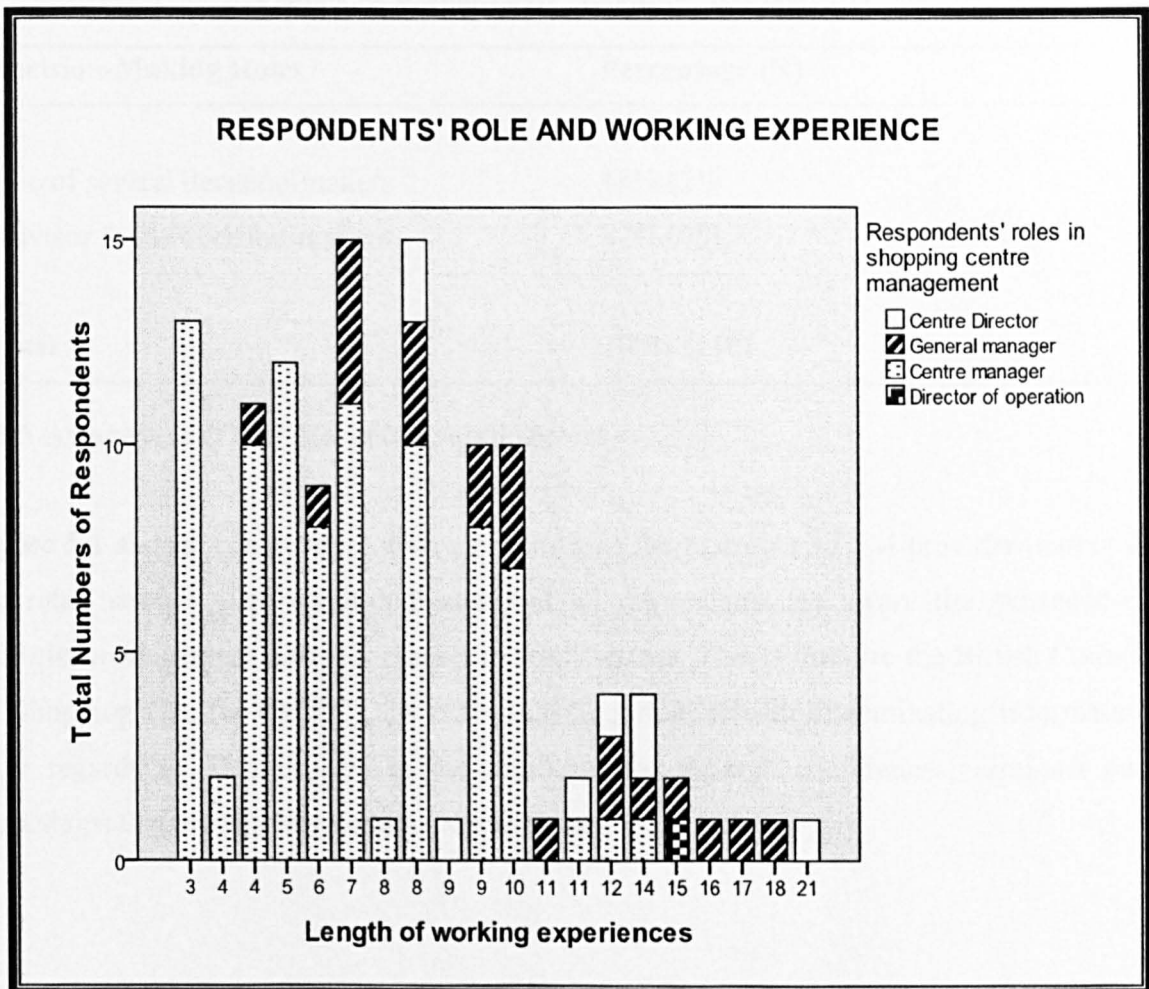


Figure 5: Respondents' role and working experience

Their working experiences range from a minimum of three years to a maximum 21 years. The results indicate that the respondents' role and extensive experiences contribute to the quality of the responses received and to the reliability and validity of the conclusion to be drawn from the research findings.

5.5.2 Management Decision-Making Roles for FM Outsourcing

Table 5.3 shows the respondents' decision-making role for outsourcing FM services in UK shopping centres. The result indicates that the respondents' decision-making role includes one of **several decision-makers** (18%) and **advisor to decision-makers** (82%). However, none of them are identified as the **final decision-maker** for outsourcing FM services. This is because the final decision-maker is the owner of the shopping centres.

Table 5.3: Respondents' Decision-Making Role

Decision-Making Roles	Percentage (N)
One of several decision-makers	18% (21)
Advisor to the decision-makers	82% (95)
Total	100% (116)

5.5.3 Awareness of FM market in retail sectors

Figure 5.1 shows management awareness towards the existence of FM provider market in the retail sectors. The result indicates that all respondents are aware the existence of facilities management provider market in retail sectors. This is because the British Council of Shopping Centres (BCSC) has played an important role in disseminating information with regards to FM services in the retail market through conferences, seminars and workshops that are actively conducted every year.

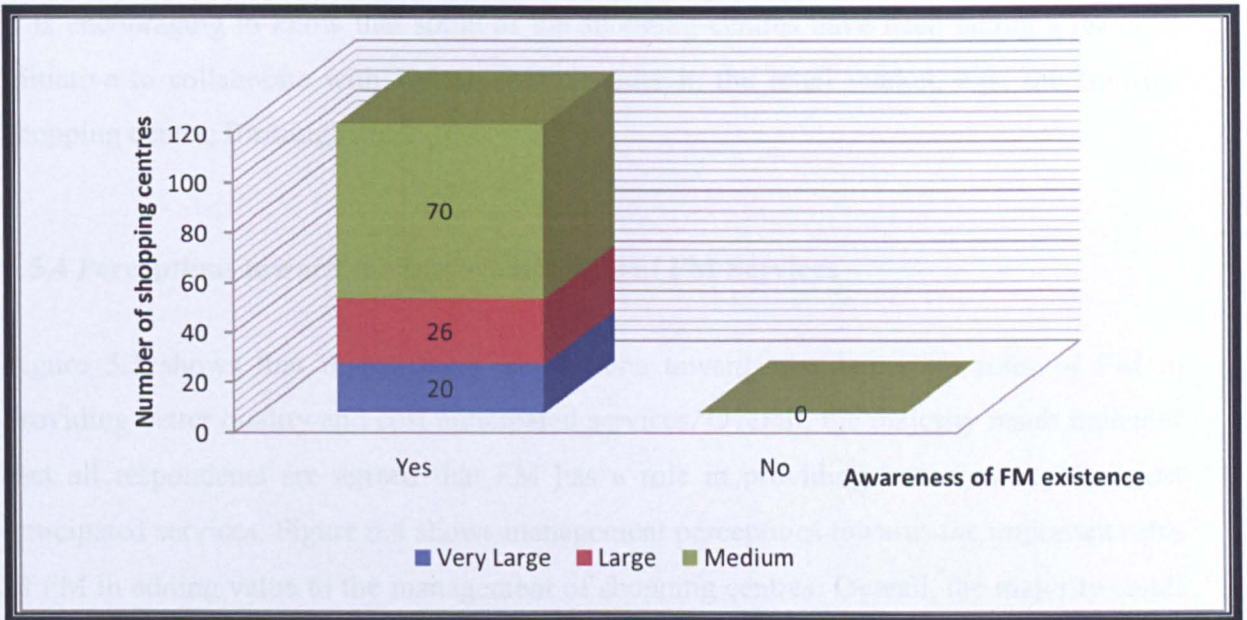


Figure 5.1: Awareness of FM existence

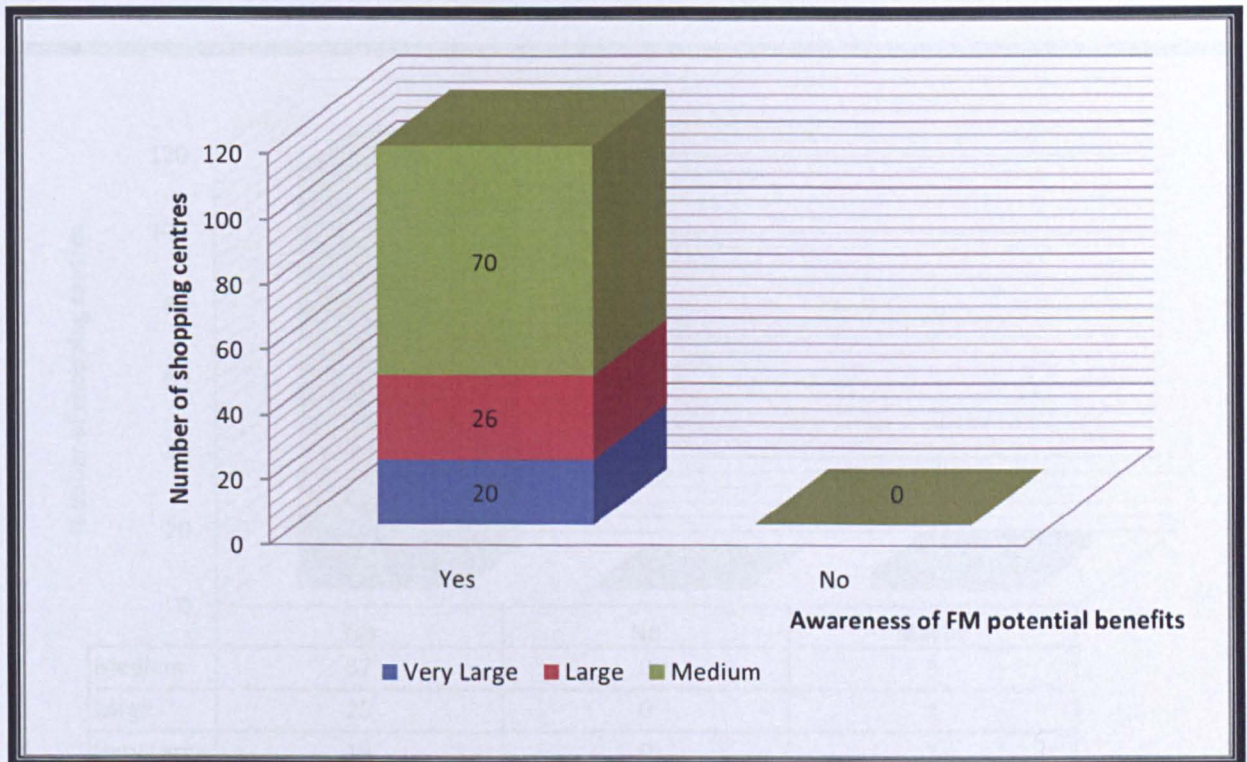


Figure 5.2: Awareness of FM potential benefits

Figure 5.2 shows management awareness towards the potential benefits of FM provider market in retail sectors. The result indicates that all respondents are aware of the potential benefits of facilities management provider market in retail sectors.

It is encouraging to know that some of the shopping centres have been taking a lead and initiative to collaborate with FM service provider in the retail market, e.g., the Bullring shopping centre, Birmingham.

5.5.4 Perceptions toward the Important Roles of FM Services

Figure 5.3 shows that management perceptions towards the important roles of FM in providing better quality and cost anticipated services. Overall, the majority result indicates that all respondents are agreed that FM has a role in providing better quality and cost anticipated services. Figure 5.4 shows management perceptions towards the important roles of FM in adding value to the management of shopping centres. Overall, the majority result indicates that all respondents are agreed that FM has a role in adding value to the management of shopping centres.

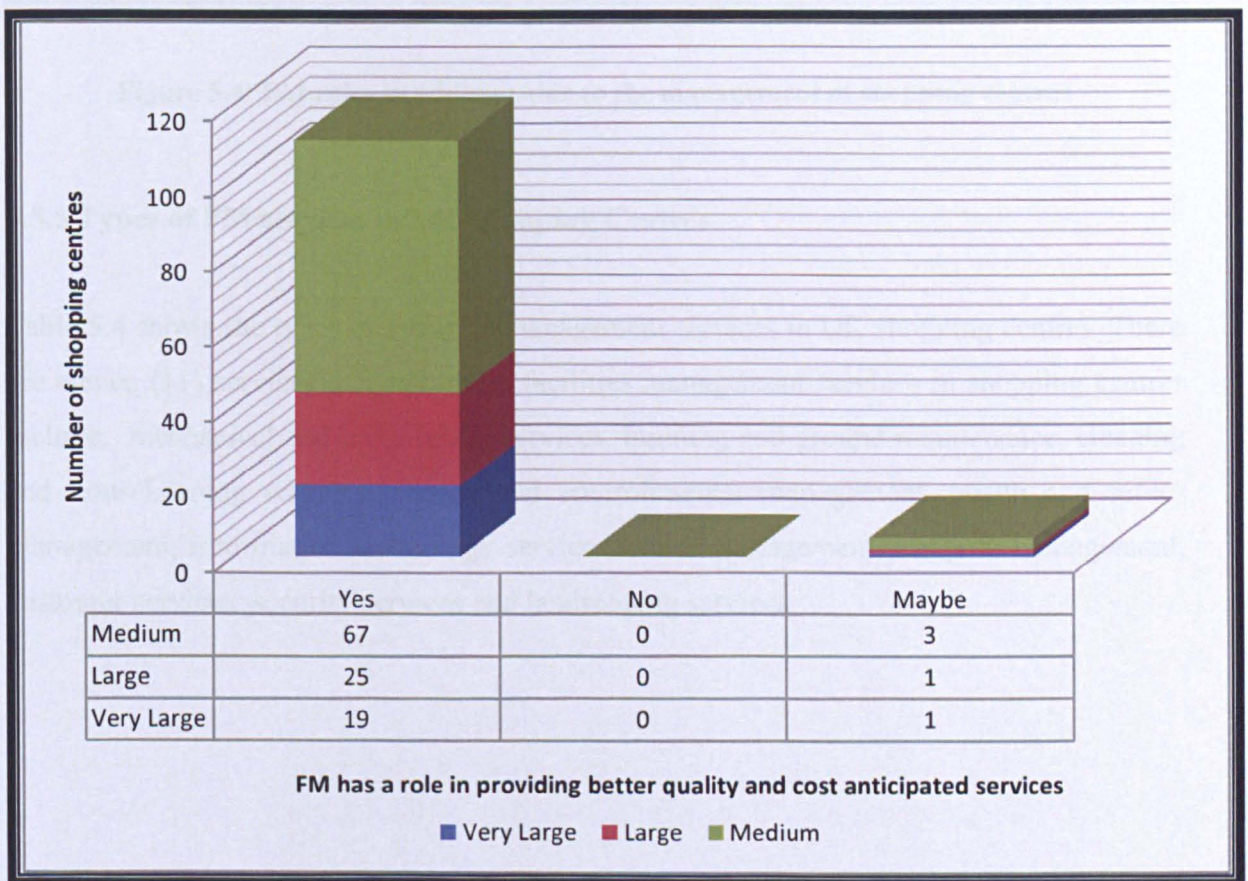


Figure 5.3 FM roles in providing better quality and cost anticipated services

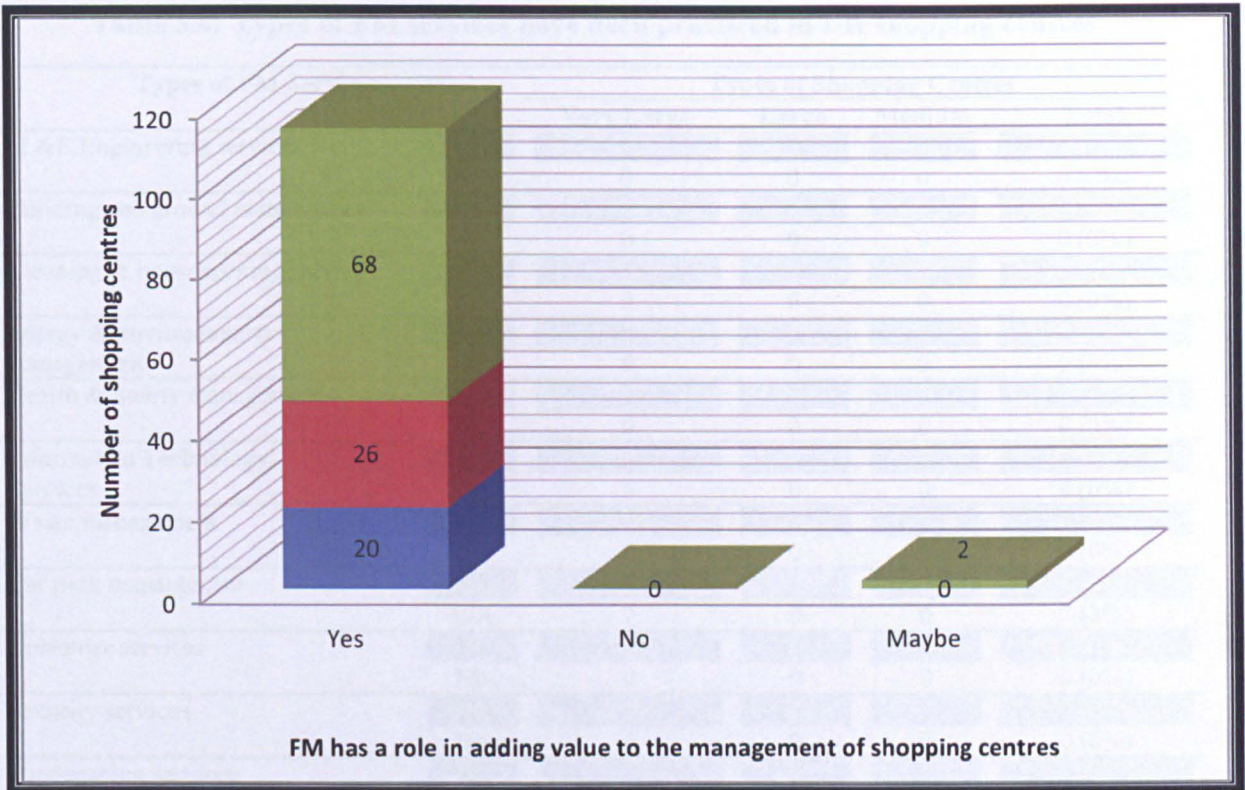


Figure 5.4: FM roles in adding value to the management of shopping centres

5.5.5 Types of FM services in UK Shopping Centres

Table 5.4 shows the types of facilities management services in UK shopping centres. There are eleven (11) services that fall under facilities management services in shopping centres include: mechanical and engineering services, building and ground maintenance, cleaning and housekeeping services, energy and environmental management, health and safety management, information technology services, waste management, car park management, customer services, security services and landscaping services.

Table 5.4: Types of FM services have been practiced in UK shopping centres

Types of FM Services		Types of Shopping Centres			
		Very Large	Large	Medium	Total
M &E Engineering services	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Building and ground maintenance	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Cleaning & housekeeping services	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Energy & environmental management	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Health & Safety management	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Information Technology Services	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Waste management	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Car park management	Yes	18	26	70	114 (98%)
	N/A	2	0	0	2 (2%)
Customer services	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Security services	Yes	20	26	70	116 (100%)
	No	0	0	0	0 (0%)
Landscaping services	Yes	19	26	70	115 (99%)
	N/A	1	0	0	1 (1%)

Most respondents agreed that those facilities management services are being practiced in their shopping centres. Those facilities management services are consistently rated by all respondents at 100% results for each service except car park management services and landscaping services. It seems that two (2) respondents from very large shopping centres have indicated that there is no availability of car park management services in their shopping centres. Meanwhile there is one (1) respondent in similar types of shopping centres that has indicated that there is no availability of landscaping services in their shopping centre. This is always the case for some shopping centres that are situated in the middle of city centres or town centres where car park facilities have been provided by the Local Authority. Overall, this result indicates that those FM services have been confirmed and are currently being practiced in UK shopping centres.

5.5.6 Criticality of FM Services to Overall Business Operations in UK Shopping Centres

Table 5.5 and Figure 5.5 show the criticality of facilities management services to overall business operations in UK shopping centres. The result indicates that six (6) out of eleven (11) FM services were perceived to be ‘very critical’ This included **security services** (100%), **health and safety management** (100%), **M & E engineering services** (97%), **waste management** (97%), **energy & environmental maintenance** (94%) and **building and ground maintenance** (86%)

Table 5.5 Criticality of FM Services in UK Shopping Centres

Types of FM Services	Very Critical	Moderate Critical	Not Critical	Total
M&E Engineering services	97% (113)	3% (3)	0% (0)	100% (116)
Building and ground maintenance	86% (100)	14% (16)	0% (0)	100% (116)
Cleaning & housekeeping services	16% (19)	84% (97)	0% (0)	100% (116)
Energy & environmental management	94% (109)	6% (7)	0% (0)	100% (116)
Health & Safety management	100% (116)	0% (0)	0% (0)	100% (116)
Information Technology services	5% (6)	95% (110)	0% (0)	100% (116)
Waste management	97% (112)	3% (4)	0% (0)	100% (116)
Car park management	5% (6)	7% (8)	88% (100)	100% (114)
Customer services	5% (6)	95% (109)	0% (0)	100% (116)
Security services	100% (116)	0% (0)	0% (0)	100% (116)
Landscaping service	5% (6)	0% (0)	95% (109)	100% (115)

Moderately critical services include **information technology services** (95%), **customer services** (94%) and **cleaning & housekeeping services** (84%). Not critical services include **landscaping services** (95%) and **car park management** (88%).

Although car park facilities are important to many shopping centres, apparently managing these car park facilities is not critical to the overall business of shopping centres. This is because most of the shopping centres have provided self-service facilities to their customers that include vending machines for tickets and payments, and automatic barriers for in and out.

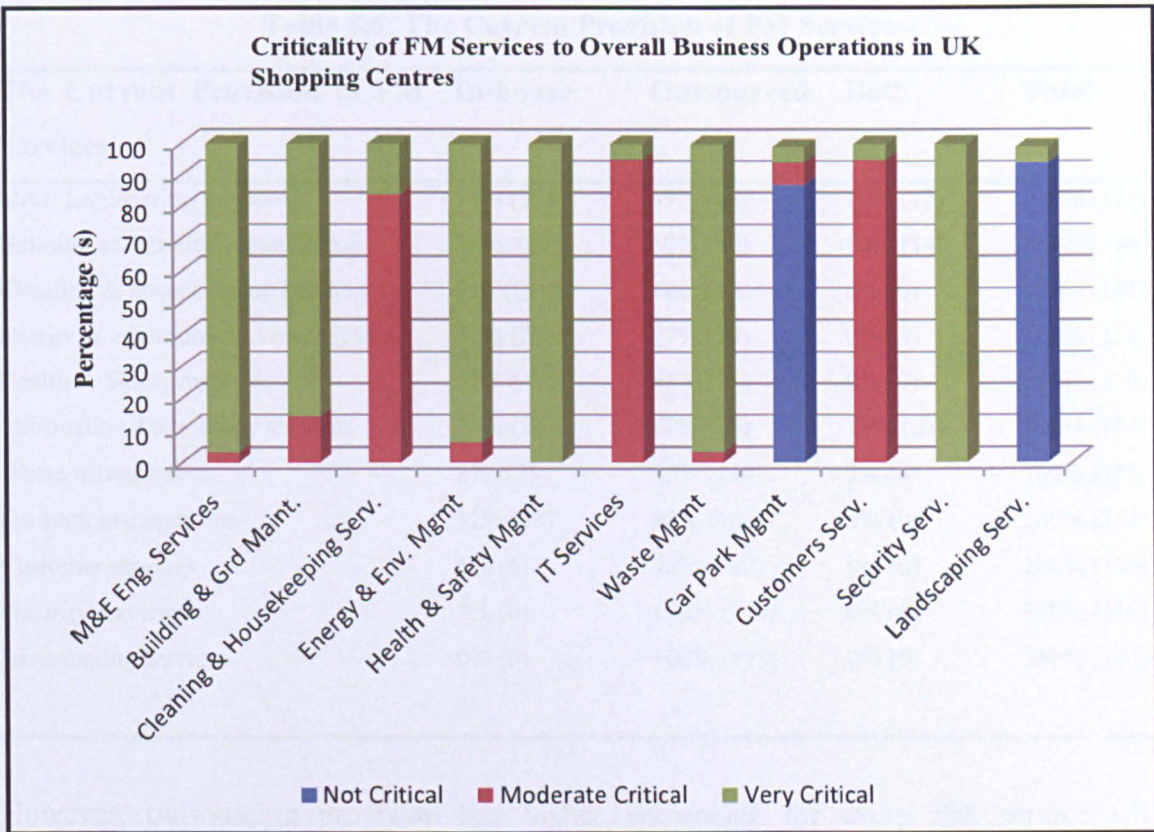


Figure 5.5: Criticality of FM Services in UK Shopping Centres

Overall, those results indicate that the management of shopping centres are aware of the importance of FM services that need to be managed properly in their shopping centres. This is because some of the services have highly legislative demands such as health and safety management, energy and environmental management and waste management; whereas some other services are affecting the quality of shopping centre environment, security and also operational costs.

5.5.7 Current Provision of FM Services in UK Shopping Centres

Table 5.6 shows the current provision of FM services in UK shopping centres. The percentage of data indicates that the provision of FM services that has been practiced in UK shopping centres includes in-house provision, outsourced and both.

Table 5.6: The Current Provision of FM Services

The Current Provision of FM Services	In-house	Outsourced	Both	Total
M&E Engineering services	31% (38)	59% (68)	10% (12)	100% (116)
Building and ground maintenance	28% (32)	60% (70)	12% (14)	100% (116)
Cleaning & housekeeping services	0% (0)	100% (116)	0% (0)	100% (116)
Energy & environmental management	33% (38)	67% (78)	0% (0)	100% (116)
Health & Safety management	35% (40)	66% (76)	0% (0)	100% (116)
Information Technology services	21% (24)	60% (70)	19% (22)	100% (116)
Waste management	2% (2)	95% (110)	3% (4)	100% (116)
Car park management	12% (14)	88% (100)	0% (0)	100% (114)
Customer services	5% (6)	95% (110)	0% (0)	100% (116)
Security services	0% (0)	100% (116)	0% (0)	100% (116)
Landscaping service	0% (0)	100% (115)	0% (0)	100% (115)

However, outsourcing provision has higher percentage for every FM service when compared to other provisions. On average, this result indicates that the major provision for facilities management services which has been practiced in UK shopping centres is **outsourcing** (81%). Meanwhile, **in-house provision** is 15% and the **other provisions** are 4%.

5.5.8 Primary Reasons For Outsourcing FM Services in UK Shopping centres

Table 5.7 shows the primary reasons for outsourcing the FM services in UK shopping centres. Respondents were asked to select more than one reason applicable to their situation. The questions also encouraged the respondents to give their own reasons if there were no reasons that were applicable to their answers. The result indicates that their primary reasons vary between shopping centres.

Overall their selected primary reasons include **cost saving** (100%), **reduced and control operating cost** (94%), **resources not available internally** (89%), **specialist knowledge required** (59%), **access to best practice** (26%), **focus on core business** (13%) **performance improvement** (11%), **reduced management burden** (11%) and **reduced risks** (10%). The most selected primary reason for outsourcing FM services in UK shopping centres is cost saving.

However, there are two (2) reasons that have not been selected by respondents at all. Those reasons are “to free capital for other investment” and “functions difficult to manage”. Probably, they believe that outsourcing is not an appropriate approach to aim to free some capital for other investment in shopping centres. Also, FM services in shopping centres were not the sort of services that are difficult to manage, which need specific equipment or technology in providing solution for the services.

Table 5.7: The Primary Reasons for Outsourcing FM Services in UK Shopping Centres

Reasons for Outsourcing	Selected	Not Selected	Total (N)
Cost saving	100% (116)	0% (0)	116
Reduced and control operating costs	94% (109)	6% (7)	116
Resources not available internally	89% (103)	11% (13)	116
Specialist knowledge required	59% (68)	41% (48)	116
Access to best practice	26% (30)	74% (86)	116
Focus on core business	13% (15)	87% (101)	116
Performance improvement	11% (13)	89% (103)	116
Reduced management burden	11% (13)	89% (103)	116
Reduce risk	10% (12)	90% (104)	116
To free capital for other investment	0% (0)	0% (0)	0
Functions difficult to manage	0% (0)	0% (0)	0

5.6 Chi-Square Test for Association

5.6.1 The Types of FM Service Delivery Options Currently Being Practiced in UK Shopping Centres

Table 5.8 shows the association between sizes of shopping centres and the options of FM service delivery that have been practiced. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables. The results indicate that the expected count of the number of larger sizes of shopping centres which have practiced single service contracts are 32 and the observed or actual count is 31. Thus, the difference between the observed and the expected values is -1. The percentage of larger sized shopping centres which have practiced single service contracts is 39%.

Table 5.8: An Association between sizes of shopping centres and FM service delivery options

Types of FM Service Delivery Options	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Single Service Contracts	31 (39%)	32	49 (61%)	48	80 (69%)
Bundled Service Contract	15 (42%)	14	21(58%)	22	36 (31%)
Total	46 (40%)		70 (60%)		116 (100%)

On the other hand, the expected count of the number of larger sized shopping centres which have practiced bundled service contract is 14 and the observed or actual count is 15. Thus, the difference between the observed and the expected values is 1. The percentage of larger sized shopping centres which have practiced bundled service contract is 42%. Meanwhile, in comparison with medium sized shopping centres, the results indicate that the expected count of the number of medium sized shopping centres which have practiced single service contracts are 48 and the observed or actual count is 49. Thus, the difference between the observed and the expected values is 1. The percentage of medium sized shopping centres which have practiced single service contracts is 61%. Then again, the expected count of the number of medium sized shopping centres which have practiced bundled service contract is 22 and the observed or actual count is 21. Thus, the difference between the observed and the expected values is -1. The percentage of medium sized shopping centres which have been practiced single service contracts is 58%.

Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which have practiced single service contracts are 80 (69%) and the total numbers of shopping centres which have practiced bundled service contract is 36 (31%).

Testing the Hypothesis:

H_0 = there is no association between the sizes of shopping centres and the options of FM service delivery has been practiced

H_1 = there is an association between the sizes of shopping centres and the options of FM service delivery has been practiced

Table 5.9: Chi-Square Tests for Association Between Sizes of Shopping Centres and FM Service Delivery Options

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	0.088 ^a	1	0.766
Continuity Correction ^b	0.008	1	0.927
Likelihood Ratio	0.088	1	0.767
Linear-by-Linear Association	0.088	1	0.767
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.28.

Table 5.9 shows the Pearson chi-square results and indicates that there is no significant relationship between size of shopping centres and the options of FM service delivery that have been practiced at the 5% significant level ($\chi^2 = 0.88$, $df = 1$, $N = 116$, $p = 0.766$, $p > 0.05$). The results do not support the hypothesis (H_1) that there is association between size of shopping centres and the options of FM service delivery have been practiced.

5.6.2 An Application of Any Specific Decision-Making Framework for FM Service Delivery Selection

Table 5.10 shows the association between sizes of shopping centres and applying any specific decision-making framework for FM service delivery selection. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables. The results indicate that the expected count of the number of larger sized shopping centres which are expected in applying any specific decision-making framework are 12 and the observed or actual count is 31. Thus, the difference between the observed and the expected values is 19. The percentage of larger sized shopping centres which apply any specific decision-making framework is 100%.

Table 5.10: An association between sizes of shopping centres and applying any specific decision-making framework for FM service delivery selection

Applying any specific decision-making framework in FM service delivery selection	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Applying	31 (100%)	12	0 (0%)	19	31 (27%)
Not Applying	15 (18%)	34	70 (82%)	51	85 (73%)
Total	46 (40%)		70 (60%)		116 (100%)

On the other hand, the expected count of the number of larger sized shopping centres which are expected not to apply any specific decision-making framework is 34 and the observed or actual count is 15. Thus, the difference between the observed and the expected values is -19. The percentage of larger sized shopping centres which are not applying any specific decision-making framework is 18%.

Meanwhile, in comparison with medium sized shopping centres, the results indicate that the expected count of the number of medium sized shopping centres which is expected in applying any specific decision-making framework is 19 and the observed or actual count is 0. Thus, the difference between the observed and the expected values is -19. The percentage of medium sized shopping centres which apply any specific decision-making framework is 0%.

Then again, the expected count of the number of medium sized shopping centres which are not applying any specific decision-making framework is 51 and the observed or actual count is 70. Thus, the difference between the observed and the expected values is 19. The percentage of medium sized shopping centres which are not applying any specific decision-making framework is 82%.

Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which apply any specific decision-making framework is 31 (27%) and the total numbers of shopping centres which are not applying any specific decision-making framework is 85 (73%).

Testing the Hypothesis:

H_0 = there is no association between the size of shopping centres and applying any specific decision-making framework

H_1 = there is an association between the size of shopping centres and applying any specific decision-making framework

Table 5.11: Chi-Square Tests for association between sizes of shopping centres and applying any specific decision-making framework for FM service delivery selection

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	64.379 ^a	1	0.00
Continuity Correction ^b	60.983	1	0.00
Likelihood Ratio	76.589	1	0.00
Linear-by-Linear Association	63.824	1	0.00
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.29.

Table 5.11 shows the Pearson chi-square results and indicates that there is significant relationship between size of shopping centres and applying any specific decision-making framework at the 1% significant level ($\chi^2 = 64.379$, $df = 1$, $N = 116$, $p = 0.001$, $p < 0.01$). The results support the hypothesis (H_1) that there is association between size of shopping centres and applying any specific decision-making framework in selecting the best options of FM service delivery. This seems to represent the fact that larger sized shopping centres are more likely to apply any specific decision-making framework in selecting the best options of FM service delivery rather than medium sized shopping centres.

5.6.3 The Basis of Management Decision-Making Supporting Tools

Table 5.12 shows the basis of management decision-making supporting tools. The result indicates that their decision-making supporting tools vary between shopping centres. Respondents were asked to select more than one decision-making tool that applicable to their practice. The questions also encouraged the respondents to add other decision-making tools if they were not listed in the questionnaire.

Table 5.12: Decision-making supporting tools

Decision-making Supporting Tools	Percentage (N)
Managment plan & operations manual	40% (46)
Solutions wanting	51% (59)
Requirements setting	84% (97)
Past experiences	53% (61)
Scientific methods and analysis	9% (10)
Others	0% (0)
Total	100% (116)

Overall their basis of decision-making supporting tools include **management plan and operational manual (40%)**, **solutions wanting (51%)**, **requirements setting (84%)**, **past experience (53%)**, **scientific methods and analysis (9%)** and **others (0%)**.

Table 5.13 shows the association between sizes of shopping centres and the use of management plan and operations manual as a basis of management decision-making supporting tools. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables. The results indicate that larger sized shopping centres which are expected to use management plan and operations manual as basis of decision-making supporting tools are 18 and the observed or actual count is 46. Thus, the difference between the observed and the expected values is 28. The percentage of larger sized shopping centres which are using management plan and operations manual as basis of decision-making supporting tools is 100%.

On the other hand, the number of larger sized shopping centres which are expected not to use management plan and operations manual as basis of decision-making supporting tools is 28 and the observed or actual count is 0. Thus, the difference between the observed and the expected values is -28. The percentage of larger sized shopping centres which are not using management plan and operations manual as basis of decision-making supporting tools is 0%.

Table 5.13: An Association Between Sizes of Shopping Centres and the use of management plan and operations manual as a basis of management decision-making supporting tools.

The use of management plan and operations manual	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Yes	46 (100%)	18	0 (0%)	28	46 (40%)
No	0 (0%)	28	70 (100%)	42	70 (60%)
Total	46 (40%)		70 (60%)		116 (100%)

Meanwhile, in comparison with medium sized shopping centres, the results indicate that the number of medium sized shopping centres which are expected to use management plan and operations manual as basis of decision-making supporting tools is 28 and the observed or actual count is 0. Thus, the difference between the observed and the expected values is -28. The percentage of medium sized shopping centres which are using management plan and operations manual as basis of decision-making supporting tools is 0%.

Then again, the number of medium sized shopping centres which are expected not to using management plan and operations manual as basis of decision-making supporting tools is 42 and the observed or actual count is 70. Thus, the difference between the observed and the expected values is 28. The percentage of medium sized shopping centres which are not using management plan and operations manual as basis of decision-making supporting tools is 100%. Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of larger sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which are using management plan and operations manual as basis of decision-making supporting tools is 46 (40%) and the total numbers of shopping centres which are not using management plan and operations manual as basis of decision-making supporting tools is 70 (60%).

Testing the Hypothesis:

H_0 = there is no association between the size of shopping centres and using management plan and operations manual as basis of decision-making supporting tools

H_1 = there is an association between the size of shopping centres and using management plan and operations manual as basis of decision-making supporting tools

Table 5.14: Chi-Square Tests for association between sizes of shopping centres and the use of management plan and operations manual

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	116.000 ^a	1	0.00
Continuity Correction ^b	111.859	1	0.00
Likelihood Ratio	155.809	1	0.00
Linear-by-Linear Association	115.000	1	0.00
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.24.

Table 5.14 shows the Pearson chi-square results and indicates that there is a significant relationship between size of shopping centres and using management plan and operations manual as basis of decision-making supporting tools at the 1% significant level ($\chi^2 = 116.000$, $df = 1$, $N = 116$, $p = 0.001$, $p < 0.01$).

The results support the hypothesis (H_1) that there is an association between size of shopping centres and the use of management plan and operations manual as basis of decision-making supporting tools. This seems to represent the fact that larger sized shopping centres are more likely to use management plan and operations manual as basis of their decision-making supporting tools rather than medium sized shopping centres.

Table 5.15: An Association Between Sizes of Shopping Centres and the solution wanting as a basis of management decision-making supporting tools.

The use of solution wanting	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Yes	2 (3%)	23	57 (97%)	36	59 (51%)
No	44(77%)	23	13 (23%)	34	57 (49%)
Total	46 (40%)		70 (60%)		116 (100%)

Table 5.15 shows the association between sizes of shopping centres and the use of solution wanting as a basis of existing management decision-making supporting tools. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables. The results indicate that the number of larger sized shopping centres which are expected to use solutions wanting as a basis of decision-making supporting tools are 23 and the observed or actual count are 2. Thus, the difference between the observed and the expected values is -21. The percentage of larger sized shopping centres which are using solutions wanting as basis of decision-making supporting tools is 3%.

On the other hand, the number of larger sized shopping centres which are expected not to use solutions wanting as basis of decision-making supporting tools is 23 and the observed or actual count is 44. Thus, the difference between the observed and the expected values is 21. The percentage of larger sized shopping centres which are not using solutions wanting as basis of decision-making supporting tools is 77%.

Meanwhile, in comparison with medium sized shopping centres, the results indicate that the number of medium sized shopping centres which expected in using solutions wanting as a basis of decision-making supporting tools is 36 and the observed or actual count is 57. Thus, the difference between the observed and the expected values is 21. The percentage of medium sized shopping centres which are using solutions wanting as basis of decision-making supporting tools is 97%.

Then again, the number of medium sized shopping centres which are not expected to be using solutions wanting as a basis of decision-making supporting tools is 34 and the observed or actual count is 13. Thus, the difference between the observed and the expected values is -21. The percentage of medium sized shopping centres which are not using solutions wanting as basis of decision-making supporting tools is 23%. Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which are using solutions wanting as a basis of decision-making supporting tools is 59 (51%) and the total numbers of shopping centres which are not using solutions wanting as basis of decision-making supporting tools is 57 (49%).

Testing the Hypothesis:

H_0 = there is no association between the size of shopping centres and using solution wanting as basis of their decision-making supporting tools

H_1 = there is an association between the size of shopping centres and using solution wanting as basis of their decision-making supporting tools

Table 5.16: Chi-Square Tests for association between sizes of shopping centres and the use of solution wanting

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	65.990 ^a	1	0.00
Continuity Correction ^b	62.942	1	0.00
Likelihood Ratio	77.129	1	0.00
Linear-by-Linear Association	65.421	1	0.00
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.60.

Table 5.16 shows the Pearson chi-square results and indicates that there is a significant relationship between size of shopping centres and using solution wanting as basis of their decision-making supporting tools at the 1% significant level ($\chi^2 = 65.990$, $df = 1$, $N = 116$,

$p= 0.001, p < 0.01$). The results support the hypothesis (H_1) that there is association between sizes of shopping centres and using solution wanting as basis of their decision-making supporting tools. This seems to represent the fact that medium sized shopping centres are more likely to use solution wanting as basis of their decision-making supporting tools rather than larger sized shopping centres.

Table 5.17: An Association between Sizes of Shopping Centres and the use of requirements setting as a basis of existing management decision-making supporting tools

The use of requirements setting	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Yes	27 (28%)	38	70 (72%)	59	97 (84%)
No	19(100%)	8	0 (0%)	11	19 (16%)
Total	46 (40%)		70 (60%)		116 (100%)

Table 5.17 shows the association between sizes of shopping centres and the use of requirements setting as a basis of existing management decision-making supporting tools. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables.

The results indicate that the number of larger sized shopping centres which are expected to use requirements setting as basis of their decision-making supporting tools are 38 and the observed or actual count are 27. Thus, the difference between the observed and the expected values is -11. The percentage of larger sized shopping centres which are using requirements setting as a basis of decision-making supporting tools is 28%.

On the other hand, the number of larger sized shopping centres which are expected not to use requirements setting as basis of their decision-making supporting tools is 8 and the observed or actual count is 19. Thus, the difference between the observed and the expected values is 11. The percentage of larger sized shopping centres which are not using requirements setting as a basis of their decision-making supporting tools is 100%.

Meanwhile, in comparison with medium sized shopping centres, the results indicate that the number of medium sized shopping centres which are expected to use requirements setting as a basis of decision-making supporting tools is 59 and the observed or actual count is 70. Thus, the difference between the observed and the expected values is 11. The percentage of medium sized shopping centres which are using requirements setting as basis of their decision-making supporting tools is 72%. Then again, the number of medium sized shopping centres which are expected to not use requirements setting as basis of their decision-making supporting tools is 11 and the observed or actual count is 0. Thus, the difference between the observed and the expected values is -11. The percentage of medium sized shopping centres which are not using requirements setting as basis of their decision-making supporting tools is 0%.

Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which are using requirements setting as basis of decision-making supporting tools is 97 (84%) and the total number of shopping centres which are not using requirements setting as basis of decision-making supporting tools is 19 (16%).

Testing the Hypothesis:

H_0 = there is no association between the size of shopping centres and using requirements setting as basis of decision-making supporting tools

H_1 = there is an association between the size of shopping centres and using requirements setting as basis of decision-making supporting tools

Table 5.18: Chi-Square Tests for association between sizes of shopping centres and the use of requirements setting

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	34.576 ^a	1	0.00
Continuity Correction ^b	31.626	1	0.00
Likelihood Ratio	41.079	1	0.00
Linear-by-Linear Association	34.278	1	0.00
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.53.

Table 5.18 shows the Pearson chi-square results and indicates that there is significant relationship between size of shopping centres and using requirements setting as the basis of their decision-making supporting tools at the 1% significant level ($\chi^2 = 34.576$, $df = 1$, $N = 116$, $p = 0.001$, $p < 0.01$). The results support the hypothesis (H_1) that there is association between size of shopping centres and using solution wanting as the basis of their decision-making supporting tools. This seems to represent the fact that medium sized shopping centres are more likely to use requirements setting as basis of their decision-making supporting tools rather than large sized shopping centres.

Table 5.19: An association between sizes of shopping centres and the use of past experiences as a basis of existing management decision-making supporting tools

The use of past experiences	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Yes	5 (8%)	24	56 (92%)	37	61 (53%)
No	41(75%)	22	14 (25%)	33	55 (47%)
Total	46 (40%)		70 (60%)		116 (100%)

Table 5.19 shows the association between sizes of shopping centres and the use of past experiences as a basis of existing management decision-making supporting tools. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables.

The results indicate that the number of larger sized shopping centres which are expected to use past experiences as basis of their decision-making supporting tools are 24 and the observed or actual count are 5. Thus, the difference between the observed and the expected values is -19. The percentage of larger sized shopping centres which are using past experiences as a basis of decision-making supporting tools is 8%.

On the other hand, the number of larger sized shopping centres which are expected to not be using past experiences as a basis of their decision-making supporting tools is 22 and the observed or actual count is 41. Thus, the difference between the observed and the expected values is 19. The percentage of larger sized shopping centres which are not using past experiences as a basis of their decision-making supporting tools is 75%.

Meanwhile, in comparison with medium sizes of shopping centres, the results indicate that the number of medium sized shopping centres which are expected to be using past experiences as basis of decision-making supporting tools is 37 and the observed or actual count is 56. Thus, the difference between the observed and the expected values is 19. The percentage of medium sized shopping centres which are using past experiences as a basis of their decision-making supporting tools is 92%. Then again, the number of medium sized shopping centres which are expected not to be using past experiences as basis of their decision-making supporting tools is 33 and the observed or actual count is 14. Thus, the difference between the observed and the expected values is -19. The percentage of medium sized shopping centres which are not using past experiences as a basis of their decision-making supporting tools is 25%.

Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which are using past experiences as a basis of decision-making supporting tools is 61 (53%) and the total numbers of shopping centres which are not using past experiences as a basis of decision-making supporting tools is 55 (47%).

Testing the Hypothesis:

H_0 = there is no association between the size of shopping centres and using past experiences as basis of decision-making supporting tools

H_1 = there is an association between the size of shopping centres and using past experiences as basis of decision-making supporting tools

Table 5.20: Chi-Square Tests for association between sizes of shopping centres and the use of past experiences

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	53.206 ^a	1	0.00
Continuity Correction ^b	50.469	1	0.00
Likelihood Ratio	58.816	1	0.00
Linear-by-Linear Association	52.747	1	0.00
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21.81.

Table 5.20 shows the Pearson chi-square results and indicates that there is a significant relationship between size of shopping centres and using past experiences as a basis of their decision-making supporting tools at the 1% significant level ($\chi^2 = 53.206$, $df = 1$, $N = 116$, $p = 0.001$, $p < 0.01$). The results support the hypothesis (H_1) that there is association between size of shopping centres and using past experiences as basis of their decision-making supporting tools. This seems to represent the fact that medium sized shopping centres are more likely to use past experiences as basis of their decision-making supporting tools than large sized shopping centres.

Table 5.21: An association between sizes of shopping centres and the use of scientific methods and analysis as a basis of existing management decision-making supporting tools

The use of scientific methods and analysis	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Yes	10(100%)	4	0 (0%)	6	10 (9%)
No	36(34%)	42	70 (66%)	64	106 (91%)
Total	46 (40%)		70 (60%)		116 (100%)

Table 5.21 shows the association between sizes of shopping centres and the use of scientific methods and analysis as a basis of existing management decision-making supporting tools. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables. The results indicate that the number of larger sized shopping centres which are expected to use scientific methods and analysis as basis of their decision-making supporting tools are 4 and the observed or actual count are 10.

Thus, the difference between the observed and the expected values is 6. The percentage of larger sized shopping centres which are using scientific methods and analysis as basis of decision-making supporting tools is 100%. On the other hand, the number of larger sized shopping centres which are expected to not be using scientific methods and analysis as basis of their decision-making supporting tools is 42 and the observed or actual count is 36. Thus, the difference between the observed and the expected values is -6. The percentage of larger sized shopping centres which are not using scientific methods and analysis as basis of their decision-making supporting tools is 34%.

Meanwhile, in comparison with medium sized shopping centres, the results indicate that the number of medium sized shopping centres which are expected to use scientific methods and analysis as a basis of decision-making supporting tools is 6 and the observed or actual count is 0. Thus, the difference between the observed and the expected values is -6. The percentage of medium sized shopping centres which are using scientific methods and analysis as a basis of their decision-making supporting tools is 0%. Then again, the number of medium sized shopping centres which are expected to not be using scientific methods and analysis as a basis of their decision-making supporting tools is 64 and the observed or actual count is 70. Thus, the difference between the observed and the expected values is 6. The percentage of medium sized shopping centres which are not using scientific methods and analysis as basis of their decision-making supporting tools is 66%.

Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which are using scientific methods and analysis as basis of decision-making supporting tools is 10 (9%) and the total numbers of shopping centres which are not using scientific methods and analysis as basis of decision-making supporting tools is 106 (91%).

Testing the Hypothesis:

H_0 = there is no association between the size of shopping centres and using scientific methods and analysis as basis of decision-making supporting tools

H_1 = there is an association between the size of shopping centres and using scientific methods and analysis as basis of decision-making supporting tools

Table 5.22: Chi-Square Tests for association between sizes of shopping centres and the use of scientific methods and analysis

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	16.653 ^a	1	0.00
Continuity Correction ^b	14.008	1	0.00
Likelihood Ratio	19.962	1	0.00
Linear-by-Linear Association	16.509	1	0.00
Total (N)	116		

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.97.

Table 5.22 shows the Pearson chi-square results and indicates that there is significant relationship between size of shopping centres and using scientific methods and analysis as basis of their decision-making supporting tools at the 1% significant ($\chi^2 = 16.653$, $df = 1$, $N = 116$, $p = 0.001$, $p < 0.01$).

The results support the hypothesis (H_1) that there is association between size of shopping centres and using scientific methods and analysis as basis of their decision-making supporting tools. This seems to represent the fact that large sized shopping centres are more likely to use scientific methods and analysis as basis of their decision-making supporting tools rather than medium sized shopping centres.

5.6.4 Status of Engagement with FM Service Providers

Table 5.23 shows the association between sizes of shopping centres and the status of engagement with FM service providers. This table gives some simple descriptive statistics that include counts and percentages for the cross tabulation of the two variables.

Table 5.23: An association between sizes of shopping centres and the status of engagement with FM service providers

Status of Engagement with FM Service Providers	Sizes of Shopping Centres				Total
	Larger		Medium		
	Observed	Expected	Observed	Expected	
Already Engaging	23 (39%)	23	36 (61%)	36	59 (51%)
Not Engaging	23 (40%)	23	34 (60%)	34	57 (49%)
Total	46 (40%)		70 (60%)		116 (100%)

The results indicate that the expected count of the number of large sized shopping centres which are already engaging with FM service provider is 23 and the observed or actual count are 23. Thus, the difference between the observed and the expected values is 0. The percentage of large sized shopping centres which are already engaging with FM service provider is 39%. On the other hand, the expected count of the number of large sized shopping centres which are not engaging with FM service provider is 23 and the observed or actual count are 23. Thus, the difference between the observed and the expected values is 0. The percentage of large sized shopping centres is which not engaging with FM service provider is 40%.

Meanwhile, in comparison with medium sized shopping centres, the results indicate that the expected count of the number of medium sized shopping centres which are already engaging with FM service provider is 36 and the observed or actual count are 36. Thus, the difference between the observed and the expected values is 0. The percentage of medium sized shopping centres which are already engaging with FM service provider is 61%. Then again, the expected count of the number of medium sized shopping centres which are not engaging with FM service provider is 34 and the observed or actual count are 34. Thus, the difference between the observed and the expected values is 0. The percentage of medium sized shopping centres which are not engaging with FM service provider is 60%.

Overall, the results indicate that the total number of respondents is 116 (100%). These include 46 (40%) of large sized shopping centres and 70 (60%) of medium sized shopping centres. The total numbers of shopping centres which are already engaging with FM service provider is 59 (51%) and the total numbers of shopping centres which are not engaging with FM service provider is 57 (49%).

Testing the hypothesis:

H_0 = there is no association between the size of shopping centres and the status of engagement with FM service provider

H_1 = there is an association between the size of shopping centres and the status of engagement with FM service provider

Table 5.24: Chi-Square Tests for Association Between Sizes of Shopping Centres and the Status of Engagement with FM Service Providers

Chi-Square Tests	Value	df	Sig. (p)
Pearson Chi-Square	0.023 ^a	1	0.880
Continuity Correction ^b	0.000	1	1.000
Likelihood Ratio	0.023	1	0.880
Linear-by-Linear Association	0.022	1	0.881
Total (N)	116		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.60.

Table 5.24 shows the Pearson chi-square results and indicates that there is no significant relationship between size of shopping centres and the status of engagement with FM service provider at the 5% significant level ($\chi^2 = 0.023$, $df = 1$, $N = 116$, $p = 0.880$, $p > 0.05$). The results do not support the hypothesis (H_1) that there is an association between size of shopping centres and the status of engagement with FM service provider.

5.7 Multivariate Analysis of Variance (MANOVA)

5.7.1 Multivariate Analysis of Variance for the Types of FM Service Delivery Options towards its Potential Benefits

Multivariate analysis of variance (MANOVA) is used to determine whether the different types of FM service delivery options have a significant difference towards its potential benefits. The independent variables (IV) include two variables: single service contracts and bundled service contract.

Meanwhile, the dependent variables (DV) include the potential benefits of FM service delivery that groups into five: financial, cost, performance, organisational and physical (Refer chapter 3 under sub-heading 3.6). The analysis was conducted to test the hypothesis of study:

H_0 = there is no significant difference in types of FM service delivery options towards its potential benefits

H_1 = there is a significant difference in types of FM service delivery options towards its potential benefits

The results were presented in accordance to the five groups that consist of financial, cost, performance, organisational and physical. The results summarise MANOVA tests for the types of FM service delivery options towards its potential benefits is shown in Appendix III.

(a) Financial

Table 5.25 shows whether the types of FM service delivery options have a significant effect on its potential financial benefits. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.25: Multivariate tests for the types of FM service delivery options towards its potential benefits in Financial

Multivariate main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery options	Pillai's Trace	0.845	204.299 ^a	3.000	112.000	0.000	0.845	1.000
	Willks' Lambda	0.155	204.299 ^a	3.000	112.000	0.000	0.845	1.000
	Hotelling's Trace	5.472	204.299 ^a	3.000	112.000	0.000	0.845	1.000
	Roy's Largest Root	5.472	204.299 ^a	3.000	112.000	0.000	0.845	1.000

a. Computed using alpha = 0.05

The result show that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.155, $F(3, 112.000) = 204.299$, $p < 0.05$, partial eta squared = 0.845. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.26: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential financial benefits

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Save money on non-core activities	48.277	1	48.277	433.729	0.000	0.792	1.000
	Opportunity to reduce investment in asset	0.001	1	0.001	0.011	0.917	0.000	0.051
Error	Save money on non-core activities	12.689	114	0.111				
	Opportunity to reduce investment in asset	12.576	114	0.110				

a. Computed using alpha = 0.05

Table 5.26 shows which of the potential financial benefits have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of FM service delivery options were obtained for save money on non-core activities, $F(1, 114) = 433.729$, $p < 0.05$, partial eta square = 0.792, power = 1

Table 5.27: Types of FM service delivery options

Pontential Benefits in Financial (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Save money on non-core activities	Single Service Contracts	3.050	0.037	2.976	3.124
	Bundled Service Contract	4.444	0.056	4.334	4.555
Opportunity to reduce investment in asset	Single Service Contracts	2.063	0.037	1.989	2.136
	Bundled Service Contract	2.583	0.059	2.466	2.700

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.27 shows which of the types of FM service delivery options that have a significant effect on its potential benefits. An inspection of the mean scores indicated that bundled service contract has higher potential benefits for saving money on non-core activities ($M=4.444$, $SD=0.056$) than single service contracts ($M=3.050$, $SD=0.037$).

(b) Cost

Table 5.28 shows whether the types of FM service delivery options have a significant effect on its potential benefits in cost. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables. The result show that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.672, $F(3, 112.000) = 18.247$, $p < 0.05$, partial eta squared = 0.328. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.28: Multivariate tests for the types of FM service delivery options towards its potential benefits in cost

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Pillai's	0.328	18.247 ^a	3.000	112.000	0.000	0.328	1.000
	Trace							
	Willks'	0.672	18.247 ^a	3.000	112.000	0.000	0.328	1.000
	Lambda							
	Hotelling's	0.489	18.247 ^a	3.000	112.000	0.000	0.328	1.000
	Trace							
	Roy's	0.489	18.247 ^a	3.000	112.000	0.000	0.328	1.000
	Largest							
	Root							

a. Computed using alpha =0.05

Table 5.29 shows which of the potential benefits in cost have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects show that the univariate main effects were examined.

Table 5.29: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential benefits in cost

Independant Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Enable to obtain cheaper services	7.472	1	7.472	37.872	0.000	0.249	1.000
	Enable operational cost to be reduced	6.879	1	6.879	39.128	0.000	0.256	1.000
	Enable to provide cost effective services	0.221	1	0.221	1.569	0.213	0.014	0.237
	Enable to control service charges	24.828	1	24.828	854.618	0.000	1.000	1.000
Error	Enable to obtain cheaper services	22.493	114	0.197				
	Enable operational cost to be	20.043	114	0.176				

reduced				
Enable to provide cost effective services	16.089	114	0.141	
Enable to control service charges	0.000	114	0.000	

a. Computed using alpha = 0.05

Significant univariate main effects for the types of FM service delivery options were obtained for enable to obtain cheaper services , $F(1, 114) = 37.872, p < 0.05$, partial eta square = 0.249, power = 1; enable operational cost to be reduced, $F(1, 114) = 39.128, p < 0.05$, partial eta square = 0.256, power = 1.; and enable to control service charges, $F(1, 114) = 854.618, p < 0.05$, partial eta square = 1.000, power = 1.

Table 5.30: Types of FM service delivery options

Potential Benefits in Cost (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Enable to obtain cheaper services	Single Service Contracts	3.812	0.050	3.714	3.911
	Bundled Service Contract	4.361	0.074	4.214	4.508
Enable operational cost to be reduced	Single Service Contracts	3.862	0.047	3.770	3.955
	Bundled Service Contract	4.389	0.070	4.250	4.527
Enable to provide cost effective services	Single Service Contracts	3.850	0.042	3.767	3.933
	Bundled Service Contract	3.944	0.063	3.820	4.068
Enable to control service charges	Single Service Contracts	3.000	0.000	3.000	3.000
	Bundled Service Contract	4.000	0.000	4.000	4.000

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.30 shows which of the types of FM service delivery options have a significant effect on its potential benefits. An inspection of the mean scores indicates that bundled service contract has potential benefits for obtaining cheaper services ($M=4.361, SD=0.074$) than single service contracts ($M=3.812, SD=0.050$).

The mean scores also indicated that bundled service contract has potential benefits of enabling operational cost to be reduced (M= 4.389, SD= 0.070) than single service contracts (M=3.862, SD= 0.047). Further inspection of the mean scores indicated that bundled service contract has potential benefits of being able to control service charges (M=4.000, SD=0.000) than single service contracts (M=3.000, SD=0.000)

(c) Performance

Table 5.31 shows whether the types of FM service delivery options have a significant effect on the potential benefits in performance. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.31: Multivariate Tests for the Types of FM Service Delivery Options towards its Potential Benefits in Performance

Multivariate	Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Pillai's	0.704	66.150 ^a	4.000	111.000	0.000	0.704	1.000
	Trace							
	Willks'	0.296	66.150 ^a	4.000	111.000	0.000	0.704	1.000
	Lambda							
	Hotelling's	2.384	66.150 ^a	4.000	111.000	0.000	0.704	1.000
	Trace							
	Roy's	2.384	66.150 ^a	4.000	111.000	0.000	0.704	1.000
	Largest Root							

a. Computed using alpha = .05

The result shows that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.296, F(4, 111.000) = 66.150, p < 0.05, partial eta squared = 0.704. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.32: Tests of Between-Subjects Effects for the Types of FM Service Delivery Options and its Potential Benefits in Performance

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Improve operating performance	20.547	1	20.547	242.489	0.000	0.680	1.000
	Enable to obtain expertise, skills and technologies	0.966	1	0.966	0.129	0.720	0.001	0.065
	Enable to improve services quality	0.785	1	0.785	6.791	0.010	0.056	0.734
	Increase customer satisfaction	4.543	1	4.543	26.667	0.000	0.190	0.999
Error	Improve operating performance	9.660	114	0.085				
	Enable to obtain expertise, skills and technologies	850.922	114	7.464				
	Enable to improve services quality	13.172	114	.116				
	Increase customer satisfaction	19.422	114	.170				

a. Computed using alpha = 0.05

Table 5.32 shows which of the potential benefits in performance have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of FM service delivery options were obtained for improve operating performance, $F(1, 114) = 242.489$, $p < 0.05$, partial eta square = 0.680, power = 1; enable to improve services quality, $F(1, 114) = 6.791$, $p < 0.05$, partial eta square = 0.056, power = 0.734.; and increase customer satisfaction, $F(1, 114) = 26.667$, $p < 0.05$, partial eta square = 0.190, power = 0.999

Table 5.33: Types of FM service delivery options

Potential Benefits in Cost (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Improve operating performance	Single Service Contracts	3.062	0.033	2.998	3.127
	Bundled Service Contract	3.972	0.049	3.876	4.068
Enable to obtain expertise, skills and technologies	Single Service Contracts	4.225	0.305	3.620	4.830
	Bundled Service Contract	4.028	0.455	3.126	4.930
Enable to improve services quality	Single Service Contracts	3.850	0.038	3.775	3.925
	Bundled Service Contract	4.028	0.057	3.916	4.140
Increase customer satisfaction	Single Service Contracts	3.850	0.046	3.759	3.941
	Bundled Service Contract	4.278	0.069	4.141	4.414

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.33 shows which of the types of FM service delivery options have a significant effect on its potential benefits. An inspection of the mean scores indicated that the bundled service contract has potential benefits of improving operating performance ($M=3.972$, $SD=0.049$) than single service contracts ($M=3.062$, $SD=0.033$). The mean scores also indicated that the bundled service contract has potential benefits of enabling improvements in services quality ($M= 4.028$, $SD= 0.057$) than single service contracts ($M=3.850$, $SD= 0.038$).

Further inspection of the mean scores indicated that bundled service contract has potential benefits of increasing customer satisfaction ($M=4.278$, $SD=0.069$) than single service contracts ($M=3.850$, $SD=0.046$)

(d) Organisational

Table 5.34 shows whether the types of FM service delivery options have a significant effect on its potential organisational benefits. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.34: Multivariate tests for the types of FM service delivery options towards its potential benefits in Organisational

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Pillai's Trace	0.940	432.071 ^a	4.000	111.000	0.000	0.940	1.000
	Willks' Lambda	0.060	432.071 ^a	4.000	111.000	0.000	0.940	1.000
	Hotelling's Trace	15.570	432.071 ^a	4.000	111.000	0.000	0.940	1.000
	Roy's Largest Root	15.570	432.071 ^a	4.000	111.000	0.000	0.940	1.000

a. Computed using alpha = 0.05

The result show that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.060, $F(4, 111.000) = 432.071$, $p < 0.05$, partial eta squared = 0.940. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.35: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential Organisational benefits

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Free up management time to focus on core activities	178.766	1	178.766	1277.697	0.000	0.918	1.000
	Enhance management effectiveness	190.423	1	190.423	1262.923	0.000	0.917	1.000
	Improve management capability	147.679	1	147.679	638.780	0.000	0.849	1.000
	Reduce management burden	150.382	1	150.382	1105.642	0.000	0.907	1.000
Error	Free up management time to focus on core activities	15.950	114	0.140				
	Enhance management effectiveness	17.189	114	0.151				
	Improve management capability	26.356	114	0.231				
	Reduce management burden	15.506	114	0.136				

a. Computed using alpha = 0.05

Table 5.35 shows which of the potential organisational benefits have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of FM service delivery options were obtained for free up management time to focus on core activities, $F(1, 114) = 1277.697$, $p < 0.05$, partial eta square = 0.918, power = 1; enhance management effectiveness, $F(1, 114) = 1262.923$, $p < 0.05$, partial eta square = 0.917, power = 1.; improve management capability $F(1, 114) = 638.780$, $p < 0.05$, partial eta square = 0.849, power = 1; and reduce management burden, $F(1, 114) = 1105.642$, $p < 0.05$, partial eta square = 0.907, power = 1.

Table 5.36: Types of FM service delivery options

Dependent Variable	FM service delivery options	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Free up management time to focus on core activities	Single Service Contracts	1.900	0.042	1.817	1.983
	Bundled Service Contract	4.583	0.062	4.460	4.707
Enhance management effectiveness	Single Service Contracts	1.925	0.043	1.839	2.011
	Bundled Service Contract	4.694	0.065	4.566	4.823
Improve management capability	Single Service Contracts	1.950	0.054	1.844	2.056
	Bundled Service Contract	4.389	0.080	4.230	4.548
Reduce management burden	Single Service Contracts	1.900	0.041	1.818	1.982
	Bundled Service Contract	4.361	0.061	4.239	4.483

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.36 shows which of the types of FM service delivery options have a significant effect on its potential benefits. An inspection of the mean scores indicated that the bundled service contract has potential benefits of free up management time to focus on core activities ($M=4.583$, $SD=0.062$) than single service contracts ($M=1.900$, $SD=0.042$). The mean scores also indicated that the bundled service contract has potential benefits of enhance management effectiveness ($M= 4.694$, $SD= 0.065$) than single service contracts ($M=1.925$, $SD= 0.043$). Further inspection of the mean scores indicated that the bundled service contract has potential benefits of improve management capability ($M=4.389$, $SD=0.080$) than single service contracts ($M=1.950$, $SD=0.054$) and finally, the mean scores indicated that the bundled service contract has potential benefits of reduce management burden ($M= 4.361$, $SD= 0.061$) than single service contracts ($M= 1.900$, $SD= 0.041$).

(e) Physical

Table 5.37 shows whether the types of FM service delivery options have a significant effect on its potential physical benefits. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables. The result show that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.163, $F(3, 112.000) = 191.722$, $p < 0.05$, partial eta squared = 0.837. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.37: Multivariate tests for the types of FM service delivery options towards its potential Financial benefits

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Pillai's Trace	0.837	191.722 ^a	3.000	112.000	0.000	0.837	1.000
	Willks' Lambda	0.163	191.722 ^a	3.000	112.000	0.000	0.837	1.000
	Hotelling's Trace	5.135	191.722 ^a	3.000	112.000	0.000	0.837	1.000
	Roy's Largest Root	5.135	191.722 ^a	3.000	112.000	0.000	0.837	1.000

a. Computed using alpha = 0.05

Table 5.38 shows which of the potential physical benefits have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of FM service delivery options were obtained for improve centre physical image, $F(1, 114) = 267.355$, $p < 0.05$, partial eta square = 0.701, power = 1; improve the quality of shopping environment $F(1, 114) = 5.560$, $p < 0.05$, partial eta square = 0.047, power = 0.647; and enable to match support services activity with footfall, $F(1, 114) = 273.262$, $p < 0.05$, partial eta square = 0.706, power = 1.

Table 5.38: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential physical benefits

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM service delivery options	Improve centre physical image	21.951	1	21.951	267.355	0.000	0.701	1.000
	Improve the quality of shopping environment	0.912	1	0.912	5.560	0.020	0.047	0.647
	Enable to match support services activity with footfall	34.278	1	34.278	273.262	0.000	0.706	1.000
Error	Improve centre physical image	9.360	114	0.082				
	Improve the quality of shopping environment	18.700	114	0.164				
	Enable to match support services activity with footfall	14.300	114	0.125				

a. Computed using alpha =0.05

Table 5.39 shows which of the types of FM service delivery options have a significant effect on its potential benefits. An inspection of the mean scores indicated that the bundled service contract has potential benefits of improve centre physical image (M=3.028, SD=0.048) than single service contracts (M=2.088, SD=0.032).

Table 5.39: Types of FM service delivery options

Potential Benefits (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Improve centre physical image	Single Service Contracts	2.088	0.032	2.024	2.151
	Bundled Service Contract	3.028	0.048	2.933	3.122
Improve the quality of shopping environment	Single Service Contracts	3.725	0.045	3.635	3.815
	Bundled Service Contract	3.917	0.068	3.783	4.050
Enable to match support services activity with footfall	Single Service Contracts	3.075	0.040	2.997	3.153
	Bundled Service Contract	4.250	0.059	4.133	4.367

Note. DV: Dependent Variables; IV: Independent Variables

The mean scores also indicated that the bundled service contract has potential benefits of improve the quality of shopping environment (M= 3.917, SD= 0.068) than single service contracts (M=3.725, SD= 0.045). Further inspection of the mean scores indicated that the bundled service contract has potential benefits of enable to match support services activity with footfall (M=4.250, SD=0.059) than single service contracts (M=3.075, SD=0.040)

5.7.2 Multivariate Analysis of Variance for the Types of FM Service Delivery Options Towards its Potential Risks

Multivariate analysis of variance (MANOVA) is used to determine whether the different types of FM service delivery options have a significant difference towards its potential risks. The independent variables (IV) include two variables: single service contracts and bundled service contract. Meanwhile, the dependent variables (DV) includes the potential risks of FM service delivery that groups into five: financial, cost, performance, organisational and physical (Refer chapter 3 under sub-heading 3.6). The analysis was conducted to test the hypothesis of study:

H_0 = there is no significant difference in types of FM service delivery options towards its potential risks

H_1 = there is a significant difference in types of FM service delivery options towards its potential risks

The results were shown in accordance to the five groups that consist of financial, cost, performance, organisational, physical and business. The results summary of MANOVA tests for the types of FM service delivery options towards its potential risks is shown in Appendix III.

(a) Financial

Table 5.40 shows whether the types of FM service delivery options have a significant effect on its potential financial risks. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.40: Multivariate tests for the types of FM service delivery options towards its potential Financial Risks

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Pillai's Trace	0.710	91.535 ^a	3.000	112.000	0.000	0.710	1.000
	Willks' Lambda	0.290	91.535 ^a	3.000	112.000	0.000	0.710	1.000
	Hotelling's Trace	2.452	91.535 ^a	3.000	112.000	0.000	0.710	1.000
	Roy's Largest Root	2.452	91.535 ^a	3.000	112.000	0.000	0.710	1.000

a. Computed using alpha = 0.05

The result shows that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.290, $F(3, 112.000) = 91.535$, $p < 0.05$, partial eta squared = 0.710. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.41: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential financial risks

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Unable to save money on non-core activities	18.888	1	18.888	211.679	0.000	0.650	1.000
	Opportunity to increase investment in asset	0.046	1	0.046	1.824	0.180	0.016	0.268
Error	Unable to save money on non-core activities	10.172	114	0.089				
	Opportunity to increase investment in asset	2.876	114	0.025				

a. Computed using alpha = 0.05

Table 5.41 shows which of the potential financial risks have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of FM service delivery options were obtained for Unable to save money on non-core activities, $F(1, 114) = 211.679$, $p < 0.05$, partial eta square = 0.650, power = 1.

Table 5.42: Types of FM Service Delivery Options

Potential Risks in Cost (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Unable to save money on non-core activities	Single Service Contracts	2.900	0.033	2.834	2.966
	Bundled Service Contract	2.028	0.050	1.929	2.126
Opportunity to increase investment in asset	Single Service Contracts	3.988	0.018	3.952	4.023
	Bundled Service Contract	3.944	0.026	3.892	3.997

Table 5.42 shows which of the types of FM service delivery options have a significant effect on its potential risks. An inspection of the mean scores indicated that single service contracts have potential risks of unable to save money on non-core activities ($M=2.900$, $SD=0.033$) than bundled service contract ($M=2.028$, $SD=0.050$).

(b) Cost

Table 5.43 shows whether the types of FM service delivery options have a significant effect on its potential cost risks. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.43: Multivariate Tests for the Types of FM Service Delivery Options towards its Potential Cost Risks

Multivariate Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b	
Types of FM Service Delivery Options	Pillai's Trace	0.657	53.183 ^a	4.000	111.000	0.000	0.657	1.000
	Willks' Lambda	0.343	53.183 ^a	4.000	111.000	0.000	0.657	1.000
	Hotelling's Trace	1.917	53.183 ^a	4.000	111.000	0.000	0.657	1.000
	Roy's Largest Root	1.917	53.183 ^a	4.000	111.000	0.000	0.657	1.000

a. Computed using alpha = .05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.343, $F(4, 111.000) = 53.183$, $p < 0.05$, partial eta squared = 0.657. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.44 shows which of the potential cost risks have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Table 5.44: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential cost Risks

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Difficult to obtain cheaper services	0.371	1	0.371	3.784	0.054	0.032	0.488
	Unable to reduce operational cost	0.120	1	0.120	1.080	0.301	0.009	0.178
	Unable to provide cost effective services	0.172	1	0.172	4.138	0.044	0.035	0.523
	Unable to control service charges	16.222	1	16.222	168.891	0.000	0.597	1.000
Error	Difficult to obtain cheaper services	11.172	114	0.098				
	Unable to reduce operational cost	12.639	114	0.111				
	Unable to provide cost effective services	4.750	114	0.042				
	Unable to control service charges	10.950	114	0.096				

a. Computed using alpha = 0.05

Significant univariate main effects for the types of FM service delivery options were obtained for unable to provide cost effective services, $F(1, 114) = 4.138$, $p < 0.05$, partial eta square = 0.035, power = 0.523.; and unable to control service charges, $F(1, 114) = 168.891$, $p < 0.05$, partial eta square = 0.597, power = 1.

Table 5.45: Types of FM Service Delivery Options

Potential Cost Risks (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Difficult to obtain cheaper services	Single Service Contracts	2.150	0.035	2.081	2.219
	Bundled Service Contract	2.028	0.052	1.924	2.131
Unable to reduce operational cost	Single Service Contracts	2.125	0.037	2.051	2.199
	Bundled Service Contract	2.056	0.055	1.946	2.165
Unable to provide cost effective services	Single Service Contracts	1.811	0.023	1.800	1.945
	Bundled Service Contract	2.083	0.034	2.016	2.151
Unable to control service charges	Single Service Contracts	2.975	0.035	2.906	3.044
	Bundled Service Contract	2.167	0.052	2.064	2.269

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.45 shows which of the types of FM service delivery options have a significant effect on its potential risks. An inspection of the mean scores indicated that single service contracts have potential risks of unable to provide cost effective services ($M= 2.083$, $SD= 0.034$) than single service contracts ($M=1.811$, $SD= 0.023$). The mean scores also indicated that bundled service contract has potential risks of unable to control service charges ($M=2.975$, $SD=0.035$) than single service contracts ($M=2.167$, $SD=0.052$).

(c) Performance

Table 5.46 shows whether the types of FM service delivery options have a significant effect on its potential performance risks. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables. The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, $Willks' \text{ Lambda} = 0.080$, $F(4, 111.000) = 318.292$, $p < 0.05$, partial eta squared = 0.920. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.46: Multivariate tests for the types of FM service delivery options towards its potential Performance Risks

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Pillai's Trace	0.920	318.292 ^a	4.000	111.000	0.000	0.920	1.000
	Wilks' Lambda	0.080	318.292 ^a	4.000	111.000	0.000	0.920	1.000
	Hotelling's Trace	11.470	318.292 ^a	4.000	111.000	0.000	0.920	1.000
	Roy's Largest Root	11.470	318.292 ^a	4.000	111.000	0.000	0.920	1.000

a. Computed using alpha = 0.05

Table 5.47 shows which of the potential risks in performance have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Table 5.47: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential Performance Risks

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Unable to improve operating performance	18.114	1	18.114	218.810	0.000	0.657	1.000
	Difficult to obtain expertise, skills and technologies	0.656	1	0.656	6.865	0.010	0.057	0.738
	Unable to improve services quality	17.588	1	17.588	194.663	0.000	0.631	1.000
	Increase risk of service interruption	70.120	1	70.120	487.748	0.000	0.811	1.000
Error	Unable to improve operating performance	9.438	114	0.083				

Difficult to obtain expertise, skills and technologies	10.888	114	0.096
Unable to improve services quality	10.300	114	0.090
Increase risk of service interruption	16.389	114	0.144

a. Computed using alpha = 0.05

Significant univariate main effects for the types of FM service delivery options were obtained for unable to improve operating performance, $F(1, 114) = 218.810$, $p < 0.05$, partial eta square = 0.657, power = 1; difficult to obtain expertise, skills and technologies $F(1, 114) = 6.865$, $p < 0.05$, partial eta square = 0.057, power = 0.738.; unable to improve services quality, $F(1, 114) = 194.663$, $p < 0.05$, partial eta square = 0.631, power = 1.; and increase risks of service interruption, $F(1, 114) = 487.748$, $p < 0.05$, partial eta square = 0.811, power = 1.

Table 5.48: Types of FM Service Delivery Options

Potential Performance Risks (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Unable to improve operating performance	Single Service Contracts	2.938	0.032	2.874	3.001
	Bundled Service Contract	2.083	0.048	1.988	2.178
Difficult to obtain expertise, skills and technologies	Single Service Contracts	2.163	0.035	2.094	2.231
	Bundled Service Contract	1.821	0.052	1.800	1.902
Unable to improve services quality	Single Service Contracts	2.925	0.034	2.858	2.992
	Bundled Service Contract	2.083	0.050	1.984	2.183
Increase risk of service interruption	Single Service Contracts	2.125	0.042	2.041	2.209
	Bundled Service Contract	3.806	0.063	3.680	3.931

Table 5.48 shows which of the types of FM service delivery options have a significant effect on its potential risks. An inspection of the mean scores indicated that single service contracts have potential risks of unable to improve operating performance (M=2.938, SD=0.032) than the bundled service contract (M=2.083, SD=0.048).

The mean scores also indicated that single service contracts have potential risks of difficult to obtain expertise, skills and technologies ($M= 2.163$, $SD= 0.035$) than the bundled service contract ($M=1.821$, $SD= 0.052$). Further inspection of the mean scores indicated that single service contracts have potential risks of unable to improve services quality ($M=2.925$, $SD=0.034$) than the bundled service contract ($M=2.083$, $SD=0.050$) and finally, the mean scores indicated that the bundled service contract has potential risks of increase risks of service interruption ($M= 3.806$, $SD= 0.063$) than single service contracts ($M= 2.125$, $SD= 0.042$).

(d) Organisational

Table 5.49 shows whether the types of FM service delivery options have a significant effect on its potential organisational risks. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables. The result shows that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.055, $F(4, 111.000) = 474.196$, $p < 0.05$, partial eta squared = 0.945. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed

Table 5.49: Multivariate tests for the types of FM service delivery options towards its potential Organisational Risks

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Pillai's Trace	0.945	474.196 ^a	4.000	111.000	0.000	0.945	1.000
	Willks' Lambda	0.055	474.196 ^a	4.000	111.000	0.000	0.945	1.000
	Hotelling's Trace	17.088	474.196 ^a	4.000	111.000	0.000	0.945	1.000
	Roy's Largest Root	17.088	474.196 ^a	4.000	111.000	0.000	0.945	1.000

a. Computed using alpha = 0.05

Table 5.50: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential Organisational Risks

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Loss of management control on non-core activities	84.209	1	84.209	671.313	0.000	0.855	1.000
	Loss of management focus on core activities	94.138	1	94.138	982.561	0.000	0.896	1.000
	Complex and time consuming to manage	207.004	1	207.004	1476.056	0.000	0.928	1.000
	Increase management burden	92.933	1	92.933	1808.005	0.000	0.941	1.000
Error	Loss of management control on non-core activities	14.300	114	0.125				
	Lost of management focus on core activities	10.922	114	0.096				
	Complex and time consuming to manage	15.988	114	0.140				
	Increase management burden	5.860	114	0.051				

a. Computed using alpha = 0.05

Table 5.50 shows which of the potential organisational risks have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of FM service delivery options were obtained for loss of management control on non-core activities, $F(1, 114) = 671.313$, $p < 0.05$, partial eta square = 0.855, power = 1; loss of management focus on core activities, $F(1, 114) = 982.561$, $p < 0.05$, partial eta square = 0.896, power = 1.; Complex and time consuming to manage, $F(1, 114) = 1476.056$, $p < 0.05$, partial eta square = 0.928, power = 1; and increase management burden, $F(1, 114) = 1808.005$, $p < 0.05$, partial eta square = 0.941, power = 1.

Table 5.51: Types of FM Service Delivery Options

Potential Risks in Organisational (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Loss of management control on non-core activities	Single Service Contracts	2.075	0.040	1.997	2.153
	Bundled Service Contract	3.917	0.059	3.800	4.034
Loss of management focus on core activities	Single Service Contracts	3.975	0.035	3.906	4.044
	Bundled Service Contract	2.028	0.052	1.926	2.130
Complex and time consuming to manage	Single Service Contracts	4.887	0.042	4.805	4.970
	Bundled Service Contract	2.000	0.062	1.876	2.124
Increase management burden	Single Service Contracts	3.963	0.025	3.912	4.013
	Bundled Service Contract	2.028	0.038	1.953	2.103

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.51 shows which of the types of FM service delivery options have a significant effect on its potential risks. An inspection of the mean scores indicated that bundled service contract has potential risks of loss of management control on non-core activities ($M=3.917$, $SD=0.059$) than single service contracts ($M=2.075$, $SD=0.040$).

The mean scores also indicated that single service contracts have potential risks of loss of management focus on core activities (M= 3.975, SD= 0.035) than bundled service contract (M=2.028, SD= 0.052).

Further inspection of the mean scores indicated that single service contracts have potential risks of complex and time consuming to manage (M=4.887, SD=0.042) than bundled service contract (M=2.000, SD=0.062) and finally, the mean scores indicated that single service contracts have potential risks of increase management burden (M= 3.963, SD= 0.025) than bundled service contract (M= 2.028, SD= 0.038).

(e) Physical

Table 5.52 shows whether the types of FM service delivery options have a significant effect on its potential risks in physical. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.52: Multivariate tests for the types of FM service delivery options towards its potential Physical Risks

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Pillai's Trace	0.865	239.850 ^a	3.000	112.000	0.000	0.865	1.000
	Willks' Lambda	0.135	239.850 ^a	3.000	112.000	0.000	0.865	1.000
	Hotelling's Trace	6.425	239.850 ^a	3.000	112.000	0.000	0.865	1.000
	Roy's Largest Root	6.425	239.850 ^a	3.000	112.000	0.000	0.865	1.000

a. Computed using alpha =0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of FM service delivery options, Willks' Lambda = 0.135, $F(3, 112.000) = 239.850$, $p < 0.05$, partial eta squared = 0.865. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.53: Tests of Between-Subjects Effects for the types of FM service delivery options and its potential Physical Risks

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of FM Service Delivery Options	Less efforts by supplier to improve centre physical image	17.997	1	17.997	164.880	0.000	0.591	1.000
	Difficult to Improve the quality of shopping environment	0.590	1	0.590	3.497	0.064	0.030	0.458
	Less efforts by supplier to match buyer's requirements	20.989	1	20.989	623.282	0.000	0.845	1.000
Error	Less efforts by supplier to improve centre physical image	12.443	114	0.109				
	Difficult to Improve the quality of shopping environment	19.238	114	0.169				
	Less efforts by supplier to match buyer's requirements	3.839	114	0.034				

a. Computed using alpha = 0.05

Table 5.53 shows which of the potential risks in physical have a significant effect on the types of FM service delivery options. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of FM service delivery options were obtained for less efforts by supplier to improve centre physical image, $F(1, 114) = 164.880$, $p < 0.05$, partial eta square = 0.591, power = 1; and less efforts by supplier to match buyer's requirements, $F(1, 114) = 623.282$, $p < 0.05$, partial eta square = 0.845, power = 1.

Table 5.54: Types of FM Service Delivery Options

Potential Risks in Physical (DV)	FM service delivery options (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Less efforts by supplier to improve centre physical image	Single Service Contracts	2.038	0.037	1.964	2.111
	Bundled Service Contract	2.889	0.055	2.780	2.998
Difficult to Improve the quality of shopping environment	Single Service Contracts	2.238	0.046	2.147	2.328
	Bundled Service Contract	2.083	0.068	1.948	2.219
Less efforts by supplier to match buyer's requirements	Single Service Contracts	2.975	0.021	2.934	3.016
	Bundled Service Contract	2.056	0.031	1.995	2.116

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.54 shows which of the types of FM service delivery options have a significant effect on its potential risks. An inspection of the mean scores indicated that bundled service contract has potential risks of less efforts by supplier to improve centre physical image (M=2.889, SD=0.055) than single service contracts (M=2.038, SD=0.037).

The mean scores also indicated that single service contracts have potential risks of less efforts by supplier to match buyer's requirements (M= 2.975, SD= 0.021) than bundled service contract (M=2.056, SD= 0.031).

5.7.3 Multivariate Analysis of Variance for the Types of UK Shopping Centres towards the Potential Benefits of FM Service Delivery

Multivariate analysis of variance (MANOVA) is used to determine whether the different types of UK shopping centres have a significant different towards the potential benefits of FM service delivery. The independent variables (IV) include two variables: larger sized and medium sized shopping centres. Meanwhile, the dependent variables (DV) include the potential benefits of FM service delivery that groups of five factors: financial, cost, performance, organisational and physical (Refer chapter 3 under sub-heading 3.6). The analysis was conducted to test the hypothesis of study;

H_0 = there is no significant difference in types of shopping centres towards the potential benefits of FM service delivery

H_1 = there is a significant difference in types of shopping centres towards the potential benefits of FM service delivery

The results were shown in accordance to five groups that consist of financial, cost, performance, organisational, physical and business. The results summary of MANOVA tests for the types of shopping centres towards the potential benefits of FM service delivery is shown in Appendix IV.

(a) Financial

Table 5.55 shows whether the types of shopping centres have a significant effect on the potential financial benefits of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.55: Multivariate tests for the types of Shopping Centres towards the potential Financial benefits of FM Service Delivery

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
The types of Shopping Centres	Pillai's Trace	0.600	55.926 ^a	3.000	112.000	0.000	0.600	1.000
	Willks' Lambda	0.400	55.926 ^a	3.000	112.000	0.000	0.600	1.000
	Hotelling's Trace	1.498	55.926 ^a	3.000	112.000	0.000	0.600	1.000
	Roy's Largest Root	1.498	55.926 ^a	3.000	112.000	0.000	0.600	1.000

a. Computed using alpha = 0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.400, $F(3, 112.000) = 55.926$, $p < 0.05$, partial eta squared = 0.600. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.56: Tests of Between-Subjects Effects for the types of Shopping Centres and the Financial potential benefits of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Save money on non-core activities	34.159	1	34.159	145.271	0.000	0.560	1.000
	Opportunity to reduce investment in asset	0.022	1	0.022	0.197	0.658	0.002	0.072
Error	Save money on non-core activities	26.806	114	0.235				
	Opportunity to reduce investment in asset	12.556	114	0.110				

a. Computed using alpha = 0.05

Table 5.56 shows which of the potential financial benefits of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of shopping centres were obtained for save money on non-core activities, $F(1, 114) = 145.271$, $p < 0.05$, partial eta square = 0.560, power = 1.

Table 5.57: Types of Shopping Centres

Potential Financial Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Save money on non-core activities	Larger Sizes	4.152	0.071	4.011	4.294
	Medium Sizes	3.043	0.058	2.928	3.158
Opportunity to reduce investment in asset	Larger Sizes	2.043	0.049	1.947	2.140
	Medium Sizes	2.071	0.040	1.993	2.150

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.57 shows which of the types of shopping centres have a significant effect on the potential benefits of FM service delivery. An inspection of the mean scores indicates that larger sized shopping centres have potential benefits of save money on non-core activities (M=4.152, SD=0.071) than medium sized shopping centres (M=3.043, SD=0.058).

(b) Cost

Table 5.58 shows whether the types of shopping centres have a significant effect on the potential cost benefits of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.58: Multivariate tests for the types of Shopping Centres towards the potential Cost benefits of FM Service Delivery

Multivariate Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b	
The types of Shopping Centres	Pillai's Trace	0.692	62.283 ^a	4.000	111.000	0.000	0.692	1.000
	Willks' Lambda	0.308	62.283 ^a	4.000	111.000	0.000	0.692	1.000
	Hotelling's Trace	2.244	62.283 ^a	4.000	111.000	0.000	0.692	1.000
	Roy's Largest Root	2.244	62.283 ^a	4.000	111.000	0.000	0.692	1.000

a. Computed using alpha = .05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.308, $F(4, 111.000) = 62.283$, $p < 0.05$, partial eta squared = 0.692. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.59: Tests of Between-Subjects Effects for the types of Shopping Centres and the potential cost benefits of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Enable to obtain cheaper services	6.854	1	6.854	33.806	0.000	0.229	1.000
	Enable operational cost to be reduced	5.912	1	5.912	32.077	0.000	0.220	1.000
	Enable to provide cost effective services	0.454	1	0.454	3.267	0.073	0.028	0.434
	Enable to control service charges	17.001	1	17.001	247.655	0.000	0.685	1.000
Error	Enable to obtain cheaper services	23.112	114	0.203				
	Enable operational cost to be reduced	21.011	114	0.184				
	Enable to provide cost effective services	15.856	114	0.139				
	Enable to control service charges	7.826	114	0.069				

a. Computed using alpha = 0.05

Table 5.59 shows which of the potential cost benefits of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of shopping centres were obtained for enable to obtain cheaper services , $F(1, 114) = 33.806$, $p < 0.05$, partial eta square = 0.229, power = 1; enable operational cost to be reduced, $F(1, 114) = 32.077$, $p < 0.05$, partial eta square = 0.220, power = 1.; and enable to control service charges, $F(1, 114) = 247.655$, $p < 0.05$, partial eta square = 0.685, power = 1.

Table 5.60: Types of Shopping Centres

Potential Cost Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Enable to obtain cheaper services	Larger Sizes	4.283	0.066	4.151	4.414
	Medium Sizes	3.786	0.054	3.679	3.892
Enable operational cost to be reduced	Larger Sizes	4.304	0.063	4.179	4.430
	Medium Sizes	3.843	0.051	3.741	3.945
Enable to provide cost effective services	Larger Sizes	3.957	0.055	3.848	4.065
	Medium Sizes	3.829	0.045	3.740	3.917
Enable to control service charges	Larger Sizes	3.783	0.039	3.706	3.859
	Medium Sizes	3.000	0.031	2.938	3.062

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.60 shows which of the types of shopping centres have a significant effect on the potential benefits of FM service delivery. An inspection of the mean scores indicated that larger sized shopping centres have potential benefits of obtaining cheaper services (M=4.283, SD=0.066) than medium sized shopping centres (M=3.786, SD=0.054).

The mean scores also indicated that larger sized shopping centres have potential benefits of enabling operational cost to be reduced (M= 4.304, SD= 0.063) than medium sized shopping centres (M=3.843, SD= 0.051). Further inspection of the mean scores indicated that larger sized shopping centres have potential benefits of controlling service charges (M=3.783, SD=0.039) than medium sized shopping centres (M=3.000, SD=0.031)

(c) Performance

Table 5.61 shows whether the types of shopping centres have a significant effect on the potential performance benefits of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.61: Multivariate tests for the types of Shopping Centres towards the potential Performance benefits of FM Service Delivery

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
The types of Shopping Centres	Pillai's Trace	0.453	22.983 ^a	4.000	111.000	0.000	0.453	1.000
	Willks' Lambda	0.547	22.983 ^a	4.000	111.000	0.000	0.453	1.000
	Hotelling's Trace	0.828	22.983 ^a	4.000	111.000	0.000	0.453	1.000
	Roy's Largest Root	0.828	22.983 ^a	4.000	111.000	0.000	0.453	1.000

a. Computed using alpha = 0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.547, $F(4, 111.000) = 22.983$, $p < 0.05$, partial eta squared = 0.453. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.62: Tests of Between-Subjects Effects for the types of Shopping Centres and the potential Performance benefits of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Improve operating performance	13.194	1	13.194	88.416	0.000	0.437	1.000
	Enable to obtain expertise, skills and technologies	1.538	1	1.538	.206	0.651	0.002	0.074
	Enable to improve services quality	1.036	1	1.036	9.138	0.003	0.074	0.850
	Increase customer satisfaction	4.197	1	4.197	24.200	0.000	0.175	0.998
Error	Improve operating performance	17.012	114	0.149				
	Enable to obtain expertise, skills and technologies	850.350	114	7.459				
	Enable to	12.921	114	0.113				

improve services quality				
Increase customer satisfaction	19.769	114	0.173	

a. Computed using alpha =0.05

Table 5.62 shows which of the potential performance benefits of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of shopping centres were obtained for improve operating performance, $F(1, 114) = 88.416, p < 0.05$, partial eta square = 0.437, power = 1; enable to improve services quality, $F(1, 114) = 9.138, p < 0.05$, partial eta square = 0.074, power = 0.850.; and increase customer satisfaction, $F(1, 114) = 24.200, p < 0.05$, partial eta square = 0.175, power = 0.998.

Table 5.63: Types of Shopping Centres

Potential Performance Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Improve operating performance	Larger Sizes	3.761	0.057	3.648	3.874
	Medium Sizes	3.071	0.046	2.980	3.163
Enable to obtain expertise, skills and technologies	Larger Sizes	4.022	0.403	3.224	4.819
	Medium Sizes	4.257	0.326	3.610	4.904
Enable to improve services quality	Larger Sizes	4.022	0.050	3.923	4.120
	Medium Sizes	3.829	0.040	3.749	3.908
Increase customer satisfaction	Larger Sizes	4.217	0.061	4.096	4.339
	Medium Sizes	3.829	0.050	3.730	3.927

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.63 shows which of the types of shopping centres have a significant effect on the potential benefits of FM service delivery. An inspection of the mean scores indicated that larger sized shopping centres have an advantages of improved operating performance ($M=3.761, SD=0.057$) than medium sized shopping centres ($M=3.071, SD=0.046$).

The mean scores also indicated that larger sized shopping centres have advantages of being able to improve services quality ($M= 4.022$, $SD= 0.050$) than medium sized shopping centres ($M=3.829$, $SD= 0.040$). Further inspection of the mean scores indicated that larger sized shopping centres have advantages of increasing customer satisfaction ($M=4.217$, $SD=0.061$) than medium sized shopping centres ($M=3.829$, $SD=0.050$)

(d) Organisational

Table 5.64 shows whether the types of shopping centres have a significant effect on the potential organisational benefits of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables. The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.356, $F(4, 111.000) = 50.102$, $p < 0.05$, partial eta squared = 0.644. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.64: Multivariate tests for the types of Shopping Centres towards the potential Organisational benefits of FM Service Delivery

Multivariate Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b	
The types of Shopping Centres	Pillai's Trace	0.644	50.102 ^a	4.000	111.000	0.000	0.644	1.000
	Willks' Lambda	0.356	50.102 ^a	4.000	111.000	0.000	0.644	1.000
	Hotelling's Trace	1.805	50.102 ^a	4.000	111.000	0.000	0.644	1.000
	Roy's Largest Root	1.805	50.102 ^a	4.000	111.000	0.000	0.644	1.000

a. Computed using alpha = 0.05

Table 5.65: Tests of Between-Subjects Effects for the types of Shopping Centres and the potential Organisational benefits of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Free up management time to focus on core activities	122.416	1	122.416	193.020	0.000	0.629	1.000

	Enhance management effectiveness	129.317	1	129.317	188.290	0.000	0.623	1.000
	Improve management capability	99.228	1	99.228	151.218	0.000	0.570	1.000
	Reduce management burden	102.979	1	102.979	186.614	0.000	0.621	1.000
Error	Free up management time to focus on core activities	72.300	114	0.634				
	Enhance management effectiveness	78.295	114	0.687				
	Improve management capability	74.806	114	0.656				
	Reduce management burden	62.909	114	0.552				

a. Computed using alpha = .05

Table 5.65 shows which of the potential organisational benefits of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of shopping centres were obtained for free up management time to focus on core activities, $F(1, 114) = 193.020$, $p < 0.05$, partial eta square = 0.629, power = 1; enhance management effectiveness, $F(1, 114) = 188.290$, $p < 0.05$, partial eta square = 0.623, power = 1.; improve management capability $F(1, 114) = 151.218$, $p < 0.05$, partial eta square = 0.570, power = 1; and reduce management burden, $F(1, 114) = 186.614$, $p < 0.05$, partial eta square = 0.621, power = 1.

Table 5.66: Types of Shopping Centres

Potential Organisational Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Free up management time to focus on core activities	Larger Sizes	4.000	0.117	3.767	4.233
	Medium Sizes	1.900	0.095	1.711	2.089
Enhance management effectiveness	Larger Sizes	4.087	0.122	3.845	4.329
	Medium Sizes	1.929	0.099	1.732	2.125
Improve management capability	Larger Sizes	3.848	0.119	3.611	4.084
	Medium Sizes	1.957	0.097	1.765	2.149
Reduce management burden	Larger Sizes	3.826	0.110	3.609	4.043
	Medium Sizes	1.900	0.089	1.724	2.076

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.66 shows which of the types of shopping centres have a significant effect on the potential benefits of FM service delivery. An inspection of the mean scores indicated that larger sized shopping centres have potential benefits of free up management time to focus on core activities (M=4.000, SD=0.117) than medium sized shopping centres (M=1.900, SD=0.095). The mean scores also indicated that larger sized shopping centres have potential benefits of enhance management effectiveness (M= 4.087, SD= 0.122) than medium sized shopping centres (M=1.929, SD= 0.099). Further inspection of the mean scores indicated that larger sized shopping centres have potential benefits of improve management capability (M=3.848, SD=0.119) than medium sized shopping centres (M=1.957, SD=0.097) and finally, the mean scores indicated that larger sized shopping centres have potential benefits of reduce management burden (M= 3.826, SD= 0.110) than medium sized shopping centres (M= 1.900, SD= 0.089).

(e) Physical

Table 5.67 shows whether the types of shopping centres have a significant effect on the potential physical benefits of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.67: Multivariate tests for the types of Shopping Centres towards the potential Physical benefits of FM Service Delivery

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
The types of Shopping Centres	Pillai's Trace	0.544	44.622 ^a	3.000	112.000	.000	0.544	1.000
	Willks' Lambda	0.456	44.622 ^a	3.000	112.000	.000	0.544	1.000
	Hotelling's Trace	1.195	44.622 ^a	3.000	112.000	.000	0.544	1.000
	Roy's Largest Root	1.195	44.622 ^a	3.000	112.000	.000	0.544	1.000

a. Computed using alpha = 0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.456, $F(3, 112.000) = 44.622$, $p < 0.05$, partial eta squared = 0.544. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.68: Tests of Between-Subjects Effects for the types of Shopping Centres and the potential Physical benefits of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Improve centre physical image	13.771	1	13.771	89.509	0.000	0.440	1.000
	Improve the quality of shopping environment	1.260	1	1.260	7.826	0.006	0.064	0.792
	Enable to match support services activity with footfall	22.114	1	22.114	95.260	0.000	0.455	1.000
Error	Improve centre physical image	17.539	114	0.154				
	Improve the quality of shopping environment	18.352	114	0.161				
	Enable to match support services activity with footfall	26.464	114	0.232				

a. Computed using alpha =0.05

Table 5.68 shows which of the potential physical benefits of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of shopping centres were obtained for improve centre physical image, $F(1, 114) = 89.509$, $p < 0.05$, partial eta square = 0.440, power = 1; improve the quality of shopping environment $F(1, 114) = 7.826$, $p < 0.05$, partial eta square = 0.064, power = 0.792; and enable to match support services activity with footfall, $F(1, 114) = 95.260$, $p < 0.05$, partial eta square = 0.455, power = 1.

Table 5.69: Types of Shopping Centres

Potential Physical Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Improve centre physical image	Larger Sizes	2.804	0.058	2.690	2.919
	Medium Sizes	2.100	0.047	2.007	2.193
Improve the quality of shopping environment	Larger Sizes	3.913	0.059	3.796	4.030
	Medium Sizes	3.700	0.048	3.605	3.795
Enable to match support services activity with footfall	Larger Sizes	3.978	0.071	3.838	4.119
	Medium Sizes	3.086	0.058	2.972	3.200

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.69 shows which of the types of shopping centres have a significant effect on the potential benefits of FM service delivery. An inspection of the mean scores indicated that larger sized shopping centres have potential benefits of improve centre physical image ($M=2.804$, $SD=0.058$) than medium sized shopping centres ($M=2.100$, $SD=0.047$).

The mean scores also indicated that larger sized shopping centres have potential benefits of improve the quality of shopping environment ($M= 3.913$, $SD= 0.059$) than medium sized shopping centres ($M=3.700$, $SD= 0.048$).

Further inspection of the mean scores indicated that larger sized shopping centres have potential benefits of enable to match support services activity with footfall ($M=3.978$, $SD=0.071$) than medium sized shopping centres ($M=3.086$, $SD=0.058$)

5.7.4 Multivariate Analysis of Variance for the Types of UK Shopping Centres towards the Potential Risks of FM Service Delivery

Multivariate analysis of variance (MANOVA) is used to determine whether the different types of shopping centres have a significant difference towards the potential risks of FM service delivery. The independent variables (IV) include two variables; larger sizes and medium sizes shopping centres. Meanwhile, the dependent variables (DV) include the disadvantages of FM service delivery that groups into five factors: financial, cost, performance, organisational, physical and business (Refer chapter 3 under sub-heading 3.6). The analysis was conducted to test the hypothesis of the study:

H_0 = there is no significant difference in types of shopping centres towards the potential risks of FM service delivery

H_1 = there is a significant difference in types of shopping centres towards the potential risks of FM service delivery

The results were shown in accordance to the five factors that consists of financial, cost, performance, organisational and physical. The results summary of MANOVA tests for the types of shopping centres towards the potential benefits of FM service delivery is shown in Appendix IV.

(a) Financial Factor

Table 5.70 shows whether the types of shopping centres have a significant effect on the potential financial risks of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.70: Multivariate tests for the types of Shopping Centres towards the potential Financial Risks of FM Service Delivery

Multivariate Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b	
The types of Shopping Centres	Pillai's Trace	0.480	34.420 ^a	3.000	112.000	0.000	0.480	1.000
	Willks' Lambda	0.520	34.420 ^a	3.000	112.000	0.000	0.480	1.000
	Hotelling's Trace	0.922	34.420 ^a	3.000	112.000	0.000	0.480	1.000
	Roy's Largest Root	0.922	34.420 ^a	3.000	112.000	0.000	0.480	1.000

a. Computed using alpha = 0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.520, $F(3, 112.000) = 34.420$, $p < 0.05$, partial eta squared = 0.480. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.71: Tests of Between-Subjects Effects for the types of Shopping Centres and the Potential Financial Risks of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Unable to save money on non-core activities	12.934	1	12.934	91.436	0.000	0.445	1.000
	Opportunity to increase investment in asset	0.024	1	0.024	0.930	0.337	0.008	0.160
Error	Unable to save money on non-core activities	16.126	114	0.141				
	Opportunity to increase investment in asset	2.899	114	0.025				

a. Computed using alpha = 0.05

Table 5.71 shows which of the potential financial risks of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of shopping centres were obtained for unable to save money on non-core activities, $F(1, 114) = 91.436$, $p < 0.05$, partial eta square = 0.445, power = 1; and lack of opportunity to create new revenue stream, $F(1, 114) = 26.743$, $p < 0.05$, partial eta square = 0.190, power = 0.999

Table 5.72: Types of Shopping Centres

Potential Financial Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Unable to save money on non-core activities	Larger Sizes	2.217	0.055	2.108	2.327
	Medium Sizes	2.900	0.045	2.811	2.989
Opportunity to increase investment in asset	Larger Sizes	3.957	0.024	3.910	4.003
	Medium Sizes	3.986	0.019	3.948	4.023

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.72 shows which of the types of shopping centres have a significant effect on the potential risks of FM service delivery. An inspection of the mean scores indicated that medium sized shopping centres have more of a potential risk of being unable to save money on non-core activities ($M=2.900$, $SD=0.045$) than larger sized shopping centres ($M=2.217$, $SD=0.055$).

(b) Cost

Table 5.73 shows whether the types of shopping centres have a significant effect on the potential cost risks of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

The result shows that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.549, $F(4, 111.000) = 22.791$, $p < 0.05$, partial eta squared = 0.451. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.73: Multivariate tests for the types of Shopping Centres towards the potential Cost Risks of FM Service Delivery

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
The types of Shopping Centres	Pillai's	0.451	22.791 ^a	4.000	111.000	0.000	0.451	1.000
	Trace							
	Willks'	0.549	22.791 ^a	4.000	111.000	0.000	0.451	1.000
	Lambda							
	Hotelling's	0.821	22.791 ^a	4.000	111.000	0.000	0.451	1.000
	Trace							
	Roy's	0.821	22.791 ^a	4.000	111.000	0.000	0.451	1.000
	Largest Root							

a. Computed using alpha = .05

Table 5.74: Tests of Between-Subjects Effects for the types of Shopping Centres and the Potential Cost Risks of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Difficult to obtain cheaper services	0.622	1	0.622	6.493	0.012	0.054	0.715
	Unable to reduce operational cost	0.274	1	0.274	2.503	0.116	0.021	0.348
	Unable to provide cost effective services	0.118	1	0.118	2.802	0.097	0.024	0.382
	Unable to control service charges	10.795	1	10.795	75.139	0.000	0.397	1.000
Error	Difficult to obtain cheaper services	10.921	114	0.096				
	Unable to reduce operational cost	12.484	114	0.110				
	Unable to provide cost effective services	4.804	114	0.042				
	Unable to control service charges	16.378	114	0.144				

a. Computed using alpha = 0.05

Table 5.74 shows which of the potential cost risks of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of shopping centres were obtained for difficult to obtain cheaper services, $F(1, 114) = 6.493$, $p < 0.05$, partial eta square = 0.054, power = 0.715; and unable to control service charges, $F(1, 114) = 75.139$, $p < 0.05$, partial eta square = 0.397, power = 1.

Table 5.75: Types of Shopping Centres

Potential Cost Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Difficult to obtain cheaper services	Larger Sizes	1.122	0.046	1.022	1.931
	Medium Sizes	2.171	0.037	2.098	2.245
Unable to reduce operational cost	Larger Sizes	2.043	0.049	1.947	2.140
	Medium Sizes	2.143	0.040	2.065	2.221
Unable to provide cost effective services	Larger Sizes	2.065	0.030	2.005	2.125
	Medium Sizes	2.000	0.025	1.951	2.049
Unable to control service charges	Larger Sizes	2.348	0.056	2.237	2.459
	Medium Sizes	2.971	0.045	2.882	3.061

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.75 shows which of the types of shopping centres have a significant effect on the potential risks of FM service delivery. An inspection of the mean scores indicated that medium sized shopping centres have potential risks of difficult to obtain cheaper services (M=2.171, SD=0.037) than larger sized shopping centres (M=1.122, SD=0.046). The mean scores also indicated that medium sized shopping centres have potential risks of unable to control service charges (M= 2.971, SD= 0.045) than larger sized shopping centres (M=2.348, SD= 0.056).

(c) Performance

Table 5.76 shows whether the types of shopping centres have a significant effect on the potential performance risks of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.76: Multivariate tests for the types of Shopping Centres towards the potential Performance Risks of FM Service Delivery

Multivariate Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b	
The types of Shopping Centres	Pillai's Trace	0.638	48.883 ^a	4.000	111.000	0.000	0.638	1.000
	Willks' Lambda	0.362	48.883 ^a	4.000	111.000	0.000	0.638	1.000
	Hotelling's Trace	1.762	48.883 ^a	4.000	111.000	0.000	0.638	1.000
	Roy's Largest Root	1.762	48.883 ^a	4.000	111.000	0.000	0.638	1.000

a. Computed using alpha = 0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.362, $F(4, 111.000) = 48.883$, $p < 0.05$, partial eta squared = 0.638. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.77: Tests of Between-Subjects Effects for the types of Shopping Centres and the Potential Performance Risks of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Unable to improve operating performance	11.583	1	11.583	82.688	0.000	0.420	1.000
	Difficult to obtain expertise, skills and technologies	0.957	1	0.957	10.310	0.002	0.083	0.889
	Unable to improve services quality	11.076	1	11.076	75.107	0.000	0.397	1.000
	Increase risk of service	44.785	1	44.785	122.365	0.000	0.518	1.000

	interruption			
Error	Unable to improve operating performance	15.969	114	0.140
	Difficult to obtain expertise, skills and technologies	10.586	114	0.093
	Unable to improve services quality	16.812	114	0.147
	Increase risk of service interruption	41.724	114	0.366

a. Computed using alpha = 0.05

Table 5.77 shows which of the potential performance risks of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of shopping centres were obtained for unable to improve operating performance, $F(1, 114) = 82.688$, $p < 0.05$, partial eta square = 0.420, power = 1; difficult to obtain expertise, skills and technologies $F(1, 114) = 10.310$, $p < 0.05$, partial eta square = 0.083, power = 0.889.; unable to improve services quality, $F(1, 114) = 75.107$, $p < 0.05$, partial eta square = 0.397, power = 1.; and increase risks of service interruption, $F(1, 114) = 122.365$, $p < 0.05$, partial eta square = 0.518, power = 1.

Table 5.78: Types of Shopping Centres

Potential Performance Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Unable to improve operating performance	Larger Sizes	2.283	0.055	2.173	2.392
	Medium Sizes	2.929	0.045	2.840	3.017
Difficult to obtain expertise, skills and technologies	Larger Sizes	1.806	0.045	1.800	1.911
	Medium Sizes	2.186	0.036	2.114	2.258
Unable to improve services quality	Larger Sizes	2.283	0.057	2.170	2.395
	Medium Sizes	2.914	0.046	2.823	3.005
Increase risk of service interruption	Larger Sizes	3.413	0.089	3.236	3.590
	Medium Sizes	2.143	0.072	2.000	2.286

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.78 shows which of the types of shopping centres have a significant effect on the potential risks of FM service delivery. An inspection of the mean scores indicated that medium sized shopping centres have potential risks of unable to improve operating performance (M=2.929, SD=0.045) than larger sized shopping centres (M=2.283, SD=0.055). The mean scores also indicated that medium sized shopping centres have potential risks of difficult to obtain expertise, skills and technologies (M= 2.186, SD= 0.036) than larger sized shopping centres (M=1.806, SD= 0.045). Further inspection of the mean scores indicated that medium sized shopping centres have potential risks of unable to improve services quality (M=2.914, SD=0.046) than larger sized shopping centres (M=2.283, SD=0.057) and finally, the mean scores indicated that larger sized shopping centres have potential risks of increase risks of service interruption (M= 3.413, SD= 0.089) than medium sized shopping centres (M= 2.143, SD= 0.072).

(d) Organisational

Table 5.79 shows whether the types of shopping centres have a significant effect on the potential organisational risks of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables.

Table 5.79: Multivariate tests for the types of Shopping Centres towards the Potential Organisational Risks of FM Service Delivery

Multivariate Main Effect	Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b	
The types of Shopping Centres	Pillai's Trace	0.634	48.120 ^a	4.000	111.000	0.000	0.634	1.000
	Willks' Lambda	0.366	48.120 ^a	4.000	111.000	0.000	0.634	1.000
	Hotelling's Trace	1.734	48.120 ^a	4.000	111.000	0.000	0.634	1.000
	Roy's Largest Root	1.734	48.120 ^a	4.000	111.000	0.000	0.634	1.000

a. Computed using alpha = 0.05

The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.366, $F(4, 111.000) = 48.120$, $p < 0.05$, partial eta squared = 0.634. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.80: Tests of Between-Subjects Effects for the types of Shopping Centres and the Potential Organisational Risks of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Loss of management control on non-core activities	55.523	1	55.523	147.249	0.000	0.564	1.000
	Loss of management focus on core activities	63.704	1	63.704	175.605	0.000	0.606	1.000
	Complex and time consuming to manage	136.714	1	136.714	180.642	0.000	0.613	1.000
	Increase management burden	62.509	1	62.509	196.392	0.000	0.633	1.000
Error	Loss of management control on non-core activities	42.986	114	0.377				
	Loss of management focus on core activities	41.356	114	0.363				
	Complex and time consuming to manage	86.278	114	0.757				
	Increase management burden	36.284	114	0.318				

a. Computed using alpha = 0.05

Table 5.80 shows which of the potential organisational risks of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined. Significant univariate main effects for the types of shopping centres were obtained for lost of management control on non-core activities, $F(1, 114) = 147.249$, $p < 0.05$, partial eta square = 0.564, power = 1; lost of management focus on core activities, $F(1, 114) = 175.605$, $p < 0.05$, partial eta square = 0.606, power = 1.; Complex and time consuming to manage, $F(1, 114) = 180.642$, $p < 0.05$, partial eta square = 0.613, power = 1; and increase management burden, $F(1, 114) = 196.392$, $p < 0.05$, partial eta square = 0.633, power = 1.

Table 5.81: Types of Shopping Centres

Potential Organisational Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Loss of management control on non-core activities	Larger Sizes	3.500	0.091	3.321	3.679
	Medium Sizes	2.086	0.073	1.940	2.231
Loss of management focus on core activities	Larger Sizes	2.457	0.089	2.281	2.632
	Medium Sizes	3.971	0.072	3.829	4.114
Complex and time consuming to manage	Larger Sizes	2.652	0.128	2.398	2.906
	Medium Sizes	4.871	0.104	4.665	5.077
Increase management burden	Larger Sizes	2.457	0.083	2.292	2.621
	Medium Sizes	3.957	0.067	3.824	4.091

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.81 shows which of the types of shopping centres have a significant effect on the potential risks of FM service delivery. An inspection of the mean scores indicated that larger sized shopping centres have potential risks of lost of management control on non-core activities (M=3.500, SD=0.091) than medium sized shopping centres (M=2.086, SD=0.073). The mean scores also indicated that medium sized shopping centres have potential risks of lost of management focus on core activities (M= 3.971, SD= 0.072) than larger sized shopping centres (M=2.457, SD= 0.089).

Further inspection of the mean scores indicated that medium sized shopping centres have potential risks of complex and time consuming to manage ($M=4.871$, $SD=0.104$) than larger sized shopping centres ($M=2.652$, $SD=0.128$) and finally, the mean scores indicated that medium sized shopping centres have potential risks of increase management burden ($M= 3.957$, $SD= 0.067$) than larger sized shopping centres ($M= 2.457$, $SD= 0.083$).

(e) Physical

Table 5.82 shows whether the types of shopping centres have a significant effect on the potential physical risks of FM service delivery. This set of multivariate tests of significance will indicate whether there are statistically significant differences among the groups on a linear combination of the dependent variables. The result shown that a one-way MANOVA revealed a significant multivariate main effect for the types of shopping centres, Willks' Lambda = 0.389, $F(3, 112.000) = 58.628$, $p < 0.05$, partial eta squared = 0.611. Power to detect the effect was 1. Thus hypothesis H_1 was confirmed.

Table 5.82: Multivariate tests for the types of Shopping Centres towards the potential Physical Risks of FM Service Delivery

Multivariate Main Effect		Value	F	Hypothesis df	Error df	Sig. (p)	Partial Eta Squared	Observed Power ^b
The types of Shopping Centres	Pillai's Trace	0.611	58.628 ^a	3.000	112.000	0.000	0.611	1.000
	Willks' Lambda	0.389	58.628 ^a	3.000	112.000	0.000	0.611	1.000
	Hotelling's Trace	1.570	58.628 ^a	3.000	112.000	0.000	0.611	1.000
	Roy's Largest Root	1.570	58.628 ^a	3.000	112.000	0.000	0.611	1.000

a. Computed using alpha = 0.05

Table 5.83: Tests of Between-Subjects Effects for the types of Shopping Centres and the Potential Physical Risks of FM Service Delivery

Independent Variables (IV)	Potential Benefits (DV)	Sum of Squares	df	Mean Square	F	Sig. (p)	Partial Eta Squared	Observed Power ^b
Types of shopping centres	Less efforts by supplier to improve centre physical image	14.584	1	14.584	104.862	0.000	0.479	1.000
	Difficult to Improve the	0.804	1	0.804	4.818	0.030	0.041	0.586

	quality of shopping environment							
	Less efforts by supplier to match buyer's requirements	14.015	1	14.015	147.768	0.000	0.564	1.000
Error	Less efforts by supplier to improve centre physical image	15.855	114	0.139				
	Difficult to Improve the quality of shopping environment	19.024	114	0.167				
	Less efforts by supplier to match buyer's requirements	10.812	114	0.095				

a. Computed using alpha = 0.05

Table 5.83 shows which of the potential physical risks of FM service delivery have a significant effect on the types of shopping centres. Given the significance of the overall test, the Tests of Between-Subjects Effects has shown that the univariate main effects were examined.

Significant univariate main effects for the types of shopping centres were obtained for less efforts by supplier to improve centre physical image, $F(1, 114) = 104.862$, $p < 0.05$, partial eta square = 0.479, power = 1; difficult to improve the quality of shopping environment $F(1, 114) = 4.818$, $p < 0.05$, partial eta square = 0.041, power = 0.586 and less efforts by supplier to match buyer's requirements, $F(1, 114) = 147.768$, $p < 0.05$, partial eta square = 0.564, power = 1.

Table 5.84: Types of Shopping Centres

Potential Physical Risks (DV)	Types of Shopping Centres (IV)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Less efforts by supplier to improve centre physical image	Larger Sizes	2.739	0.055	2.630	2.848
	Medium Sizes	2.014	0.045	1.926	2.103
Difficult to improve the quality of shopping environment	Larger Sizes	1.087	0.060	1.026	1.168
	Medium Sizes	2.257	0.049	2.160	2.354
Less efforts by supplier to match buyer's requirements	Larger Sizes	2.261	0.045	2.171	2.351
	Medium Sizes	2.971	0.037	2.899	3.044

Note. DV: Dependent Variables; IV: Independent Variables

Table 5.84 shows which of the types of shopping centres have a significant effect on the potential risks of FM service delivery. An inspection of the mean scores indicated that larger sized shopping centres have potential risks of less efforts by supplier to improve centre physical image (M=2.739, SD=0.055) than single service contracts (M=2.014, SD=0.045). The mean scores also indicated that medium sized shopping centres have potential risks of difficult to improve the quality of shopping environment (M= 2.257, SD= 0.049) than larger sized shopping centres (M=1.087, SD= 0.060). Further inspection of the mean scores indicated that medium sized shopping centres have potential risks of less efforts by supplier to match buyer's requirements (M=2.971, SD=0.037) than larger sized shopping centres (M=2.261, SD=0.045)

5.8 Summary

The results from the main questionnaire survey have been analysed and measured quantitatively through the analysis of SPSS packages. The statistical used in analysing these data consists of descriptive statistic, chi-square test and multivariate analysis of variance (MANOVA). The descriptive analysis provides the results in a form of statistical percentages and numbers of frequencies. The results from the descriptive analysis have shown that the major provision for FM services which has been practiced in UK shopping centres is outsourcing and the primary reasons for outsourcing cost saving, reduced and control operating cost, resources not available internally, specialist knowledge required and access to best practiced.

The chi-square test analysis provides the results in statistical measurement of association between types of shopping centres and also the types of FM service delivery options. The results from chi-square test have shown that there is no association between the sizes of shopping centres and the options of FM service delivery that have been practiced. This is because they made their decision based on their needs or solution that they are looking for.

Meanwhile, the MANOVA analysis provides the results in statistical measurement of significant differences between groups (Sizes of shopping centres and also types of FM service delivery options) and dependant variables (The potential benefits and the potential risks criteria). The results from the MANOVA test have shown that there is significant different in sizes of shopping centres towards the potential benefits and risks of FM service delivery. There is also identified a significant different in types of FM service delivery options towards its potential benefits and risks. Those highlighted results from main questionnaire have shown a significant importance to the research undertaken. Moreover, these results have provided the key findings towards the overall aim and objectives of the research.

CHAPTER 6: DEVELOPMENT OF DECISION-MAKING FRAMEWORK FOR FACILITIES MANAGEMENT OUTSOURCING SELECTION SYSTEM (FMOSS)

6.1 Introduction

This chapter provides for the development of decision-making framework for determining the best options of FM service delivery in UK shopping centres. The development of this framework is based on Analytical Hierarchy Process (AHP) methodology and is supported by the Expert Choice 11 software. Expert Choice system is used as the development tool of this framework and also to facilitate the decision-making process during the selection of the best options. Assessment criteria used in this framework is basically obtained from the literature review. These criteria are based on the potential benefits and the potential risks of outsourcing that result from several studies in outsourcing.

6.2 Developing the Decision-Making Framework

This research aims to develop an effective decision-making framework for determining the best options of facilities management service delivery in UK shopping centres. The proposed decision-making framework is called facilities management outsourcing selection system (FMOSS). The decision-making framework of FM outsourcing selection system is shown in Figure 6. The proposed decision-making framework is developed to assist shopping centres' managers in selecting the best option for FM service delivery in shopping centres. The result from the proposed decision-making framework is the priorities ranking for the entire decision criterion. The highest priority ranking in accordance to the potential benefits criteria of FM service delivery will be considered as the best option to be selected. Meanwhile, the lowest priority ranking in accordance to the potential risks criteria of the FM service delivery is also considered as one of the best options to be selected. The development of this framework includes:

- 1) FM service delivery options
- 2) Assessment criteria
- 3) Analytical hierarchy process (AHP) methodology
- 4) Expert Choice 11 software

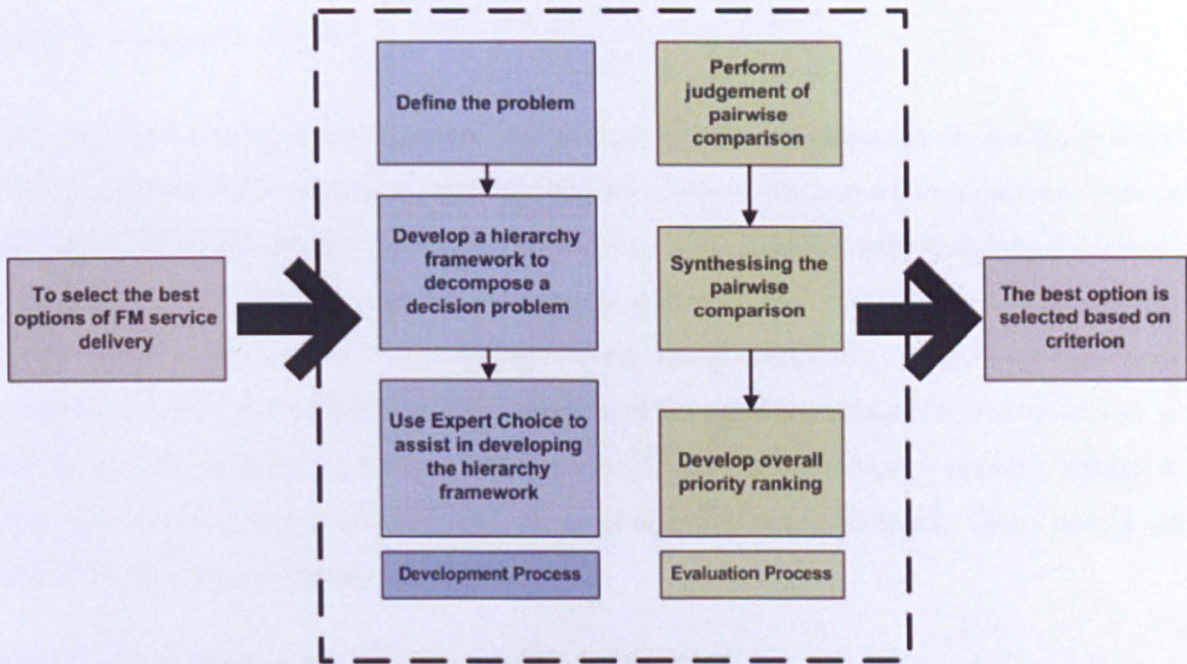


Figure 6: Decision-making Framework of the FM Outsourcing Selection System (FMOSS)

6.2.1 FM Service Delivery Options

In shopping centres, there are currently two options that have been practiced for outsourcing facilities management services. According to the survey results in Chapter 5, the options are single service contracts and bundled service contract. With single service contracts, shopping centres have a tendency to contract the different types of FM services to be delivered by different service providers. In this case, shopping centres would have both an in-house management team providing some FM services and a host of single service contractors to manage.

Meanwhile, the bundled service contract offers a different approach, where some FM services in shopping centres are bundled or packaged together to be delivered by a single service provider. In this case, shopping centres would have both an in-house management team providing some FM services and lesser single service contractor to manage. Both options have their own benefits and risks. The development of this framework would take into account the selection of the best amongst these two options. Based on the potential benefits and the potential risks of outsourcing, this framework will assist and facilitate shopping centres' managers to evaluate the potential benefits and the potential risks of the options before making any decision.

6.2.2 Assessment Criteria

The assessment criteria are important components in the development of this framework. This is because these criteria are used to evaluate both of the outsourcing options. First of all, the assessment criteria should be defined by the decision-makers/shopping centres' managers before carrying out the evaluation process. The assessment criteria of this framework are based on the potential benefits and the potential risks of outsourcing. Those criteria have been identified from the literature review and are grouped into five factors in accordance to Greaver's (2007) categorisation of outsourcing reasons, namely, financial, cost, performance, organisational, and the other added factor is physical. These factors are described in Chapter 3 under sub-headings 3.6.

6.2.3 Analytical Hierarchy Process (AHP) Methodology

The analytical hierarchy process (AHP) is a structured technique helping to deal with complex multi-criteria evaluations or decisions. The AHP provides a comprehensive and rational framework for structuring a problem, for representing and quantifying its elements, for relating those elements to overall goals and for evaluating alternative solutions.

Generally, AHP consists of three main procedures, including hierarchy framework, priority analysis and consistency verification. Formulating the decision problem in the form of the hierarchy framework is the first step of AHP, with the top level representing overall objectives or goal, the middle levels representing factors and criteria, and the decision alternatives at the lowest level.

Once a hierarchy framework is constructed, shopping centres' managers are requested to set up a pair-wise comparison matrix at each hierarchy and compare each other by using a scale pair-wise comparison as shown in Table 6.3. Finally, in the synthesis of priority stage, each comparison matrix is then solved by an eigenvector method to determine the factors' importance and alternative performance. These procedures involve nine steps as shown in Figure 6.1.

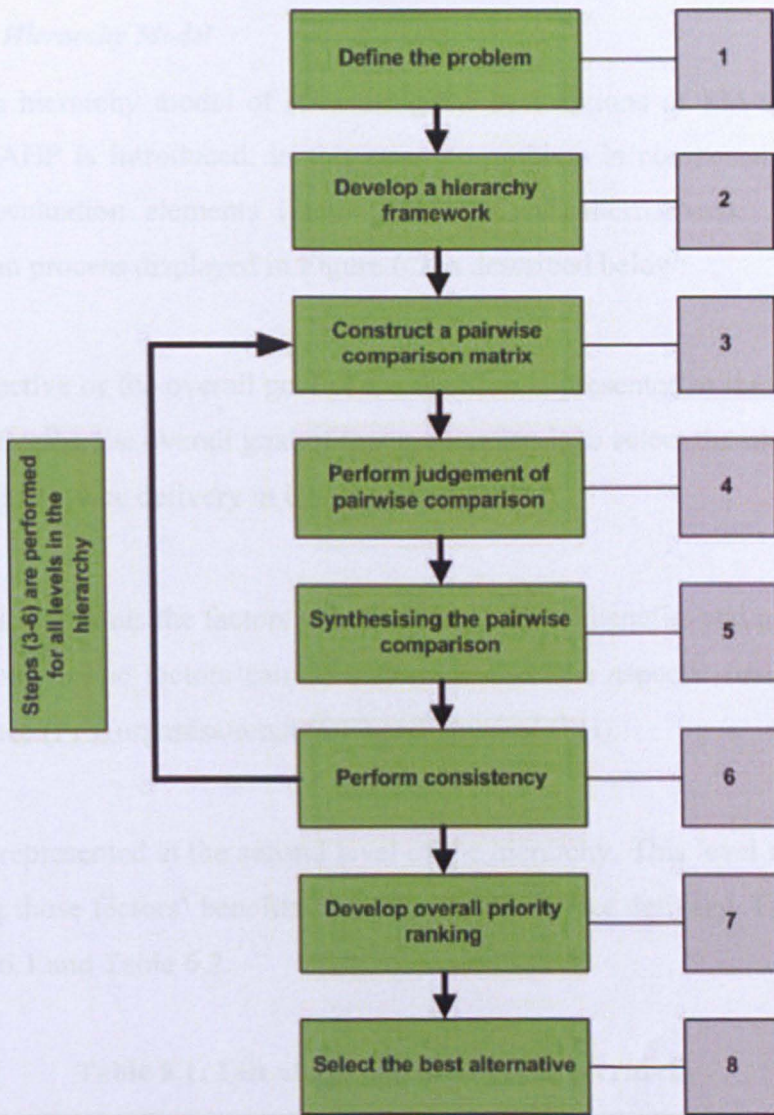


Figure 6.1: The steps of the analytical hierarchy process (AHP)

Step 1: Define the problem

Typically, facilities management services in UK shopping centres are carried out or services delivered through either in-house provision or outsourcing to contractors or FM service providers. In shopping centres, there are two options that have been practiced for FM outsourcing, namely: single service contracts and bundled service contract. The problem occurs when shopping centres managers have few alternatives in selecting the best options of FM service delivery where, typically, the best option of FM service delivery has led shopping centres’ managers to making a decision in accordance to its potential benefits and risks.

Using AHP will facilitate in evaluating the process of the best options of FM service delivery in accordance to its potential benefits and risks, and finally to select the best options.

Step 2: Develop a Hierarchy Model

In this section, a hierarchy model of structuring the best options of FM service delivery decisions using AHP is introduced. In this step the problem is composed of a hierarchy structure with evaluation elements (factors, criteria and alternatives). A three level hierarchy decision process displayed in Figure 6.2 is described below:

4) Goal:

Initially, the objective or the overall goal of the decision is presented at the top level of the hierarchy. Specifically, the overall goal of this application is to select the most benefits and lowest risks of FM service delivery in UK shopping centres.

5) Level 1:

The second level represents the factors affecting the potential benefits and potential risks of FM service delivery. The factors can be classified into five aspects: financial (FI), cost (CO), performance (PF), organisational (OR) and physical (PH).

6) Level 2:

The criteria are represented at the second level of the hierarchy. This level represents those criteria affecting those factors' benefits and risks of FM service delivery. Those criteria are shown in Table 6.1 and Table 6.2.

Table 6.1: List of the potential benefits criteria

No	Factor(s)	Criteria	Abbreviation used
1)	Financial (FI)	Save money on non-core activities Opportunity to reduce investment in asset	PBFI 1 PB FI 2
2)	Cost (CO)	Enable to obtain cheaper services Enable operational cost to be reduced Enable to provide cost effective services Enable to control service charges	PBCO 1 PBCO 2 PBCO 3 PBCO 4
3)	Performance (PF)	Improve operating performance Enable to obtain expertise, skills and technologies Enable to improve service quality Increase customer satisfaction	PBPF 1 PBPF 2 PBPF 3 PBPF 4
4)	Organisational (OR)	Free up management time to focus on core activities Enhance management effectiveness Improve management capability Reduce management burden	PBPF 1 PBPF 2 PBPF 3 PBPF 4
5)	Physical (PH)	Improve centre physical image Improve the quality shopping environment Enable to match support service activity with footfall	PBPF 1 PBPF 2 PBPF 3

Table 6.2: List of the potential risks criteria

No	Factor(s)	Criteria	Abbreviation used
1)	Financial (FI)	Unable to save money on non-core activities Opportunity to increase investment in asset	PRFI 1 PRFI 2
2)	Cost (CO)	Difficult to obtain cheaper services Unable to reduce operational cost Unable to provide cost effective services Unable to control service charges	PRCO 1 PRCO 2 PRCO 3
3)	Performance (PF)	Unable to improve operating performance Difficult to obtain expertise, skills and technologies Unable to improve service quality Increase risks of service interruption	PRPF 1 PRPF 2 PRPF 3 PRPF 4
4)	Organisational (OR)	Loss of management time on non-core activities Loss of management focus on core activities Complex and time consuming to manage Increase in management burden	PROR 1 PROR 2 PROR 3 PROR 4
5)	Physical (PH)	Less efforts by supplier to improve centre physical image Difficult to improve the quality shopping environment Less efforts by supplier to match buyer's requirements	PRPH 1 PRPH 2 PRPH 3

7) *Level 3:*

Finally, at the lowest level of the hierarchy, the alternatives of FM service delivery are identified, which are the decision options with single service contracts or bundled service contract.

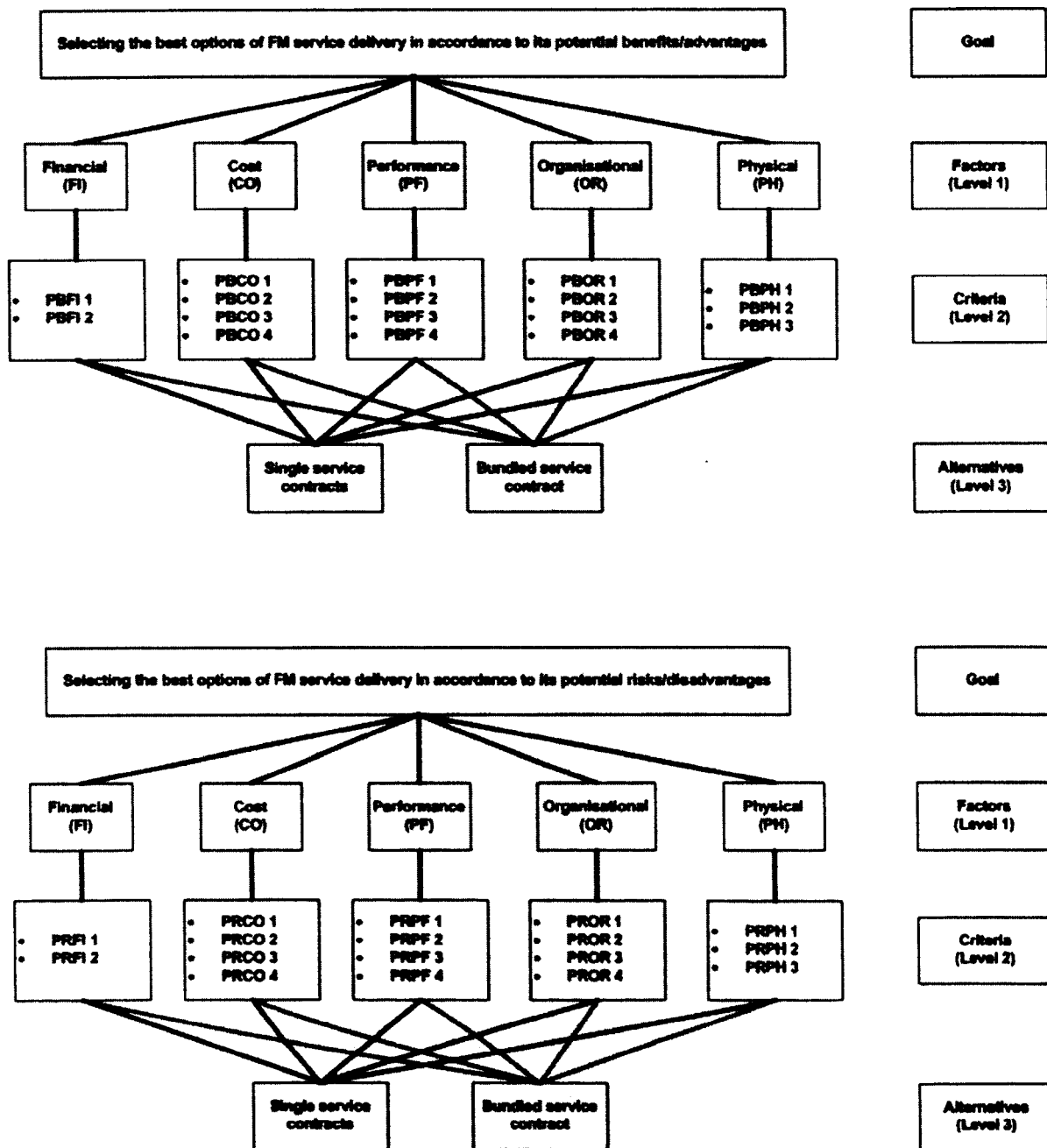


Figure 6.2: A hierarchy model for the selection of the best options of FM service delivery

Step 3: Construct a pair-wise comparison matrix

One of the major strengths of AHP is the use of pair-wise comparison to derive accurate ratio scale priorities. Pair-wise comparisons are fundamental to the AHP methodology. Then, a pair-wise comparison matrix (size $n \times n$) is constructed for the lower levels with one matrix in the level immediately above. The pair-wise comparisons generate a matrix of relative rankings for each level of the hierarchy.

The number of matrices depends on the number of elements at each level. The order of the matrix at each level depends on the number of elements at the lower level to which it links.

Step 4: Perform judgement of pair-wise comparison

Pair-wise comparison begins with comparing the relative importance of two selected items. There are $n \times (n - 1)$ judgements required to develop the set of matrices in step 3. The shopping centres' managers have to compare or judge each element by using the relative scale pair-wise comparison as shown in Table 6.3

Table 6.3: Scale for pair-wise comparison

The judgements are decided based on the shopping centres managers' experience and knowledge. The scale used for comparisons in AHP enables the shopping centres managers to incorporate experience and knowledge intuitively.

Step 5: Synthesising the pair-wise comparison

To calculate the vectors of priorities, the average of normalised column method is used. The average normalised column is to divide the elements of each column by the sum of the column and then add the element in each resulting row and divide this sum by the number of elements in the row (n). This is a process of averaging over the normalised columns. In mathematical form, the vector of priorities can be calculated as

$$W_i = \frac{1}{n} \sum_{j=1}^n \frac{a_{ij}}{\sum_i^n a_{ij}}, i, j = 1, 2, \dots, n$$

Where W_i = Average weight of the row (Priority vector)

a = comparison pair-wise matrix

i = the number in the i row

j = the number in the j column

Equation 6: The vector of priorities calculation

Step 6: Perform the consistency

Since the comparisons are carried out through personal or subjective judgements, some degree of inconsistency may occur. To guarantee that the judgements are consistent, the final operation - called consistency verification, which is regarded as one of the most advantages of the AHP - is incorporated in order to measure the degree of consistency among the pair-wise comparisons by computing the consistency ratio. Consistency ratio (CR) is the ratio of consistency index (CI) to random index (RI) for the same order matrices. To calculate the consistency ratio (CR), there are three steps to be implemented as follows:

1) Calculate the Eigenvalue (λ_{max})

Eigenvalue method is used to calculate the relative weights of elements in each pair-wise comparison matrix. The relative weights (W) of matrix A is obtained from following equation:

$$(A - \lambda_{max} I) \times W = 0$$

Where λ_{max} = the biggest eigenvalue of matrix A ,

I = unit matrix

W = relative weight

Equation 6.1: The eigenvalue calculation

2) Calculate the consistency index (CI)

Consistency index is calculated as:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

Where λ_{max} = the biggest eigenvalue of matrix A
 n = number of elements

Equation 6.2: Consistency index calculation

The consistency index of a randomly generated reciprocal matrix shall be called the random index (RI), with reciprocal forced. An average RI for the matrices of order 1-12 was generated by using a sample size of 100. The table of random indexes of the matrices of order 1-12 can be seen in Table 6.4.

Table 6.4 Random index of AHP

Size of matrix (n)	1	2	3	4	5	6	7	8	9	10	11	12
Random Index (RI)	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.58

3) Calculate the consistency ratio (CR)

The last ratio that has to be calculated is consistency ratio (CR). Generally, if CR is less than 0.10, the judgements are consistent, so the derived weights can be used. The formulation of CR is:

$$CR = \frac{CI}{RI}$$

Where CI = Consistency Index
 RI = Random Index

Equation 6.3: Consistency ratio calculation

Step 7: Develop overall priority ranking

After the consistency calculation for all levels is completed, further calculation of the overall priority vector to select the best option of FM service delivery must be performed.

The relative weights of evaluation elements are aggregated to obtain an overall rating for the alternative as follows:

$$W_i^a = \sum_{j=1}^m w_{ij}^a w_j^c \quad \text{for } i = 1, 2, 3 \dots n$$

Where W_i^a = total weight of alternative i,
 w_{ij}^a = weight of alternative i associated to attribute (criterion) j,
 w_j^c = weight of attribute j,
 m = numbers of attribute,
 n = numbers of alternatives

Equation 6.4: Overall priority vector calculation

Step 8: Selection of the best alternatives

This is the final step of the process, where overall priority vector for the alternatives with respect to the factors and criteria is ranked in accordance to the highest value. The highest value of the alternative indicates that is best alternative in accordance to the factors and criteria used in the evaluation process. The selection of the best alternative is based on that result.

6.2.4 Expert Choice 11 Software

Expert Choice software is used as a development tool to assist in developing this decision-making framework. Expert Choice is employed to assist in structuring the hierarchy and synthesising judgements and make it quick and simple by eliminating tedious calculations (Forman et. al, 2002). Some of the features of this software are:

- It offers user-friendly displays that make decision model building straightforward and simple.
- It offers a model view containing either a tree view (see Figure 6.3) or cluster view of the decision hierarchy

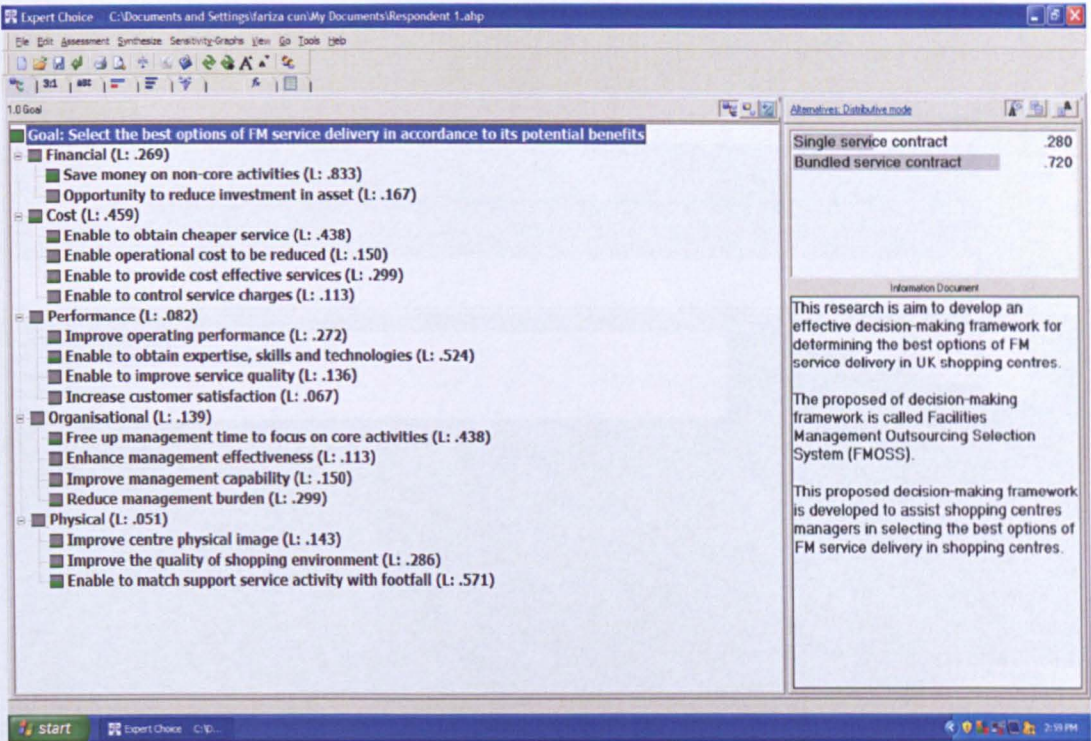


Figure 6.3: A model tree view of the decision hierarchy in Expert Choice

- It offers three ways to perform judgement. The pair-wise comparisons can be performed numerically, verbally or graphically (see Figure 6.4, 6.5 and 6.6). This is because the software has capability to convert subjective judgement into the 1 – 9 scale prescribed by AHP theory and then into meaningful priority vectors

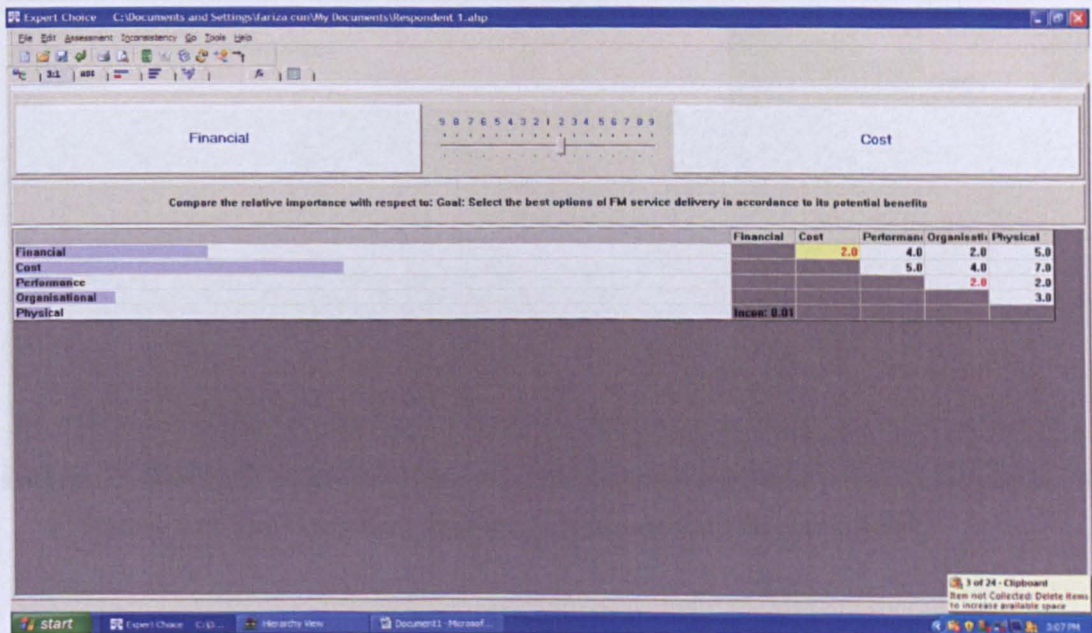


Figure 6.4: A Numerical Pair-wise Comparison in Expert Choice

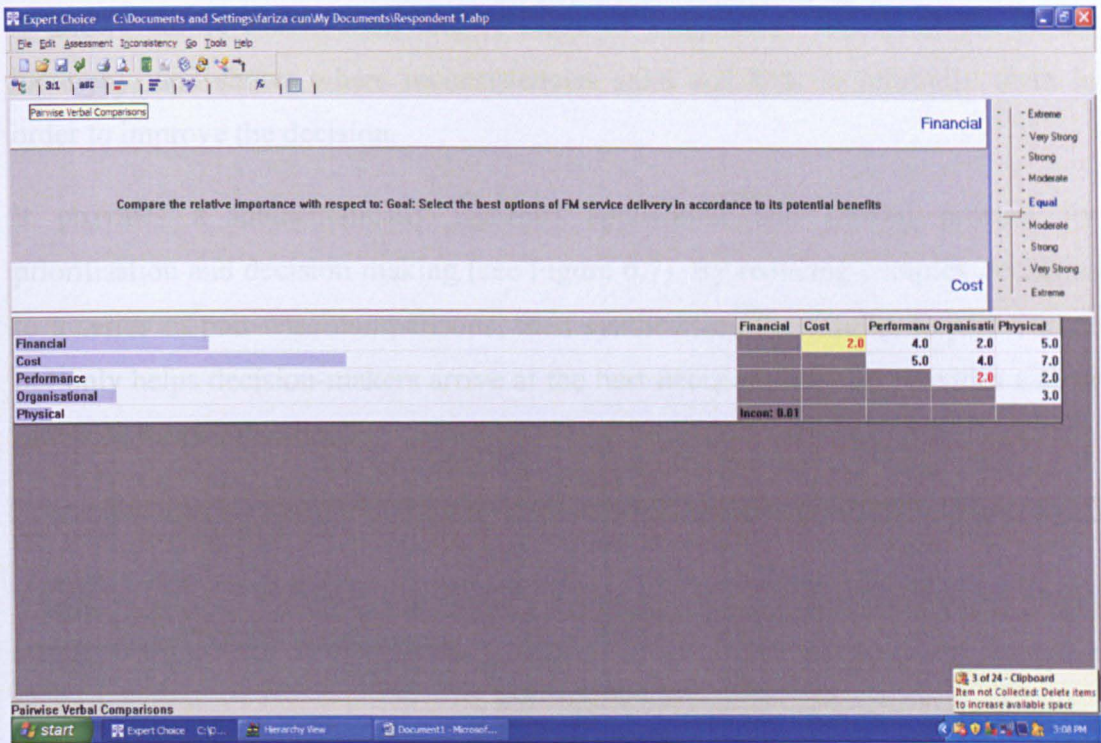


Figure 6.5: The Verbal Pair-wise Comparison in Expert Choice

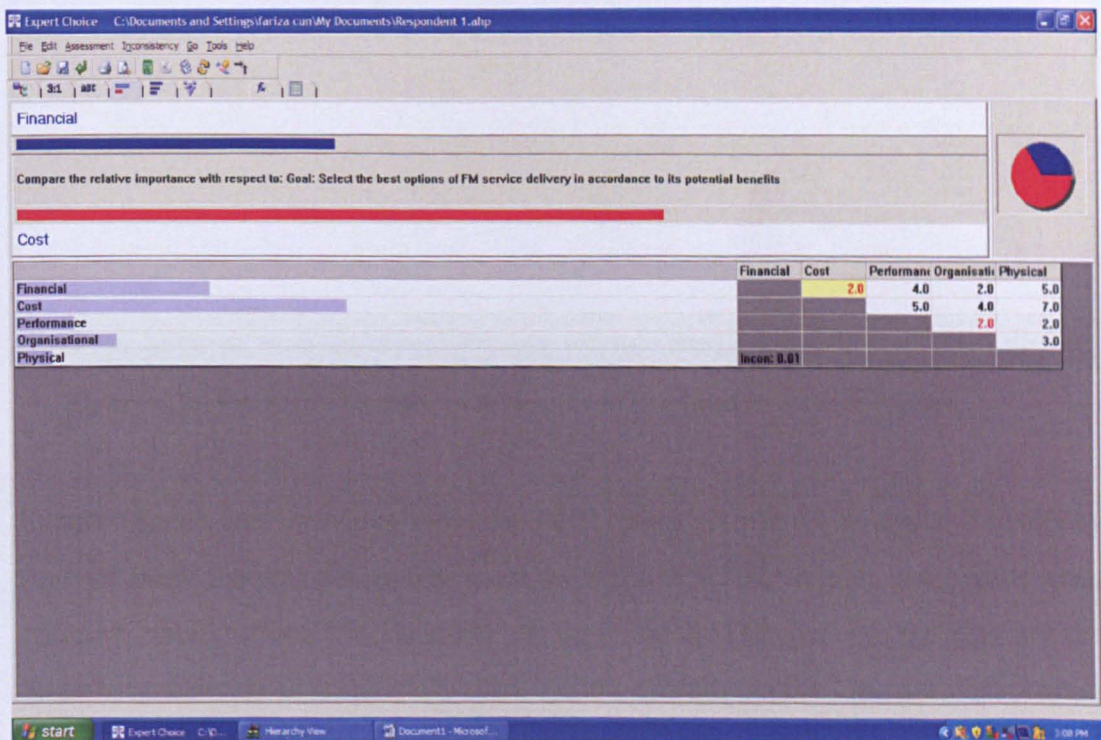


Figure 6.6: The Graphical Pair-wise Comparison in Expert Choice

- It works by examining judgements made by decision-makers, and measuring the consistency of those judgements.

- It allows for re-examination and revision of judgements for all levels of the hierarchy, and shows where inconsistencies exist and how to minimise them in order to improve the decision.
- It provides a mathematically rigorous application and proven process for prioritisation and decision-making (see Figure 6.7). By reducing complex decisions to a series of pair-wise comparisons, then synthesising the results, Expert Choice not only helps decision-makers arrive at the best decision, but also provides a clear rationale for that decision.

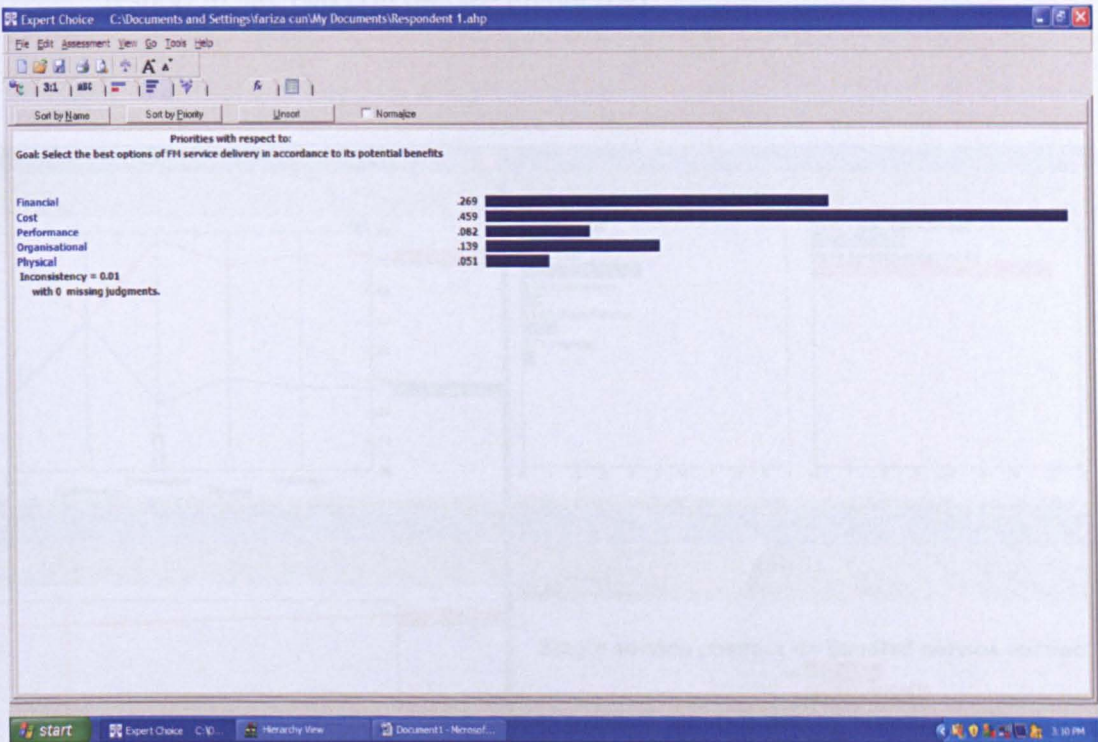


Figure 6.7: Priorities Results with respect to the Goal in Expert Choice

- Expert Choice also provides tools for performing sensitivity analysis. Sensitivity analysis helps the decision-maker to see how the different weights assigned to each criterion could affect the outcome of the model. The general purpose of the sensitivity analyses is graphically seen by how the alternative changes with respect to the importance of the criteria or sub-criteria. There are five types of sensitivity analyses that can be carried out in Expert Choice:
 1. Performance sensitivity: Displays how the alternatives perform with respect to all criteria (see Figure 6.8).

2. Dynamic sensitivity: Displays how the choice priorities of alternatives changes when the priority of one criterion is varied (see Figure 6.8).
3. Gradient sensitivity: Displays the composite priority of the alternatives with respect to the priority of a single criterion (see Figure 6.8).
4. Head to head sensitivity: Displays how any two alternatives compare with respect to each criterion and the goal (see Figure 6.8). and
5. Two – Dimensional sensitivity: Displays how alternatives perform with respect to any two criteria (see Figure 6.9).

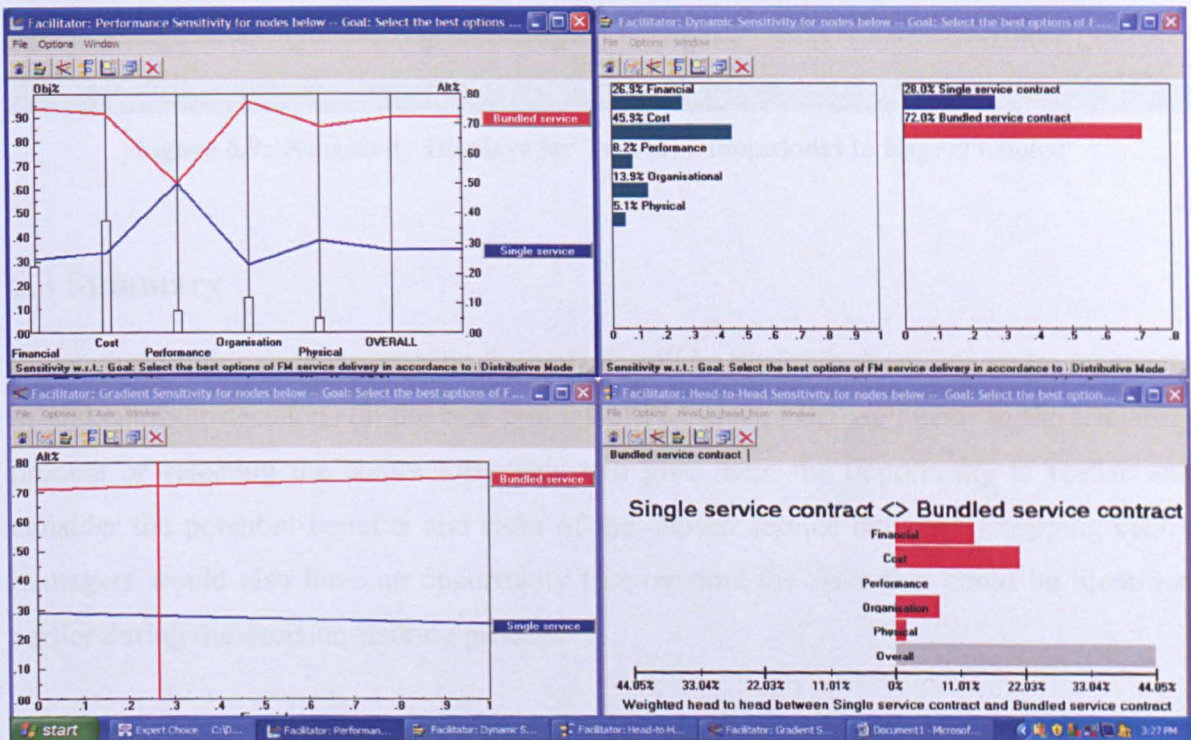


Figure 6.8: Sensitivity Displays for Performance, Dynamic, Gradient and Head to Head in Expert Choice

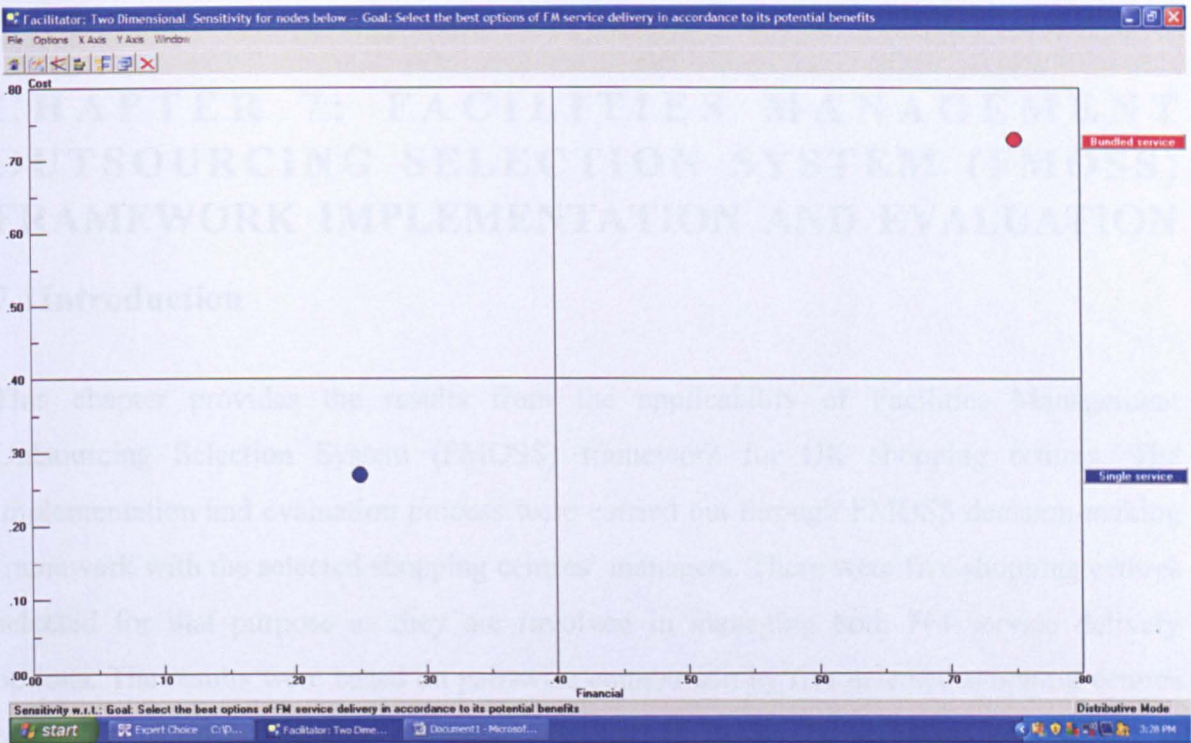


Figure 6.9: Sensitivity Displays for Two (2) Dimensional in Expert Choice

6.3 Summary

In conclusion, this decision-making framework will be useful to shopping centre managers in making their decisions on the best options of FM service delivery prior to the tendering process or selecting the contractors. This will give them the opportunity to realise and consider the potential benefits and risks of the chosen service delivery. Shopping centre managers would also have an opportunity to overcome the risks that could be identified earlier during the decision-making process.

Although this framework provides the assessment criteria based on the literature review, shopping centre managers are also recommended to assert their own assessment criteria as they are involved in the selection process. This will give flexibility to this framework in using the assessment criteria that is not rigid for the selection process. These proposed criteria can be used as guidance for their decision-making process. Later, this decision-making framework will be used in Phase 4 of research undertaken. This will validate the framework through its implementation testing.

CHAPTER 7: FACILITIES MANAGEMENT OUTSOURCING SELECTION SYSTEM (FMOSS) FRAMEWORK IMPLEMENTATION AND EVALUATION

7.1 Introduction

This chapter provides the results from the applicability of Facilities Management Outsourcing Selection System (FMOSS) framework for UK shopping centres. The implementation and evaluation process were carried out through FMOSS decision-making framework with the selected shopping centres' managers. There were five shopping centres selected for that purpose as they are involved in managing both FM service delivery options. The results were based on pair-wise comparison by five selected shopping centres managers. Shopping centres managers were asked to do the pair-wise comparison in accordance to the FMOSS decision-making framework. The AHP methodology was employed to carry out the process. This process is facilitated with Expert Choice software in order to determine the shopping centres managers' selection.

7.2 Shopping Centres Managers Profiles

The shopping centres managers' profiles and the dates of meeting are summarised in Table 7.

Table 7: Shopping centres managers' profiles and meetings dates

Shopping Centres Managers	Position	Experience	Size of shopping centres (m ²)	Location	Dates of Meetings
G C	Centre Manager	12 years	96, 700	Hampshire	15/04/2011
T W	General Manager	7 years	124, 700	Birmingham	21/04/2011
M N	Centre Manager	4 years	129, 561	Cardiff	26/04/2011
P L	General Manager	5 years	133, 180	Essex	05/05/2011
G B	Centre Manager	9 years	130, 060	Manchester	09/05/2011

7.3 Results Based on Pair-wise Comparison

7.3.1 G.C, Shopping Centre Manager, 12 Years' Experiences:

A) Decision-Making Based on the Potential Benefits/Advantages

1) Overall Priority Ranking

Table 7.1 and Table 7.2 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential benefits/advantages of FM service delivery, the results indicate this shopping centre manager's priority factors ranking in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.457), financial (0.269), organisational (0.140), performance (0.083) and physical (0.051). The consistency ratio (CR) is $0.01 < 0.10$, this represents a good consistency.

Table 7.1: All Priority Vectors for factors, criteria and alternative

		PRIORITY VECTOR									
		GOAL									
FACTORS (Level 1)	Financial (FI)	Cost (CO)				Performance (PF)					
	0.269	0.457				0.083					
CR	0.01	0.01				0.01					
CRITERIA (Level 2)	PBFI 1	PBFI 2	PBCO 1	PBCO 2	PBCO 3	PBCO 4	PBPF 1	PBPF 2	PBPF 3	PBPF 4	
	0.833	0.167	0.433	0.150	0.300	0.117	0.231	0.530	0.166	0.073	
CR	0.00	0.00	0.09	0.09	0.09	0.09	0.00	0.00	0.00	0.00	
Alternatives (Level 3)											
Single	0.250	0.250	0.167	0.167	0.500	0.200	0.500	0.500	0.500	0.500	
Bundled	0.750	0.750	0.833	0.833	0.500	0.800	0.500	0.500	0.500	0.500	
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note. CR= Consistency Ratio

Table 7.2: All Priority Vectors for factors, criteria and alternative

		PRIORITY VECTOR					
		GOAL					
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
		0.140				0.051	
CR	0.01				0.01		
CRITERIA (Level 2)	PBOR 1	PBOR 2	PBOR 3	PBOR 4	PBPH 1	PBPH 2	PBPH 3
	0.433	0.117	0.150	0.300	0.143	0.286	0.571
CR	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.125	0.500	0.500	0.143	0.500	0.500	0.167
Bundled	0.875	0.500	0.500	0.857	0.500	0.500	0.833
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager’s priority criteria ranking for:

- 1) Financial is PBFI 1 (0.833) and PBFI 2 (0.167). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PBCO 1 (0.433), PBCO 3 (0.300), PBCO 2 (0.150) and PBCO 4 (0.117). As the value of CR is $0.09 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PBPF 2 (0.530), PBPF 1 (0.231), PBPF 3 (0.166) and PBPF 4 (0.073). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 4) Organisational is PBOR 1 (0.433), PBOR 4 (0.300), PBOR 3 (0.150) and PBOR 2 (0.117). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PBPH 3 (0.571), PBPH 2 (0.286) and PBPH 1 (0.143). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PBFI 1, PBFI 2, PBCO 1, PBCO 2, PBCO 4, PBOR 1, PBOR 4 and PBPH 3, indicate that bundled service contract has more potential benefits in delivering FM services in UK shopping centres rather than single service contracts. Meanwhile, the priority vectors for the criteria of PBCO 3, PBPF 1, PBPF 2, PBPF 3, PBPF 4, PBOR 2, PBOR 3, PBPH 1 and PBPH 2, indicate that single service contracts and bundled service contract both have equal potential benefits in delivering FM services in UK shopping centres.

Table 7.3: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.269	0.457	0.083	0.140	0.310	
Single	0.250	0.271	0.500	0.261	0.310	0.285
Bundled	0.750	0.729	0.500	0.799	0.690	0.724

Table 7.3 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor: bundled service contract is more preferable than single service contracts in term of its potential financial benefits.
- 2) Cost factor: bundled service contract is more preferable than single service contracts in term of its potential cost benefits.
- 3) Performance factor: both bundled service contract and single service contracts are equally preferable in term of their potential performance benefits.
- 4) Organisational factor: bundled service contract is more preferable than single service contracts in term of its potential organisational benefits.
- 5) Physical factor: bundled service contract is more preferable than single service contracts in term of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.4 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in bundled service contract is 0.720 (72%) and the value of overall priority matrix in single service contracts is 0.280 (28%), which are based on their potential benefits. The highest value of overall priority matrix suggests that bundled service contract is the best options of FM service delivery in UK shopping centres because of more potential benefits.

Table 7.4: Result of selection

Rank	Best Selection	
1	Bundled Service Contract	0.720
2	Single Service Contracts	0.280

B) Decision-Making Based on the Potential risks/Disadvantages

1) Overall Priority Ranking

Table 7.5 and Table 7.6 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential risks/disadvantages of FM service delivery, the results indicate this shopping centre manager’s priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.389), financial (0.250), organisational (0.164), performance (0.119) and physical (0.077). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.5: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR										
GOAL										
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.250		0.389				0.119			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PRFI 1	PRFI 2	PRCO 1	PRCO 2	PRCO 3	PRCO 4	PRPF 1	PRPF 2	PRPF 3	PRPF 4
	0.328	0.672	0.152	0.313	0.104	0.432	0.231	0.122	0.181	0.466
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.787	0.667	0.667	0.608	0.500	0.750	0.612	0.500	0.500	0.245
Bundled	0.213	0.333	0.333	0.392	0.500	0.250	0.388	0.500	0.500	0.755
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.6: All Priority Vectors for factors, criteria and alternative

		PRIORITY VECTOR					
		GOAL					
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
		0.164				0.077	
CR	0.00				0.00		
CRITERIA (Level 2)	PROR 1	PROR 2	PROR 3	PROR 4	PRPH 1	PRPH 2	PRPH 3
	0.101	0.148	0.444	0.307	0.154	0.309	0.537
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.250	0.750	0.802	0.667	0.602	0.500	0.726
Bundled	0.750	0.250	0.198	0.333	0.398	0.500	0.274
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PRFI 2 (0.672) and PRFI 1 (0.328). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PRCO 4 (0.432), PRCO 2 (0.313), PRCO 1 (0.152) and PRCO 3 (0.104). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PRPF 4 (0.466), PRPF 1 (0.231), PRPF 3 (0.181) and PRPF 2 (0.122). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 4) Organisational is PROR 3 (0.444), PROR 4 (0.307), PROR 2 (0.148) and PROR 1 (0.101). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PRPH 3 (0.537), PRPH 2 (0.309) and PRPH 1 (0.154). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PRFI 1, PRFI 2, PRCO 1, PRCO 2, PRCO 4, PRPF 1, PROR 2, PROR 3, PROR 4, PRPH 1 and PRPH 3, indicate that single service contracts have more potential risks/disadvantages in delivering FM services in UK shopping centres than bundled service contract. Meanwhile, the priority vectors for the criteria of PRCO 3, PRPF 2, PRPF 3, PBPF 3 and PRPH 2, indicate that single service contracts and bundled service contract both have equal potential risks/disadvantages in delivering FM services in UK shopping centres.

In addition, the priority vectors for the criteria of PRPF 4 and PROR 1 indicate that the bundled service contract has more potential risks/disadvantages in delivering FM services in UK shopping centres.

Table 7.7: Overall priority vector for the alternatives with respect to the factors and criteria

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.250	0.389	0.119	0.164	0.077	
Single	0.706	0.667	0.407	0.697	0.637	0.648
Bundled	0.294	0.333	0.593	0.303	0.363	0.352

Table 7.7 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager’s overall priority vector for the alternatives with respect to:

- 1) Financial factor is riskier in single service contracts than bundled service contract in term of its potential financial risks.
- 2) Cost factor is riskier in single service contracts than bundled service contract in term of its potential cost benefits.
- 3) Performance factor is riskier in bundled service contract than single service contracts in term of its potential performance benefits.
- 4) Organisational factor is riskier in single service contracts than bundled service contract in term of its potential organisational benefits.
- 5) Physical factor is riskier in single service contracts than bundled service contract in term of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.8 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in single service contracts is 0.648 (65%) and the value of overall priority matrix in bundled service contract is 0.352 (35%), which are based on their potential risks. The lowest value of overall priority matrix suggests that bundled service contract is the best option of FM service delivery in UK shopping centres because of low potential risks.

Table 7.8: Result of selection

Rank	Best Selection	
1	Single Service Contracts	0.648
2	Bundled Service Contract	0.352

7.3.2 T.W, General Managers, 7 Years' Experiences

A) Decision-Making Based on the Potential Benefits/Advantages

1) Overall Priority Ranking

Table 7.9 and Table 7.10 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential benefits/advantages of FM service delivery, the results indicate this shopping centre manager's priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.347), financial (0.223), physical (0.186), performance (0.149) and organisational (0.095). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.9: All Priority Vectors for factors, criteria and alternative

	PRIORITY VECTOR									
	GOAL									
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.223		0.347				0.149			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PBFI 1	PBFI 2	PBCO 1	PBCO 2	PBCO 3	PBCO 4	PBPF 1	PBPF 2	PBPF 3	PBPF 4
	0.857	0.143	0.415	0.195	0.340	0.050	0.124	0.243	0.093	0.540
CR	0.00	0.00	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
Alternatives (Level 3)										
Single	0.198	0.333	0.143	0.143	0.500	0.166	0.333	0.500	0.333	0.500
Bundled	0.802	0.667	0.857	0.857	0.500	0.834	0.667	0.500	0.667	0.500
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.10: All Priority Vectors for factors, criteria and alternative

	PRIORITY VECTOR						
	GOAL						
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
	0.095				0.186		
CR	0.00				0.00		
CRITERIA (Level 2)	PBOR 1	PBOR 2	PBOR 3	PBOR 4	PBPH 1	PBPH 2	PBPH 3
	0.500	0.066	0.125	0.309	0.136	0.272	0.592
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.143	0.500	0.500	0.125	0.500	0.500	0.250
Bundled	0.857	0.500	0.500	0.875	0.500	0.500	0.750
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PBFI 1 (0.857) and PBFI 2 (0.143). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PBCO 1 (0.415), PBCO 3 (0.340), PBCO 2 (0.195) and PBCO 4 (0.050). As the value of CR is $0.02 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PBPF 4 (0.540), PBPF 2 (0.243), PBPF 1 (0.124) and PBPF 3 (0.093). As the value of CR is $0.05 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PBOR 1 (0.500), PBOR 4 (0.309), PBOR 3 (0.125) and PBOR 2 (0.066). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PBPH 3 (0.592), PBPH 2 (0.272) and PBPH 1 (0.136). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PBF1 1, PBF1 2, PBCO 1, PBCO 2, PBCO 4, PBPF 1, PBPF 3, PBOR 1, PBOR 4 and PBPH 3, indicate that bundled service contract has more potential benefits in delivering FM services in UK shopping centres than single service contracts. Meanwhile, the priority vectors for the criteria of PBCO 3, PBPF 2, PBPF 4, PBOR 2, PBOR 3, PBPH 1 and PBPH 2, indicate that single service contracts and bundled service contract both have equal potential benefits in delivering FM services in UK shopping centres.

Table 7.11: Overall priority vector for the alternatives with respect to the factors and criteria

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.223	0.347	0.149	0.095	0.186	
Single	0.221	0.240	0.500	0.500	0.296	0.284
Bundled	0.779	0.760	0.500	0.500	0.704	0.716

Table 7.11 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor: bundled service contract is more preferable than single service contracts in term of its potential financial benefits.
- 2) Cost factor: bundled service contract is more preferable than single service contracts in term of its potential cost benefits.
- 3) Performance factor: both bundled service contract and single service contracts are equally preferable in term of their potential performance benefits.
- 4) Organisational factor: both bundled service contract and single service contracts are equally preferable in term of their potential organisational benefits .

- 5) Physical factor: bundled service contract is more preferable than single service contracts in term of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.12 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in bundled service contract is 0.716 (72%) and the value of overall priority matrix in single service contracts is 0.284 (28%), which are based on their potential benefits. The highest value of overall priority matrix suggests that bundled service contract is the best option of FM service delivery in UK shopping centres because of more potential benefits.

Table 7.12: Result of selection

Rank	Best Selection	
1	Bundled Service Contract	0.716
2	Single Service Contracts	0.284

B) Decision-Making Based on the Potential risks/Disadvantages

1) Overall Priority Ranking

Table 7.13 and Table 7.14 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential risks/disadvantages of FM service delivery, the results indicate this shopping centre manager's priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.355), financial (0.228), performance (0.198), organisational (0.149), and physical (0.070). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.13: All Priority Vectors for factors, criteria and alternative

		PRIORITY VECTOR									
		GOAL									
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)				
		0.228		0.355				0.198			
CR	0.00		0.00				0.00				
CRITERIA (Level 2)	PRFI 1	PRFI 2	PRCO 1	PRCO 2	PRCO 3	PRCO 4	PRPF 1	PRPF 2	PRPF 3	PRPF 4	
	0.733	0.267	0.117	0.470	0.080	0.333	0.204	0.108	0.160	0.527	
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Alternatives (Level 3)											
Single	0.699	0.667	0.626	0.667	0.333	0.667	0.629	0.500	0.500	0.315	
Bundled	0.301	0.333	0.374	0.333	0.667	0.333	0.371	0.500	0.500	0.685	
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note. CR= Consistency Ratio

Table 7.14: All Priority Vectors for factors, criteria and alternative

		PRIORITY VECTOR							
		GOAL							
FACTORS (Level 1)	Organisational (OR)				Physical (PH)				
		0.149				0.70			
CR	0.00				0.00				
CRITERIA (Level 2)	PROR 1	PROR 2	PROR 3	PROR 4	PRPH 1	PRPH 2	PRPH 3		
	0.091	0.558	0.217	0.134	0.125	0.334	0.542		
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Alternatives (Level 3)									
Single	0.200	0.783	0.822	0.720	0.500	0.500	0.759		
Bundled	0.800	0.217	0.178	0.280	0.500	0.500	0.241		
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PRFI 1 (0.733) and PRFI 2 (0.267). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PRCO 2 (0.470), PRCO 4 (0.333), PRCO 1 (0.117) and PRCO 3 (0.080). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PRPF 4 (0.527), PRPF 1 (0.204), PRPF 3 (0.160) and PRPF 2 (0.108). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PROR 2 (0.558), PROR 3 (0.217), PROR 4 (0.134) and PROR 1 (0.091). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PRPH 3 (0.542), PRPH 2 (0.334) and PRPH 1 (0.125). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PRFI 1, PRFI 2, PRCO 1, PRCO 2, PRCO 4, PRPF 1, PROR 2, PROR 3, PROR 4 and PRPH 3, indicate that single service contracts have more potential risks/disadvantages in delivering FM services in UK shopping centres rather than bundled service contract. Meanwhile, the priority vectors for the criteria of PRPF 2, PRPF 3, PRPH 1 and PRPH 2, indicate that single service contracts and bundled service contract both have equal potential risks/disadvantages in delivering FM services in UK shopping centres.

In addition, the priority vectors for the criteria of PRCO 3, PRPF 4 and PROR 1 indicate that the bundled service contract has more potential risks/disadvantages in delivering FM services in UK shopping centres.

Table 7.15: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.228	0.355	0.198	0.149	0.070	
Single	0.690	0.635	0.429	0.730	0.640	0.621
Bundled	0.310	0.365	0.571	0.270	0.360	0.379

Table 7.15 represents the overall priority vector for the alternatives with respect to the factors. The results indicate the interviewee One's overall priority vector for the alternatives with respect to:

- 1) Financial factor is riskier in single service contracts than bundled service contract in term of its potential financial risks.
- 2) Cost factor is riskier in single service contracts than bundled service contract in terms of its potential cost benefits.

- 3) Performance factor is riskier in bundled service contract than single service contracts in terms of its potential performance benefits.
- 4) Organisational factor is riskier in single service contracts than bundled service contract in terms of its potential organisational benefits.
- 5) Physical factor is riskier in single service contracts than bundled service contract in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.16 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in single service contracts is 0.621 (62%) and the value of overall priority matrix in bundled service contract is 0.379 (38%), which are based on their potential risks. The lowest value of overall priority matrix suggests that bundled service contract is the best option of FM service delivery in UK shopping centres because of low potential risks.

Table 7.16: Result of selection

Rank	Best Selection	
1	Single Service Contracts	0.621
2	Bundled Service Contract	0.379

7.3.3 M.N, Centre Manager, 4 Years' Experiences

A) Decision-Making Based on the Potential Benefits/Advantages

1) Overall Priority Ranking

Table 7.17 and Table 7.18 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential benefits/advantages of FM service delivery, the results indicate this shopping centre manager's priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.403), financial (0.253), organisational (0.163), performance (0.104) and physical (0.077). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.17: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR										
GOAL										
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.253		0.403				0.104			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PBFI 1	PBFI 2	PBCO 1	PBCO 2	PBCO 3	PBCO 4	PBPF 1	PBPF 2	PBPF 3	PBPF 4
	0.875	0.125	0.439	0.290	0.108	0.163	0.173	0.440	0.088	0.299
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.442	0.396	0.379	0.407	0.552	0.319	0.319	0.519	0.500	0.500
Bundled	0.558	0.604	0.621	0.593	0.448	0.681	0.681	0.481	0.500	0.500
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.18: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR							
GOAL							
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
	0.163				0.077		
CR	0.00				0.00		
CRITERIA (Level 2)	PBOR 1	PBOR 2	PBOR 3	PBOR 4	PBPH 1	PBPH 2	PBPH 3
	0.522	0.062	0.118	0.298	0.141	0.471	0.388
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.333	0.515	0.510	0.125	0.500	0.500	0.325
Bundled	0.667	0.485	0.490	0.875	0.500	0.500	0.675
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PBFI 1 (0.875) and PBFI 2 (0.125). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PBCO 1 (0.439), PBCO 2 (0.290), PBCO 3 (0.163) and PBCO 3 (0.108). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PBPF 2 (0.440), PBPF 4 (0.299), PBPF 1 (0.173) and PBPF 3 (0.088). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PBOR 1 (0.522), PBOR 4 (0.298), PBOR 3 (0.118) and PBOR 2 (0.062). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PBPH 2 (0.471), PBPH 3 (0.388) and PBPH 1 (0.141). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PBF1 1, PBF1 2, PBCO 1, PBCO 2, PBCO 4, PBPF 1, PBOR 1, PBOR 4 and PBPH 3, indicate that bundled service contract has more potential benefits in delivering FM services in UK shopping centres than single service contracts. Meanwhile, the priority vectors for the criteria of PBPF 3, PBPF 4, PBPH 1 and PBPH 2, indicate that single service contracts and bundled service contract both have equal potential benefits in delivering FM services in UK shopping centres.

In addition, the priority vectors for the criteria of PBCO 3, PBPF 2, PBOR 2 and PBOR 3, indicate that single service contracts have more potential benefits in delivering FM services in UK shopping centres.

Table 7.19: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.253	0.403	0.104	0.163	0.077	
Single	0.436	0.399	0.513	0.328	0.444	0.416
Bundled	0.564	0.601	0.487	0.672	0.556	0.584

Table 7.19 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor: bundled service contract is more preferable than single service contracts in terms of its potential financial benefits.
- 2) Cost factor: bundled service contract is more preferable than single service contracts in terms of its potential cost benefits.
- 3) Performance factor: single service contracts are more preferable than bundled service contract in terms of its potential performance benefits.

- 4) Organisational factor: both bundled service contract and single service contracts are equally preferable in terms of their potential organisational benefits.
- 5) Physical factor: bundled service contract is more preferable than single service contracts in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.20 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in bundled service contract is 0.584 (58%) and the value of overall priority matrix in single service contracts is 0.416 (42%) which are based on their potential benefits. The highest value of overall priority matrix suggests that bundled service contract is the best option of FM service delivery in UK shopping centres because of more potential benefits.

Table 7.20: Result of selection

Rank	Best Selection	
1	Bundled Service Contract	0.584
2	Single Service Contracts	0.416

B) Decision-Making Based on the Potential risks/Disadvantages

1) Overall Priority Ranking

Table 7.21 and Table 7.22 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential risks/disadvantages of FM service delivery, the results indicate this shopping centre manager's priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.325), financial (0.244), performance (0.200), organisational (0.145), and physical (0.086). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.21: All Priority Vectors for factors, criteria and alternative

	PRIORITY VECTOR									
	GOAL									
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.244		0.325				0.200			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PRFI 1	PRFI 2	PRCO 1	PRCO 2	PRCO 3	PRCO 4	PRPF 1	PRPF 2	PRPF 3	PRPF 4
	0.694	0.306	0.532	0.218	0.108	0.142	0.399	0.129	0.175	0.297
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.728	0.695	0.404	0.667	0.667	0.769	0.677	0.500	0.500	0.194
Bundled	0.272	0.305	0.596	0.333	0.333	0.231	0.323	0.500	0.500	0.806
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.22: All Priority Vectors for factors, criteria and alternative

	PRIORITY VECTOR						
	GOAL						
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
	0.145				0.086		
CR	0.00				0.00		
CRITERIA (Level 2)	PROR 1	PROR 2	PROR 3	PROR 4	PRPH 1	PRPH 2	PRPH 3
	0.114	0.172	0.267	0.447	0.294	0.245	0.461
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.250	0.750	0.802	0.667	0.602	0.500	0.726
Bundled	0.750	0.250	0.198	0.333	0.398	0.500	0.274
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PRFI 1 (0.694) and PRFI 2 (0.306). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PRCO 1 (0.532), PRCO 2 (0.218), PRCO 4 (0.142) and PRCO 3 (0.108). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PRPF 1 (0.399), PRPF 4 (0.297), PRPF 3 (0.175) and PRPF 2 (0.129). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PROR 4 (0.447), PROR 3 (0.267), PROR 2 (0.172) and PROR 1 (0.114). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PRPH 3 (0.461), PRPH 1 (0.294) and PRPH 2 (0.245). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PRFI 1, PRFI 2, PRCO 2, PRCO 3, PRCO 4, PRPF 1, PROR 2, PROR 3, PROR 4, PRPH 1 and PRPH 3, indicate that single service contracts have more potential risks/disadvantages in delivering FM services in UK shopping centres than bundled service contract. Meanwhile, the priority vectors for the criteria of PRPF 2, PRPF 3 and PRPH 2, indicate that single service contracts and bundled service contract both have equal potential risks/disadvantages in delivering FM services in UK shopping centres. In addition, the priority vectors for the criteria of PRCO 1, PRPF 4 and PROR 1 indicate that the bundled service contract has more potential risks/disadvantages in delivering FM services in UK shopping centres.

Table 7.23: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.244	0.325	0.200	0.145	0.086	
Single	0.718	0.523	0.480	0.669	0.634	0.593
Bundled	0.282	0.477	0.520	0.331	0.366	0.407

Table 7.23 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor is riskier in single service contracts rather than bundled service contract in terms of its potential financial risks.
- 2) Cost factor is riskier in single service contracts rather than bundled service contract in terms of its potential cost benefits.
- 3) Performance factor is riskier in bundled service contract rather than single service contracts in terms of its potential performance benefits.

- 4) Organisational factor is riskier in single service contracts rather than bundled service contract in terms of its potential organisational benefits.
- 5) Physical factor is riskier in single service contracts rather than bundled service contract in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.23 represents the result of selection in accordance to this shopping centre manager’s decisions. This result indicates that the value of overall priority matrix in single service contracts is 0.593 (60%) and the value of overall priority matrix in bundled service contract is 0.407 (40%), which are based on their potential risks. The lowest value of overall priority matrix suggests that the bundled service contract is the best option of FM service delivery in UK shopping centres because of low potential risks.

Table 7.23: Result of selection

Rank	Best Selection	
1	Single Service Contracts	0.593
2	Bundled Service Contract	0.407

7.3.4 P.L, General Manager, 5 Years’ Experiences

A) Decision-Making Based on the Potential Benefits/Advantages

1) Overall Priority Ranking

Table 7.24 and Table 7.25 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential benefits/advantages of FM service delivery, the results indicate that this shopping centre manager’s priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.429), financial (0.216), performance (0.156), physical (0.120) and organisational (0.079). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.24: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR										
GOAL										
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.216		0.429				0.156			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PBFI 1	PBFI 2	PBCO 1	PBCO 2	PBCO 3	PBCO 4	PBPF 1	PBPF 2	PBPF 3	PBPF 4
	0.667	0.333	0.134	0.204	0.499	0.163	0.157	0.483	0.078	0.282
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.333	0.200	0.333	0.303	0.667	0.200	0.333	0.500	0.500	0.500
Bundled	0.667	0.800	0.667	0.697	0.333	0.800	0.667	0.500	0.500	0.500
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.25: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR							
GOAL							
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
	0.079				0.120		
CR	0.00				0.00		
CRITERIA (Level 2)	PBOR 1	PBOR 2	PBOR 3	PBOR 4	PBPH 1	PBPH 2	PBPH 3
	0.332	0.058	0.111	0.499	0.093	0.537	0.370
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.125	0.500	0.500	0.125	0.500	0.500	0.167
Bundled	0.875	0.500	0.500	0.875	0.500	0.500	0.833
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager’s priority criteria ranking for:

- 1) Financial is PBFI 1 (0.667) and PBFI 2 (0.333). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PBCO 3 (0.499), PBCO 2 (0.204), PBCO 4 (0.163) and PBCO 1 (0.134). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PBPF 2 (0.483), PBPF 4 (0.282), PBPF 1 (0.157) and PBPF 3 (0.078). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PBOR 4 (0.499), PBOR 1 (0.332), PBOR 3 (0.111) and PBOR 2 (0.058). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PBPH 2 (0.537), PBPH 3 (0.370) and PBPH 1 (0.093). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

2) Selection of the best option of FM services

The results from the priority vectors for the criteria of PBF1 1, PBF1 2, PBCO 1, PBCO 2, PBCO 4, PBPF 1, PBOR 1, PBOR 4 and PBPH 3, indicate that the bundled service contract has more potential benefits in delivering FM services in UK shopping centres than single service contracts. Meanwhile, the priority vectors for the criteria of PBPF 2, PBPF 3, PBPF 4, PBOR 2 and PBOR 3 indicate that single service contracts and bundled service contract both have equal potential benefits in delivering FM services in UK shopping centres.

of FM service delivery in UK shopping centres

In addition, the priority vectors for the criteria of PBCO 3, PBPH 1, and PBPH 2 indicate that single service contracts have more potential benefits in delivering FM services in UK shopping centres.

Table 7.26: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.216	0.429	0.156	0.079	0.120	
Single	0.289	0.472	0.474	0.188	0.377	0.399
Bundled	0.711	0.528	0.526	0.812	0.623	0.601

Table 7.26 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager’s overall priority vector for the alternatives with respect to:

- 1) Financial factor: bundled service contract is more preferable than single service contracts in terms of its potential financial benefits.
- 2) Cost factor: bundled service contract is more preferable than single service contracts in terms of its potential cost benefits.
- 3) Performance factor: bundled service contract is more preferable than single service contracts in terms of its potential performance benefits.

- 4) Organisational factor: bundled service contract is more preferable than single service contracts in terms of its potential organisational benefits.
- 5) Physical factor: bundled service contract is more preferable than single service contracts in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.27 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in bundled service contract is 0.601 (60%) and the value of overall priority matrix in single service contracts is 0.399 (40%), which are based on their potential benefits. The highest value of overall priority matrix suggests that the bundled service contract is the best option of FM service delivery in UK shopping centres because of more potential benefits.

Table 7.27: Result of selection

Rank	Best Selection	
1	Bundled Service Contract	0.601
2	Single Service Contracts	0.399

B) Decision-Making Based on the Potential risks/Disadvantages

1) Overall Priority Ranking

Table 7.28 and Table 7.29 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential risks/disadvantages of FM service delivery, the results indicate that this shopping centre manager's priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.391), financial (0.239), performance (0.170), organisational (0.140), and physical (0.060). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.28: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR										
GOAL										
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.239		0.391				0.170			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PRFI 1	PRFI 2	PRCO 1	PRCO 2	PRCO 3	PRCO 4	PRPF 1	PRPF 2	PRPF 3	PRPF 4
	0.328	0.672	0.152	0.313	0.104	0.432	0.231	0.122	0.181	0.466
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.787	0.667	0.769	0.608	0.500	0.694	0.612	0.500	0.500	0.189
Bundled	0.213	0.333	0.231	0.392	0.500	0.306	0.388	0.500	0.500	0.811
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.29: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR							
GOAL							
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
	0.140				0.060		
CR	0.00				0.00		
CRITERIA (Level 2)	PROR 1	PROR 2	PROR 3	PROR 4	PRPH 1	PRPH 2	PRPH 3
	0.101	0.148	0.444	0.307	0.154	0.309	0.537
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.250	0.750	0.802	0.667	0.602	0.500	0.726
Bundled	0.750	0.250	0.198	0.337	0.398	0.500	0.274
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate that this shopping centre manager's priority criteria ranking for:

- 1) Financial is PRFI 2 (0.672) and PRFI 1 (0.328). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PRCO 4 (0.432), PRCO 2 (0.313), PRCO 1 (0.152) and PRCO 3 (0.104). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PRPF 4 (0.466), PRPF 1 (0.231), PRPF 3 (0.181) and PRPF 2 (0.122). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PROR 3 (0.444), PROR 4 (0.307), PROR 2 (0.148) and PROR 1 (0.101). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PRPH 3 (0.537), PRPH 2 (0.309) and PRPH 1 (0.154). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

2.3 Selection of the best option of FM service contracts

The results from the priority vectors for the criteria of PRFI 1, PRFI 2, PRCO 1, PRCO 2, PRCO 4, PRPF 1, PROR 1, PROR 4 and PRPH 3, indicate that single service contracts have more potential risks/disadvantages in delivering FM services in UK shopping centres than bundled service contract. Meanwhile, the priority vectors for the criteria of PRCO 3, PRPF 2, PRPF 3 and PRPH 2, indicate that single service contracts and bundled service contract both have equal potential risks/disadvantages in delivering FM services in UK shopping centres. In addition, the priority vectors for the criteria of PRPF 4 and PROR 1 indicate that the bundled service contract has more potential risks/disadvantages in delivering FM services in UK shopping centres.

Table 7.30: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.239	0.391	0.170	0.140	0.060	
Single	0.706	0.658	0.381	0.697	0.637	0.627
Bundled	0.294	0.342	0.619	0.303	0.363	0.373

Table 7.30 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor is riskier in single service contracts than bundled service contract in terms of its potential financial risks.
- 2) Cost factor is riskier in single service contracts than bundled service contract in terms of its potential cost benefits.
- 3) Performance factor is riskier in bundled service contract than single service contracts in terms of its potential performance benefits.

- 4) Organisational factor is riskier in single service contracts than bundled service contract in terms of its potential organisational benefits.
- 5) Physical factor is riskier in single service contracts than bundled service contract in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.31 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in single service contracts is 0.627 (63%) and the value of overall priority matrix in bundled service contract is 0.373 (37%), which are based on their potential risks. The lowest value of overall priority matrix suggests that the bundled service contract is the best option of FM service delivery in UK shopping centres because of low potential risks.

Table 7.31: Result of selection

Rank	Best Selection	
1	Single Service Contracts	0.627
2	Bundled Service Contract	0.373

7.3.5 G.B, Centre Manager, 9 Years' Experiences

A) Decision-Making Based on the Potential Benefits/Advantages

1) Overall Priority Ranking

Table 7.32 and Table 7.33 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential benefits/advantages of FM service delivery, the results indicate this shopping centre manager's priority factors in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.361), financial (0.251), organisational (0.215), performance (0.098) and physical (0.076). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.32: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR										
GOAL										
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.251		0.361				0.098			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PBFI 1	PBFI 2	PBCO 1	PBCO 2	PBCO 3	PBCO 4	PBPF 1	PBPF 2	PBPF 3	PBPF 4
	0.783	0.217	0.197	0.398	0.201	0.203	0.214	0.408	0.107	0.271
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.250	0.333	0.245	0.333	0.500	0.245	0.465	0.500	0.500	0.500
Bundled	0.750	0.667	0.755	0.667	0.500	0.755	0.535	0.500	0.500	0.500
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.33: All Priority Vectors for factors, criteria and alternative

PRIORITY VECTOR							
GOAL							
FACTORS (Level 1)	Organisational (OR)				Physical (PH)		
	0.215				0.076		
CR	0.00				0.00		
CRITERIA (Level 2)	PBOR 1	PBOR 2	PBOR 3	PBOR 4	PBPH 1	PBPH 2	PBPH 3
	0.304	0.108	0.160	0.428	0.123	0.384	0.493
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)							
Single	0.165	0.500	0.500	0.167	0.500	0.500	0.143
Bundled	0.835	0.500	0.500	0.833	0.500	0.500	0.857
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PBFI 1 (0.783) and PBFI 2 (0.217). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PBCO 2 (0.398), PBCO 4 (0.203), PBCO 3 (0.201) and PBCO 1 (0.197). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PBPF 2 (0.408), PBPF 4 (0.271), PBPF 1 (0.214) and PBPF 3 (0.107). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PBOR 4 (0.428), PBOR 1 (0.304), PBOR 3 (0.160) and PBOR 2 (0.108). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PBPH 3 (0.493), PBPH 2 (0.384) and PBPH 1 (0.123). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PBF1 1, PBF1 2, PBCO 1, PBCO 2, PBCO 4, PBPF 1, PBOR 1, PBOR 4 and PBPH 3, indicate that the bundled service contract has more potential benefits in delivering FM services in UK shopping centres than single service contracts. Meanwhile, the priority vectors for the criteria of PBCO 3, PBPF 2, PBPF 3, PBPF 4, PBOR 2, PBOR 3, PBPH 1 and PBPH 2, indicate that single service contracts and bundled service contracts both have equal potential benefits in delivering FM services in UK shopping centres.

Table 7.34: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.251	0.361	0.098	0.215	0.076	
Single	0.268	0.332	0.493	0.256	0.324	0.315
Bundled	0.732	0.668	0.507	0.744	0.676	0.685

Table 7.34 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor: bundled service contract is more preferable than single service contracts in terms of its potential financial benefits.
- 2) Cost factor: bundled service contract is more preferable than single service contracts in terms of its potential cost benefits.
- 3) Performance factor: bundled service contract is more preferable than single service contracts in terms of its potential performance benefits.
- 4) Organisational factor: bundled service contract is more preferable than single service contracts in terms of its potential organisational benefits.

- 5) Physical factor: bundled service contract is more preferable than single service contracts in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.35 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in bundled service contract is 0.685 (69%) and the value of overall priority matrix in single service contracts is 0.315 (31%), which are based on their potential benefits. The highest value of overall priority matrix suggests that the bundled service contract is the best option of FM service delivery in UK shopping centres because of more potential benefits.

Table 7.35: Result of selection

Rank	Best Selection	
1	Bundled Service Contract	0.685
2	Single Service Contracts	0.315

B) Decision-Making Based on the Potential risks/Disadvantages

1) Overall Priority Ranking

Table 7.36 and Table 7.37 represent the priority vectors for factors, criteria and alternatives. Those priority vectors are obtained from the synthesis of the pair-wise comparison in Expert Choice 11 software. Based on the potential risks/disadvantages of FM service delivery, the results indicate this shopping centre manager's priority factors ranking in making a decision for the selection of the best options of FM service delivery in UK shopping centres are cost (0.461), financial (0.219), organisational (0.139), performance (0.104), and physical (0.077). The consistency ratio (CR) is $0.00 < 0.10$, this represents a good consistency.

Table 7.36: All Priority Vectors for factors, criteria and alternative

	PRIORITY VECTOR									
	GOAL									
FACTORS (Level 1)	Financial (FI)		Cost (CO)				Performance (PF)			
	0.219		0.461				0.104			
CR	0.00		0.00				0.00			
CRITERIA (Level 2)	PRFI 1	PRFI 2	PRCO 1	PRCO 2	PRCO 3	PRCO 4	PRPF 1	PRPF 2	PRPF 3	PRPF 4
	0.328	0.672	0.152	0.313	0.104	0.432	0.231	0.122	0.181	0.466
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternatives (Level 3)										
Single	0.787	0.667	0.663	0.608	0.500	0.750	0.612	0.500	0.500	0.245
Bundled	0.213	0.333	0.333	0.392	0.500	0.250	0.388	0.500	0.500	0.755
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. CR= Consistency Ratio

Table 7.37: All Priority Vectors for factors, criteria and alternative

	PRIORITY VECTOR							
	GOAL							
FACTORS (Level 1)	Organisational (OR)				Physical (PH)			
	0.139				0.077			
CR								
CRITERIA (Level 2)	PROR 1	PROR 2	PROR 3	PROR 4	PRPH 1	PRPH 2	PRPH 3	
	0.101	0.148	0.444	0.307	0.154	0.309	0.537	
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Alternatives (Level 3)								
Single	0.250	0.750	0.802	0.667	0.602	0.500	0.726	
Bundled	0.750	0.250	0.198	0.333	0.398	0.500	0.274	
CR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note. CR= Consistency Ratio

The results also indicate this shopping centre manager's priority criteria ranking for:

- 1) Financial is PRFI 2 (0.672) and PRFI 1 (0.328). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 2) Cost is PRCO 4 (0.432), PRCO 2 (0.313), PRCO 1 (0.152) and PRCO 3 (0.104). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 3) Performance is PRPF 4 (0.466), PRPF 2 (0.231), PRPF 3 (0.181) and PRPF 1 (0.122). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

- 4) Organisational is PROR 3 (0.444), PROR 4 (0.307), PROR 2 (0.148) and PROR 1 (0.101). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.
- 5) Physical is PRPH 3 (0.537), PRPH 2 (0.309) and PRPH 1 (0.154). As the value of CR is $0.00 < 0.10$, this consistency judgement is acceptable.

The results from the priority vectors for the criteria of PRFI 1, PRFI 2, PRCO 1, PRCO 2, PRCO 4, PRPF 1, PROR 2, PROR 3, PROR 4, PRPH 1 and PRPH 3, indicate that single service contracts have more potential risks/disadvantages in delivering FM services in UK shopping centres rather than bundled service contract. Meanwhile, the priority vectors for the criteria of PRCO 3, PRPF 2, PRPF 3 and PRPH 2, indicate that single service contracts and bundled service contract both have equal potential risks/disadvantages in delivering FM services in UK shopping centres.

In addition, the priority vectors for the criteria of PRPF 4 and PROR 1 indicate that the bundled service contract has more potential risks/disadvantages in delivering FM services in UK shopping centres.

Table 7.38: Overall priority vector for the alternatives with respect to the factors

	Priority Vector					Overall Priority
	FI	CO	PF	OR	PH	
	0.219	0.461	0.104	0.139	0.077	
Single	0.706	0.667	0.407	0.697	0.637	0.650
Bundled	0.294	0.333	0.593	0.303	0.363	0.350

Table 7.38 represents the overall priority vector for the alternatives with respect to the factors. The results indicate this shopping centre manager's overall priority vector for the alternatives with respect to:

- 1) Financial factor is riskier in single service contracts rather than bundled service contract in terms of its potential financial risks.
- 2) Cost factor is riskier in single service contracts rather than bundled service contract in terms of its potential cost benefits.

- 3) Performance factor is riskier in bundled service contract rather than single service contracts in terms of its potential performance benefits.
- 4) Organisational factor is riskier in single service contracts rather than bundled service contract in terms of its potential organisational benefits.
- 5) Physical factor is riskier in single service contracts rather than bundled service contract in terms of its potential physical benefits.

2) Selection of the best option of FM service delivery

Table 7.39 represents the result of selection in accordance to this shopping centre manager's decisions. This result indicates that the value of overall priority matrix in single service contracts is 0.650 (65%) and the value of overall priority matrix in bundled service contract is 0.350 (35%), which are based on their potential risks. The lowest value of overall priority matrix suggests that the bundled service contract is the best option of FM service delivery in UK shopping centres because of low potential risks.

Table 7.39: Result of selection

Rank	Best Selection	
1	Single Service Contracts	0.650
2	Bundled Service Contract	0.350

7.5 Summary of the results in comparison with all shopping centres managers' decisions

Table 7.40 and Figure 7 represent the summary of the results by comparison with all shopping centres managers' priority factors in their decision to select the best options of FM service delivery in UK shopping centres, which is based on the potential benefits/advantages of FM service delivery. This summary of results indicates that the cost factor has top ranking in making the decision on the best options of FM service delivery. It is followed by financial factor - second ranking, organisational factor - third ranking, performance factor ranked fourth and finally physical factor ranked fifth. The majority of shopping centre managers have ranked cost, financial and physical factors equal and have a different ranking for organisational and performance factors.

Table 7.40: Summary of the results which based on the potential benefits/advantages of FM service delivery

Priority Ranking	Shopping Centres Managers				
	G.C	T.W	M.N	P.L	G.B
1	Cost	Cost	Cost	Cost	Cost
2	Financial	Financial	Financial	Financial	Financial
3	Organisational	Physical	Organisational	Performance	Organisational
4	Performance	Performance	Performance	Physical	Performance
5	Physical	Organisational	Physical	Organisational	Physical

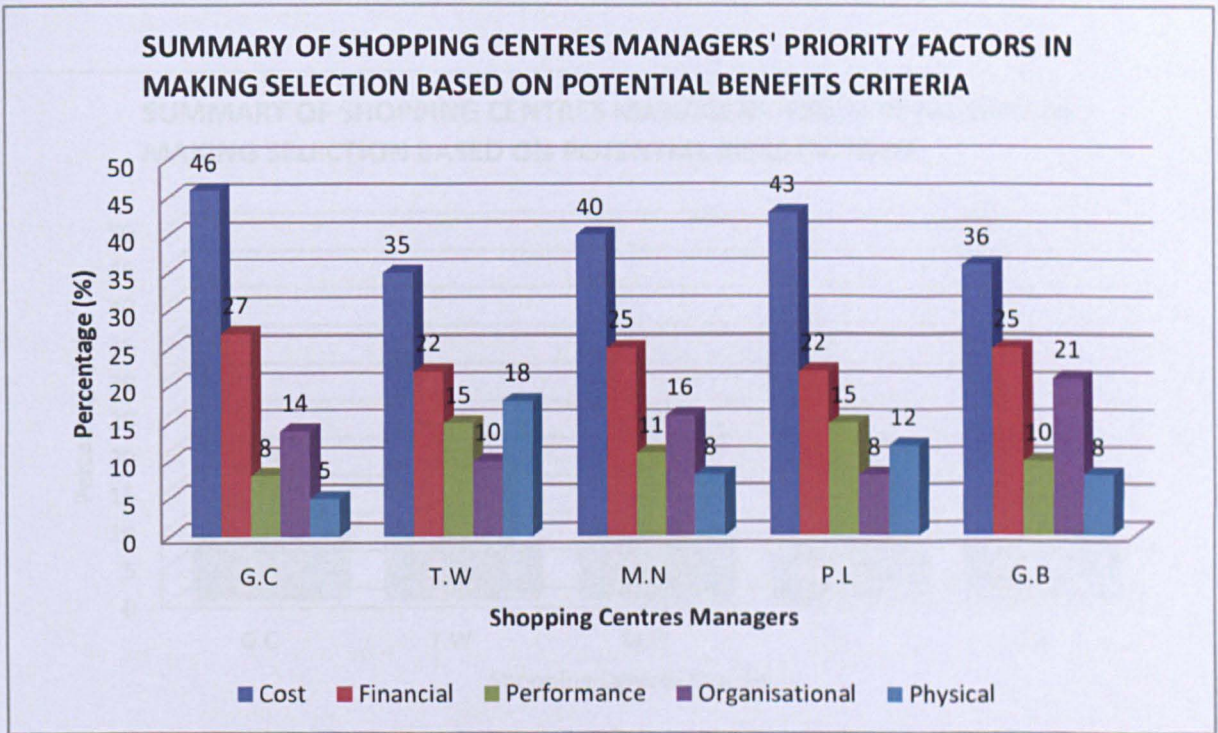


Figure 7: Summary of shopping centres managers' priority factors in accordance to the potential benefits/advantages of FM service delivery

Table 7.41 and Figure 7.1 represent the summary of the results by comparison with all shopping centres managers' priority factors in their decision to select the best options of FM service delivery in UK shopping centres, which is based on the potential risks/advantages of FM service delivery. This summary of results indicates that cost factor has the top ranking in making the decision on the best options of FM service delivery. It is followed by financial factor - second ranking, performance factor - third ranking, organisational factor - fourth ranking, and finally physical factor ranked fifth. The majority of shopping centres managers have given cost, financial and physical factors the same ranking and have a different ranking for organisational and performance factors.

Table 7.41: Summary of the results which based on the potential risks/disadvantages of FM service delivery

Priority Ranking	Shopping Centres Managers				
	G.C	T.W	M.N	P.L	G.B
1	Cost	Cost	Cost	Cost	Cost
2	Financial	Financial	Financial	Financial	Financial
3	Organisational	Performance	Performance	Performance	Organisational
4	Performance	Organisational	Organisational	Organisational	Performance
5	Physical	Physical	Physical	Physical	Physical

7.4.1 Evaluation Results

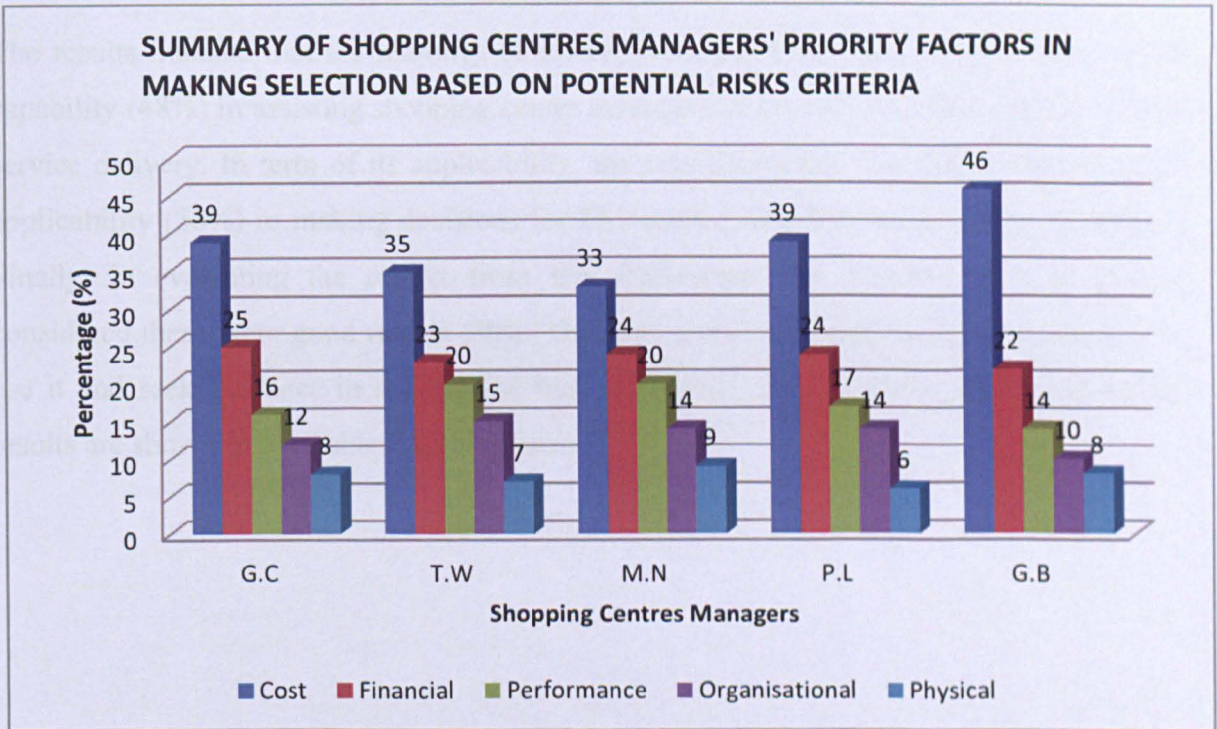


Figure 7.1: Summary of shopping centres managers' priority factors in accordance to the potential risks/disadvantages of FM service delivery

7.6 Shopping Centres Managers' Evaluation of FMOSS Decision-making Framework

After the implementation of FMOSS decision-framework towards five (5) selected shopping centre managers, evaluation was carried out on FMOSS decision-making framework in order to validate its capability, applicability and the validity of the results.

7.6.1 Evaluation Results

The results indicate that the majority of interviewees perceived that FMOSS has a good capability (48%) in assisting shopping centre managers in selecting the best options of FM service delivery. In term of its applicability, the result indicates that FMOSS has a good applicability (56%) in making decisions for FM service delivery in UK shopping centres. Finally, in evaluating the results from this framework, the majority of interviewees considered these were good results (80%) that they were convinced and had confidence to use it and seek guidance in making the best selection. The summary of the evaluation results are shown in the Table 7.42 as follow;

Table 7.42: Interviewees' Evaluation towards FMOSS Decision-making Framework

FMOSS Evaluation Questions		Rating				
		1 (Poor)	2 (Fair)	3 (Satisfactory)	4 (Good)	5 (Excellent)
(Overall Rating) The Capability of the Framework				40%	48%	12%
1	How well was the selection technique process in the framework?			2 (40%)	3 (60%)	
2	How reliable was the assessment criteria employed in the framework?			4 (80%)	1 (20%)	
3	How helpful was the framework in supporting the decision process?			1 (20%)	3 (60%)	1 (20%)
4	How well did the framework reflect the decision-making process in a real situation?			3 (60%)	2 (40%)	
5	How useful was the Expert Choice software is employed in the framework?				3 (60%)	2 (40%)
(Overall Rating) The Applicability of the Framework				32%	56%	12%
6	How relevant was the framework in the selection of the best options for FM service delivery?			2 (40%)	3 (60%)	
7	How appropriate was the assessment criteria used in the selection process?			4 (80%)	1 (20%)	
8	How appropriate was the framework as an alternative decision making for a supporting system?				3 (60%)	2 (40%)
9	How relevant was the framework in improving the existing decision-making process?				4 (80%)	1 (20%)
10	How relevant was the framework in terms of speed, flexibility and consistency in the decision-making process?			2 (40%)	3 (60%)	
(Overall Rating) The Validity of the Results				20%	80%	
11	How convinced were you with the results produce by this framework?			1 (20%)	4 (80%)	
12	How confident are you in using the result as a selection making process in a real situation?			1 (20%)	4 (80%)	

7.7 Summary

In conclusion, the results from the analytical hierarchy process analysis indicate that bundled service contract is the best option of FM service delivery in UK shopping centres. This is because bundled service contracts have resulted in more potential benefits and less potential risks when compared to single service contracts. Moreover, the factors that influenced the decision-making are favourable on cost and finance. All interviewees have consistently chosen the cost and financial factors to be priorities when making selection towards the best options of FM service delivery in UK shopping centres. The results from this analytical hierarchy process have shown to be of significant importance to the research undertaken. Moreover, these results have provided the key findings toward the overall aim and objectives of the research as well as the applicability of the decision-making framework.

CHAPTER 8: RESEARCH FINDINGS AND DISCUSSION

8.1 Introduction

This chapter provides a discussion on research findings in relation to the existing knowledge. It reflects and highlights this research, its difference from previous research, and extends current knowledge of the area in which the research was carried out. All the findings discussed in this chapter are based from the results in Chapter 5 as well as the implementation results of the decision-making framework in Chapter 7.

8.2 Research Findings

This research came to several findings. These research findings are listed and will be discussed as follows:

- 1) FM services in UK shopping centres, the importance of its role and awareness, including the perceptions of shopping centres' managers.
- 2) Identification of the types of facilities management services that have been practiced in UK shopping centres.
- 3) Identifying centre management perceptions towards the potential benefits and potential risks of FM service delivery in UK shopping centres.
- 4) Identifying the significant different between the sizes of shopping centres and the potential benefits and potential risks of FM service delivery in UK shopping centres.
- 5) Management decision-making, its roles, decision supporting tools and application of any decision framework in selecting the best options in UK shopping centres.
- 6) Identifying the current options of FM service delivery in UK shopping centres.
- 7) Identifying the best options of FM service delivery in UK shopping centres.

8.2.1 FM services in UK shopping centres, the importance of its role and awareness, including the perceptions of shopping centres' managers

According to Tay and Ooi (2001), facilities management is a relatively young industry; however, since the late 1980s, it has gradually increased in momentum as a credible discipline within the property and construction industry. Even though much has been written on meeting these sector-based demands, one area that has received relatively little attention is the retail sector (Willis, 2003). This is because the role of the facilities management initially was not completely understood within the shopping centre industry. Therefore, the perceptions and expectations of many investors and retailers were not cascaded fully into FM provider market (Cant, 2005).

However, the research finding from this survey has shown that shopping centre industry is now more aware of the existence of FM provider market in retail sectors and more attention is given towards its potential benefits. This is because the British Council of Shopping Centres (BCSC) has played an important role in disseminating information with regards to FM services in the retail sector through its conferences, seminars and workshops which are actively conducted every year.

In addition, the research finding from the survey indicates that the role of facilities management is now completely understood within the shopping centres industry. This is because the majority of shopping centres' managers agreed that facilities management has an important role in providing better quality and cost anticipated services as well as adding value to the management of shopping centres. This finding also has shown that there is a change in perceptions and expectations of shopping centre industry towards FM provider market in retail sectors. This is because the survey findings indicate that more than half of shopping centres in UK are already engaged with the FM service providers' market.

Although, facilities management is still an industry in its infancy to shopping centres, it is encouraging to know that there is a demand for facilities management in the retail market. Understanding the demand from the shopping centres' industry is crucial to FM service providers in order to deliver quality, innovative, cost effective and best value services.

8.2.2 Identifying the types of facilities management services that have been practiced in UK shopping centres

In practice, facilities management can cover a wide range of services, including real estate management, financial management, change management, human resource management, health and safety and contract management, in addition to building maintenance, utilities suppliers and domestic services, that is cleaning and security (Atkin and Brooks, 2005). Barret (1995) pointed out that facilities management can be implemented either at the management level or operational level. The split between 'management' and 'operational' in an FM context is reflected in the way 'suppliers' approach FM. In shopping centres, facilities management services are seen as non-core services that include mechanical and electrical engineering, cleaning, waste management, security, landscape, energy management and etc. (Cant, 2005). Outsourcing of non-core activities to third parties has become a popular trend with many organisations, both from the public and the private sector. However, the reasons to outsource may vary (Johnson, 1997).

The findings from the research survey were confirmed with the existing knowledge of the studies, which found agreement by the majority of the shopping centre managers that the types of facilities management services that have been practiced in UK shopping centres include eleven (11) services. These are mechanical and engineering services; building and ground maintenance; cleaning and housekeeping services; energy and environmental management; health and safety management; information technology services; waste management; car park management; customer services; security services; and landscaping services. Those services are non-core services in nature and were implemented at the operational level of shopping centre by shopping centres' management. Even though facilities management services are non-core services in shopping centres, if managed correctly, they should play a strategic importance to add value to the shopping centres' core business delivery.

The survey findings also indicated how critical the FM services are to the overall business operation in UK shopping centres, however, the majority of shopping centres' managers have classified that the very critical FM services include security services, health and safety management, mechanical and electrical engineering services, waste management, energy and environmental management and building and ground maintenance.

Moderately critical FM services include information technology services, customer service, and cleaning and housekeeping services. Finally, the less critical FM services include landscaping services and car park management. These findings have shown that management of shopping centres were aware of the important of facilities management services that need to be managed properly in their shopping centres. This is because some of these services have high legislative demands and other services were affecting the quality of shopping centre environment, security and also operational costs.

According to the findings from the research survey, the provision of those FM services in UK shopping centres are currently being practiced either in-house, by outsourcing or both. However, the majority of shopping centres' managers indicate that outsourcing is the best provision that is currently being practiced in UK shopping centres. The findings also indicate that cost saving, reduction and control operating costs, resources not available internally, specialist knowledge required and access to the best practice are amongst the top five (5) reasons for why they decided to outsource their facilities management services.

8.2.3 Identifying centre management perceptions towards the potential benefits and potential risks of FM service delivery in UK shopping centres

According to Kamarazaly (2007), the decision to outsource and choosing the right options can be made subjectively or objectively by an organisation. This is because different organisations have different needs on their outsourcing. However, the decision to outsource basically leads to both advantages/benefits and disadvantages/risks. Underpinning this notion, the survey was carried out to identify centre management perceptions towards the potential benefits and potential risks of FM service delivery in UK shopping centres. Overall, 17 potential benefits and 17 potential risks have been identified from a variety of literature (see Chapter 6).

The findings are shown in Table 8 and Table 8.1, and indicate that the bundled service contract has higher potential benefits with low potential risks if compared with single service contracts. Both potential benefits and potential risks have shown a significant difference between these two outsourcing options of FM service delivery that have been practiced in UK shopping centres. Multivariate test in MANOVA has confirmed significant differences.

Table 8.1: Centre Management perceptions towards the potential benefits of FM service delivery in UK shopping centres

Table 8: Centre Management perceptions towards the potential benefits of FM service delivery in UK shopping centres

Potential Benefits	Shopping Centres Managers' Perceptions	
	Single Service Contracts	Bundled Service Contract
Save money on non-core activities	Moderate	High
Opportunity to reduce investment in assets	Low	Low
Enable to obtain cheaper services	Moderate	High
Enable operational cost to be reduced	Moderate	High
Enable to provide cost effective services	Moderate	Moderate
Enable to control service charges	Moderate	High
Improve operating performance	Moderate	High
Enable to obtain expertise, skills and technologies	High	High
Enable to improve service quality	Moderate	High
Increase customer satisfaction	Moderate	High
Free up management time to focus on core activities	Low	High
Enhance management effectiveness	Low	High
Improve management capability	Low	High
Reduce management burden	Low	High
Improve centre physical image	Low	Moderate
Improve the quality of shopping environment	Moderate	High
Enable to match support services activity with footfall	Moderate	High

Table 8.1: Centre Management perceptions towards the potential risks of FM service delivery in UK shopping centres

Potential Risks	Shopping Centres Managers' Perceptions	
	Single Service Contracts	Bundled Service Contract
Unable to save money on non-core activities	Moderate	Low
Opportunity to increase investment in assets	High	High
Difficult to obtain cheaper services	Low	Low
Unable to reduce operational cost	Low	Low
Unable to provide cost effective services	Very Low	Low
Unable to control service charges	Moderate	Low
Unable to improve operating performance	Moderate	Low
Difficult to obtain expertise, skills and technologies	Low	Very Low
Unable to improve service quality	Moderate	Low
Increase of risks of service interruption	Low	High
Loss of management control on non-core activities	Low	High
Loss of management focus on core activities	High	Low
Complex and time consuming to manage	Very High	Low
Increase management burden	High	Low
Less efforts by supplier to improve centre physical image	Low	Moderate
Difficult to improve the quality of shopping environment	Low	Low
Less effort by suppliers to match buyer's requirements	Moderate	Low

In addition, both potential benefits and potential risks have been employed in the development of a decision-making framework for determining the best options of FM service delivery. These findings are also important to assist the shopping centres' managers in making selection of the best options of FM service delivery in their shopping centre before the tendering process takes place. This will enable shopping centres' managers to realise the potential benefits that they are looking for and anticipate potential risks.

8.2.4 Identifying the significant different between the sizes of shopping centres and the potential benefits and potential risks of FM service delivery in UK shopping centres.

According to the Pan-European Centre Standard (2005) shopping centre are in categorisation as a traditional centre is an all-purpose scheme that could be either enclosed or open-air and is classified by size, i.e. very large, large, medium and small. There are two types of small traditional centres: comparison-based and convenience-based. Comparison-based centres include retailers typically selling fashion apparel and shoes, home furnishings, electronics, general merchandise, toys, luxury goods, gifts and other discretionary goods. Musa and Pitt (2009) conclude that the management and operation of shopping centres may vary from one shopping centre to another. This is because of differences in the structure of the organisation, size of the centre, management strategy and facilities provided.

The findings are shown in Table 8.2 and Table 8.3, and indicate that there is a significant different in the perception of two different sizes of shopping centres towards the potential benefits and potential risks of the FM service delivery. The larger sizes of shopping centres have perceived higher potential benefits with low potential risks if compared with Medium sizes of shopping centres. Both potential benefits and potential risks have shown a significant different between these two sizes of shopping centres. Multivariate test in MANOVA has confirmed significant differences.

Table 8.2: Centre Management perceptions in accordance with the sizes of shopping centres towards the potential benefits of FM service delivery in UK shopping centres

Potential Benefits	Shopping Centres Managers Perceptions	
	Medium Sizes	Larger Sizes
Save money on non-core activities	Moderate	High
Opportunity to reduce investment in asset	Low	Low
Enable to obtain cheaper services	Moderate	High
Enable operational cost to be reduced	Moderate	High
Enable to provide cost effective services	Moderate	Moderate
Enable to control service charges	Moderate	High
Improve operating performance	Moderate	High
Enable to obtain expertise, skills and technologies	High	High
Enable to improve service quality	Moderate	High
Increase customer satisfaction	Moderate	High
Free up management time to focus on core activities	Low	High
Enhance management effectiveness	Low	High
Improve management capability	Low	High
Reduce management burden	Low	High
Improve centre physical image	Low	Moderate
Improve the quality of shopping environment	Moderate	High
Enable to match support services activity with footfall	Moderate	High

Table 8.3: Centre Management perceptions in accordance with the sizes of shopping centres towards the potential benefits of FM service delivery in UK shopping centres

Potential Risks	Shopping Centres Managers Perceptions	
	Medium Sizes	Larger Sizes
Unable to save money on non-core activities	Moderate	Low
Opportunity to increase investment in asset	High	High
Difficult to obtain cheaper services	Low	Very Low
Unable to reduce operational cost	Low	Low
Unable to provide cost effective services	Low	Low
Unable to control service charges	Moderate	Low
Unable to improve operating performance	Moderate	Low
Difficult to obtain expertise, skills and technologies	Low	Very Low
Unable to improve service quality	Moderate	Low
Increase of risks of service interruption	Low	Moderate
Lost of management control on non-core activities	Low	Moderate
Lost of management focus on core activities	High	Low
Complex and time consuming to manage	Very High	Low
Increase management burden	High	Low
Less efforts by supplier to improve centre physical image	Low	Moderate
Difficult to improve the quality of shopping environment	Low	Very Low
Less effort by suppliers to match buyer's requirements	Moderate	Low

8.2.5 Management decision-making, its role, decision supporting tools and application of any decision framework in selecting the best options of FM service delivery in UK shopping centres.

According to Musa and Pitt (2009a), shopping centres' management teams have the important role in managing the shopping centres. This role includes a thorough development of decision-making, managerial creativity, and the art of management. Muhlebach and Alexander (2005) identified the management plan and the operations manual as meaningful decision-making tools for the individuals or entity that owns the shopping centre and for the shopping centre manager who runs it. The management plan provides an organised collection of information about shopping centre that guides decisions about day-to-day operations and prepares the shopping centre manager to meet the challenges of a changing business environment. Meanwhile, the operations manual should provide a ready reference to answer most of the operating and management questions that arise on daily basis.

The findings from the survey have shown that the role of shopping centres' managers as decision-makers for outsourcing FM services in UK shopping centres is limited to the role of advisor to the decision-maker. However, about 18% of shopping centres' managers identified their role as one of several decision-makers. The final decision-maker was identified as the owner of the shopping centres. Although, the roles of shopping centres' managers were not identified as the final decision-maker, they still make an important contribution or reliable input into the decision, as they are managing and operating the shopping centres day by day basis.

The findings also identified that the basis of centre management decision-making supporting tools include:

- Management plan and operations plan
- Solution wanting
- Requirement setting
- Past experiences
- Scientific methods and analysis

However, not all shopping centres have employed those similar decision-making supporting tools in their decision-making. The findings show that there is a significant relationship between the types of shopping centres and using those decision-making tools as a basis. Chi-Square Test of Association has confirmed this significant relationship. These findings indicate that larger sized shopping centres have used the management plan and operations plan, requirement setting, past experiences and scientific methods as a basis of their decision-making supporting tools. Meanwhile, medium sized shopping centres have used solution wanting, requirement setting and past experiences as a basis of their decision-making supporting tools.

Aside from the management's decision supporting tools, this research also attempted to find if management of shopping centres have applied any specific decision-making framework for FM service delivery in their shopping centres. Overall, the findings have shown that the majority of UK shopping centres did not apply any specific decision-making framework for FM service delivery.

Although there was a small percentage of UK shopping centres identified in applying the specific decision-making framework for FM service delivery, there is still no evidence documented and a clear specific decision-making framework have been practiced in UK shopping centres. Therefore, the finding have shown there is a need for alternative decision-making framework and this has given a potential prospect to develop an alternative decision-making framework to assist shopping centres' managers in determining the best options of FM service delivery in UK shopping centres.

8.2.6 Identifying the current options of FM service delivery in UK shopping centres.

Payne (2000) proposed that the portfolio of services and the range of options relating to the various combinations of service delivery have sparked discussion and debate over the merits of certain modes of service delivery. Williams (2003) identified that there is a number of FM service delivery models ranging from in-house provision to total outsourcing, operating in the UK market. However, most shopping centres have continually been outsourcing their facilities services either through single service contracts or the bundled service contract. Mines (1999) perceived that people have outsourced facilities management services for a long time, but the bundling of overall facility operations to a single source is relatively new to the shopping centre industry.

The findings from the survey confirmed that shopping centres in the UK have currently practice both options: single service contracts and bundled service contract of FM service delivery. This includes 69% of UK shopping centres which currently practice single service contracts rather than 31% of UK shopping centres which currently practice bundled service contracts.

The findings have shown that the majority of UK shopping centres that currently practice single service contracts are medium sized shopping centres rather than larger sized shopping centres. However, Chi-Square Test of Association confirmed that there is no significant relationship between size of shopping centres and practicing FM service delivery options. This means that size of shopping centres has nothing to do with the decision on the outsourcing options. It is up to the management decision to strategise and manage their FM services within the centre.

8.2.7 Selecting the best options of FM service delivery in UK shopping centres

Ferris (2011), Director, Head of Shopping Centre Management, Colliers International stated that it is the 'age old' dilemma that Shopping Centre Managers and Managing Agents face every time they tender FM services in their Shopping Centres on whether to go for expertise of the specialist in the field, or to save money by putting all under one provider. According to the statement above, this always been the dilemma and there is a need for a framework to assist the shopping centre managers in selecting the best options of FM service delivery. However, lack of studies in this particular area makes this a continuous discussion because FM is still at its infancy to the shopping centres' industry and has been given little attention.

This research has developed a decision-making framework for selecting the best options of FM service delivery based on Analytical Hierarchy Process methodology. This framework has been implemented through structured interviews to five selected interviewees. The findings from this framework have shown that all interviewees have selected bundled service contract as the best options of FM service delivery in UK shopping centres. These selections were based on the potential benefits and the potential risks of FM service delivery.

The findings have also shown that the majority of interviewees made their choices based on cost factor and financial factor in their decision making process. Both factors are recognised as the most influence factors in their decision-making. The overall priority factors ranking in making a decision for the selection of the best options of FM service delivery in accordance to its potential benefits are cost, financial, organisational, performance and physical. Meanwhile, the overall priority factors ranking in making a decision for the selection of the best options of FM service delivery in accordance to its potential risks are cost, financial, performance, organisational and physical.

Although, cost factor has been identified as a key factor in selecting the best options of FM service delivery, but adding the other four factors into their decision-making process definitely makes the assessment process more rigorous.

8.3 Summary

In conclusion, this research has found six (6) main findings that will contribute to the knowledge in the area of facilities management services in UK shopping centres. Those findings also provide updated information with regards to shopping centres and the current options of FM services that have been practiced in UK shopping centres. Finally, one of the significant findings is the need to develop the decision-making framework for assisting the shopping centres' managers in selecting the best options of FM service delivery.

CHAPTER 9: CONCLUSION AND RECOMMENDATION

9.1 Introduction

This chapter provides the conclusion of the research undertaken and recommendations for further studies. It also provides verification of the research hypothesis and answers to the key research questions as well as an evaluation of the research aims and objectives. In addition, this chapter also includes the summary of research findings, research contribution and research limitation.

9.2 Summary of Research Findings

The British Council of Shopping Centres (BCSC) has played an important role in introducing facilities management to the retail market. Today, the shopping centres' industry is more aware of the existence of FM service providers in retail sectors and more attention has been given towards its potential benefits. The important role of facilities management in supporting the core business of shopping centres is now completely understood within the shopping centres' industry. In addition, many shopping centres' managers perceived that facilities management has an important role in providing better quality and cost anticipated services as well as adding value to the management of shopping centres. Surprisingly, more than half of UK shopping centres are now already engaged with the FM service provider market.

In practice, facilities management can cover a wide range of services, but within the shopping centres' industry, facilities management services are seen as non-core services to the business operations of shopping centres. This is because FM services in UK shopping centres have been implemented at the operational level rather than at strategic management level. Eleven (11) types of facilities management services have been practiced in UK shopping centres. These are mechanical and engineering services; building and ground maintenance; cleaning and housekeeping services; energy and environmental management; health and safety management; information technology services; waste management; car park management; customer services; security services; and landscaping services.

The level of criticality of those FM services to overall business operation in UK shopping centres' varies. Six (6) out of eleven (11) FM services are identified as very critical to the overall business operation in UK shopping centres. These are: security services, health and safety management, mechanical and electrical engineering services, waste management, energy and environmental management and building and ground maintenance. On the other hand, information technology services, customer service and cleaning and housekeeping services are termed moderately critical to overall business operation in UK shopping centres. In the meantime, landscaping services and car park management are considered less critical to overall business operation in UK shopping centres.

The provision of FM services in UK shopping centres varies from one shopping centre to another as they practice either in-house, outsourcing or both provisions. However, the majority of UK shopping centres are now practicing outsourcing of their FM services in order to gain cost-saving benefits. Other reasons that they are outsourcing their FM services include: reduced and control operating costs, resources not available internally, specialist knowledge required and access to the best practice.

The decision to outsource and choosing the right options basically leads to both advantages/benefits and disadvantages/risks. There are 17 potential benefits and 17 potential risks that have been identified from previous studies and shopping centres' managers have rated those potential benefits and potential risks in accordance to their perceptions. Multivariate Test has confirmed that there are significant differences between the two options in accordance to the shopping centre managers' perceptions.

Meanwhile, the role of shopping centres' managers as decision-maker for outsourcing FM services was limited to the role of advisor to the decision-maker. However, only a few of shopping centres' managers identified their role as one of several decision-makers. The basis of their decision-making supporting tools varies from one shopping centre to another. This is because larger sized shopping centres have used the management plan and operations plan, requirement setting, past experiences and scientific methods as a basis of their decision-making supporting tools. On the other hand, medium sized shopping centres have used solution wanting, requirement setting and past experiences as a basis of their decision-making supporting tools.

Those decision-making tools are important to assist shopping centre managers' decision-making process to determine the best option of FM service delivery. Moreover, there are a number of FM service delivery models ranging from in-house provision to total outsourcing, operating in the UK market. However, outsourcing FM services to single service contracts and the bundled service contract are currently being practiced in UK shopping centres.

In selecting the best options of FM service delivery, the majority of UK shopping centres did not have or apply any specific decision-making framework. Therefore, there is a need to develop a decision-making framework that can be of benefit to the shopping centres' industry. The implementation of Facilities Management Outsourcing Selection System to five selected interviewees has shown that the bundled service contract is the best option of FM service delivery in UK shopping centres. Their ranking priority factor in making such selection towards the potential benefits of FM service delivery is based on cost, financial, organisational, performance and physical. Meanwhile, their ranking priority factor in making such selection towards the potential risks of FM service delivery is based on cost, financial, performance, organisational and physical.

9.3 Verification and Answering the Key Research Questions

The issues discussed and aspects raised and investigated in this research allowed the researcher to test the research hypothesis and answer the key research questions. The research was undertaken through four phases of research design, the hypothesis was verified and the research questions answered. The summary of the outcomes can be presented as follows:

“Which option is the best facilities management (FM) service delivery in UK shopping centres?”

Outcome: The results from the implementation of FMOSS decision-making framework indicate that the bundled service contract has been selected as the best option of FM service delivery in UK shopping centres. This significant result has shown in chapter 7 based on pair-wise comparisons by five (5) selected shopping centres managers.

According to the shopping centres' managers, bundled service contract has the potential to deliver more benefits and low risks when compare with single service contracts. The summaries of the results in chapter 7 have shown that cost factor and financial factor are the keys factors that influenced their decision-making in selecting the best options of FM service delivery. This has justified the answer to the main research question.

In summary, the following research questions were answered, as follows:

Q1. What is the current option of FM service delivery in UK shopping centres?

Answer: This is to identify the current options of FM service delivery that have been practiced in UK shopping centres as there are a number of FM service delivery models ranging from in-house provision to total outsourcing, operating in the UK market. This research has identified that outsourcing to single service contract and the bundled service contract are currently being practiced in UK shopping centres. The result presented in chapter 5 under the Table 5.8 has confirmed the current options of FM service delivery that have been practiced. This finding provides important information to use in the development of the decision-making framework for the selection of the best options.

Q2. What are the management's perceptions towards the potential benefits and potential risks of FM service delivery in UK shopping centres?

Answer: This is to identify the management's perceptions towards 17 potential benefits and 17 potential risks that have been identified and selected from the literature and previous studies in outsourcing. To eliminate the bias in perceptions, Likert scale and rating 1 to 5 were used in a questionnaire survey to identify the shopping centres' managers' perceptions. Multivariate test was used to identify the significant differences in shopping centres' managers' perceptions between those potential benefits and risks towards the options of FM service delivery. This test measured the internal validity of the data. The result of the management perceptions towards the potential benefits and risks were shown in Chapter 5 under sub-headings 5.7 and Chapter 8 under sub-heading 8.2.3. This finding provides the validity of those potential benefits and potential risks as assessment criteria in the development of the decision-making framework for the selection of the best options.

Q3. Are they having significant differences in size of shopping centres towards the potential benefits and potential risks of FM service delivery?

Answer: This is to identify whether the medium sized and the larger sized of shopping centres have a significant different perceptions towards the potential benefits and potential risks of FM service delivery in shopping centres. Multivariate test was used to identify these significant differences. Overall results have shown significant differences in sizes of shopping centres towards the potential benefits and potential risks of FM service delivery in shopping centres. The results summary of MANOVA tests for the sizes of shopping centres towards the potential benefits and potential risks of FM service delivery is shown in Appendix 5.3 and Appendix 5.4.

Q4. What are the existing management decision-making tools in determining the best options of FM service delivery in UK shopping centres?

Answer: This is also to identify the existing management decision-making tools that have been practiced in determining the best options of FM service delivery in UK shopping centres. Those decision-making tools include management plan and operations plan, solution wanting, requirements setting, past experiences and scientific methods and analysis. Shopping centres' managers have used these decision-making tools as a basis in supporting their decision-making for determining the best options of FM service delivery. However, a significant relationship has been identified between sizes of shopping centres and using the decision-making tools in supporting their decision-making. This is because different sized shopping centres have different way of making decisions as well as using the decision-making tools in supporting their decision. These results have shown in chapter 5 under sub-heading 5.6.3.

However, the majority of UK shopping centres have identified that they did not have or apply any specific decision-making framework in determining the best options of FM service delivery. The result from chapter 5 under sub-heading 5.6.2 confirmed with the identification above. Therefore, there is a need to develop a decision-making framework that can assist the shopping centres' managers in determining the best options of FM service delivery in UK shopping centres.

Q5. What is an alternative decision-making model that can be employed in developing the framework for the selection of the best options of FM service delivery in UK shopping centres?

Answer: This is to introduce Analytical Hierarchy Process (AHP) as an alternative decision-making model that provides a basis of methodological framework for the selection of the best options of FM service delivery in UK shopping centres (refer chapter 2 under sub-headings 2.7 and chapter 6 under sub-headings 6.2.3). The AHP method was selected for the development of the framework due to a number of reasons, which include:

1. Its capability to compare both quantitative and qualitative criteria by using informed judgement to derive weights and priorities.
2. Its pair-wise comparison scale makes it easy to create a pair-wise comparison matrix for each relevant element of problem
3. It has the capability to measure inconsistency in subjective judgements by calculating the consistency ratio for each judgement.
4. Results from previous studies by several researchers recommend AHP as a better decision-making method than most (refer chapter 2 under-sub-headings 2.7.5).

Expert Choice System is used as a development tool to assist in developing this decision-making framework. Expert Choice System is employed to assist in structuring the hierarchy and in synthesising judgements and make it quick and simple by eliminating tedious calculations (refer chapter 6 under sub-headings 6.2.4).

Q6. What are the important factors that influenced the selection of the best options of FM service delivery in UK shopping centres?

Answer: This is to identify the important factors that influenced the shopping centres' managers' decisions in selecting the best options of FM service delivery in UK shopping centres. Through the implementation of FMOSS decision-making framework, the key factors were identified. There were five factors employed in the decision-making framework, with each of the factors including several criteria.

Overall, shopping centres' managers' priorities factor in selecting the best options of FM service delivery in UK shopping centres are cost and financial factors. Both are identified as the important factors that influenced the shopping centres' managers' decision-making. The summaries of the results in chapter 7 have confirmed the above identification.

9.4 Evaluation of the Research Aim and Objectives

In this research, the aim and objectives have been achieved. This is summarised and presented as follows:

Aim and Objectives	Achieved Results
<p>Aim: To develop an effective decision-making framework for determining the best options of FM service delivery in UK shopping centres</p>	<p>The development of decision-making framework is completed and discussed as in Chapter 6.</p>
<p>Objective 1: To investigate the current option of FM service delivery in UK shopping centres.</p>	<p>Through the distribution of questionnaires to the shopping centres managers in UK shopping centres. The results have been analysed and presented in Chapter 5.</p>
<p>Objective 2: To investigate the management perception towards the potential benefits and the potential risks of FM service delivery in UK shopping centres</p>	<p>Through the distribution of questionnaires to the shopping centres' managers in UK shopping centres. The results have been analysed and presented in Chapter 5.</p>
<p>Objective 3: To identify the different relationship between size of shopping centres and the potential benefits and potential risks of FM service delivery</p>	<p>Through the distribution of questionnaires to the shopping centres' managers in UK shopping centres. The results have been analysed and presented in Chapter 5.</p>

<p>Objective 4: To investigate the existing management decision-making tools in determining the best options of FM service delivery.</p>	<p>Through the distribution of questionnaires to the shopping centres' managers in UK shopping centres. The results have been</p>
<p>Objective 5: To introduce AHP model as a basis in developing the decision-making framework for selecting the best options of FM service delivery in UK shopping centres.</p>	<p>AHP model has provided a basis of methodological framework for the selection of the best options of FM service delivery in UK shopping centres. The development of decision-making framework is completed and discussed as in Chapter 6.</p>
<p>Objective 6: To identify the important factors in selecting the best options of FM service delivery in UK shopping centres.</p>	<p>Through the implementation of FMOSS decision-making framework to five selected shopping centres managers. The summary of the important factors were shown in Chapter 7.</p>

9.5 Contribution of the Research

There are important contributions arising from this research. These contributions are divided into three important areas: academic, shopping centres' industry and facilities management industry.

9.5.1 Area of academic research:

- Most of the previous research on facilities management relates to the commercial office building, medical, hotel, educational and industrial. This research has bridged the gap in the existing research and also contributed to the knowledge on

theoretical development in facilities management with regards to shopping centres.

- There are no current studies that have been identified in the area of facilities management as well as in the retail studies with regards to FM services in UK shopping centres. Therefore, this research has contributed to the knowledge in academic research by providing the current information with regards to the current practice of facilities management in UK shopping centres.
- The decision to outsource and choose the right options basically lead to both benefits and risks. This research has contributed to the knowledge in academic research by identifying the potential benefits and the potential risks of outsourcing facilities management services in UK shopping centres.
- Selecting the best options is the 'age old' dilemma that Shopping Centre Managers and Managing Agents face every time they tender FM services in their Shopping Centres. Underpinning this problem, the research has contributed to knowledge in academic research by introducing Analytical Hierarchy Process (AHP) as a basis of providing methodological framework in selecting the best options of FM service delivery in UK shopping centres.
- Finally, this research also has contributed to the knowledge in the academic research by providing the ranking of factors that were important and influenced the shopping centres' managers' decision in selecting the best options of FM service delivery.

9.5.2 Area of shopping centres industry:

- The basis of decision-making supporting tools used by shopping centres managers in selecting the best options of FM service delivery currently varies from one shopping centre to another. This research has contributed to the shopping centres' industry by providing FMOSS decision-making framework as an alternative decision-making tool in selecting the best options of FM service delivery in UK shopping centres.
- As mentioned earlier, the decision to outsource and choose the right options will basically lead to both benefits and risks. This research has contributed to the

shopping centres' industry by providing information on the potential benefits and the potential risks of FM services in order to evaluate the options prior to the tendering process.

- Lastly, this research has also contributed to the shopping centres' industry by assisting the shopping centres' managers through facilitating the process provided by the FMOSS decision-making framework in making decisions for selecting the best options of FM service delivery.

9.5.3 Area of facilities management industry:

- Facilities management industry is a relatively young industry but today facilities management has proven to deliver business advantages and many organisations view that there is a need for outsourcing FM to provide the lead to changing the business environment. This research is imperative in helping the facilities management industry understand more about the perceptions of the shopping centres' industry and their requirements towards FM services in shopping centres in order for them to deliver quality, innovative, cost effective and best value services.
- This research has also contributed to the facilities management industry by providing information to FM service providers in the retail market in regards to provide FM solutions in the shopping centres with the specific requirements, e.g., size area of services delivered against the delivered services with the footfall.

9.6 The Potential Application of FMOSS Decision-Making Framework

The application of FMOSS decision-making framework is very useful for all shopping centres managers who are involved in selecting the best options of FM service delivery in shopping centres prior to the tendering process. The potential applications of FMOSS decision-making framework are as follow;

1. It supports decision-making by structuring, segregating and providing transparent access to data, and by allowing communication of value judgments among shopping centres managers.
2. It provides with a quantitatively decision. Thus, it can overcome the difficulty or dilemma in selecting the best options of FM service delivery.

3. It provides a feasible quantitative evaluation system to select the best options of FM service delivery.
4. It can be used for making a strategic decision for implementing the best options of FM service delivery.
5. It is a sustainable framework as it allows the flexibility for changing or adding any new criteria and new alternative that might happened in future.

9.7 Limitations of the Research

There are a certain number of limitations identified upon completion of this research:

1. Limitation of research subject area

During the investigation on facilities management in UK shopping centres, it was identified that there are limited research studies within this subject. This is because most of the previous research was in relation to the commercial office building, medical, hotel, educational and industrial. Therefore, the information needed with regards to this research was less available in the literature. However, this limitation gave the researcher the opportunity to carry out the exploratory survey in the shopping centres' industry.

2. Limitation of research focus

This research has been designed to investigate how facilities management in UK shopping centres has been managed and the service delivered. Therefore, this research focused on investigation on the perspective of the shopping centres' industry rather than the FM service providers' market. This was in order to understand more and explore the way they are managing their facilities management services and the way they are determining their best options of FM service delivery in the shopping centres.

Based on this focus, the researcher aimed to develop an effective decision-making framework for determining the best options of FM service delivery in UK shopping centres. This framework has provided a basis of methodological framework in selecting the best options of FM service delivery prior to the tender process.

3. Limitation of the FMOSS decision-making framework

Facilities management outsourcing selection system (FMOSS) framework has been developed to assist the shopping centres' managers in making selection of the best options of FM service delivery. In this framework, Analytical Hierarchy Process has been introduced as a basis of methodological framework in selecting these best options. By using this method, shopping centres are required to define the assessment criteria in order to evaluate the alternatives.

However, this framework has employed only five (5) factors with several criteria that underpin each factor. These factors and criteria – which have been identified from the literature review - are taken into account as the most influential factors in the decision-makers' decision. The limitation of these factors as used in assessment criteria within this decision-making framework is only for the purpose of this study. In practice, these identified assessment criteria can be used as guidance but the numbers of assessment criteria employed are not limited in assessing the alternatives.

Another limitation from using this decision-making framework is the numbers of alternatives employed. The minimum number of alternatives should be more than one alternative or at least two (2) alternatives. Otherwise, this decision-making framework is not very useful as an alternative decision-making supporting tool.

4. Limitation of the research time and cost

Typically, the time limit given for a full-time research student to complete the PhD studies is 3 years. However, as the research is undertaken from scratch, it took more than one year to identify and define the research focus. Consequently, this research is carried out within 3 to 4 years to complete the PhD study.

This research has also identified cost constraint as a limitation to this study in choosing the methods of data collection. Moreover, there is also cost constraint in buying some published reports from the British Councils of Shopping Centres as well as attending their conferences every year in order to understand and provide current information with regards to shopping centres' management practice in UK shopping centres. However, these limitations do not affect any major aspect of completing the research.

9.8 Recommendation for Further Research

The research has provided a study for understanding how facilities management services have been managed and service delivered in UK shopping centres. This study also includes the development of decision-making framework that aim to assist shopping centres managers for determining the best options of FM service delivery. This research has been designed to investigate from the perspectives of the shopping centres' industry rather than FM service providers' market. As this research investigated from a demand side (shopping centres' industry) towards FM service delivery in UK shopping centres, however, further research would be recommended to investigate from the supply side (facilities management industry) towards delivering FM services in UK shopping centres. This further study would have a significant importance to understand from FM service providers' perspective in delivering quality, innovative, cost effective and best in value services for the shopping centres' industry.

Aside from that the above, other studies that are recommended for a further research are summarised as follows:

1. Comparative study on the advantages and disadvantages of single service contracts and the bundled service contract in larger sized UK shopping centres.
2. In-depth study on the important role of FM in UK shopping centres in supporting the core business of shopping centres.
3. Exploratory study on outsourcing versus in-house facilities management in UK shopping centres.
4. In-depth study on the failure of total FM outsourcing in the UK shopping centres' market.

5. Comparative study on FM services in UK shopping centres and in European countries.
6. Exploratory study on the barriers of implementing FM services at the strategic management level in UK shopping centres.

9.9 Summary

In conclusion, this research has achieved the aim and objectives of the study. Besides which the research has provided the current information with regards to FM services in UK shopping centres; it has also provided the decision-making framework in determining the best options of FM service delivery in UK shopping centres. This framework is identified as an original contribution of this research and would be beneficial to the shopping centres' managers in making better decisions. As a result, the FMOSS decision-making framework is the original product of this PhD's research.

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Appendix I



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DATE: XX.XX.XXXX
REF. NO: FM/LJMU/XX

RESPONDENT NAME

RESPONDENT ADDRESS

Dear Mr/Mrs,

RESEARCH SURVEY: DETERMINING THE BEST OPTIONS OF FACILITIES MANAGEMENT (FM) SERVICE DELIVERY IN UK SHOPPING CENTRES

It has been known that facilities management services are the non-core services and non-critical function in any UK shopping centres. It is found that most shopping centres in the UK outsourced their facilities management services as they are believed to be cost effective and are best in value. The current trends are also showing a move from a traditional management style of an all in-house provision to outsourcing to various contractors and now towards a single service provider.

This research is aimed to seek and determine the best options of FM service delivery model in UK shopping centres. The focus of this study is on the demand side point of views. The evaluation is based on shopping centre management perceptions towards outsourcing options of FM service delivery. The outcome of the study will include a methodological framework for determining the best options of FM service delivery in UK shopping centres. In order to meet the objectives of the research, the attached questionnaire has been designed in accordance to the aim of this research and will take just approximately 10 to 15 minutes to complete.

We cordially invite you to response to the survey, as the players and movers of the shopping centres industries and hope that your experience will enhance the reliability and validity of the research findings. Your responses will be treated in strict confidence, and will be used solely for the purpose of the research. In return, if you would be interested in the key findings of this research, we will send you the summary of this survey report.

Kindly returned the filled questionnaire into the prepaid envelope provided before 30th June 2010.

Thank you in anticipation of your helpful response.

Yours sincerely,

Mr. Zairul Musa

(Researcher)



**QUESTIONNAIRE SURVEY
DETERMINING THE BEST OPTIONS OF FM SERVICE DELIVERY IN UK
SHOPPING CENTRES**

SECTION 1: RESPONDENT DETAILS

1.1 What is your role in the shopping centre management teams?

[Please tick appropriate box]

- Centre Director
- Commercial Director
- General Manager
- Deputy General Manager
- Centre Manager
- Deputy Centre Manager
- Director of Operations
- Operations Manager
- Group Operations Manager
- Property Manager
- Others (Please specify)

1.2 How long have you been working in the shopping centre management?

1.3 What type of the shopping centre scheme are you currently managing?

[Please tick appropriate box]

<u>TYPE of SCHEME</u>	<u>GROSS LESEABLE AREA (m²)</u>
<input type="checkbox"/> Very Large	80,000 and above
<input type="checkbox"/> Large	40,000 - 79,999
<input type="checkbox"/> Medium	20,000 - 39,999
<input type="checkbox"/> Small	5,000 - 19,999

1.4 What is your total number of your tenants?

SECTION 2: FACILITIES MANAGEMENT SERVICES

2.1 In your shopping centre, which of the following types of facilities management services do you have?

[Please tick all which apply]

- M & E engineering services
- Building & ground maintainance
- Cleaning & housekeeping services
- Energy & environmental management
- Health & safety management
- Information technology services (IT)
- Waste management
- Car park management
- Customer services
- Security services
- Landscaping services

2.2 How critical are facilities management services to your overall business operations in your shopping centre?

[Please tick appropriate box]

	Very Critical	Moderate Critical	Not Critical
M & E engineering services			
Building & ground maintainance			
Cleaning & housekeeping services			
Energy & environmental management			
Health & safety management			
Information technology services (IT)			
Waste management			
Car park management			
Customer services			
Security services			
Landscaping services			

2.3 What is the current provision of facilities management services in your shopping centre?

[Please tick appropriate box]

	In-house	Outsourced	Both
M & E engineering services			
Building & ground maintainance			
Cleaning & housekeeping services			
Energy & environmental management			
Health & safety management			
Information technology services (IT)			
Waste management			
Car park management			
Customer services			
Security services			
Landscaping services			

SECTION 3: MANAGEMENT DECISIONS ON OUTSOURCING FACILITIES MANAGEMENT SERVICES

3.1 What is your role in making decisions for outsourcing facilities management services?

[Please tick appropriate box for questions 3.1 – 3.5]

- One of several decision-makers
- The final decision maker
- Advisor to decision-makers
- No role

3.2 Do you have any specific decision making framework on outsourcing the best options of facilities management service delivery?

- Yes
- No

3.3 What are the primary reasons for outsourcing the facilities management services in your shopping centre?

- Cost saving
 - Performance improvement
 - Access to best practice
 - Focus on core business
 - Reduced risks
 - Resources not available internally
 - Reduced management burden
 - Reduced and control operating costs
 - Specialist knowledge required
 - To free capital for other investment
 - Functions difficult to manage
 - Others (Please specify)
-

3.4 Which type of the facilities management service delivery options currently being practiced in your shopping centre?

- Single service contract
(to various contractor/service provider)
- Bundled service contract
(to single service provider)
- Both services above

3.5 What is the basis of your decision on determining the best options for facilities management service delivery in your shopping centre?

- Management plan & operations manual
 - Solutions wanting
 - Requirements setting
 - Past experiences
 - scientific methods and analysis
 - Others (Please Specify)
-

SECTION 4: MANAGEMENT PERCEPTIONS TOWARDS THE BEST OPTIONS OF FM SERVICE DELIVERY

4.1 Based on your perceptions, please indicate the score for the ADVANTAGES/BENEFITS of these options in accordance to the criteria

FACTOR(S)/CRITERIA	Please tick the appropriate score					Please tick the appropriate score				
	[1]Very low	[2]Low	[3]Moderate	[4]High	[5]Very high	[1]Very low	[2]Low	[3]Moderate	[4]High	[5]Very high
FINANCIAL FACTOR	SINGLE SERVICE CONTRACT					BUNDLED SERVICE CONTRACT				
Save money on non-core activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Opportunity to reduce investment in asset	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
COST FACTOR										
Enable to obtain cheaper service	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enable operational cost to be reduced	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enable to provide cost effective services	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enable to control service charges	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PERFORMANCE FACTOR										
Improve operating performance	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enable to obtain expertise, skills and technologies	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enable to improve service quality	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Increase customer satisfaction	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
ORGANISATIONAL FACTOR										
Free up management time to focus on core activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enhance management effectiveness	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Improve management capability	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Reduce management burden	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PHYSICAL FACTOR										
Improve centre physical image	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Improve the quality of shopping environment	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Enable to match support service activity with footfall	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

SECTION 4: MANAGEMENT PERCEPTIONS TOWARDS THE BEST OPTIONS OF FM SERVICE DELIVERY

4.2 Based on your perceptions, please indicate the score for the **DISADVANTAGES/RISKS** of these options in accordance to the criteria

FACTOR(S)/ CRITERIA	Please tick the appropriate score					Please tick the appropriate score				
	[1]Very low	[2]Low	[3]Moderate	[4]High	[5]Very high	[1]Very low	[2]Low	[3]Moderate	[4]High	[5]Very high
FINANCIAL FACTOR	SINGLE SERVICE CONTRACT					BUNDLED SERVICE CONTRACT				
Unable to save money on non-core activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Opportunity to increase investment in asset	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
COST FACTOR										
Difficult to obtain cheaper service	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Unable to reduce operational cost	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Unable to provide cost effectiveness service	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Unable to control service charges	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PERFORMANCE FACTOR										
Unable to Improve operating performance	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Difficult to obtain expertise, skills and technologies	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Unable to improve service quality	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Increase risk of service interruption	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
ORGANISATIONAL FACTOR										
Lost of management control on non-core activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Lost of management focus on core activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Complex and time consuming to manage	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Increase in management burden	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PHYSICAL FACTOR										
Less efforts by supplier to improve centre physical image	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Difficult to improve the quality of shopping environment	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Less efforts by supplier to match buyer's requirements	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

SECTION 5: GENERAL

[Please tick appropriate box for questions 5.1 – 5.5]

5.1 Are you aware the existent of facilities management service provider in the current market?

Yes

No

5.2 Are you aware of the facilities management's potential benefits?

Yes

No

5.3 Are you currently looking into engaging facilities management provider market?

Yes Engaged

No

Will be

5.4 Do you think that facilities management has an important role to provide solutions into better quality and cost anticipated?

Yes

No

Maybe

5.5 Do you think that the best options of facilities management service delivery will be an added value to the management of shopping centres?

Yes

No

Maybe

SECTION 6: SURVEY INFORMATION

6.2 Would you like a copy of this survey report?

Yes

No

6.3 Would you like to take part in a validation of the framework?

Yes

No

Maybe

All responses are strictly confidential and no information which could reveal your organisation's or your own identity will be used in any data reporting, nor will it be shared in its individual form with any outside party without your expressed permission to do so.

THANK YOU

----- END OF SURVEY-----

Appendix III: Summary of MANOVA Tests for the Types of FM Service Delivery Options towards its Potential Benefits

Potential Benefits	Shopping Centres Managers Perceptions			
	Single Service Contracts	Bundled Service Contract	Sig. (p)< 0.05	Hypothesis Testing
Save money on non-core activities	Moderate	High	0.000	There is significant different.
Opportunity to reduce investment in asset	Low	Low	0.917	There is no significant different.
Enable to obtain cheaper services	Moderate	High	0.000	There is significant different.
Enable operational cost to be reduced	Moderate	High	0.000	There is significant different.
Enable to provide cost effective services	Moderate	Moderate	0.213	There is no significant different.
Enable to control service charges	Moderate	High	0.000	There is significant different.
Improve operating performance	Moderate	High	0.000	There is significant different.
Enable to obtain expertise, skills and technologies	High	High	0.720	There is no significant different.
Enable to improve service quality	Moderate	High	0.010	There is significant different.
Increase customer satisfaction	Moderate	High	0.000	There is significant different.
Free up management time to focus on core activities	Low	High	0.000	There is significant different.
Enhance management effectiveness	Low	High	0.000	There is significant different.
Improve management capability	Low	High	0.000	There is significant different.
Reduce management burden	Low	High	0.000	There is significant different.
Improve centre physical image	Low	Moderate	0.000	There is significant different.
Improve the quality of shopping environment	Moderate	High	0.020	There is significant different.
Enable to match support services activity with footfall	Moderate	High	0.000	There is significant different.

Appendix III: Summary of MANOVA Tests for the Types of FM Service Delivery Options towards its Potential Risks

Potential Risks	Shopping Centres Managers Perceptions			
	Single Service Contracts	Bundled Service Contract	Sig. (p)< 0.05	Hypothesis Testing
Unable to save money on non-core activities	Moderate	Low	0.000	There is significant different.
Opportunity to increase investment in asset	High	High	0.180	There is no significant different.
Difficult to obtain cheaper services	Low	Low	0.054	There is no significant different.
Unable to reduce operational cost	Low	Low	0.301	There is no significant different.
Unable to provide cost effective services	Very Low	Low	0.044	There is significant different.
Unable to control service charges	Moderate	Low	0.000	There is significant different.
Unable to improve operating performance	Moderate	Low	0.000	There is significant different.
Difficult to obtain expertise, skills and technologies	Low	Very Low	0.010	There is significant different.
Unable to improve service quality	Moderate	Low	0.000	There is significant different.
Increase of risks of service interruption	Low	High	0.000	There is significant different.
Lost of management control on non-core activities	Low	High	0.000	There is significant different.
Lost of management focus on core activities	High	Low	0.000	There is significant different.
Complex and time consuming to manage	Very High	Low	0.000	There is significant different.
Increase management burden	High	Low	0.000	There is significant different.
Less efforts by supplier to improve centre physical image	Low	Moderate	0.000	There is significant different.
Difficult to improve the quality of shopping environment	Low	Low	0.064	There is no significant different.
Less effort by suppliers to match buyer's requirements	Moderate	Low	0.000	There is significant different.

Appendix IV: Summary of MANOVA Tests for the Types of Shopping Centres towards the Potential Benefits of FM Service Delivery

Potential Benefits	Shopping Centres Managers Perceptions			
	Medium Sizes	Larger Sizes	Sig. (p)< 0.05	Hypothesis Testing
Save money on non-core activities	Moderate	High	0.000	There is significant different.
Opportunity to reduce investment in asset	Low	Low	0.658	There is no significant different.
Enable to obtain cheaper services	Moderate	High	0.000	There is significant different.
Enable operational cost to be reduced	Moderate	High	0.000	There is significant different.
Enable to provide cost effective services	Moderate	Moderate	0.073	There is no significant different.
Enable to control service charges	Moderate	High	0.000	There is significant different.
Improve operating performance	Moderate	High	0.000	There is significant different.
Enable to obtain expertise, skills and technologies	High	High	0.651	There is no significant different.
Enable to improve service quality	Moderate	High	0.003	There is significant different.
Increase customer satisfaction	Moderate	High	0.000	There is significant different.
Free up management time to focus on core activities	Low	High	0.000	There is significant different.
Enhance management effectiveness	Low	High	0.000	There is significant different.
Improve management capability	Low	High	0.000	There is significant different.
Reduce management burden	Low	High	0.000	There is significant different.
Improve centre physical image	Low	Moderate	0.000	There is significant different.
Improve the quality of shopping environment	Moderate	High	0.006	There is significant different.
Enable to match support services activity with footfall	Moderate	High	0.000	There is significant different.