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Design of Sustainable Outsourcing Services for Facilities Management: Critical Success Factors

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Abstract: The management problems of Facilities Management (FM) outsourcing relationships occur because of provision of low quality analytical, managerial, cooperative, and professional services. On selection, the ideal service providers for specific FM outsourcing contractual procurement needs is of paramount importance to achieve high quality FM services. This paper aims at reviewing the concept of outsourcing in relation to facilities management and dealing with the importance of outsourcing success. Factors of outsourcing strategies from the perspectives of clients and service providers are examined and analysed through the Delphi technique in Hong Kong. The results reveal four main drivers of FM practice through evaluation of thirty-five outsourcing critical success factors identified by clients and service providers. Evaluation of the critical success factors from FM drivers shows that there is an inclination towards FM competence, measurement of performance, cost effectiveness, etc. from clients, whilst there is an inclination to the core skills, measurement of performance, allocation of human resources, cost effectiveness, customers' satisfaction, etc. from service providers. The result of the study reveals an interesting understanding that the impact of outsourcing critical success factors can be strategically implemented into the outsourcing strategies in Hong Kong's FM practice.

Keywords: Delphi technique; facilities management drivers; critical success factors; outsourcing services; customer satisfaction

1. Introduction

The latest investigation of outsourcing in different industries focuses on financial and economic perspectives. Achieving sustainable competitive advantage is the goal of companies and organizations. Ref. [1] analysed sustainable outsourcing and supply chain management through various aspects, including financial, sustainability, internal operations, learning and growth, and stakeholder/customer impacts. Sustainability is imperative, especially for the operational decisions from both environmental and economic angles. Previous research [2,3] has analysed whether outsourcing has an impact on organizational performance from financial and non-financial perspectives. A positive and significant relationship was discovered between outsourcing and financial performance. As for the importance of sustainability, it is in acceleration because of the increase in the human population and the extraction of non-renewable natural resources [4]. The logistical services of companies are outsourced in the interest of maintaining or increasing competitiveness. For effective outsourcing, the top management of companies are aware that they are responsible for managing the outsourcer–provider relationship [5]. Further discussion of the FM sector, the clients' and service providers' relationship, or the nature of their operational and management elements is key. "Contracting-out" refers to services that are

provided in-house but have been directly contracted, whereas "outsourcing" refers to services that continue to be procured from external providers. It is important to take a wider view of the basic components of outsourcing in an attempt to understand outsourcing relationships; this may include the nature, services, strategies, and the management of the relationship. The elements or components should be critically examined using a relevant theoretical lens. Analysis of relevant literature shows the general working mechanisms of outsourcing [6,7], and also explains the unclear relationship between FM outsourcing providers and clients. The effective utilization of integrated resources of FM involves planning of people, property, and technology. Many business problems in the built and human environment are mostly accepted to be solved by the ideal use of high-quality facilities. To operate such facilities, some proponents agree outsourcing procurement as an effective and efficient approach, as is currently widespread in many industries to manage resources [8–13]. However, many organizations usually do not consider the effects of performance of outsourced service providers on business success. It is also often unclear how the type of outsourcing relationship affects business success. It is therefore highly useful to have a specific outsourcing model for the FM industry. Service providers' services affect client satisfaction; the service providers can tailor-make relevant FM outsourcing strategies for sustainable development. Thus, the purpose of this study is not only to investigate the critical success factors, but also to understand the expected standards of service for clients now and in the future. It is anticipated that the clients' requirements for sustainable outsourcing services can be satisfactory through the efforts of the service providers.

FM organizations cannot afford to ignore outsourcing as a strategic option [14] as key trends in outsourcing is towards smaller and more strategic deals for realizing the goals and the objectives of the business strategies. Through focusing on measures of end-to-end process efficiency, clients can make sustainable savings. As for FM Service providers, they provide industry insight, geographical diversity, technical innovations, and high-value skills necessary to enter new markets and exploit new opportunities [15]. It is clear that the main underlying managerial interest is to gain a greater understanding of the factors responsible for the success of outsourcing [13,16,17]. Outsourcing reduces risk due to reliance on experts and infusion of new technology in tertiary education institutions [12]. Managing the outsourcing process correctly is essential in ensuring positive outsourcing outcomes. It has been documented in various research studies that contingency theory and systems theory grew in significance after the oil crisis of 1973. However, Ref. [18] argues that organizations as open systems must interact with their surroundings to survive. It is widely stated that, organizations are necessary to adapt the external environment for survival. In the areas of IT studies, there are been recently widespread research work on the contingency theory [19]. However, historical trends on contingency theory sought to formulate broad generalizations about the formal structures that are typically associated with or best fit the use of different technologies.

There are numerous outsourcing models in various fields and the contingency outsourcing model used in the IT industry is called the Four Outsourcing Relationships Types (FORT) framework [20]. The characteristics of the FORT model are based on the contingency approach, which argues that there is no single best solution to outsourcing; rather, the best approach depends on a number of factors. Ref. [21] claims that survival of organizations depends on the restructuring and development of their prediction strategies. Moreover, the FORT model can be used as the basis of providing the perspective of outsourcing relationships between the stakeholders in the IT field [20]. Even though the contingency theory has shortcomings, this principle is appropriate for more accurate prediction of the future of FM outsourcing relationships and enhancement of the quality of future FM outsourcing services. Hence, a firm's FM services must be suitably integrated into the external environment and the market conditions.

2. Successful Outsourcing in FM Sector

Following the publication of a number of seminal studies on Facilities Management in recent times, researchers have undertaken many significant explorations on outsourcing strategies, focusing mainly

on the explanations for outsourcing and its critical success factors in various industries [22]. However, these studies failed to examine the link between outsourcing arrangements and the performance of service providers in the FM sector. Ref. [23] argues that FM corporations should work on managing profitable customer relationships to ensure outsourcing success. Though outsourcing has been discussed from many perspectives in various fields, some clients still sacrifice their services from the unsatisfactory performance of their outsourcing service providers. As more companies made the transition to outsourced FM services, the number of reported fail cases was also rising. Refs. [24–26] address seven common problems for most failed outsourcing efforts, while Ref. [27] also discusses the relationships between clients and service providers in the FM sector which is not working as anticipated. Hence, there is still possibly a problem of outsourced FM services yet to be discovered and solved.

Poor management of the relationship between outsourcers and stakeholders is one possible reason for outsourcing failures; however, no detailed investigation of this factor has recently been undertaken. Moreover, Ref. [28] reports that process studies of outsourcing FM services are rare; however, there is only limited research on structured partnerships in the field of FM services [29]. This reflects that our existing knowledge of best-fit FM outsourcing with reference to service providers, clients, and end-users are insufficient and under-developed. It is critical not only to explore new skills for managing outsourcing relationships, but also to develop how to utilize these skills effectively [30]. The relationship between the firm and the service providers should be taken into account when addressing facility-related services [31]. Again, Ref. [27] claims that partnering and collaboration principles are necessary for the firm and the service providers' relationships in the context of FM procurement if the full advantages are to be achieved.

3. Facilities-Management Drivers

Aligning real-estate portfolios with corporate real-estate services and capabilities will require strategic planning [32]. This paper is based on two main areas; FM resources and FM practices and processes, with a focus on four facilities-management drivers. The key drivers for FM resources are adequacy and coordination whilst FM practices and processes are driven by competence of service providers and quality of performance. FM resources are described as adequate when it includes people, budgets, and systems. However, coordination of facilities management resources includes quality information and well-structured organization. The main competencies of service providers in FM practices and processes are planning, design, and quality of performance with processes such as construction and maintenance operations [32].

3.1. Adequacy of Facilities Management Resources

Adopting smart and sustainable FM practices and processes requires the smooth operation at the organizational level [33]. Providing adequate facilities is essential for businesses in service-oriented sectors, such as hotels, commercial mixed-use premises, and leisure facilities. Services in these industries are mostly tailor-made to satisfy specific customer needs. The adequacy of FM resources and the efficiency of deployed resources can be measured by the costs of practices and processes, and the spaces occupied by such resources. Resources required to deliver FM services (in the form of practices and processes) are said to be aligned when sufficient in terms of the number of personnel, budget size, plant equipment, inventory size, etc. [34].

Portfolio statements can evaluate resource usage to analyse such measurements of the cost and the allocation of space, capacity analysis of the space, number of personnel used, and space requirements, including methods of providing space [35,36]. However, FM resources are still used inefficiently in the corporate context; especially the inappropriate allocation of already scarce human and capital resources due to the lack of internal and external strategic planning, and this difficulty is exacerbated by longer leading times before implementing programmes [32]. Therefore, there is the need to emphasize

the importance of strategic planning and to improve the design of such plans to enhance resource allocation in the FM sector.

3.2. Competence of Facilities Management Service Providers

Competence is considered as one of the essential components of FM service providers' business success [37,38]. In some organizations, emphasis has been placed on FM executives (facilities directors with greater authority than facilities managers) and the development of business skills, such as marketing, human resource management, and contracting [39]. It is important that FM service providers develop both generic and specific forms of competencies. Generally, external FM competencies, and competence in the provision of FM support services, are basic requirements for the effective deployment of FM resources. According to Ref. [40], some of the key generic FM competencies are in the areas of real-estate and strategic planning, operations and maintenance, human and environmental factors, planning and project management, facility function, financial management, quality assessment, innovation, and communication.

Facility managers are expanding their skill-sets in view of the current business-service environment, resulting in enhanced relationships among users and providers. To achieve this, efficient operation should be combined with a more strategic focus as part of FM service delivery [39,41]. Again, current facility managers should have certain basic intrinsic characteristics. For example, a corporate real-estate manager with important skills such as the ability to think innovatively, listen and negotiate, and act proactively and cogently is not only able to foster a productive working environment and promote strategic alliances, but to think for and with the customer [42]. At the critical stages of the FM process, Facilities managers can bring important information to the process to support decision making [43]. The generic management skills, knowledge and experiences of executives in FM organizations have also been investigated in terms of the management of customers, services, working environments, and assets [39,41].

A competency framework is critical in supporting both headquarters staff and support personnel in sharpening and developing their communication and leadership skills, as well as cultivating productive outsourcing relationships if FM service providers want to increase their competitive advantage [36,44]. Skilled facility managers with special entrepreneurial skills, thorough knowledge of the core organization, and the ability to co-coordinate diverse activities provide the means by which an organization delivers and sustains a satisfactory relationship between 'hardware' and 'software' management. Such FM managers create an appropriate working environment and establish the service–provision relationships necessary to meet the organization's strategic needs in a cost-effective way [39,45,46].

Facilities Managers must be capable of improving quality and ensuring efficient service delivery and performance during the project-management process [47]. The work of Ref. [47] argues that the essential skills of a contemporary facility manager includes maintenance management, outsourcing and contract management, post-occupancy evaluation, space planning, life cycle costing, and process mapping. However, specialized facilities, such as hospitals and factories, may require specific skill-sets over and above these generic competencies [41]. It is therefore imperative that positive outcomes are delivered and specific knowledge regarding the technical areas, such as property and facilities management and the promotion of health and safety in the workplace, are developed [44]. Furthermore, Ref. [47] adds that the role of the FM should be extended to include responsibility for project delivery. This means that facility managers with core skills in managing operational building assets are capable of combining project management and facilities management delivery since the most effective measure of the competence of FM service providers is performance.

3.3. Coordination of Facilities Management Resources

However, Ref. [48] categorized the main factors determining FM practice into two groups, namely: internal factors, such as organisational characteristics, the features of the relevant facilities, and the

business sector to which the organization belongs; and the external factors, which include economic, social, and environmental conditions, legislations and regulations, the context of the FM market, and the local culture and context. One major resource essential for an organization's FM practice is the co-ordination of resources When coordination and integration between IT systems, people, processes, and places are done properly, it greatly enhances efficiency and maximizes cost relief for various stakeholders in the FM sector. However, the main challenge is meeting the needs of the business in a consistent fashion, and to achieve this goal through the optimal use of resources [49,50].

At the operational level, co-ordination is important to both design and operational activities. According to Barrett [36], a generic model of interactions within the FM organization between the facilities manager and various functional units is essential; the role of the facility manager in this model is one of co-ordination. Moreover, Nutt [51] adds that FM responsibilities may include arranging transport, providing support for communication, and managing information exchange; they may also accommodate wider arrangements, such as providing support for communities and families and arranging social and leisure activities in terms of human resource-related roles. Efficient coordination of physical resources can increase staff efficiency in facilities management at the design stage. When it comes to the design of the FM working environment, Ref. [45] describes four practical conditions that affect the working relationship between designers and users/clients in the sector as: (1) performance; (2) a willingness to demystify design by using data; (3) the use of a systemic design process that places equal weight on IT and resources belonging to the physical environment; (4) enthusiastic involvement in the design process as a whole. It is observed that innovative workplace design likely can promote efficient communication among executives and improved teamwork of companies [52]. Corporate success in the facilities management sector is significantly driven by good co-ordination since corporations gain economic advantage when resource usage and capabilities are aligned with the use and management of real-estate services. This means that co-ordination enables FM firms to gain a competitive advantage and to increase their products and services optimization [49].

3.4. Quality of Facilities Management Performance

Limited and scarce resources managed by FM professionals should be investigated as sophisticated and global real-estate portfolio in a highly decentralized corporation without sacrificing quality pose a significant problem to many FM professionals. Ref. [36] tackles the problem of resources in the FM sector by introducing a strategy-alignment model based on the quality of space occupied by real estate. However, [48] observes that the capacity of the FM market in terms of service availability, supplier capability, and available technology can affect the decision making and also influence the choice of FM service-delivery method. The quality of facilities management services is affected by the performance of the various service providers involved in contract procurement. Various academics continue to discuss the benefits of emphasizing quality by engaging real-estate service providers at all levels of an FM organization to improve workplace design for the benefit of the company. For example, to increase an awareness of the need for social responsibility among the workforce, it is believed that ethical FM practices should be encouraged and promoted [52,53]. According to Ref. [54], quality is defined in terms of four absolutes, namely: (a) conformance to requirements, (b) prevention, (c) zero defects, and (d) price of non-conformance. The study concludes that customer satisfaction plays an essential role in quality-based processes, and that the efficiency with which limited in-house resources are utilized can be used to measure quality in the world of corporate real-estate management. To ensure an effective ongoing improvement in an organization's facilities management, quality should be reviewed on regular basis.

4. Critical Success Factors

Outsourcing risk in FM has been defined as the likelihood of the occurrence of uncertain, unpredictable, and undesirable outcomes capable of jeopardizing an outsourcing relationship between a principal (a client or its representatives) and agents (outsourcing vendors) [17]. The results

indicate that 'poor quality of services' is the most critical risk factor associated with FM outsourcing, closely followed by lack of 'security' and 'inexperience', in that order. It is also essential to understand the competitive advantages of outsourcing in order to achieve a complete picture of outsourcing in the FM sector. This study therefore develops a measure of the quality of FM outsourcing strategies using the identified critical success factors associated with FM outsourcing. The FORT model consists of four outsourcing relationship types that are used to determine the proportion of service providers' responsibility and the strategic effect of a company's portfolio on clients. The relationship between critical success factors and FM drivers can be derived by weightings of the critical success factors connected to each of the possible FM drivers from the client's perspective. Alternatively, other combinations of weightings can be connected to the same FM drivers from the service provider's perspective. Each of the four outsourcing relationship dimensions of the proposed outsourcing model (i.e., substitution on ownership of FM assets, substitution on control of FM assets, outsourced FM portfolio on firm's competition position and its long term plan) are then measured by evaluating the four FM dimensions (i.e., four FM drivers) regarding the identified critical success factors by clients and service providers, as shown in Table 1.

The objectives of the paper are the following:

(a)   Measure the quality of FM outsourcing strategies using the identified critical success factors associated with FM outsourcing.

(b)   Study the relationship between critical success factors and FM drivers that can be derived from weightings of the critical success factors connected to each of the possible FM drivers from the client's and service provider's perspectives.

Table 1. A series of critical success factors for outsourcing strategies in local FM practice.

FM Drivers	No.	Critical Success Factors	Related Literatures/Source
Adequacy dimension	1	Choice of mechanical and electrical plants	[32–36]
	2	Choice of IT equipment	
	3	Choice of firm infrastructure systems	
	4	Flow of information	
	5	Design of organization structure	
	6	Design of inventory list	
	7	Procurement strategies	
	8	Space measurement	
	9	Allocation of human resources	
	10	Allocation of capital resources	
Competence dimension	11	General FM competence	[36–48]
	12	Specific FM competence required for specialist facilities	
	13	Core skills of facilities managers	
	14	IT enabling learning competence	
	15	Measurement on performance	
	16	Capability transfer on business knowledge and management processes	
Co-ordination dimension	17	Alignment of group/individual cultures within organization	[41,45,48–50,52]
	18	Choice of on-site communication method	
	19	Speed of off-site electronic information infrastructural support	
	20	Co-ordination between the facilities manager and functional units on operational level	
	21	Collaboration of team-work among executives by innovative physical workplace design	
	22	FM practice and whole life cycle processes	
	23	Integration of work procedures with workplace design	
	24	Geographical spread of facilities (local, regional, international)	
	25	Resource sharing on people, budget, systems, information and organization structure	

<p align="center">**Table 1.** *Cont.*</p>

FM Drivers	No.	Critical Success Factors	Related Literatures/Source
Quality dimension	26	Conformance to specification requirements of services	[36,39,48,52,54]
	27	Methods for defect rectification	
	28	Support on defect prevention	
	29	Cost of non-conformance work	
	30	Awareness of corporate social responsibility	
	31	Cost effectiveness	
	32	Value of customers satisfaction	
	33	Excellence of value-added services	
	34	Design and availability of user-oriented services	
	35	Measurement on quality of work	
Others	36	Client's objectives	Suggested by a FM service provider in Delphi study

5. Research Methodology

The paper adopts a quantitative research approach using the Delphi method in examining the Four Outsourcing Relationship Types (FORT) model in the FM industry with the aim identifying the critical success factors for outsourcing strategies. The FORT framework comprises four outsourcing relationship types, namely support, alignment, reliance, and alliance. The relationships types of the clients are determined by assessing the extent of substitution of FM service providers and strategic effects of FM outsourced portfolios.

The Delphi method is described as a systematic, interactive forecasting method which relies on a panel of experts converging towards the "correct" answer [55]. The main objective is to develop a technique to obtain the most reliable consensus of a group of experts through a series of questionnaires interspersed with controlled opinion feedback [55,56]. The Delphi method provides members of a group with the ideas of others without a face-to-face meeting and an individual member writes down his thoughts on a problem and submits them to a coordinator. However, the Delphi process does not require the experts to meet physically [56], preventing direct conflict of the experts and allowing international experts to take part in the study [57].

The Delphi study for this research focused on FM professionals from service providers and local clients from Hong Kong Special Administrative Region's Government, semi-public organization, i.e., universities, Vocational Training Council of Hong Kong, Hong Kong Cyber Port, Hong Kong Science and Technology Park, and Hong Kong International Airport, and the private sector, respectively. The different types of clients from the local stock market were selected from IT, banking, health care, engineering, property development, and retail services. The data collection method is mainly based on the respondents' individual objective assessments, while the design of pilot study was formatted in a qualitative manner to the outsourcing strategies of the FORT framework. Finally, interviews and site visits were carried out to achieve more detailed and specific ideas from some respondents whenever available.

5.1. Design of Delphi Surveys

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

5.1.1. Design on panel structure

Initially, experts were divided into panels. Their size and constitution depended on the nature of the research question and the dimensions along which the experts will probably vary. Two

categories of experts have trustworthy and valuable knowledge about outsourcing of FM. They are clients and services providers, respectively. The two groups were expected to have somewhat different perspectives. Since the goal was to obtain a reasonable degree of consensus, it would be best to separate these groups. This design also permits comparison of the perspectives of the two stakeholder groups. Following recommendations from Delphi literature, there are 10 to 18 people in each panel [57]. Thus, there were 10 to 18 FM experts in each Delphi panel i.e., client and service provider in this study. Within each panel, the goal is that all members actually work in the field of FM. This structure obtained a sufficient number of perspectives. The perspectives of the respondents were analysed afterwards.

5.1.2. Identification of FM experts

Selection of FM experts was by a multiple-step iterative approach (five steps). Application of this five-step process ensured the identification and invitation of the most qualified experts available. The five steps are described as follows: (1) Prepare Resource Nomination Worksheet (RNW) for identification of relevant disciplines or skills and organizations; (2) Prepare RNW with writing names of individuals in relevant disciplines or skills and relevant organizations; (3) Nominate additional experts by contacting experts listed in RNW and asking contacts to nominate other experts; (4) Rank experts by creating three categories i.e., clients, consultants, and service providers and categorizing experts according to professionalism, working experience, length of years in FM, and qualifications; (5) Invite experts to each panel, with the panels corresponding to each category, in the order of their ranking within their category sub list. The target size of each Delphi panel was 10–18.

5.2. Data Analysis of Delphi Surveys

Data on the critical success factors of outsourcing strategies from the perspectives of clients and service providers were collected using the Delphi technique. Initially, there were three categories of target professionals invited to join in the Delphi survey—clients, independent consultants or researchers, and service providers. However, there was the need to make some adjustment in the arrangement during the process because there were insufficient consultants or researchers willing to participate. The details of the results and changes arising are presented in Table 2. The study involved fourteen experts from client organizations, including quasi-government organizations, universities, The Hong Kong Special Area Region Government, and private and publicly listed companies. These experts included professors, directors, managers, surveyors, lecturers, teaching fellows, officers, and project assistants. There are three experts with more than 10 years of FM experience and two experts with more than 5 years of FM experience; while the remaining nine experts have less than 5 years of FM experience. In terms of service providers, the eight experts mainly work in two kinds of organizations; private companies and universities. Experts from these organizations included directors, senior managers, managers, and senior facility officers. The experts have different levels of FM experience with two experts having more than 10 years of FM experience and four experts with more than 5 years of FM experience while the remaining two experts have less than 5 years of FM experience.

Table 2. Number of experts in the whole Delphi process.

Category	Number of Experts Invited	Results Arising before Transformation	Final Results Arising
(I) Clients	57	11	14
(II) Independent Consultants/Researchers	51	3	-
(III) Service Providers	28	8	8
			Total 22

To achieve optimum results from the Delphi technique, a minimum of ten experts were required for each category. The first round of the Delphi survey lasted for a month. Table 2 shows the profile of experts who participated in the Delphi process. The Delphi survey was changed due to the following reasons:

- A total of three consultants/researchers agreed to participate in the Delphi study and were added to the expert list of clients as they have previously worked in client firms. These experts were capable of answering the questionnaire from the perspective of the client, resulting in a total of fourteen clients participating in the Delphi questionnaire survey.
- Although ten experts from the service provider category were expected to take part, only eight experts eventually agreed to participate since the other two experts could not join the expert team on time.

Table 3 indicates the exact figure of starting time and finishing time of each round of the whole Delphi survey.

Table 3. Working schedule of the whole Delphi process.

Category	Total Number of Professionals Invited	Results Arising before Transformation	Final Results Arising
(I) Clients	57	11	14
(II) Independent Consultants/Researchers	51	3	-
(III) Service Providers	28	8	8
			Total 22

To produce validated data from the Delphi study, two rounds of surveying were conducted [57], with round one of the survey lasting four weeks, as shown in Table 3. After the first round of the process, the respondents discussed the remaining part of the Delphi process. It was suggested to reduce the length of the whole survey by conducting fewer rounds. Hence, the Delphi survey of this study was designed to have two rounds in order to achieve the required validated data. There were about 14 client participants and 8 service provider participants. About 23% of both client and service participants were practitioners with more than 10 years of FM experience, while approximately 27% had more than 5 years of FM experience. About 50% had less than 5 years of FM experience.

6. Research Findings and Discussions

6.1. Results of Round 1 of the Delphi Questionnaire

The first round of the Delphi survey involving fourteen clients and eight service providers examining the critical success factors in FM outsourcing is presented in Tables 4 and 5. Table 4 indicates that more than 50% of clients agree on the importance of competence and cost, while around 40% of clients consider the allocation of resources, coordination, and customer satisfaction as important.

Table 4. Critical success factors for outsourcing strategies in round 1 Delphi survey (Clients).

Clients: Critical Success Factors for Outsourcing Strategies	Total Frequency	Percentage	Rank
Specific FM competence required for specialist facilities	9	64	1
Cost effectiveness (i.e., productivity)	7	50	2
Measurement on performance (i.e., assessment on service providers)	7	50	2
Allocation of capital resources (i.e., utilization of budget)	6	43	4
Co-ordination between the facilities manager and functional units on operational level	6	43	4
Allocation of human resources (i.e., senior management to junior)	6	43	4
Procurement strategies (i.e., details in contract administration)	5	36	7
Value of customers satisfaction	5	36	7
FM practice and whole life cycle processes	5	36	7

However, Table 5 shows that more than 50% of service providers believe that core skills, co-ordination and procurement, performance, resources, and customer satisfaction are important. Again, around 40% of service providers consider practice, cost, organizational structure, competence, defect rectification, and value-added services as important.

Table 5. Critical success factors for outsourcing strategies in round 1 of the Delphi survey (Service providers).

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

6.2. Results of Round 2 of the Delphi Questionnaire

The results of the second round of the Delphi survey involving fourteen clients and eight service providers is presented in Tables 6 and 7. The top critical success factors were selected if at least 50% of experts selected them in this round of the Delphi survey. Table 6 indicates that more than 60% of clients agreed on the importance of competence and performance, while around 60% of clients also consider the importance of cost and coordination.

Table 6. Critical success factors for outsourcing strategies in round 2 of the Delphi survey (Clients).

Clients: Critical Success Factors for Outsourcing Strategies	Total Frequency	Percentage	Rank
Specific FM competence required for specialist facilities	9	64	1
Measurement on performance (i.e., assessment on service providers)	9	64	1
Cost effectiveness (i.e., productivity)	8	57	3
Co-ordination between the facilities manager and functional units on operational level	8	57	3

Table 7 indicates that more than 80% of service providers agreed on the importance of co-ordination as a critical success factor for FM outsourcing strategies. Again, 60% to 70% of service providers agreed on the importance of procurement and core skills, while 50% of service providers considered performance, resources, practice, cost, and customer satisfaction as important.

Table 7. Critical success factors for outsourcing strategies in round 2 of the Delphi survey (service providers).

Service Providers: Critical Success Factors for Outsourcing Strategies	Total Frequency	Percentage	Rank
Co-ordination between the facilities manager and functional units on operational level	7	88	1
Core skills of facilities managers (e.g., innovative thinking, listening and negotiating capacities, etc.)	6	75	2
Procurement strategies (i.e., details in contract administration)	5	63	3
Measurement on performance (i.e., assessment on service providers)	4	50	4
Allocation of human resources (i.e., senior management to junior)	4	50	4
FM practice and whole life cycle processes	4	50	4
Cost effectiveness (i.e., productivity)	4	50	4
Value of customers satisfaction	4	50	4
Resource sharing on people, budget, systems, information, and organization structure	4	50	4

6.3. Discussion of Critical Success Factors for Clients and Service Providers

As from the above literature review, identification of critical success factors is crucial for the clients and service providers to sustain success of outsourcing. The two rounds of Delphi surveying have revealed clients' and service providers' perspectives on how to sustain outsourcing in facilities management.

According to the analysis from the view of service providers, their objectives are mainly to compete and to survive in the challenging business world. In order to sustain their competitive advantages, it is necessary to increase their bargaining power in terms of skills, co-ordination, and allocation of human resources and assets accordingly. The service providers consider these kinds of attributes as important for their sustainability. Individual skills or competencies can be classified into technical and administrative capabilities, respectively. Service providers are required to utilize the latest and most advanced facilities and equipment to achieve high productivity in the workplace. As a working team, internal co-ordination is also paramount for the service providers to achieve efficient and effective systems in daily operation. Daily technical and administrative difficulties cannot be eliminated, but the output of high competence and efficient co-ordination of teammates can solve those problems. As for allocation of human resources and assets, effective deployment can raise the level of service provider productivity.

According to the Delphi study, clients focus on competence, performance, and cost effectiveness. Without a sufficient level of competence, it is difficult to drive and to operate the work effectively, especially for specialist facilities, such as technical centres, hospitals, airports, hotels, etc. In terms of commitment and utilization of resources for achieving a high level of performance, clients also emphasize the importance of efficient operation by a daily routine. Regardless of the type of resource, be it capital, human, or equipment and machinery, the management level of the companies should focus on operating efficiently to maintain a high level of performance. As for cost effectiveness or profitability, the more effective daily routine operation is, the more productive and profitable the business can be. Increasing profitability is critical in the clients' minds. In addition, decreasing the running cost of the business also contributes to the productivity of the companies.

6.4. Differences and Similarities between the Perspectives of Clients and Service Providers

The differences and similarities between the perspectives of clients and service providers on the critical success factors for outsourcing strategies were analysed. The clients concentrate on competence, performance, and cost effectiveness, whilst the service providers select skills, co-ordination, and allocation of human resources and assets. The difference between the stakeholders on the critical success factors for outsourcing strategies is that the former focus on measurement of performance but the latter focus on co-ordination.

Clients emphasize constructive outcomes from the support of service providers' high performance. The clients trust that the service providers can satisfy the requirements of users. The more satisfied the users are, the greater the profitability of the clients. The quality of provided services is related to the profitability of the clients from the supply of services. Therefore, clients generally emphasize the importance of service providers' performance.

As for the service providers, effective co-ordination can increase their survival in the challenging FM business environment. Nowadays, the efficiency and effectiveness of the provision of services to users are very high. To achieve high standards of service, the service providers must have constructive team work. Efficient and effective operation is of paramount importance.

Both groups agree upon the importance of skills, resources, and cost effectiveness of sustainable outsourcing services.

Advanced FM technology is developing rapidly because of globalization and the growing importance of information technology. Clients and service providers are required to equip themselves in alignment with the latest technology. This means that both groups must also upgrade their skills or competencies. Through effective utilization of skills and resources among the stakeholders, their co-operative outsourcing customer relationships can be sustained [58].

7. Conclusions

Outsourcing strategies were evaluated against various critical success factors. In the questionnaires, the respondents were asked to rate the factors accordingly. After finishing the two rounds of Delphi questionnaires from the clients and service providers, the findings were summarized. Clients' critical success factors are FM competence, measurement of performance, cost effectiveness, and co-ordination, while the service providers selected factors such as core skills, co-ordination, procurement strategies, measurement of performance, allocation of human resources, FM practice, cost effectiveness, customers' satisfaction, and resource sharing.

Clients are generally required to pay for provided services according to contracts and are convinced that the competence and performance of the service providers are critical to success. In addition, it is also expected that they can manage budgets through effective control mechanisms. However, service providers are required to provide satisfactory outsourcing services to the clients according to their contracts. Generally, the skills, capabilities, and co-ordination of service providers are critical to achieve outsourcing success. More importantly, service providers are also expected to supply high-quality outsourcing services to the clients through effective outsourcing management and communication to win new outsourcing contracts and renew existing outsourcing contracts. Finally, the identified critical success factors from clients and service providers were used to measure the four FM outsourcing relationship dimensions. Identification of those factors can be used to examine the design of outsourcing strategies of the two stakeholders. This study reveals a significant relationship between FM outsourcing relationship types and services in the context of Hong Kong's higher education sector. Clients and service providers have indicated that applying the FM outsourcing relationship types improves the quality of the services. As for the implications for professionals and academics of the critical success factors for outsourcing strategies, the former can apply the identified factors to their strategies for improvement of their outsourcing performance. The latter can theoretically study the factors to enhance their outsourcing.

8. Limitations and Future Research

Ref. [59] describes how one of the initial problems of the method was its inability to make complex forecasts with multiple factors. Potential future outcomes were usually considered as if they had no effect on each other. Later on, several extensions to the Delphi method were developed to address this problem, such as cross impact analysis which takes into consideration the possibility that the occurrence of one event may change probabilities of other events covered in the survey. In this study of outsourcing strategies, there is no need to consider complex forecasts with multiple factors. The Delphi

group size does not depend on statistical power, but rather on group dynamics for arriving at consensus among experts [57]. Thus, a Delphi study could be considered a type of virtual meeting or as a group decision technique in this study, though it appears to be a complicated survey.

Both clients and service providers focus on the importance of FM competence, productivity, co-ordination, and utilization of resources on the strategic level. Nowadays, the development of the world is faster than in the past because of globalization and the growth of information technology. Current transfer of human resources, materials, information, and big data is accelerated through electronic technology. The profession of facilities management can also be beneficial in alignment with the comprehensive information infrastructure around the world. All business can benefit from the rapid growth of information technology. However, this study neglected the significant growth of artificial intelligence, the Internet of Things, and big data. In addition, the study is limited geographically to government-funded tertiary institutes and universities in Hong Kong; an interesting line of enquiry would be to replicate this research across the corporate sector of the FM industry.

Future research is critical to investigate the impact of information technology on the design of outsourcing strategies for facilities management. Artificial intelligence may be able to predict future trends and development of FM issues and decrease related planning and operational costs. Today, [5] firms consider outsourcing as a network of stable agreements with specialized suppliers from a long-term, and thus strategic, perspective. FM service providers' capabilities can be assessed by a sustainable framework. This paper provides the initial step of identifying the critical FM outsourcing success factors.

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