



# Facilities Management Service Providers Competencies Reviews for Managing Green Buildings in Malaysia

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**Abstract:** Competence can be described as an individual's aptitude or capability to perform a task effectively. Competencies utilise job-related behaviour, motivation, and technical knowledge to ensure that all employment needs are met. Therefore, there is a list of competencies reserved for managing green buildings. However, there are still green buildings that are not well managed, and this is closely related to the level of competencies of a facility manager who manages the green building. This paper aims to determine the competency elements of facilities management service providers in managing green buildings. The qualitative method through document review with content analysis was used on selected previous research related to the topic. The five main facilities management service provider competencies in managing green buildings were defined as sustainable procurement, sustainable operations, resource management, repair and maintenance, and environmental health. The results are expected to reveal evidence that a framework, guideline, or specific training is needed to improve facilities management skills in future research.

**Keywords:** Competency, facilities management, green buildings, service provider

## 1. Introduction

Green building is a term that we are all familiar with. Green building is also known for buildings built to provide various benefits, especially to the environment. Green buildings are facilities that have a lower environmental effect than traditional structures. Green buildings are more advanced than conventional structures in terms of energy efficiency, resource depletion, and health and environmental protection. Malaysia's rapid urbanisation has contributed to increased carbon dioxide emissions (Anuar et al., 2019). According to Dwaikat & Ali (2018), "green building" describes a structure designed and constructed using sustainable construction principles.

Facilities managers will manage the green building after completing it to ensure it remains in good working order. Over the years, the facility management (FM) industry has emerged as one of the fastest-growing sectors. One of the facilities management goals is to reduce maintenance costs while preserving the quality of the facilities (Isa et al., 2016). Kamaruzzaman et al. (2018) believe that local facilities management practitioners lack competencies, and most facilities management companies in Malaysia only practise tactical and operational levels in their facilities management services. The Green Building Index (GBI) rating tool allows developers and building owners to design and create green, sustainable structures that can save water, electricity, provide a healthy indoor climate, enhance access to public transportation, and incorporate recycling and greenery into their projects, all while reducing our impact on the environment (Algburi et al., 2016).

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According to the Index (2021), Malaysia has 983 green buildings registered. However, only 570 of them are accredited. This indicated that the other 413 green building ventures reported had failed to meet the GBI's standard features. This raises the question of why green buildings still fail to meet the GBI standards and the extent of the competencies of facilities management service providers in managing green buildings in Malaysia. Facilities management (FM) service providers must equip themselves with specific attribute competencies to handle green buildings as efficiently as feasible, and the green building index certification will not be revoked. Among them are sustainable procurement, sustainable operations, resource management, repair and maintenance management, and environmental health. Thus, this study aims to identify the competency attributes among FM service providers towards managing green buildings in Malaysia and propose the FM service provider competency improvement for managing green buildings. In addition, this study also provides information to facilities management service providers to enable them to organise the facilities management service provider competency improvement for managing green buildings so that these green buildings will be well managed.

## 2. Literature Review

Facilities managers that lack the necessary competency traits to manage green buildings, on the other hand, will have problems managing green buildings. The following are a few of them. According to Lim (2013), disregarding components of a building after it is completed results in long-term inefficiency. Developers and facility management teams frequently have doubts about green buildings' ability to govern themselves. However, this is not the case. Facilities managers must continue to monitor and maintain green buildings. Unfortunately, facilities managers in Malaysia continue to take it easy, considering that green building management is unimportant (Lim, 2013). This demonstrates that they lack in-depth expertise and understanding of green building management.

In addition, inaccurate measurements are also an example of a regular difficulty for a facilities management team. Green building certification necessitates the retrieval of high-accuracy data via costly building management systems. However, these systems are frequently implemented by unskilled people and not thoroughly tested. As a result, the system cannot capture the data required for the facilities management team or energy auditor to understand how the building is doing, preventing the necessary energy-saving techniques from being implemented (Lim, 2013).

When facilities managers fail to apply competency qualities to green building management, a variety of challenges arise. However, when the skills traits are exercised, it has been shown to bring various benefits. Studies suggest that green building users are consistently happier with building design and facilities management elements than non-green building users. Design, facility requirements, building image, cleanliness, meeting room availability, and storage are just a few of them (Khoshbakht et al., 2018).

Green buildings are changing the way people construct, and Malaysia is gearing up for an early adoption because of the potential economic and environmental benefits. According to existing reports, greater ecological consciousness and corporate social responsibility among firms, and rising evidence that green buildings make financial sense will increase demand for green buildings. Despite growing interest, the danger of ambiguity continues to obstruct green building investment (Aliagha et al., 2013).

### 2.1 Competency in FM Service with Relation To Green Building

The importance of sustainable facilities management practices, such as developing new ways of working to meet sustainability assessment criteria and the up-skilling of facilities managers to do changing duties, is growing (Sarpin et al., 2016). Hence, facilities managers must prepare themselves with good sets of work competencies. Competencies comprise job-related behaviour, motivation, and technical knowledge and are utilised to ensure that all employment needs are met. Competence can be defined as focusing on skills rather

than understanding and its role in facilitating practice change (Michie et al., 2011). Contextual competence, technical competence, and behavioural competence are the three categories of competencies that must be settled.

Implementing green building management in green buildings results in facilities owners, managers, and renters saving money by optimising diverse energy, reducing emissions, and saving money (Goodman, 2008). However, there are several issues highlighted by the previous research faced by the manager. First is the high replacement costs in which many of the materials required for green construction are more expensive. Suppose a LEED-certified building is damaged in a storm, for example. In that case, property owners should expect to spend more to keep the structure's energy-efficient LEED certification than it would cost to replace it with non-LEED criteria. Other considerations that could raise the cost of rebuilding include that green building materials are more difficult to come by, and replacement parts may be limited by location.

Proper ventilation is the second issue the managers face where HVAC concerns for green buildings can be complex, primarily if the structure is humid. The amount of outside air brought into a building is part of LEED certification (Odom et al., 2009). When exceeding the minimum outside air requirements recommended by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, the designer must consider the increased energy load (and cost) and HVAC equipment sizing required to dehumidify a building properly.

Combating moisture and mould can enter a green building due to bulk water infiltration through the building's exterior or a relative humidity increase due to the heating, ventilation, and air conditioning (HVAC) system. Moisture problems may wreak havoc on a structure, eventually leading to its demise. If the mould spreads to other parts of the building, it could cause health problems (Odom et al., 2009).

It is getting more straightforward to find a construction business with sophisticated knowledge of green building materials, but it is still not guaranteed. Builders are sorting out items that have not been on the market for very long as green technology evolves. However, according to a Zurich Insurance Group (2011) report, many devices are being developed hastily and not adequately field-tested. This can result in legal wrangling over who is to blame if the product fails or meets expectations.

Finally, the consistent performance and expectations, unfortunately, result in property owners may not be getting what they paid for when constructing green in the present and future because the construction process is continually evolving. Therefore, business insurance advises organisations to ensure that the consultants and advisors they pick are well-qualified for satisfying expectations. Furthermore, risk managers must be worried about whether the structure continues to live up to its promises. Therefore, to ensure those facility managers who manage green buildings can do so as effectively as possible, they must be skilled in the competencies necessary for green building management. As a result, we can lower the number of green buildings that fail to pass this method's green building index certification.

### **3. Research Methodology**

A qualitative approach through document review is used to obtain information on the competence of facilities management service providers in managing green buildings. Several national and international literature reviews were collected and compared to achieve the objectives of this study. The information collected through document review will be examined using content analysis. The data resources used in this research are from journals and articles related to facilities management, green buildings, and competencies perspectives. The journals and article used are from Google Scholar and Emerald Insight database. The researcher will assess the competency attributes of the FM service providers in managing green buildings mentioned in the literature review as a result of this analysis.

### **4. Results and Discussion**

The reviews indicate five main facilities management competencies in managing green buildings: sustainable procurement, sustainable operations, resource management, repair and maintenance, and environmental health (as shown in Table 1.0). There 18 journals and articles being used for this analysis. 11 from the journals and articles were eligible for this research while another seven is not eligible.

Sustainable procurement methods adhere to sustainable development principles to maintain a healthy society, protect the environment, and promote good governance (Walker & Brammer, 2009). Sustainable procurement is a process by which companies fulfil their responsibilities for products, services, and capital projects to achieve long-term value for money while providing advantages to society, the economy, and the environment (Wilkinson et al., 2009). According to Brammer & Walker (2011), sustainable procurement methods aim to reduce the negative environmental, social, and economic implications of acquiring goods and services throughout their life cycle.

The strategies, systems, techniques, and operational policies that can assert economic and environmental goals are called sustainable operation management. The second definition includes sustainable operation management, defined as the planning, coordinating, and controlling a system that produces cost-effective results while preserving natural resources and the environment (Gunasekaran et al., 2014). Researchers in operations

management and management science place a high value on long-term operations (Gunasekaran & Irani, 2014). According to Gimenez et al. (2012), there are various principles in sustainable operation management. The first is sustainable operation management, which refers to skills and resources that enable a company to arrange its business processes to achieve long-term success.

According to Kakkar (2014), resource management covers natural and artificial resources to manage green buildings. It encourages resource use in a way that produces less pollution. Furthermore, resource management is an essential discipline since it leads to lower operating costs, increased productivity and profitability, and increased corporate competitiveness. The advantages of resource management frequently extend beyond energy, water, and waste (Aghili et al., 2017).

Environmental policy has primarily focused on addressing the most pressing issues related to pollution. However, the public and policymakers are increasingly focusing on reducing resource consumption and its environmental effects. According to Jones (2015), if we use our resources wisely, structures will inevitably be sustainable for the present and future. It is critical to complete energy, water, and waste management to meet resource management. Our natural resources will be used more efficiently if we make wise use of them. To summarise, in the green construction business, resource management is a relatively new and emerging concept.

Repair and maintenance describes how buildings and structures confront challenges caused by environmental conditions and vulnerabilities during their lives (Thaheem & De Marco, 2014). However, the terms "repair" and "maintenance" have different connotations. Maintenance entails taking preventative and corrective efforts to avoid collapsing the building and its systems (Thomson, 2012).

Furthermore, maintenance is responsible for restoring or improving every facility in any section of the building, its services, and its surroundings to establish standards and encourage the facility's tool values. In reality, proper and timely maintenance reduces harmful impacts on the environment and inhabitants, thus improving residents' quality of life (De Oliveira et al., 2014). On the other hand, repair is described as the act of rebuilding a broken, damaged, or failing item, equipment, part, or property to bring it back to a usable state (Sikdar, 2014).

Environmental Health (EH) is concerned with human health and quality of life, as determined by environmental physical, biological, social, and psychosocial factors. Furthermore, EH is concerned with the theory and practice of assessing, correcting, controlling, and preventing environmental conditions that may harm current and future generations (Frumkin, 2005).

Compared to general buildings, IFMA has drawn the competency benchmark for FM service providers. Eleven core competencies have been highlighted, namely, communication, performance and quality, real estate, project management, facility information management and technology management, operations and maintenance, risk management, sustainability, leadership and strategy, occupancy and human factors, and finance and business.

Communications - Ease of organisation necessitates the support of many stakeholders and the obligation to deliver information to them. As a result, stakeholder feedback is gathered, appropriate audiences are identified, relevant communications are planned, appropriate delivery mechanisms and communication frequency are selected, and the effectiveness of communication plans is evaluated.

Performance and Quality - The facility manager must be aware of and document the demands and expectations of stakeholders in terms of the facilities and services. To make continual improvements, they must measure the performance of facility organisations and service providers.

Real Estate - Property is supposed to be managed and monitored by facilities managers as a physical asset designed to assist the people who utilise it. Therefore, facilities managers must be familiar with property concepts and practices to give knowledge and experience about the property and its impact on business decisions and strategies.

Project Management - Because of the range of projects given to the facilities organisation, project management is a core competency in facilities management. The complexity, financial risk, scope, and timeliness of projects can all vary.

Facility Information Management and Technology Management - The facilities organisation provides services and maintains the internal and external building structures that house the technological infrastructure. Therefore, the facility manager must be skilled in the following areas: data verification, obtaining facility information, the planning, development, and use of technologies that support the facilities management function's day-to-day operations, data collection and automation of intelligent building systems, data management and reporting as well as the transformation of raw data into valuable and contextual knowledge.

Operations and Maintenance - A facility manager's primary responsibility is to oversee or supervise the operation of a facility. To do so, the facility manager must have a thorough understanding of the facility's structure, internal and external building systems, and the reasons for the facility and all of its critical systems to operate efficiently, reliably, safely, securely, and securely following existing regulations and standards.

**Risk Management** - The function of the facilities manager who has a primary concern for the health and safety of the built environment and parts as a custodian of the built environment, requires responsibility for business continuity, facility durability, and disaster preparedness.

**Sustainability** - Facilities are an essential component of every organisation's attempt to fulfil its social duties and comply with laws and regulations. Following minimal standards is not only a legal requirement, but it is also vital for the organisation's survival. Facilities managers must preserve the environment and the people who utilise their facilities while promoting organisational effectiveness and minimising risks and responsibilities. They must consider the facility's entire environmental impact as early as practicable in the design, facility management, construction, and planning phases.

**Leadership and Strategy** - Facilities managers must match the facility portfolio with the organisation's mission, demand, and available resources and be inventive to keep their employees and processes ahead of the curve to meet ever-changing needs. They should lead the facility organisation by guiding staff and service providers. In addition, they should impact demand organisation leaders and government officials, residents, business partners, community leaders, and suppliers by influencing their decisions and attitudes.

**Occupancy and Human Factors** - Facilities managers must preserve the environment and the people who utilise the facility while promoting organisational effectiveness and minimising risks and responsibilities. To have a good influence on all stakeholders, the astute facilities manager will examine the total impact of the facility at the earliest possible level in all planning, operation, maintenance, management, construction, and design activities.

**Finance and Business** - The facilities manager manages or oversees the organisation's overall operations, including considerable financial investments in technology, buildings, areas, internal, external, structural infrastructure, and significant operating expenses.

Table 1.0 below shows the facilities management competencies for general building and green building. IFMA (2020) has issued 11 competencies that should be practised by facilities management service providers in managing general buildings. Table 1.0 has shown that there has been a study on the competencies of facilities management service providers as early as 1999.

Based on Table 1.0, Clark & Hinxman (1999) stated ten competencies that need to be applied by facilities management service providers. Nevertheless, Kamaruzzaman et al. (2018) only stated six of the 11 competencies even though the study was recent. This is likely to happen because Clark and Hinxman (1999) conducted research extensively and openly; nonetheless, Kamaruzzaman et al. (2018) also researched in detail.

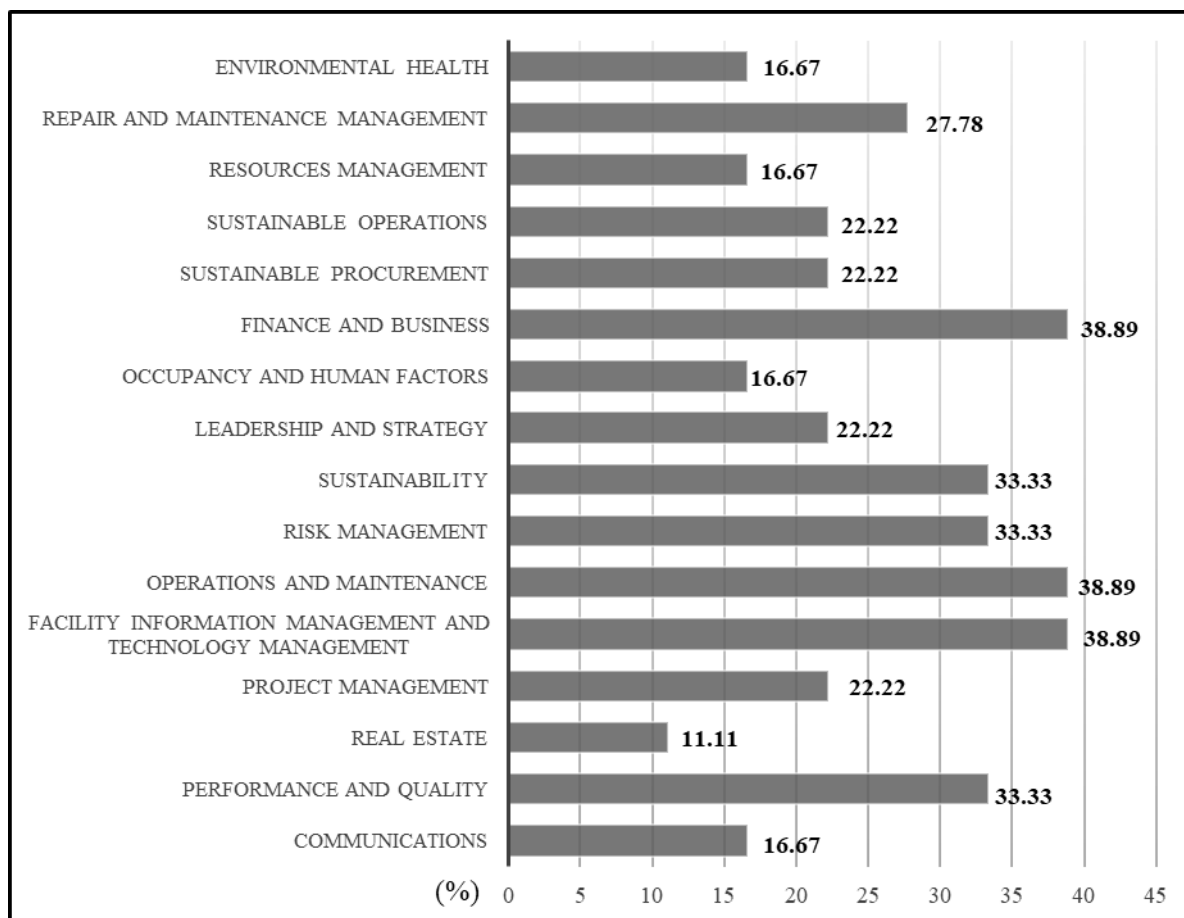
From the table above, Firdauz (2015) found five competencies of facilities management service for general building while Brown et al. (2010) tackles eight competencies. Most of the competencies found by both authors are the same, but Brown et al. (2010) manage to find more. This is because Firdauz (2015) only take the essential competencies that the majority of green building company have while Brown et al. (2010) take all including the common competencies

For green building, Aghili et al. (2017) manage to get five facilities management service provider competencies: sustainable procurement, sustainable operations, resource management, repair and maintenance, and environmental health. To compare with other authors, Aghili et al. (2017) found the most competencies. This is because the literature from Aghili et al. (2017) was from the newest year, 2017. As green building development improves year by year, the competencies of facilities management service providers will be increased.

Selected journals are ranging from 1999 to the year 2020 (refer to table 1.0). It shows that the least competencies studied was a real estate with 11.11 per cent. Communication, occupancy and human factors, resource management, and environmental health were at 16.67 per cent. Project management, leadership and strategy, sustainable procurement, and sustainable operations competencies were at 22.22 per cent. The repair and maintenance management competencies were at 27.78 per cent. Performance and quality, risk management and sustainability competencies were at 33.33 per cent. Finally, the most competencies studied are facility information management and technology management, operations and maintenance, and finance and business were at 38.89 per cent.

**Table 1 - Facilities management competencies for general building and green building**

Competencies of Facilities Management Service Provider		Clark & Hinxman (1999)	Frumkin (2005)	Walker & Brammer (2009)	Wilkinson et al. (2009)	Brown et al. (2010)	Brammer & Walker (2011)	Thomson (2012)	Gimenez et al. (2012)	Gunasekaran et al. (2014)	Gunasekaran & Irani (2014)	Thaheem & De Marco (2014)	Sikdar (2014)	De Oliveira et al. (2014)	Firdauz (2015)	Jones (2015)	Aghili et al. (2017)	Kamaruzzaman et al. (2018)	IFMA (2020)
<b>General Building</b>	Communications	✓			✓														✓
	Performance and Quality	✓			✓				✓					✓				✓	✓
	Real Estate	✓																	✓
	Project Management	✓				✓									✓				✓
	Facility Information Management and Technology Management	✓				✓					✓			✓	✓			✓	✓
	Operations and Maintenance	✓				✓				✓	✓			✓	✓				✓
	Risk Management	✓				✓				✓	✓		✓					✓	✓
	Sustainability								✓	✓	✓	✓	✓					✓	✓
	Leadership and Strategy	✓				✓												✓	✓
	Occupancy and Human Factors	✓													✓				✓
	Finance and Business	✓				✓			✓	✓					✓			✓	✓
<b>Green Building</b>	Sustainable Procurement			✓	✓		✓											✓	
	Sustainable Operations								✓	✓	✓							✓	
	Resources Management	✓														✓	✓		
	Repair and Maintenance Management							✓				✓	✓	✓				✓	
	Environmental Health	✓	✓															✓	



**Fig. 1 - Percentage of facilities management competencies mentioned in Journals**

## 5. Conclusion

Based on the results we have collected and compared from several journals and articles regarding competencies in facilities management service providers for both general and green building, it can be observed that not all five competencies in green building management are applied along with the 11 competencies of facilities management service providers outlined by the International Facilities Management Association (IFMA). This can be concluded that there is a need for competencies improvement in facilities management. Competencies improvement in facilities management must be emphasised because this can maintain the effectiveness of building maintenance in the long run. This research identifies that five attribute competencies have the potential to be pursued in further studies. The five competencies in facilities management are sustainable procurement, sustainable operations, resources management, repair and maintenance management, and environmental health. Further research can be continued in detailing what indicators of each element, characteristic, and improvement that need to be done. In the following additional research, we propose a new framework that requires a model to unify general and green building competencies.

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