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Farhan Md Dahlan, Asniza Hamimi Abdul Tharim, Ashrof Zainuddin, Noraini Md Zain, Suhaila Ali, Siti Nadiah Mohd Ali

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Determining Critical Success Factors (CSFs) of Facilities Management in High-rise Strata (HRS) Housings: The Case of Malaysia

Farhan Md Dahlan, Asniza Hamimi Abdul Tharim, Ashrof
Zainuddin, Noraini Md Zain, Suhaila Ali, Siti Nadiah Mohd Ali
Department of Built Environment Studies and Technology, Faculty of Architecture, Planning
and Surveying, Universiti Teknologi MARA Perak Branch, 32610, Seri Iskandar, Perak,
Malaysia

Abstract

Aged, high-rise strata (HRS) housing's safety is critical as to lengthening the life span of the physical buildings towards sustainability in cities. The performance of the facilities management (FM) organization managing HRS housing schemes determines the extent of residents' expectations of the building. This study provides an empirical study on the identification of the critical success factors (CSFs) towards effectiveness of FM organization's performance in managing aged HRS housing schemes in Malaysian industries. Through a face-to-face questionnaire survey throughout HRS housing, aged more than 10 years old after certificate of completion and compliance (CCC) issuance, this study examines the level of critical each of the success factor is considered from the perspective of committee members, facilities managers, and residents in Kuala Lumpur. All types of respondents' categories felt that all 5 success factors were perceived as "critical", with the most emphasis given to the financial resources. These CSFs offer new insights into the understanding of the respondents' perceptions towards their effectiveness performance in managing aged HRS housing schemes in Malaysian industries.

Keywords: Critical Success Factors, Facilities Management, Aged High-Rise Housing.

Introduction

Facilities management (FM) is an activity that supports an organisation's primary activities. The Malaysian National Housing Policy (2018–2025), in addition, emphasises the need for the maintenance of the existing housing to enhance the life span of the building and enhance the residents' safety and comfort. Therefore, FM is needed to ensure that each element of a building is provided at optimum functionality and meets the users' needs in changing conditions, thus achieving sustainable cities. Unfortunately, scarce mechanism such as guidelines, standard of operation as a reference point for the FM organizations in managing aged, HRS housing. Added with poor management practices being a bone of contention among the residents and management body. Some HRS housing schemes are equipped with basic facilities, such as a children's playground and building services for example, lift, power supply, and water supply (Tiun, 2006). Some are equipped with vertical transportation

systems, landscaping and gardening, swimming pools, sports and recreational facilities, social facilities, sheltered parking lots, and high-security accessibility (Au-Yong et al., 2019). The more facilities are provided, the more complex the management will be. Such complexity is more apparent in places where the demographic profiles of the residents are heterogeneous. The management and maintenance of these common properties, services, facilities and physical building are crucial to ensure their operability and functionality. Eventually, demanding integration of FM discipline and local communities aiming for sustainable cities (Alexander & Brown, 2006). Such a case requires a systematic and structured management. Several previous studies have reported that aged HRS housing schemes imposes higher risks compared to large modern buildings. Ignorance may result in catastrophic consequences if a building failure occur. Such incidences causes the inability to extend a building's lifespan and accelerate the obsolescence process (Vergara et al., 2019; Gifford, 2011; Yau et al., 2008; Tiun, 2006). These in turn will affect the revenues of the real estate (Hui et al., 2013; Mossel & Jansen, 2010). Therefore, this study intended to examine the level of critical each of the success factors considered from the perspective of committee members, facilities managers and residents. The CSFs identification of this study was based on internal and external factor (Vieira et al., 2019; Freund, 1988; Leidecker & Bruno, 1984) of FM organisation focusing on human-related factors because, according to Aziz et al (2014); Ariff (2018) the role of stakeholders is the driver of management effectiveness in high-rise housing strata. There are 5 variables involved in the development of the research frameworks.

Literature Review

Critical Success Factors (CSFs) are "the essential points that must be achieved by an organisation in order to receive the greatest competitive leverage" (Brotherton & Shaw, 1996). Rockart (1979) defined the CSF approach as having a limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisations. Therefore, Rockart (1979) further defined these factors as "areas where things must go right and as key areas where favourable results are absolutely necessary if management goals are to be reached." According to Bonyton and Zmud (1986) the CSFs are "areas of those few things that must go well to ensure success." From the definition of CSFs addressed above, it is clear that CSFs aim to achieve a company's business objectives by focusing on a few key management practises that, if sufficient, will produce the desired outcome.

- *Financial Resources*

In HRS housing, financial resources are crucial in controlling the quality and functionality of the properties and assets (Rasip, 2017; Gao & Ho, 2016; Abd-Wahab et al., 2015). Financial resources in managing HRS housing schemes are used for administrative tasks such as administration work, staff salaries, operation costs, insurance, utilities bills, and any penalty charges (Abd Wahab et al., 2016). Financial support is provided for maintenance spending, i.e., cleaning, minor repair work, electrical supervision in each unit of the parcel, and scheduled maintenance of the landscape and lifts. In addition, financial support is needed for exclusive facilities maintenance, i.e., swimming pool maintenance, pest control, security fees, and maintenance of CCTV. The funds are also used for large-scale projects such as painting, replacing lift motors, equipment, or lift cars, or any other large-scale project that necessitates a large sum of money. As a result, any arrears must be minimized as much as possible (Salleh et al., 2016). If no mitigating actions were taken, it may have resulted in

catastrophic consequences if building failures occurred (Gifford, 2011), not to mention in aged buildings (Vergara et al., 2019). In turn, this affects the residents' safety and comfort, shortens the life span of the building, and causes dysfunction of the common properties, services, facilities, and physical building.

- *Committee Members' Commitment*

The committee members, particularly the chairman, secretary, and treasurer, will act as the top management, whose role is to be the pillars of decision-making. Correspondingly, Johnston and Too (2015) stated that the primary role of a management body is to make decisions within the framework set by the management governing the strata housing. The decision was made to achieve an acceptable standard of living for the residents. Jonsson, (2020) claims that the way a management body manages and governs strata housing has a significant effect on the quality of the buildings. The way a management body manages and governs their strata housing enhances the lifespan of the buildings, thus ensuring that the common properties, services, and facilities are fit for purpose. The aim is to achieve an acceptable standard of living and create a conducive neighbourhood environment. Tyagi et al., (2015) support that top management is responsible for all the activities in an organisation with a view to conceptualising a vision for the successful implementation of the required activities and proposing any changes. They are the ones who are responsible for an organisation's continuous improvement.

- *Pre-condition During Developer's Transition Period*

The developer is the stakeholder who creates the strata housing, beginning from the strategic definition stage until the handover stage to the subsequent management. Blandy et al., (2006) point out that a developer's ability in coordinating governance, decision-making, and overall development management has implications in the long run. Other scholars have unanimously concurred that a developer's actions in establishing a strata housing will affect substantially the effectiveness of the governance and management. These actions translate into matters such as the contracts entered into, the quality of the building, the design and layout, the service charge forecasting, and funds raised to maintain the common properties (Blandy et al., 2006; Easthope et al., 2012; Johnston et al., 2012; Johnston & Reid, 2013; Easthope et al., 2014; Sajan, 2015; Waziri, 2016). The developer decides which design to build, what layout to adopt, which team of trades to achieve what standard of workmanship, and which building materials to use. Upon completion, inappropriate budget settings, entering unsuitable long-term contracts, and retention of majority voting power of all affect the viability and functionality of a strata scheme. They will also be grounds for continuing the conflict inherited by the subsequent management, even though the developer has ceased being the management of the scheme (Easthope et al., 2013, 2014; Easthope & Randolph, 2009, 2016). Problems may arise due to financial viability issues, resulting in management ineffectiveness, and in the worst-case scenario, affecting the balance of power amongst owners and causing disagreements (Easthope & Randolph, 2016). The decisions or actions taken by a developer during the development phase will have long-term consequences on any HRS housing schemes once it enters the occupancy phase, affect the quality of building throughout the building life, and lead to ineffectiveness of the management.

- *Residents' Role*

In practice, it is the owners who usually use a building on a daily basis and take part in its day-to-day management affairs. Residents are the building users who benefit the most from good management and lose the most from poor ones (Gao, 2015). Compared to the other stakeholders (government, management body, individual homeowners, MA if appointed, tenants, and the general public, i.e., visitors and pedestrians), residents, particularly homeowners, have greater incentives to participate in managing FM. They are legally responsible for managing their strata schemes. Their role is the key to good management practises (Gao, 2015). Unlike single-ownership dwellings, which are owned by sole owners, HRS housing schemes involves multiple owners sharing the common properties and facilities. Additionally, there is the issue of the heterogeneity of residents' backgrounds, leading to a diversity of residents' interests (Hansmann, 1991). Thus, collective action is required from among them. Heterogeneity of the residents' backgrounds has been explained by (Gao and Chen, 2016). Gao and Chen (2016) explain that the heterogeneity of residents includes heterogeneity in the aspects of knowledge, tenure mode, and period of time living in the building. These disparities cause the residents to have little common ground. Gao (2015) argued that this leads to disagreements and disputes among the residents and the management body. To reconcile, collective action among residents is needed towards harmonious neighbourhoods, thus achieving sustainable cities.

- *Competence of Facilities Manager*

A facilities manager is an agent who has been appointed by the management body to provide agency services on their behalf. According to Yong (2015) an agent is a trustee who is designated by unit owners to manage their assets in trust for the benefit of another person. In other words, agent is maintenance personnel involved in the HRS housing, with the position of building managers, building executives, facilities manager, strata manager or resident's manager which work in daily basis of official management body in the schemes. They are the person-in-charge when it comes to planning and executing maintenance programs. They are the FM professionals eligible to provide reliable and valid information about the maintenance practise in the schemes they work in (Ali, et al., 2019). Their professionalism in managing Hong Kong private HRS housing, should contribute to improved building management and a longer building life, assist in maintaining the value of a property (Chau et al., 2003; Kent, Merry & Walters, 2002) and prevent the increase of unauthorised building works in common building (Lai & Yik, 2011). Hence their role in FM is essential as they control the process of the maintenance and ensure that the related activities are carried out effectively.

Methodology

Research methodology is critical because it can guide researchers on what steps to take in order to meet the research objectives. In this study, the purpose was to use the perceptions and experiences of FM organisations managing HRS housing schemes in Kuala Lumpur, Malaysia as the basis of data collection. The analysis has enabled the identification of CSFs towards the effectiveness of the FM organisation managing HRS housing schemes in Kuala Lumpur. A total of 348 questionnaires were distributed for each HRS housing schemes involving 116 non low-cost (NLC), private in Kuala Lumpur aged more than ten (10) years old. The questionnaire was targeted at the committee members, residents who used to be members of the committee and facilities managers who work on a daily basis with the official management body.

The method used for gathering data was a face-to-face survey. The method was chosen because of the difficulty of answering mail or telephone surveys because of disability or infirmity (Doyle, 2005). A similar method was also used by Sajan (2015) which used a sample of private HRS housing schemes in Australia. A total of 181 questionnaires were returned, of which 152 were valid. The response rate was 50.2 per cent. According to Sajan (2015), reaching out to respondents is a significant challenge in such studies. Non low-cost, private HRS housing schemes is believed to have strict accessibility to give privacy and high security to the residents in the scheme as it is built for the services. Peck et al (2008) state that sample size is an important aspect of any empirical study in which the goal is to draw conclusions about a population from a sample. This study's estimated sample size was 103 out of the 348 eligible target population with a confidence level of 95% and with a beta-value of 0.2 (80% error) and the number of groups (referring to the independent variable of the research) was 7. This was calculated using an automated software programme named the G*Power program. This sample size calculator has been used by many researchers in various fields of research to calculate the sample size of their research, such as (Alpak et al., 2015; Al-Bitar et al., 2013; Al-Qazaz et al., 2011). It was also used in a similar field of study as this research, for example, by Desa et al (2012); Araújo et al (2019) hence showing that the sample size calculation is rational and reliable for this study.

Prior to the actual survey, the pilot questionnaires were distributed with 52 questionnaires to non low-cost, private in Selangor to ensure it reflected the real scenario of the industry. Then the reliability test was carried out by calculating the Cronbach's coefficient alpha value. The overall Cronbach alpha value was 0.950. This means that all questions in the questionnaire received coefficient alpha values more than 0.60, which indicates acceptable reliability (Sekaran & Bougie, 2016). Therefore, the result of the reliability test verifies that all variables in the study demonstrate internal consistency and the questionnaire survey could be carried out to all targeted respondents. A five-point Likert scale was used to assess the influence of the listed CSFs towards the effectiveness of FM organizations managing HRS housing schemes ranging from 1 (not very critical) to 5 (very critical) was adopted. In order to identify the level of critical priority of each factor, the ranking analysis using mean score value was computed using the following formula:

$$\text{Mean } (\bar{x}) = \frac{\sum x_i}{n}$$

where,

x_i was the sum of scores given to each variable by the respondents;

n was the total number of responses for that particular variable; and

i was for the respective variables.

When the mean values of the CSF were identical, the approach taken was to choose the one with the lesser standard deviation. This approach has been utilised previously in research (see Ahadzie et al., 2008; Chileshe & Yirenki-Fianko, 2012). Using Ikediashi et al., (2012, p. 306) analysis, a benchmark of 3 [(1 + 2 + 3 + 4 + 5)/5 = 3] was utilised to identify significant CSFs. Following that, any CSFs with mean values ≥ 3 were classified as significant.

Results

- Respondents' Background

The response rate of this survey was 52.9% consisting of 21 (13.82 per cent) committee members, 59 residents (38.81 per cent) and 72 (47.37 per cent) facilities managers (refer Table 1). According to the findings, the respondents are the people who truly understand the operation of non-low-cost, private, HRS housing, implying that the data gathered in this study came from reliable sources because the respondents were at the forefront of managing FM in the housing schemes.

Table 1

Category of Respondents (n = 152)

Category of Respondents	Frequency (n)	Percentage (%)
Committee members	21	13.82 %
Residents	59	38.81 %
Facilities Managers	72	47.37 %
Total	152	100.00 %

The experienced of the committee members and facilities managers managing HRS were assessed involving 93 respondents. Among the committee members and facilities managers almost 42 per cent had experienced more than 5 years (refer Table 2). Meanwhile, the remaining (46.23 per cent) had less than 5 years' experience. About 11.83 per cent did not answer the questions.

Table 2

Years of Experience Among Committee Members and Facilities Managers (n = 93)

Years of Experience	Committee Members (n)	Facilities Managers (n)	Total	Percentage (%)
Less than 5 years	9	34	43	46.23 %
5 to 10 years	2	20	22	23.66 %
11 to 15 years	2	9	11	11.83 %
More than 16 years	1	5	6	6.45 %
Missing value	7	4	11	11.83 %
Total	21	72	93	100.00 %

- Housing Characteristics

From the 116 HRS housing schemes surveyed, only 83 were involved in this survey. About 42.2 percent of the schemes are managed by JMB, while the remaining 57.8 % is in the MC management mode (refer Table 3). JMB's management consists of JMB that is managed by the MA (outsourced) (7.2 %) and JMB that is managed by the committee member (in-house) (34.9 %). For HRS housing schemes managed by the MC (in-house), about 37.3 % are managed by MC while 20.5 % from the MC is managed by MA. The analysis indicates that although the age of the HRS housing schemes in Kuala Lumpur is more than ten (10) years, there still exist strata schemes without a strata title. This research involved more MC managed in-house compared with other management modes.

Table 3

Type of Management Mode (n = 83)

Management Mode	Frequency (n)	Percentage (%)
JMB (outsource to MA)	6	7.2 %
JMB (in-house)	29	34.9 %
Total JMB	35	42.2 %
MC (in-house)	31	37.3 %
MC (outsource to MA)	17	20.5 %
Total MC	48	57.8 %

Table 4 shows the cross-tabulation of housing age and management mode. Most of the respondents from the HRS housing schemes (46.99%) state that their strata housing is aged between 31 and above, followed by those aged between 11 to 20 years (22.89%) and 21 to 30 years old (20.48%). A small percentage (9.64%) of the schemes are aged 10 years. According to these findings, more than 90% of HRS housing schemes are more than 10 years old. The analysis also identified that the HRS housing schemes managed by JMB (outsourced to MA) was aged 10 years (16.67%), 11 to 20 years (33.33%), 21 to 30 years (16.67%), and 31 years or more (33.33%). The majority of JMB (in-house) is the age of 31 or more (37.93%), approximately 34.48 percent being between the ages of 21 and 30. The remaining schemes are aged 10 years old and 11 to 20 years old, with 13.79% each. As for both types of JMB management mode, most of the HRS housing schemes is aged 31 years or more. The analysis also revealed the housing age under the management of MC (in-house) and outsourced to MA. Approximately, 61.29 percent of HRS housing schemes under MC (in-house) is at least 31 years old. This is followed by 22.58% aged 11 to 20 years old. The remaining, aged 10 years old and 21 to 30 years old, contribute a percentage of 6.45% and 9.6% respectively. Meanwhile, the HRS housing schemes under the management of MC outsourced to MA indicates that the majority (41.18%) are aged 31 years or more, followed by 35.29% aged 11 to 20 years old. The remaining, aged 10 years old and 21 to 30 years old, contribute a percentage of 5.88% and 17.65%, respectively. This finding indicates that in both types of MC management mode, the majority of the HRS housing schemes is aged 31 years or more. The findings above indicate that this study involves the management of four (4) types of management modes: JMB outsource to MA, JMB (in-house), MC outsource to MA, and MC (in-house). Overall, most of the HRS housing schemes under the four (4) types of management mode is more than 31 years old. This finding indicates that the sample of this study consists of buildings older than 10 years.

Table 4

Cross Tabulation of Housing Age and Management Mode (n = 83)

	Cross-tabulation of Housing Age and Management Mode (n = 83)									
	Management Mode								Total Overall (n=83)	
	JMB (outsource to MA) (n = 6)		JMB (in-house) (n = 29)		MC (in-house) (n = 31)		MC (outsource to MA) (n = 17)		n	%
	n	%	n	%	n	%	n	%	n	%
10 years	1	16.67%	4	13.79%	2	6.45%	1	5.88%	8	9.64%
11 - 20 years	2	33.33%	4	13.79%	7	22.58%	6	35.29%	19	22.89%
21 - 30 years	1	16.67%	10	34.48%	3	9.68%	3	17.65%	17	20.48%
31 years & more	2	33.33%	11	37.93%	19	61.29%	7	41.18%	39	46.99%
Total	6	100.0%	29	100.0%	31	100.0%	17	100.0%	83	100.0%

- *Ranking Analysis*

Following the ranking analysis using mean score values was conducted for the identification of the CSFs of management practises for managing aged HRS housing schemes in Malaysian industries. The analysis was based on the perspective of committee members, facilities managers and residents in Kuala Lumpur. The data as shown in Table 5 indicated that out of the mean scores for the 5 CSFs towards effectiveness of FM organization's performance rated by overall respondents, financial resources were seen to have high influence in NLC, private HRS housing schemes with the mean value of 4.20. Residents' role (M = 4.13) was ranked as the second CSFs towards effectiveness of FM organization's performance. The third, fourth and fifth were the pre-condition during developer transition period (M = 4.12), leadership and motivation (M = 4.02) and committee members' commitment (M = 3.97) respectively with critical influence.

Further, the mean score values according to the perception of each respondent were assessed to identify the level of critical priority towards the effectiveness of the FM organisation's performance in managing HRS housing. The findings were explained based on the perspectives of the committee members, residents, and facilities managers. Initially, two (2) factors were rated as critical by committee members: financial resources (M = 4.18) and residents' role (M = 4.07). Other factors that are perceived to have a critical influence on the effectiveness of the FM organisation's performance in managing HRS housing schemes are pre-conditions during the developer transition period (M = 3.97) and committee members' commitment (M = 3.89). However, a competent of facilities managers was ranked the least critical by the committee members.

From the residents' perspectives, financial factors (M = 4.13) were the most critical factors towards the effectiveness of the FM organisation's performance in managing HRS housing schemes. Both the residents' factor (M= 4.07) and the pre-conditions during the developer transition period (M = 4.07) were ranked second and third, respectively, by the residents. Respondents ranked committee members (M = 3.89) fourth. The residents believed

that a competent of facilities managers ($M = 3.83$) was the least important factor. From the perspective of the facilities managers, they also ranked financial resources as the most critical factor ($M = 4.25$). Pre-condition during the developer transition period was ranked second ($M = 4.22$), followed by residents' role ($M = 4.13$) and committee members' commitment ($M = 4.06$). Competence of facilities managers were rated the lowest by facilities managers ($M = 3.84$). The analysis indicated that financial resources are the most critical priority towards the effectiveness of the FM organisation's performance in managing HRS housing schemes. Meanwhile, competence of facilities managers was the least critical towards the effectiveness of the FM organisation's performance in managing HRS housing schemes.

Table 5
Ranking Analysis Based on Type of Respondent (n = 152)

Constructs (CSFs)	Overall (n=152)		Committee members (n=21)		Residents (n=59)		Facilities Managers (n=72)	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Financial Resources	4.20	1	4.18	1	4.13	1	4.25	1
Residents' Role	4.13	2	4.07	2	4.07	2	4.13	3
Pre-condition during Developer Transition Period	4.12	3	3.97	3	4.08	3	4.22	2
Committee Members' Commitment	3.97	4	3.89	4	3.89	4	4.06	4
Competence of Facilities Managers	3.89	5	3.75	5	3.83	5	3.99	5

Discussion

Financial resources factor was identified as the topmost critical influence on the effectiveness of the FM organisation's performance in managing HRS housing schemes. The result is expected because financial resources are crucial for controlling the quality and functionality of properties and assets (Abd-Wahab et al., 2015; Gao & Ho, 2016; Rasip, 2017). A research in Sweden by Jonsson (2020) found that the residents' perception of building quality was the indicator of the housing cooperatives' effectiveness. In the local context, a study by Rasip (2017) revealed that the residents' payment attitude was affected by the quality of the management managing their HRS. Budget shortage was also found to possibly lead improper repair and maintenance. The factor may result in catastrophic consequences if building failures occur (Gifford, 2011), not to mention in aged buildings (Vergara et al., 2019). The residents' safety and comfort are affected, the building's life span is shortened, and the common properties, services, facilities, and physical building may become dysfunctional.

The result of this study shows that the residents' role was ranked the second-highest critical in influencing the effectiveness of FM organisation's performance by committee members and residents. Basically, residents' role is the key to good management practices (Gao, 2015). Residents usually use a building daily and take part in its day-to-day management affairs. They are legally responsible for managing their HRS housing schemes. The residents have to share the responsibilities so that they live peacefully and harmoniously. Collective

actions are required among them (Ho et al., 2006; Gao, 2015; Gao & Chen, 2016) towards achieving the same benefits and an acceptable living standard. Hence, every resident is bound by the laws and regulations. However, this CSF was ranked the third by the facilities managers as they perceived the precondition during the developer's transition period was more critical compared to residents' role. The preconditions during the developer transition period were ranked the third-most critical in influencing the effectiveness of the FM organization's performance in managing HRS housing schemes by the committee members and residents. Meanwhile, this CSF was ranked the second highest by the facilities managers. The developer's actions during the initial establishment of the scheme can have a significant impact on effective governance throughout the life of the building (Easthope & Randolph, 2016). Sajan (2015) argued that poor design, inadequate building regulations, and possible inconsistencies in certification are the primary causes of high operational maintenance costs in the future. When the cost-effectiveness of a building's long-term operational maintenance activities is affected and imposes insufficient funds (Easthope & Randolph, 2016), the residents will become dissatisfied (Easthope & Randolph, 2016). Easthope et al (2014) contended that developers are the ones responsible for choosing their design and construction professional team from the strategic definition stage to vacant possession. In addition, upon completion, inappropriate budget settings, entering unsuitable long-term contracts, and retention of majority voting power of all affect the viability and functionality of a HRS housing. They will also be grounds for continuing the conflict inherited by the subsequent management, even though the developer has ceased being the management of the scheme (Easthope et al., 2013, 2014; Easthope & Randolph, 2009, 2016). Therefore, efforts at identifying operation and maintenance concerns are important during the strategic definition stage as the measure will influence a building's sustainability as well as their decisions and actions upon completion of the schemes.

Committee members' commitment was ranked the fourth by all the respondents. Committee members who are elected by the unit owners, represent them in the management and governance of their HRS housing. Their primary role is to make decisions within the framework set by the management governing the housing scheme to achieve the objectives set by them (Johnston & Too, 2015). They are responsible for the maintenance and management of the common properties, services, facilities, and physical buildings. This measure serves to ensure that the housing scheme remains at an acceptable standard and is fit for its purpose. The committee members; particularly the chairman, secretary, and treasurer will act as the top management whose role is as the pillars of decision making. Correspondingly, Johnston and Too (2015) stated that the primary role of a management body is to make decisions within the framework set by the management governing the HRS housing. The decision is arrived at to achieve an acceptable standard of living by residents. However, they could be inexperienced in the FM of their HRS housing. Yet, they are carrying out the residents' trust voluntarily (Aziz et al., 2014; Christudason, 2004). Such necessitates a FM professional and management body to work together in sharing information and expertise, considering their common benefits and interests. Technical advice and inputs from the facilities managers, neither in-house nor out-source (MA), are needed. The way they managed and governed their HRS housing schemes affect the lifespan of the buildings hence ensuring that the common properties, services, and facilities are fit for purpose.

The fifth CSF was competence of facilities managers. The results of this study found that the influence was at a critical score although least ranked by all the respondents. Their role in FM is essential as they control the process of maintenance and ensure that the related activities are carried out effectively (Chua et al., 2018). The findings are consistent with the literature of FM-related research. Vilutiene and Zavadskas (2003) found that FM specialists and people who work in the FM field needed more experience. They identified that experienced people faced more real problems on-site but managed to solve the problem compared to those who lack experience. Similarly, Au-Yong et al (2014) noted that a skillful and experienced skilled technical staff can eliminate errors and mistakes when carrying out maintenance works. The previous research highlights that facilities manager need to have the ability to handle the entire management's complexity. This study assumes that the factor was ranked the least was not because they are not critical towards effectiveness of FM organisation's performance, but, rather when a comparison is made between other significant success factors, competence of facilities managers is less critical. In addition, the possible reason this factor was ranked the least critical was that the owners of aged HRS housing schemes may have expected that as the building gets older, some things will be broken and therefore, it is acceptable that it stays that way (Hudson, 2011).

Conclusion

This study presents the results of the identification of the CSFs towards the effectiveness of a FM organisation's performance in managing aged HRS housing schemes in Malaysian industries. A total of 5 success factors were considered in the study involving 116 non low-cost (NLC), private HRS housing schemes in Kuala Lumpur aged more than ten (10) years old. All types of respondents' categories felt that all 5 success factors were perceived as "critical", with the most emphasis given to the financial resources. Based on the finding and discussion, financial resources were the topmost CSFs influencing the effectiveness of the FM organisation's performance. The least ranked CSFs were the competence facilities managers. These CSFs offer new insights into the understanding of the respondents' perceptions towards their effectiveness and performance in managing aged HRS housing schemes in Malaysian industries.

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Corresponding Author

Farhan Md Dahlan

Department of Built Environment Studies and Technology, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA Perak Branch, 32610 Seri Iskandar, Perak, Malaysia
Email: farha221@uitm.edu.my.

References

- Abd-Wahab, S., Sairi, A., Che-Ani, A. I., Tawil, N. M., & Johar, S. (2015). Building maintenance issues: A Malaysian scenario for high-rise residential buildings. *International Journal of Applied Engineering Research*, 10(6), 15759–15776.
- Abd Wahab, S. R. H., Che Ani, A. I., Sairi, A., Mohd Tawil, N., & Abd Razak, M. Z. (2016). Classification of high-rise residential building facilities : a descriptive survey on 170

- housing scheme in Klang Valley. In Ali, A. S. B. et al. (Eds.), *The 4th International Building Control Conference 2016 (IBCC 2016)* (pp. 4–7). EDP Sciences.
<https://doi.org/10.1051/mateconf/20166600103>.
- Ahadzie, D. K., Proverbs, D. G., & Olomolaiye, P. O. (2008). Critical success criteria for mass house building projects in developing countries. *International Journal of Project Management*, 26(6), 675–687.
- Al-Bitar, Z. B., Al-Omari, I. K., Sonbol, H. N., Al-Ahmad, H. T., & Cunningham, S. J. (2013). Bullying among Jordanian schoolchildren, its effects on school performance, and the contribution of general physical and dentofacial features. *American Journal of Orthodontics and Dentofacial Orthopedics*, 144(6), 872–878.
<https://doi.org/10.1016/j.ajodo.2013.08.016>
- Al-Qazaz, H. K., Hassali, M. A., Shafie, A. A., Syed Sulaiman, S. A., & Sundram, S. (2011). Perception and knowledge of patients with type 2 diabetes in Malaysia about their disease and medication: A qualitative study. *Research in Social and Administrative Pharmacy*, 7(2), 180–191. <https://doi.org/10.1016/j.sapharm.2010.04.005>.
- Alexander, K., & Brown, M. (2006). Community-based facilities management. *Facilities*, 24(7–8), 250–268. <https://doi.org/10.1108/02632770610666116>.
- Alpak, G., Unal, A., Bulbul, F., Sagaltici, E., Bez, Y., Altindag, A., Dalkilic, A., & Savas, H. A. (2015). Post-traumatic stress disorder among Syrian refugees in Turkey: A cross-sectional study. *International Journal of Psychiatry in Clinical Practice*, 19(1), 45–50.
<https://doi.org/10.3109/13651501.2014.961930>.
- Araujo, M. B., Anderson, R. P., Barbosa, A. M., Beale, C. M., Dormann, C. F., Early, R., Garcia, R. A., Guisan, A., Maiorano, L., Naimi, B., O'Hara, R. B., Zimmermann, N. E., & Rahbek, C. (2019). Standards for distribution models in biodiversity assessments. *Science Advances*, 5(1), 4858. <https://doi.org/10.1126/sciadv.aat4858>.
- Ariff, N. R. M. (2018). Improving governance of high-rise MOPs in Malaysia. In Altmann, E. & Gabriel, M. (Eds.), *Multi-Owned Property in the Asia-Pacific Region: Rights, Restrictions and Responsibilities* (pp. 269–289). Palgrave Macmillan. https://doi.org/10.1057/978-1-137-56988-2_15.
- Au-Yong, C. P., Ali, A. S., & Ahmad, F. (2014). Optimising maintenance cost performance with skilled technicians. *Structural Survey*, 32(3), 238–245. <https://doi.org/10.1108/SS-01-2014-0005>.
- Au-Yong, C. P., Ali, A. S., & Chua, S. J. L. (2019). Maintenance priority in high-rise housings: Practitioners' perspective versus actual practice. *Journal of Engineering Research (Kuwait)*, 7(2), 167–177.
- Aziz, W. N. A. W. A., Haniff, N. R. Z. N. M., Aini, A. M., Sarip, A. G., & Zyed, Z. (2014). Vertical Living Phenomenon in Malaysia. *FIG Congress 2014, Engaging the Challenges - Enhancing the Relevance*, 16 – 21 June, June, 2014.
- Blandy, S., Dixon, J., & Dupuis, A. (2006). Theorising power relationships in multi-owned residential developments: Unpacking the bundle of rights. *Urban Studies*, 43(13), 2365–2383.
- Bonyton, & Zmud. (1986). An assessment of critical success factors. *Sloan Management Review (Pre-1986)*, Summer 198(25), 17–27.
- Brotherton, B., & Shaw, J. (1996). Towards an identification and classification of critical success factors in UK Hotels Plc. *International Journal of Hospitality Management*, 15(2), 113–135.
- Chau, K. W., Leung, A. Y. T., Yiu, C. Y., & Wong, S. K. (2003). Estimating the value enhancement

- effects of refurbishment. *Facilities*, 21(1/2), 13–19.
- Chileshe, N., & Yirenki-Fianko, A. B. E. (2012). An evaluation of risk factors impacting construction projects in Ghana. *Journal of Engineering Design and Technology*, 10(3), 306–329.
- Christudason, A. (2004). Common property in strata titled developments in Singapore: common misconceptions. *Property Management*, 22(1), 14–28.
<https://doi.org/10.1007/s11205-008-9246-3>
- Chua, S. J. L., Zubbir, N., Ali, A. S., & Yong, C. P. A. (2018). Maintenance of high-rise residential buildings. *International Journal of Building Pathology and Adaptation*, 36(2), 137–151.
<https://doi.org/10.1108/IJBPA-09-2017-0038>.
- Desa, A., Abd Kadir, N. B., & Yusoooff, F. (2012). Environmental awareness and education: a key approach to solid waste management (SWM) – A Case Study of a University in Malaysia. *Waste Management - An Integrated Vision*, 48169.
<https://doi.org/10.5772/48169>.
- Doyle, J. K. (2005). Face-to-Face Surveys. In *Encyclopedia of Statistics in Behavioral Science* (Vol. 2, pp. 593–595). John Wiley & Sons, Ltd.
- Easthope, H., Randolph, B., & Judd, S. (2012). Governing the compact city: The role and effectiveness of strata management. *City Futures Research Centre*.
- Easthope, Hazel, Hudson, S., & Randolph, B. (2013). Urban renewal and strata scheme termination: Balancing communal management and individual property rights. *Environment and Planning A*, 45(6), 1421–1435. <https://doi.org/10.1068/a4598>
- Easthope, Hazel, & Randolph, B. (2009). Governing the compact city: The challenges of apartment living in Sydney, Australia. *Housing Studies*, 24(2), 243–259.
<https://doi.org/10.1080/02673030802705433>.
- Easthope, Hazel, & Randolph, B. (2016). Principal–agent problems in multi-unit developments: The impact of developer actions on the on-going management of strata titled properties. *Environment and Planning*, 48(9), 1829–1847.
<https://doi.org/10.1177/0308518X16650894>.
- Easthope, Hazel, Warnken, J., Sherry, C., Coiacetto, E., Dredge, D., Guilding, C., Johnston, N., Lamminmaki, D., & Reid, S. (2014). How property title impacts urban consolidation: A life cycle examination of multi-title developments. *Urban Policy and Research*, 32(3), 289–304. <https://doi.org/10.1080/08111146.2014.899210>.
- Freund, B. Y. P. (1988). Critical success factors. *Planning Review*, 16(4), 20–23.
- Gao, L. W., & Ho, D. C. W. (2016). Explaining the outcomes of multi-owned housing management: A collective action perspective. *Habitat International*, 57(2016), 233–241.
<https://doi.org/10.1016/j.habitatint.2016.08.005>.
- Gao, W. (2015). Collection actions for the management of multi-owned residential building: A case of Hong Kong. *Habitat International*, 49(2015), 315–324.
- Gao, W., & Chen, G. Z. (2016). Does owner heterogeneity matter in the management of multi-owned housing? *Habitat International*, 53(2016), 106–114.
<https://doi.org/10.1016/j.habitatint.2015.11.015>.
- Gifford, R. (2011). The consequences of living in high-rise buildings. *Architectural Science Review*, 50.1, 2–17. <https://doi.org/10.3763/asre.2007.5002>.
- Hansmann, H. (1991). Condominium and cooperative housing: transactional efficiency, tax subsidies, and tenure choice. *The Journal of Legal Studies*, 20(1), 1991.
- Ho, Yau, Y., Wong, S. K., Cheung, A. K. C., Chau, K. W., & Leung, H. F. (2006). Effects of building management regimes of private apartment buildings in Hong Kong. *Property*

- Management*, 24(3), 309–321. <https://doi.org/10.1108/02637470610660174>
- Hudson, S. (2011). *An analysis of the expenditure of residential strata schemes in NSW* (Issue July).
- Hui, E. C. M., Zhang, P., & Zheng, X. (2013). Facilities management service and customer satisfaction in shopping mall sector. *Facilities*, 31(5), 194–207. <https://doi.org/10.1108/02632771311307070>.
- Ikediashi, D. I., Ogunlana, S. O., Boateng, P., & Okwuashi, O. (2012). Analysis of risks associated with facilities management outsourcing: A multivariate approach. *Journal of Facilities Management*, 10(4), 301–316. <https://doi.org/10.1108/14725961211265756>.
- Johnston, N., Guilding, C., & Reid, S. (2012). *Examining developer actions that embed protracted conflict and dysfunctionality in staged multi-owned residential schemes* [Paper presentation]. 18 Th Annual Pacific-RIM Real Estate Society Conference, Adelaide, Australia.
- Johnston, N. R., & Reid, S. (2013). Multi-owned developments: a life cycle review of a developing research area. *Property Management*, 31(5), 366–388. <https://doi.org/10.1108/PM-01-2013-0003>.
- Johnston, N., & Too, E. (2015). Multi-owned properties in Australia: a governance typology of issues and outcomes. *International Journal of Housing Markets and Analysis*, 8(4), 451–470.
- Kent, P., Merry, M., & Walters, M. (2002). *Building Management in Hong Kong*. Lexis Nexis.
- Lai, J. H. K., & Yik, F. W. H. (2011). An analytical method to evaluate facility management services for residential buildings. *Building and Environment*, 46(1), 165–175. <https://doi.org/10.1016/j.buildenv.2010.07.012>.
- Leidecker, J. K., & Bruno, A. V. (1984). Identifying and Using Success Factors. *Long Range Planning*, 17(1), 23–32. [https://doi.org/10.1016/0024-6301\(84\)90163-8](https://doi.org/10.1016/0024-6301(84)90163-8).
- Mossel, H. Van, & Jansen, S. J. T. (2010). Maintenance services in social housing : What do residents find important? *Structural Survey*, 28(3), 215–229. <https://doi.org/10.1108/02630801011058942>.
- Peck, S. C., Roeser, R. W., Zarrett, N., & Eccles, J. S. (2008). Exploring the roles of extracurricular activity quantity and quality in the educational resilience of vulnerable adolescents: Variable- and pattern-centered approaches. *Journal of Social Issues*, 64(1), 135–156. <https://doi.org/10.1111/j.1540-4560.2008.00552.x>.
- Rasip, M. K. (2017). *Faktor utama yang mempengaruhi kualiti perkhidmatan dan pembayaran caj penyenggaraan bangunan* [Doctoral dissertation]. Universiti Teknologi Malaysia. ProQuest Dissertations and Theses Global.
- Rockart, J. F. (1979). Chief executives define their own data needs. *Harvard Business Review*, 57(2), 80–81.
- Sajan, J. (2015). Design implications for multi-owned properties from a household survey. *International Journal of Housing Markets and Analysis*, 8(7), 502–518. <https://doi.org/10.1108/IJHMA-02-2015-0009>.
- Salleh, N. A., Yakin, M. K. A., Ismail, K., & Talib, Y. (2016). Preliminary Investigation on The Factors That Influencing The Maintenance Cost of Apartment. In Ali, A. S. B. et al. (Eds.), *The 4th International Building Control Conference 2016 (IBCC 2016)* (pp. 1–7). EDP Sciences. <https://doi.org/10.1051/mateconf20166600046>.
- Sekaran, U., & Bougie, R. (2016). *Research methods for business; A skill-building approach* (7th Edition). John Wiley & Sons Ltd.
- Tiun, L. T. (2006). Managing High-rise Residential Building in Malaysia: Where Are We? In J. P.

- dan P. H. . I. P. Negara. (Ed.), *Second NAPREC Conference* (pp. 1–25). Jabatan Penilaian dan Perkhidmatan Harta.; Institut Penilaian Negara.
- Tyagi, A. S., Baag, D., Jaikhani, H., Poulouse, J., & Patel, J. (2015). Identification of the success factors for the implementation of total productive maintenance in an organisation using interpretive structural modeling (ISM). *International Journal of Quality & Reliability Management*, 32(3), 308–331.
- Vergara, L. M., Gruis, V., & Flier, K. van der. (2019). Understanding housing management by low-income homeowners: technical, organisational and sociocultural challenges in Chilean Condominium Housing. *Buildings*, 9(65), 1–21.
<https://doi.org/10.3390/buildings9030065>
- Vieira, E. S., Neves, M. E., & Dias, A. G. (2019). Determinants of Portuguese firms' financial performance: panel data evidence. *International Journal of Productivity and Performance Management*, 68(7), 1323–1342. <https://doi.org/10.1108/IJPPM-06-2018-0210>
- Vilutiene, T., & Zavadskas, E. K. (2003). The application of multi-criteria analysis to decision support for the facility management of a residential district. *Journal of Civil Engineering and Management*, 9(4), 241–252. <https://doi.org/10.1080/13923730.2003.10531335>
- Waziri, B. S. (2016). Design and construction defects influencing residential building maintenance in Nigeria. *Jordan Journal of Civil Engineering*, 10(3), 313–323.
- Yau, Y., Ho, D. C. W., & Chau, K. W. (2008). Determinants of the safety performance of private multi-storey residential Buildings in Hong Kong. *Social Indicators Research*, 89(3), 501–521. <https://doi.org/10.1007/s11205-008-9246-3>
- Yong, Y. C. (2015). *A Legal Guide to Strata Management*. Lexis Nexis.
- Zalejska-Jonsson, A. (2020). Does facility management affect perception of building quality?: A study of cooperative residential buildings in Sweden. *Facilities*, 38(7–8), 559–576. <https://doi.org/10.1108/F-02-2019-0026>