



Key Elements of Corporate Real Estate Sustainable Management for Office Buildings

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Abstract

Green corporate real estate (CRE) provides many benefits, especially to the environment. However, companies cannot fully benefit from a green building if the manager poorly manages the building. The CRE manager must consider numerous factors to ensure the building performs well and contributes a positive financial return to the company. Therefore, a study was conducted to investigate the key elements of corporate real estate sustainable management (CRESM) to facilitate CRE managers in efficiently managing and enhancing the existing management of their office buildings. Thus, the researcher conducted a semi-structured interview with thirteen experts in CRESM. Then, the data was analysed through thematic content analysis using Atlas.ti software. The findings highlight nine key elements of CRESM for office buildings.

Keywords: Corporate real estate; Corporate real estate sustainable management; Elements; Office building

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1.0 Introduction

Globally, more green CRE are emerging, particularly office buildings, because they believe green buildings contribute numerous benefits, especially to the environment (Fauzi, Johari, et al., 2021). However, this benefit can be optimally achieved if it is well managed. Managing and maintaining a green office building, especially one owned by non-real estate companies, is complex because the property management practice is complicated and challenging (Baharum et al., 2016). In practice, the management of green CRE is known as corporate real estate sustainable management (CRESM). Numerous factors need to be taken into account to ensure the building continues to perform as a green building should while also ensuring that green buildings can contribute to the financial return of the companies. The previous discussion did not specify which element of sustainable buildings significantly contributed to business performance and goals (Fauzi, Zainuddin, et al., 2021). Looking at the rapid development of CRESM practices that have evolved, come to mind, what are the key elements to effectively managing green office buildings?

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1.1 Objective of Study

Therefore, this study was conducted to investigate the key elements of CRESM in ensuring the green office building can be well managed and simultaneously provide the best performance to its owner and its occupants. The finding of this study could help CRE managers manage and improve the management of their office buildings in an effective way. Kuala Lumpur, Johor and Selangor are the study targets due to the higher number of green office buildings constructed in those regions.

2.0 Literature Review

2.1 Interpretation of Green CRE and CRESM

Green CRE refers to sustainable buildings assessed with suitable assessment tools from rating systems (Usman & Abdullah, 2018). Shurrab et al. (2019) acknowledged sustainable buildings as environmentally friendly buildings. Sustainable buildings use less water, optimise energy efficiency, conserve natural resources, generate less waste, and provide healthier space for occupants (Kanika et al., 2016). **CRESM** is a management of sustainable/green CRE owned by non-real estate companies. CRESM is a practice of corporate real estate management that embeds sustainable triple-bottom-line principles of environmental, social and economic (Fauzi et al., 2016). CRESM is also known as sustainable corporate real estate management (Ziemba et al., 2015).

2.2 Elements of CRESM

According to Fauzi et al. (2021), corporate companies implement sustainability to achieve four goals: environmental benefits, economic benefits (maximising value and reducing cost), and social benefits. The environmental benefits are the most influential goal that motivates businesses to go green. Therefore, operating this green office building should include several key elements to accomplish this business goal. As Sinke (2015) recommended, the real estate strategy must fully align with the corporate strategy. Because this topic is new, not many studies have been conducted in the past, particularly in Malaysia. In Finland, Masalskyte et al. (2014) discovered twenty elements of CRESM, while Fauzi et al. (2016) through a literature review, identified fourteen elements of CRESM that divided into three main elements of economic, environmental and social as similar to UNEP (2014). In a study conducted in the Netherlands, Sinke (2015) discovered eight components of CRESM. Fauzi et al. (2018) interviewed five participants in Malaysia and discovered six elements that should be considered for CRESM. Fauzi et al. (2018) added that apart from that, two significant elements are energy-saving and water-saving. The low number of participants selected in the study by Fauzi et al. (2018) raises the question of whether it is sufficient to reflect the sample. So, this study selected more participants from a broader spectrum of relevant backgrounds in order to obtain a larger sample and a more accurate set of results.

3.0 Methodology

3.1 Qualitative Research

The research adopted a qualitative approach to deeply explore the key elements of CRESM for green office buildings since this is a new research area, especially in Malaysia. In conjunction with that, a purposive sampling technique was adopted whereby a semi-structured interview with thirteen participants who are experts in CRESM from various backgrounds was selected, as in Table 1. The interview is one of the primary sources for qualitative research (Zilber & Meyer, 2022). The participant was contacted through email and phone call based on recommendation from Board of Valuers, Appraisers, Estate Agents and Property Managers (BOVEAP). In the early stage 5 participants was proposed for each state, however the data have reach the saturation point at 13 participants. Therefore researchers decided to stop for the data collection. The participants were coded with P1 - P13 as follows:

Table 1. Background of participants

Participants	Profession	Experience (years)	Experience in CRESM (years)	Region
P1	Real Estate Experts I	28	7	Kuala Lumpur
P2	Real Estate Experts II	34	6	Kuala Lumpur
P3	Real Estate Experts III	28	5	Kuala Lumpur
P4	Real Estate Experts IV	31	5	Selangor
P5	Real Estate Experts V	31	5	Selangor
P6	Real Estate Experts VI	23	5	Johor
P7	Sustainable CRE Manager I	22	6	Kuala Lumpur
P8	Sustainable CRE Manager II	16	6	Kuala Lumpur
P9	Sustainable CRE Manager III	11	6	Selangor
P10	Sustainable CRE Manager IV	11	7	Selangor
P11	Sustainable CRE Manager V	10	5	Johor
P12	Green Building Index Facilitator I	23	9	Kuala Lumpur
P13	Green Building Index Facilitator II	20	8	

The interview session was recorded and transcribed. Then, the data was analysed through thematic content analysis using Atlas.ti software. Earlier, six themes were developed refer to Fauzi et al. (2018). However, during the analysis process, the theme was modified and verified with two green experts to suit the finding from the interview as follows:

Table 3. CRESM Themes

No	CRESM Theme	Explanations	Before Analysis	After Analysis
1.	Energy management (ENM)	Energy saving strategy	✓	✓
2.	Water management (WTM)	Water saving strategy	✓	✓
3.	Indoor green management (IGM)	Indoor green strategy	✓	✓
4.	Site planning & management (SPM)	Site planning and management	✓	
5.	Material & Resources (MTR)	Material and resources used	✓	
6.	Innovation management (INM)	Innovation strategy	✓	✓
7.	Waste management (WAM)	Waste management strategy		✓
8.	Workspace management (WSP)	Internal space organisation strategy		✓
9.	Workplace management (WPM)	Overall localization strategy		✓
10.	Organisation management (OGM)	Organisation structure strategy		✓
11.	Human satisfaction management (HSM)	Occupants, employees and, customer satisfaction strategy		✓

4.0 Findings and Discussion

The results are shown according to the approach of **Participant number: Quotation number (P:Q)**. Following is a breakdown of the study's findings into the nine main components of CRESM.

4.1 Energy Management Element (ENM)

Energy management is the main element in green office building management, which focuses more on reducing energy consumption and electricity costs in the building. Energy-saving appliances should be used as suggested by **P7:Q22** because energy-saving ability appliances can reduce the energy used (Razali & Hamid, 2018). **P7:Q23** pointed out that management needs to install energy-saving fittings in green office buildings to contribute further energy saving (**P4:Q41; P8:Q28; P9:Q27**). Mikulic et al. (2010) stated installation of energy-saving fittings resulted in reduced energy consumption. **P10:Q28** shared that energy-saving fittings include energy-saving heating, ventilation, and air conditioning (HVAC) installation; lifts (elevator) and escalators. Furthermore, **P1:Q57** shared that management should adopt energy-saving fire-fighting equipment too. Next is automated energy use control (**P10:Q28, P5:Q22, P6:Q30**) or automated systems (**P5:D7:Q23**), which assist management in controlling and monitoring energy use, as well as all building installation systems such as air conditioning system control. Then, the adoption of digital power meters to control energy use (**P3:D5:Q78**). Mohd Adnan et al. (2017) found that electrical metering is commonly used to monitor the energy used. Further, zoning strategies are the best alternative energy management approach, including lighting zoning (**P2:Q34, P8:Q32, P10:Q29**). Management should also use temperature zoning and staff zoning (**P10:Q31**). Razali and Hamid (2018) suggested that a room with high occupancy should be in a cool area and low in a hot area. It is essential to implement an energy control rule, for example, by reducing any activity that requires energy, especially during weekends or holidays (**P8:Q29**) and after office hours. **P6:Q32** suggested implementing control of the allowable voltage used (**P6:Q32**) for any equipment in the building. **P5:D7:Q21** urged the implementation of efficient maintenance and management practices. Companies adopted sustainable maintenance practices identified at about 92% to lower the energy used. The transparency of the information is an excellent element to be adopted by management to inform all occupants about the results of their efforts and indirectly motivate occupants (**P5:Q44**). Management teams worldwide are currently practising energy renewal through solar power systems (**P2:Q38; P12:Q16**) to replace and back up the use of non-renewable energy.

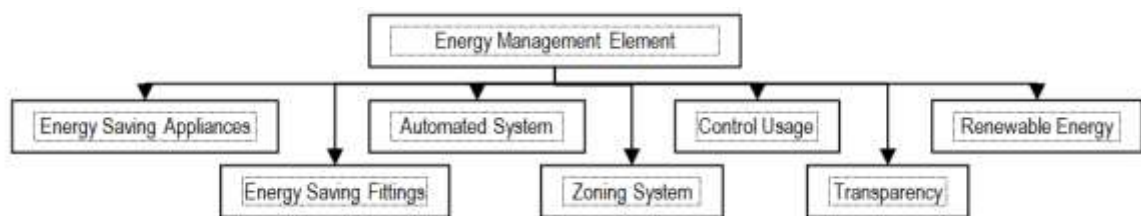


Fig. 1: Energy Management Element
(Source: Authors)

4.2 Water Management (WTM)

Water management is an essential element in green buildings after energy management. Most property and facility managers stressed this element because it is directly related to building expenses or utility costs. As agreed by Fowler et al. (2011) that mentioned reduction of water consumption in sustainable buildings contributes to a significant reduction in building operating costs. The best way to reduce water use is by using water-saving fittings (**P1:Q84, P4:Q67 P6:Q55 P7:Q42 P9:Q48, P12:Q28**). Water pressure control systems (**P8:Q52**), digital water meters (**P3:Q101**), and any other water controlling system should also be used to reduce water consumption. Along with systematic water management, water leak control is also very significant to install (**P13:Q47**). The next element is a rainwater harvesting system (**P2:Q65, P2:Q47, P10:Q48, P12:Q30**). According to (**P6:65**), a rainwater harvesting system positively contributes to water savings. Management can then use the water to water plants and other uses (Tjenggoro & Khusnul Prasetyo, 2018). Another element participants discussed was recycled water and greywater management (**P4:Q66**). A greywater system is used to recycle the

used water, which is later used for watering plants and for toilet flushing (Oyewole & Markson Opeyemi, 2018; Tjenggoro & Khusnul Prasetyo, 2018).

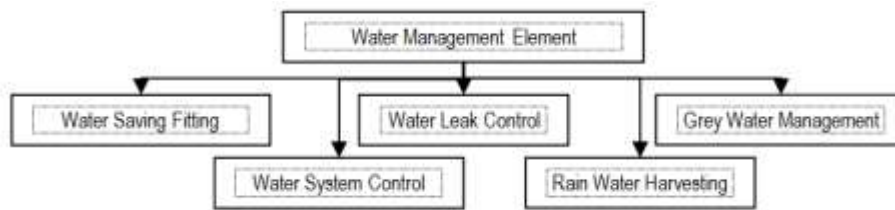


Fig. 2: Water Management Element
(Source: Authors)

4.3 Waste Management Element (WAS)

The next element addressed is waste management. The most important element shared for waste management is scheduled collection to avoid garbage dump problems and contribute to other environmental pollution (P6:Q57). Therefore, management should efficiently identify waste produce trends in the building and plan the schedule (Lützkendorf & Lorenz, 2006). It is recommended that contractors that offer recycled waste collection are chosen. P11:Q33 discussed another element which is electronic waste, commonly known as e-waste. Almost every corporation (P1 to P13) had adopted an element of recycled waste practices at their buildings. Waste recycling is an essential element to be considered (Fowler et al., 2011). P10:Q51 recommended reusing the waste generated especially regarding solid waste. Management is also encouraged to hold waste product innovation activities with the occupants (P6:Q58). This will encourage occupants to reuse the waste in a good way (Mohd Adnan et al., 2017). In addition, management also needs to remind the occupants to reduce waste by encouraging them to bring their food and beverage containers to the café when buying food and drinks. This is to reduce the volume of waste produced in the building (P11:Q35). Management should consider ways to sell the waste collected, as this can generate passive income for the corporation (P10:Q50, P6:Q59, P12:Q32).

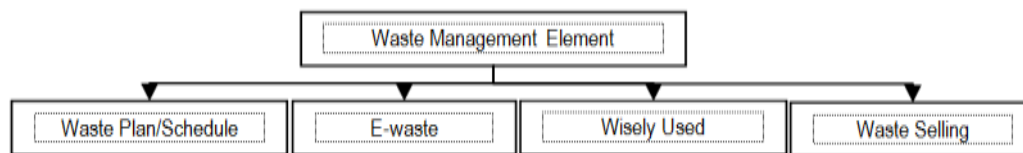


Fig. 3: Waste Management Element
(Source: Authors)

4.4 Innovation Management Element (INN)

Involvement in innovation can solve and facilitate several problems and difficulties experienced by management. Corporations began to develop systems and new applications that could be used to improve management work processes (P10:Q53). Adopting new technology can support green implementation in the building (Ohueri et al., 2018). Innovation teams need to be created in the organisational structure to be responsible for innovation (P3:Q106). The systems created include food ordering systems (P6:Q66) and facilities/room booking system (P6:Q67), which helps internal parties with space reservations, and external parties can also use this system for rental purposes. Corporations have also adopted parking booking systems that allow visitors to reserve their parking earlier (P5:Q51). For safety purposes, most corporations should consider implementing a visitor management system to control unwelcome visitors (P5:Q55). Further, due to involvement in green buildings, corporations need to pay more attention to innovation in maintenance management (P1:Q89) whereby management is required to upgrade the maintenance systems from time to time (P10:Q54). Moreover, innovation also should be included in the building designing stage like passive design building (P13:Q79).

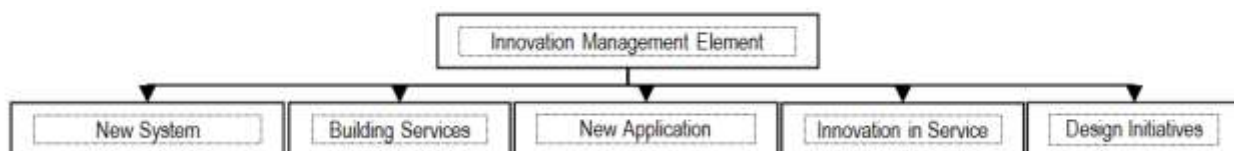


Fig. 4: Innovation Management Element
(Source: Authors)

4.5 Workspace Management Element (WSP)

Workspace management is essential when managing green office buildings. Space in the building should be optimally used to avoid wasting space and to reduce costs. This is preferable by the sustainability committee (WBDG Sustainable Committee, 2018). P4:Q47 mentioned that space efficiency needs to be identified before occupying the building. Some participants felt the design element played

an important role in workspace management because the design portrays the overall view of the workspace (Cass, 2018). **P1:Q59:Q61** states that workspaces should be designed suitably depending on the nature of work. The accessible workspace also needs to be taken into account (**P1:Q62**). The elements of flexibility and convertibility should also be embedded included of the open space style of the office (**P3:Q80, P4:Q46, P9:Q34**). The sustainable building should be designed that is flexible enough to allow for easy conversation (Oyewole & Markson Opeyemi, 2018). Next is to ensure the workspace can encourage interaction and communication (**P10:Q36**), not only among employees but also clients and visitors. Moreover, ensure it meets the required standard (**P8:89**).

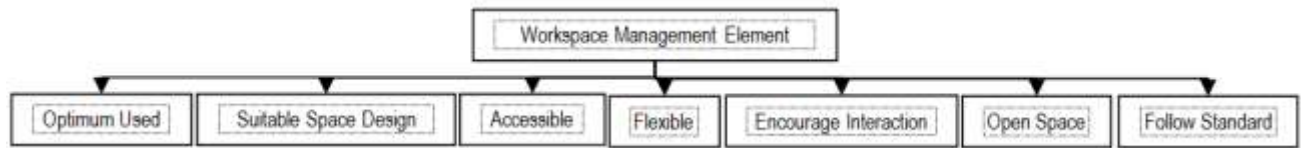


Fig. 5: Workspace Management Element
(Source: Authors)

4.6 Workplace Management Element (WPM)

Workplace management is a crucial element of CRESM. Strategic and convenient locations are the main elements for corporations to consider before acquiring or constructing an office building (**P4:Q53, P5:Q29, P6:Q47, P10:Q37, P11:Q22, P12:Q20**). Next are facilities and amenities provided in the building and the surroundings (**P6:Q43, P3:Q76, P1:Q73, P8:Q38**). Agreed by Wani & Mushtaq (2018) that stated sites that are close to jobs, schools, shops and, facilities will reduce travelling time. The following common element is public transportation services. (**P5:Q92**). Workplaces closer to public transport facilities are in higher demand (Oyewole & Markson Opeyemi, 2018). Another vital element is internet connectivity within the building, which is considered essential (**P5:Q28, P6:Q37, P7:Q32, P10:Q40**). **P2:Q43** acknowledged that the architectural design of the building is part of the workplace management strategy that needs to consider for CRESM element. Cass (2018) highlighted building design as another important element of CRESM. It includes proper orientation of the building with maintenance and management friendly. **P7:Q1** stated that plant preventive maintenance (PPM) should be efficiently scheduled and conducted. PPM covers maintenance and management, post-performance evaluation and mitigation (**P7:Q2:Q55**). **P1:Q71** stressed that corporations should adopt risk management monitoring and control, especially regarding decision-making (**P6:Q40**), including real estate acquisition and development (**P1:Q70**), safety (**P1:Q72**) and security (**P7:Q29**) and cyber security (**P6:Q39**). Accordingly, research and development also need to be embedded in the strategy (**P6:Q41, P8:Q36**), especially regarding supply and demand trend analysis that needs to be investigated.

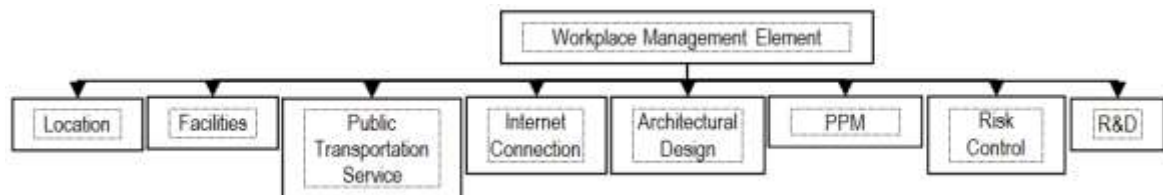


Fig. 6: Workplace Management Element
(Source: Authors)

4.7 Organisation Management Element (OGM)

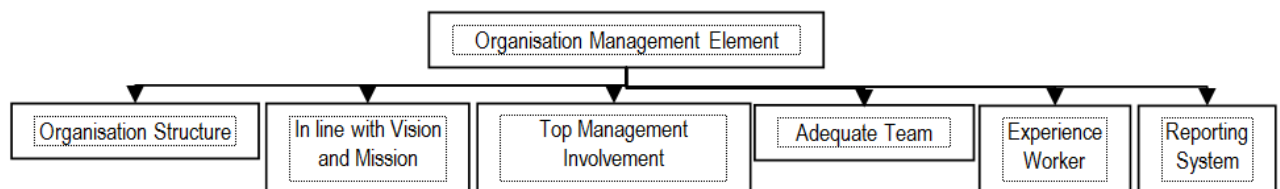


Fig. 7: Organisation Management Element
(Source: Authors)

Organizations should develop strategic organization planning that considers sustainability to build effective and efficient green building organisation management involving all parties, including management itself (**P2:Q51:Q52**), the maintenance team (**P2:Q56**), tenants (**P2:Q53**), clients (**P2:Q54**), and visitors (**P2:Q55**). Well-organized management can avoid any mismanagement and destruction (Fauzi et al., 2019). In addition, organization management strategies must be coordinated in line with the company vision and mission (**P10:Q52**). **P12:Q35** also stated that organization management for green building should be part of the business strategies and not a sole agenda. Further, top management must actively participate in the green implementation and fully support the overall organisation (**P12:Q33**). A lack of top management commitment will negatively impact the sustainable management team (Newsham et al., 2018). A strong management team is required to support top management (**P3:Q105**). **P7:Q47** suggested that management appoint experts and

professionals to manage green buildings. Appointing the right person to manage a property is crucial (Usman & Abdullah, 2018). If green buildings are outsourced, a transparent reporting system is critical to develop to ensure the efficiency and transparency of the information (P6:Q61).

4.8 Indoor Green Management (IGM)

Indoor environment control includes air quality and fresh air control, as mentioned by P5:Q40. Control air change and CO2 monitoring were discussed as part of important elements for indoor environmental quality control (Mohd Adnan, 2017). Then, control of lighting and glare is crucial because many issues are found to be related to lighting, especially glare. The angle of the sunlight needs to be carefully studied before designing the building. Several participants noted the humidity and temperature control elements in managing green buildings, especially temperature and heat in the building. Further, several participants stated that noise control should be considered in green building management (P1:Q79). Noise also includes acoustic problems (Oyewole & Markson Opeyemi, 2018).

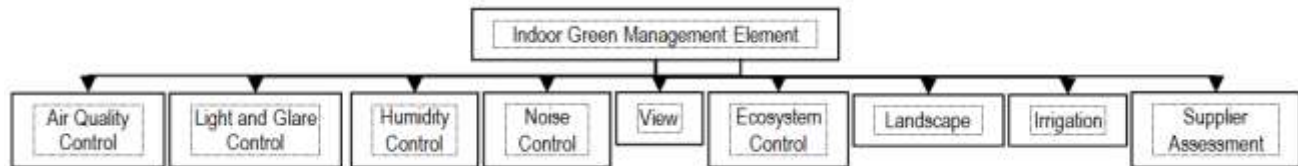


Fig. 8: Indoor Green Management Element
(Source: Authors)

Another element that should be considered is the visual (P1:Q78) or scenery elements related to view obstruction. It is recommended that management provide green and healthy views from both inside and outside the building (P8:Q43). Next is ecosystem control and the assessment (P9:Q36). Next element is a green landscape in order to produce oxygen to the occupants and environment (P12:Q37). In line with that, the automated irrigation system needs to place to irrigate the plants (P5:Q98). Another element is green materials (P10:Q41), either through recycled content materials (P7:Q27), or natural-based materials, as also mentioned by P4:Q63. Natural materials (Tjenggoro & Khusnul Prasetyo, 2018) and recycle materials (Wani & Mushtaq, 2018) are more valuable for sustainability in many ways. P13:Q41 also stressed the management should pay more attention to suppliers or tenders that offer eco products.

4.9 Human Satisfaction Management (HSM)

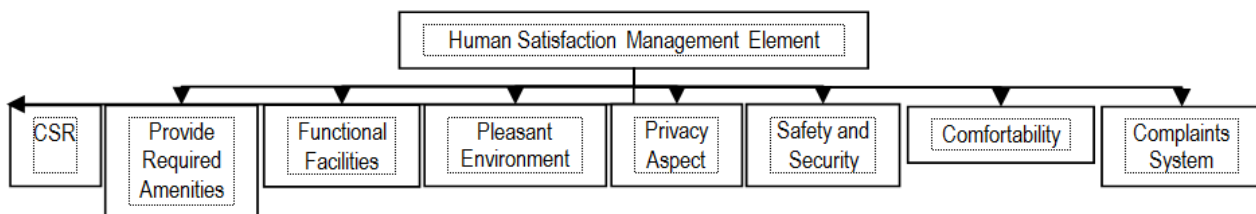


Fig. 9: Human Satisfaction Management Element
(Source: Authors)

Human satisfaction management was identified as contributing to the efficient implementation of green building management, which is synonymous with corporate social responsibility (CSR). CSR includes welfare for various groups, including charity and donations for the needy, both internal and external (P10:Q46). Responsibility towards the disabled and poor is part of CSR (P8:Q49). Building design should consider the needs of the disabled to respect their needs and facilitate their use of the building. Further, P4:Q73 and P3:Q107 suggested that management should provide required and desired amenities in the office, such as surau, restrooms, exclusive pantries, and any other amenities to reduce turnover and reduce stress. P10:Q50 suggested that management provide facilities that facilitate daily work processes, including production, operation, and service delivery, as well as facilitating managerial processes. P1:Q94:Q96 stressed a pleasant and peaceful work environment. P4:Q47 encouraged green buildings to include green spaces or recreational areas to create a pleasant environment. Besides that, the internal and external landscape also contributed to a green environment and produced oxygen for the occupants and environment. P4:Q64 discussed the privacy element as one important element. Malaysian people are mainly concerned with the privacy aspect of their workplace, and as such, management needs to consider the privacy of staff and personal control of their workspace. Another important element discussed was the safety and security aspect (P2:Q46; P3:Q100), including monitoring the security of the occupants, and employees inside and outside of the building (P12:Q18). Educational and training programmes are important to encourage the career development of all employees and educate them about and develop sustainable behaviour (P1:Q82, P7:Q41, P3:Q99, P11:Q30, P10:Q42, P6:Q53). P9:Q44 believed that management should provide, collect, and analyse the feedback surveys and complaints from all parties involved with the green building, including occupants and customers, regarding the services provided by management.

5.0 Conclusion & Recommendations

The study's findings revealed nine key CRESM elements that must be considered to manage the green office building efficiently and improve the performance of the business. Everything has been covered, including the organisational structure and governance design, to ensure that CRESM can have the most significant impact possible. These nine key components also take into account human well-being. It is advised that corporate companies integrate these nine key elements into their CRESM to look at the CRESM's overall performance. This finding revealed five new elements compared to previous research, includes of Waste management, Workspace management, Workplace management, Organisation management, and Human satisfaction management. The next research should identify the significant level of each element to guide the CRE manager to plan for their management practices and process. Therefore future research should be conducted quantitatively or qualitatively to identify the important level of each element and which elements significantly affect business performance.

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Paper Contribution to Related Field of Study

Since there is a need for more research in this area and the green office building is managed by non-real estate companies, this finding significantly contributes to the study and practice of CRESM.

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