



Best Practices in Facilities Management to Rectify Office Building Performance Issues in Malaysia: Insights From Facilities Management Team

Ling Zhi^{1,*}, Siti Hamidah Husain¹

¹ School of Housing, Building and Planning, Universiti Sains Malaysia, 11800, Penang, Malaysia

ARTICLE INFO

ABSTRACT

Article history:

Received 8 April 2024

Received in revised form 25 June 2024

Accepted 28 June 2024

Available online 16 July 2024

Keywords:

Primary challenges; facilities management; office building

Malaysian facilities management (FM) faces a variety of obstacles that make it difficult for them to carry out their essential duties. These challenges are found in the domains of personnel, policies, budget, technology and equipment. The literature contains an infinite array of challenges. Thus, the goal of this research was to determine which FM approach would be most useful in addressing the challenges of attaining building performance in the Malaysian real estate market. This study used fully qualitative methods through interviews with experts. This research expands knowledge by investigating FM practices to ensure that buildings and facilities are well-maintained, operational and comply with safety and regulatory standards. The results of this study revealed that FM teams in Malaysia face critical challenges such as aging infrastructure, limited budgets and insufficient personnel training, which hinder maintenance efforts, necessary upgrades and the adoption of modern practices. Then, the effectiveness of FM teams in Malaysia is significantly influenced by technological adoption and stakeholder engagement, which collectively impact standards, efficiency and service delivery. Third, to enhance FM in Malaysia, the study recommends investing in training programs, adopting advanced management systems and predictive maintenance tools and fostering proactive stakeholder engagement. Furthermore, the findings of this study were useful to FM teams and users since they provide the best strategies for FM practitioners, based on experts' insights in managing and maintaining office buildings in Malaysia. It is suggested that further study be conducted to study the best approach to FM in maintaining and managing the safety and regulatory standards in Malaysian office buildings.

1. Introduction

The property industry in Malaysia is projected to encounter several challenges commonly faced by new businesses. One of these challenges is a lack of efficient space management, which refers to the effective utilization of available space to maximize productivity and functionality [1]. This issue can hinder the industry's growth and development.

* Corresponding author.

E-mail address: lingzhijames@gmail.com

<https://doi.org/10.37934/ard.117.1.3443>

The poor quality of work and poor facilities management (FM) might contribute to low building performance and lead to a disaster, damage or fatality [2]. This entails implementing effective systems and processes to streamline operations, enhance decision-making and optimize resource allocation. Without efficient manageability, businesses in the property industry may struggle to achieve their objectives and meet customer demands. Sustainability is also a pressing concern for the property industry in Malaysia. As the country aims to reduce its environmental impact and promote sustainable practices, property developers and managers must adopt eco-friendly strategies [3]. This includes incorporating energy-efficient designs, using renewable materials and implementing sustainable waste management practices.

FM is a field that encompasses the management and maintenance of physical assets and infrastructure within an organization. This literature review aimed to provide an overview of key concepts, theories and practices related to FM towards the best approach of FM in dealing with building performance issues. According to the International Facility Management Association, FM is the practice of coordinating the physical workplace with the people and work of an organization to support its objectives [4]. FM involves a wide range of activities, including space planning, maintenance and repairs, security, energy management and sustainability.

FM is essential for providing a safe and comfortable working environment for employees. Effective FM is crucial for organizations to achieve their strategic goals and objectives. Well-managed facilities can enhance productivity, employee satisfaction and overall organizational performance. FM plays a vital role in ensuring the safety, security and comfort of occupants [5]. In Malaysia, FM is an area that is still new in terms of the growth of knowledge and practice according to FM industry needs. As such, knowledge in the FM field needs to be studied to develop a competency model and ensure a glorious future in the FM field. There are several important factors that contribute to the success of developing a certification designation for managers in a particular industry such as understanding what knowledge, skills and attributes are related [6].

Running a facility can be a challenging task demanding a range of responsibilities, including upholding standards, maintaining the building and managing costs. The integration of technology, such as Internet of Things (IoT) devices and Building Information Modeling (BIM), is transforming FM by enabling real-time monitoring, predictive maintenance and data-driven decision-making. Sustainability and green building practices are gaining importance in FM, with a focus on energy efficiency, waste reduction and environmental conservation. The COVID-19 pandemic has highlighted the need for effective FM strategies to ensure the health and safety of occupants, including implementing social distancing measures, enhanced cleaning protocols and remote work arrangements [7].

In the past several decades, FM has been a professional integrated approach to support core business for many business organizations, educational institutions and 101 FM knowledge government departments in managing facility resources effectively and offering a high degree of support services [8]. However, with the rapid development of this profession, FM is suffering from an acute identity crisis and a confusing field of activity where the theoretical research is far behind practice demand, which causes the difference in recognition and misunderstanding [8-11]. In other words, the field of FM is not yet supported by an adequate knowledge base to underpin best practices, advance the field and bridge the gap between its promise and performance [10].

According to Gao and Cao [8], it is important to develop FM theory knowledge in the form of a conception frame model to help people recognize the essence and core value of FM. Climate adaptation, energy efficiency, sustainable development and green growth are societal challenges for which the FM profession can develop solutions, make positive contributions at the organizational

level and have societal-level effects. It is well-known that buildings are responsible for approximately 40 percent of total energy consumption and one-third of greenhouse gas emissions [12].

The operating phase of a building is important not only for energy but also in relation to other sustainability challenges such as food consumption, biological diversity in the built environment, health, poverty and the use of non-renewable resources. Therefore the ways we use, operate and manage buildings will have a substantial influence on the entire building sector, society and the planet soon. As Miller [13] suggested, focusing on the operation and management of buildings will create relatively more rapid advances in the sustainability sphere because a building's operation can be more critical than its design in this respect.

FM has previously been regarded as a poor relation within the real estate, architecture, engineering and construction professions. This is because it was seen in the old-fashioned sense of caretaking, cleaning, repairs and maintenance. Nowadays, it covers real estate management, financial management, change management, human resources management, health and safety and contract management, in addition to building and engineering services maintenance, domestic services and utilities supplies. FM is an umbrella term that covers a wide range of properties and user related functions [14]. All these are brought together for the benefit of the organization and its employees. Therefore, the aim of FM should not only to be optimize the running costs of buildings, but also to raise the efficiency and suitability of the management of space and other related assets for people and processes. This is so that the mission and goals of the organization can be achieved with the best combination of efficiency, cost and quality [14]. The main cause of FM's passive development in Malaysia may be a lack of knowledge about FM definitions and functionalities. FM practice is not regulated, and company strategies frequently downplay its significance. Analysis of this field's evaluation is challenging due to the lack of an FM department within the government agency that would set guidelines, control the quality level and evaluate the effectiveness of FM [15].

The function of FM is wide and includes the management of property, human resources and finance [16]. FM also investigates the management of assets, where it relates to the systematic and structured system that involves planning, operating, maintaining, upgrading and replacing assets cost effectively with minimum risk at the expected levels of service over the assets life cycle. Schuman and Brent [17] believe that asset management is often one of the last options to maximize cost savings in a competitive global economy because of its intrinsic complexity, particularly in many developing countries. Mitchell and Carlson [18] also believe that asset management is a strategic, integrated set of comprehensive processes to gain the greatest lifetime effectiveness, utilization and return from physical assets.

2. Methodology

This study has used a fully qualitative method to study the three outlined objectives: (i) To identify the primary challenges faced by the facilities management team in managing office buildings in Malaysia concerning their performance; (ii) To analyze the factors that affect the facilities management team in managing office buildings in Malaysia; and (iii) To provide actionable recommendations on the best practices and strategies employed by leading facilities management companies operating in Malaysia. An interview with three experts has been conducted, which is facilities manager and maintenance technician. An invitation email has been sent to each expert to invite them to participate in this research and to set an appropriate date and time. Once getting approval from experts, a face-to-face interview session using an open-ended questionnaire form was conducted, and all data were recorded with the approval of respondents.

3. Results and Discussion

3.1 The Primary Challenges Faced by the Facilities Management Team in Managing Office Buildings in Malaysia Concerning Their Performance

The interviews revealed several critical challenges that facilities management teams in Malaysia encounter (Table 1). These include ageing infrastructure, limited budget allocations and insufficient training for personnel. Ageing buildings often require significant maintenance, which strains resources and impacts overall building performance. Budget constraints further exacerbate these issues, limiting the ability to invest in necessary upgrades or advanced technologies. Additionally, the lack of continuous professional development opportunities hampers the teams' ability to adopt modern facilities management practices.

Table 1

The outlined interview questions in identifying the primary challenges faced by the FM team in managing office buildings in Malaysia concerning their performance

No.	Questions	Respondent	Answers
1.	From a facilities management perspective, what do you perceive to be the main challenges in maintaining and managing the performance of office buildings in Malaysia?	A	"...ageing of equipment, maintenance cost and outdated technology..."
		B	"...have to keep up with rapid development of building and facilities technology..."
		C	"...coping with the tropical climate, which can strain HVAC systems, navigating stringent regulatory requirements, managing aging infrastructure, and integrating modern sustainability practices in older buildings..."
2.	In your experience, what are the most common issues or problems encountered in maintaining the performance of office buildings in Malaysia, and how do you address the challenges?	A	"...upgrade machinery and equipment by phase based on company financial and allocation. Then, to increase maintenance period, for example from 1 month to 2 month depends on condition of the machinery and to control and monitor usage of building electricity and other utilities usages..."
		B	"...keeping up with the rapid development of building and facilities technology requires continuous learning, adoption of new innovations and integrating advanced systems that enhance efficiency, sustainability and user experience..."
		C	"...limited skilled labour and fluctuating costs of maintenance materials can further complicate efficient building management..."
3.	Have you encountered any difficulties in implementing sustainability initiatives or energy efficiency measures to improve the performance of office buildings? If so, could you describe the primary challenges you faced and the strategies you employed to overcome them?	A	"...increment of electricity tariff by government the recent increment 4-6 % hike from original tariff building need to bear additional cost for electricity. To overcome this challenge, facility management take initiative to reset all timers for air conditioning to open 1 to 2 hours late from operation hours and close early 1 to 2 hours from the closing hour, and control lighting only switch 75 % inside the building..."
		B	"...a lack of proper training on new technologies, resistance from management or occupants who are accustomed to traditional systems, and budget constraints that limit the purchase of advanced, eco-friendly equipment. ..."

		C	"...retrofitting older buildings to meet modern energy standards can be complex and time-consuming, requiring careful planning and significant adjustments to existing infrastructure...."
4. Based on your opinion, what role does technology play in Malaysia's office building performance management?	A	"...to ease the maintenance job, increase building performance and save cost..."	
	B	"...make the job become easier and more efficient...."	
	C	"...to increase the overall building performance and the problem can be detected at first sight ..."	
5. How do you ensure effective communication and collaboration between different stakeholders, such as building owner, tenants and service providers, to address performance issues in office buildings?	A	"...to collaborate between parties and find best solution in term of budget, services and corporation to overcome performance issues...."	
	B	"...by establishing clear channels of communication and regular updates..."	
	C	"...an organized periodic meetings to discuss performance issues and proposed solutions, ensuring everyone is informed and involved. Additionally, using collaborative platforms can facilitate real-time communication and document sharing...."	

Maintaining and managing the performance of office buildings in Malaysia involves several challenges, including dealing with aging equipment, high maintenance costs and outdated technology. Facilities managers must keep up with rapid advancements in building technology, cope with the tropical climate that strains HVAC systems, navigate stringent regulatory requirements, manage aging infrastructure and integrate modern sustainability practices into older buildings. Common issues include the gradual upgrading of machinery and equipment based on financial constraints, extending maintenance periods depending on equipment condition and monitoring utility usage. Additionally, continuous learning and adoption of new innovations are required to improve efficiency and sustainability amid limited skilled labour and fluctuating maintenance material costs. Specific challenges reported include a 4-6 % increase in electricity tariffs, inadequate training on new technologies, resistance from management and occupants accustomed to traditional systems, budget constraints limiting the purchase of eco-friendly equipment and the complexity of retrofitting older buildings to meet modern energy standards. Furthermore, technology plays a crucial role in simplifying maintenance tasks, enhancing building performance and reducing costs by enabling early detection of problems and ensuring optimal operations.

Effective communication and collaboration among stakeholders involve strategies such as collaboration to find optimal solutions within budget and service constraints, establishing clear communication channels, providing regular updates, organizing periodic meetings to discuss performance issues and potential solutions, and utilizing collaborative platforms for real-time communication and document sharing. These approaches collectively foster transparency, cooperation and efficient problem-solving to enhance building performance and address issues effectively.

3.2 To Analyze the Factors that Affect the Facilities Management Team in Managing Office Buildings in Malaysia

Several factors were identified as having a profound impact on the effectiveness of FM teams (Table 2) and additional factors affecting FM in office buildings based on their experience.

Table 2

The outlined interview questions in analyzing the factors that affect the facilities management team in managing office buildings in Malaysia

No.	Factors	Expert A		Expert B		Expert C		Percentage of agreement (%)
		Yes	No	Yes	No	Yes	No	
1.	Integration of smart building technologies	/		/		/		100
2.	Utilization of Building Management Systems (BMS)	/		/		/		100
3.	Adoption of Internet of Things (IoT) devices for monitoring and control	/		/		/		100
4.	Regular preventive and corrective maintenance schedules	/		/		/		100
5.	Availability and management of spare parts and equipment	/		/		/		100
6.	Handling of unplanned repairs and emergency situations	/		/		/		100
7.	Energy efficiency measures and initiatives	/		/		/		100
8.	Monitoring and optimizing energy consumption	/		/		/		100
9.	Use of renewable energy sources	/		/		/		100
10.	Budgeting and financial planning	/		/		/		100
11.	Cost control and reduction strategies	/		/		/		100
12.	Investment in facility upgrades and renovations	/		/		/		100
13.	Efficient utilization of office space	/		/		/		100
14.	Space planning and allocation	/			/	/		66.67
15.	Managing space for growth and changes in occupancy	/			/	/		66.67
16.	Ensuring a safe working environment	/		/		/		100
17.	Managing risks related to health hazards	/		/		/		100
18.	Implementing emergency response plans	/		/		/		100
19.	Based on your experience, what are the additional factors affecting facilities management in office buildings (which are not included in the checklist)?		"...waste management and recycling programs..."		"...ensuring high standards of cleanliness and hygiene..."		"...water conservation and strategies..."	Not Applicable

Several factors were identified as having a profound impact on the effectiveness of FM teams. These include technological adoption and stakeholder engagement. Regulatory frameworks in Malaysia demand stringent adherence, which can be both a challenge and a guiding framework for maintaining high standards. The level of technological integration within FM practices varies widely, affecting efficiency and responsiveness. Moreover, active engagement with stakeholders, including tenants and building owners was crucial for aligning expectations and improving service delivery.

3.3 To Provide Actionable Recommendations on the Best Practices and Strategies Employed by Leading Facilities Management Companies Operating in Malaysia

Based on the insights gathered, the study offers several recommendations to enhance FM practices in Malaysia (Table 3). Firstly, there is a need for strategic investment in training programs

to equip FM personnel with up-to-date skills and knowledge. Secondly, embracing technology through the adoption of advanced management systems and predictive maintenance tools can significantly improve operational efficiency. Lastly, fostering a culture of proactive stakeholder engagement can help in understanding and meeting the needs of all parties involved, thereby enhancing overall satisfaction and building performance.

Table 3

Outlined interview questions in providing actionable recommendations on the best practices and strategies employed by leading facilities management companies operating in Malaysia

No.	Questions	Respondent	Answers
1.	Based on your expertise, what recommendations or suggestions would you offer to improve the performance management of office buildings in Malaysia from a facilities management perspective?	A	"...to upgrade all machinery and equipment to latest technology available. Government increase subsidy on electricity, water, etc to building to reduce operational cost. A good collaboration and communication between stakeholder, building owner, tenant and service provider, need to maintain all the time..."
		B	"...prioritize sustainable practices by adopting green building certifications and optimizing resource utilization through smart technology solutions ..."
		C	"...conduct regular training for facilities management staff on best practices and emerging trends to ensure efficient and effective operations...."
2.	In your opinion, what are the most critical factors that contribute to the success of facilities management companies in Malaysia, particularly in terms of delivering high-quality services and maximizing client satisfaction?	A	"...to understand the needs and client requirements and address all complaints and client dissatisfaction as soon as possible ..."
		B	"...to make sure facilities management is in tip-top and superb condition at all times...."
		C	"...a continuous staff training and development to maintain high standards of service quality...."
3.	How do leading facilities management companies in Malaysia approach the recruitment, training and development of their staff to ensure they have the necessary skills and expertise to deliver top-notch services?	A	"...to hire the right man for the job, based on expertise and qualification. ..."
		B	"...to make sure continuous training and staff keep up with current or latest technologies...."
		C	"...invest in continuous professional development through regular training sessions, workshops and access to the latest industry knowledge and technological advancements...."
4.	Have you observed any notable trends or shifts in the strategies employed by facilities management companies in Malaysia in response to changing client needs, market dynamics or regulatory requirements?	A	"...yes, most of the companies in Malaysia currently recruit and hiring employees or staff, which not only based on academic and experience but multi-skill especially hard skill. Advantage given to the staff who possess different skills set and certified quality in professional bodies or organization..."
		B	"...technicians in Malaysian facilities management companies are increasingly using mobile and IoT-enabled tools for real-time diagnostics and predictive maintenance, ensuring quicker response times and more efficient service delivery to adapt to changing client demands and regulatory standards..."
		C	"...many companies in Malaysia start to adopt smart technologies and sustainability practices to meet evolving client expectations, enhance operational efficiency and comply with stricter environmental regulations..."

5. What recommendations or suggestions would you offer to facilities management companies in Malaysia looking to improve their practices and strategies based on the success of industry leaders?	A	"...many companies in Malaysia are start to adopting smart technologies and sustainability practices to meet evolving client expectations, enhance operational efficiency, and comply with stricter environmental regulations..."
	B	"...implement mobile workforce management tools to streamline communication and task allocation for technicians, ensuring efficient and responsive service...."
	C	"...in-charge department should invest in advanced technologies such as IoT and AI for predictive maintenance and energy management ..."
6. How do leading facilities management companies in Malaysia prioritize sustainability and environmental responsibility in their operations? In this regard, have they implemented any specific initiative or practice?	A	"...yes, some of the initiatives is to reduce carbon and emissions created by electricity by repressing their electricity supply from plants to solar or wind turbines...."
	B	"...to maintain a good practice on managing "Sewage Treatment Plant" on all wastewater before discharge to drain or water source...."
	C	"...leading facilities management companies in Malaysia prioritize sustainability by implementing energy-efficient systems, green building certifications and waste reduction programs, often integrating renewable energy sources and smart technology to minimize environmental impact...."
7. Based on your expertise and observations, what is your actionable recommendations would you offer to facilities management companies in Malaysia seeking to emulate the best practices and strategies of industry leaders?	A	"...working together and sharing knowledge or technology transfer (TOT)..."
	B	"...adaptation with current technology and market trend ..."
	C	"...study and learn from industry leaders ..."

Improving the performance management of office buildings in Malaysia from a FM perspective involves several key strategies. Upgrading machinery and equipment to the latest technology enhances operational efficiency, while increased government subsidies on utilities reduce costs. Effective collaboration and communication among stakeholders, including building owners, tenants and service providers, are essential for sustained operational excellence. Prioritizing sustainable practices through green building certifications and smart technology solutions optimizes resource utilization and reduces environmental impact. Regular training for FM staff on emerging trends ensures efficient operations aligned with best practices. Ensuring facilities are consistently maintained at peak condition and addressing client needs promptly are crucial for maintaining positive relationships and satisfaction.

Leading FM companies prioritize recruiting qualified individuals based on expertise and qualifications, providing ongoing training and fostering a culture of continuous learning. They also adapt to evolving client needs, market dynamics and regulatory requirements by hiring multi-skilled employees, utilizing mobile and IoT-enabled tools for real-time diagnostics and embracing smart technologies and sustainability practices. Emphasizing meticulous planning, implementing mobile workforce management tools and investing in advanced technologies like IoT and AI further enhance operational efficiency. Furthermore, transitioning to renewable energy sources, managing sewage treatment effectively and integrating energy-efficient systems are key sustainability initiatives. FM companies should foster collaboration and knowledge sharing, adapt to technological advancements and learn from industry leaders to improve operational efficiency and service delivery. By integrating

these recommendations, FM companies in Malaysia can elevate service standards, enhance client satisfaction and position themselves as leaders in the industry.

4. Conclusions

Through a comprehensive analysis of challenges, influencing factors and best practices, this study will offer a holistic view of the FM landscape in Malaysia. The insights gained will not only benefit FM teams but also contribute to the broader discourse on sustainable building management practices in rapidly developing urban settings. The interviews revealed several critical challenges that FM teams in Malaysia encounter. These include ageing infrastructure, limited budget allocations and insufficient training for personnel. Ageing buildings often require significant maintenance, which strains resources and impacts overall building performance. Budget constraints further exacerbate these issues, limiting the ability to invest in necessary upgrades or advanced technologies. Additionally, the lack of continuous professional development opportunities hampers the teams' ability to adopt modern FM practices. Several factors were identified as having a profound impact on the effectiveness of FM teams. These include regulatory compliance, technological adoption and stakeholder engagement. Regulatory frameworks in Malaysia demand stringent adherence, which can be both a challenge and a guiding framework for maintaining high standards. The level of technological integration within FM practices varies widely, affecting efficiency and responsiveness. Moreover, active engagement with stakeholders, including tenants and building owners, is crucial for aligning expectations and improving service delivery.

Based on the insights gathered, the study offers several recommendations to enhance FM practices in Malaysia. Firstly, there is a need for strategic investment in training programs to equip FM personnel with up-to-date skills and knowledge. Secondly, embracing technology through the adoption of advanced management systems and predictive maintenance tools can significantly improve operational efficiency. Thirdly, fostering a culture of proactive stakeholder engagement can help in understanding and meeting the needs of all parties involved, thereby enhancing overall satisfaction and building performance. To address the multifaceted challenges faced by FM teams in Malaysia, this study recommends a comprehensive approach encompassing strategic training, technological adoption and proactive stakeholder engagement. Firstly, it is imperative to invest in robust training programs that provide continuous professional development for FM personnel. This can include certifications, workshops and seminars focusing on the latest industry trends, regulatory changes and advanced management techniques. Such training will equip staff with the necessary skills to manage modern office buildings effectively and respond adeptly to emerging challenges. Secondly, the adoption of advanced technologies, such as BMS, IoT devices and predictive maintenance tools, is crucial. These technologies can enhance real-time monitoring, streamline maintenance processes and predict potential issues before they escalate, thereby reducing downtime and maintenance costs. Furthermore, the implementation of energy-efficient systems and sustainable practices can contribute to significant cost savings and environmental benefits. Thirdly, fostering a culture of proactive stakeholder engagement is essential. This involves regular communication with tenants, building owners and other stakeholders to understand their needs and expectations better.

By establishing clear lines of communication and feedback mechanisms, FM teams can ensure that they are aligned with stakeholder requirements, leading to improved satisfaction and co-operation. Additionally, creating collaborative partnerships with vendors and service providers can optimize resource utilization and service delivery. These recommendations, when implemented

holistically, can transform FM practices in Malaysia, enhancing the performance and sustainability of office buildings while setting new industry benchmarks for excellence.

References

- [1] Saaid, M. N. F., M. A. Ayob, A. I. A. Yunus, A. W. Razali, and K. A. Maarof. "The Challenges of Space Management in Higher Education Institution." In *IOP Conference Series: Materials Science and Engineering*, vol. 429, no. 1, p. 012102. IOP Publishing, 2018. <https://doi.org/10.1088/1757-899X/429/1/012102>
- [2] Wahed, Tanima Abdul. "Impact of Facility Management on Fire Safety Crisis in Bangladesh's Aec Industry." (2018).
- [3] Mydin, Azree Othuman. "SIGNIFICANCE OF BUILDING MAINTENANCE MANAGEMENT SYSTEM TOWARDS SUSTAINABLE DEVELOPMENT: A REVIEW." *Journal of Engineering Studies & Research* 21, no. 1 (2015). <https://doi.org/10.29081/jesr.v21i1.41>
- [4] IFMA. (2013) "What is Facility Management?" International Facility Management Association, <https://www.ifma.org/about/what-is-fm/>
- [5] IFM NET. (2013) "What is facilities management, how does it work and how to find out more." i-FM.net, <https://www.i-fm.net/fm-info>
- [6] Koenigsfeld, Jason P., SeungHyun Kim, JaeMin Cha, Joe Perdue, and Ronald F. Cichy. "Developing a competency model for private club managers." *International journal of hospitality management* 31, no. 3 (2012): 633-641. <https://doi.org/10.1016/j.ijhm.2011.08.007>
- [7] Mapsted. (2023) "Facilities Management Trends to Watch In 2023." <https://mapsted.com/blog/facilities-management-trends>
- [8] Gao, Xing, and Ji-ming Cao. "The research of facility management based on organization strategy perspective." In *Advances in Education and Management: International Symposium, ISAEBD 2011, Dalian, China, August 6-7, 2011, Proceedings, Part IV*, pp. 161-167. Springer Berlin Heidelberg, 2011.
- [9] Grimshaw, R. W. "FM: the professional interface." *Facilities* 21, no. 3/4 (2003): 50-57. <https://doi.org/10.1108/02632770310469352>
- [10] Nutt, Bev. "Linking FM practice and research." *Facilities* 17, no. 1/2 (1999): 11-17. <https://doi.org/10.1108/02632779910248406>
- [11] Price, Ilfryn. "Can FM evolve? If not, what future?." *Journal of Facilities Management* 1, no. 1 (2002): 56-69. <https://doi.org/10.1108/14725960310807845>
- [12] Nielsen, Susanne Balslev, Anna-Liisa Sarasoja, and Kirsten Ramskov Galamba. "Sustainability in facilities management: an overview of current research." *Facilities* 34, no. 9/10 (2016): 535-563. <https://doi.org/10.1108/f-07-2014-0060>
- [13] Miller, Norman, Dave Pogue, Jeryldine Saville, and Charles Tu. "The operations and management of green buildings in the United States." *Journal of Sustainable Real Estate* 2, no. 1 (2010): 51-66. <https://doi.org/10.1080/10835547.2010.12091804>
- [14] Nizam Kamaruzzaman, Syahrul, and Emma Marinie Ahmad Zawawi. "Development of facilities management in Malaysia." *Journal of facilities management* 8, no. 1 (2010): 75-81. <https://doi.org/10.1108/14725961011019094>
- [15] Moore, Mike, and Edward Finch. "Facilities management in south east Asia." *Facilities* 22, no. 9/10 (2004): 259-270. <https://doi.org/10.1108/02632770410555986>
- [16] bin Syed Mustapa, Syed Abdul Haris, Hamimah Adnan, and Kamaruzaman Jusoff. "Facility management challenges and opportunities in the Malaysian property sector." *Journal of Sustainable Development* 1, no. 2 (2008): P79. <https://doi.org/10.5539/jsd.v1n2p79>
- [17] Schuman, Charles A., and Alan C. Brent. "Asset life cycle management: towards improving physical asset performance in the process industry." *International Journal of Operations & Production Management* 25, no. 6 (2005): 566-579. <https://doi.org/10.1108/01443570510599728>
- [18] Mitchell, J. S., and J. Carlson. "Equipment asset management—what are the real requirements." *Reliability magazine* 4, no. 14 (2001): 4-14.