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Abstract

In the national budget for 2021, the Malaysian government allocated RM 14.5 billion for higher education and RM50 million for infrastructure and equipment replacement in public universities. The most critical issues in managing university logistics are to fulfil academic space requirements by academic studies programs or professional bodies' accreditations. The issues arise due to indistinct information management on actual space inventory and space ownership allocation. Without a systematic space management process, it might affect static student enrolment, limited room capacity, occupancy overload, inadequate academic space facilities, poor space allocation and ownership, improper timetable management, increase in cost maintenance operation and new development costs in the future. There is still insufficient research that has comprehensively explored space management that gave impactful on the facilities management performance of the university. Thus, this study is significant to review the academic space management process framework for Malaysian public universities. Through a critical review of literature, it has been found that space strategic planning, space management operations and space audit assessment, are the three main elements of the process in space management for Malaysian public universities. It could strongly affect the overall facilities management performance in achieving sustainable development thus supporting the mission and vision of the university. This research contributed to both theoretical and practical aspects where it benefited university management, especially in the decision-making process for implementing effective institutions delivery in asset and facilities management and also becoming standard guideline on academic space management process for Malaysia public universities.

Keywords: Space Management Process, Public Universities, Facilities Management, Space Planning, Space Operation and Space Audit

Introduction

The government has given serious emphasis to asset and facilities management due to the huge investments that have been made towards the development and provision of assets (Berahim, 2015). A systematic, comprehensive, and integrated asset and facilities

management system must be established in line with the policy of continuous improvement of delivering systems in the public sector service. In 2009, The Government Asset Management Policy has been introduced by the Malaysian government as an effort to emphasize asset management due to the extensive number of investments that have been made in the development of assets (Yusof, 2013). The Malaysian government allocated RM14.5 billion for higher education and RM50 million for infrastructure and equipment replacement in public universities in the national budget for 2021 (Malaysia Ministry of Finance, 2021). The budget is for managing the university's logistics to fulfil academic space requirements by academic studies programs or professional bodies which is the most critical issue in the higher education industry. The issues arise due to indistinct information management on actual space inventory and space ownership allocation (Hamid et al., 2018). Hence, the management of learning or academic space is one of the most vital aspects of managing physical facilities resources in public universities. The importance of space management is not just limited to improving the capacity index only, but the cost of maintenance operations also has a significant impact (Hamdan et al., 2016). The university's management should foresee its implication for any unattended space where the risk is high for the organisation that needs urgent attention by the management. Therefore, a systematic academic space management process is required as it might affect students' enrolment, limited room capacity, occupancy overload, inadequate academic space facilities, poor space allocation and ownership, improper timetable management, increase of cost maintenance operation and less development in the future. As such, this study proposed an academic space management process framework for Malaysian public universities for the advancement of facility management.

Issues on Space Management Process at Public Universities

According to Hamid, space should be managed effectively to avoid wasted space (Hamid et al., 2018). However, studies show that most public universities in Malaysia frequently received a report of inadequate academic space (Abdullah et al., 2013). The situation occurred due to the institution was not optimizing the use of physical resources at particular times. Since the operation of the academic building is based on the timetable, it will lead to lower occupancy when the classes are not conducted. The space is also not in use during the evenings, nights, holidays, and semester breaks (Abdul Rahman et al., 2015). Space management is one of the most important aspects of facilities management and has significant sources of value optimization which can contribute to an effective higher education institutions (HEI) financial management (Saa'id et al., 2018; Valks et al., 2021). The issues arise when assignable academic space is abundant and not optimized used. This situation tremendously impacted the maintenance costs and if no action is taken effectively the budget will highly increase. It also will result in additional building operational expenses if there is no necessary action is taken.

There is also a need in compiling data inventory for space academics at the beginning phase right after the completion of construction work. The issue appears when the management did not receive complete data on the academic space function according to its purpose and user (Saa'id et al., 2018). The use of space can be estimated by frequency and occupancy rates. The frequency rate is based on actual hours divided by the maximum allocated hours per week. Whereas the occupancy rate is based on the actual capacity used per week divided total maximum capacity per week (Aziz et al., 2013). The challenges occurred when the class timetable is not permanently fixed to measure frequency rates. Inaccurate information on

maximum space capacity will also lead to failure in measuring occupancy rates (Abdullah et al., 2013). The use of space in higher education institutions is determined by different interests and users' requirements (Hamdan, 2019). The issue arises when there are difficulties in managing space in public universities due to faculty and administrators who often have different priorities and views on space management issues from different perspectives. The consequence is the management of the universities is unable to manage the space properly and systematically.

The next issues came from the top management support. According to (Hamdan, W.,2019), top management support has a significant role in establishing effective space management practices. A deficiency of top management support may contribute to low utilization of space even though the best-planned technique has been applied to managing space. As such, top management may establish a special space management committee to be included in the higher university decision-making team (UiTM, 2021). Most public universities in Malaysia seldom conduct space audit assessments. There are several of them who have audited their space in the academic building occasionally (Hamdan, 2019). Studies show that most space management guidelines in Malaysia only focus on space utilization (Hamdan, 2019). There is a loophole in the standard process of space management in the Malaysian context. Hence, there are need to develop an academic space management process framework for Malaysian public universities for the advancement of facility management.

Methodology

This literature review tried to provide practical information by critically reviewing several academic literatures and achieving a comprehensive analysis of the current literature related to the space management process, space management policy and space management guidelines in university. The ultimate objective is to establish an academic space management process for Malaysian public universities to identify potential elements which have a fatal influence on facilities management in university buildings. Therefore, for this study, a range of assorted studies was reviewed to create a key critical and shape the body of the current manuscript. The literature included refereed journals, conference proceedings, book, thesis, and reports. Three critical stages for this study were hired to shape the body of the manuscript identifying and collecting, classifying, and analysing. In the first place, the identification of critical keywords was conducted. According to the objective of the study, the following main keyword was employed in a space management process, public universities, facilities management, space planning, space operation and space audit. The keywords were searched in the databases by main search engines such as google scholar, web of science, science direct, and Wiley to identify and collect related manuscripts. Then, the collected articles were scrutinised to identify which article is more important and related to the study.

Space Management Process Model Analysis

Facilities planning and space management are decision-making process that gives direction for managing and providing adequate space for administrative and academic units on campus (Ibrahim et al., 2011). Effective facilities planning and space management are critical in maximising the use of available resources which include the unit assignment, building inventory, utilisation, modification, and evaluation of academic and administrative facilities on the campus (Blancheette, 2010). The Facilities Management Department is the university's custodian of all campus space and is responsible for maintaining and updating the campus

building, room inventory and building floor plans (Aziz, et al. 2013). In addition, the university should create an office responsible for analysing space use, optimising existing space use and predicting future space requirements. Therefore, the space management office will become a reference for all parties on university campuses.

All spaces are to be considered a valuable university resource and disposition is to be thoughtfully considered (Abdullah et al., 2010). No space assignment is to be considered exempt from a periodic review of use; it is essential to be justified to ensure continued relevance to the university's mission and goals (Abdullah, 2012). In maintaining the effectiveness, efficiency, and sustainable space management in higher education institutions (HEI), the organisation must establish a space management process model (Hamdan, 2019). Based on the literature (Hamdan, 2019), five existing established space management process models are found to be applied in managing physical space in higher education institutions (Figure 1.0). Four of the space management process models came from higher education space management policy and standards, while the remaining one is from a research journal appropriate to the corporate organisation. However, not all four space management processes in higher education institutions focused on the equivalent criteria. This is because each organisation of HEI has different policies and objectives in managing physical space criteria (Saidin et al., 2018; Hamdan, 2019). The same goes for the space management process for corporate organisations which is different from the HEI sector.

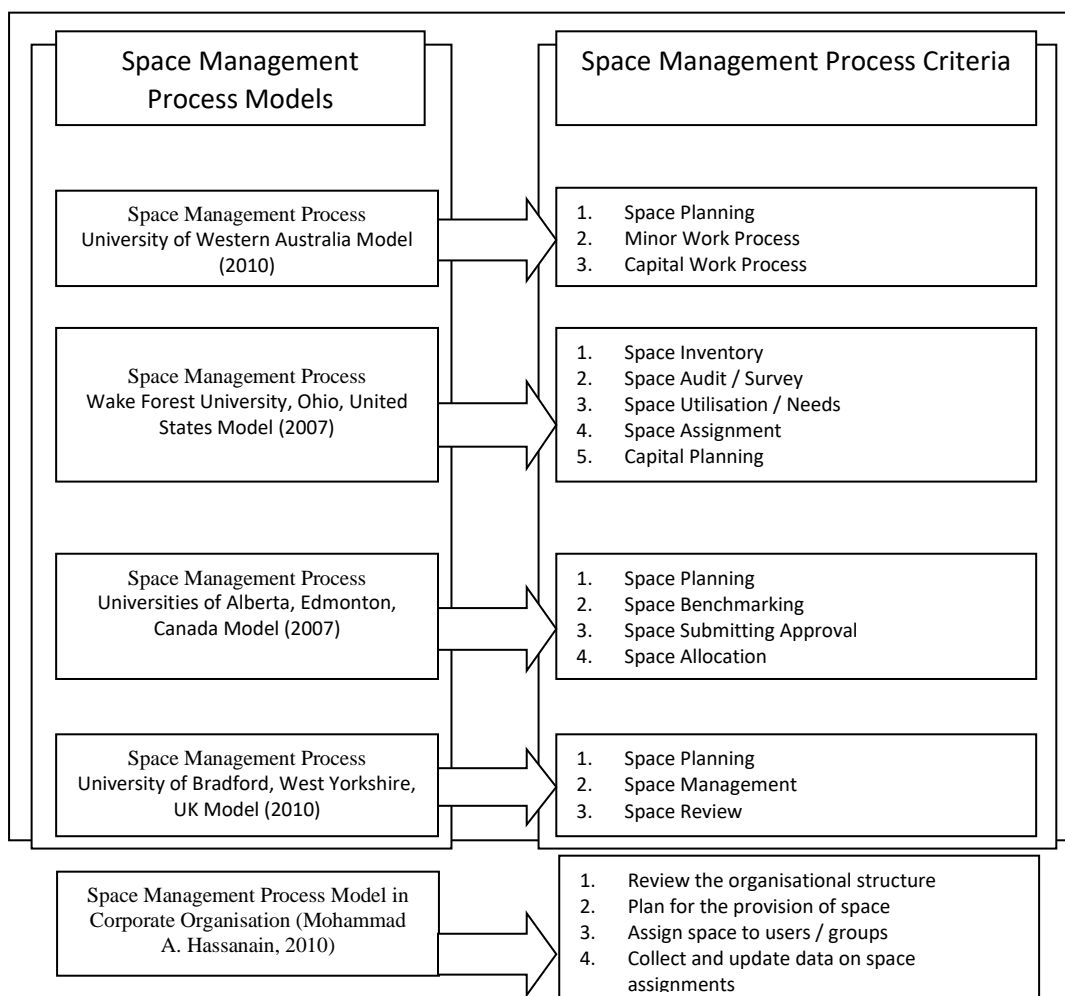


Figure 1.0: Space Management Process Model

Finding on the Space Management Process Framework for Malaysia Public Universities

Nevertheless, the conceptual category flow space of the management process seems to be similar, even with the different HEI organisations or another organisational sector. Therefore, the main findings from existing the five space management process models been analysed and discovered three main criteria of the space management process models for HEI. The three main criteria of the space management process are space strategic planning, space management operation and space audit assessment. As a result, a space management process framework for public universities in Malaysia is established through the development of a theoretical framework from various literature.

This new three strong main criteria framework (Space Planning, Space Operation and Space Audit) are also supported by 22 sub-criteria or parameters analysed from various literature related to the space management process. However, this new theoretical framework of the space management process framework has not been tested at any HEIs in Malaysia. Hopefully, from the implementation of a qualitative case study exploratory research, this model will establish a space management process standardisation for HEIs in Malaysia. Most of the space management processes in public universities are directly involved with facilities management. This is because space management is a part of facilities management (Abdullah et al., 2011; Ibrahim et al. 2011). Figure 2 shows the Academic Space Management Process Framework for Malaysia Public Universities is proposed by three strong main criteria which are Space Strategic Planning, Space Management Operation and Space Audit Assessment. Each main criteria have different number supporting activities, which becoming as sub-criteria on the space management process for HEI. This framework is expected to establish standard guideline on space management process for Malaysia public universities.

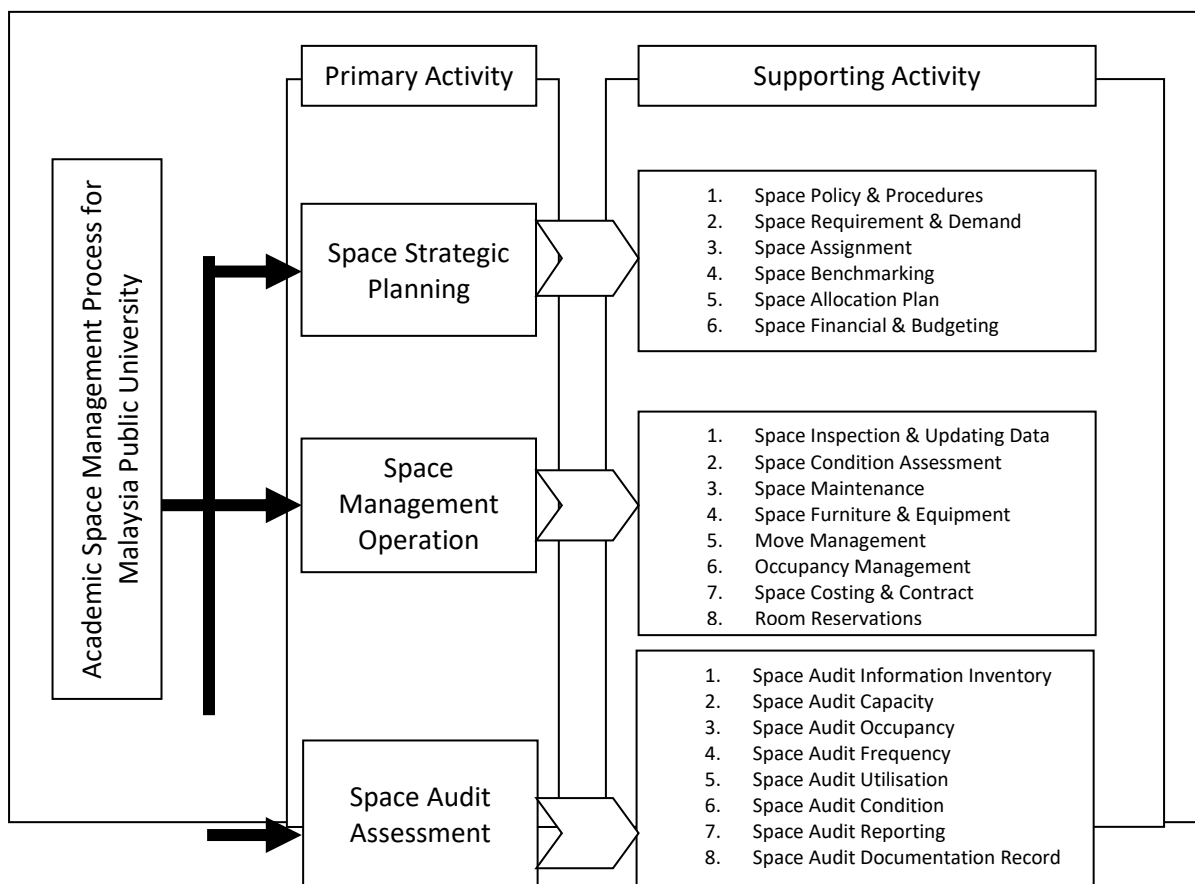


Figure 2: Academic Space Management Process Framework for Malaysia Public Universities

Conclusion

The rationale of this research is to propose an academic space management process framework for Malaysia public universities through exploring the related components and current practices model in other countries. The major discoveries are three strong main criteria which are space strategic planning, space management operation and space audit assessment. The main function of space strategic planning is to determine the goal and objective of space management for supporting sustainable facilities management to achieving vision and mission of higher education institutions. To ensure academic space physical constantly fulfill the facilities management requirement by the stakeholder and users is the main function of space management operation criteria. The main function on third criteria of space audit assessment is to review and analyses the performance of space management on higher education institutions for improvement on facilities management strategic. These three main criteria with subsidiary criteria function as supporting activities of academic space management process in Malaysia public universities. This research is predicted to contribute significant impact on financial management performance through optimization space management in Malaysia public universities. Additionally, other prediction on significant contribution is the academic space management process framework for Malaysia Public Universities which is vital to ensure the best decision-making by the stakeholders in managing the asset life cycle costing towards achieving sustainable facilities management. Latterly, this proposed framework is expected to benefit on the establishment of standard guideline on academic space management process for Malaysia public universities.

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