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SPACE MANAGEMENT: A PRACTICES AND APPROACH BY MALAYSIA PUBLIC UNIVERSITIES

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Abstract

Space is one of major assets of public universities, and on average represents around 29% of the costs of operating an institution. While this incurs a major cost to an institution, the availability of appropriate space is essential to support the teaching, research and community services objectives of institutions. The provision of the right space is becoming even more important as institutions are increasingly competing each other for students and funding. The management of space is therefore an essential part of an asset management strategy for any public universities. This study focused on the practice and approaches within four Research University in Klang Valley specific to assess the space management approaches. Approach, in the content of this study is referred to examine and constraint on the various approaches of space management in public universities to improve space use. Therefore, the findings revealed that all four respective public universities implemented different approaches in space management. The differences approach basically influences by the different philosophy and strategy of each organization. Although it found enormous gap in implementation of space management, all the organizations adheres towards optimizing of academic space usage and conducive learning and teaching environment.

Keywords:Space Management, Current Practice, Approach, Malaysia Public Universities.

1. Introduction

Malaysia generally succeeded in tertiary education democratization effort and produces a number of graduate students in order to meet workforce requirement for economic growth throughout the duration three decades ago. Nowadays, public universities have been expanding rapidly with expansion number of student and various educational programmed. In line with globalization development, public universities are required to have competitiveness and endurance so that they can emerge as world-class university. In order to achieve the vision to become a world class university, one of the conditions that need to be fulfilled is that they need to have quality academic facilities. Logendran (2002) states that as an infrastructure which support individual in an organization to achieve their vision, academic facilities play a vital role in public universities.

Facilities management can be further divided into different fields such as security management, maintenance management, emergency management, property management, asset management, estate management and space management. In other word, space management is one of the branches of the field of facilities management. Space management has been defined as “the art and science of maximizing the value of existing space and minimizing the need for new space” (Hier & Biddison, 1996). Space management is important to public universities because “facilities are the largest asset on the balance sheet and worth many times an institution’s liquid assets” (Hier & Biddison, 1996). Space is one of the most valuable and finite resources on campus that must be well managed to accommodate the competing needs of the various campus constituencies (Harris & Holley, 2008).

The main objective of this study is to identify current practices of space management approach in Malaysia Public Universities. Space management approaches to be encroaching are Space Planning, Space Strategy, Space Audit, Space Inventory Data, Space Utilization and implementation of Information Technology. Apart from that, this paper also looks at the performance of current space management based on students, academic and non-academic staffs and space personnel satisfaction level.

A public university, as any other organization, is trying to improve its efficiency in the face of rising operating costs and increasing user expectations (Varcoe, 1995). Currently, Department of Higher Education states that public universities in Malaysia will be categorized into three groups, namely Research University,

University Focusing and Comprehensive University. Yet, there are 20 public universities in Malaysia and were constituted that consisting of five Research Universities, four Comprehensive Universities and 11 Focusing Universities. These categories reflect the main course or field offered by each university. However, case studies will be conducted on four Research University in Klang Valley consisted of Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) and UTM International Campus (UTMIC).

As a summary, it can be said that space management approach is definitely significant in public universities in order to fully utilize the use of facilities. Although managing space is a complex process, mechanisms or measures can be put in place to run this task. But these needs to be actively and intensively managed in order to get real improvement in space use (University of Wales Swansea, Space Management: A Good Practice Guide, 2002). Lastly, this paper will present the results of the data collected from questionnaire and the subsequent analyses carried out. The study's ends with some conclusions and suggestion for improvement of space management approach in Malaysia Public Universities.

2. Literature Review

According to Downie (2005), space management thinking has developed largely during the 1990s, in response to growth in the public universities sector. Increases in student numbers, research output and privately funded research and consultancy put pressure on HE institutions' (HEIs) estates and finances, because they were accompanied by reduced funding. The estate, typically the second highest revenue expense, is an obvious target for efficiency gains, especially since over-provision of space is widespread (HEFCE, 2002a). The study of space management is to ensure that new facilities are constructed according to requirements, unneeded facilities are closed and possibly disposed of to reduce maintenance costs; occupancy is consolidated to minimize energy, maintenance and other operating cost. Apart from that, use and occupancy of space is validated and unauthorized use is ended, available space is distributed equitably among all users and a safe and healthful workplace free of hazards is provided. The objectives of space management therefore are to achieve functionality, equity, consistency, efficiency, flexibility, cost effectiveness and proximity.

Traditionally, public universities estates managers in the UK planned and allocated space using space norms (UGC, 1987) originating in the 1970s. These provide rules for calculating floor areas based on student numbers in individual academic disciplines. They are still in use, often in modified form (Downie, 2005). The different view occurs with local context where there are still unavailable specific practice guide for space management. Furthermore, space charging did not implement yet in local context. Currently, all public universities in Malaysia are using Guidelines and Rules for Building Planning by Standard and Cost Subcommittee (JKPK) Year Edition 2008 as reference for space norms and other approval application. But now, increasingly government agencies including public universities are realizing the strategic value of their academic space as a tool for maintaining a competitive edge.

The importance of space on campus can be seen from several different perspectives. In his groundbreaking publications on culture and space, *The Silent Language* (1959) and *The Hidden Dimension* (1966), anthropologist Edward T. Hall observed that issues about space are unique in different cultures and are instrumental in how social groups arrange their lives and interact within their communities. When space is viewed symbolically, the amount and quality of space allocated to individuals, departments, or to specific research topics is indicative of their value within the organizational culture and represents institutional priorities (Harris & Holley, 2008). From a political perspective, space can be equated with power and prestige, and from a functional perspective, space can determine how one works (Davis, 1984) and how one learns (Chism & Bickford, 2002).

2.1 Space Management Approaches

Space on campus has many purposes and types, including academic space (e.g. classroom and research space), administrative office space, commercial space (e.g. bookshop and cafeteria) student service space (e.g. athletic space, recreation facilities and social space), library space and residential space. Inception stage in managing space is Space Planning, means 'standards of guidelines for assessing or projecting current and future needs based on specific assumptions of program, enrolment, employment, and/or research growth during a given planning period'. Space planners play a vital role to collect and maintain space related data and provide information about space and associated costs to the different entities on campus. Their role in the space management process is more reactive than proactive, although they do engage in general planning studies for the future.

A Space Management Strategy (SMS) should be a clear statement on how space is to be managed in the public universities. It should describe the course of action that the institution will pursue in managing space. The Space Management Strategy needs to be dynamic. Although the strategy needs to be based upon key

strategic drivers (e.g. the Estate Strategy and Institutional Strategy), it also needs to be developed around users needs and feedback. This is important to help ensure maximum 'buy-in' to the strategy. In developing a Space Management Strategy document there are a number of broad issues that should be considered by an institution. What is the SMS to focus upon? Then, it is essential that public universities look at the advantages and disadvantages of the various spaces management measures, specifically in terms of how they assist in achieving the objectives of the Space Management Strategy.

Space Management Committee is vital in public universities in order to implement all space management strategy that has been scheduled. According to Blanchette, S. MC (2010), governance is hierarchical and all binding decisions are made at the senior administrator level. Besides that, guidelines and procedures are designed to assist the public universities in providing safe and productive work and study facilities for its staffs and students. Space management policy defines as 'intended to assist the public universities in achieving savings and efficiencies through the appropriate management of space allocation and utilization (James Cook University, 2010). For this moment, Malaysia public universities only referred Guidelines and Rules for Building Planning by Standard and Cost Subcommittee (JKPK) Year Edition 2008 in space matters. The policy is to conduct a comprehensive and competitive delivery system in line with the latest technology to achieve high efficiencies in supporting university teaching and learning activities as well as to promote a conducive education and research environment to the users.

The challenges to provide better value bring public universities in Malaysia to implement Computerized Space Management System (CSMS). Watt, C. E (2008) defined Computerized Space Management System (CSMS) as a large body of information stored in a computer, which can be processed and from which particular pieces of space campus information can be retrieved when required. New technology based systems, for instance Archibus, BricsNet or C-Works, can make the information more accessible by those in physical plant and even link architectural drawings to rooms, but the information seems to still be isolated from those who could use it for daily decision-making.

Space utilization is a measure of whether and how space is being used. The utilization rate is a function of a frequency rate and an occupancy rate. The frequency rate measures the proportion of time that space is used compared to its availability and the occupancy rate measures how full the space is compared to its capacity. Utilization rates can be assessed in terms of both actual use and predicted use (UK Higher Education Space Management Project, Space Utilization: practice, performance and guidelines, 2006). Shahabudin A., Wee L.H, Fairul A.M.N (2007) also declared that room utilization can better reflex the actual usage of a room. Therefore, a study and analysis for room utilization can reveal whether a room is actually under load or over load.

Space Audit is conducted basically to seek of fulfills the needs of faculties, institute, centre of research, departments and units spaces as well as residence colleges. Therefore, any increment in the number of students and numbers of new programmed offered would reflect to the space capacity needed and it forces the space personnel to arrange an existing space to accommodate while at the same time create some more spaces as well. Undertaking space audits of all facilities are to verify or update current space management data and design drawings. Thus, data collection is used for determination of space utilization rates (James Cook University, 2010). For most institutions, traditional facilities inventories are maintained for state reporting, for listing maintenance and renovation orders, for tracking individual classrooms. A space inventory data is, by definition, a list or schedule of facilities fields with codes and low level of details (Watt, C. E, 2008). Space inventory data and current campus space planning efforts are used to assess if space is being used efficiently.





As summary, public universities have the opportunity to design space management strategies with a 'blank sheet of paper'. For most organizations there will be existing activities, probably fragmented, possibly with gaps in the provision and maybe with overlaps and some confusion. It is from this base that those seeking change must move. In sum, a space management approach is a process that required enough information, feedback within supple systems and direction, provided by a strategy linked to corporate aspirations. Underpinning these mechanism are actions to create learning individuals and groups within an organizational context which encourages them to innovate.

3. Background Information of Case Study

This section will discuss on background information, organizational philosophy and current practice of space management approach by four Research University in Klang Valley. Background Information is referred directly to the organization background, organization structure that managed campus space, information on total number of students, staffs including academic and non-academic and total number of faculty and department. Whilst, organizational philosophy consist of organization vision, mission, quality objectives and future prospectus. Lastly, current practice describe on space strategy including of space committee/ governance, space management system and space policy. It is also information on the space management scope of field which represent by different organization. This study is based on four Research University located in Klang Valley consisted of Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia

(UPM) and UTM International Campus (UTMIC). The information is gathered from the interview and closed observation done with Space Personnel who represented each of organization. Table 1 below summarizes all the information.

Table 1: Space Management Approach By Four Respective Case Study

DESCRIPTIONS				 UTMiC, Jalan Semarak
Department that managed space campus	Property Management Division (Jabatan Pembangunan & Penyelenggaraan Harta Benda - JPPHB)	Building Maintenance Unit (Jabatan Pengurusan Pembangunan)-JPP)	Building Survey & Space Section (Pejabat Pembangunan & Pengurusan Aset -PPPA)	Administration Unit (Office of Asset and Development- OAD)
Organization load volume	22 zones, 12 faculties, 6 institutes, 5 centre's; approximate 20,000 students & 5000 staffs	8 faculties, 12 institutes, student enrollment estimation : 20,000	16 faculties, 9 centre's & institutes, student enrollment: estimation 25,018	6 centre of excellences, 5 schools, 8 depart.'s; student enrollment estimation : 1,200
Current practice on space management	Implemented own policy			
	Distribution and Space Utilization Policy (2009);	UKM Space Usage Policy (2011);	In planning to draft and outline own procedure/ policy;	Non
	Space authority			
	Deputy Vice Chancellor (Dev.);	Registrar;	Development Director;	Assistant Director Of Work;
	Computerized Space Management System (CSMS)			
Aperture System (2002), Integrated Property Management Systemn (IPMS), Online Common Space Reservation System (OCSRS) in 2010	e-Warga consisted of Sistem Maklumbalas & Aduan Kerosa (SAK) and Sistem Maklumat Pengurusan Ruang (SMPR) in 2000	Currently used manual method, trial and training session on Archibus FM (2010)	Manual method through fill up form	

Source: (Aizam, 2011)

Note: Although related case studies implement own policy on space management, yet there also referred to Economy Planning Unit (EPU Guidelines - 2008) endorsed by JKPK (*Jawatankuasa Kecil Piawaian*)

3. Methodology

Basically, this study will be conducted by using a combination of qualitative and quantitative. Structured or semi-structured questionnaires and interview are the vital medium in providing the reliable data that used to support the findings of the study. The opinion and suggestion from users are collected through open ended and structured interview. The secondary data is all the theories that related to space management review through journal, report, studies and etc.

3.1 Questionnaires

There are two sets of questionnaire were used in this study which is first set of questionnaire was designed for space personnel and facilities staff especially in space unit to look on their understanding, opinion and interpretations about subject matter. 30 prospective respondents were selected randomly involved from whole section/unit under the department from top to bottom by assume that all respondents are well known about the operation and organization. Second set of questionnaire designed for end users consist of student, academic and non-academic staffs to seek on their satisfaction level on space management in their organization. The prospective respondent was targeted among 50 for each public university.

3.2 Likert Scaling

Likert scale is a type of psychometric response scale often used in questionnaire, and is the most widely used scale in survey. The respondents are requested to respond the question in the six degree of agreement represent by rating scale indicated as follows: 1 – Strongly Disagree, 2 – Disagree, 3 – Fairly Disagree, 4 – Fairly Agree, 5 – Agree and 6 – Strongly Agree and 1 – Excellence, 2 – Good, 3 – Average and 4 – Poor.

4. Result and Analysis

The findings will be explained, analyze the feedback from the groups of space personnel and users (student and academic and non-academic staff).

4.1 The Importance of Having Relevant Competency, Skill and Knowledge in Space Management

It was found that most of the respondent from four universities picked strongly agree and agree with the significant to have relevant competency, skill and knowledge in space management section, unit or department. Thus, there are different perspectives on to have relevant competency, skill and knowledge in space management section, unit or department among them. For instance, only UPM appointed Building Surveyors in Building Survey and Space Unit Section, otherwise UTMIC only appointed administrative officer, UKM appointed Engineer and UM appointed Value Officer in managing space matter. These qualifications and experiences required for these positions are of course vary.

4.2 Main Reason for Having Space Committee/ Governing

Most of the universities noted strongly agree and agree on having Space Committee/ Governing. However, respondent from UM stated on other comment that it is not necessary to have Space Committee/ Governing if consideration of approval or local authority is within jurisdiction of Vice Chancellor or Deputy Vice Chancellor (as stated in their policy). In general, four respective universities mostly agreed on main reason for having Space Committee/Governed as a role of policy, circular and procedure space maker except for UTMIC. Overall, Space Committee/Governed can be one of the strategies to identify unfair practices, responsible to manage any dispute regarding space, final authority from top management, policy space maker and to review and monitoring issues that arise. This in line with University of Wales Swansea, Space Management: A Good Practice Guide (2002) statement that space management committee is vital in public universities in order to implement all space management strategy that has been scheduled.

4.3 Significance Aspect of Space Audit

In general, high percentages of respondents in UM, UKM, UPM and UTMIC strongly agree and agree with this statement especially on reason of to have more effective utilization of space aspect. However, UPM recorded highest percentage at 100% of fairly agree on health and safety environment aspect. It also indicate least percentage of strongly disagree, disagree and fairly disagree in UKM especially in as-built drawing for computerized space management system and health and safety environment aspect. As a conclusion, it can be said that the questionnaire result shows significant awareness on space audit. A report from James Cook University (2010) noted that undertaking space audits of all facilities are to verify or update current space management data and design drawings. Thus, data collection is used for determination of space utilization rates. However, UKM and UTMIC did not used space audit as the significant purpose of as-built drawing for computerized space management system as they are currently using manual method. While, from interview with UPM, there is lack of manpower to conduct space audit even though they are highly aware on the significant important of having it.

4.4 Important to Have and Implement Space Inventory Data

Most respondents among four respective universities strongly agree and agree with that statement, while least percentage in UM and UKM disagree with space inventory data can be as collection of better information, to have annual update database and to identify rooms by function. Finally, it can be concluded that different approaches of space inventory data in four respective universities were influenced by strategy, manpower capacity, viable in-term of cost (to implement database inventory data system) and capacity of students. Watt, C. E (2008) also emphasized that space inventory data approach leads to the development of personal

relationships and trust between the facilities department/space planners and the individual units. This personal interaction results in the collection of better information and helps to properly identify rooms by function.

4.5 Important of Information Technology (software) in Space Management

About 50% of the respondents strongly agree and agree with the significance of statement earlier. Information technology (software) in space management such as Aperture, Integrated Property Management System (IPMS), Archibus FM and Space Management System (SMS) may reduce cost and time, provide systematic record, can be updated daily and assigned directly to user. On the other hand, it also acts as current market trend, facilitate user to make complaint and development of better space management system. However, it also indicate least percentage at 7.6% and 11.1% of strongly disagree from UM and UKM on current market trend and development of better space management system. From the observation, most respective universities except UTMIC totally do not implement information technology (software) in space management. The implementation of information technology (software) in space management need fully support on cost, skill and knowledge of I.T staffs, sufficient internet supply and top management motivation support. Watt, C. E (2008) stated that Computerized Space Management System (CSMS) can make the information more accessible by those in physical plant and even link architectural drawings to rooms, but the information seems to still be isolated from those who could use it for daily decision-making.

5. Conclusion

As a conclusion, all four respective public universities implemented different approaches in space management. There are also different allocation of space division, unit and section in facility department. However, one of their role and objective which is similar to each other is to provide satisfactory supporting service to users in space management. A.A Aziz (2011) noted that existing guidelines in space management is found to be lack in certain part of it. Thus, UM and UKM have make their own strategy whereby to create their own policy in space matter but still referred to the existing one. Apart of it, there is also some adjustment on space norm for academic and non-academic staff. It is one of the reasons which contribute to non-standardization within our public universities. On the other hand, UM has added guidelines for space parking, whereby it stated the detail requirement on the entitlement of personal car park, permission to student to park and its regulation. As parking space is one of the major problem among staffs and students, so UM determine it is compulsory to add in their own policy. Out of four public universities, only UTMIC did not implement Computerized Space Management system (CSMS). Constraint of its usage in UIMIC lies on the small volume of student at currently only 1,200 is one of the main reasons of not viable to use it compared to other public universities with almost 5000 enrollment of student. Implementation of CSMS needs high budget of cost to purchase it, coupled with time consuming training session. Other disadvantages on it, is existing inventory and drawings which must be completed and updated, whereby UPM declared 60% of its buildings are in varied age. All the updated data and drawing must be inserted and assigned in the system. However, manpower constraint, as was earlier mentioned, and outsourcing of space audit may occur. It is different with UM and UKM, whereby it already implemented CSMS and launch to user about three years with two years trial mode including training session. The objectives of the study are achieved in ascertaining the implementation of space management approach adopted by public universities in Malaysia. Objectives are met by analyzing the case studies on the current practice on space management approach. As a result of reviewing the information gathered through interview and questionnaire on the space management approach, it can be concluded that the implementation of it by these selected public universities covers full spectrum of major activities which addressed the areas that have relationship between the users. However, the other areas are subject for further improvement.

References

- Abdullah, F. Hj & Moghni, M. (2010). *Space Planning and Design Standard for University Campus Development*.
- Australian Association of Higher Educational Facilities Officers, AAPA. (1998). *AAPA Space Planning Guidelines*.
- Australian Association of Higher Educational Facilities Officers, AAPA. (2001). *AAPA Space Planning Guidelines*.
- Blanchette, S. MC. (2010). *Space and Power in the Ivory Tower: Decision Making in Public Higher Education*.
- Downie, M.L. (2005). *Efficiency Outcomes from Space Charging in UK Higher Education Estates, Property Management*.
- Higher Education Funding Council for England, Bristol, HEFCE. (2000). *Estate Strategies: A Guide to Good Practice*.

Jawatankuasa Kecil Piawaian dan Kos (JKPK). (2008). *Guidelines and Rules for Building Planning, Standard and Cost Subcommittee*.

National Audit Office London, NAO. (1996). *Space Management in Higher Education: A Good Practice Guide*.

Uma Sekaran. (1984). *Research Methods for Managers A Skill-Building Approach*. John Wiley & Sons, Ltd.

Shahabudin A., Wee L.H, Fairul A.M.N. (2007). *Application of Space Management in University Towards Sustainable Usage*. Universiti Teknologi Malaysia (UTM).

Space Management Group, SMG. (2006). *UK Higher Education Space Management Project, Space Utilization: Practice, Performance and Guidelines*.

The University Grants Committee UGC. (1987). *University Building Project-Notes on Control and Guidance*.

Watt, C. E. (2008), *The Role of Academic Space Management at Research Universities and Academic Medical Centers*