

Lean Management: A Case of a Malaysian Multi-Campus University

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Abstract—The reduction in funding for Malaysia’s public Higher Education Institutions requires Malaysian public universities to implement lean management strategies to optimize available resources. This paper presents a case study on resources optimization at University Teknologi MARA (UiTM) and its state branch campuses. A qualitative study was conducted across all the campuses and eleven out of twelve campuses responded in 2016. (One of the campuses opted not to be included). Written responses from these campuses were analyzed and categorized into eight waste practice categories for higher education institutions. In total, thirty-five types of waste practice were identified. Actions taken to eliminate each waste practice category were identified and discussed.

Index Terms—Higher Education Institutions, Lean Management, Waste Practices.

I. INTRODUCTION

The world oil price has dropped more than 60% since 2014. As a crude oil producing country, Malaysia’s economy is adversely affected. Therefore, on 19th January 2015, the Malaysian Government announced cut backs in the federal budget¹. Following that, in the 2016 Budget, the Malaysian government further reduced budget allocations for many ministries and agencies including, that for the Ministry of Higher Education (MOHE) which saw a 9.794% reduction from RM100,263,400 to RM 90,443,400². This resulted in the reduction of budget allocation for Malaysian public universities.

Universiti Teknologi MARA (UiTM) is the largest university in Malaysia. It has 12 state branch campuses in Malaysia. Furthermore, there are 21 satellite campuses under nine of the state branch campuses. The funding for each state branch campus is determined by the main campus located in Shah Alam, Selangor, which received an annual budget from MOHE.

Lean Management is the key to optimization when resources are limited. Prudent management of available resources and the generation of income from these resources through various measures must now be made a priority. The

most haves are what UiTM should strive for, leaving the nice to haves for better days. Prior to the implementation of Lean Management, a study focusing on identifying wasteful practices with the system of UiTM state campuses is essential. With its budget reduced by 23.72% or from RM2,618 million in 2015 to 1,997 million in 2016³, UiTM like its 19 other counterparts will have to be innovative and creative in the management of its funds to remain competitive. The study thus aims to (1) identify wasteful practices and (2) explore actions taken to eliminate the wastage.

II. REVIEW OF RELATED LITERATURE

Lean Management is a tested and proven tool for achieving significant performance improvements by delivering higher quality at lower costs^{4,5}. As such, Blazer⁶ suggested Lean Management principles and practices be adopted by Higher Education Institutions (HEI). In response to the 2008 financial crisis, Lean Management was adopted in HEI mainly to reduce practices leading to wastage, streamline processes making them more efficient and re-engage a workforce fatigued⁷ from the financial crisis (p6). In education, the application of Lean Management principle has significantly improved colleges’ and universities’ critical services and processes⁵.

HEI had focused on teaching and conducting research for centuries⁸. For last 2 decades, HEI has changed fundamentally due to the increase in the number of students^{9,10}, a higher expectation from the public¹⁰, increasing demand on the quality of education from parents¹⁰, the emphasis on the position of institutions in the world ranking¹⁰, the change in the demography of students¹⁰, increasing costs¹⁰, the reduction of public funding¹⁰, the change of funding structure for expansion and competition from other HEI^{9,10} and the globalization of HEI and research^{9,10}. The increasing intake of students had transformed the higher education from an exclusive to mass offering. Universities are competing for international students and staff resulting from the globalization of higher education. To be more efficient, universities need to improve their operations management^{9,10}. To meet higher expectations with constant budget cuts, HEI have adopted the lean service concept to stay competitive¹¹.

The main focus of the Lean Management concept is to identify and eliminate wastes. Womack and Jones⁴ define waste as a human activity that absorbs resources with no added value. Before waste can be removed, we must first recognize the types of waste in the organization’s processes and understand the causes. After confirming that it has no more added values, it should be permanently removed¹². In the manufacturing environment, the generic wastes were identified and classified. Duffy and Wong¹³ identified eight categories of waste, namely, excess motion, excess transportation, underutilized people, unprocessed inventories,

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defects, over production, waiting time, and over processing. Based on these eight waste categories, Kang and Manyonge¹⁴ only recommended seven categories that are relevant to HEI. The seven categories were excess motion, excess transportation, excess inventory, defects, over production, waiting time and over processing. They also suggested possible ways to eliminate each waste in HEI.

Douglas et al.¹² (p977) however suggested underutilized people to be included in Lean Management for HEIs, where academic staff were not teaching their specialized subject area, postgraduate courses, and had no research or scholarly activity time. Paradoxically, the enthusiasm for Lean Management in HEI seems to be limited. Some organizations prefer to give advice to other organizations rather than applying Lean Management to their own organization¹⁵. Nevertheless, a few universities have initiated Lean Management in their universities. The current literature reviewed in the study had shown that accounts on Lean Management practices remained rather descriptive and non-critical⁶. They were largely based on anecdotal evidence⁶.

III. METHODOLOGY

A multiple-case study approach was utilized in this study. Qualitative data were collected through a set of open-ended questions. Administrators from all campuses were requested to respond to the questionnaire which was hosted on an online cloud based survey software. Content analysis was used to analyze the data. Data with similar waste category were categorized according to the categories suggested by Kang and Manyonge¹⁴ and Douglas et al.¹², for higher Education Institutes as shown in Table 1.

TABLE 1: CATEGORIES OF WASTE PRACTICES FOR HIGHER EDUCATIONAL INSTITUTIONS (HEI)

No	Waste Practices for HEI
1	Excess motion ^{12,14}
2	Excess transportation ^{12,14}
3	Underutilized people ¹²
4	Excess Inventory ^{12, 14}
5	Defects ^{12, 14}
6	Over production ^{12, 14}
7	Waiting time ^{12, 14}
8	Over processing ^{12,14}

IV. FINDINGS AND DISCUSSIONS

Eleven of the twelve state branch campuses responded to the online open-ended questionnaire. The waste practices were categorized into the eight categories as shown in Table 2. In each category of waste, actions taken to eliminate the waste were also summarized in Table 2.

TABLE 1: WASTES IDENTIFIED AND ACTIONS TAKEN TO ELIMINATE THEM

Waste Category	Waste identified	Action taken to eliminate the waste
Excess Motion	✓ Students were allowed to have overseas and local academic visits by using the Academic Development Trust Fund and Student Affairs Trust Fund.	✓ Limiting the area for academic visit to reduce travelling cost. Limiting academic visits to certain localities within the country to reduce travel costs.

Under Utilized People	Utilized	People
✓ Staff from campuses travelled to different campuses for meetings.	✓ Most of the students' activities were conducted outside the campus.	✓ Enhancing the use of video conferencing for inter-campus meetings.
✓ Staff training programs were conducted outside campus		✓ Faculties are encouraged to organize their activities within the campus area. If the campus cannot provide the required environment, the location nearest to the campus will be considered first.
Excess Transportation	✓ Transportation was provided for staff on duty outside campus regardless of the number of staff involved. Petrol and toll costs and drivers' overtime costs were high.	✓ Members of staff pay their own travelling expenses and claim later.
	✓ Decisions on policies and regulations were decided by the main campus. Briefings were conducted at the main campus which resulted in high travel expenses incurred by branch campuses.	✓ Decentralized policy is gradually being implemented and autonomous decision-making is granted.
	✓ Examination papers are delivered by hand.	✓ Developing an online question bank where each campus can retrieve sets of questions from a secure online system.
	✓ Staff could e mail using the 'send to all' tool.	✓ Advising staff to only send e mail to relevant recipients.
	✓ Office hours were fixed from 8.00am to 5.00pm and work hours beyond the time frame were considered overtime. Overtime claims were high.	✓ Implementing flexi office hours for servicing support staff where the schedules are from 7.30am to 4.30pm or 9.30am to 6.30pm. Staff can choose their working preferred work hours. This approach has helped reduce overtime claims.
	✓ Overtime costs for staff who carried out their task outside the 8.00am to 5.00pm schedule.	✓ Shift system is implemented for departments which need longer service hours.
	✓ Over staff for certain departments.	✓ Restructuring and moving the excess staff to other departments.
	✓ Assistant invigilators were employed to invigilate final examination. Extra cost incurred.	✓ Support staffs are appointed as assistant invigilators during final examination. No cost is incurred.
	✓ Part time full time lecturers were employed when faculty lecturers were loaded with minimum workload.	✓ Maximize lecturers' workload is implemented as stated in the criteria fixed by Academic Affairs division through the implementation of Lecturers Workload Guideline

	<ul style="list-style-type: none"> ✓ Some faculty lecturers were under load. 	<ul style="list-style-type: none"> ✓ Faculty lecturers with less workload are arranged to teach basic courses in other faculty /department after going through training. 	<ul style="list-style-type: none"> organized throughout the year. 	<ul style="list-style-type: none"> /courses which are only extremely necessary, and have added value.
Excess Inventory	<ul style="list-style-type: none"> ✓ Lecturers printed notes and materials for students ✓ Excess of University Brochure ✓ Some tasks were carried out at certain sections for too long. ✓ Many stationery items were stored in the store room, taking up space ✓ Idle assets were not utilized. 	<ul style="list-style-type: none"> ✓ Lecturers are only allowed to print tests and quizzes for students. ✓ Limited brochures will be printed and public are encourage to get university information through university's website. ✓ Standardize work procedures are prepared to ensure tasks do not linger too long at certain sections. Key Performance Indicators (KPI) should be adhered to. ✓ Purchasing enough stationery items through proper planning. ✓ Unused assets are open for other options to maximize their use such as renting out available space or places to generate income. 	<ul style="list-style-type: none"> ✓ Fixed meeting schedule for administration ✓ Centralized air-conditioning system remained operational as long as someone is in the campus. ✓ Most of the applications to attend training were approved. ✓ Most of the applications to present papers at local and overseas conferences were approved ✓ Most of the programs that involve staff participation were organized at non-government premises. ✓ Activities were carried out by each department at fixed schedules. 	<ul style="list-style-type: none"> ✓ Call for meetings only when necessary ✓ Centralized air-conditioning is operational only on from 7am to 7pm. It is encouraged that lectures and activities be conducted within the time frame. ✓ Approving training that provides added value to department and UiTM ✓ Only applicants whose papers will be published in high impact journals will be considered for funding. ✓ Staff programs are organized at government premises such as hotels that belong to the state government to get cheaper rates or zero charges through the NBOS initiative ✓ Only added value activities will be organized.
Defects	<ul style="list-style-type: none"> ✓ A lot of equipment in the lab was not fully utilized and just kept in the store. ✓ Many rooms were not used at all time. 	<ul style="list-style-type: none"> ✓ Consider rental options for facilities. Space audit should be done to identify unused space. ✓ Renting out these rooms to generate income. 		
Over Production	<ul style="list-style-type: none"> ✓ Too many activities were organized for students 	<ul style="list-style-type: none"> ✓ Only activities that are aligned with students' course/program outcomes are organized. 		
Waiting time	<ul style="list-style-type: none"> ✓ Waiting time for many processes. ✓ Administrative officers were given special tasks and only the assigned officers can carried out the tasks. This results in the delay if the officer is unavailable. ✓ Branch campuses took at least a week to write reports or give responses. ✓ Customers waited too long for staff to find information or forms 	<ul style="list-style-type: none"> ✓ Information should be made available online. ✓ Encouraging multi-tasking so that unavailable officers are replaced immediately to avoid delays. ✓ Developing a systematic workflow and schedule. ✓ Making e-forms and information available online 		
Over Processing	<ul style="list-style-type: none"> ✓ Refreshments were provided during or after meetings. ✓ Accommodation and air tickets were booked using government warrants. ✓ Many courses were 	<ul style="list-style-type: none"> ✓ Refreshments provision should be reduced during or after meetings. Lunch should only be served if the meetings take more than 5 hours. ✓ Staff are encouraged to book their accommodation and flights online and purchase the cheapest options. ✓ Organizing training 		

Overall, 35 types of waste practices were identified in this study that matched the categories by Kang and Manyong¹⁴ and Douglas et al.¹². There were four types of waste practices that matched the category of Excess Motion suggested by Kang and Manyong¹⁴ and Douglas et al.¹². Under the Excess Transportation category, the study also identified four types of waste practices. There were six types of waste practices that fell under category of Under Utilized people by Douglas et al.¹². Under the Excess Inventory category, the study found five types of waste practices that matched the description. There were only 2 types of waste practices that matched the categories of Defect and 1 type of waste practice matched Over Production as suggested by Kang and Manyong¹⁴ and Douglas et al.¹². Furthermore, under the Waiting time category, four types of waste practices were identified. Finally, nine waste practices matched the general description of the Over Production category by Kang and Manyong¹⁴ and Douglas et al.¹².

Kang and Manyong¹⁴ suggested 20 possible ways to eliminate waste practices in their seven categories. In this study, 35 actions were taken to eliminate the 35 types of waste practices in the 8 categories of waste as shown in Table 1.

V. CONCLUSION

This study has investigated waste practices at eleven UiTM state branch campuses and identified actions taken by these campuses to eliminate waste practices. There were 35 waste practices identified in the management which matched the eight categories of waste suggested by Kang and Manyong¹⁴ and Douglas et al.¹² for HEI. All the wastes identified were eliminated through 35 actions as suggested in Table 2. The study illustrated the possibility of lean management practices as a response to dwindling allocation of federal budget, These

, in addition to income generating activities will help buffer the effects of reduced funding and help UiTM move forward.

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