

FURNITURE PROCUREMENT IN HIGHER EDUCATION INSTITUTIONS

CASE STUDY: KOLEJ 9 AND 10, UNIVERSITI TEKNOLOGI MALAYSIA

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## **DEDICATION**

“To my beloved father and mother, my only brother, thank you for all your support and encouragement.”

“To all my fellow friends, thank you for all your support.”

“To my supervisor, who guided and helped me, thank you”

*Dr Rohaya binti Abd Jalil*

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## ABSTRACT

Furniture is one of the basic amenities provided by Higher Education Institutions (HEIs) in Malaysia in order to support and ease the activities done by their students, lecturers and staffs. It is provided in an effort to ensure the learning process can be conducted smoothly, appropriate learning environment can be created, and with the thought that it can assist them in producing effective and efficient work performance. Despite its significance, limited scientific and economic research has been undertaken to examine the best method in procuring the furniture. Therefore, there are situation arise whereby there are unseen costs in the management of the furniture which resulted in the higher costs to manage and maintain it during the furniture economic life span. Therefore, this study aims to ascertain the best procurement method that can be employed by the HEIs by identifying the total costs involved in the whole life cycle of the furniture in UTM's hostels as well as identifying the most beneficial procurement option (buy-in or leasing) by conducting sensitivity analysis. The study was conducted through a quantitative analysis method by using life cycle costing analysis (LCCA) and sensitivity analysis. From the analysis, it is discovered that the costs elements that contribute to the whole life cycle costing of the furniture is the initial costs, operating and maintenance costs, replacement costs, salvage value, base date, economic life span as well as the discount rate. Through the identification and the analysis made through LCCA and sensitivity analysis, the findings indicates that although furniture owned by UTM through buy-in method has the highest initial costs which contributed to 97% of the total of its life cycle costing but they are generating more savings in the long terms rather than leasing. Therefore, the study concludes that, the best procurement option for the furniture in HEIs in Malaysia is buy-in method rather than leasing.

## ABSTRAK

Perabot adalah merupakan salah satu kemudahan asas yang disediakan oleh Institusi Pengajian Tinggi di Malaysia bagi membantu dan memudahkan aktiviti yang dilakukan oleh pelajar, pekerja dan pensyarah mereka. Dalam usaha bagi memastikan proses pembelajaran dapat dijalankan dengan lancar, persekitaran pembelajaran yang baik haruslah diwujudkan oleh pihak IPT bagi memastikan proses pembelajaran dapat dilaksanakan dengan baik dan membantu meningkatkan prestasi yang baik dikalangan pelajar. Walaupun kepentingan penggunaan perabot telah diakui oleh pelbagai pihak namun terdapat kekangan di mana penyelidikan yang dilakukan terhadap pengendalian dan pembelian perabot adalah amat terhad. Di sebabkan itu, terdapat keadaan-keadaan yang tidak dijangka berlaku dalam pengendalian perabot seperti kos-kos yang tersembunyi yang pada akhirnya mengakibatkan pihak IPT terpaksa menelan belanja yang tinggi bagi mengatasinya. Oleh itu, kajian ini dilakukan bagi mengenal pasti kos-kos yang terlibat di dalam pengendalian perabot tersebut terutamanya di Universiti Teknologi Malaysia (UTM) melalui pengumpulan data bersama pihak-pihak yang terlibat. Selain itu, kajian ini turut dilakukan bagi mengenal pasti jumlah kesuluruhan kos di dalam pengendalian perabot di UTM melalui kaedah analisis kos kitar hayat atau dikenali sebagai LCCA. Akhirnya, kajian ini juga dilakukan bagi mengenalpasti pilihan perolehan yang terbaik (sama ada belian semula atau sewaan) dengan menjalankan analisis kepekaan. Melalui analisis yang dijalankan, penulis dapat mengenalpasti kaedah perolehan yang sesuai bagi perabot di UTM. Walaupun keputusan analisis menunjukkan bahawa perabot yang diperoleh melalui kaedah pembelian mempunyai kos permulaan yang tinggi iaitu melibatkan 97 peratus kos hayatnya, tetapi melalui kaedah ini, UTM dapat menjana simpanan yang lebih banyak berbandin kaedah sewaan. Di sebabkan itu, kajian ini menyimpulkan bahawa pilihan perolehan yang terbaik bagi perabot di IPT di Malaysia adalah kaedah pembelian.

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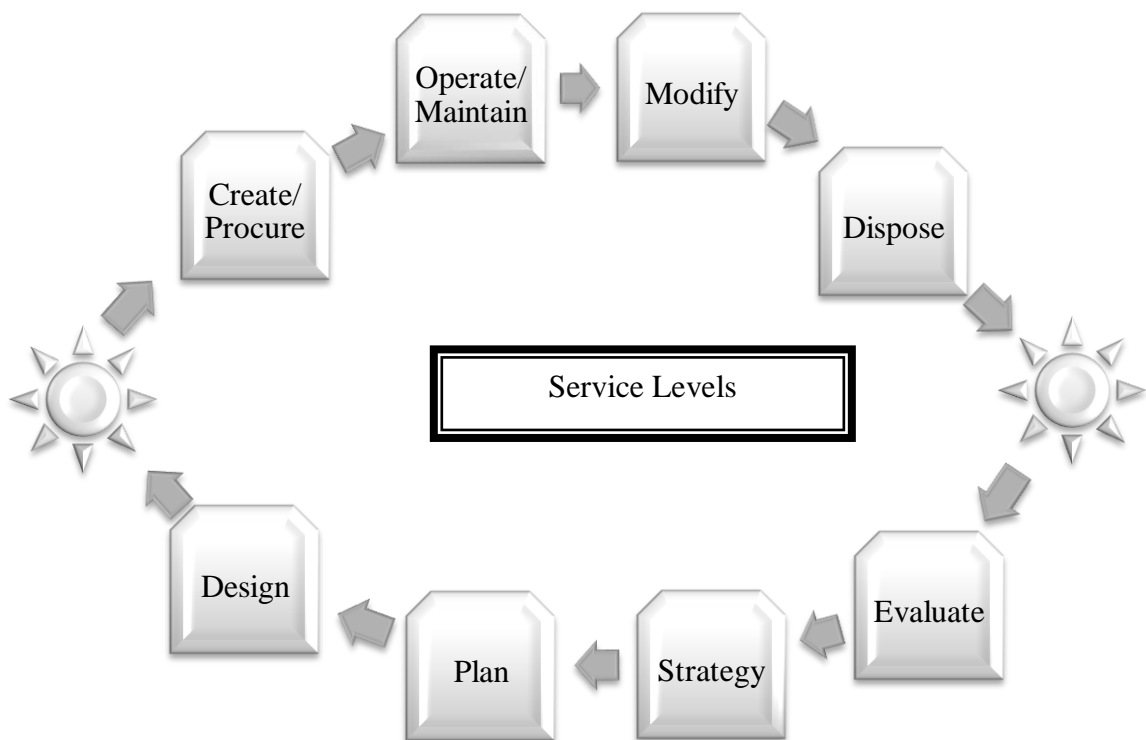
## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

In the world today, physical assets are considered as the basis for success and future development for many organisations (Frolov *et al*, 2010). Physical assets are used in every operations of the organisation either in the production of products, goods, providing services to the customers or just to add value to the organisations. Due to that, the effective management of these assets are very important in ensuring the overall success of the organisations. Throughout the world, hundreds of billions of dollars are used up to manage the assets. But yet, according to Frolov *et al* (2010), in parallel with the financial significance shown, the increased in the importance of asset management practices are also fuelled by other factor. Among the factors are the differences and changing needs between stakeholders and service level requirements, the life span of the assets and increased knowledge and attention on the public health. Many organisations admit such factors as being importance to their operations and they are searching for methods to consistently improve their asset management practices. Consecutively, this has led to an increase in research on asset management in both the academic and practitioner fields. The evidences can be seen by the increase numbers of literature being published either by the academician and practitioners.

Asset management (with the focus on physical assets, rather than financial assets) is known as a systematic and structured process that covers the management of the physical assets from the moment it was produced until its disposal. It is a process done with the underlying hypothesis that the assets exist to support the organisations delivery strategies, and it requires a certain level of management approach and capability from various organisational disciplines (Cooperative Research Centre for Integrate Engineering Asset Management (CRCIE, 2008). In support of the definition provided by CRCIE, it has been recognized in the literature that effective and optimal management of physical assets requires multidisciplinary approach (Amadi-Echendu J.E. et al, 2007). Thus Amadi-Echendu (2004) stated that currently it is not enough to only consider asset management as only the maintenance of an asset, but it is rather as a holistic approach to the management of the assets which started from the production of the assets until its disposal stage. In other words, the management of the assets should start from the production stage until the end of its life cycle which is the stage of disposal. According to Lutchman (2006), there are eight phases involves in the life cycle of the assets. Each of the phases are shown as below:



**Figure 1.1:** Assets Life Cycle  
Sources: Lutchman (2006)

Each of these life cycle phases plays an important role to the management of the assets. Without proper management of each of this life cycle phases, the organisation may not obtain the benefits and optimum use of the assets and it may eventually leads to the situation whereby the organisation need to pay more for the usage of the assets either for the maintenance of the assets or during the initial payment although the assets are not able to form certain function or duties as required by the stakeholders. This situation may occur due to several reasons and several stages in the equipment life cycle. But one of the reasons identified is the mistake done in the procurement stage (Mwikali and Kavale, 2012).

Procurement or acquisition of assets is one of the phases in the assets life cycle. It is the phases whereby the organisations make an acquisition of the assets. All the organisations need to deal with this stage at some point in the life of their business. According to Velnampy (2008), procurement is the act of acquiring the goods, service or products from external sources to assist the organisation in carrying out their work process. However, there are several factors to be considered in making acquisition of the assets. Among the factors that should be considered by any organisation before the acquisition are made is determining their needs and methods of procurement. It is an essential process because they need to ensure that the procurement are done at the best possible costs and meet the needs of the organisation and the stakeholders in terms of the quality, quantity, and time. When they know what are their needs and requirement in carrying out their business, they will know the best method to procure the assets. This act will prevent and future hassle and problems in managing the assets. It is because, not all the assets that a business requires need to be purchased from outside. They can also be created, rented out from the selected suppliers for a certain period of time or employed any other methods that they think at the end of the process will be beneficial for their company. Because of this, it is very essential for the organisation to weight the pros and cons of purchasing or renting these goods and services from outside. One of the scenarios that can be used to portray this situation is the selection of procurement method for furniture in Higher Learning Institutions (HEIs) in Malaysia.

Furniture is one of the assets that any organisation or HEIs would need to have. They are the basic amenities that is usually prepared by the organisation or HEIs in Malaysia for the usage of their staffs and students in carrying out their jobs or to support any human activities such as seating and sleeping. In other words, it means that the furniture need to be prepared to ease human activities so that they are able to carry out their jobs properly as well as helping in creating ambiance and environment that are safe, assuring, comfortable, and able to facilitate them to produce effective and efficient results and at the same time increase their work performance. In HEIs in Malaysia, furniture is being provided not only for the use of the staff and students in their learning process or working environment but it is also being provided for the usage of the students at the hostels. The furniture are supplied to each of the hostels to serve several function such as providing facilities to the students in their daily activities whether to study, keeping up their clothes or just to have a rest. When all the furniture is available, it will ease their learning process, activities and make them ready to face future endeavor.

Due to the facts that most students are most likely to spend half of their time in the hostels either to study or to rest their mind and body before the starting of the next learning session, it is important for the HEIs in Malaysia to play important parts in ensuring the furniture are prepared and well managed. They need to make sure that the furniture can function accordingly, safe to be use, and delivered with a certain quality specified by the government. However, they also need to keep in mind on the costs aspects in management of the furniture. They need to make sure that the furniture are able to function well to serve the students needs at all time but they need to ensure that the furniture will not costs to much in its management. Due to that, it is important for the HEIs to pay attention to such problems in their programs of furniture management in order to prevent problems such as unending maintenance needs and faced unexpected costs during the furniture life span. Therefore, one of the ways to prevent that is through better selection of procurement method. Better selection of procurement method will ensure that the organisation can managed its furniture with ease. It is because purchasing and leasing the furniture have different advantages and disadvantages. Among the pros and cons of buying and leasing the furniture is:

**Table 1.1** Advantages and Disadvantages of Purchasing and Leasing

<b>Type of Procurement Method</b>	<b>Purchasing</b>	<b>Leasing</b>
Advantages	Ownership No penalties Control of equipment	Less initial expense Flexible terms Easier to upgrade equipment Transfer risks to the supplier
Disadvantages	Higher initial expenses Lack of flexibility Need to handled complaint by themselves	Does not own the equipment Limited operational control Expensive in the long run

Source: Eisfeldt, A. L., & Rampini, A. A. (2007)

Through the listed advantages and disadvantages, HEIs can foresee what are the benefits and problems that may wait for them in the future. Therefore, through better selection of the method, they can transfer certain risk or enjoyed certain benefits that will help them in saving the costs in managing the furniture.

While it's important to choose which one of the procurement methods are the best and suitable for owning the furniture in HEIs in Malaysia, the real situation shows different scenarios. Some example can be seen in the management of furniture at UTM. Traditionally, the furniture provided at the hostels in UTM is provided through purchasing. However, starting from 1998, UTM starts to lease up the furniture to be provided in all the new hostels building to serve the student needs. Furthermore, finance lease are recognizes as one of the sources of financing (Kraemer-Eis and Lang, 2013). Therefore, although there are limited literatures supporting which one of the procurement method is the best in the management of the furniture, most of the HEIs including Universiti Teknologi Malaysia (UTM), Universiti Teknologi Mara (UiTM), and Universiti Tun Hussien Onn (UTHM) choose to lease their furniture.



Financial leases means at the end of the contract to prepare and managed the furniture, the ownership of the furniture will transfer from the lessor to the lessee. However, UTM is adopting operating lease which means there is no transferable agreements to the lessee at the end on the contract. When the lease period ended, the suppliers will need to take out all the furniture from the hostels. In other words, UTM needs to continually renewing their contract to ensure the furniture is always available to cater the student needs. Because of that reason, the costs for furniture management in UTM are starting to increase. Therefore, Bursar UTM are looking forward for research to be conducted for them to make future references on which procurement method are the best to managed the furniture especially for two of their hostels which is currently provided with purchased furniture. Moreover, this is an important task to do because currently, the decision to lease all of the items is made solely on the initial costs of the items as tendered by the contractor without bearing in mind the probability of the total life cycle costs of the furniture. Although at the initial stage the value would always be higher, but it does not reflect the total life cycle costs of the equipment. According to Jossund (1998) , the current practices which only focusing on the initial costs of the materials should change from only considering the initial costs to considering the total life cycle costs of the materials (Tysseland, 2007). It is because the lowest initial costs do not always representing the same things will occur in terms of its maintenance and disposal costs. Therefore according to Kim (2008), one of the ways that can be done to look at the best procurement method is through life-cycle costing. Life cycle costing analysis or LCCA will enable UTM to know the total costs to managed the furniture for both of the alternatives and derives at the best procurement methods that will benefits them in the future.

## **1.2 Statement of Problem**

Furniture is the basic amenities use to accommodate all the spaces in UTM hostels, however, there are no studies being conducted before on how it should be procured. Most of the studies conducted through economic analysis such as Life Cycle Cost Analysis (LCCA) are focusing on the buildings, equipment or

infrastructure. Although there are many research on LCCA regarding the alternatives, but still no one mention about the furniture. Due to the lacking of research and guidelines on what are the best procurement methods in acquiring furniture, not many was troubled with the decision whether to buy or lease the furniture and making the right choices between them. Hence, mostly HEIs in Malaysia choose to lease the furniture for the usage in the universities.

Moreover, the decision to lease all of the items is made solely on the initial costs of the items as tendered by the contractor. A higher cost for the items usually does not make the bid. The same thing applies to buy in furniture. Because of the higher initial costs that will be incur by the organisation in purchasing the product, most of the organisations tend to lease their furniture without considering the after cost such as the maintenance costs of the furniture. In other words, initial costs are always used as benchmark to determine the procurement decision (Bowyer, J. et al., 2013).

The cheapest costs are always chosen as the best methods compared to the one that are more expensive. Indirectly, this situation makes the person in charge in the procurement of the assets reluctant to invest in the buy-in furniture because of the usual initial costs for buy-in furniture that is always high compared to the one that is leased. Regrettably, the lowest price frequently does not result in the lowest all-in cost or total cost of acquisition, operation and disposal. According to Jossund (1998) , “The Norwegian Defense’s ongoing and future organisational change, demands that the present focus on costs associated with material system procurement is changed from only considering the initial procurement cost to looking at the total life cycle cost of the materials (Tysseland, 2007). It is because the lowest initial costs do not always representing the same things will occur in terms of its maintenance and disposal costs.

Aside from the costs, there are also problems caused by the suppliers (UTM Minutes Meeting, 2012). Among the problems arise are they do not manage the furniture properly once they get back their investment. While the contract for the furniture lasts for 5 years, the contractor might get back their investment during the

period of 3 years and 8 months. It means the remaining period are the profit obtained solely for the company. Due to that, there are cases whereby the furniture is not being managed properly especially during the end of the contract. This lead to an event where there are many complaint received by the college regarding the damage furniture but the complaint cannot be entertain and left unattended. Hence, because of there is lack of research on how the furniture should be manage as well as how it should be procured, most of the furniture are leased by HEIs without realising the actual costs that they need to bear. With the focus given only on the initial costs, other operating costs involve in the management of the furniture are dismissed. Thus, it is important for the study to be conducted to assist the HEIs in making the right decision on how they should procure the furniture to gain the benefits in the future.

### **1.3 Research Questions**

Maxwell (2005) stated in his books that the main reasons research questions are developed is because they are needed to explain particularly what the study are trying to learn or understand. It is to provide a path to help the study to be more focus and provide guidance to the author to map out their research. Among the research questions outlined for this study are:

- i. What are the cost elements to manage the furniture in UTM's hostel?
- ii. What are the total costs involved in the whole life cycle of the furniture in UTM's hostel?
- iii. What are the most beneficial procurement option (buy-in or leasing) by conducting sensitivity analysis?

#### 1.4 Research Objectives

Based on the issues arise from the problem statements, the objectives in this research are as follows:

- i. To identify the cost elements to manage the furniture in UTM's hostel.

In managing the furniture in the hostels, there many costs that need to be incurred by UTM in ensuring that the furniture are being able to function in accordance with its intended use. The costs involved would be from the initial stage of owning the furniture until the disposal of the furniture. Hence, this study aims to understand and identify what are the costs involved in managing the furniture in UTM's hostels in ensuring its effective and optimum usage. The cost elements will be identified through the literature reviews as well as the interview with related parties.

- ii. To identify the total costs involved in the whole life cycle of the furniture in UTM's hostel.

After the cost elements to manage the furniture in UTM's hostels have been determined, this study aims to identify the total costs that would be involved in the management of the furniture by using Life Cycle Costing Analysis (LCCA). LCCA is one of the economic analysis methods that can be utilised by any HEIs or organisation to calculate the costs that would be involved in the whole life cycle of the furniture. From the analysis conducted, the costs that UTM need to incur in order to provide the furniture for the students from the initial stage of acquisition until the disposal stage can be ascertained.

- iii. To identify the most beneficial procurement option (buy-in or leasing) by conducting sensitivity analysis.

When the total costs in managing the furniture through buy-in option (current procurement method in Kolej 9 and 10) has been ascertained, this study aims to look at the whole life cycle costs of the furniture if it was leased in the future as another alternatives for UTM to own the furniture. For this reason, the total life cycle costs of the furniture if it was to be leased will be analysed by using LCCA to compare the total life cycle costs for both option. Meanwhile, sensitivity analysis will be conducted to look at the most cost saving option even if some of the variables are altered. Therefore through this study, the best option to own the furniture can be pointed out. It will act as one of the decision making tool for HEIs in making the best decision between both of the alternatives in their future planning.

## **1.5 Scope of Study**

The scope of this study is developed in order to assist the researcher in achieving the objectives of this research. In this research, scope of the study includes the study areas as well as the target of the study. The study will be conducted at Universiti Teknologi Malaysia (UTM)'s hostels or also known as colleges. This study will employ case study approach and therefore Kolej 9 and 10 are selected as the case study for this research. Both of these colleges are selected due to their differences in their furniture management procurement method which is buy-in method.

Currently there are eleven colleges in UTM. They are:

- i. Kolej Rahman Putra
- ii. Kolej Tun Fatimah
- iii. Kolej Tun Razak
- iv. Kolej Tun Hussien Onn
- v. Kolej Tun Dr Ismail
- vi. Kolej Tuanku Canselor
- vii. Kolej Perdana
- viii. Kolej 9 and 10
- ix. Kolej Datin Seri Endon
- x. Kolej Dato' Onn Jaafar
- xi. Kolej Tun Ghaffar Baba

As mentioned, apart from all the colleges listed above, currently, the only colleges or hostels that purchase all the furniture for the usage of their students are Kolej 9 and 10. Meanwhile, the others are being leased from several contractors. Kolej 9 and 10 starts their operation in 2000 and there have been total number of 1813 sets of furniture provided in the hostels. The sets of furniture are matched with the total number of rooms provided to the students.

In achieving the objectives of the study, the data that will be gathered are the data on the furniture management at Kolej 9 and 10 as well as the data on leased furniture at other colleges. The data are gathered in ensuring justifiable comparison is made between both of the procurement option. The data will be gathered from the parties involved with the procurement and management of the furniture in UTM which is UTM's Procurement Management Decision, Student Affairs and Alumni, UTM Office of Asset and Development and the management staff for the colleges.

As the number of furniture per set for each of the hostels are different according to the rooms provided, the study will focus on comparing the furniture per set either for the option of buying or leasing as they consists the same unit of furniture which is:

- i. Bed
- ii. Mattress
- iii. Wardrobe
- iv. Seat
- v. Table
- vi. Bulletin Board

## **1.6 Research Design and Methodology**

Research methodology is an important steps and method to ensure that a research will accomplish its objectives. It is also a crucial stage to determine type of data to be collected and the suitability of the methods to ensure that the objectives of the study will be achieved at the end of the research. Thus, this chapter will discuss on the description of methods used in conducting survey for the case study, data collection and finally the measurements of the data. Hence, it will act as a guideline in determining the right steps to carry out the study and methods to analyze the results obtained.

Basically, there are three steps that will employed by the author to achieve the objectives of the study.

### **i. Stage 1: Research Background**

In this stage, the cost element is identified with the focus on the furniture management at UTM's hostels. Next, introduction and short review on the issues are prepared. Subsequently, three research objectives are developed based on the issues identified. Scopes, objectives, significances and also the methodology of the study is determined as a guideline to the research.

**ii. Stage 2: Data Collection**

In this study, data are collected through two parts which is primary data and secondary data. Primary data comprises of interview questions prepared for the related parties involves in the management of UTM's hostel furniture. With the information provided through the interview conducted, the costs elements that are found in the literature review will be identified and justified.

Whilst the secondary data is gathered through the books obtained from the library, journals related to the procurement and furniture management, articles, magazines, and other printed materials. Therefore, literature review was prepared through the usage of secondary data as writing references. After that, all the data received will be analyzed in parallel with the objectives and scope determined in the study.

**iii. Stage 3: Data Analysis**

In this stage, all the data received through the interviews will be analyzed in accordance with the objectives and scope of the study. Analysis of data will be conducted by using content analysis to extract all the related data pertaining to the costs elements involved in the management of furniture in UTM's hostels and finally the data extracted will be analysed through LCCA method to get the whole life cycle costs of the furniture for both option.

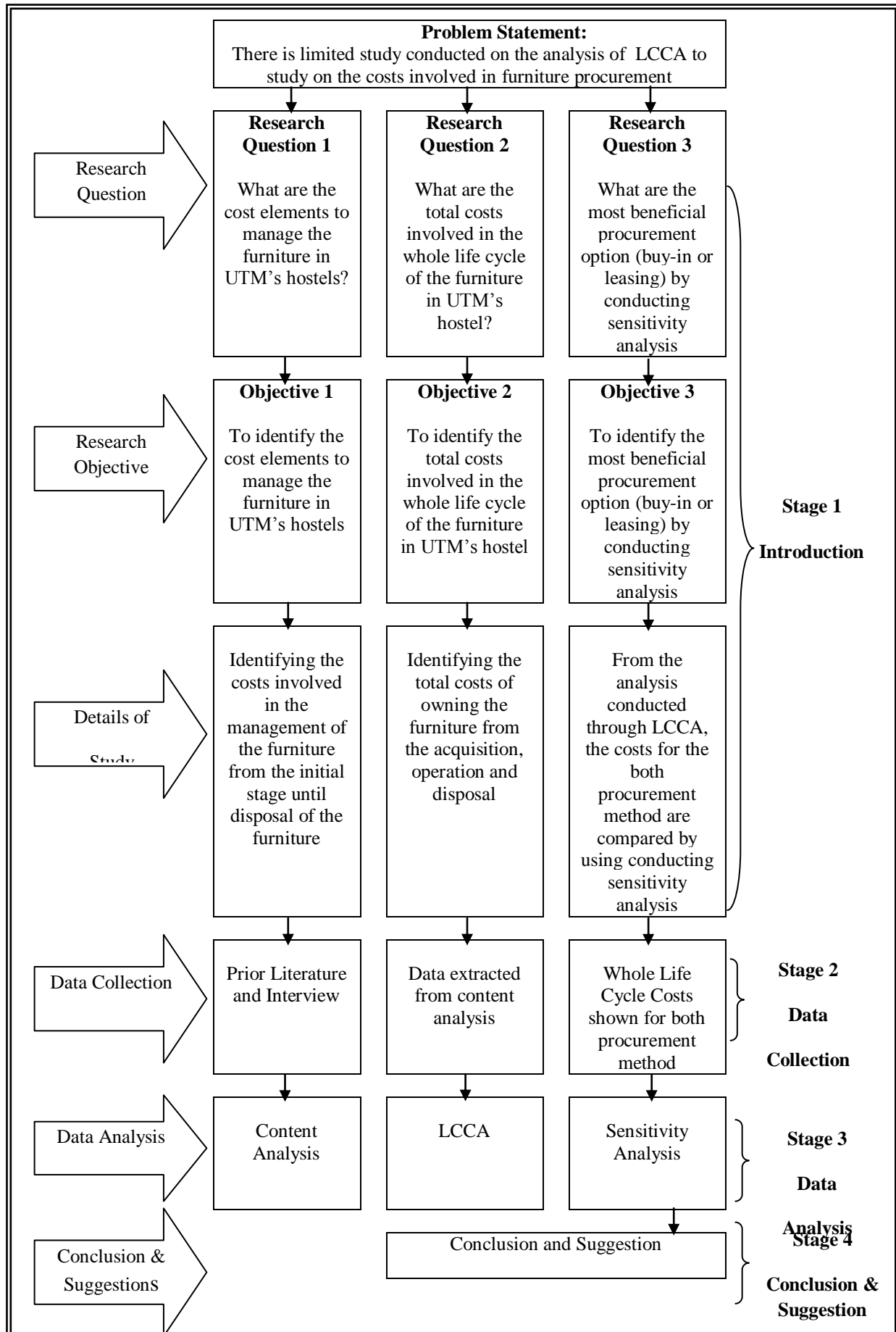
Next, sensitivity analysis is conducted to look at the most costs saving option between buy-in and lease furniture even if the variables are changed.



**iv. Stage 4: Conclusion and Suggestion**

This is the last stage of the research. After the data has been analyze and interpreted, the conclusion from the research is derived and suggestions will be given to the parties concerned. The limitation of the study will also be discussed in this last chapter. The recommendations are formed based on the results obtained from the study.

Generally, the flow chart for the study is shown as below:



**Figure 1.2:** Research Methodology Flow Chart

## **1.7 Chapters Outline**

This study consists of five chapters. The arrangements of the chapters are as follows:

### **1.7.1 Chapter 1: Introduction**

Basically, this chapter explains about the introduction of this study, problem statements, objectives, scopes of the study, and also the importance of the study. The methodologies that will be used in conducting the study are also briefly explained.

### **1.7.2 Chapter 2: Literature Review**

This chapter will generally define what is furniture management, procurement management and Life Cycle Costing Analysis (LCCA). It will give the readers better understanding on the issue discussed as well as the costs element involves in conducting LCCA.

### **1.7.3 Chapter 3: Research Methodology**

Generally, this chapter will be discussing on the data collection method that will be used to obtain the data related to the studies as well as the methods that will be utilised in analyzing the data.

#### **1.7.4 Chapter 4: Findings and Discussions**

Generally, this chapter will discuss on the analysis of data that are extracted from the content analysis and literature review. The data will be analysed by using economic analysis methods such as LCCA and sensitivity analysis.

#### **1.7.5 Chapter 5: Conclusion and Suggestions**

In this chapter, the main point of the research will be sum up to define what the research is all about, how and why the study is conducted in a nutshell. Suggestion will be given to the parties involve.

### **1.8 Significance of the Research**

The study focuses on the furniture management at the UTM's hostel. Currently, the furniture at UTM's hostel is mostly leased from several contractors and only two of them are bought by UTM as part of the hostel building during its completion. As a result, the costs in managing them have been varied. Hence, this study is carried out to look into all the costs related to both ways of procurement methods to ensure the minimum future expenditure can be generated by deciding the best option of owning the furniture. For this reason, the costs related to the whole life cycle of the furniture is identified and analyzed by using Life Cycle Cost Analysis or known as LCCA.

LCCA is an economic model over the project life span. Previous study on LCCA showed that one of the LCCA main objectives is to decide on the most cost effective approach from a series of alternatives. It is done in order to attain the lowest long term cost of possession or ownership of the materials or assets. From the previous studies, it is usually found out that the cost of maintenance, operation and

disposal costs always higher than the costs occur during the initial stage of procuring the assets. Thus, this research will employ LCCA as a method of depicting the true overall cost of the procurement alternatives between the furniture. From this, minimum cost in owning the furniture can be obtained and the savings from the chosen method can be use for other purpose to assist the objectives of the business. Besides that, this research can assist other researchers or organisation in making decision in relation to managing the assets of the organisation in the future.

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