THE DEVELOPMENT OF A LANDSCAPE MANAGEMENT SYSTEM FOR PEJABAT HARTA BINA, UNIVERSITI TEKNOLOGI MALAYSIA: A STUDY FOR THE GUIDELINES

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ABSTRAK

Projek Sarjana ini melaporkan kajian bagi menghasilkan garis panduan bagi membangunkan Sistem Pengurusan Landskap bagi Pejabat Harta Bina, Universiti Teknologi Malaysia. Landskap merupakan salah satu dari perkhidmatan sokongan di UTM yang bertindak mewujudkan persekitaran pembelajaran yang kondusif untuk para pelajar serta kakitangan akademik. Untuk memastikan kebaikan dan keterpeliharaan pembangunan landskap UTM, Pejabat Harta Bina memerlukan Sistem Pengurusan Landskap yang komprehensif dan sistematik untuk membantu kerja-kerja pengurusan landskap kampus UTM. Kajian dan analisis terhadap keperluan Sistem Pengurusan Landskap bagi Pejabat Harta Bina, skop kerja, proses kerja serta data yang terlibat di dalam kerja-kerja pengurusan landskap dilakukan bagi memahami secara menyeluruh fungsi-fungsi yang perlu dipenuhi oleh sistem yang dicadangkan. Struktur modul-modul dan rekabentuk pangkalan data kemudiannya dihasilkan, dimana ini bertindak sebagai garispanduan terhadap perkara-perkara yang perlu dilibatkan dan bagaimana untuk membangunkan satu Sistem Pengurusan Landskap sebelum proses pembangunan yang seterusnya iaitu rekabentuk antaramuka dan pengarurcaraan dilakukan.

ABSTRACT

This Masters project reports the task of studying for the guidelines for the development of a Landscape Management System for Pejabat Harta Bina, Universiti Teknologi Malaysia. Landscape is one of the support services in UTM that serves to provide a conducive learning environment for students and academic staffs. To ensure the well-being of its landscape developments, Pejabat Harta Bina requires a comprehensive and systematic Landscape Management System to assist landscape management tasks for the campus. Studies and analysis on Pejabat Harta Bina's requirements of a Landscape Management System, the scope of work, work processes and data involved in landscape management works were undertaken to thoroughly comprehend the functions that the proposed system should fulfill. Module structures and database design were then produced, functioning as guidelines on what should be incorporated and how to develop a Landscape Management System prior to subsequent development processes of interface design and programming.

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Chapter 1

INTRODUCTION

1.0 Introduction

Landscape is most popularly known as one of the artistic elements, used to modify and manipulate natural as well as manmade elements to make the landscape more attractive without jeopardising its function. The natural elements may include plants, water and the earth surface itself. Manmade elements on the other hand may include structures and buildings for public uses. Hence, landscape requires meticulous planning and design not only to ensure that it is able to function well but to ensure that it fulfils the public needs with regards to its surroundings. Landscape also requires thorough management, preservation, conservation and maintenance to ensure that it is always in good form and to allow the public to enjoy its aesthetical values.

With the development of information technology that offers various possibilities of data storage, data retrieval and manipulation of both spatial and attribute data, management tasks have recently shifted to a new trend through the utilisation of information technology to further improve decision makings, strategic planning, tactical approaches, policy makings, assessment tasks as well as assisting operational works.

However, the application of information technology in landscape management is still considered to be relatively new and uncommon, where manual filing systems are still the common practice in most government and private organisations. In fact, landscape management software are rare and mostly custom made for certain organisations to cater its own requirements. However, custom-made landscape management systems are also relatively rare. Perhaps, the fact that landscaping is often seen as a discipline that merely functions to provide aesthetics and conducive environment influences the perception of landscape managers to not see the benefit that can be gained through the investment of information technology in landscape management.

As landscape provides values that may increase the competence of organisations, core businesses that focus on recreational activities and education require good and well-managed landscape in order to complement and support the running of the core business. The following diagram shows how landscape functions as a support service entity.

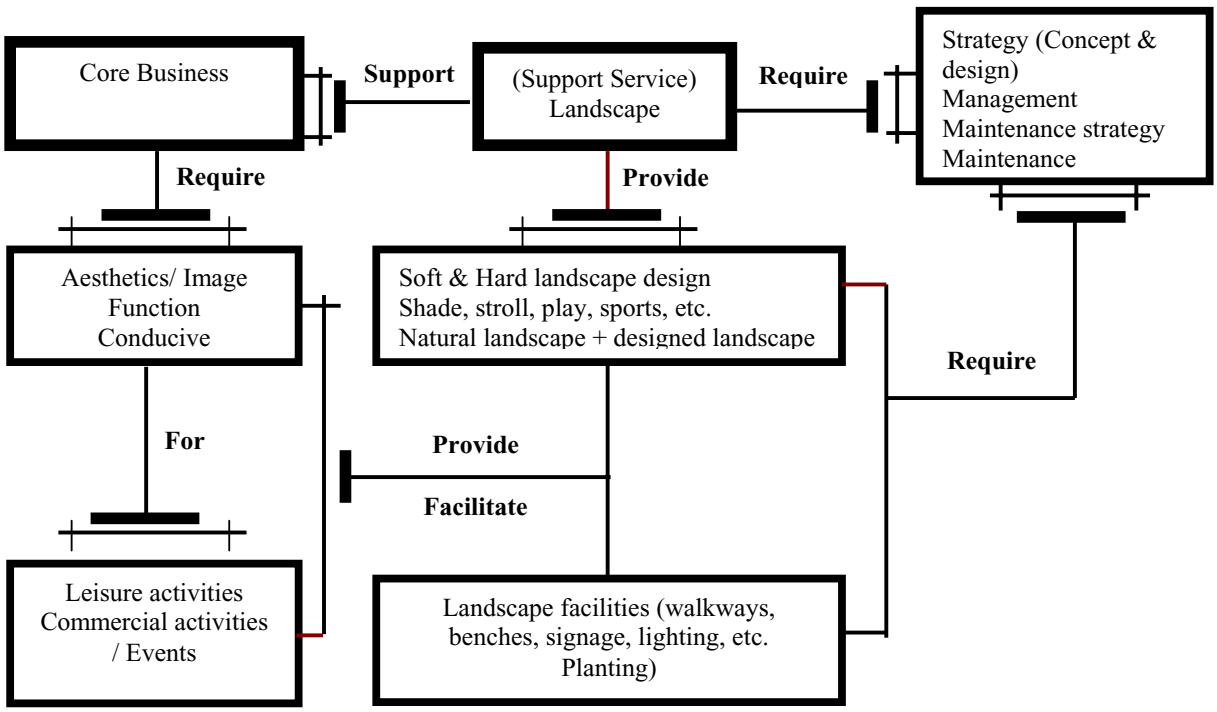

Figure 1.1. The function of landscape as a support service entity
(Source: Author's interpretation)

1.1 Problem Statement

Cullen (1981) stated that two of the most influential factors that govern the failure of landscape projects are poor landscape planning and poor landscape maintenance works. Landscape planning requires thorough understanding on matters pertaining to the site, goal to be achieved, cost, and labour. Landscape maintenance on the other hand requires thorough understanding on the requirements of maintaining the landscape elements in good condition. Both factors inevitably demand organised, comprehensive and convenient accessible information to assist management and maintenance works.

Pejabat Harta Bina, Universiti Teknologi Malaysia is currently facing problems in landscape management and maintenance works due to unsystematic archiving of landscape information. Hence, records on landscape contractors, fertilisers, schedules, soft and hard landscapes, etc. are often hardly available when needed by the management team for evaluation, strategy-making and planning. En. Mohd. Faizal B. Suleiman, the Landscape Technical Assistant at Unit Penyenggaraan & Ubahsuai Bahagian Harta, Pejabat Harta Bina conveyed the problem of facing difficulties in retrieving and analysing landscape related information due to the absence of a systematic information system to assist landscape management works. En. Roslan Shariff, a Civil Engineer at Bahagian Harta, Pejabat Harta Bina with wide experience in system development on the other hand stated that where other information systems can be found in abundance that include Real Estate Information Systems, Property Management Information Systems and Facilities Management Information Systems, Landscape Information Systems are rare.

The existence of various other facilities management software with various modules to assist management tools can be found in abundance in the market. However, these software do not provide modules that are suited for landscape management purposes despite the recognition of landscape as one of the elements in facilities management. Table 1.1 shows a number of the most popular facilities management software in the market and the modules that they offer.

Table 1.1. Computer Aided Facilities Management (CAFM) Systems & Modules.

Software	Modules
Archibus	▪ Space management ▪ Real estate management ▪ Building operations ▪ Telecommunication
Aperture	▪ Space management
FM Systems	▪ Space management
OFMS	▪ Space accounting ▪ Space management ▪ Autocad ARX overlay
Prism	▪ Maintenance management ▪ Inventory control ▪ Space management ▪ Event management
ATG	▪ Space management ▪ Electricity ▪ Life safety
SSM	▪ Space management ▪ Electricity ▪ Life safety

Source: CAFM System Peer Preview –University of Massachusetts (2001)

From the above table, it can be seen that CAFM systems do not offer modules that can be applied to landscape management works. The Space Management modules are somewhat related and can be partly utilised in landscape management works but lack essential functions that are vital in landscape management. Hence, the scenario of the problem is:

i. Most landscape organisations (including Pejabat Harta Bina, UTM) that are responsible in landscape management still practise manual filing systems.
ii. Most management software including CAFM do not have modules for landscape management works.

Due to these facts, this research project aims to study for the guidelines for the development of a Landscape Management System that can be recommended to Pejabat Harta Bina, Universiti Teknologi Malaysia which can benefit landscape management works.

1.2 Goal & Objectives

The goal of this research is to study for the guidelines for the development of a Landscape Management System that covers all landscape management aspects practised by Pejabat Harta Bina, UTM. A prototype of one of the modules of the proposed system (inventory module) will be produced as a by-product of this research. The objectives of this research are to:

i. To translate the work process of landscape management & maintenance practised by Pejabat Harta Bina, Universiti Teknologi Malaysia into an information system that will enhance the efficiency of the work process.
ii. To structure the modules that are essential to be incorporated in a Landscape Management System.
iii. To structure the database design of a Landscape Management System by analysing the types of landscape management data required in the system.

1.3 Scope of Research

The scope of this research shall cover these following aspects:

i. The landscape management & maintenance policies, strategies, and procedures of Pejabat Harta Bina, Universiti Teknologi Malaysia.
ii. The criteria that should be taken into consideration in designing and developing a complete Landscape Management System.
iii. The types of modules and data to be incorporated in a Landscape Management System.

This research aims to study for the guidelines for developing a Landscape Management System by studying the work process, required modules and data, followed by the designing of the structure of the system modules and database. This research does not however cover subsequent system development processes such as interface design and programming due to limitation of time.

1.4 The Importance Of The Research

This undertaking of this research is expected to benefit the following parties:

i. The UTM Administration

This research can benefit the UTM administration in identifying problems in landscape management works, upgrading landscape policies and strategies, and further improve and refine outsourcing criteria, through the awareness of the development of an organised and systematic landscape management system.

ii. Pejabat Harta Bina, UTM

Pejabat Harta Bina, UTM can benefit from this research by gaining insights on how to develop a system that can further improve the efficiency of landscape management and maintenance works.

1.5 Methodology

The steps of works involved in this research are mainly divided into:

i) Literature Review

Literature studies on related works, landscape management scopes, information system designs and requirements, required data sets.

ii) Landscape Management Appraisal

Studying the landscape management policies, strategies, procedures, scopes and work processes of Pejabat Harta Bina, Universiti Teknologi Malaysia.

iii) Data Acquisition

Acquiring data related to user requirements, scopes, and work processes via interviews with the personnel in charge of landscape management and other related works at Pejabat Harta Bina.

iv) User Requirements Analysis

The main purpose of analysing user requirements is to understand the function that the system has to fulfil. A thorough study on current problems and discussion with the user are important to truly understand the objective of the system. The gathered information that may include user's specification, organisation policies and standards is subsequently analysed in order to produce the specification of the system. The identification of user requirements will decide the data that has to be acquired for the design of the system.

iv) Landscape Management System Design

Designing the system based on the findings in the user requirements analysis phase. Existing landscape management systems shall be studied to look into the possibilities of adaptation or improvement, with regards to the suitability of the intended landscape management system. The output of this phase is the module and database design of a complete landscape management system for Pejabat Harta Bina, UTM. This research will not develop the whole complete system due to the constraints of time. Instead, only a single inventory module will be developed as a partial prototype of the whole system.

v) Development of The Inventory Module Prototype

The development of a prototype module of the system will be developed as a by-product of this research. The prototype shall be an inventory module of the larger designed system. This research will utilise ARCHIBUS/FM V.14 for the development of the inventory module.

Figure 1.1 shows the Methodology Diagram for this research.

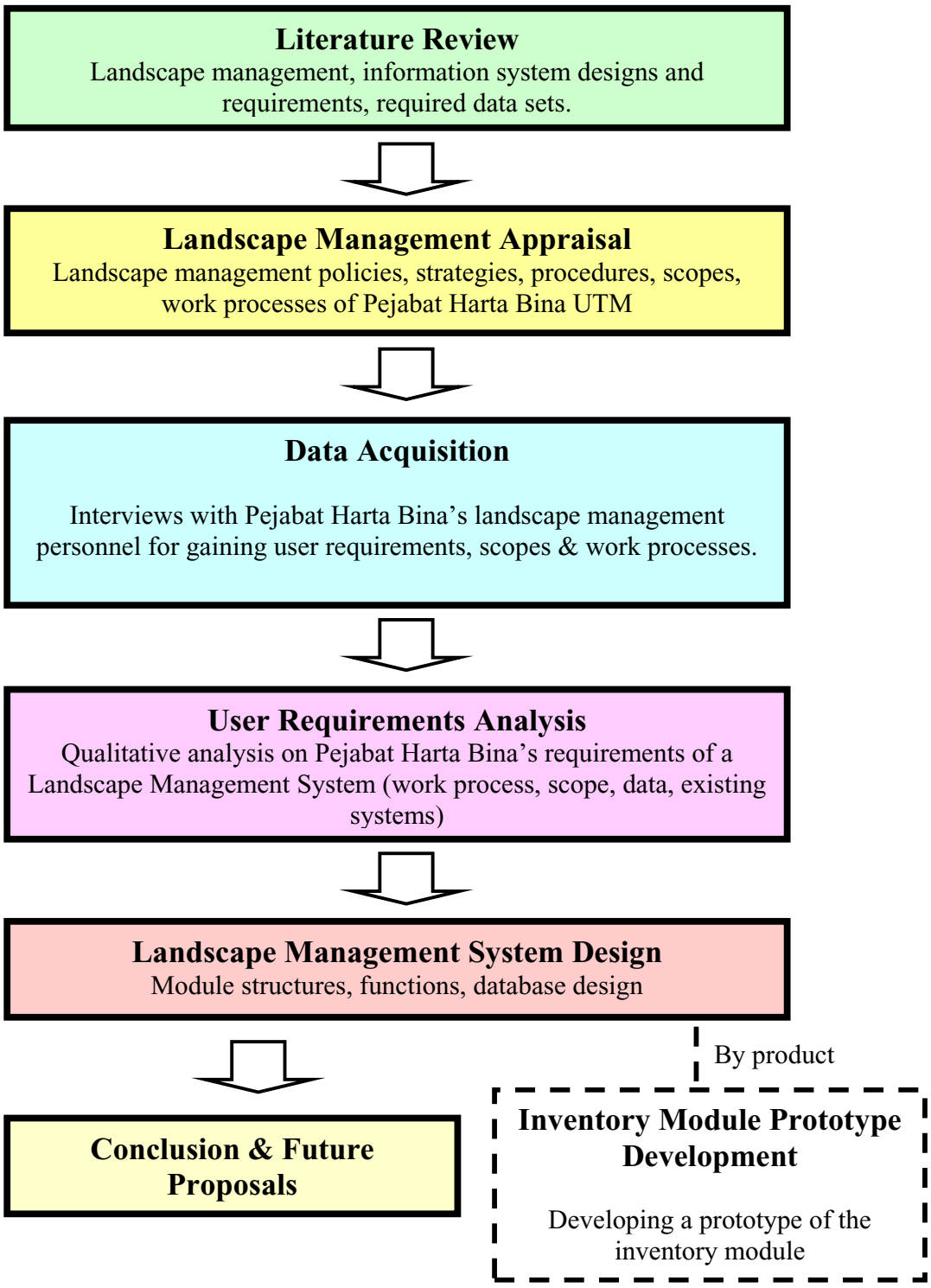

Figure 1.2. Research Methodology Diagram

(Source: Author's Interpretation (2005))

1.6 Chapters

The write-up of this research is divided into 6 chapters. The first two chapters cover the theoretical part of the research while the 4 remaining chapters cover the practical aspects of the research. The chapters are as follows:

Chapter 1: Consist the introduction part of the research. This chapter discusses the issues of the research, research goal and objectives, importance of the research, research methodology and chapters.

Chapter 2: Chapter 2 mainly discusses landscape and information systems. It comprises the definition of landscape, types of landscape, landscape elements, landscape planning, management and maintenance, landscape information systems, issues of landscape information systems, information system design criteria and approaches, models and examples of existing systems.

Chapter 3: This chapter looks into the details of landscape management of UTM. It covers the landscape areas of UTM, UTM's landscape policies, strategies, management standards and systems, maintenance systems, existing database/filing systems and UTM's requirements of a landscape management system. These findings will then be analysed by using qualitative analysis methods to reach a conclusion to what the design of the proposed system should be like.

Chapter 4: This chapter is the pinnacle of the research. It discusses the design of the system based on the findings in Chapter 3. The information acquired in Chapter 3 is analysed and the results of the analysis are used to propose a design most compatible with the requirements of Pejabat Harta Bina, UTM.

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