A CAMPUS TREE INFORMATION SYSTEM: ESTABLISHING AN INFORMATION SYSTEM IN SUPPORT OF THE HIGHER LANDSCAPE ARCHITECTURE EDUCATIONAL QUALITIES

Azrul Bahaluddin[1], Norazlan Anual[2], Ismail Hafiz Salleh[3]

[1]Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Seri Iskandar Campus, Seri Iskandar 32610, Perak, Malaysia
azrul009@perak.uitm.edu.my
[2]Faculty of Business, Universiti Teknologi MARA, Machang Campus, Machang 18500, Kelantan, Malaysia
azlananual@kelantan.uitm.edu.my
[3]Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Shah Alam 40450, Selangor, Malaysia
ismailhafiz86@yahoo.com

Abstract: Developing a tree information system containing basic information of the collection of various tree species available in the university makes the campus environment more relevant for landscape architecture education or any relevant programmes as it encourages a more dynamic and vibrant teaching and learning delivery processes. Through the three phases of development, this system helps the teaching and learning of landscape sciences and design niche courses, especially in terms of tree identification and tree species selection process. Moreover, it also serves as a continuous reference for practitioners from all over the world, especially when this system is able to even suggest the suitable tree species for specific areas. A collection of various species of trees that exist in the database are vital assets to the university (University Teknologi MARA) and its community through continuous data storage and hence can diversify its use.

Keywords: Campus Tree, Information system, Landscape architecture, Education

Introduction

The Landscape Architecture Agenda 2050 (LAA2050) as looking at the global contact currently plays a vital role in the education and research development with innovative planning and design as well as providing better and more inspirational teaching environments for all. Realising the issues and needs especially the integration of teaching methodology, the campus tree information system that has just been developed, is a scientific and artistic project towards the establishment of special database that stores information about the diversity of tropical ornamental campus tree species. This is an artistic revolution of a digital information system as it is displayed in a creative, informative and interactive database besides serving as a convenient collection of teaching and learning materials. The project rationale and outcome are related to establishment of a system which acts as an integral part and quality improvement of the landscape architecture education. In addition, this system allows effective campus tree information management and disseminates knowledge through three areas of activity, which are public education, research and conservation, as well as campus recreational activities.

Literature Review

Landscape Architectural Education

Under the IFLA/UNESCO Charter for Landscape Architectural Education (2012), one of the criteria highlighted is the "acquisition of knowledge and skills in the plant material and horticultural applications". For this purpose, the role of landscape architecture students especially in plant material identification, it is crucial for the students to have this knowledge and skills as it is part of the scope of future work as a practicing landscape architect. This is in line with France Bouthillier and Kathleen Shearer (2002), who stated that the real enthusiasm and interest in establishing significant information as well as knowledge management and information system as an integral part of landscape architectural education by the increasing number of the publications especially relating to the topic and current demand.

Landscape architects understanding in determining "which plants are used in landscape" and "the value of plants" have recently been acknowledged by various organizations especially for those

involved in the decision-making process (E. Day & M. P. Garber, 1993). Moreover, the world library organization and information press, supported by others scholar suggested for a number of years that is a burgeoning field of great interest to information professionals since they possess the necessary skills to work in the field (France Bouthillier & Kathleen Shearer; Oxbrow & Abell, 2002; Henczel, 2001; Broadbent; Chase, 1998; Abram, 1997). However, the information sources used by the landscape architects to specify plants are still limited. Research shows that most of the data were obtained from the botanical and public gardens, other landscape architects, producing trade shows, journals, and university personnel (E. Day & M. P. Garber, 1993). In Malaysia, the only reference exist is the National Landscape Guideline Second Edition (2008) produced by the National Landscape Department (JLN) that has limited reach to the public and students.

Apparently, for the landscape architects, these methods are time-consuming and lack of detailed information. Therefore, landscape architects have their "informational wish lists" - to have the information which complete with the recommendations of plants for special conditions; photographs or drawings of plants; descriptions of plant size along with, or in lieu of, container size; and presentations on plants and their cultural requirements (E. Day & M. P. Garber, 1993). With this complete information, it will help not only the landscape architecture students, but also the practitioners and the organizations are involved in the landscape industries having complete information about the plants. In addition, the tree information system will support the digital consumers, who enjoy more interactive knowledge sharing and in line with the challenge of the fourth industrial revolution education. The goal of higher education is to ensure quality of learning via teaching, to enable the students to get the latest knowledge through exploratory research, and to sustain the development of societies by means of service (Xiang B., & Marwala T. 2017).

Tree Information System

The functions from a diversity of tree species used as main soft elements of campus landscape should expand in the form of an information system that can explore as a general reference and alternative teaching and learning process to the related programmes and departments. This system that stores significant information of all tree species located in the campus can be considered as a virtual arboretum, or a virtual library also potentially offer more interactive and convenient collection of teaching and learning materials in one location. The system could offer an accessible online information system containing various tree-related information.

In the current digital era, accessible online information is popularly sought after and could be considered as an efficient and effective method in gaining knowledge. However, in Malaysia, information on local tree species is still disseminated through conventional methods and only be obtained from National Landscape Guidelines, 2008. By expanding the current database contents from the guidelines and transforming it into a more interactive and accessible information system would offer greater potentials in the teaching and learning process for the intended students. Based on the principles of the national landscape policy, the findings of this research would contribute towards realizing some of its key strategies. This means that the existence of these systems must not only benefit the teaching and learning process in the institution only, but also contribute to the national landscape industry.

Methodology

The methodology used to conduct this research was through qualitative approach. It was divided into three main phases which are; Phase 1: Recognition and Conceptualization; Phase 2: Preliminary Design and Phase 3: Simulation Model and Analogues. Each phase was further divided into two major focus areas.

There were two essential steps common to all computer system development, regardless of size or complexity which includes analysis and coding. The first step of this system development is the analysis step which was covered in Phase 1 of this system. Even it seems like a very simple implementation concept, it is in fact all that is required if the effort is sufficiently small and it is also

the kind of development effort for which most customers will be happy. The second step is coding. This step was covered after Phase 2 of this system has completed. They are further preceded by two levels of requirement analysis, are separated by a program design step, and followed by a testing step in system development. This was covered in Phase 3 of this project.

Phase 1: Recognition and Conceptualization

Recognition and conceptualization stage is where all the tree species in campus area were identified and defined. The species was listed and should be recognized by the National Landscape Department (JLN). The next step is an identification of the recent information process and morphological elements flow of any existing relevant system to refer.

Phase 2: Preliminary Design

Preliminary design involved in two major focus areas. In the first focus area, the significant data on all ornamental tree species that have been identified in the first phase is gathered. They were later coded. The process must follow the criteria and indicator formula to achieve complete data. The second major area conceived the design criteria transformed from the clarification of the conceptualization in phase one, which are assigned specific functions, program elements, and the interface features

Phase 3: Simulation Model and Analogues

In this phase, the data was modelled completely and comprehensively through the assessment process. This process was to identify errors and weaknesses of the model interface. The second major area was a refinement and alteration stemming from the assessment process. During this refinement and alteration stage, the data and information was re-worked and re-designed. This action was to ensure that only the final stable model will be published to the World Wide Web on the Internet. This system was later tested and used in the developers' classes.

Results and Discussions

This campus tree information system manages to expand the scope of the functions of a university as a centre of knowledge where learning is not only happening in the lecture halls, classrooms, laboratories and libraries, but it maximizes the elements of campus outdoor environment as a teaching and learning support materials. This system that stores significant information on all local tree species located in the campus can be considered as a virtual arboretum, or library. Moreover, this system also helps practitioners in capturing information and data instantly without having to refer to the Landscape Manual which is hard to get. The summary of the results could be illustrated in Figure 1 below.

The Tree Information System started off by introducing the basic information about the ornamental tree species that encourages the experiential learning through direct tree tour across the campus evokes students' sense of belonging to their university environment. This online system includes the process of tree species selection with its characteristics through several physical features and usage as teaching and learning supporting material of any relevant courses or as a reference for any relevant practitioners in landscape architecture industry. Later, in future, various classifications of plants including native trees and forest trees will be added. Indirectly, this tree information system gives more interactive and convenient collection of teaching and learning materials and method. Obviously, students and lecturers in various programs such as landscape architecture, town and regional planning, and park and amenity management potentially use this system as a one of teaching and learning delivery process for the specific subjects. Figure 2 illustrates the interface of the system developed for UiTM Perak Branch, Seri Iskandar Campus. It is hoped that different types of species trees from other campuses of UiTM could also be collected and be stored in this information systems in the near future so as the system serves not only as teaching materials for its students; and practical output for the general public, but also a data storage for UiTM national treasure.

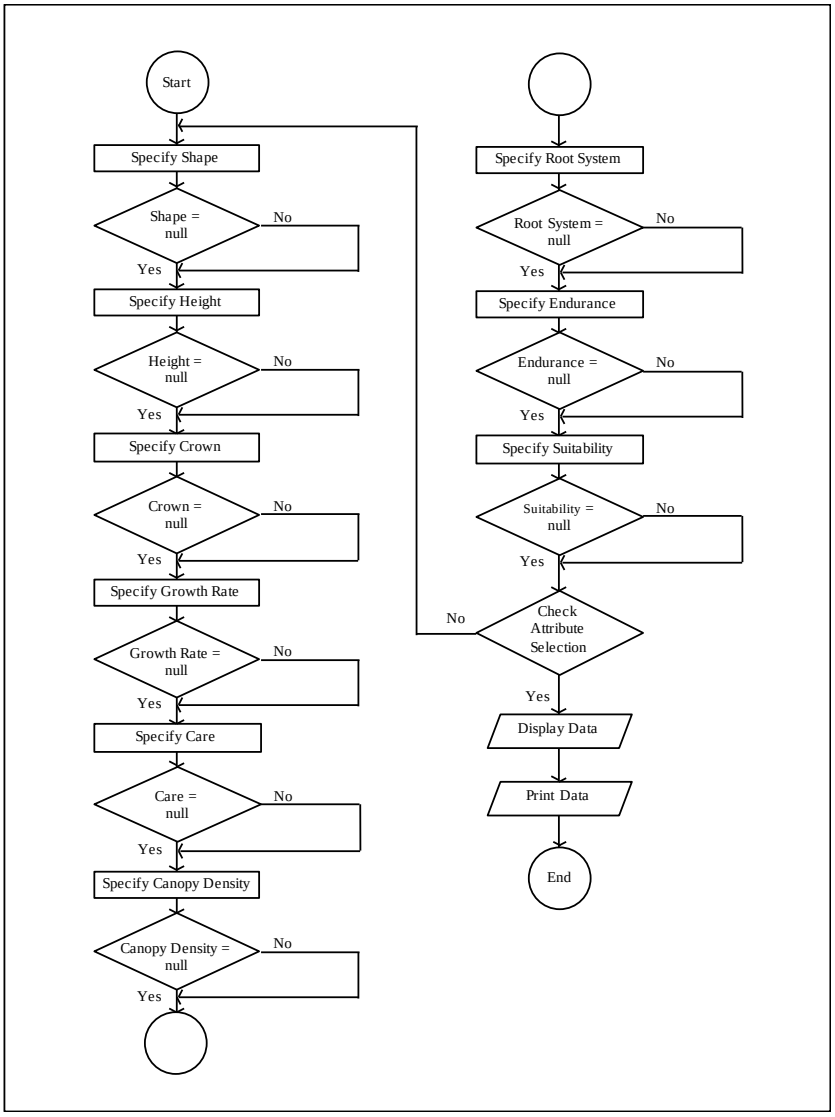

Figure 1: Overall flow chart for tree selection system

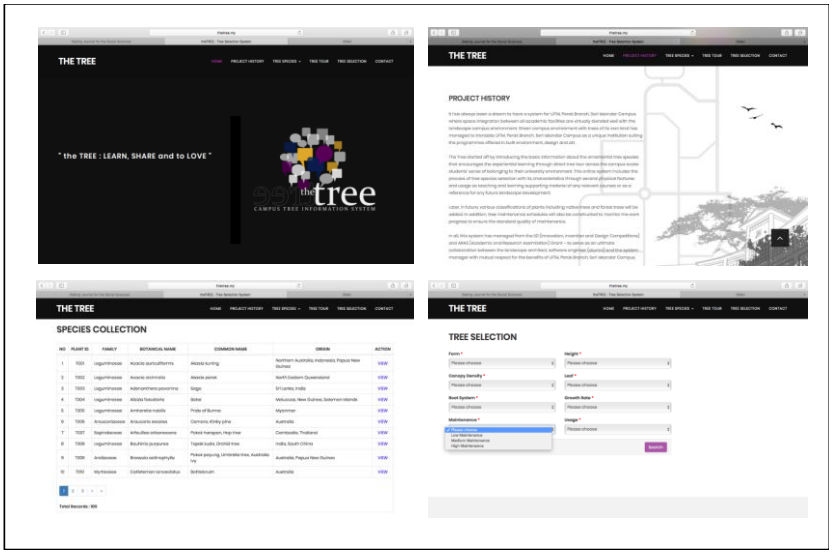

Figure 2: The Tree Interface for UiTM, Perak Branch, Seri Iskandar Campus

Conclusion

The implication of this system towards teaching and learning would be directed on offering an enhanced experiential learning tool via a more interactive and responsive sharing knowledge environment. In this system, the focus was not only on the cognitive benefits that are provided especially when it managed to serve as a learning resource for the students, and academicians, but developing this system has been an essential requirement in the delivery process of core courses in a landscape architecture programme. In addition, in terms of commercialization prospects, the use of this system is not only be expanded to all institutions of higher education, but also has the potential to be used in schools, skill based institutions, local authorities and various government and private agencies such as the National Landscape Department and landscape architecture consultant firms as well as to serve as an ultimate collaboration between the landscape architect, software engineer and the system manager with mutual respect for the benefits of all.

Acknowledgements

This work was supported in part by Universiti Teknologi MARA's internal research grant, ARAS (Academic & Research Assimilation).

References

Abram, S. (1997). Post Information Age Positioning for Special Librarians: Is Knowledge Management the Answer? Information Outlook, 1(6), 18-25.

Broadbent, M. (1998). The Phenomenon of Knowledge Management: What Does It Mean to the Information Profession. Information Outlook. 2(5), 23-36.

Chase, R. L. (1998). Knowledge Navigators. Information Outlook, 2(9), 17-20.

E. Day and M. P. Garber (1993). The Role of the Landscape Architect in Plant Material Purchases: Implications for Marketing Communications. HortTechnology Vol. 3, pp. 218-223, 1993.

France Bouthillier and Kathleen Shearer (2002). Understanding Knowledge Management and Information Management: The Need for an Empirical Perspective. Graduate School of Library and Information Studies, McGill University, Montreal, Canada. Information Research, Vol. 8 No. 1, October 2002

Henczel, S. (2001). The Information Audit as a First Step towards Effective Knowledge Management. INSPEL 34(2000)3/4, pp. 210-226

IFLA/UNESCO Charter for Landscape Architectural Education, IFLA, 2012.

Jabatan Landskap Negara (2008). Garis Panduan Landskap Negara, Jabatan Landskap Negara, Ed., 2nd ed. Kuala Lumpur: Kementerian Perumahan dan Kerjaan Tempatan Malaysia, 2008.

Landscape Architecture Agenda 2050 - LAA2050, (2017). Institute of Landscape Architects Malaysia (ILAM), from http://www.ilamalaysia.org/landscape-architecture-agenda-2050

Oxbrow, N. and Abell, A. (2002). Is there Life after Knowledge Management. Information Outlook, 6(4), 20-29.

Xiang, B., & Marwala, T. (2017). Implications of the Fourth Industrial Age on Higher Education. [Abstract]. Retrieved from https://www.researchgate.net/publication/315682580_Implications_of_the_Fourth_Industrial_Age_on_Higher_Education