MODELLING OF URBAN FOREST MANAGEMENT SYSTEM FOR DBKL

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By

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ABSTRAK (BAHASA MALAYSIA)

Keperluan bagi sistem pengurusan hutan bandar di kalangan pihak berkuasa tempatan adalah penting kerana ia akan membantu dalam perancangan dan pengurusan pokok-pokok jalanan. Kajian penyelidikan ini dilakukan dengan matlamat utama untuk membangunkan sistem prototaip bagi pengurusan hutan bandar dengan kajian kes perlaksanaan ke atas Dewan Bandaraya Kuala Lumpur (DBKL). Objektif khusus penyelidikan ini adalah untuk mengenal pasti keperluan melaksanakan sistem inventori pokok, sistem pengurusan penyelenggaraan pokok, dan sistem bantuan dalam menangani kes-kes kecemasan yang disebabkan oleh kegagalan pokok-pokok jalanan. Metodologi pembangunan yang digunapakai adalah daripada Kaedah Penyelidikan Sistem Pembangunan yang diperkenalkan oleh Nunamaker. Hasil kajian penyelidikan ini adalah sebuah prototaip Sistem Pengurusan Hutan Bandar dengan harapan ia dapat meningkatkan keberkesanan dan kecekapan pengurusan pokok-pokok di dalam bandar.

ABSTRACT (ENGLISH)

The necessity for urban forest management system among local authorities is important as it will change the efficiency of street trees planning and management. This research work addressed the main objective to develop a prototype system for urban forest management with case study implementation for Dewan Bandaraya Kuala Lumpur (DBKL). The specific objectives are to derive design requirements to implement tree inventory, tree works maintenance program and trees emergency incidents response. The methodology of system development is applied from Nunamaker's System Development Research Method. The outcome of study is the prototype of Urban Forest Management system with expectation to improve urban trees management effectiveness and efficiency. The system covers modules in inventorying tree details, managing trees work maintenance program, and handling public requests and complaints of failure urban trees incidents.

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1.0 Introduction

Greening the cities is one of the agenda in many countries in the world, and Malaysia is no exception where urban cities like Kuala Lumpur through its city council planted trees to enliven streets and parks, and to sustain ecological properties to city folks. By some means, without proper monitoring and maintenance work programs over these trees, it may impose the risk of failure and cause damages to people and properties surrounding. There were few cases of fallen tree incidents reported in Kuala Lumpur with the most recent just happened on 7 March 2011. There were 34 cars crushed down by 6 uprooted trees at parking lot nearby Jalan Tun Razak during evening thunderstorm. Luckily there were no casualties reported in this incident as what had happened last year where a motorcyclist was killed after a 5 meters dead tree branch falls over him while on his way to work at Kuala Lumpur city centre.

The focal point of this research is to come out with strategies and recommendations for Dewan Bandaraya Kuala Lumpur (DBKL) municipal council to adapt computerized system to maintain and manage their urban trees systematically. DBKL is selected due to factors such as the complexness in their works done to manage their street trees, and

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REFERENCES

Andreu, M.G., Brown, E.M., Friedman, M.H., Northrop, R.J., Thornhill, M.E. (2009). *Comparison of Urban Forest Inventory & Management Software Systems*. School of Forest Resources and Conservation Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Retrieved from http://edis.ifas.ufl.edu.

Bloniarz, D.V., Deutsch, B.L, Mahon, J.R, (2003). Handheld Technologies for Urban Forestry - Inventories, GIS, & More. *Paper presented at American Forests National Urban Forest Conference*, 17 September 2003. San Antonio.

Devi, L. (1998). JLocator: a Web-based Asset Location System. *Presented at 9th IFIP/IEEE Intl. Workshop on Distributed Systems (DSOM '98): Operations and Management.*
University of Delaware, Newark. Retrieved from *http://dpnm.postech.ac.kr/papers/DSOM/98/Deri_Luca_5.pdf*

Godfrey, C. G. (2001). GIS and GPS in Urban Forestry. City Trees - The Journal of Society of Municipal Arborists, Vol 37-3. Retrieved from http://www.urban-forestry.com/citytrees/v37n3a11.html

Hasan, H. (2004), *Information Systems Development As A Research Method*. Australasian Journal of Information Systems Special Issue 2003/2004.

Johnston, M. (2002). BSc Arboriculture Lecture notes. Module: Management of Tree Growth and Function.

http://www.fixed-asset-barcode-inventory.com/barcoding-benefits.html

http://www.php.net/

http://www.arborprousa.com

http:// www.arborsoftworx.com/municipal.htm

http://www.itreetools.org

Middleton, I. (1996). *Key Factors in HelpDesk Success (An analysis of areas critical to helpdesk development and functionality).* British Library R&D Report 6247, The British Library 1996.

Noorsiha, A., Lai, E.M., Muhammad Farid, A.R., Lau, K.H., (2010). *Upgrading and Supporting Research Facilities at the Penang Botanic Gardens*. Forest Research Institute Malaysia, 52109 Kepong, Selangor Darul Ehsan.

Nowak, D. (2000). Tree Species Selection, Design, and Management to Improve Air Quality Construction Technology. *Paper presented at Annual meeting proceedings of the American Society of Landscape Architects.* Washington, DC.

O'Brien, J.G. (2003*). Introduction to Urban Tree Risk Management*. Published by USDA Forest Service. Publication Number NA-TP-03-03. Washington, DC.
Sekaran, U., Cavana, R.Y., Delahaye. B.L., (2001). *Applied business research: qualitative and quantitative methods*, Wiley and Sons, Pages: 472, ISBN: 0471341266

Studer, N. (2003). Urban Forest Program Development Washington State Municipalities. *Paper presented at the 2003 National Urban Forest Conference*, 17–20 September 2003. pp. 21–23. Washington, DC.

Tree Emergency Manual for Public Officials (2000), Community Forestry Education Project
Cornell Cooperative Extension of Monroe County Rochester, New York

Wiegers, K. E. (2003). *Software Requirements (2nd ed.).* Redmond: Microsoft Press. ISBN 978-0735618794. Retrieved from http://processimpact.com/pubs.shtml#reqs.

Wolf, K.L. (2007). *Urban Forest In Washington Cities & Towns.* DNR Community Forestry Program (Nov 2007). Washington State Department of Natural Resource.