

Mobile Ticket Booking System for Long Haul Bus Transport

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Mobile Ticket Booking System for Long Haul Bus Transport

**A Thesis submitted to College of Arts & Sciences in partial
fulfillment of the requirements for the degree Master
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ABSTRACT

Personal Digital Assistants (PDAs) and mobile phones have been increasingly getting more powerful every day. Web services in the near future will not only have to support mobile access, but also have to deal with other forms of web access, such as voice interfaces. This project performed a literature study of the involved standard documents, and explored available library resources for “Wireless Application Protocol (WAP)”. The focus is on the widespread Wireless Application Protocol standard for cell phone based internet connectivity, and explores some of the possibilities it offers. The project involves the design of an application and its prototype for electronic Mobile Ticketing and booking Systems for long haul bus transport. The processes include converting HTML documents into WML.

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CHAPTER ONE

INTRODUCTION

This chapter briefly elaborates the main idea of this work, providing answer of the question why the study was conducted and what is the main element involved in the study. The first sub-topic describes the overall idea in this study through the scenario and motivation that lead to the implementation of the whole project. This is followed by the problem statement, objectives of the study, significance of the study and scope of the study. The last sub-topic elaborates the way this project is organized.

1.1 Background

Mobile Computing is a generic term describing one's ability to use technology that is not physically connected, or in remote or mobile environments. The term is evolved in modern usage such that it requires that the mobile computing activity be connected wirelessly through the Internet or through a private network. This connection ties the mobile device to centrally located information or application software through the use of battery powered, portable, and wireless computing and communication devices. Mobile phones have been increasingly and these devices have been getting more powerful because of more benefits and less expensive than PC. Rhoton (2002), states that the basic aim of WAP is to provide users with a web like experience, but over a handheld device rather than PC, whilst accessing the content that is readily available on the Internet.

The contents of
the thesis is for
internal user
only

- The mobile ticketing should be upgraded with some more useful and beneficial functions according to the users needs.

5.3 SYSTEM WEAKNESSES

There are some limitations or weaknesses as described below—

- 1) M-ticket booking system can only for those owned a Mobile phone with GPRS enable.
- 2) The user must subscribe a WAP or GPRS services. It is not free of charge (FOC).
- 3) Users need to ensure that they are located in the phone's signal coverage because WAP and GPRS services only work with the adequate coverage.
- 4) This project will use mobile emulator and laptop to simulate the application.

5.4 Summary

It is believed that the development of the mobile ticketing for Mara Liner is going to give a new dimension of information gathering especially in the field of Long Haul Bus Transport. Among others, it will bring the traveling sector up to another level of development with the integration of the WAP technology. It is hoped that this project will be part of a more promising growth of information technology in Malaysia.

REFERENCE

Abowd, G.D., Atkeson, C.G., Hong, J., Long, S., Kooper, R. & Pinkerton, M. (1996).

Cyberguide: A Mobile Context Aware Tour Guide, Georgia Institute of Technology, Atlanta, pp. 1-21.

ARC Group and the Wireless Advertising Association (October 15, 2001). *Privacy is not a Barrier to the Success of Mobile Advertising (survey summary)*. Guildford, Surrey, UK: ARC.

Bahrami, A. (1999). *Object Oriented System Development*, McGraw-Hill, United States of America.

Bhram P. and Crowcroft J. *Ticket based Service Access for the Mobile User, Proc. MobiCom'97*, Budapest, Hungary.

Bennett, S., McRobb, S., & farmer, R. (2002). *Object-oriented System Analysis and Design 2nd Edition*. UK, McGraw Hill.

Bennett, S., McRobb, S., & farmer, R. (2007). *Object-oriented System Analysis and design using UML*. Berkshire: McGraw Hill.

Country Profile: Malaysia. (2006), *Library of Congress: Federal Research Division*.

Centre for Technology in Government, University at Albany. (1998). *Models for Action Project: Developing Practical Approaches to Electronic Records Management and Preservation*, A Survey of System Development Process Models.

Cheverst, K., Davies, N., Mitchell, K., Friday, A. & Efstratiou, C. (2000). Developing a Context-aware Electronic Tourist Guide: Some Issues and Experiences, Lancaster University, pp. 1-8.

Dennis, A., Wixom, B.H., & Tegarden, D. (2005). System analysis and design with UML version 2.0: an object-oriented approach with UML, 2nd edition. Hoboken, NJ: John Wiley and Sons, Inc.

Eriksson, H., & Penker, M. (1998). *UML Toolkit*. USA, John Wiley & Sons, Inc.

Erlanson & Ocklind, (1998). WAP- The wireless application protocol. Pages 165-174 in Mobile Networking with WAP. ISBN: 3-528-03149-2.

Goto, K., Matsubara, H., Myojo, S. (1999). Autonomous Decentralized Systems, Integration of Heterogeneous Systems Proceedings, The Fourth International Symposium, pp. 12-17.

Gregory D. Abowd, Chris Atkeson, Ami Feinstein, Yusuf Goolamabbas, Cindy Hmelo, Scott Register, Nitin "Nick" Sawhney and Mikiya Tani (September 1996). Classroom 2000: *Enhancing classroom interaction and review*. GVU Center, Georgia Institute of Technology, Technical Report GIT-GVU-96-21. September 1996.

Harry Stockman, 1998. *Heavy transport vehicle tracking and maintenance system*. Barcode data system private system Ltd.

Hoffer, J. A., George, J. F & Valacich, J. S. (1999). *Modern Systems Analysis and Design (2nd Edition)*. United Kingdom : Addison Wesley Longman.

Hoffer, J. A., George, J. F & Valacich, J. S. (2002). *Modern Systems Analysis and Design (3rd Edition)*. Upper Saddle River, New Jersey: Prentice Hall.

Hoo, W. S. (2005). Going 'Green' Pays, TTG Asia.

Hulberts, S.J. C. (1989). How Important Is Mobile Communication For A Truck Company? *Proceedings of the Vehicle Navigation and Information Systems Conference, 11-13 Sep 1989*, pp. 361-364.

Imulienski, T., & Badrinath, B. R. (2001). *Mobile Wireless Computing: Solutions and Challenges in Data Management*. Retrieved from:
<http://citeseer.ist.psu.edu/imielinski93mobile.html> [24th March 2006]

Jacobson, I., Christerson, M., Johnsson, P. & Overgaars, G. (2004). *Object-oriented Software Engineering: A Use Case Driven Approach (revised)*. Harlow, England: Addison-Wesley.

Jago, A. (2003). *Mobile Location Services: The Definitive Guid*. Upper Saddle River, New Jersey: Pearson Education Inc.

Jukka Lieslehto, (2000). *Wap application for pid controller tuning*, in: Proceedings of the 2000 IEEE International Symposium on Computer-aided Control System Design, volume, Anchorage, Alaska, USA, pp. 168-172.

Kargl, F., Illmann, T., Raschke, A., Schlott, H., & Weber, M. (2001). WAPcam - using a WAP application in student education, SIGGROUP Bulletin, pp. 12-15.

Kendall, P. A. (1996). *Introduction to Systems Analysis and Design: A Structured Approach*, Irwin, Times Mirror Higher Education Group, USA.

Kwok, T., Nguyen, T., Lam, L., & Roy, K. (2004). An Efficient and Systematic Method to Generate XSLT Stylesheets for Different Wireless Pervasive Devices, ACM 1-58113-912-8/04/0005, New York, USA.

Lieslehto, K. (2000). WAP Application for PID Controller Tuning, *Proceedings of the 2000 IEEE International Symposium on Computer-Aided Control System Design*, Anchorage, Alaska, USA, pp. 168-172.

Lyytinen, K. (2001). *M-commerce – Mobile Commerce: a New Frontier for E-business*. MapInfo. *Mobile Location Services*. Retrieved from: <http://www.mapinfo.com> [25th November 2005].

Mara Liner Company website: <http://www.maraliner.com.my/Defaulte.asp>

Maureen, O. N. (1998). Client Server Approach to Mobile Location Services. Retrieved from: www.w3.org/mobile/posdep/signalsoft.htm [25th November 2005].

Masniza, H., & Mohamed Amir, A. S (2005). Guidelines in Designing the E-Publishing Environment for Hand Held Devices: A Study on E-InfoC WebSite. *Mater Thesis*. Universiti Utara Malaysia.

Mobile communications. Retrieve July 15, 2007. From www.inquirer.net/infotech/may2000wk1/info_5.htm

Nielsen, J. (2000). *Scenarios in Discount Usability Engineering*. Envisioning work and Technology. Book under preparation. Netherlands: Amsterdam.

Nielsen, J. & Landauer, T. (2001). *A Mathematical Model of The Finding Of Usability problems*. In ACM INTERCHI'93. Netherlands: Amsterdam.

- Nunes, N. J. & Cunha J.F.E. Towards a UML profile for Interaction Design: the Wisdom Approach Retrieved from: <http://citeseer.ist.psu.edu/cache/papers/cs/23122/http://zszszmath.uma.ptszsznznzszpublicationszszuml2000.pdf/nunes00towards.pdf> [24th March 2006].
- Prasad, S.K., Weeks, M., Zhang, Y., Zelikovsky, A., Belkasim, S., Sunderraman, R., & Madiseti, V. (2002). *Mobile Fleet Application Using SOAP and System on Devices (SYD) Middleware Technologies*. Retrieved from: http://www.carmaux.cs.gsu.edu/~mweeks/research/fleet_CIIT_376_107_Prasad_Weeks.pdf [18th November 2005]
- Rhoton C. J. (2002). Department of Computer Science Virginia Polytechnic Institute, 46th Annual Meeting. Blacksburg, Virginia, USA.
- Salkintzis, A.K. (1999). *A Survey of Mobile Data Networks*. Retrieved from: <http://www.comsoc.org/livepubs/surveys/public/3q99issue/salkintzis.html> [18th November 2005].
- Schmuller, J. (2002). *SAMS Teach Yourself UML in Hours (2nd ed)*. SAMS Publishing, Indiana.
- Silva, A, P. & Mateus, G.R. (2003). A Mobile Location-Based Vehicle Fleet Management Service. *Proceedings of the Intelligent Vehicles Symposium*, 9-11 June 2003, pp. 25-30.
- Silva, P.P.D. & Paton, N.W. (2003). UMLi: The Unified Modeling Language for Interactive Applications. Retrieved from: [http://scholar.google.com/scholar?q=UMLi:%20The%20Unified%20Modeling%](http://scholar.google.com/scholar?q=UMLi:%20The%20Unified%20Modeling%20Language)

20Language%20for%20Interactive%20Applications&hl=en&lr=&oi=scholar

[24th March 2006].

Socichi Kubota. (1948). *Communication by Means of Reflected Power*. Proceedings of the IRE.

Sommerville, I., (2001). *Software Engineering* (6th ed.). Harlow, England: Addison

Wesley. Sparxsystems's UML Tutorial Page (n.d.). Retrieved from:

http://www.sparxsystems.com.au/UML_Tutorial.htm [3rd March 2006]

Swedberg, G. (1999). *Ericsson's Mobile Location Solution*. Retrieved from:

<http://www.soi.city.ac.uk/~kam/mobilesolution.pdf> [18th November 2005].

Whitten, J. L., Bentley, L. D. & Dittman, K.C. (2001). *System Analysis and Design Methods* (5th ed.). Boston: McGraw-Hill.

Tétard, F.& Patokorpi, E. (2004). Design of a Mobile Guide for Educational Purposes, *Conference'04*, ACM, pp. 1-7.

Tourism Malaysia Annual Report. (2003)

Valacich, J.S., George, J.M. and Hoffer, J.A. (2004). *Essentials of Systems Analysis and Design*, Prentice Hall, Upper Sadder River, NJ.

Wireless Application Protocol, *Web ProForum Tutorials*, International Engineering Consortium.

Wireless Application Protocol Forum (1999). Wireless Application Protocol, *Wireless Markup Language Specification Version 1.2*. Retrieved April 16, 2007 from:
<http://www.wapforum.org/what/technical/SPEC-WML-19991104.pdf>

WAP Forum (2002). WAP 2.0 *Technical White Paper*. Retrieved April 16, 2007 from
http://www.wapforum.org/what/WAPWhite_Paper1.pdf

Wireless Application Protocol Forum (1998). Wireless Application Protocol Architecture Specification, WAP Architecture Version 30. <http://www.siliconpress.com/briefs/brief.wml/brief.pdf>

U.S House of Representative (1999). Systems Development Life Cycle, pp. 1-12.