A SUSTAINABLE MOBILE WORKSHOP APPLICATION FOR PROVIDING USERS WITH THE LEARNING MATERIALS

A thesis submitted to the College of Arts and Science
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By

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ABSTRACT

M-learning has gained significant popularity and it is expected to continue in the future. M-learning is a multi-dimensional activity where each dimension should be most organization adequately supported by an M-learning system to provide fruitful learning materials to those are interest to read via mobile applications. Different agent systems have been integrated wildly to enhance the flexibility of mobile knowledge presentation over WAP technology. Moreover, the current e-learning materials are not enough to provide users with the appropriate information, which make those users unable to brows information without PC's. Hence, this study proposed a mobile workshop application for providing users with the learning materials via mobile. Furthermore, Spiral development model by Barry, B. (2000) has been used to design and develop the proposed application. Finally, 40 postgraduate students from UUM have been selected to evaluate the proposed application.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Today's, mobile applications are a usable solution in different area and sectors. The new integration for the mobile application makes it easier for the users to browse and get their enquire anytime and anywhere by managing information through the mobile screen. A new framework for developing a mobile information services in this time is very important especially after the development in the technology domain (Lembke, & Johan, 2002). Mobile applications have been used in different fields such as learning, healthcare, government, services and etc. In education, a workshop is a brief intensive course, a seminar or a series of meetings emphasizing interaction and exchange of information among a usually small number of participants. The study aims to provide a sustainable mobile workshop application for providing users and learners with the workshop materials. Furthermore, there is no study has been done to provide users or learners with a mobile workshop application.

Mobile technology has developed into one of today's eye-catching topics due to its ability. The impact it has on everyday lifestyle is obvious. As the popularity of wireless services grows, manufacturers are enabling wireless devices with an increasing array of features and capabilities. However, a new "motto" being mentioned in the market place Wireless Application Protocol which is known as WAP. The WAP visualized being a web in pocket. As the benefits of the WAP are recognized and become more widely. The

The contents of the thesis is for internal user only

REFERENCES

- Andrews T. et al (2003). Business Process Execution Language for Web Services Version 1.1.
- Ashok J. (2008). How will life change in the future mobile information society, another Opportunity for developing economies, Chennai, India. Retrieved on 22 March 2009, by TeNeT Group.
- Amitava, M., & Agnimitra, B. (2005). Simple Implementation Framework for m-Government Services. Retrieved 25 Jun 2009. From (doi.ieeecomputersociety.org/10.1109/ICMB.2005.93).
- Adeyeye, O. & Atayero, A. (2008). Implementation of a Multi-Channel Application for Customer Care Service Using Best-First Search Algorithm. European Journal of Scientific Research ISSN 1450-216X Vol.23 No.3 (2008), pp.436-445.
- Anang, A., Ahmad, M. & Ahmad A. (2006). M-Learning Management Tool Development in Campus-Wide Environment. Issues in Informing Science and Information Technology Volume 3, 2006.
- Abowd D., Atkeson 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.
- Barbara, D. (1999). Mobile Computing and Databases Survey. IEEE. Transactions on Knowledge and Data Engineering, 11(1) January/February (1999) 108–117.
- Barry, B. (2000). Spiral model. Retrieved on 11 Jun. From (http://encyclopedia.thefreedictionary.com/Spiral%20model).
- Bahrami A. (1999). Object Oriented System Development, McGraw-Hill, United States of America.
- Bhrat P. and Crowcroft J. (1997). *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
- Ching, & Chen, (2007). Data mining capability for a mobile commerce environment. Retrieved 27 May 2009. From (ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4106041).
- Catalin, B. & Lorena, B. (2009). Analysis of M-Learning Applications Quality. WSEAS TRANSACTIONS on COMPUTERS Catalin Boja, Lorena Batagan. ISSN: 1109-2750. Issue 5, Volume 8, May 2009.
- 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.
- Erlandson & Ocklind (1998). WAP- The wireless application protocol. Pages 165-174 in Mobile Eriksson, H., & Penker, M. (1998). *UML Toolkit*. USA, John Wiley & Sons, Inc. 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., Chris A., and Ami F. (1996). *Enhancing classroom interaction and review*. GVU Center, Georgia Institute of Technology, Technical Report GIT-GVU-96.
- Harry S. (1998). Heavy transport vehicle tracking and maintenance system. Bar code data system private system Ltd.
- Hoffer J., George J. & Valacich J. (1999). *Modern Systems Analysis and Design (2nd Edition)*. United Kingdom: Addison Wesley Longman.
- Hoffer J., George J. & Valacich J. (2002). *Modern Systems Analysis and Design (3rd Edition)*. Upper Saddle River, New Jersey: Prentice Hall.
- Hulberts S. (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. (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.
- Jagoe A. (2003). Mobile Location Services: The Definitive Guid. Upper Saddle River, New Jersey: Pearson Education Inc.
- Jukka, L. (2000). Wap application for pid controller tuning, in: Proceedings of the 2000 IEEE International Symposium on Computer-aided Control System Design, volume, Ancorage, Alaska, USA, pp. 168-172.
- Kargl F., IIImann T., Raschke A., Schlott H., & Weber M. (2001). WAPcam using a WAP application in student education, SIGGROUP Bulletin, pp. 12-15.
- Kendall P. (1996). Introduction to Systems Analysis and Design: A Structured Approach, Irwin, Times Mirror Higher Education Group, USA.
- Lembke, & Johan (2002). Mobile Commerce and the creation of a marketplace. Info-The Journal of policy, regulation and strategy for telecommunications, 4(3), 52.

- Ljungstrand, P. (2001). Context-awareness and mobile phones. Personal and Ubiquitous Computing 5: 58–61.25.
- MOBIlearn (2003). Guidelines for learning/teaching/tutoring in a mobile environment". Retrieved on 15 July 2009. From (http://www.mobilearn.org/download/results/guidelines.pdf).
- Matthias, K., et al. (2005). WS-BPEL Extension for People BPEL4People.
- Norbayah M., and Norazah M. (2007). Mobile phone usage for m-learning: comparing heavy and light mobile phone users, Campus-Wide Information Systems, Vol. 24 No. 5, pp. 355-365.
- Rubin, J. (2004). Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests. London: John Wiley & Sons.
- Ridar, M., & zafiq, W. (2007). M-Government: The Convergence of Wireless Technologies and e-Government. Retrieved 20 March 2009. From (http://www.ec3.org/Downloads/2001/m-Government ED.pdf).
- Stuckman. P, Finck. H and Bahls .T, (2001). AWAP traffic model and its appliance for the performance analysis of WAP over GPRS, in: Proceedings of 3G Wireless '01, San Francisco, CA.
- Sasivimon, S. (2007). Applying of Bulk SMS System to Enhance Educational Communications. Proceedings of the 13th Asia Pacific Management Conference, Melbourne, Australia, 2007, 582-58.
- Sushil K. & Fred L. (2004). Web Services Architecture for M-Learning. Electronic Journal on e-Learning Volume 2 Issue 1 (February 2004) 203-216.
- Swedberg G. (2005). *Ericsson's Mobile Location Solution*. Retrieved from: http://www.soi.city.ac.uk/~kam/mobilesolution.pdf.
- Tay, K., Koh, T. &Quan, Q. (2002). Juth Lee Lay Hee (TO/ICT/MP) M-Commerce Wireless Application Protocol (Wap) Store Technology Project As A Teaching And Learning Model. ITE TEACHERS' CONFERENCE 2002.
- Taylor, D. (2006). WAP Review: Carnival of the Mobilists, No. 39. Retrieved on 22 May 2008, from Website: http://wapreview.com/blog/?cat=5.
- WAP Forum (2001). WAP Architecture. Wireless Application Protocol. Retrieved: 5 Jan 2009. From: http://www.wapforum.com.
- WAP Forum (2000). Wireless Application Protocol White Paper. Retrieved: 5 Jan 2009. From: http://www.wapforum.org/what/WAP_white_pages.pdf.
- Whitten J., Bentley L. & Dittman K. (2001). System Analysis and Design Methods (5th ed.). Boston: McGraw-Hill.