Online Class Alert System (OCAS)

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ABSTRACT

Mobile technologies are rapidly growing, and they play an important role in the management of relations between people in social, economic, education, and everyday life. The study aims to improve communication method between lecturer and students by designing a web-based system to help lecturer and students to get news about the new events. Charging scheme for SMS is out of the study scope. The study aims to provide an effective utilization of WEB technology for easing and improving process of communication and alerting between the lecture and students. The prototype of Online Class Alert System (OCAS) is introduced to be used by lecturers at UUM. The system covers two main functions: First function is to review classes and groups of the lecturer, and second is to send SMS to students. The General Methodology of Design Research is adopted to achieve the research objectives. Results of user evaluation on the MBTS indicate that it has good usability in terms of Usefulness, Ease of Use and Outcome and Future Use. An independent samples t-test was conducted to compare the Usefulness, Outcome and Future Use and Ease of Use for participants who send SMS hourly and daily. The t-test results indicate that there is no statistically significant different in the mean Usefulness, Outcome, or Future Use, and Ease of Use on two groups of participant who send SMS or Email, hourly and daily.

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CHAPTER 1

INTRODUCTION

1.1 Background

Throughout history, people need to communicate and interact; and during the past decade every area of education has been affected by the introduction and use of technology. Moreover, mobile technologies are rapidly growing, and they have played an important role in the management of relations between people in social, economic and everyday life (Goh, Kim, Lavanya, Kim, & Soh, 2006). It is undeniable that many benefits can be realized through exploitation of the new and distributed technologies such as greater independence, self-confidence, ease-of-living, quality and equality of life. With the rapid growth of the means of communication, the learning and education has adopted such technology. However, in order to develop technology to the levels whereby these benefits can be realized by the users in-the-large, there are a number of issues which must be considered in addition to the already complex development and intensive processing requirements of digital distributed systems (McCrindle, 1999).

A survey conducted by Malaysian Communications and Multimedia Commission (MCMC) in 2007 investigated users internet access using hand phones in Malaysia found that for the Internet 13.7% of users accessed the internet through their hand phones. Moreover, the survey found that Malaysia has 51.98% Internet user in 2007, while

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REFERENCES

- Amor (2002). Internet future Strategies: How pervasive computing services will change the world. USA: Prentice Hall.
- Attewell, J. (2005). *Mobile technologies and learning: A technology update and mlearning project summary*. London, UK: Published by the Learning and Skills Development Agency.
- Best, J. W., & Kahn, J. V. (2000). *Research in education* (8th ed.). USA: Allyn and Bacon.
- Bhola, H. S. (1990). Evaluating Literacy for development projects, programs and campaigns. Paper presented at the Evaluation planning, design and implementation, and utilization of evaluation results, Hamburg, Germany.
- Brown, T. (2004). *The Role of m-learning in the Future of e-learning in Africa*. Paper presented at the Distance Education and Technology: Issues and Practice, Open University of Hong Kong Press, Hong Kong, China.
- Carlsson, C., Carlsson, J., & Walden, P. (2005). *Mobile Services For The Hospitality Industry*. Paper presented at the Thirteenth European Conference on Information Systems, Regensburg, Germany.
- Chan, S. S., Fang, X., Brzezinski, J., Zhou, Y., Xu, S., & Lam, J. (2002). Usability for Mobile Commerce Across Multiple Form Factors. *3*(3), 187-199.
- Chen, J., & Kinshuk, J. (2005). Mobile Technology in Educational Services. *Journal of Educational Multimedia and Hypermedia*, 14(1), 91.
- Chen, Y.-F., Gibbon, D., Liu, Z., Shahraray, B., & Wei, B. (2006). Personal Media Alert Systems: Personalization and Dissemination of Broadcast Content With a P2p Micropayment Scheme. Paper presented at the Multimedia and Expo, 2006 IEEE International Conference.
- Coakes, S. J. (2005). SPSS version 12 for Windows Analysis Without Anguish. Sydney: John Wiley & Sons Australia.
- Colafigli, C., Inverard, P., & Martriccian, R. (2001). *InfoParco: An Experience in Designing an Information System Accessible through WEB and WAP Interfaces*.
 Paper presented at the Hawaii International Conference on System Science, Los Alamitos.
- Computer Science and Telecommunications Board [CSTB] (1998). Design and Evaluation: A Review of the State-of-the-Art Retrieved September 1, 2009, from <u>http://www.dlib.org/dlib/july98/nrc/07nrc.html</u>

- Corlett, D., Sharples, M., Chan, T., & Bull, S. (2005). A Mobile Learning Organiser for University Students. *Journal of Computer Assisted Learning*, 21(3), 162-169.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *International Journal of Human-Computer Interaction*, 7(1), 57-78.
- El-Alfy, E.-S. M. (2005). A General Look at Building Applications for Mobile Devices.
- Goh, K. W., Kim, E., Lavanya, J., Kim, Y., & Soh, C. B. (2006). Issues in Implementing a Knowledge-based ECG Analyzer for Personal Mobile Health Monitoring. Paper presented at the Engineering in Medicine and Biology Society.
- Hair, J. F., Black, B., Babin, B., Anderson, R. E., & Tatham, R. L. (2007). *Multivariate Data Analysis* (6th ed.). Zug, German: Pearson Higher Education.
- He, P., Wen, X., & Zheng, W. (2008). A Novel Method for Filtering Group Sending Short Message Spam. Paper presented at the the 2008 International Conference on Convergence and Hybrid Information Technology.
- ISO (1991). International Organization for Standardization (ISO) 9126 Retrieved July 15, 2009, from <u>http://www.angelfire.com/nt2/softwarequality/ISO9126.pdf</u>
- John, B. E., & Kieras, D. E. (1996). Using GOMS for user interface design and evaluation: which technique? ACM Transactions on Computer-Human Interaction (TOCHI), 3(4), 287-319.
- Jones, M. L. W., Gay, G. K., & Rieger, R. H. (1999, November 1999). Project Soup: Comparing Evaluations of Digital Collections Efforts. *D-Lib Magazine*, 5.
- Jones, M. L. W., Rieger, R. H., Treadwell, P., & Gay, G. K. (2000). Live from the stacks: user feedback on mobile computers and wireless tools for library patrons. Paper presented at the Fifth ACM conference on Digital libraries, San Antonio, Texas, United States
- Junior, W. M. d. A., & Verdier, C. (2005). Public Health Alert System for Health Networks: Application to Cardiolo. *Computers in Cardiology*, 2005, 151 - 154.
- Kadirire, J. (2007). Instant Messaging for Creating Interactive and Collaborative m-Learning Environments. *International Review of Research in Open and Distance Learning*, 8(2).
- Kaikkonen, A., & Tormanen, P. (2000). *User Experience in Mobile Banking*. Paper presented at the Proceedings of HCI2000, BCS.
- Kalkbrenner, G., & Nebojsa, F. (2001). Campus Mobil: Mobile Services for Campus and Student needs Retrieved August 15, 2009, from <u>http://ls12.cs.unidortmund.de/~kalkbren/campusmobil.pdf</u>

- Leggatt, H. (2008). China almost world's largest online community Retrieved July 27, 2009, from <u>http://www.bizreport.com/2008/01/china_almost_worlds_largest_online_commun</u> <u>ity.html</u>
- Lewis, J. R. (1995). IBM Computer Usability Satisfaction Questionnaires: Psychometric Evaluation and Instructions for Use. *International Journal of Human-Computer Interaction*, 7(1), 57-78.
- Lubanski, M., & Doshi, D. (2000). SMS 2 Administration Sams.
- Malaysian Communications and Multimedia Commission [MCMC] (2008).
 Communications and Multimedia Selected Facts and Figures- Q4 2007.
 Cyberjaya, Selangor Darul Ehsan, Malaysia: Malaysian Communications and Multimedia Commission (MCMC).
- McCrindle, R. (1999). *The Impact of New and Distributed Technologies on Disabled Users*. Paper presented at the IEE European Workshop.
- Missingham, R. (1999). *Perspectives on DL'99*. Paper presented at the Fourth ACM Conference on Digital Libraries.
- Mnaouer, A. B., Aendenroomer, A., & Hismanto, L. (2004). An Event Chain Notification and Management System Using SMS. Paper presented at the 2004 IEEE International Conference on Industrial Technology.
- Muller, N. J. (2002). Desktop encyclopedia of telecommunications: McGraw-Hill.
- Nielsen, J. (1994). Usability Engineering. San Diego: Morgan Kaufmann Publishers.
- Nielsen, J. (2006). Quantitative Studies: How Many Users to Test? Retrieved September 20, 2009, from <u>http://www.useit.com/alertbox/quantitative_testing.html</u>
- Norman, D. A. (1998). *The invisible computer*: MIT Press Cambridge, MA, USA.
- Open University Malaysia (OUM) (2002). University Profile Retrieved July 30, 2009, from <u>http://www.oum.edu.my/portal/index.php?op=view&m=3&page=1</u>
- Pallant, J. (2007). SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS (3rd ed.). Wellington, New Zealand: Allen and Unwin.
- Papagelis, A., Papagelis, M., & Zaroliagis, C. (2008). Enabling Social Navigation on the Web. Paper presented at the International Conference on Web Intelligence and Intelligent Agent Technology, 2008. WI-IAT '08. IEEE/WIC/ACM
- Plaisant, C., Marchionini, G., Bruns, T., Komlodi, A., & Campbell, L. (1997). Bringing treasures to the surface: iterative design for the Library of Congress National

Digital Library Program. *Proceedings of the SIGCHI conference on Human factors in computing systems*, 518-525.

- Ramsay, M., & Nielsen, J. (2000). WAP Usability Report London: Nielsen Norman Group.
- Sachpazidis, I., Fragou, S., & Sakas, G. (2004). Medication adherence system using SMS technology. Paper presented at the Intelligent Sensors, Sensor Networks and Information Processing Conference, 2004. Proceedings of the 2004.
- Seppala, P., Sariola, J., & Kynaslahti, H. (2002). Mobile Learning in Personnel Training of University Teachers. Paper presented at the IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE'02).
- Shih-Ming, P., Yi-Chih, L., Tsang-Yao, C., & Shih-Hua, L. (2008). The Influence of Instant Messaging Usage Behavior on Organizational Communication Satisfaction. Paper presented at the Hawaii International Conference on System Sciences, Proceedings of the 41st Annual.
- Shneiderman, B. (1980). Software psychology: Human factors in computer and information systems: Winthrop Publishers.
- Stone, A. (2004). Mobile Scaffolding: An Experiment in Using SMS Text Messaging to Support First Year University Students. Paper presented at the IEEE International Conference on Advanced Learning Technologies (ICALT'04).
- Vaishnavi, V. K., & Kuechler, W. J. (2004). Design Research in information system Retrieved July 15, 2009, from <u>http://www.isworld.org/Researchdesign/drisISworld.htm</u>
- Wikipedia (2007, September 28, 2009). Usability Retrieved September 20, 2009, from http://en.wikipedia.org/wiki/Usability
- Wu, N., Wu, M., & Chen, S. (2008). Real-time Monitoring and Filtering System for Mobile SMS. Paper presented at the International Conference on Convergence and Hybrid Information Technology.
- Xiao, Q., Zhou, S., Xing, Y., Dai, G., & Wu, Y. (2007). Wireless Pre-paid Phone Cards Distributing System Based on SMS Paper presented at the SoftCOM 2007. 15th International Conference on Software, Telecommunications and Computer Networks.
- Xu, H., Teo, H. H., & Wang, H. (2003, January 6-9, 2003). Foundations of SMS commerce success: lessons from SMS messaging and co-opetition. Paper presented at the 36th Annual Hawaii International Conference on System Sciences

Yaping, C., Dan, H., & Jun, Y. (2009). The Impact of B2C Website Design Features on Consumers' Purchase Intention. Wireless Communications and Trusted Computing, Networks Security, 2009(2), 17 - 20.