

**DISSEMINATING TRAINING COURSES INFORMATION USING SMS**

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# **DISSEMINATING TRAINING COURSES INFORMATION USING SMS**

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**Fulfillment of the Requirement for the Degree Master**

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## **Abstract**

*In these days most media acknowledge the importance of SMS news and web in reaching and interacting with their users. However, there is much discussion regarding the effectiveness when it comes to SMS news. This project to help the students and staff prepared to accept, reading using SMS messages: effective is SMS news compared to traditional news communications. The goal of this study is to investigate the use of SMS news compared to traditional ways distribute in news in different aspects and on the other hand, to develop prototype by using web and SMS technology to apply this system and extent users are willing to accept commercial messages on their mobile phone, since the effectiveness of SMS news highly depends on this willing. The results of this project indicate that the use of the web and SMS for the benefit of disseminating UTLC center training Courses information by extending web technology to SMS using WLAN for students and staff.*

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Introduction**

UTLC was established on October 1, 1986 .It was then known as Unit Teknologi Pendidikan (UTP), or Educational Technology Unit, UTP then metamorphosed to become the Pusat Inovasi Pendidikan (PiP), or Centre for Educational Innovation, On February 23, 2001, the university officially renamed PiP as Pusat Pengajaran Pembelajaran Universiti, or University Teaching and Learning Centre (UTLC) under the Office of Academic Affairs, UTLC had three divisions, namely :Unit for Training and Evaluation, Unit for Educational Multimedia, and Management Unit .Few months later, the Unit for Educational Multimedia was merged on August 1, 2001 with the University Publication Office, with responsible directly to the university Vice-Chancellor.

The important of UTLC introduction showing correlation between UTLC center with the issues of this project .The main issues that would be about the mobile concept follow in wireless networks, and SMS .

Nowadays, we have 1.7 billion mobile phone users in the world, over a quarter of the world's population, which means possibility of the same number of potential users .In fact, within under developed countries the mobile device such as PDA becomes more popular in using than a PC or even laptop (Momo, 2005).

The contents of  
the thesis is for  
internal user  
only

## REFERENCES

- Acharya, A., Bisdikian, C., Misra, A., & Ko, Y.-B. (2004). AirConn: A Framework for Tiered Services in Public Wireless LAN Hot Spots. *IEEE COMMUNICATIONS MAGAZINE*. 42 (9), 124-133.
- Amundsen, M., & Litwin, P. (2002). *ASP. NET for developers*. Princeton, N.J.: Recording for the Blind & Dyslexic.
- Ang, L.M.; Ow, S.H.; Seng, K.P.; Tee, Z.H.; Lee, B.W.; Thong, M.K.; Poi, P.J.H.; Kunanayagam, S., "Wireless intelligent incontinence management system using smart diapers," *Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology, 2008. ECTI-CON 2008. 5th International Conference on* , vol.1, no., pp.69-72, 14-17 May 2008  
URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4600374&isnumber=4600357>
- 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.
- Azirah Hashim. (2005). *How to write a thesis: The thesis writing journey from start to finish*. Kuala Lumpur: University of Malaya Press.
- Basios, C.; Solidakis, M., "Current trends and challenges towards wireless Internet," *Computer Systems and Applications, 2005. The 3rd ACS/IEEE International*

*Conference on* , vol., no., pp. 77-, 2005s

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1387071&isnumber=30191>

Corcoran, P. M., Bigioi, P., & Steinberg, E. (2001). Wireless Transfer of Images from a Digital Camera to the Internet via a Standard GSM Mobile Phone. *IEEE TRANSACTIONS ON CONSUMER ELECTRONICS CE.* 47, 542-547.

Craig, A. & John, D., (2004) Creating Web Services Using Asp.Net, CCSC: Rocky Mountain Conference.

Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. "User Acceptance of Computer Technology: a Comparison of Two Theoretical Models," *Management Science* (35:8) 1989

Darrell, B. (2008) Requirements modeling technology a vision for better, faster, and cheaper systems. Retrieved on: march 11, 2009. from:  
[www.apl.jhu.edu/classes/notes/schappelle/704/requirementsmodeling.pdf](http://www.apl.jhu.edu/classes/notes/schappelle/704/requirementsmodeling.pdf).

Esato, (2006) Billion Mobile Phone Users in the World. Retrieved on: March 22, 2009 from:<http://www.esato.com/news/article.php?id=1365>).

Esposito, D. (2007). *Introducing Microsoft ASP.NET Ajax*. Redmond, WA: Microsoft Press.

Esposito, D. (2009). *Microsoft ASP.NET and Ajax: Architecting Web applications*. Redmond, Wash: Microsoft Press.

Gallivan, M. J., Spitler, V. K., and Koufaris, M. 2005. Does Information Technology Training Really Matter? A Social Information Processing Analysis of Coworkers' Influence on IT Usage in the Workplace. *J. Manage. Inf. Syst.* 22, 1 (May. 2005), 153-192.

IEEE Computer Society, Institute of Electrical and Electronics Engineers, IEEE-SA Standards Board, & IEEE Xplore (Online service). (2000). *IEEE standard for Information technology-- telecommunications and information exchange between systems-- local and metropolitan area networks-- specific requirements Part 11 : wireless LAN medium access control (MAC) and physical layer (PHY) specifications : Amendment 3: Specification for operation in additional regulatory domains*. New York, N.Y., USA: Institute of Electrical and Electronics Engineers. <http://ieeexplore.ieee.org/servlet/opac?punumber=20478>.

IEEE Computer Society, Institute of Electrical and Electronics Engineers, IEEE-SA Standards Board, & IEEE Xplore (Online service). (2003). *IEEE standard for information technology Telecommunications and information exchange between systems--local and metropolitan area networks--specific requirements. Part 11, Amendment 8, Wireless medium access control (MAC) and physical layer (PHY) specifications. medium access control (MAC) quality of service enhancements*. New York, NY: Institute of Electrical and Electronics Engineers. <http://ieeexplore.ieee.org/servlet/opac?punumber=10328>.

International Conference On Telecommunications (Croatia) (8th: 2005: Zagreb, C.

(2005). *Contel 2005: Proceedings of the 8th international conference on telecommunications*. Piscataway: Ieee Press Books.

Introduction to Microsoft .Net Platform. (2008) Microsoft Internet Explorer, Accessed on

Jan 12, 2009. From: <http://www.asp101.com/articles/nakul/intronet/default.asp/>

Janevski, T.; Tudzarov, A.; Stojanovski, P.; Temkov, D., "Applicative Solution for Easy

Introduction of WLAN as Value-Added Service in Mobile Networks," *Vehicular Technology Conference, 2007. VTC2007-Spring. IEEE 65th* , vol., no., pp.1096-1100, 22-25 April 2007

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4212661&isnumber=4212428>

Janevski, T.; Tudzarov, A.; Temkov, D.; Stojanovski, P.; Stojanov, G.; Janevska, M.;

Kantardziev, D.; Pavlovski, M.; Bogdanov, T., "AAA solution for interworking between mobile networks and wireless LANs," *Telecommunications, 2005. ConTEL 2005. Proceedings of the 8th International Conference on* , vol.1, no., pp. 231-237, June 15-17, 2005

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1458538&isnumber=31385>

Kendall, K. E., & Kendall, J. E. (1998). *Systems analysis and design*. Upper Saddle River, N.J.: Prentice-Hall.

Kotz, D., & Essien, K. (2005). Analysis of a Campus-Wide Wireless Network. *Wireless Networks*. 11 (1-2), 1-2.

Kuechler, W., & Vaishnavi, V. (2008). The emergence of design research in information systems in North America. *JOURNAL OF DESIGN RESEARCH*. 7 (1), 1-16.

Laudon, K. C., & Laudon, J. P. (2000). *Management information systems: Organization and technology in the networked enterprise*. Upper Saddle River, NJ: Prentice Hall.

Lita, I.; Cioc, I.B.; Visan, D.A., "A New Approach of Automobile Localization System Using GPS and GSM/GPRS Transmission," *Electronics Technology, 2006. ISSE '06. 29th International Spring Seminar on*, vol., no., pp.115-119, 10-14 May 2006  
URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4216009&isnumber=4215983>

Memory Limits for Windows Releases

<http://msdn.microsoft.com/en-us/library/ee206698.aspx>

Michalk, D., & Cameron, R. (2003). *Building ASP.NET server controls*. Berkeley, Calif: Apress.

Moma, C. (2005). INTERNATIONAL FOCUS - Wireless in Africa: Insights into Mobile Markets - The explosive growth of mobile telephony in Africa offers insights into the differences in deploying new technologies in underdeveloped countries. *IT Professional*. 7 (3), 34.

Munoz, C.U., "An approach to software product testing," *Software Engineering, IEEE Transactions on*, vol.14, no.11, pp.1589-1596, Nov 1988

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9047&isnumber=45>

7

Naismith, L. (2004). *Literature review in mobile technologies and learning*. NESTA Futurelab series, report 11. Bristol: NESTA Futurelab.

Nielsen, J. (1993). *Usability engineering*. Boston: Academic Press.

Pressman, Roger S. (2007). *Software Engineering A Practitioner's Approach*. McGraw-Hill Science Engineering.

Ramsey, N., & Marceau, C. (1991). *Literate programming on a team project*. Princeton, N.J.: Princeton University, Dept. of Computer Science.

Ravden, S. J., & Johnson, G. I. (1989). *Evaluating usability of human-computer interfaces: A practical method*. Ellis Horwood books in information technology. Chichester: E. Horwood.

Scholz, H. (2008) SMS Marketing Para Pequenas medianas empresas. Retrieved on: April 1, 2009.from: <http://www.mobile-zeitgeist.com/es/2008/01/26/sms-marketing-fuer-kleine-und-mittelstaendische-unternehmen/>

Sekaran, U. (2003). *Research methods for business: A skill-building approach*. New York: John Wiley & Sons.

Shelly, G. B., Cashman, T. J., & Rosenblatt, H. J. (2001). *Systems analysis and design*. Boston: Course Technology.

Sheriff, P. D. (2006). *Fundamentals of VB. NET*. [USA]: PDSA.

Singelee, D., & Preneel, B. (2005). The Wireless Application Protocol. *International Journal of Network Security*, 1(3), 161–165. Retrieved on: Feb 20, 2009.

From:<http://ijns.femto.com.tw/contents/ijns-v1-n3/ijns-2005-v1-n3-p161-165.pdf>

*Systems Analysis & Design With Uml Ms Visio 2007*. (2008). John Wiley & Sons.

Talekar, S. (2008). *WEBSTORM Web-based support tool for organization of requirements modeling*. Thesis (M.S.)--University of Nevada, Reno, 2008.

University Utara Malaysia, University Teaching and Learning Centre.

<http://www.utlc.uum.edu.my/>

Vaishnavi, V., and Kuechler, W. (2004). *Design Research in Information Systems*,

<http://www.isworld.org/Researchdesign/drisISworld.htm> (accessed May 08, 2007).

WAP Forum. (2000). *Wireless Application Protocol White Paper*. Retrieved on: Jan 16,

2009. from [http://www.wapforum.org/what/WAP\\_white\\_pages.pdf](http://www.wapforum.org/what/WAP_white_pages.pdf)

WAP Forum, (2001) *WAP Architecture. Wireless Application Protocol Architecture Specification.WAP-210-WAPArch-20010712*. Retrieved on: Jan 25, 2009, from

<http://www.openmobilealliance.org/tech/affiliates/wap/wap-210-waparch-20010712a.pdf>.

Wei Yuan; Xiangyu Wang; Linnartz, J.-P.M.G., "A Coexistence Model of IEEE 802.15.4 and IEEE 802.11b/g," *Communications and Vehicular Technology in the Benelux, 2007 14th IEEE Symposium on* , vol., no., pp.1-5, 15-15 Nov. 2007

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4436237&isnumber=4436227>

Whitten, J. L., Bentley, L. D., & Dittman, K. C. (1998). *Systems analysis and design methods*. Boston, Mass: Irwin/McGraw-Hill.

Whitten, J. L. (2004). *Systems analysis and design methods*. Boston: McGraw-Hill/Irwin.

Wireless Application Protocol (2008), retrieved on: March 1, 2009. From: [http://en.wikipedia.org/wiki/Wireless\\_Application\\_Protocol](http://en.wikipedia.org/wiki/Wireless_Application_Protocol).

Xiaofeng Meng; Wei Liu, "Web and Mobile Data Management," *Network and Parallel Computing Workshops, 2007. NPC Workshops. IFIP International Conference on*, vol., no., pp.36-40, 18-21 Sept. 2007

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4351457&isnumber=4351442>

Xu, H., Teo, H. H., & Wang, H. (2003). Foundations of SMS Commerce Success: Lessons from SMS Messaging and Co-opetition (DTMCC06). *PROCEEDINGS OF THE ANNUAL HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES*. (Conf 36), 90-90.

Yates, D., Moore, D. S., & Starnes, D. S. (2002). *The practice of statistics*. New York: W. H. Freeman.

Zerzelidis, A., & Wellings, A. J. (2005). Requirements for a Real-Time.Net Framework. *ACM SIGPLAN NOTICES*. 40 (2), 41-50.