

**DESIGNING A MOBILE LINGUIST GUIDE APPLICATION
TO FACILITATE THE COMMUNICATION BETWEEN
MALAYSIANS AND ARABS**

**A Thesis submitted to the College of Arts and Sciences in full fulfillment of
the requirements for the degree of Master of Science
University Utara Malaysia**

by

Haider M. Habeeb

© 2009, Haider

PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the University Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or, in their absence by the Dean of Faculty of Information Technology. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to

Dean of Faculty of Information Technology

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman.

ABSTRACT

Mobile device can be used anywhere and anytime. Relying on this characteristic, the research aims to introduce electronic linguist guide can be applied on the mobile devices in order to obtain the communication between the countries which are talking different languages. Facilitating or enhancing the communication leads to convergence of cultures. As long as the research deals with Malaysians and those people who talk Arabic language, that will be useful for both sides where the Malaysians will be more familiar with the Arabic language which is the Holy Quran language and Arabs can spread the Islamic language actively. Learning common phrases will urge users to have more about a specific language. Hope of the benefits of this study serves more than two kinds of people if we have knew it can expand for including many languages.

ACKNOWLEDGMENT

I would like to express my deep and sincere gratitude to my supervisor, Dr. SHAFIZ AFFENDI MOHD YUSOF, Senior Lecturer, Graduate Department of Information Technology, College of Arts & Sciences, University Utara Malaysia. His wide knowledge and his logical way of thinking have been of great value for me. His understanding, encouraging and personal guidance have provided a good basis for the present thesis.

My utmost gratitude goes to the staff of University Utara Malaysia (UUM). I believe that one of the main gains during my study in UUM made me grow and gave me more confidence as a researcher.

I owe my loving thanks to my wife and my sons. They have lost a lot due to my study abroad. Without their encouragement and understanding it would have been impossible for me to finish this study. My special gratitude is due to my brothers, sisters and friends.

I would like to thank my mother whose love is boundless and I do believe in her pray which has a great effect for achieving my study. I am really thankful to my mother in law for her support and patient by caring of my family.

TABLE OF CONTENTS

Title	Page
PERMISSION TO USE	i
ABSTRACT	ii
ACKNOWLEDGMENT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vii
CHAPTER ONE	1
STATEMENT OF OBJECTIVE	1
1.1 Introduction	1
1.1.1 Problem Statement	3
1.1.2 Research Question	4
1.1.3 Research Objective	4
1.1.4 Limitation and Scope	5
1.1.5 Significant of the Research	5
1.1.6 Thesis Overview	6
CHAPTER TWO	7
LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Cultural Differences	7
2.3 Mobile phone	9
2.4 Mobile Usability	11
2.5 Mobile Applications	16
CHAPTER THREE	20
RESEARCH METHODOLOGY	20
3.1 Introduction	20
3.2 Awareness of Problem	21
3.2.1 Collect Data	22
3.2.2 The current Process of Study	22
3.3 Suggestion	22
3.4 Development	23
3.5 Evaluation	24
3.5.1 Usability	24
3.5.2 Questionnaire	25
3.6 Conclusion	25
CHAPTER FOUR	27
RESULT	27
4.1 Introduction	27
4.2 Requirements	27
4.2.1 Functional Requirements	27
4.2.2 Non Functional Requirements	28
4.2.3 Hardware and Software Requirements	28

Title	Page
4.3 System Design	30
4.4 Use Case Specifications	31
4.4.1 Select Malay to Arabic	31
4.4.1.1 Brief description	31
4.4.1.2 Pre-condition	31
4.4.1.3 The Characteristics of Activation	32
4.4.1.4 Flow of event	32
4.4.1.5 Post-condition	33
4.4.2 Select Arabic to Malay	33
4.4.2.1 Brief description	33
4.4.2.2 Pre-condition	33
4.4.2.3 The Characteristics of Activation	33
4.4.2.4 Flow of event	34
4.4.2.5 Post-condition	34
4.5 Sequence diagram	34
4.5.1 Select Malay to Arabic Sequence Diagram	34
4.5.2 Select Arabic to Malay Sequence Diagram	35
4.5.3 Class diagram	36
4.6 Design Interfaces for MLGA Prototype	37
4.7 Summary	45
CHAPTER FIVE	46
DISCUSSION OF RESULTS	46
5.1 Introduction	46
5.2 Evaluation Techniques	46
5.3 Evaluation questionnaire	47
5.4 Data Analysis	47
5.4.1 Descriptive of Each Usability	47
5.4.2 Reliability Analysis	54
5.4.2.1 Reliability Analysis of Each Usability	54
5.4.3 Item-Total Statistics	55
5.4.4 Summary Item Statistics	57
5.4.5 Respondent Profile	57
CHAPTER SIX	61
CONCLUSIONS	61
6.1 Introduction	61
6.2 Conclusion of the study	61
6.3 Study contribution	62
6.4 Problems and Limitations	62
6.5 Future works	62
6.6 Recommendation	63
7.0 REFERENCES	64
Appendix A:	72
Questionnaire Template	72

LIST OF FIGURES

No	Name of Figure	Page
2.1	Consumer Services	10
2.2	The New Generation of Mobile Phones	11
2.3	Range of mobile devices, and the kinds of applications that run on them	17
3.1	Research Design Methodology	21
4.1	Use Case Diagram for the prototype	31
4.2	Select Malay to Arabic Use Case Specification	32
4.3	Select Arabic to Malay Use Case Specification	33
4.4	Select Malay to Arabic Sequence Diagram	35
4.5	Select Arabic to Malay Sequence Diagram	36
4.6	Mobile Linguist Guide class Diagram	37
4.7	Welcomed Page for MLGA	38
4.8	Main Menu page	39
4.9	Malay to Arabic Categories	40
4.10	Arabic to Malay Categories	41
4.11	Greetings Phrases in Bahasa Malaysia	42
4.12	Emergency phrases in Bahasa Malayisa	42
4.13	Greetings Phrases in Arabic Language	43
4.14	Emergency Phrases in Arabic Language	43
4.15	Some Malay phrases translated to Arabic language	44
4.16	Some Arabic phrases translated to Bahasa Malaysia	45
5.1	Descriptive Statistic Mean for Usefulness	49
5.2	Descriptive Statistic Mean for Ease of Use and Learning	50
5.3	Descriptive Statistic Mean for Flexibility	51
5.4	Descriptive Statistic Mean for Satisfaction	52
5.5	Respondent Profile (Gender)	58
5.6	Respondent Profile (Age)	58
5.7	Respondent Profile (Nationality)	59
5.8	Respondent Profile (Marital Status)	59
5.9	Respondent Profile (Using Mobile Phone)	60

LIST OF TABLES

No	Name of Table	Page
4.1	Hardware and software Requirements	29
5.1	Descriptive Statistics (Usefulness)	48
5.2	Descriptive Statistics (Ease of Use and Learning)	49
5.3	Descriptive Statistics (Flexibility)	50
5.4	Descriptive Statistics (Satisfaction)	51
5.5	Descriptive Statistics of all usability	53
5.6	Reliability Statistics (Usefulness)	54
5.7	Reliability Statistics (Ease of Use and Learning)	54
5.8	Reliability Statistics (Flexibility)	55
5.9	Reliability Statistics (Satisfaction)	55
5.10	Item -Total Statistics	56
5.11	Summary Item Statistics	57

CHAPTER ONE

STATEMENT OF OBJECTIVE

1.1 Introduction

Mobile devices were one of the greatest technology have been discovered. Certainly, the mobile devices are used and involved in many fields and services. One of these fields is the tourism service. The services of mobile tourism became has become a vital tool for supporting tourists in the world (Tan, Goh, Theng and Foo, 2007). Mobile devices are used to serve the interactions between local people and tourists (Lee and Watson, 1993; Munro, 1998). Although tourism presents a number of barriers to introduce new technology - in particular the need for devices to be sufficiently mobile - tourists have already adopted many new technologies, e.g. the web, mobile phones and digital cameras. This suggests that there are opportunities for new tourist systems that fit tourist practice (Brown & Chalmers, 2003).

Nowadays, no one can leave his cellular; it becomes part of the life. This objectivity encouraged us to exploit this device to apply IT usability in order to solve or develop a part of what might be faced in the universal. This can be noticed when we read what Kayan mentioned when he said "Information technologies (IT) could help greatly in today's era of multinational collaborations" (Kayan, Fussell & Setlock,

The contents of
the thesis is for
internal user
only

7.0 REFERENCES

- Ardkan, M. A., 2009. "Applying Design Research Method to IT Performance Management: Forming a New Solution". *Journal of Applied Sciences*. ISSN 1812-5654.
- Asprova Corporation, 2008. *Advanced Planning and Scheduling APS*, [online] Retrieved date 9-January-2009 from <http://www.asprova.com>.
- Atanu Banerjee, "Architectural Considerations for a World of Devices", the *architecture journal*, 14, 2008. [online] Retrieved date 4-2-2009 from <http://msdn.microsoft.com/en-us/library/bb985492.aspx>
- Brown, B., & Chalmers, M. 2003. *Tourism and mobile technology*, Proceedings of the eighth conference on European Conference on Computer Supported Cooperative Work, p.335-354, September 14-18, 2003, Helsinki, Finland.
- Bucolo, S. 2004. *Understanding cross cultural differences during interaction within immersive virtual environments*. In *Proceedings of the 2004 ACM SIGGRAPH international Conference on Virtual Reality Continuum and Its Applications in industry* (Singapore, June 16 - 18, 2004). VRCAI '04. ACM, New York, NY, 221-224. DOI=<http://doi.acm.org/10.1145/1044588.1044634>
- Cell phone, In *Encyclopædia Britannica*. [online] Retrieved date 1.4.2009 from *Encyclopædia Britannica*: <http://www.britannica.com/eb/article-9360134>
- Cho, S. M., Kim, H. H., Cha, S. D., & Bae, D. H. (2000). *A semantics of sequence diagrams (sequence diagram)*
- Cramton, C. D. 2001. *The mutual knowledge problem and its consequences for dispersed collaboration*. *Organizational Science*, 12, 346-371

- Daniel, S. K. S. 2006. Usability guidelines for designing mobile learning portals. In Proceedings of the 3rd international conference on Mobile technology, applications & systems (Bangkok, Thailand). ACM. DOI = <http://doi.acm.org/10.1145/1292331.1292359>.
- Dunckley L, Smith, A & Howard, D (1999). 'Designing for Shared Interfaces with diverse user groups.' INTERACT 99, pp 630.636. Eds. M.A. Sasse, C. Johnson. Chapman & Hall. 1999.
- Field, A. (2006). Reliability Analysis. [online]. Retrieved date 4-4-2009 from <http://www.sussex.ac.uk/Users/andyf/reliability.pdf>.
- Garretson, R. (October 13, 1999) "Palm Computing, Symbian to Team", [online] Retrieved date 3-3-2009 from Computerworld [http://www.computerworld.com/cwi/story/0,1199,NAV47_STO29169.00.html\(current January 20,2002\)](http://www.computerworld.com/cwi/story/0,1199,NAV47_STO29169.00.html(current January 20,2002))
- Herbsleb, J. D., Mockus, A., Finholt, T. A., & Grinter, R. E. 2000. Distance, dependencies, and delay in a global collaboration. Proc. CSCW 2000 (pp. 319-328). ACM Press.
- Herman, L. (1996)"Towards Effective Usability Evaluation in Asia: Cross-Cultural Differences," ozchi, p. 0135, 6th Australian Conference on Computer-Human Interaction (OZCHI '96).
- Herstad, J., D. V. Thanh, and S. Kristoffersen (1998) "Wireless Markup Language as a Framework for Interaction with Mobile Computing Communication Devices", in C. Johnson (ed.), Proceedings of the First Workshop on Human Computer Interaction for Mobile Devices, available at:

www.dcs.gla.ac.uk/~johnson/papers/mobile/HCIMD1.html (current Oct. 7, 2001).

Hrabe, D. P., & Gazda, R. B. (2004). Igniting the SPARK: Supporting the Technology Needs of Online Learners. [online] Retrieved date 23-3-2009 from

http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1b/a7/48.pdf

Hussain, A. and Ferneley, E. 2008. Usability metric for mobile application: a goal question metric (GQM) approach. In Proceedings of the 10th international Conference on information integration and Web-Based Applications & Services (Linz, Austria, November 24 - 26, 2008). G. Kotsis, D. Taniar, E. Pardede, and I. Khalil, Eds. iiWAS '08. ACM, New York, NY, 567-570. DOI= <http://doi.acm.org/10.1145/1497308.1497412>

IBM, 2006. Mobile Content Services: Delivering next-generation content service capabilities. [online] Retrieved date 4-4-2009 from http://www.03.ibm.com/industries/media/doc/content/bin/Ped_8_Mobile_Content_Services_White_Paper_09_2006.pdf

Jokela, T., Koivumaa, J., Pirkola, J., Salminen, P. and Kantola, N. "Methods for quantitative usability requirements: a case study on the development of the user interface of a mobile phone". Personal Ubiquitous Computing, 10, 6, 345-355, 2006.

Kasper, H. and Effie, L. C. L. 2007. Meta-analysis of correlations among usability measures. In Proceedings of the SIGCHI conference on Human factors in

computing systems (San Jose, California, USA). ACM. DOI = <http://doi.acm.org/10.1145/1240624.1240722>.

Kayan, S., Fussell, S., & Setlock, L. 2006. Cultural differences in the use of instant messaging in Asia and North America, Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work, November 04-08, 2006, Banff, Alberta, Canada [doi>10.1145/1180875.1180956]

Kim, J., & Lee, K. 2005. Cultural difference and mobile phone interface design: icon recognition according to level of abstraction, Proceedings of the 7th international conference on Human computer interaction with mobile devices & services, September 19-22, 2005, Salzburg, Austria [doi>10.1145/1085777.1085841]

Koller, A., Foster, G., and Wright, M. 2008. Java Micro Edition and Adobe Flash Lite for arcade-style mobile phone game development: a comparative study. In Proceedings of the 2008 Annual Research Conference of the South African institute of Computer Scientists and information Technologists on IT Research in Developing Countries: Riding the Wave of Technology (Wilderness, South Africa, October 06 - 08, 2008). SAICSIT '08, vol. 338. ACM, New York, NY, 131-138. DOI=<http://doi.acm.org/10.1145/1456659.1456675>

Laudon, K. C., & Laudon, J. P. 2000. Management Information Systems: Prentice Hall PTR Upper Saddle River, NJ, USA.

Lee, J. R. E., & Watson, D. R. 1993. Final Report to the Plan Urbain: Public Space as an Interactional Order. Manchester, Department of Sociology, University of Manchester.

- Leung, Chan, Y. Y. and Chan, C. S. C. 2003. Analysis of mobile commerce market in Hong Kong. Proceedings of the 5th international conference on Electronic commerce ACM. Pittsburgh, Pennsylvania.
- Lewis, J. R. (1993). IBM Computer Usability Satisfaction Questionnaires: Psychometric Evaluation and Instructions for Use. (IBM o. Document Number)
- Lin, H. X., Choong, Y.-Y., & Salvendy, G. (1997). A Proposed Index of Usability: A Method for Comparing the Relative Usability of Different Software Systems Taylor & Francis, 16, 267-278
- Lund, A. M. (2001). Measuring Usability with the USE Questionnaire. STC Usability SIG Newsletter. [online] Retrieved 5-3-2009 from <http://hcibib.org/perlman/question.cgi?form=USE>
- Martin, R. C. (2003). UML Tutorial: Part 1 -- Class Diagrams [online]. Retrieved date 16/3/2009 from <http://www.objectmentor.com/resources/articles/umlClassDiagrams.pdf>
- McDougall, P. 2008. Microsoft Adds Adobe's Flash Lite to Windows Mobile. InformationWeek. [online] retrieved 10-January-2009 from <http://www.informationweek.com/news/mobility/messaging/showArticle.jhtml?articleID=206904112>
- Microsoft website. [online] Retrieved date 5-3-2009 from <http://www.microsoft.com/presspass/press/2001/feb01/02-05namingpr.msp>

- Mobile Computing. (2005). WAP. [online] Retrieved date 5-3-2009 from http://searchmobilecomputing.techtarget.com/sDefinition/0,,sid40_gci213337,00.html
- Morales, C., and Nelson, D. 2007. Mobile 3D Game Development: From Start to Market. Charles River Media, Inc., Rockland, MA, USA.
- Munro, A. 1998. Fringe benefits: an ethnographic study of social navigation at the Edinburgh Festival. Stockholm, Sweden, SICS, Persona deliverable 2.1.1.
- Nielsen, J. (June 26, 2006). Quantitative Studies: How Many Users to Test. Alertbox. [online] Retrieved date 2-2-2009 from http://www.useit.com/alertbox/quantitative_testing.html
- Nielsen, J. (August 25, 2003). Usability 101: Introduction to Usability. Alertbox. [online] Retrieved date 2-2-2009 from <http://www.useit.com/alertbox/20030825.html>
- OP Papers, Research paper and essays for all. [online] Retrieved date 12.3.2009 from <http://www.oppapers.com/essays/Uml/55284>
- Ozkirimli, U. (2000). Theories of Nationalism: A Critical Introduction. New York: St. Martin's Press.
- Palm PC. (2007). In Encyclopædia Britannica. [online] Retrieved date 6-4-2009 from Encyclopedia Britannica Online: <http://www.britannica.com/eb/article-9374440>
- Rhodes, G. 2006. Macromedia Flash Professional 8 Game Development. Charles River Media, Inc., Rockland, MA, USA.
- Ryan, C. & Gonsalves, A. 2005. The effect of context and application type on mobile usability: an empirical study. In Proceedings of the Twenty-Eighth

Australasian Conference on Computer Science - Volume 38 (Newcastle, Australia). V. Estivill-Castro, Ed. ACM International Conference Proceeding Series, vol. 102. Australian Computer Society, Darlinghurst, Australia, 115-124.

Sun Microsystem. [online] Retrieved date 7-3-2009 from <http://java.sun.com/javame/index.jsp>

Tan, E. M., Goh, D. H., Theng, Y., and Foo, S. 2007. An analysis of services for the mobile tourist. In Proceedings of the 4th international Conference on Mobile Technology, Applications, and Systems and the 1st international Symposium on Computer Human interaction in Mobile Technology (Singapore, September 10 - 12, 2007). Mobility '07. ACM, New York, NY, 490-494. DOI= <http://doi.acm.org/10.1145/1378063.1378142>

UML Use Case Diagrams. (1998). Engineering Notebook.

Vaishnavi, V. & Kuechler, B. 2004. Design Research in information system. [online] Retrieved date 7-January -2009 from <http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=279>

Vaishnavi, V. K. and Kuechler, W. 2008. Design Science Research Methods and Patterns. 1st Edn., Auerbach Publications, Taylor and Francis Group, Boca Raton, FL., ISBN: 978-1-4200-5932-8.

Van Aken, J. E., 2007. Design science and organization development interventions: Align business and humanistic valu. J, Applied Behavioral Sci., 43: 67-88.

Wingyan Chung. 2008. Web searching in a multilingual world: Communications of the ACM, May 2008, Vol. 51, No. 5.

Woolfolk, A.E., & Winne, P.H., & Perry, N.E. (2006). Educational Psychology, 3rd ed. Toronto, ON: Pearson.

Yu, C. H. (2000). An introduction to computing and interpreting Cronbach Coefficient Alpha in SAS [online]. Retrieved date 5-4-2009 from <http://www2.sas.com/proceedings/sugi26/p246-26.pdf>.