Generic Model for Mobile Tourists Guide System (GMMTGS)

Mohamed B.SH.Elarbi

Universiti Utara Malaysia

2009

Generic Model for Mobile Tourists Guide System (GMMTGS)

A Thesis submitted to college Arts & Sciences in partial

Fulfillment of the requirement for the degree master

(Information Technology)

University Utara Malaysia

By

Mohamed B.Sh.Elarbi

Mohamed Elarbi

All Rights Reserved 2009

KOLEJ SASTERA DAN SAINS
(College of Arts and Sciences)
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK
(Certificate of Project Paper)

Saya, yang bertandatangan, memperakukan bahawa
(I, the undersigned, certify that)

MOHAMED B. SH. ELARBI
(800306)

calon untuk Ijazah
(candidate for the degree of) **MSc. (Information Technology)**

telah mengemukakan kertas projek yang bertajuk
(has presented his/her project paper of the following title)

GENERIC MODEL FOR MOBILE TOURISTS GUIDE SYSTEM (GMMTGS)

seperti yang tercatat di muka surat tajuk dan kulit kertas projek
(as it appears on the title page and front cover of project paper)

bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the project paper acceptable in form and content, and that a satisfactory knowledge of the field is covered by the project paper).

Nama Penyelia Utama
(Name of Main Supervisor): **DR. FAUZIAH BAHAROM**

Tandatangan
(Signature) : _____ Tarikh (Date) : 29-04-2009

Nama Penyelia Kedua
(Name of 2nd Supervisor): **MDM. NORIDA MUHD DARUS**

Tandatangan
(Signature) : _____ Tarikh (Date) : 29.04-2009

PERMISSION TO USE

In presenting this thesis of the requirements for a Master of Science in Information Technology (MSc. IT) 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 purposes may be granted by my supervisor or in her absence, by the Dean of the Graduate School. 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.

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

Dean of Graduate School

Universiti Utara Malaysia

06010 Sintok

Kedah Darul Aman

ABSTRACT

Nowadays, information discovery becomes more relevant to peoples' lifestyle with the implementation of mobile technology. In different ways, people can gather information they need just about anywhere without having to be physically connected to the Internet. With the support of Wireless Application Protocol (WAP), the development of mobile application turns to be realistic and reliable as it follows the correct protocol. This study has developed and designed a generic mobile tourist system based on tourists' requirements. The study used the JSP language and MYSQL server for the system development. Furthermore, the proposed system was tested using use test case with five students. Finally, the proposed generic mobile tourists guide system aims to satisfy tourist needs.

ACKNOWLEDGMENT

I thank Allah for His guidance. May your blessings be on me. I would like to extend my thanks and my gratitude to my supervisors, Dr.Fauziah Bt Baharom, and madam Norida Muhd Darus, for their help and advice during the duration of the research project and for guiding me in the completion of this research. In all truthfulness, without them, the project would not have been a complete one. Both my supervisors have always been my source of motivation and guidance. I am truly grateful for their continual support and cooperation in helping me all the way through the semester. I am grateful to Suraiya Ibrahim, Executive Officer, Perlis Tourism Action Council, for her help in making my project successful.

I would like to present my thanks to my father, my mother and all my family members who have always been there for me. Finally, I would like to express my appreciation to all my friends, colleagues, other staff, and everyone who have helped me in this journey.

TABLE OF CONTENTS

PERMISSION TO USE i

ABSTRACT ii

ACKNOWLEDGEMENT iii

TABLE OF CONTENTS iv

LIST OF FIGURES ix

LIST OF TABLES ix

CHAPTER 1

INTRODUCTION

1.0 Introduction 1

1.1 Problem Statement 2

1.2 Research Questions 3

1.3 Research Objectives 3

1.4 Research Scope 4

1.5 Research Significance 4

1.6 Thesis Organisation 5

1.7 Conclusion 6

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction ……..……...……7

2.1 The Importance of Tourism in Malaysia……..……...…..…8

2.2 Wireless Technology and Mobile Device……..……...…....9

2.3 Mobile Application ……..……...……..10

2.3.1 Mobile Phone Guide ……..……...…..…11

2.3.2 Why Mobile Phones Are Helpful ……...……....11

2.3.3 WAP Application Architecture……...…….....12

2.3.3.1 Bearers ……...……...…13

2.3.3.2 Application Layer (WAE)……..……...……..13

2.3.3.3 Session Layer (WSP).....…....13

2.3.3.4 Transaction Layer (WTP)……..……..……...…..14

2.3.3.5 Security Layer (WTLS)……..……...…14

2.3.3.6 Transport Layer (WDP)……..……..……14

2.4 Related Works on Mobile Application……..……...……..…15

2.5 Summary……..……..……..……...……19

CHAPTER THREE 3

RESEARCH METHODOLOGY

3.0 Introduction……..20

3.1 Awareness of Problem……..…21

3.2 Suggestion 21

3.3 Development.....22

3.4 Evaluation.....22

3.5 Conclusion.....23

CHAPTER FOUR

ANALYSIS AND RESULT

4.0 Introduction 24

4.1 Analysis 26

4.1.1 Requirements Determination 27

4.2 Functional Requirements.....30

4.2.1 Functional Requirements for Tourists.....30

4. 2.2 Functional Requirements for Administrator.....31

4.3 Uses Case Diagram.....32

4.4 Use Case Description.....33

4.4.1 Use Case Places Details.....33

4.4.2 Use Case Transportation Details.....34

4.4.3 Use Case Hotel Details.....36

4.4.4 Use Case Restaurants Details.....38

4.4.5 Use Case Login.....39

4.4.6 Use Case Manage City.....41

4.4.7 Use Case Manage Details.....43

4.5 Sequence Diagram.....46

4.5.1 View Interesting Places Details Sequence Diagram..46

4.5.2 View Transportation Details Sequence Diagram..48

4.5.3 View Hotel Details Sequence Diagram..50

4.5.4 View Restaurant Details Sequence Diagram..52

4.5.5 Login Sequence Diagram..54

4.5.6 Manage City Details Sequence Diagram ..56

4.5.7 Manage Details Sequence Diagram..58

4.6 Class Diagram ..60

4.7 User Interface..61

4.7.1 Tourists/Welcome Screen..61

4.7.2 Tourists/ View Places..62

4.7.3 Tourists/ View Category..63

4.7.4 Tourists/ View Hotel Details..64

4.7.5 Tourists/ View Restaurant Details..65

4.7.6 Tourists/ View Transportation Details..66

4.7.7 Tourists/ View Interesting Place Details..67

4.7.8 Admin/ Login Page..68

4.7.9 Admin/ Manage Details Page..69

4.7.10 Admin/ Manage Hotel Details..71

4.7.11 Admin/ Manage Restaurant Details..71

4.7.12 Admin/ Manage Transportation Details..72

4.7.13 Admin/ Manage Interesting Place Details..73

CHAPTER FIVE

RESULT DISCUSSION

5.0 Introduction....74

5.1 Use Case Testing....74

5.1.1 Use Test Case for Tourists/ View Places Page....76

5.1.2 Use Test Case for Tourists/ Category Page....77

5.1.3 Use Test Case for Tourists/ View Hotel Details....78

5.1.4 Use Test Case for Tourists/ View Restaurant Details....79

5.1.5 Use Test Case for Tourists/ View Transportation Details....80

5.1.6 Use Test Case for Tourists/ View Interesting Places Details....81

5.2 User Evaluation....82

CHAPTER SIX

CONCLUSION

6.0 Introduction....83

6.1 Recommendations....84

6.2 Limitation....84

6.3 Future work....85

6.4 Conclusion....85

6.5 References....87

List of Figures

Figure 2.1: Web Application Architecture.....12

Figure 2.2: Mobile Guide Framework.....18

Figure 2.3: The Mobile Voting.....19

Figure 3.1: The General Methodology of Design Research 20

Figure 4.1: Use Case Diagram for the Proposed Application 33

Figure 4.2: Use Case View Place Details 34

Figure 4.3: Use Case View Transportation Details 35

Figure 4.4: Use Case View Hotel Details 37

Figure 4.5: Use Case View Restaurants Details 39

Figure 4.6: Use Case Login 40

Figure 4.7: Use Case Manage City 42

Figure 4.8: Use Case Manage Details 44

Figure 4.9: Sequence Diagram View Place Details 47

Figure 4.10: Collaboration Diagram View Place Details 48

Figure 4.11: Sequence Diagram View Transportation Details.....49

Figure 4.12: Collaboration Diagram View Transportation Details.....50

Figure 4.13: Sequence Diagram View Hotel Details.....51

Figure 4.14: Collaboration Diagram View Hotel Details.....52

Figure 4.15: Sequence Diagram View Restaurant Details.....53

Figure 4.16: Collaboration Diagram View Restaurant Details.....54

Figure 4.17: Sequence Diagram Login 55

Figure 4.18: Collaboration Diagram Login 56

Figure 4.19: Sequence Diagram Manage City 57

Figure 4.20: Collaboration Diagram Manage City 58

Figure 4.21: Sequence Diagram Manage Details 59

Figure 4.22: Collaboration Diagram Manage Details 58

Figure 4.23: Class Diagram Mobile Tourists 61

Figure 4.24: Tourists Welcome Screen 62

Figure 4.25: Tourists View Places 63

Figure 4.26: Tourists View Category 64

Figure 4.27: Tourists View Hotel Details 65

Figure 4.28: Tourists View Restaurant Details.....66

Figure 4.29: Tourists View Transportation Details.....67

Figure 4.30: Tourists View Interesting Place Details.....68

Figure 4.31: Admin Login Page.....69

Figure 4.32: Admin Manage Places Page.....70

Figure 4.33: Admin Manage Hotels Page.....71

Figure 4.34: Admin Manage Restaurant Page.....72

Figure 4.34: Admin Manage Transportation Page 72

Figure 4.34: Admin Manage Interesting Place Page.....74

Figure 5.1: Tourists View Places.....77

Figure 5.2: Tourists View Category.....78

Figure 5.3: Tourists View Hotel Details.....79

Figure 4.4: Tourists View Restaurant Details.....80

Figure 4.5: Tourists View Transportation Details.....81

Figure 4.6: Tourists View Interesting Place Details.....82

List of Tables

Table 1.1: Mobile Services Categories.....4

Table 2.1: Facts of Tourism Malaysia Source.....9

Table 5.1: Use Case Test for Tourists - View Places Page 76

Table 5.2: Use Case Test for Tourists Category Page 77

Table 5.3: Use Case Test for Tourists - View Hotel Details 78

Table 5.4: Use Case Test for Tourists - View Restaurant Details.....79

Table 5.5: Use Case Test for Tourists - View Transportation Details.....80

Table 5.6: Use Case Test for Tourists - View Interesting Places Details 81

Chapter One

Introduction

1.0 Introduction

Nowadays, mobile applications can be considered as a new technology that assists users in their daily life. According to the MMA (2009), mobile applications are assumed to be common on most mobile phones today. This is emphasised by the fact that such applications are the key to providing user interfaces for basic telephony and messaging services, as well as for more advanced and entertaining experiences such as playing games, browsing and watching videos on mobile phones. The tracking system application has been used in many organisations and businesses for a long time, as a way of obtaining information from customers or internal staff. Mobile technology has many uses, including the filling up of job application forms, university applications and discovery of tourist attractions (Cheverst, 2000).

Currently, some countries have developed their own mobile application guide system. Through this system, most of the developers believe that it can solve many problems like those related to tourists who can access their required information at anytime and from anywhere.

The contents of the thesis is for internal user only

6.5 REFERENCES

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.

Ashok, J.(2003). *How will life change in the future mobile information? Society, Other Chances for Mobile Applications.*

ARC& WAA (2001). *Privacy is not a Barrier to the Success of Mobile Advertising (survey summary)*. Guildford, Surrey, UK: ARC.

Atanas Rountev, O. V., Miriam Reddoch (2006). *Static control-flow analysis for reverse engineering of UML sequence diagrams*. 31(1): 96 – 102.

Atle Refsdal, K. S. (2008). *Extending UML Sequence Diagrams to Model Trust-dependent Behavior with the Aim to Support Risk Analysis.* 197(2): 15-29.

Baus, J., Cheverst, K., Kray, Ch. (2005). *A Survey of Mapbased Mobile Guides, in Liqiu Meng and Alexander Zipf (eds.): Map-based mobile services. Theories, Methods and Implementations*. Springer, Berlin, Heidelberg, New York,

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

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

Bisdikian C, Christensen J et al (2001). *Enabling location based applications. WMC 01, Rome*. ACM.

Bhavnani, A., Chiu, R., Janakiram, S., Silarszky, P., & Bhatia, D. (2008). *The Role of Mobile Phones in Sustainable Rural Poverty Reduction. ICT policy division global information and communications* department (GICT).

Christoph G., Birgit P., Hannes W., Werner R.& Wieland S. (2008).*Assisting Tourists on the Move An Evaluation of Mobile Tourist Guides*, 7th International Conference on Mobile Business.

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.

Cheverst, K., Davies, N., Mitchell, K., Friday, A., Efstratiou, C. (2000). *Developing a contextaware electronic tourist guide: some issues and experiences. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.* CHI '00. ACM Press.

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.

Eisenhauer, M., Oppermann, R., Schmidt-Belz, B. (2003). Mobile information systems for all. In: Proceedings of the Tenth International Conference on Human-Computer Interaction 2003. pp. 354-358.

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 Networking with WAP.* ISBN: 3-528-03149-2.

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.

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.

Harris, R.W., Bala, P., Songan, P., Khoo E., (2001), *Challenges and Opportunities In Introducing Information and Communication Technologies to the Kelabit Community of North Central Borneo,* New Media and Society, Vol. 3, No. 3.

Hoffer, J. A., George, J. F. & Valacich, J. S. (1999). *Modern Systems Analysis and Design (2nd Edition). Object Oriented System Development,* McGraw-Hill, United States of America.

Imulienski, T., & Badrinath, B. (2001). *Mobile Wireless Computing: Solutions and Challenges in Data Management.*

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

Kray, C., Baus, J. (2003). *A survey of mobile guides. Workshop HCI in mobile guides at Mobile HCI*, Italy.

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

Lin, H. & Wang, Y. (2006). *An examination of the determinants of customer loyalty in mobile commerce contexts, Information & Management*, 43, pp.271–282.

Lieslehto, (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.

Matthias K. et al. (2005). WS-BPEL Extension for People - BPEL4People, 2005.Mobile Marketing Association (2009), Mobile Advertising Overview, e-education, USA New York.

Mobile Application Architecture (2007). Rus Shuler, Enterprise Architect, Retrieved Feb 22, 2009 from http://www.theshulers.com/whitepapers/mobile_architecture/index.html.

Mobile web application architecture (2009). Retrieved Feb 26, 2009 from (http://static.asp.net/asp.net/images/mobile/2514A_01A001.swf).

Norbayah M. & 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

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

Opportunity for developing economies (2008). *Chennai, India, retrieved on 22 Feb 2009,* by TeNeT Group.

Petra Blixt (2005). *Mobile Telephony in Rural India, Stockholm*, Sweden 2005.

Polylab (1998). *WAP Architecture.* Retrieved 5 Feb 2009, from (http://polylab.sfu.ca/spacesystems/teach/wireless/wap/documents/SPECWAPArch 19980430.pdf).

Rubin, J (2004). *Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests*. London: John Wiley & Sons.2004.

Sasidhar (2005). *The effects of mobile devices and wireless Technology on e-learning retrieved* 11 March 2009. From (http://www.sunway.edu.my/others/vol2/sasidhar45.pdf).

Silva, A, & Mateus, G. (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). UML: *The Unified Modeling Language for Interactive Applications. Retrieved from:* http://scholar.google.com/scholar?q=UMLi:%20The%20Unified%20Modeling%20Language%20for%20Interactive%20Applications&hl=en&lr=&oi=scholart.

Schmuller, J. (2002). *SAMS Teach Yourself UML in Hours* . SAMS Publishing, Indiana.

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

WAP Forum (2002). *WAP 2.0 Technical White Paper*. Retrieved April16, 2007 From (http://www.wapforum.org/what/WAPWhite_Paper1.pdf).

World Wide Web Consortium (2003). *The Platform for Privacy Preferences 1.0 (P3P1.0) Specification. W3C Recommendation*. (www.w3c.org/TR/ P3P 26).

Yakasai, R. (2008). Rural Internet Propagation Enhancement (RIPE). A Position Paper to Workshop on Role of Mobile Technologies in Fostering Social Development June 2-3.