M-GOVERNMENT APPLICATION FOR RETRIEVING USERS QUERIES BASED ON WAP TECHNOLOGY IN THE RURAL COMMUNITIES AREA

AHMED DHEYAA BASHA

University Utara Malaysia

2010

M-GOVERNMENT APPLICATION FOR RETRIEVING USERS QUERIES BASED ON WAP TECHNOLOGY IN THE RURAL COMMUNITIES AREA

A Thesis submitted to Faculty of Information Technology in partial fulfillment of the requirements for MSc. (Information Technology)
University Utara Malaysia

Ву

Ahmed Dheyaa Basha (800019)

©Ahmed Dheyaa Basha, 2010. All rights reserved.

Prof Dr Abdul Razak B Yaakub



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)

AHMED DHEYAA BASHA (800019)

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)

M-GOVERNMENT APPLICATION FOR RETRIEVING USERS QUERIES BASED ON WAP TECHNOLOGY IN THE RURAL COMMUNITIES ARES

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): PROF. DR. ABDUL RAZAK YAAKUB

Tandatangan (Signature)

Tarikh (Date)

16/5/2010

PERMISSION TO USE

In presenting this project of the requirements for a Master of Science in Information and Communication Technology (MSc. IT) from University Utara Malaysia, I agree that the University library may make it freely available for inspection. I further agree that permission for copying of this project paper in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or in their absence, by the Dean of Graduate School. It is understood that any copying or publication or use of this project 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 University Utara Malaysia for any scholarly use which may be made of any material from my project paper.

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

Dean of Graduate School
University Utara Malaysia
06010 Sintok

Kedah Darul Aman

Malaysia

ABSTRACT

Today's, mobile applications have brought the different advantages for accessing and sharing information over wireless application protocol (WAP). There are difficulties for accessing and searching information especially in the rural communities. Hence, the study aimed to develop a mobile application for accessing and retrieving user queries over WAP technology. Moreover, the proposed application will provide users in rural communities with their request information about different events, such as (News, clinics, stations, and other events). Furthermore, Application Development Modified Methodology (Charles, 1995) has been used for building the proposed application. Finally, the proposed application has been evaluated and the obtained results have been produces.

ACKNOWLEDGEMENTS

Praise to Allah for his guidance and blessing for giving me the strength and perseverance to complete this project. I would foremost like to thank my parents, for providing me with the opportunity to pursue my goals and for their love and affection, which has helped me through the most trying times. Equal gratitude goes out to my siblings and brothers. I would like to thank my supervisor: "Prof Dr Abdul Razak B Yaakub" for his guidance and constant motivation that has enabled me to complete my project works. Moreover, I would also like to thank his for the opportunities that she has made available to me.

Ahmed Dheyaa Basha / 2010

TABL OF CONTENTS

CHAPTER ONE

INTRODU	CTION	1
Introduc	ction	1
1.2 Prob	olem Statement	4
1.3 Rese	earch Question	4
1.4 Obje	ectives	5
1.5 Scop	oe	5
1.6 Sign	rificant of Study	6
1.7 Chaj	pters structure	7
1.8 Sum	mary	8
CHAPTER	a TWO	
LITERAT	URE REVIEW	9
2.1 Introd	uction	9
2.2 WAP	Definition and Overview	10
2.2.1 The	Rapid Growth of the Mobile Phone	11
	/ernment	
	ed Works	
	nary	
2. 1 Summ	<u>uu</u> y	
CHAPTER	RTHREE	
RESEARC	H METHODOLOGY	20
3.1 Introdu	action	20
3.1.1	Scope of Project	21
3.1.2	Prototype	21
3.1.3	Design	
	A) Logical Design	
• • •	B) Physical Design	
3.1.4	Development	
3.1.5	Test	
3.2 Summ	nary	26

CHAPTER FOUR

SYSTEM ANALYSIS AND DESIGN	27
4.1 Functional Requirements	27
4.2 Non-Functional Requirements	27
4.3 Requirement to Design Mobile Government Application	28
4.4 Use Case Diagram	29
4.5 Use Case Identification	30
4.6 Use Case Specification	30
4.6.1 User/Registration	31
4.6.2 User/Login	
4.6.3 User/Browse	
4.6.4 User/Search	
4.6.5 Admin/ Add Events	
4.7 Sequence Diagram and Collaboration Diagram	35
4.7.1 Add Events Sequence Diagram	36
4.7.2 Registration Sequence Diagram	38
4.7.3 Login Sequence Diagram	40
4.7.4 Browse Events Sequence Diagram	42
4.7.5 Search Sequence Diagram	44
4.8 Development and User Screen.	46
4.8.1 User Home Page	46
4.8.2 User Registration Page.	47
4.8.3 User Login Page	48
4.8.4 User Main Page	49
4.8.5 About us Page	50
4.8.6 User Browse Events Page	51
4.8.7 User Search Page	53
4.8.8 Admin/Add Events Page	54
4.9 Summary	56

CHAPTER FIVE

OBSERVATION AND EVALUATION	
5.1 User Interview	57
5.2 Application Test	58
5.3 Result Discussion	61
5.4 Summary	62
CHAPTER SIX	
CHAFTERSIA	
CONCLUSION	63
6.1 Conclusion of the Study	63
6.2 Study Contribution	63
6.3 Problems and Limitations	
6.4 Future Works	64
REFERENCES	65
Appendix A	

LIST OF FIGURES

Figure 1.1: M-Government Framework6
Figure 2.1: A Scenario of Mobile Social Software on Mesh Network for Cultural Heritage
Communities (Raffaele, at el., 2005)14
Figure 2.2: Zurfer screenshots: Mobile Government Application for Browsing Information
Based Photos Presentation
Figrue 2.3: WAP small user interface among mobile phones
Figure 2.4: Mobile Government course representation
Figure 2.5: M mobile patient data management system using ASP .Net
Figure 3.1: Rapid Application Development Modified Methodology (Charles, 1995)21
Figure 3.2: Tentative design for the proposed m-government application24
Figure 4.1: Use Case Diagram for the proposed Mobile Government Application30
Figure 4.2: Add Events Sequence Diagram
Figure 4.3: Add Events Collaboration Diagram
Figure 4.4: Registration Sequence Diagram
Figure 4.5: Registration Collaboration Diagram
Figure 4.6: Login Sequence Diagram
Figure 4.7: Login Collaboration Diagram
Figure 4.8: Brose Events Sequence Diagram
Figure 4.9: Browse Events Collaboration Diagram
Figure 4.10: Search Sequence Diagram44
Figure 4.11: Search Collaboration Diagram
Figure 4.12: Mobile Government Home Page
Figure 4.13: Mobile Government Registration Page
Figure 4.14: Mobile Government Login Page
Figure 4.15: Mobile Government Main Page
Figure 4.16: About us Page50
Figure 4.17: Browse Events Page51
Figure 4.18: View Events Page52
Figure 4.19: Search event Page53
Figure 4.20: Add Events Page54
Figure 4.21: Insert Event Page55
Figure 5.1: Information Gathering Diagram61
Figure 5.2: Benefit of user Satisfaction

LIST OF TABLES

Table 2.1: Hand phone users by urban and rural sector in Malaysia (MCMC, 2007)		
Table 4.1: List of Hardware and Software Requirements	29	
Table 5.1: Set of Questionnaire Gathered	59	
Table 5.2: The result of the system usability	60	

CHAPTER ONE

INTRODUCTION

1. Introduction

M-Government (from mobile government, also known as m-gov, digital government, and a certain context transformational government) refers to government's use of information technology to exchange information and services with citizens, businesses, and other arms of government (Agarwal, & Tom, 2001). M-Government may be applied by the legislature, judiciary, or administration, in order to improve internal efficiency, the delivery of public services, or processes of democratic governance. The primary delivery models are Government-to-Citizen or Government-to-Customer (G2C), Government-to-Business (G2B) and Government-to-Government (G2G) & Government-to-Employees (G2E) (Krause, & Magedanz, 1998). However, most of the rural communities areas are dispersed in different locations and derived or lag behind urban counterparts, this make it hard for the community to access the digital technologies, and share of the benefits as in urban. Otherwise the rural communities should have access to these facilities through a TeleCenter (TC) and broadband telecommunications infrastructure.

The contents of the thesis is for internal user only

REFERENCE

- Agarwal, P., & Tom, L., (2001). M-Government: The Convergence of Wireless Technologies and e-Government. *Vol 23, p5-6*.
- Atanas Rountev, O. V., Miriam Reddoch (2006). Static control-flow analysis for reverse Engineering of UML sequence diagrams. 31(1): 96 102.
- Albrecht, S., Henning, S. &Oliver, F. (2001). WAP Designing for Small User Interfaces.
- Atle, K. (2008). Extending UML Sequence Diagrams to Model Trust- Dependent Behavior with the Aim to Support Risk Analysis. 197(2): 1529.
- Bennett, S., McRobb, S., & farmer, R. (2002). Object-oriented System Analysis and Design 2nd Edition. UK, McGraw Hill.
- 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).
- Charles, S. (1995). RAD, Finding the Right Hammer, Working Paper 95-07, Babson Hall 323 Babson Park, MA 0257-0310.
- Davis, A. (1993). Software Requirements: Objects, Functions & States. Englewood Cliffs, NJ: Prentice Hall.
- Darrell, B. (2008). Requirements modeling technology a vision for better, faster, and cheaper systems, retrieved on 13 May 2009, from (www.apl.jhu.edu/classes/notes/schappelle/704/requirementsmodeling.pdf).
- 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.
- Harris, R., Bala, P., Songan, P., & Khoo E., (2001). Challenges and Opportunities In Introducing Information and Communication Technologies To The Kelabit Community of North Central orneo, *New Media and Society, Vol. 3, No. 3.*
- Thomas, C., & Ricketts, K. (1998). Webb, Patricia Taylor. Chapel Hill: North Carolina Rural Health Research Program, Cecil G. Sheps Center for Health Services Research, *University of North arolina*. Vol 4. P 13.
- Mcmc.gov (2005). Facts & Figures, Statistics & Records. Retrieved 25 May 2009, from (http://mcmc.gov.my/facts figures/stats/index.asp).

- Parikh, T., & Lazowska, E. (2006). Designing Architecture for Delivering Mobile Information Services to the Rural Developing World. Vol 23, 34-45.
- Requirements Modeling (2008). Retrieved On 11 Jun 2009, from (www.ittc.ku.edu/Projects/rosetta/downloads/barker-viuf00.pdf).
- Kushchu, & Kuscu (2003). Mobile Government (M-Government), retrieved 11 Jun 2009, from (http://topics.developmentgateway.org/egovernment/rc/BrowseContent).
- Krause, S., & Magedanz, T. (1998). Mobile Service Agents enabling "Intelligence on Demand" in Telecommunication. IEEE. 594337.
- Malaysia Communication and Multimedia Commission (2007). Statistical Brief Number Six. Hand phone users survey 2007.
- Laura, B. (2004). An Innovative Approach to E-Government Geo-Based Services on Packet-Switched Mobile Networks. *International Conference on Mobile Services*. Vol 9, 11-67.
- Raffaele, B., Marco, C., & Enrico, G. (2005). Mesh Networks: Commodity Multihop Ad Hoc Networks. *IEEE Communications Magazine*, 43(3):123–131.
- Mor, N., Rahul, N., Vlad, K. (2007). Photos on the Go: A Mobile Application Case Study. Berkeley, CA, USA.
- Frank, K., Torsten, I., Alexander, R., Stefan, S., Michael, W. (2002).WAPcam using a WAP application in student education. Department of Multimedia Computing University of Ulm, Germany. SIGGROUP Bulletin August 2002/Vol 20, No.2
- Kadri, N., Mat, Raha, M., & Mohd, N.(2007). Development of a mobile patient data management system using ASP .Net. IFMBE Proceedings Vol. 14/1.
- Polylab (1998). WAP Architecture. Retrieved Jan, 3, 2009, from (http://polylab.sfu.ca/spacesystems/teach/wireless/wap/. PDF).
- WAP, (2008), Wireless Application Protocol, retrieved on 12 Sep 2008, (http://en.wikipedia.org/wiki/Wireless Application_Protocol).
- Hulberts, S.J. C. (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.html.

- Jagoe, A. (2003). Mobile Location Services: The Definitive Guid. Upper Saddle River, New Jersey: Pearson Education Inc.
- Kendall, A. (1996). Introduction to Systems Analysis and Design: A Structured Approach, Irwin, Times Mirror Higher Education Group, USA.
- WAP Forum (2002). WAP 2.0 Technical White Paper. Retrieved April16, 2007 from http://www.wapforum.org/what/WAPWhite Paper1.pdf.
- Nielsen, J. & Landauer, T. (2001). A Mathematical Model of The Finding of Usability problems. In ACM Interchi'93. Netherlands: Amsterdam.
- Elalfy E. (2005). A General Look at Building Applications for Mobile Devices. Distributed Systems Online, IEEE, 6(9), 1-3. Retrieved Dec 30, 2008 from: http://csdl2.computer.org/comp/mags/ds/2005/09/09005.pdf.
- Kray, C., Baus, J. (2003). A survey of mobile guides. Workshop HCI in mobile guides Mobile HCI, Italy.
- Petra, B. (2005). Mobile Telephony in Rural India, Stockholm, Sweden 2005.
- Raffaele, B., Marco, C., & Enrico, G., (2005). Mesh Networks: Commodity Multihop Ad Hoc Networks. IEEE Communications Magazine, 43(3):123–131, March 2005.
- Schmuller, J. (2002). SAMS teach your self UML in Hours. SAMS Publishing, Indiana.
- Eriksson, H., & Penker, M. (1998). UML Toolkit. USA, John Wiley & Sons, Inc.
- Hoffer, J. A., George, J. F & Valacich, J. S. (2002). Modern Systems Analysis and Design (3rd Edition). Upper Saddle River, New Jersey: Prentice Hall.
- Hoffer, J. A., George, J. F & Valacich, J. S. (1999). Modern Systems Analysis and Design (2nd Edition). United Kingdom: Addison Wesley Longman.
- 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.