

**REQUIREMENTS FOR REDESIGNING THE
INTERFACE OF IRAQI E-GOVERNMENT
PORTAL**

HAYDER SABAH ABDULWAHID

**MASTER OF SCIENCE
UNIVERSITI UTARA MALAYSIA**

2015

REQUIREMENTS FOR REDESIGNING THE INTERFACE OF IRAQI E-GOVERNMENT PORTAL

Thesis submitted to Dean of Awang Had Salleh Graduate School in

Partial Fulfillment of the requirement for the degree

Master of Science in Information Technology

Universiti Utara Malaysia

HAYDER SABAH ABDULWAHID

© Hayder Sabah Abdulwahid. All rights reserved. 2015

Permission to Use

In presenting this thesis in fulfilment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the Universiti Library may make it freely available for inspection. I further agree that permission for the 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 Awang Had Salleh Graduate School of Arts and Sciences. 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 Awang Had Salleh Graduate School

College of Arts and Sciences

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman

Malaysia

Abstrak

Kebanyakan negara telah menyediakan perkhidmatan kerajaan secara atas talian. Namun, Iraq masih mencari peluang baru menuju ke arah perkhidmatan atas talian tersebut. Inisiatif bagi menceburi perkhidmatan kerajaan atas talian atau disebut kerajaan elektronik (e-kerajaan) tidak menunjukkan hasil yang memuaskan. Walaupun e-kerajaan telah tersedia, pelanggan masih memilih kaedah tradisional, atau memasuki sistem atas talian melalui laluan yang tidak diiktiraf. Melalui cara tersebut, pelanggan dianggap tidak menggunakan portal e-kerajaan. Beberapa faktor telah dikenalpasti sebagai pengaruh kepada kelemahan portal e-government sedia ada; di mana reka bentuk paparan hadapan bagi portal adalah salah satu dari faktor yang menyebabkan pengguna tidak tertarik untuk melayari portal melalui laluan yang sempurna, iaitu melalui muka hadapan yang diiktiraf dan selamat. Sebaliknya, pengguna terus mencapai modul yang diinginkan melalui laluan pintas. Dengan itu, kajian ini menyimpulkan bahawa tahap 'mudah' rekabentuk interaksi pada paparan muka hadapan portal e-kerajaan sedia ada adalah lemah dan tidak menyokong pengalaman pengguna. Usaha menjawab persoalan-persoalan tersebut memerlukan kajian ini mencadangkan satu set elemen bagi portal e-kerajaan Iraq bagi memastikan ia diterima baik sebagai berguna dan mudah digunakan. Kajian ini menamakan prototaip yang menerapkan elemen yang diperoleh dan disyorkan sebagai Iraqi e-government portal (Ie-gP). Sehubungan itu, matlamat kajian ini adalah ditetapkan untuk mengusulkan satu set elemen yang membuatkan Ie-gP berguna dari persepsi pengguna. Bagi menyempurnakan matlamat tersebut, tiga objektif telah dirangka: (1) menentukan elemen antara muka bagi halaman hadapan (front office) Ie-gP, (2) untuk mereka bentuk dan membangunkan front office bagi Ie-gP, dan (3) untuk menilai tahap kebergunaan dan mudah menggunakan front office Ie-gP. Analisis perbandingan, pembangunan prototaip, dan kajian eksperimental telah dijalankan bagi mencapai matlamat kajian. Dapatan umum menunjukkan bahawa Ie-gP telah mendapat persepsi yang baik dari pengguna terhadap aspek kebergunaan dan tahap mudah untuk digunakan. Justeru, sumbangan kajian yang utama adalah elemen yang menjadikan front office bagi Ie-gP mendapat persepsi yang baik dari pengguna dan prototaip yang dibangunkan.

Abstract

Many countries have provided their government services to the people online. However, Iraq is still looking for opportunities to implement the online technology for their government services. The initiatives to venture into online government services, or called electronic government (e-government) have not shown good return. Although the e-government is available, people still prefer to work on traditional way, or enter into the e-government modules through improper channels. Hence, they are viewed as not using the e-government portal. Many factors were identified influencing the disadvantages of the existing e-government portal; nevertheless the design of the front office is not making users attracted to enter into the portal through the proper home page. In contrast, the users tend to go directly to the module they intend to. Hence, his study deduces that the user interface of the front office of the portal was not usable, not supporting user experience. This study proposes a set of elements for the Iraqi e-government portal to ensure that it is perceived usable in terms of usefulness and ease-of-use. This study develops the prototype that incorporates the elements as Iraqi e-government portal (Ie-gP). Therefore, the aim of the study is to propose a set of elements that make the Ie-gP usable from users' perception. To accomplish that, three specific objectives are formulated: (1) to determine the interface elements for the front office of Ie-gP, (2) to design and develop the front office of Ie-gP, and (3) to evaluate the ease-of-use of the front office of Ie-gP. Comparative analysis, prototyping, and experimental studies are used to accomplish the objectives and aim. General findings show that Ie-gP is perceived useful and easy-to-use. The main contributions of this study are the elements of usable e-government portals for Iraqi context and the prototype of the usable portal called Ie-gP.

Acknowledgment

In the Name of Allah, the Most Gracious and Most Merciful

First and foremost, all praise to Allah for providing me with the strength, perseverance, and wisdom to have this work done on time.

I would like express my deepest gratitude to my supervisor, **Dr. Ariffin Abdul Mutalib** for his intellectual guidance and kind support given to me during the period of this study.

I would like to thank to the Coordinator **Dr. Norliza Katuk** who helped me through the discussion, and for her support for me to accomplish this work.

Deepest appreciation and heartfelt thankful goes to my Evaluators, **Dr. Azham Hussain**, and **Dr. Rohaida Binti Romli** who supported me throughout my research process with their vital support and knowledge.

I want to express my gratitude and dedicate this thesis to my father, who is my best friend **Sabah Abdulwahid Abdulrazaq**. He encourages me and expresses confidence in my abilities to complete my study.

I want to express gratitude and dedicate this thesis to my mother **Iman Ibrahem Mohammad**. She has supported and is continuously praying for me during my studies. And I pray to Allah to keep her.

I am also grateful to my brothers (**Krar, Mustafa and Murtatha**) for their help and contributions, too many moments of insight, inspiration and support throughout my study.

I dedicate this thesis to my wife **Suhad Jaffar Ali** and my son (**Hasan**) who unremittingly supported me during my years of study. They made this work possible.

I want to special express gratitude and dedicate this thesis to my Uncle **Falah Abdulwahid** and His wife **Haifa Abdulkareem**. They encouraged accomplishing my study.

I am deeply grateful to my family (all my aunts and uncles) for their love and support during my Master studies. I truly could not have achieved this milestone without their support . and I thankful my grandmother for her pray to me and grateful to my uncle and my best friend **Ali Abdulwahid** .

I am also grateful to my sister (**Alaa Mostafa** and **Remah Ghanim**) for their help and contributions too many moments of insight, inspiration and support throughout my study.

Lastly, I express my deepest thanks to Ministry of Science and Technology in Iraq (MOST) for help and support me and giving necessary advices and guidance and arranged all facilities to make my study (Master Information and Technology) easier.

I say thank you to the staffs of Information and Communication Technology, College of Arts and Science, University Utara Malaysia and those that contributed indirectly towards the success of my studies

THANK YOU UUM

HAYDER SABAH ABDULWAHID

JANUARY 2015

Table of Contents

Permission to Use	ii
Abstrak	iii
Abstract	iv
Acknowledgment	v
List of Tables	xi
List of Figures	xiii
List of Abbreviations	xv
List of Appendices	xvii
CHAPTER ONE: INTRODUCTION	1
1.1 Introduction	1
1.1.1 E-government	1
1.1.2 Front Office	1
1.1.3 Portal	2
1.1.4 Background of Iraqi E-government	2
1.1.5 ICT in Iraq	3
1.2 Problem Statement	3
1.3 Research Questions	8
1.4 Research Objectives	8
1.5 Significance of Research	8
1.6 Research Scope	9
1.7 Organization of the Thesis	9
CHAPTER TWO: LITERATURE REVIEW	11
2.1 Introduction	11
2.2 The Use of the Internet in Iraq	11
2.3 E-government	12
2.4 Technology for E-government	13
2.5 The Current State of E-government	14
2.6 Front Office System	14
2.7 Front Office Architecture	19
2.8 E-government Portal	20
2.9 Existing Portals	22
2.9.1 Malaysia EG Portal	23

2.9.2 Punjab and Portal of E-government (SUWIDHA)	25
2.9.3 The E-government Dubai Portal.....	25
2.9.4 Korea Portal.....	27
2.9.5 Haryana Portal (in India)	29
2.9.6 The Proposed Architecture for Jordan E-government Portal	30
2.9.7 Iraqi Portal	31
2.10 Strength and Weakness of the Portals	33
2.11 Common Features for a Portal	36
2.12 Summary.....	40
CHAPTER THREE: RESEARCH METHODOLOGY	41
3.1 Introduction.....	41
3.2 Research Procedure.....	41
3.2.1 Awareness of Problem.....	44
3.2.2 Suggestions	44
3.2.3 Development.....	45
3.2.4 Evaluation.....	46
3.3 Procedure.....	47
3.4 Instrumentation	47
3.5 Sampling.....	49
3.6 Data Collection and Analysis.....	49
3.7 Validity.....	49
3.8 Reliability.....	50
3.9 Summary.....	50
CHAPTER FOUR: ANALYSIS AND COMPARISON	51
4.1 Introduction.....	51
4.2 Analysis of the Portals	51
4.2.1 The Korea Portal.....	52
4.2.2 The Malaysia E-government Portal.....	54
4.2.3 The Punjab portal.....	58
4.2.4 The Dubai Portal.....	61
4.2.5 The Haryana Portal	64
4.2.6 The Jordan Portal.....	67
4.3 Basis on the Analysis	69
4.4 Website Evaluation Tool	70

4.5 Using Website Diagnostic Tools	71
4.6 Comparative Analysis of the Features in the Previous Models	72
4.7 Summary.....	74
CHAPTER FIVE: ANALYSIS AND DESIGN	75
5.1 Introduction.....	75
5.2 Requirement for the Ie-gP.....	75
5.2.1 Non-Functional Requirement	75
5.2.2 Functional Requirement	77
5.3 Modeling and Portal Design	79
5.3.1 Use Case Diagram	80
5.3.2 Sequence Diagram.....	85
5.4 Prototype Development	87
5.4.1 The Main Page.....	87
5.4.2 Registration Page.....	89
5.4.3 Feedback Page	89
5.4.4 Control Panel Page	90
5.4.5 View Information and Links.....	90
5.4.6 Login Section.....	91
5.5 Data Base Design.....	91
5.6 Summary.....	92
CHAPTER SIX: EVALUATION.....	93
6.1 Introduction.....	93
6.2 Evaluation Procedure	93
6.2.1 Feature Test	93
6.2.2 Functionality Test.....	94
6.2.3 User Usability Test	94
6.3 Validation.....	94
6.4 Results.....	95
6.4.1 Results of Feature Test	95
6.4.2 Results of Functionality Test.....	98
6.4.3 Results of User Usability Test.....	99
6.5 Reliability for Easy of Use and Usefulness	113
6.6 Comparison Between the Existing Portal and the Ie-gP	114
6.7 Summary.....	116

CHAPTER SEVEN: CONCLUSION	117
7.1 Introduction.....	117
7.2 Objectives Achievement	117
7.3 Limitations and Recommendations for Future Studies.....	119
7.4 The Context.....	120
7.5 Summary.....	121
REFERENCES.....	122
APPENDICES.....	129
Appendix A.....	130
Appendix B.....	132
Appendix C.....	135
Appendix D.....	151
Appendix E	155

List of Tables

Table 1.1: List of Questions.....	4
Table 2.1: Justifications for Selecting the Portals.....	22
Table 2.2: The Main Element to Evaluate the Web Portal.....	25
Table 2.3: The Strong and Weak Points in Many Web Portal.....	33
Table 3.1: Prototype Development Environment.....	46
Table 3.2: Items of Features.....	48
Table 4.1: The Scaling.....	51
Table 4.2: Comparison between the Previous Models.....	70
Table 4.3: Details about the Portals.....	71
Table 4.4: That lists all the Portals with the Elements and the Rate.....	73
Table 5.1: Non-Functional Requirement.....	76
Table 5.2: Functional Requirements for the Ie-gP.....	78
Table 6.1: Results of Features Test.....	96
Table 6.2: Login Functionality	98
Table 6.3: Gender.....	100
Table 6.4: Age.....	101
Table 6.5: Level of Education.....	102
Table 6.6: Perceived usefulness – Question 1.....	103
Table 6.7: Question 2.....	104
Table 6.8: Question 3.....	104
Table 6.9: Question 4.....	105
Table 6.10: Question 5.....	105
Table 6.11: Question 6.....	106
Table 6.12: Question 7.....	106
Table 6.13: Question 8.....	107
Table 6.14: Question 9.....	107
Table 6.15: Question 10.....	108
Table 6.16: Question 11.....	109
Table 6.17: Question 12.....	109
Table 6.18: Question 13.....	110
Table 6.19: Question 14.....	110
Table 6.20: Question 15.....	111

Table 6.21: Question 16.....	112
Table 6.22: Descriptive Statistics.....	113
Table 6.23: Reliability Result.....	114
Table 6.24: Compare between Existing Portal and Ie-gP.....	114

List of Figures

Figure 1.1: Analysis the Result of Preliminary Study, 2014.....	5
Figure 1.2: The Average of Result for Preliminary Study, 2014.....	5
Figure 1.3: Preliminary study – low access to Iraqi portal	7
Figure 2.1: Internet Usage Factors (Heshmati, Al-Hammadany & Ashraf, 2013).....	12
Figure 2.2: One-Stop Center E-government to Access all Kinds of Public Services	14
Figure 2.3: The UK E-government Evolution Model	16
Figure 2.4: The Architecture of the Front Office (Qing Chen, 2010).....	19
Figure 2.5: Relationship Among Citizen, Business and Government (Halal,2010)...	21
Figure 2.6: Functions In E-government Portal In Malaysia.....	24
Figure 2.7: E-government Portal o Dubai (Al-Zuabi & Mahmud, 2011).....	27
Figure 2.8: E-government Portal of Jordan.....	31
Figure 2.9: E-government Portal of Iraq 2014.....	32
Figure 2.10: The Factors Effect to Use Portal (Wangpiptwong Et At., 2008).....	35
Figure 2.11: Common Feature for Evaluation Portal	37
Figure 3.1: The Research Procedure.....	43
Figure 4.1: The Home Page for Korea Portal.....	52
Figure 4.2: The Strengths and Weaknesses of The Portal	54
Figure 4.3: The Malaysian Portal.....	55
Figure 4.4: The Rating for Malaysian Portal.....	58
Figure 4.5: The Rating for The Punjab Portal.....	60
Figure 4.6: The Punjab Portal.....	61
Figure 4.7: Home Page for Dubai Portal.....	61
Figure 4.8: The Scores for the Dubai Portal.....	64
Figure 4.9: The Haryana Home Page.....	65
Figure 4.10: Scores for Haryana Portal.....	67
Figure 4.11: The Jordan Portal.....	68
Figure 4.12: Scores for Jordan Portal.....	69
Figure 5.1: Use Case Diagram for Ie-gP.....	81
Figure 5.2: Sequence Diagram for Register and Login	86
Figure 5.3: Sequence Diagram for Managing the Ie-gP.....	86
Figure 5.4: Sequence Diagram for The Staff Mange the Information.....	87

Figure 5.5: The Ie-gP In Arabic.....	88
Figure 5.6: The Ie-gP In English.....	88
Figure 5.7: Registration Page.....	89
Figure 5.8: Feedback Page.....	89
Figure 5.9: Control Panel Page.....	90
Figure 5.10: View Information Page.....	90
Figure 5.11: Login.....	91
Figure 5.12: The Database of Ie-gP.....	91
Figure 6.1: Gender Distribution.....	100
Figure 6.2: Graph for Age Distribution.....	101
Figure 6.3: Respondents Education Level.....	102

List of Abbreviations

Ie-gP	Iraqi E-government Portal
ICT	Information and Communications Technology
IT	Information Technology
GIP	Government Information Portal
E-SERVICES	Electronic Services
MOU	Memorandum of Understanding
MOI	Ministry of Interior
MMPW	Ministry of Municipalities and Public Works
UN	United Nations
MMS	Multimedia Messaging Service
3G	Third Generation
GPRS	General Packet Radio Service
G2C	Government-To-Citizen
G2G	Government-To- Government
G2B	Government-To-Business
G2E	Government-To-Staff
EG	E-Government
UML	Unified Modelling Language
GUL	Graphic User Interface
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
UTF-8	Unicode From Universal Character Set + Transformation Format -8 Bit
MB	Megabyte
DIT	Department of Information Technology

HTML	Hypertext Mark-up Language
IEEE	Institute of Electrical and Electronics Engineers
AVI	Audio Video Interleaved

List of Appendices

Appendix A: Preliminary Study 2014

Appendix B: Feature Test

Appendix C: Functionality Test

Appendix D: Usability Test

Appendix E: Use Case Details

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter explains the e-government in general and the services provided through the Internet. It also provides the definitions of front office of e-government portal. Besides, it discusses the background and current state of e-government portal in Iraq.

1.1.1 E-government

E-government has become one of the essential foundations in recent modern society (Alfawwaz, 2011). It represents an important part in economic, social, and political development of the country (Al-Taie & Kadry, 2013). As part of Information and Communication Technology (ICT) infrastructure, it assists in knowing the aspiration of the government as well as offering various services (Al-Khafaji, Shittuline & Osman, 2012). This allows various transactions to be available online, which is referred to as e-government. The e-government portal is composed of two parts, front and back office; particularly, the front office serves the clients, while the back office functions to deal with records (Durickovic & Kovacevic, 2011).

1.1.2 Front Office

The front office, as it connects the system and the users need to be user-friendly. It should support users' tasks at its best, well-tailored to the needs of the users, appropriate to the context of use and the environment, as well as be aesthetic to the users (Sharp, Rogers & Preece, 2007). Based on that, it should serve as an online service center and citizen engagement tool at the same time (Abdulwahida, Mutalib, Affendi, Yusof & Alib, 2014; Cook, 2000; Thomas & Streib, 2003).

The contents of
the thesis is for
internal user
only

REFERENCES

- Abdulwahida, H. S., Mutaliba, A. A., Yusofa, S. A. M., & Alib, S. J. (2014). Designing and implementation Iraqi e-government front office online system. *Journal of Knowledge Management, Economics and Information Technology*, 4(1.1).
- Al Athmay, (2013). E-Governance in Arab Countries: Status and Challenges. *Global Journal of Business Research*, 7(5), 79–98.
- Al-Dabbagh, M. (2011). *Electronic Government in Iraq: Challenges of development and implementation*. Swedish Business School, Örebro University available <http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A447880&dswid=-2248>
- Alfawwaz, B. M. (2011). Evaluation of eGovernment Websites Usability in Jordan. Ph. D. Theses, Brunel University, 2012. Available: Brunel University Research Archive (BBURA) <http://bura.brunel.ac.uk/handle/2438/6155>
- Alghamedi, Ahmad, A. (2011). Designing an Appointment Management System for the Mother and Child Health Department of the Klinik Kesihatan Changlun (Doctoral Dissertation, Universiti Utara Malaysia).
- Al-Hammadany, F. H., & Heshmati, A. (2011). Determinants of Internet use in Iraq. *International Journal of Communication*, 5, 23.
- Al-Khafaji, N. J., Shittuline, A. J. K., & Osman, W. R. B. S. (2012). The effect of resistance to change in the application of e-Government in Iraq. *2012 Tenth International Conference on ICT and Knowledge Engineering*, 99–103.
- Al-Taie, M. Z., & Kadry, S. (2013). E-Government: Latest Trend and Future Perspective The Iraq Case. <http://www.academia.edu/3517507>.
- Al-Zuabi, H., & Mahmud, M. (2011). Implementation of e-Government in Arab countries: A literature review. In *Research and Innovation in Information Systems (ICRIIS), 2011 International Conference on* (pp. 1–5).
- Alorfi, A. S. M., (2012). *Web Based Online Volunteer Trainer System (Ovtrs)*. (Masters Thesis, Universiti Utara Malaysia).
- Alzughoul, M. A. H. (2010). Usability Evaluation of Web-based Online Airline Booking System. (Master Thesis, Universiti Utara Malaysia).
- Ansah, A. K., Blankson, V. S., & Kontoh, M. (2012). The Use of Information and Communication Technologies (ICT) in Front Office Operations of Chain Hotels in Ghana, 3(3), 72–77.

- Ariffin, A. M. (2009). *Conceptual design of reality learning media (RLM) model based on entertaining and fun constructs*. (Doctoral Dissertation , Universiti Utara Malaysia).
- Basa & Bringula (2011). Factors affecting faculty web portal usability. *Educational Technology & Society*, vol. 14 , no. 4, p. 253–265.
- Billon, M., Marco, R., & Lera-Lopez, F. (2009). Disparities in ICT adoption: A multidimensional approach to study the cross-country digital divide. *Telecommunications Policy*, 33(10), 596–610.
- Bennett, S., McRobb, S., & Farmer, R. (2002). *Object-oriented System Analysis and Design* (2nd ed.). UK: McGraw Hill.
- Chander, S. (2012). Performance Analysis using metrics of two e- government Portal services, 1(4), 32–40.
- Chen, Q. (2010). Content-Oriented E-Government Information Portal Architecture and Strategies. In *E-Business and E-Government (ICEE), 2010 International Conference on* (pp. 468–471).
- Choudrie, J., Ghinea, G., & Weerakkody, V. (2004). Evaluating global e-government sites: A view using web diagnostics tools. *Electronic Journal of E-Government*, 2(2), 105–114.
- Chung, L., & do Prado Leite, J. C. S. (2009). On non-functional requirements in software engineering. In *Conceptual modeling: Foundations and applications* (pp. 363–379). Springer.
- Coakes, S. J., & Steed, L. (2009). *SPSS: Analysis without anguish using SPSS version 14.0 for Windows*. John Wiley & Sons, Inc.
- Committee, I. & Board, I.-S. S. (1998). IEEE Recommended Practice for Software Requirements Specifications. The Institute of Electrical and Electronics Engineers, IEEE Std. 830-1998.
- Conallen, J. (2002). *Building Web applications with UML*. Addison-Wesley Longman Publishing Co., Inc.
- Cook, M. E. (2000). *What Citizens Want From E-Government*, Center for Technology in Government, University at Albany; (518)442-4598 .
- Daradkeh, M. M. M. (2010). *Development of Online Advertising System for Supporting Training Course (DOASFSTC)*. (Masters thesis, Universiti Utara Malaysia).
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319–340.

- Dennis, A., Wixom, B. H., & Tegarden, D. (2005). System analysis and design with UML version 2.0: an object-oriented approach with UML(2nd ed.). Hoboken, NJ: John Wiley and Sons, Inc.
- Dix, A. (2009). Human-computer interaction (pp. 1327-1331). Springer US.
- Dominic, P. D. D., Jati, H., Sellappan, P., & Nee, G. K. (2011). A comparison of Asian e-government websites quality: using a non-parametric test. *International Journal of Business Information Systems*, 7(2), 220.
- Dubai Portal (2014), Dubai e-government portal available <http://dubai.ae/en>.
- Durickovic, T., & Kovacevic, D. (2011). eGovernment in the context of developing countries. In *MIPRO, 2011 Proceedings of the 34th International Convention* (pp. 1370–1375).
- Dominic, P. D. D., Jati, H., Sellappan, P., & Nee, G. K. (2011). A comparison of Asian e-government websites quality: using a non-parametric test. *International Journal of Business Information Systems*, 7(2), 220.
- Evans, D., & Yen, D. C. (2006). E-Government: Evolving relationship of citizens and government, domestic, and international development. *Government Information Quarterly*, 23(2), 207–235.
- Gant, J. P., & Gant, D. B. (2002). Web portal functionality and State government E-service 1, 00(c), 1–10.
- Haidar, G. G., & Bakar, A. Z. A. (2012). E-Government Success In Malaysia Through Government Portal And Website Assessment. *International Journal of Computer Science Issues (IJCSI)*, 9(5).
- Hair, J. F., Tatham, R. L., Anderson, R. E., & Black, W. (2006). *Multivariate data analysis* (Vol. 6). Pearson Prentice Hall Upper Saddle River, New Jersey: Pearson Education Inc.
- Harfoushi, O., AlFawwaz, B., Obiedat, R., Faris, H., & Al-Sayyed, R. (2012). Usability Assessment of the Government Web Services in the Hashemite Kingdom of Jordan. *Journal of American Science*, 8(12).
- Heshmati, A., Al-hammadany, F. H., & Bany-mohammed, A. (2013). Analysis of Internet Usage Intensity in Iraq : An Ordered Logit Model, *III*(3), 1–21.
- Heshmati, A., Al-Hammadany, F. H., & Bany-Mohammed, A. (2013). Analysis of Internet Usage Intensity in Iraq: An Ordered Logit Model. *Journal of Knowledge Management, Economics and Information Technology*, 3(3).

- İdikat, Tuğba,, 2004 “ *Evaluation Of Readiness Of Turkey For E-Government*”, JSTOR Public Administration Review, Vol.62, No.4 Site of Victoria University Institutional Repository.
- Iraqi Portal (2014), Official Iraqi e-governmet portal avialble www.egov.gov.iq/egov.
- Järveläinen, J. (2007). Online purchase intentions: an empirical testing of a multiple-theory model. *Journal of Organizational Computing and Electronic Commerce*, 17(1), 53–74.
- Jaeger, P. T., & Bertot, J. C. (2010). Designing, implementing, and evaluating user-centered and citizen-centered e-government. *International Journal of Electronic Government Research (IJEGR)*, 6(2), 1–17.
- Jiang, X. (2011). Enhancing Users' Continuance Intention to E-Government Portals: An Empirical Study. In Management and Service Science (MASS), 2011 International Conference on (pp. 1-4).
- Jordan Portal (2014) , official Jordan e-government portal available www.jordan.gov.jo/.
- Kakbra, J. F., & Sidqi, H. M. (2013, March). Measuring the Impact of ICT and E-learning on Higher Education System With Redesigning and Adapting System in Kurdistan Region Government, KRG-Iraq. In Proceedings of the 2nd e-learning Regional Conference–State of Kuwait (Vol. 1, p. 13).
- Kettani, D., & Mahdi, A. E. I. (2009). Implementing e-government accessible to illiterate citizens. In Information and Communication Technologies and Development (ICTD), 2009 International Conference on (pp. 486-486).
- Kern, J., & Garrett, C. (2003). Effective sequence diagram generation. *Borrand White Paper*. (www.borland.com/together/white_papers).
- Khan, M. Z., Miankhel, A. K., & Nawaz, A. (2012). Diminishing Digital Divide: Dynamics and Implications. *Acta Universitatis Danubius. Communicatio*,6(2). AUDC, Vol 6, no 2, pp. 143-156.
- Khasawneh, R. T., & Abu-shanab, E. A. (2013). E-Government and Social Media Sites : The Role and Impact, 1(1), 10–17.
- Krishnan, H., & Samuel, P. (2010). Relative Extraction Methodology for class diagram generation using dependency graph. In *Communication Control and Computing Technologies (ICCCCT)*, 2010 IEEE International Conference on (pp. 815–820).
- Khasawneh, R. T., & Abu-shanab, E. A. (2013). E-Government and Social Media Sites : The Role and Impact, 1(1), 10–17.
- Korea portal (2014), official Korean e-government portal available <http://korea.go.kr>.

- Lallana, E. C. (2004). eGovernment for Development. mGovernment Definitions and ModelsPage. Retrieved September, from <http://www.egov4dev.org/mgovdefn.htm>.
- Lect, A., & Hasan, H. (2010). E-Government in Iraq, 14(4), 183–198.
- Lee, S., & Cho, J. E. (2007a). Usability evaluation of Korean e-government portal. In *Universal Access in Human-Computer Interaction. Applications and Services* (pp. 64–72). Springer.
- Liddle, D. (1996). Design of the conceptual model. In T. Winograd (ed.), *Bringing design to software*. Addison-Wesley, Reading, MA. 17-31.
- Li, L. (2011). Portal websites evaluation of Heilongjiang municipal-scale e-government in China. In *E-Business and E-Government (ICEE), 2011 International Conference on* (pp. 1–4).
- Magoutas, B., & Mentzas, G. (2009). Adaptive Evaluation of Portal Quality: An eGovernment Case. *2009 13th Panhellenic Conference on Informatics*, 136–140.
- Maheshwari, B., Kumar, V., Kumar, U., & Sharan, V. (2007). E-government portal effectiveness: managerial considerations for design and development. *Proceedings of International Congress of e-Governance*, Hyderabad, pp. 258-269.
- Mahmud, M., Hussin, A. R. C., Othman, N. K., & Dahlan, H. M. (2010). Evaluating heuristic for EG portal design model. In *Information Technology (ITSim), 2010 International Symposium in* (Vol. 3, pp. 1555–1560).
- Mayhew, D. J. (1999). The usability engineering lifecycle. In *CHI'99 Extended Abstracts on Human Factors in Computing Systems* (pp. 147–148).
- Moon, M. J. (2002). The Evolution of E-Government among Municipalities: Rhetoric or Reality? *Public Administration Review*, 62(4), 424–433.
- Moonier, K. R. (2012). *The Relationship of Job Satisfaction and Human Resource Factors Towards Employees of Permodalan Nasional Berhad*. (Master Theses Universiti Utara Malaysia).
- Muhsen, Z. A. (2011). *Developing an Online Student Accommodation Registration in UUM*. (Masters Thesis, Universiti Utara Malaysia).
- Nielsen, J. (1994). Heuristic evaluation. *Usability Inspection Methods*, 17(1), 25–62.
- Omari, H. A. (2006). E-government architecture in Jordan: a comparative analysis. *Journal of Computer Science*, 2(11), 846.
- Othman, M., & Ramasamy, A. (2013). Citizen Identification System Of Iraq : Challenges And Barriers In Enabling E-Government Services, (125), 399–404.

- Petrie, H., & Bevan, N. (2009). The evaluation of accessibility, usability and user experience. *The Universal Access Handbook*, 10–20.
- Punjab portal (2014) Available at <http://www.punjab.gov.pk>.
- Preece, J., Rogers, Y., & Sharp, H. (2007). Interaction Design: beyond human-computer interaction 2nd edition. John Wiley& Sons, Ltd. England.
- Sabah, H. (2014). Mission of Women in The Scope of E-government in Iraq. *Journal of Knowledge Management, Economics and Information Technology*, 4(1).
- Saldhana, A. (2007). Secure E-Government Portals -Building a web of trust and convenience for global citizens. W3C Workshop on e-Gov and the Web, National Academy of Sciences, Washington DC.
- Salih, A. K. (2012). *Design Web-Based of Hajj Registration System for Iraq*. (Master Thesis Universiti Utara Malaysia).
- Sarwer, D. B., Crawford, I., & Durlak, J. A. (1997). The relationship between childhood sexual abuse and adult male sexual dysfunction. *Child Abuse & Neglect*, 21(7), 649–655.
- Shareef, S. M., Jahankhani, H., & Dastbaz, M. (2012). E-Government Stage Model: Based on citizen-centric approach in regional government in developing countries. *International Journal of Electronic Commerce Studies*, 3(1), 145–164.
- Sharp, H., Rogers, Y., & Preece, J. (2007). Interaction Design: beyond human-computer interaction 2nd edition. John Wiley& Sons, Ltd. England .
- Sethi, N., & Sethi, V. (2008). E-government implementation: a case study of Dubai e-government. E-Government in Practice. Nanyang Technological University, Singapore. Retrieved from: http://www.iceg.net/2008/books/3/22_185-195.pdf.
- Song, H. J. (2006). E-Government in Developing countries: Lessons learned from Republic of Korea. *Bankok: UNESCO Bankok*.
- Szeróvay, K. (2011). Usability Of E-Government Websites, Evaluation Of The Hungarian E-Government Portal. *Proceedings of COFOLA 2011*.
- Teoh, K. K., Ong, T. S., Lim, P. W., Liong, R. P. Y., & Yap, C. Y. (2009). Explorations on web usability. *American Journal of Applied Sciences*, 6(3), 424.
- Thomas, J. C., & Streib, G. (2003). The New Face of Government: Citizen-Initiated Contacts in the Era of E-Government. *Journal of Public Administration Research and Theory*, 13(1), 83–102.
- Thompson, K. M., McClure, C. R., & Jaeger, P. T. (2003). Evaluating federal websites: Improving e-government for the people. *Computers in Society: Privacy, Ethics, and the Internet*, 400–412.

- UN Global E-Government Survey (2010). Leveraging e-government at a time of financial and economic crisis, United Nations Department of Economic and Social Affairs/Division for Public Administration and Development Management at: <http://www.un.unpan.org/dpag/>.
- UN Global E-Government Survey (2012). Leveraging e-government at a time of financial and economic crisis, United Nations Department of Economic and Social Affairs/Division for Public Administration and Development Management at: <http://www.un.unpan.org/dpag/>.
- UN, United Nations E-Government Survey 2014: E-Government for the People. New York : United Nations, 2014.
- Vaishnavi, V. K., & Kuechler Jr, W. (2007). *Design science research methods and patterns: innovating information and communication technology*. CRC Press.
- Von Alan, R. H., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 28(1), 75–105.
- Wangpipatwong, S., Chutimaskul, W., & Papasratorn, B. (2008). Understanding Citizen ' s Continuance Intention to Use e- Government Website : a Composite View of Technology Acceptance Model and Computer Self-Efficacy, 6(1), 55–64.
- West, D. (2007). “Global E-Government, 2007”, Providence: Centre for Public Policy, Brown University <http://www.insidepolitics.org/egovt02int.html> (Accessed 12 November 2004).
- Wickens, C. D., Gordon, S. E., & Liu, Y. (1998). An introduction to human factors engineering. Addison-Wesley Educational Publishers Inc. USA. An introduction to human factors engineering.
- Wimmer, M. A. (2003). E-Government services in future. In *short abstract for the JANUS workshop, 17th February*.
- Wiegers, K., E. (2003). Software Requirements 2: Practical techniques for gathering and managing requirements throughout the product development cycle (2nd ed.). Washington, USA: Microsoft Press.