

The copyright © of this thesis belongs to its rightful author and/or other copyright owner. Copies can be accessed and downloaded for non-commercial or learning purposes without any charge and permission. The thesis cannot be reproduced or quoted as a whole without the permission from its rightful owner. No alteration or changes in format is allowed without permission from its rightful owner.



**FACTORS INFLUENCING CLOUD COMPUTING ADOPTION IN
YEMEN HIGHER EDUCATION INSTITUTIONS**



**DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
2019**



Awang Had Salleh
Graduate School
of Arts And Sciences

Universiti Utara Malaysia

PERAKUAN KERJA TESIS / DISERTASI
(*Certification of thesis / dissertation*)

Kami, yang bertandatangan, memperakukan bahawa
(We, the undersigned, certify that)

ABDULLAH HUSSEIN ALI AL-GHUSHAMI

calon untuk Ijazah
(candidate for the degree of)

PhD

telah mengemukakan tesis / disertasi yang bertajuk:
(has presented his/her thesis / dissertation of the following title):

"FACTORS INFLUENCING CLOUD COMPUTING ADOPTION IN YEMEN'S HIGHER EDUCATION INSTITUTIONS"

seperti yang tercatat di muka surat tajuk dan kulit tesis / disertasi.
(as it appears on the title page and front cover of the thesis / dissertation).

Bahawa tesis/disertasi tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan, sebagaimana yang ditunjukkan oleh calon dalam ujian lisan yang diadakan pada : **19 November 2018**.

*That the said thesis/dissertation is acceptable in form and content and displays a satisfactory knowledge of the field of study as demonstrated by the candidate through an oral examination held on:
November 19, 2018.*

Pengerusi Viva:
(Chairman for VIVA)

Prof. Dr. Ku Ruhana Ku Mahamud

Tandatangan
(Signature)

Pemeriksa Luar:
(External Examiner)

Assoc. Prof. Dr. Abd Rahman Ahlan

Tandatangan
(Signature)

Pemeriksa Dalam:
(Internal Examiner)

Dr. Rahayu Ahmad

Tandatangan
(Signature)

Nama Penyelia/Penyelia-penyalia: Dr. Nur Haryani Zakaria
(Name of Supervisor/Supervisors)

Tandatangan
(Signature)

Nama Penyelia/Penyelia-penyalia: Dr. Zahurin Mat Aji @ Alon
(Name of Supervisor/Supervisors)

Tandatangan
(Signature)

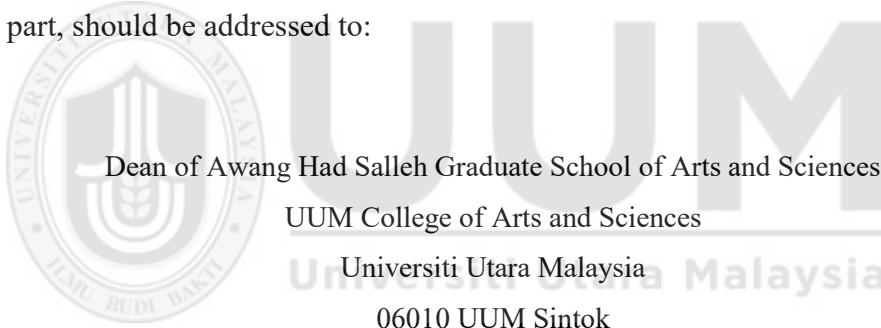
Tarikh:

(Date) **November 19, 2018**

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:



Abstrak

Teknologi-berasaskan awan, yang kini semakin mantap, mampu mengurangkan kos, dan menyediakan kebolehcapaian, kebolehpercayaan, serta fleksibiliti. Walau bagaimanapun, sistem pendidikan tinggi Yaman belum lagi menerima pengkomputeran awan kerana keselamatan dan kebimbangan privasi, kekurangan kepercayaan, sikap budaya negatif (iaitu tribalisme), dan yang paling penting, kurang pengalaman peranti digital dalam persekitaran pendidikan serta kekurangan pengetahuan dan pengetahuan teknikal. Oleh itu, kajian ini mencadangkan model konsepsual penerimaan penkomputeran awan (CC) di institusi pengajian tinggi (IPT) Yaman dengan menyiasat pengaruh faktor Teknologi, Organisasi dan Persekutaran (TOE). Selain itu, kajian ini menyiasat kesan moderasi budaya kabilah dalam hubungan antara faktor yang telah dikenalpasti dan penggunaan CC. Kajian ini telah menggunakan kedua-dua pendekatan kualitatif dan kuantitatif. Kajian awal melalui temu ramah separa berstruktur ke atas sepuluh (10) orang peserta dalam kalangan pihak pengurusan atasan IPT bagi menambahbaik dan mengesahkan model yang dicadangkan. Pendekatan kuantitatif telah diguna pakai untuk menentukan faktor yang mempengaruhi penggunaan CC menerusi kajian selidik. Data yang terkumpul daripada 328 responden yang mewakili 38 IPT telah dianalisis menggunakan Partial Least Squares-Structural Equation Modeling (PLS-SEM). Dapatan menunjukkan faktor kelebihan relatif, kebolehgantungan, keserasian, keselamatan, kesediaan teknologi, sokongan pihak pengurusan, penyeliaan polisi, dan tekanan kompetitif memberi kesan positif yang signifikan ke atas penggunaan CC. Walaubagaimanapun, budaya kabilah mempunyai kesan negatif yang signifikan ke atas penerimaan CC. Kajian ini juga mendapati bahawa faktor budaya kabilah memoderasikan hubungan antara keserasian, kebolehgantungan, keselamatan, kelebihan relatif, penyeliaan polisi, dan penerimaan CC. Kajian ini menyumbang kepada penggunaan model TOE dengan memasukkan faktor budaya sebagai moderator untuk faktor lain yang mempengaruhi penerimaan CCA di IPT Yaman. Kajian ini juga menyediakan model dan perspektif kepada IPT, perunding teknologi, vendor, dan penggubal polisi dalam meningkatkan kefahaman terhadap faktor yang mempengaruhi penerimaan CC di negara kurang membangun (LDCs), terutamanya, Yaman.

Kata Kunci: Penerimaan Pengkomputeran Awan (CC), Model Teknologi, Organizasi, dan Persekutaran (TOE), Structural Equation Modelling (SEM), Institusi pengajian tinggi (IPT), Negara kurang membangun (LDCs).

Abstract

Cloud-based technology, which is now well established, helps reducing costs and providing accessibility, reliability and flexibility. However, the Yemen Higher educational system has not yet embraced cloud computing due to security and privacy concerns, lack of trust, negative cultural attitudes (i.e. tribalism), and most importantly, little digital devices experience in educational settings as well as lack of knowledge and technical know-how. Thus, this study proposes a conceptual model of cloud computing (CC) adoption in Yemen HEIs by investigating the influence of Technology, Organization and Environment (TOE) factors. In addition, this study investigates the moderating effect of tribalism culture in the relationships between the identified factors and CC adoption. The study employed both qualitative and quantitative approaches. A preliminary study through semi-structured interviews with ten (10) participants from top management of HEIs to refine and confirm the proposed model. The quantitative approach was used to determine the factors that influence CC adoption in Yemen HEIs through a questionnaire survey. Data were collected from 328 respondents in 38 HEIs and analyzed using Partial Least Square (PLS) Structural Equation Modelling (SEM). The results showed that relative advantage, reliability, compatibility, security, technology readiness, top management support, regulatory policy and competitive pressure have a positive significant impact on CC adoption. However, tribalism culture has a negative significant impact towards CC adoption. The study also found that tribalism culture moderates the relationship between compatibility, reliability, security, relative advantage, regulatory policy and CC adoption. This study contributes to TOE model adoption by including the cultural factor as a moderator towards CC adoption in Yemen HEIs. The study also provides a model and insights for HEIs, technology consultants, vendors and policy makers in better understanding of the factors that influence CC adoption in least developed countries (LDCs), specifically, Yemen.

Keywords: Cloud Computing (CC) adoption, Technology, Organization and Environment (TOE) model, Structural Equation Modelling (SEM), Higher Education Institutions (HEIs), Least Developed Countries (LDCs).

Acknowledgements

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

First and foremost, all praise and thanks go to Allah for giving me the strength and patience to accomplish this study. Besides, completing this thesis would not have been possible without a number of people who offered their unfailing support throughout the period of the study.

I would like to express my sincerest thanks and deepest gratitude to my supervisors Dr. Nur Haryani Zakaria and Dr. Zahurin binti Mat Aji for their excellent guidance, caring, patience, encouragement and sharing of all their research experience throughout these challenging years.

My sincere thanks must also go to the members of the viva oral examination committee: Dr. Rahayu Binti Ahmad and Assoc. Prof. Dr. Abdrahman Alhan as the examiners for sharing their constructive advice and comments to improve my thesis; and Prof. Dr. Ku Ruhana Ku Mahamud as the chairperson.

I would like to extend my thanks to the Ministry of Higher Education Yemen for providing funds and opportunity to conduct this study. My sincere appreciation also goes to the staff of the Yemeni universities for their kind support and comments. I would also like to thank the knowledge and domain experts who provided their insights on this study; their fruitful comments and suggestions were of the utmost importance for my study.

On a more personal level, I would like to express my gratitude to my parents and my beloved family members for their continuous prayers, patience and support throughout my four years plus of difficult endeavour. My gratitude also goes to all my colleagues on the PhD journey, especially for the discussions and suggestions on better ways to perform my study.

Table of Contents

| | |
|---|-----------|
| Permission to Use | i |
| Abstrak..... | ii |
| Abstract..... | iii |
| Acknowledgements..... | iv |
| Table of Contents..... | v |
| List of Tables | x |
| List of Figures..... | xii |
| List of Appendices | xiii |
| List of Abbreviations | xiv |
| CHAPTER ONE INTRODUCTION | 1 |
| 1.1 Overview..... | 1 |
| 1.2 Background | 1 |
| 1.3 Problem Statement..... | 6 |
| 1.4 Research Questions | 11 |
| 1.5 Research Objectives..... | 11 |
| 1.6 Scope..... | 11 |
| 1.7 Significance..... | 13 |
| 1.8 Thesis Organisation | 15 |
| CHAPTER TWO LITERATURE REVIEW | 16 |
| 2.1 Introduction..... | 16 |
| 2.2 Cloud Computing Technology..... | 16 |
| 2.3 Characteristics of Cloud Computing..... | 18 |
| 2.4 Cloud Technology in the Educational Sector | 19 |
| 2.4.1 Cloud Computing's Advantages and Limitations..... | 19 |
| 2.4.2 Cloud Computing Service Providers for Educational Purposes | 22 |
| 2.4.3 Cloud Computing for Education in Developing and Developed Countries | 27 |
| 2.4.4 Potential Benefits of Cloud Computing in HEIs in Least Developed Countries..... | 32 |
| 2.5 Related Theories on Technology Adoption | 35 |
| 2.5.1 Theory of Planned Behaviour | 37 |

| | |
|--|-----------|
| 2.5.2 Technology Acceptance Model | 39 |
| 2.5.3 Unified Theory of Acceptance and Use of Technology | 40 |
| 2.5.4 Institutional Theory..... | 41 |
| 2.5.5 Diffusion of Innovation | 42 |
| 2.5.6 Technology-Organization-Environment Framework | 44 |
| 2.6 The TOE Framework and its application..... | 45 |
| 2.7 Related Work on Cloud Computing Factors..... | 50 |
| 2.7.1 Technological Context..... | 50 |
| 2.7.2 Organizational Context | 56 |
| 2.7.3 Environmental Context..... | 59 |
| 2.8 Culture..... | 62 |
| 2.8.1 Tribalism in Yemen | 69 |
| 2.9 Summary | 72 |
| CHAPTER THREE RESEARCH METHODOLOGY | 74 |
| 3.1 Introduction..... | 74 |
| 3.2 Research Approach | 74 |
| 3.3 Research Design..... | 75 |
| 3.3.1 Literature Review Analysis | 78 |
| 3.3.2 Preliminary Study | 78 |
| 3.3.2.1 Semi-Structured Interviews..... | 79 |
| 3.3.2.2 Semi-Structured Interview Analysis | 83 |
| 3.3.2.3 Confirmatory CCA factors | 104 |
| 3.4 Development of the Conceptual Model | 106 |
| 3.4.1 Hypothesis Development..... | 108 |
| 3.4.2 Operational Definitions..... | 110 |
| 3.4.3 Instrument Development..... | 111 |
| 3.4.4 Content Validity..... | 117 |
| 3.4.5 Pre-testing the questionnaire..... | 118 |
| 3.4.6 Face validity..... | 120 |
| 3.5 Pilot study | 121 |
| 3.5.1 Statistical validity of the questionnaire..... | 123 |

| | |
|--|------------|
| 3.5.2 Reliability test..... | 123 |
| 3.6 Data Collection | 124 |
| 3.7 Data Analysis | 126 |
| 3.8 Summary | 129 |
| CHAPTER FOUR ANALYSIS AND RESULTS..... | 130 |
| 4.1 Introduction..... | 130 |
| 4.2 Response Rate..... | 130 |
| 4.3 Data Screening and Preliminary Analysis | 131 |
| 4.3.1 Missing Values | 132 |
| 4.3.2 Test of Normality..... | 133 |
| 4.3.3 Multicollinearity Test | 134 |
| 4.4 Demographic Profile of the Respondents | 136 |
| 4.5 Assessment of Measurement Model | 139 |
| 4.5.1 Individual Item Reliability..... | 140 |
| 4.5.2 Internal Consistency Reliability..... | 140 |
| 4.5.3 Convergent Validity..... | 142 |
| 4.5.4 Discriminant Validity | 142 |
| 4.6 Assessment of the Structural Model | 146 |
| 4.6.1 Assessment of Variance Explained in the Dependent Variable | 149 |
| 4.6.2 Effect Size (f^2) | 150 |
| 4.6.3 Cross-validated redundancy..... | 151 |
| 4.7 Testing the Moderating Effects..... | 152 |
| 4.7.1 Compatibility | 153 |
| 4.7.2 Relative advantage | 154 |
| 4.7.3 Reliability..... | 155 |
| 4.7.4 Security | 156 |
| 4.7.5 Regulatory Policy | 157 |
| 4.8 Summary of findings..... | 158 |
| 4.9 Summary | 159 |
| CHAPTER FIVE DISCUSSION AND CONCLUSION | 160 |
| 5.1 Introduction..... | 160 |

| | |
|--|-----|
| 5.2 Discussion of Direct Hypothesis..... | 160 |
| 5.2.1 Relative advantage on CCA..... | 162 |
| 5.2.2 Compatibility and CCA | 164 |
| 5.2.3 Security and CCA | 165 |
| 5.2.4 Reliability and CCA..... | 167 |
| 5.2.5 Top management support and CCA..... | 169 |
| 5.2.6 Technology readiness | 171 |
| 5.2.7 Regulatory Policy and CCA | 172 |
| 5.2.8 Competitive Pressure and CCA | 174 |
| 5.2.9 Culture and CCA | 175 |
| 5.3 Discussion of the Moderating Effects of Culture | 180 |
| 5.3.1 The Moderating Effect of Culture on the Relationship Between Relative Advantage and CCA..... | 180 |
| 5.3.2 The Moderating Effect of Culture on The Relationship Between Compatibility and CCA..... | 182 |
| 5.3.3 The Moderating Effect of Culture on The Relationship Between Security and CCA | 183 |
| 5.3.4 The Moderating Effect of Culture on The Relationship Between Reliability and CCA | 185 |
| 5.3.5 The Moderating Effect of Culture on the Relationship Between Top Management Support and CCA..... | 186 |
| 5.3.6 The Moderating Effect of Culture on The Relationship Between Technology Readiness and CCA..... | 187 |
| 5.3.7 The Moderating Effect of Culture on The Relationship Between Regulatory Policy and CCA | 188 |
| 5.3.8 The Moderating Effect of Culture on the Relationship Between Competitive Pressure and CCA..... | 190 |
| 5.4 Research Contributions..... | 191 |
| 5.4.1 Theoretical contributions | 192 |
| 5.4.2 Practical contributions | 195 |
| 5.5 Research Limitations | 201 |
| 5.6 Future work..... | 201 |

| | |
|------------------------|------------|
| REFERENCES..... | 204 |
|------------------------|------------|



List of Tables

| | |
|---|-----|
| Table 2.1 Characteristics of Cloud Computing (Plummer et al., 2009; Mell and Grance, 2011)..... | 18 |
| Table 2.2 Benefits and Limitations of Cloud Computing in Higher Education Institutions..... | 21 |
| Table 2.3 Some of the Leading Cloud Services Used in Higher Education | 27 |
| Table 2.4 Related IS Theories and Models..... | 36 |
| Table 2.5 Some Examples of Studies That Use The TOE Model | 47 |
| Table 3.1 List of Research Hypothesis Development..... | 109 |
| Table 3.2 List of Research Hypotheses..... | 109 |
| Table 3.3 Definition of Operational Variables | 110 |
| Table 3.4 Measurement Items for Technology Factors (Predictor Variables)..... | 112 |
| Table 3.5 Items for Organisational Factors..... | 113 |
| Table 3.6 Items for Environmental Factors | 114 |
| Table 3.7 Measurement Items for Cloud Computing Adoption * Dependent Variable | 116 |
| Table 3.8 Questionnaire pre-test modification..... | 119 |
| Table 3.9 Results of the Face Validity..... | 120 |
| Table 4.1 Response Rate of the Questionnaire | 131 |
| Table 4.2 Total and Percentage of Missing Values | 132 |
| Table 4.3 Correlation Matrix of the Exogenous Latent Constructs | 134 |
| Table 4.4 Tolerance and Variance Inflation Factors (VIF)..... | 135 |
| Table 4.5 Demographic Characteristics of the Respondents | 136 |
| Table 4.6 Institutional Characteristics | 137 |
| Table 4.7 Item Loadings, Average Variance Extracted and Composite Reliability.. | 141 |
| Table 4.8 Latent Variable Correlations and Square Roots of Average Variance Extracted | 144 |
| Table 4.9 Cross Loading | 144 |
| Table 4.10 Structural Model Assessment with all values | 147 |
| Table 4.11 Variance Explained in the Dependent Variable..... | 150 |
| Table 4.12 Effect Size of Predictive Variables..... | 151 |

| | |
|---|-----|
| Table 4.13 Values of Predictive Relevance Q2 for the Dependent Variables of Model | |
| | 152 |
| Table 4.14 Summary of Hypotheses Testing..... | 158 |



List of Figures

| | |
|---|-----|
| <i>Figure 2.1.</i> Cloud Computing definition based on NIST (Mell & Grance, 2011)..... | 17 |
| <i>Figure 2.2.</i> Representation on the Council of Higher Education in Yemen Universities (Muthanna, 2011)..... | 33 |
| <i>Figure 2.3.</i> TOE Framework (DePietro, Wiarda and Fleischer (1990). | 46 |
| <i>Figure 3.1.</i> The Research Design..... | 76 |
| <i>Figure 3.2</i> The Conceptual Model..... | 107 |
| <i>Figure 3.3.</i> The Two Steps Process of PLS Path Model Assessment..... | 128 |
| <i>Figure 4.1</i> Measurement Model | 139 |
| <i>Figure 4.2.</i> Structural Model (Full Mode). | 146 |
| <i>Figure 4.3.</i> Interaction Effect of compatibility (COM) and culture (CUL) on cloud computing adoption (CCA)..... | 154 |
| <i>Figure 4.4.</i> Interaction Effect of relative advantage (RA) and culture (CUL) on cloud computing adoption (CCA)..... | 155 |
| <i>Figure 4.5</i> Interaction Effect reliability (REL) and culture (CUL) on cloud computing adoption (CCA)..... | 156 |
| <i>Figure 4.6.</i> Interaction Effect of security (SEC) and culture (CUL) on cloud computing adoption (CCA)..... | 157 |
| <i>Figure 4.7.</i> Interaction Effect of regulatory policy (RP) and culture (CUL) on cloud computing adoption (CCA)..... | 158 |

List of Appendices

| | |
|--|-----|
| Appendix A The interview Questions in English and Arabic..... | 238 |
| Appendix B The Questionnaire English Version (Instrument)..... | 240 |
| Appendix C The Questionnaire Arabic Version..... | 248 |
| Appendix D The Pilot Study Validity Test..... | 255 |
| Appendix E The Pilot Study Reliability Test | 257 |
| Appendix F The List of Higher Education Institutions in Yemen..... | 258 |
| Appendix G The Variables Normality Test Result..... | 259 |
| Appendix H Publications | 261 |



List of Abbreviations

| | |
|-------|--|
| AVE | Average Variance Extracted |
| CC | Cloud Computing |
| CCA | Cloud Computing Adoption |
| CIOs | Chief Information Officers |
| COM | Compatibility |
| CP | Competitive Pressure |
| CR | Composite Reliability |
| CTO | Chief Technical Officers |
| CUL | Culture |
| DC | Data Centre |
| DOI | Diffusion of Innovation |
| DV | Dependent Variable |
| ERP | Enterprise Resource Planning |
| GNI | Gross National Income |
| H | Hypothesis |
| HEIs | Higher Education Institutions |
| IaaS | Infrastructure as a Service |
| ICT | Information Communication Technology |
| IDC | International Data Corporation |
| IS | Information System |
| IT | Information Technology |
| ITA | International Trade Administration |
| NIST | National Institute of Standards and Technology |
| PaaS | Platform as a Service |
| PLS | Partial Least Squares |
| RA | Relative Advantage |
| REL | Reliability |
| RP | Regulatory Policy |
| SaaS | Software as a Service |
| SEC | Security |
| SEM | Structure Equation Modelling |
| SME | Small, Medium Enterprises |
| SPSS | Statistical Package for Social Science |
| TAM | Technology Acceptance Model |
| TMS | Top Management System |
| TOE | Technology Organization Environment |
| TPB | Theory of Planned Behaviour |
| TR | Technology Readiness |
| UN | United Nation |
| US | United States |
| UTAUT | Unified Theory of Acceptance and Use of Technology |
| VIF | Variance Inflation Factors |

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter introduces the study, starting with the background and then discussing the problem statement. The research questions are presented and used to formulate the objectives. The scope and significance of the research are explained, and the chapter concludes with an overview of the remaining chapters of this thesis.

1.2 Background

Cloud computing (CC) has been named by proponents of innovation as the fifth necessary utility, after water, electricity, oil or gas, and telephone (Monroy, Arias, & Guerrero, 2013; Sabi, Uzoka, Langmia, & Njeh, 2016). Sabi et al. (2016) consider CC as a pervasive computing paradigm that has revolutionised the delivery of information technology (IT) infrastructure and services. Other researchers such as Monroy et al. (2013) also emphasise the trend for cloud computing being investigated from the perspective of innovation, applications, costs, advantages, and security based on the organisational level within small and medium enterprises (SMEs) and higher education institutions (HEIs).

The National Institute of Standards and Technology (NIST) defines cloud computing as,

“a model for empowering helpful, on-demand network access to a shared pool of configurable computing assets and resources (e.g. network systems, servers, storage,

The contents of
the thesis is for
internal user
only

REFERENCES

- Abaa, K. (2012). Cloud Computing Adoption - Large Enterprises in India. *Journal of India*, 19 (3), 487–517.
- Abdalla, S. (2012). *An e-government adoption framework for developing countries: A case study from Sudan*. PhD Thesis. Cranfield University: UK. Retrieved from <http://dspace.lib.cranfield.ac.uk/handle/1826/7314>.
- Abdulrab, S. (2011). *The impact of culture on information technology adoption in universities*. PhD Thesis. Robert Morris University. Moon Township, PA, USA. ProQuest Dissertations and Theses.
- Abrahamson, E., & Rosenkopf, L. (1993). Institutional and Competitive Bandwagons: Using Mathematical Modeling as a Tool to Explore Innovation Diffusion. *The Academy of Management Review*, 18 (3), 487–517. <http://northumbria.summon.serialssolutions.com>.
- Agarwal, R., & Prasad, J. (1997). The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies. *Decision Sciences*, 28(3), 557–582.
- Agarwal, R., & Prasad, J. (1998). A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology. *Information Systems Research*, 9(2), 204–215.
- Ahronovitz, et al. [about 30 authors] (2010). *Cloud Computing Use Cases*, A White Paper of National Institute of Standards and Technology, July 2010.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Al Awadhi, S., & Morris. A. (2009). Factors influencing the adoption of e-government services. *Journal of Software*, 4 (6), 584–590.
- Alabbadi, M. M. (2011). Cloud computing for education and learning: education and learning as a service (ELaaS). In: *14th International Conference on Interactive Collaborative Learning*, 589–594.
- Alam, S. S., Ali, M. Y., & Jani, M. F. M. (2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. *J. Bus. Econ. Manage*, 12, 375–399.
- AlAwadhi, S. & Morris, A. (2009). Factors influencing the adoption of e-government services. *Journal of Software*, 4, 584–590.

- Albugmi, A., Allassafi, M. O., Walters, R. J., & Wills, G. B.)2016). Data Security in Cloud Computing, In, *Fifth Int. Conf. Futur. Gener. Commun. Technol. (FGCT 2016)*, Luton, GB, 17 - 19 Aug 2016, 55–59.
- Albugmi, A., Wills, G., & Walters, R. (2016). A framework for cloud computing adoption by Saudi Government overseas agencies. In *Fifth International Conference on Future Generation Communication Technologies (FGCT), 2016*. IEEE. ([doi:10.1109/FGCT.2016.7605063](https://doi.org/10.1109/FGCT.2016.7605063)).
- Al-Dawsari, N. (2012). Tribal Governance and Stability in Yemen. *The Carnegie Papers, Carnegie Endowment for International Peace*.
- Aldrich, A. W. (2010). Universities and libraries move to the mobile web. *EDUCAUSE*
- Al-Gahtani, S. S., Hubona, G. S., & Wang, J. (2007). Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management*, 44(8), 681-691.
- Al-Ghaith, W., Sanzogni, L., & Sandhu, K. (2010). Factors influencing the adoption and usage of online services in Saudi Arabia. *EJISDC: The Electronic Journal on Information Systems in Developing Countries*, 40 (1).671-681.
- Alhujran, O. (2009). *Determinants of e-government services adoption in developing countries: A field survey and a case study*. School of Information Systems and Technology, Faculty of Informatics, University of Wollongong.
- Al-Huneiti, R. (2014). *Towards a new framework for education and training in developing countries*. Brunel University School of Engineering and Design PhD Theses.
- Aljenaa, E., Al-Anzi, F., & Alshayeqi, M. (2011). *Towards an efficient e-learning system based on cloud computing*. In the *Proceedings of the Second Kuwait Conference on e-Systems and e-Services*. (April 05-07, 2011). Kuwait City, Kuwait. Retrieved from the ACM (Association for Computing Machinery) Digital Library at <http://dl.acm.org/citation.cfm?id=2107556>
- Aljenaa, E., Al-Anzi, F., & Alshayeqi, M. (2011). Towards an efficient e-learning system based on cloud computing. In the *Proceedings of the Second Kuwait Conference on e-Services and e-Systems*.
- Alkabsi, A. (2014). Yemen cloud computing market poised to grow quickly evolving into a premium model. *Al-thawara News*.
- Alkhater, N., Wills, G., & Walters, R. (2014). Factors influencing an organisation's intention to adopt cloud computing in Saudi Arabia. *2014 IEEE 6th International Conference on Cloud Computing Technology and Science (CloudCom) pp. 1040-1044.*

- Alkhater, N., Wills, G., & Walters, R. (2014). Factors influencing an organisation's intention to adopt cloud computing in Saudi Arabia. *IEEE 6th International Conference on Cloud Computing Technology and Science (CloudCom)*, pp. 1040-1044.
- Allen, D., & Kern, T. (2002). ERP Critical Success Factors: An exploration of the contextual factors in public sector institutions, pp.1–10.
- Allen, D., Kern, T., & Havenhand, M. (2002). ERP critical success factors: an exploration of the contextual factors in public sector institutions. In System Sciences, *HICSS Proceedings of the 35th Annual Hawaii International Conference*, pp. 3062–3071.
- Alsaif, M. (2013). Factors Affecting citizens' adoption of e-government moderated by socio-cultural values in Saudi Arabia. *Proceedings of the European Conference on E-Government*.
- Alsanea, M. (2015). *Factors Affecting the Adoption of Cloud Computing in Saudi Arabia's Government Sector*. Ph.D. Dissertation. University of London.
- Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26 (3), 250-275.
- Alshwaier, F., Alshwaier, A., & Areshy, A. (2012). *Applications of cloud computing in education*. Paper presented at the 8th International Conference on Computing and Networking Technology (ICCNT), 2012.
- Alshwaier, A. (2012). A new trend for e-learning in KSA using educational clouds. *Advanced Computing*, 3(1), 81-97.
- Al-Sukkar, A. S. (2005). *The application of information systems in the Jordanian banking sector: a study of the acceptance of the internet*. University of Wollongong Thesis.
- Altameem, T. A. (2007). *The critical factors of e-government adoption: An empirical study in the Saudi Arabia public sectors*. Brunel University.
- Al-Zoube, M., Abou El-Seoud, S., & Wyne, M. F. (2010). Cloud computing based e-learning system. *International Journal of Distance Education Technologies (IJDET)*, 8(2), 58-71.
- Alzougool, B., & Kurnia, S. (2010). Towards a better understanding of SMEs' perception of electronic commerce technology adoption. *Interdisciplinary Journal of Contemporary Research in Business*, 2(3), 9–37.
- Anderson, J., & Rainie, L. (2010). *The Future of Cloud Computing*, A White paper publication of Pew Internet & American Life Project, Retrieved from: <http://pewinternet.org/Reports/2010/The-future-of-Cloud-computing.aspx>.

- Annukka, V. (2008). Organisational factors affecting IT innovation adoption in the early child-hood education. *European conference on Information Systems*, Galway, Ireland.
- Armbrust, M., Fox, A., Griffith, R., Joseph, A., Katz, R., Konwinski, A., Lee, G., Patterson, D., Rabkin, A., Stoica, I., & Zaharia, M. (2010). A view of cloud computing. *Communications of the ACM*, 53(4), 50–58.
- Armstrong, J. S., & Yokum, J.T. (2001). Potential Diffusion of Expert Systems in Forecasting. *Technological Forecasting & Social Change*, 67(1), 93–103.
- Atieno, O. P. (2009). An analysis of the strengths and limitation of qualitative and quantitative research paradigms. *Problems of Education in the 21st Century*, 13(1), 13-38.
- Azadegan, A., & Teich, J. (2010). Effective benchmarking of innovation adoptions: a theoretical framework for e-procurement technologies, *Benchmarking: Int. J.* 17, 472–490.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models, *Journal of the Academy of Marketing Science*, 16(1), 74–94. doi: 10.1007/BF02723327.
- Baabbad. M. (2015). The Influence of Tribalism on Perceived Auditor Independence: The Yemeni Evidence. 12 (2):17-25.
- Baggaley, J., & Belawati, T. (2007). “Distance Education Technology in Asia. Lahore: Virtual University of Pakistan.”
- Baker, J. (2011). *The Technology – Organization – Environment Framework*, in Dwivedi, Y., Wade, M. and Schneberger, S. (eds.) *Information Systems Theory: Explaining and Predicting Our Digital Society*. New York: Springer.
- Baker, S. (2007). Google and the wisdom of clouds. *Business Week*, Dec, 13. Retrieved from www.businessweek.com/magaizne/content/07_52/b4064048925836.htm.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Barriball, K. L., & While, A. (1994). Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing*, 19(2), 328–335. JOUR. <http://doi.org/10.1111/j.1365-2648.1994.tb01088.x>
- Bay & Murugan (2010). Factors that determine the adoption of cloud computing: a global Perspective. *International Journal of Enterprise Information Systems*, 6(4), 55.

- Beatty, R.C., Shim, J.P., & Jones, M.C. (2001). Factors influencing corporate web site adoption: a time-based assessment. *Information & management*, 38(6), 337–354.
- Behrend, T.S. et al. (2011). Cloud computing adoption and usage in community colleges. *Behaviour & Information Technology*, 30(2), 231–240. [Accessed February 27, 2013].
- Benlian, A., & Hess, T. (2011). Opportunities and risks of software-as-a-service: Findings from a survey of IT executives, *Decision Support System*, 52, 232–246
- Berman, S., Kesterson-Townes, A., & Marchal, A. (2012). How cloud computing enables process and business model innovation. *Strategy and Leadership*, 40(4), 27-35.
- Bernius, S., & Krönung, J. (2012). Fostering academic research by cloud computing: The users' perspective. *ECIS 2012 Proceedings* (Paper 181). Retrieved from: <http://aisel.aisnet.org/ecis2012/181>
- Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, 24(1), 169–196.
- Bishop, M. (2003). *Computer Security: Art and science*. Boston: Addison-Wesley.
- Bishop, M. (2012). *Computer Security: Art and Science*. Boston: Addison-Wesley.
- Blue, E., & Tirotta, R. (2011). The benefits & drawbacks of integrating: Cloud computing and interactive whiteboards in teacher preparation. *TechTrends*, 55(3), 31-38.
- Borgman, H. P., Bahli, B., Heier, H., & Schewski, F. (2013). Cloudrise: Exploring cloud computing adoption and governance with the TOE framework. In the *Proceedings of the 46th Hawaii International Conference on System Sciences*, pp. 4425-4435. Retrieved from the ACM (Association for Computing Machinery) Digital Library at <http://dl.acm.org/citation.cfm?id=2471101&CFID=882367696&CFTOKEN=61176678>.
- Bose, R., & Luo, X. (2011). Integrative framework for assessing firms' potential to undertake green IT initiatives via virtualization—A theoretical perspective. *The Journal of Strategic Information Systems*, 20(1), 38-54.
- Bradford, M., & Florin, J. (2003). Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems. *International Journal of Accounting Information Systems*, 4(3), 205–225.

- Brender, N., & Markov, I. (2013). Risk perception and risk management in cloud computing: Results from a case study of Swiss companies. *International Journal of Information Management*, 33(5), 726-733.
- Brian, O., Brunschwiler, T., Dill, H., Christ, H., Falsafi, B., Fischer, M., & Gutmann, R. (2013). *Cloud computing*. Swiss Academy of Engineering Sciences. Retrieved from www.satw.ch.
- Brown, D., & Lockett, N. (2004). Potential of critical e-applications for engaging SMEs in e-business: a provider perspective. *European Journal of Information Systems* 13(1), 21-34.
- Bryman, A., & Bell, E. (2007). *Business Research Methods*, 2nd edn, Oxford University Press: Oxford.
- Bulmer, M. G. (1979). *Principles of statistics TT -, TA -*. New York: Dover.
- Burgess, J. (2015). Is Saudi Arabia a developed country? Quora. Retrieved from <https://www.quora.com/Could-Saudi-Arabia-be-called-a-developed-country-Why-or-why-not>)
- Buyya, R., Yeo, C. S., Venugopal, S., Broberg, J., & Brandic, I. (2009). Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility. *Future Generation Computer Systems*, 25, 599-616.
- Carroll, M., Van Der Merwe, A., & Kotze, P. (2011). *Secure cloud computing: Benefits, risks and controls*. Paper presented at the 2011 Information Security South Africa (ISSA).
- Carter, L., & Weerakkody, V. (2008). E-Government Adoption: A Cultural Comparison. *Information Systems Frontiers*, 10, 473-482.
- Castells, M. (2001). *The Internet Galaxy: Reflections on the Internet, Business, and Society*. Oxford; New York: Oxford University Press.
- Cavana, R. Y., Delahaye, B. L., & Sekaran, U. (2001). *Applied business research: Qualitative and quantitative methods*. Queensland: John Wiley & Sons.
- CDW. (2011). From tactic to strategy: The CDW 2011 cloud computing tracking poll. Retrieved from: <http://webobjects.cdw.com/webobjects/media/pdf/Newsroom/CDW-Cloud-Tracking-Poll-Report-0511.pdf>
- Cearley, D. W. (2014). *The top 10 strategic technology trends for 2014*. A White paper publication of Gartner Inc. Available at <http://www.gartner.com/doc/2667526?refval=&pcp=mpe>. Accessed 25 Dec 2014

- Cegielski, C. G. (2012). Adoption of cloud computing technologies in supply chains: An organizational information processing theory approach. *International Journal of Logistics Management*, 23, 184–211.
- Cervone, H. F. (2010). An overview of virtual and cloud computing. *OCLC Systems & Services*, 26(3), 162–165.
- Chang, I. C., Hwang, H. G., Hung, M. C., Lin, M. H., & Yen, D. C. (2007). Factors affecting the adoption of electronic signature: Executives' perspective of hospital information department. *Decision Support Systems*, 44(1), 350–359.
- Chang, V., Walters, R., & Wills, G. (2013). The development that leads to the Cloud Computing Business Framework. *International Journal of Information Management*, 33(3), 524–538.
- Chatterjee, D., Grewal, R., & Sambamurthy, V. (2002). Shaping up for E-Commerce: Institutional Enablers of the Organizational Assimilation of Web Technologies. *MIS Quarterly*, 26(2), 65–89.
- Chau, P. Y., & Tam, K. Y. (1997). Factors affecting the adoption of open systems: An exploratory study. *MIS Quarterly*, 1-24.
- Chebrolu, S. B. (2010). *Assessing the relationships among cloud adoption, strategic alignment, and information technology effectiveness*. Dissertation, Capella University, Minneapolis, MN.
- Chernick, M. R. (2012). The jackknife: a resampling method with connections to the bootstrap', *Wiley Interdisciplinary Reviews: Computational Statistics*, 4(2), 224–226. John Wiley & Sons, Inc., doi: 10.1002/wics.202.
- Chin, W. R., & Newsted, P. (1999) *Structural Equation Modeling Analysis with Small Samples Using Partial Least Square, Statistical Strategies for Small Sample Research*.
- Chin, W. W. (1998). The partial least squares approach for structural equation modeling. in G. A. Marcoulides (Ed.). pp. 295–236. London, UK.: Lawrence Erlbaum Associates.
- Chin, W. W. (1998). The partial least squares approach for structural equation modeling. in G. A. Marcoulides (Ed.), pp. 295–236., London, UK.: Lawrence Erlbaum Associates.
- Chin, W. W. (2010). How to write up and report PLS analyses. In Handbook of partial least squares, pp. 655–690. CHAP, Springer. http://doi.org/10.1007/978-3-540-32827-8_29
- Cho, V. (2006). Factors in the adoption of third-party B2B portals in the textile industry. *The Journal of Computer Information Systems*, 46(3), 18.

- Chong, A. Y. L., Lin, B., Ooi, K. B., & Raman, M. (2009). Factors affecting the adoption level of c-commerce: An empirical study. *Journal of Computer Information Systems*, 50(2), 13-22.
- Choo, K.-K. R. (2010). Cloud computing: Challenges and future directions. *Trends & Issues in Crime and Criminal Justice*, 400, 1–6.
- Choudrie, J., Umeoji, E., & Forson, C. (2012). *Diffusion of e-government in Nigeria: A qualitative study of culture and gender*. UH Business School Working Papers, University of Hertfordshire.
- Christensen, L. B., Johnson, B., & Turner, L. A. (2014). *Research methods, design, and analysis* (Twelfth Ed). New Jersey: Pearson Education.
- Chun, S., & Choi, B. (2014). Service models and pricing schemes for cloud computing. *Clust. Comput.* 17(2), 529–535.
- Chung, S., & Snyder, C. A. (2000). ERP adoption: A technological evolution approach. *International Journal of Agile Management*
- Churchill, A. G., & Iacobucci, D. (2009). *Marketing Research: Methodological Foundations*. Cengage Learning.
- Churchill, A.G., Brown, J.T., & Suter, A.T. (2010). *Basic Marketing Research*. 7th Edition.
- Chwelos, P. Benbasat, I., & Dexter, A.S. (2001). Research report: Empirical test of an EDI adoption model. *Inf. Syst. Res.* 12, 304–321.
- Cohen, J. (1988) *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Earlbaum Associates.
- Cooper, R. B., & Zmud, R. W. (1990). Information Technology Implementation Research: A Technological Diffusion Approach. *Management Science*, 36(2), 123–139.
- Corstange, D. (2008). *Tribes and the Rule of Law in Yemen*. Paper presented at the Annual Conference of the Middle East Studies Association Washington, D.C.
- Creswell, J. W. (2012a). *Educational research Planning conducting and evaluating quantitative and Qualitative Research* (Forth Edit). Boston: Pearson Education.
- Creswell, J. W. (2012b). *Qualitative inquiry and research design: Choosing among five approaches* (Third Edit). California: Sage.
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (Forth Edition). California: Sage.

- Creswell, J.W. (2009). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Third Edition, United States of America: Sage.
- Crump, G. (2013). Cloud storage infrastructures raise many issues, InformationWeek.
- D'MacRedie, R. D., & Mijinyawa, K. (2011). A theory-grounded framework of Open Source Software adoption in SMEs. *European Journal of Information Systems*, 20(2), 237–250.
- Dadzie, K. Q., Lee, E., & Dadzie, E. W. (2000). Assessing logistics technology adoption time with event history analysis. *The International Journal of Logistics Management*, 11(1), 47-60.
- Daim, T., Basoglu, N., & Tanoglu, I. (2010). A critical assessment of information technology adoption: technical, organisational and personal perspectives. *Int. J. Bus. Inf. Syst.*, 6(3), 315–335.
- Dasgupta, S., Agarwal, D., Ioannidis, A., & Gopalakrishnan, S. (1999). Determinants of information technology adoption: An extension of existing models to firms in a developing country. *Journal of Global Information Management (JGIM)*, 7(3), 30-40.
- Dasgupta, S., Agarwal, D., Ioannidis, A., & Gopalakrishnan, S. (1999). Determinants of information technology adoption: An extension of existing models to firms in a developing country. *Journal of Global Information Management (JGIM)*, 7(3), 30-40.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.
- David, W., (2013). Google Vs. Microsoft: Choosing Cloud Apps for Schools - InformationWeek. Present. *IEEE Transactions on Information Technology*, 20(1), 4-7.
- Davis, F.D., Bagozzi, R.P. & Warshaw, P.R., (1989). User Acceptance of Computer Technology: A Comparison of Two. *Management Science*, 35(8), 982.
- Davison, R., & Martinsons, M. (2003). Guest editorial cultural issues and IT management: Past and present. *IEEE Transactions on Engineering Management*, 50(1), 3-7.
- Dawson, J. (2013). Moderation in Management Research: What, Why, When, and How. *Journal of Business and Psychology*, 1-19. doi: 10.1007/s10869-013-9308-7
- de Lara, P., & Tacoronte, D. (2007). Investigating the effects of procedural justice on workplace deviance: Do employees' perceptions of conflicting guidance call the tune? *International Journal of Manpower*, 28(8), 715-729.

- Dedrick, J., & West, J. (2004). An exploratory study into open source platform adoption, *37th Hawaii International Conference on System Sciences*, IEEE, Big Island.
- Delmas, M. (2002). Stakeholders and competitive advantage: The case of ISO 14001. *Production and Operations Management*, 10(3), 343–358. <http://dx.doi.org/10.1111/j.1937-5956.2001.tb00379.x>
- Denton, D. W. (2012). Enhancing instruction through constructivism, cooperative learning, and cloud computing. *Techtrends: Linking Research and Practice to Improve Learning*, 56(4), 34-41
- DePietro, R., Wiarda, E., & Fleischer, M. (1990). *The context for change: organization, technology and environment*, in Tornatzky, L.G., Fleischer, M. (ed.) *The Process of Technological Innovation*, pp. 151-175. *Lexington: Lexington Books*
- Devinney, T. et al. (2008) *Formative Versus Reflective Measurement Models: Two Applications of Formative Measurement*, *Journal of Business Research*. doi: 10.1016/j.jbusres.2008.01.013.
- Dickinson, E. (2015). Dell to partner up with Middle East firms to build cloud services. *Gulf Business*. Retrieved from <http://gulfbusiness.com/dell-to-partner-up-with-middle-east-firms-to-build-cloud-services/>
- Dillon, T., Wu, C., & Chang, E. (2010). *Cloud computing: Issues and challenges*. Paper presented at the 24th IEEE International Conference on Advanced Information Networking and Applications (AINA), 2010.
- Dimaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147–160.
- Dimaggio, P., & Powell, W. W. (2010). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. In N. Berkovich (Ed.), *Sociology of Organizations* Open University of Israel Press.
- Doelitzscher, F., Sulistio, A., Reich, C., Kuijs, H., & Wolf, D. (2011). Private cloud for collaboration and e-learning services: From IaaS to SaaS. *Computing*, 91(1), 23- 42. Retrieved from: <http://dx.doi.org/10.1007/s00607-010-0106>.
- Duan, S. X. (2012). *An integrated solution to the adoption of electronic market in Australian small and medium sized enterprises*. RMIT University. Melbourne, Australia
- Duarte, P., & Raposo, M. (2010). *A PLS Model to Study Brand Preference: An Application to the Mobile Phone Market*, *Handbook of Partial Least Squares: Concepts, Methods and Applications*. doi: 10.1007/978-3-540-32827-8_21.

- Duarte, P., & Raposo, M. (2010). *A PLS Model to Study Brand Preference: An Application to the Mobile Phone Market, Handbook of Partial Least Squares: Concepts, Methods and Applications*. doi: 10.1007/978-3-540-32827-8_21.
- Dwivedi, Y. K., & Mustafee, N. (2010). It's unwritten in the cloud: The technology enablers for realizing the promise of cloud computing. *Journal of Enterprise Information Management*, 23(6), 673-679.
- Dwivedi, Y. K., & Mustafee, O. (2010). Predicting SMEs' adoption of enterprise systems. *Journal of Enterprise Information Management*, 22(1/2), 10-24.
- EarthBrowser (2015a). *EarthBrowser*. [online]. Retrieved from: <http://blog.earthbrowser.com/>
- EarthBrowser (2015b). *EarthBrowser - Frequently Asked Questions*. Retrieved from: <http://www.earthbrowser.com/about/>
- Easterby-Smith, M., Thorpe, R., & Lowe, A. (1991). *Management Research: An Introduction*. London: Sage.
- Ebrahim, Z.A.)2005(. *The Adoption of E-Government In The Kingdom Of Bahrain*. A Thesis Submitted for the Degree of Doctor of Philosophy.
- Edberg, D., Grupe, F. H., & Kuechler, W. (2001). Practical issues in global IT management. *Information Systems Management*, 18(1), 34-46.
- Eder, L.B., & Igbaria, M. (2001). Determinants of intranet diffusion and infusion. *Omega*, 29(3), 233–242.
- EDUCAUSE (2010). Cloud Computing for Higher Education. *EDUCAUSE Review*. 44 (6), 52-66.
- EDUCAUSE. (2009). The evolution of the CIO. Retrieved from <http://net.educause.edu/ir/library/pdf/PUB9007.pdf>
- EDUCAUSE. (2010). 7 Things you should know about cloud security. Retrieved from <http://net.educause.edu/ir/library/pdf/EST1008.pdf>.
- Edwards, J. R. (2011). The Fallacy of Formative Measurement, *Organizational Research Methods*, 14(2), 370–388.
- Ercan, T. (2010). Effective use of cloud computing in educational institutions. *Procedia Soc. Behav. Sci.* 2(2), 938–942.
- Erumban, A.A., & de Jong, S.B. (2006). Cross-country differences in ICT adoption: A consequence of Culture? *Journal of World Business*, 41(4), 302-314.
- Espadanal, M., & Oliveira, T. (2012). Cloud computing adoption by firms. In the *Proceedings of the Mediterranean Conference on Information Systems, MCIS*.

- Everdingen, Y. M., & Waarts, E. (2003). The effect of national culture on the adoption of innovations. *Marketing Letters*, 14(3), 217-232.
- Falk, R., & Miller, N. (1992). *A Primer for Soft Modeling*. Akron, OH: The University of Akron Press:
- Fernández, A., Peralta, D., Benítez, J. M., & Herrera, F. (2014). E-learning and educational data mining in cloud computing: an overview. *International Journal of Learning Technology*, 9(1), 25-52.
- Fichman, R. (2004). Going beyond the dominant paradigm for information technology innovation research: Emerging concepts and methods, *Journal of the Association for Information Systems*, 5(8), 314-355.
- Fink, A. (1995). *How to sample in surveys*. London: Sage Publications.
- Finnegan, D. J., & Currie, W. L. (2010). A multi-layered approach to CRM implementation: An integration perspective. *European Management Journal*, 28(2), 153-167.
- Folkestad, B. (2008). *Analysing interview data: Possibilities and challenges*. Germany: Eurosphere.
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error, *Journal of Marketing Research*, 18(1), 39–50. doi: 10.2307/3151312.
- Forrester (2012). Cloud bursts into higher education. Retrieved from www.cisco.com/web/strategy/docs/education/cloud_bursts_into_higher_education.pdf. Accessed 17 July 2014
- Frankfort-Nachmias, C., & Nachmias, D. (2008). *Research Methods in the Social Sciences*. WORTH PUBL Incorporated.
- Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *J. Enterp. Inf. Manage.* 28(1), 107–130.
- Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *Journal of Enterprise Information Management*, 28(1), 107-130.
- Garrison, G., Kim, S., & Wakefield, R. L. (2012). Success factors for deploying cloud computing. *Communications of the ACM*, 55(9), 62-68.
- Garson, G. D. (2013) *Validity and Reliability (Statistical Associates Blue Book Series 12)*. Kindle Edi. USA: Statistical Associates Publishers.

- Gatignon, H., & Robertson, T. S. (1989). Technology diffusion: an empirical test of competitive effects. *The Journal of Marketing*, 35-49.
- Gelo, O., Braakmann, D., & Benetka, G. (2008). Quantitative and qualitative research: Beyond the debate. *Integrative psychological and behavioral science*, 42(3), 266-290
- Ghezzi, A., Rangone, A., & Balocco, R. (2013). Technology diffusion theory revisited: a regulation, environment, strategy, technology model for technology activation analysis of mobile ICT. *Technology Analysis & Strategic Management*, 25(10), 1223–1249.
- Gibbs, J. L., & Kraemer, K. L. (2004). A cross-country investigation of the determinants of scope of e-commerce use: An institutional approach. *Electronic markets*, 14(2), 124-137.
- Gill, R., (2011). Why cloud computing matters to finance, Institute of Management Accountants.
- Goodwin, B. (2013). Small companies slow to adopt disruptive technologies. Retrieved from: http://www.computerweekly.com/blogs/computer_weekly_data_bank/2013/02/small-and-medium-sized-companies.html (Accessed 1 May 2013).
- Google for Education (2017). *G suit*. Retrieved Feb, 2017, from <https://gsuite.google.com/>
- Google Inc. (2015). Google Apps for Education. Retrieved from: <https://www.google.com/work/apps/education/>.
- Google. (2011). *Create documents, spreadsheets and presentations online*. Retrieved from: <http://www.google.com/google-d-s/intl/en/tour1.html>
- Götz, O., Liehr-Gobbers, K., & Kraftt, M. (2010). *Evaluation of Structural Equation Models Using the Partial Least Squares (PLS) Approach BT - Handbook of Partial Least Squares: Concepts, Methods and Applications*, in Esposito Vinzi, V. et al. (eds). Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 691–711. doi: 10.1007/978-3-540-32827-8_30.
- Grandon, E.E. & Pearson, J.M. (2004). Electronic commerce adoption: an empirical study of small and medium US businesses. *Information & management*, 42(1).197–216
- Gray, T. (2010). A tale of two clouds. *EDUCAUSE Quarterly*, 33(2). Retrieved from: http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazi_neVolum/ATaleofTwoClouds/206529

- Greengard, S. (2010). Cloud computing and developing nations. *Communications of the ACM*, 53(5), 18-20.
- Greenhalgh, T. Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q*, 82, 581–629.
- Grover, V., Cheon, M. J., & Teng, J.T.C. (2014). of Service Quality and The Effect of on the Outsourcing Partnership Functions. *Information Systems*, 12(4), 89–116.
- Gulfeyes magazine (2016). The opening of the First Scientific Conference on Information Technology and networks at the University of Andalusia in Sana'a. Retrieved November 5, 2016 from <http://www.gulfeyes.net/Al-Ymn/828833.html>
- Gupta, P., Seetharaman, A., & Raj, J. (2013). The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management*, 33(5), 861-874.
- Gutierrez, A., Boukrami, E., & Lumsden R. (2015). Technological, organisational and environmental factors influencing managerial decision to adopt cloud computing in the UK. *Journal of Enterprise Information Management*, 28(6), 788-807.
- Haag, S., & Eckhardt, A. (2014). Organizational cloud service adoption: a scientometric and content-based literature analysis. *Journal of Business Economics*, 84(3), 407–440.
- Hailu, A. (2012). *Factors influencing cloud-computing technology adoption in developing countries*. Capella University, USA.
- Hair, J., Black, W., Babin, B. y. A., Anderson, R., & Tatham, R. (2010). RE *Multivariate Data Analysis. A Global Perspective*. Pearson Prentice Hall: UK
- Hair, J., Hult, G. T., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. California: Sage Publications.
- Hair, J., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed, a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. JOUR. <http://doi.org/10.2753/MTP1069-6679190202>
- Hamad, H. (2014). *Antecedents of business-to-business e-commerce adoption and its effect on competitive advantage in manufacturing small and medium-sized enterprises: A comparative study of United States of America and Egypt*. Plymouth University, England.
- Han, Y. (2013). On the clouds: A new way of computing. *Information Technology and Libraries*, 29(2), 87-92.

- Haniffa, R., & Hudaib, M. (2007). Locating audit expectations gap within a cultural context: The case of Saudi Arabia. *Journal of International Accounting, Auditing and Taxation*, 16(2), 179-206.
- Hashemi, S. Y. (2013). Cloud Computing for E-Learning with More Emphasis on Security Issues. *International Journal of Computer, Control, Quantum and Information Engineering*, 18(7), 1190-201.
- Hassan, H., Tretiakov, A., & Whiddett, D. (2010). Extent of adoption as opposed to adoption: Case of e-procurement. *ACIS 2010 Proceedings*, <http://aisel.aisnet.org/acis2010/12>.
- Hayes, B. (2008). Cloud computing. *Communications of the ACM*, 51, 9-11.
- Hemlata G., Hema D., & Ramaswamy R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model, *Journal of Enterprise Information Management*, 28(1), 107 – 130
- Henderson, D., Sheetz, S. D., & Trinkle, B. S. (2012). The determinants of inter-organizational and internal in-house adoption of XBRL: A structural equation model. *International Journal of Accounting Information Systems*, 13(2), 109-140.
- Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling', *Computational Statistics*, 28(2), 565–580. doi: 10.1007/s00180-012-0317-1.
- Herbig, P., & Dunphy, S. (1998). Culture and Innovation. *Cross Cultural Management*, 5(4), 13-21.
- Hirschheim, R. (2007). Introduction to the Special Issue on “Quo Vadis TAM – Issues and Reflections on Technology Acceptance Research”, *Journal of the Association for Information Systems*, 8(4), 19-29.
- Hofstede, G. (1997). *Cultures and Organizations: Software of the Mind*. United States of America: McGraw-Hill.
- Hofstede, G., Hofstede, G. J., & Minkov, M. (1991). *Cultures and organizations: Software of the mind*. McGraw-Hill. Retrieved from [https://doi.org/10.1016/0147-1767\(92\)90033-Q](https://doi.org/10.1016/0147-1767(92)90033-Q).
- Hong, W., & Zhu, K. (2006). Migrating to internet-based e-commerce: Factors affecting e-commerce adoption and migration at the firm level. *Information and Management*, 43(2), 204–221.
- Hossain, M.A., & Quaddus, M. (2011). The adoption and continued usage intention of RFID: an integrated framework, *Information Technology & People*, 24 (3), 236-256.

- Hossein, S. (2007). *Response modeling in direct marketing*. Master thesis, Department of Business Administration and Social Science, University of Technology, Iran.
- Hox, J., & Bechger, T. (1998). An Introduction to Structural Equation Modelling, *Family Science Review*, 11(1), 354–373.
- Hoyle, R. (1995). The structural equation modeling approach: Basic concepts and fundamental issues. In R. H.
- Hsu, P., Ray, S., & Li-Hsieh, Y. (2014). Examining cloud computing adoption intention, pricing mechanism, and deployment model. *Int. J. Inf. Manage.* 34(4), 474–488. Retrieved from: http://www.computerweekly.com/blogs/computer_weekly_data_bank/2013/02/small-and-medium-sized-companies.html.
- Hsu, P.-F., Kraemer, K.L., & Dunkle, D. (2006). Determinants of E-Business Use in U.S. Firms. *International Journal of Electronic Commerce*, 10(4), 9–45.
- Hugos, M., & Hulitzky, D. (2011). *Business in the Cloud: What Every Business Needs to Know about Cloud Computing*. New Jersey: John Wiley & Sons, Inc.
- Iacobucci, D., & Churchill, G. A. (2009). *Marketing Research: Methodological Foundations*. South-Western.
- Iacovou, C. L., Benbasat, I., & Dexter, A. S. (1995). Electronic data interchange and small organizations: Adoption and impact of technology. *MIS Quarterly*, 465–485.
- IBM (2014). IBM Cloud Academy - Overview - United States. Retrieved from: <http://www.ibm.com/solutions/education/cloudacademy/us/en>
- Ifinedo, P. (2011a). An empirical analysis of factors influencing Internet/e-business technologies adoption by SMEs in Canada. *Int. J. Inf. Technol. Decis. Mak.*, 10, 731–766.
- Ifinedo, P. (2011b). Internet/e-business technologies acceptance in Canada's SMEs: an exploratory investigation. *Internet research*, 21, 255–281.
- Igbaria, M., Zinatelli, N., & Cragg, P. (1997). Personal Computing Acceptance Factors in Small Firms: A Structural Equation Model. *MIS Quarterly*, 21(3), 279–305.
- International Data Corporation (IDC) (2014). Worldwide smart connected device shipments, Retrieved from: <http://www.idc.com/getdoc.jsp?containerId=prUS25732415>.

- International Trade Administration (ITA). (2016). *2016 Top markets report: Cloud computing*. US Department of Commerce, International Trade Administration, Industry & Analysis (I&A).
- Intharaksa, U. (2009). *Using diffusion of innovation theory to explain the degree of faculty adoption of Web-based instruction in a Thai university* (Unpublished doctoral dissertation). Oklahoma State University. Available at: <http://139.78.48.197/utils/getfile/collection/Dissert/id/72454/filename/73145.pdf>
- Jaeger, P. T., Jimmy, L., & Justin, M. G. (2008). Cloud Computing and Information Policy: Computing in a Policy Cloud. *Journal of Information Technology and Politics* 5 (3), 269–83.
- Jarvis, C. B., Mackenzie, S. B. and Podsakoff, P. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research, *Journal of Consumer Research*, 30(2), 199.
- Jay, G. (2014). Edutech for Teachers » Blog Archive » Guest Post: Google vs. Microsoft: Cloud Apps for Educators.
- Jeffrey, K., & Neidecker-Lutz, B. (2009). The future of cloud computing: opportunities for European cloud computing beyond 2010.
- Jennett, P., Yeo, M., Pauls, M., & Graham, J. (2003). Organizational readiness for telemedicine: implications for success and failure. [Research Support, Non-U.S. Gov't]. *J Telemed Telecare*, 9 Suppl 2(suppl 2), S27-30. doi: 10.1258/135763303322596183
- Jeyaraj, A., Rottman, J.W., & Lacity, M. C. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1), 1–23. Retrieved from: <http://www.palgrave-journals.com/doifinder/10.1057/palgrave.jit.2000056>
- Jobber, D. (1989). An examination of the effects of questionnaire factors on response to an industrial mail survey. *International Journal of Research in Marketing*, 12(3), 13-21, doi: 10.1016/0167-8116(89)90006-2.-
- Joo, Y.-B., & Kim, Y.-G. (2004). Determinants of corporate adoption of e-marketplace: An innovation theory perspective. *Journal of Purchasing and Supply Management*, 10(2), 89-101.
- Kamal, M.M.M. (2006). IT innovation adoption in the government sector: identifying the critical success factors, Available at: <http://www.emeraldinsight.com/10.1108/17410390610645085> [Accessed March 12, 2013].

Kamien, M. I., & Schwartz, N. L. (1982). *Market structure and innovation*. Cambridge University Press.

Karahanna, E., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 183-213.

Karim, F. (2018). *Researching the Acceptance and Use of Cloud Computing for Education and Administration in Saudi Arabian Universities*. PhD Thesis. Flinders University: Australia. Retrieved from <https://theses.flinders.edu.au/view/2de56a79-5aa3-40f6-af15-d28d612af307/1>.

Karim, F. and Rampersad, G. (2017). Factors Affecting the Adoption of Cloud Computing in Saudi Arabian Universities. *International Journal of Computer and Information Science*, 10(2), 109.

Katz, R. N., Goldstein, P. J., & Yanosky, R. (2009). Demystifying cloud computing for higher education. *EDUCAUSE Center for Applied Research Bulletin*, 19, 1-13.

Kaur, R. S. (2015). Exploring the benefits of cloud computing paradigm in education sector. *International Journal of Computer Applications*, 115(7), 1-3.

Kendall, J. D., Tung, L. L., Chua, K. H., Ng, C. H. D., & Tan, S. M. (2001). Receptivity of Singapore's SMEs to electronic commerce adoption. *The Journal of Strategic Information Systems*, 10(3), 223-242.

Kenny, D. A., & Judd, C. M. (1984). Estimating the nonlinear and interactive effects of latent variables. *Psychological Bulletin*, 96, 201-210. doi: 10.1037/0033-2959.96.1.201

Kerlinger, F. N. F. N., & Pedhazur, E. J. (1973). Multiple regression in behavioral research.

Kerlinger, F. N. F. N., & Pedhazur, E. J. (1973). Multiple regression in behavioral research (No. 04; HA31. 3, K4.).

Khalil, I., Khreishah, A., & Azeem, M. (2014). Cloud computing security: A survey. *Directory of Open Access Journals*, 3(1), 1-35.

Khmelevsky, Y., & Voytenko, V. (2010). Cloud computing infrastructure prototype for university education and research. In ACM Proceedings of the 15th Western Canadian Conference on Computing Education, p. 8

Khmelevsky, Y., & Voytenko, V. (2010). Cloud computing infrastructure prototype for university education and research. *Proceedings of the 15th Western Canadian Conference on Computing Education*, Article No. 8, USA. <http://dx.doi.org/10.1145/1806512.1806524>

- King, J. L. et al., (1994). Institutional Factors in Information Technology Innovation. *Information Systems Research*, 5(2), 139–169.
- Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.
- Klug, W. (2014). The determinants of cloud computing adoption by colleges and universities. *Ph.D. Dissertation*. ProQuest, UMI Dissertations Publishing.
- Kshetri, N. (2010). Cloud Computing in Developing Economies. *Computer*, 43(10), 47-55.
- Kuan, K. K. Y., & Chau, P. Y. K. (2001). A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework. *Information and Management*, 38(8), 507–521.
- Kuan, K. K., & Chau, P. Y. (2001). A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework. *Information & Management*, 38(8), 507-521.
- Kumar, R. (2011). *Research Methodology: A Step-by-Step Guide for Beginners*. Field: Sage Publications.
- Kundra, V. (2011). Federal cloud computing strategy. Washington D.C: The White House.
- Kushida, K. E., Murray, J., & Zysman, J. (2011). Diffusing the cloud: Cloud computing and implications for public policy. *Journal of Industry, Competition and Trade*, 11(3), 209-237.
- Kushida, K., Breznitz, D., & Zysman, J. (2010) Cutting through the fog: understanding the competitive dynamics in cloud computing. *The Berkeley Roundtable on the International Economy (BRIE)*.
- Kvale, S. (1996). *InterViews: An Introduction to Qualitative Research Interviewing*. Thousand Oaks, CA: SAGE Publications.
- Lacity, M., & Reynolds, P. (2014). Cloud Services Practices for Small and Medium-Sized Enterprises, *MIS Quarterly Executive*, 13 (1), 31-44.
- Lakshminarayanan, R., Kumar, B., & Raju, M. (2013). *Cloud computing benefits for educational institutions*. Second International Conference of the Omani Society for Educational Technology.
- Lavrakas, P. J. (2008) *Encyclopedia of Survey Research Methods*. 1st Edition. United States: SAGE Publications, Inc

- Law, M. (2011). *Cloud computing basics*. Hillcrest Media Group, Inc. Minneapolis.
- Lee, J. (2004). Discriminant Analysis of Technology Adoption Behaviour: A Case of Internet Technologies in Small Business, *Journal of Computer Information Systems* 4(4), 57–66.
- Lee, O.-K. D., Wang, M. W., Lim, K. H., & Peng, Z. J. (2009). Knowledge management systems diffusion in Chinese enterprises: A multistage approach using the technology-organization-environment framework. *Journal of Global Information Management*, 17(1), 70.
- Li, Y. H. (2008). An Empirical Investigation on the Determinants of EProcurement Adoption in Chinese Manufacturing Enterprises. *15th International Conference on Management Science & Engineering*, California, USA, pp. 32-37.
- Lin, A., & Chen, N. C. (2012). Cloud computing as an innovation: Perception, attitude, and adoption. *International Journal of Information Management*, 32(6), 533–540.
- Lin, H. F., & Lee, G. G. (2005). Impact of organizational learning and knowledge management factors on e-business adoption. *Management Decision*, 43(2), 171–188.
- Lin, H.-F. & Lin, S.-M. (2008). Determinants of e-business diffusion: A test of the technology diffusion perspective. *Technovation*, 28(3), 135–145.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Ling, C.Y. (2001). Model of factors influences on electronic commerce adoption and diffusion in small and medium sized enterprises. *Doctoral Consortium on 9th European Conference on Information Systems*, Bled, Slovenia.
- Lippert, S. K., & Govindarajulu, C. (2006). Technological, Organizational, and Environmental Antecedents to Web Services Adoption. *Communications of the IIMA*, 6(1), 146–158.
- Loebbecke, C., Thomas, B., & Ulrich, T. (2012). Assessing cloud readiness at Continental AG. *MIS Quarterly Executive*, 11(1), 11-23.
- Low, C., Chen, Y., & Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial Management & Data Systems*, 111(7), 1006–1023.
- Luo, X., Gurung, A., & Shim, J.P. (2010). Understanding the determinants of user acceptance of enterprise instant messaging: an empirical study. *J. Organ. Comput. Electr. Commer.* 20, 155–181.

- MacKenzie, S.B., Podsakoff, P. M., & Jarvis, C. (2005). The Problem of Measurement Model Misspecification in Behavioral and Organizational Research and Some Recommended Solutions, *Journal of Applied Psychology*, 90(4), 710–730.
- Maitland, C. F., & Bauer, J. M. (2001). National level culture and global diffusion: The case of the Internet. In *Culture, technology, communication: Towards an intercultural global village*, 87-128.
- Malapile, S., & Keengwe, J. (2014). Information Communication Technology Planning in developing countries. *Education Information Technology*, 19, 691-701.
- Manea, E. M. (2006). *Yemen, The Tribe and The State*. A Working paper was presented to the International Colloquium on Islam and Social Change at the University of Lausanne on 10-11 October 1996. Retrieved from <http://www.albab.com/yemen/soc/manea1.htm>
- Marston, Z., Li, S., Bandyopadhyay, J. Z., & Ghalsasi, A. (2011). Cloud computing the business perspective. *Decis. Support Syst.* 51, 176–189
- Massadeh S. A., & Meslah M. A. (2013). Cloud computing in higher education in Jordan. *World of Computer Science and Information Technology Journal*, 3, 38-43.
- Masud, Hossain., Huang, X., & Yong, J. (2012). Cloud Computing for Higher Education: A Roadmap. *Proceedings of the 2012 IEEE 16th International Conference on Computer Supported Cooperative Work in Design*.
- Mataher, M. (2016). *Yemen's achievements in the field of higher education technology*. Issue 11671. Retrieved from <https://www.spa.gov.sa/803484>
- Mathew, S. (2012). Implementation of cloud computing in Education – A revolution, *International Journal of Computer Theory and Engineering* 4(3), 473-475
- Maxwell, J. A. (2012). *Qualitative Research Design: An Interactive Approach* (Third). California: Sage.
- McDonald, D., Breslin, C., & MacDonald, A. (2010). Final report from the JISC review of the environmental and organizational implications of cloud computing in higher and further education. *Technical Report*, University of Strathclyde.
- Mdabesh, A. (2010). The Equation of the Tribe in Yemen. Middle East Newspaper. Issue 11671. Retrieved from <http://www.aawsat.com/details.asp?section=4&article=594803&issueno=11671>
- Mei, L., Zhang, Z., & Chan, W. K. (2008). A tale of clouds: paradigm comparisons and some thoughts on research issues. *Proceedings of the 2008 IEEE Asia-Pacific Services Computing Conference*, 464-469

- Mell, P., & Grance, T. (2011). The NIST definition of cloud computing. *Recommendations of the National Institute of Standards and Technology-Special Publication 800-145*, Washington DC: NIST. Retrieved from: <http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf>.
- Mero, R., & Mwangoka, J. (2014). Road map towards eco-efficient cloud computing adoption in higher learning institutions in Tanzania. In Science, *Pan African Conference on Computing and Telecommunications (PACT)*, 2014 154-159.
- Michael, G. M., & Earl, R. B. (2012). *Basics of Research Methods for Criminal Justice and Criminology*. USA: Wadsworth Cengage Learning.
- Michael, R. N. (2009). *Cloud Computing and Public Policy*. Briefing Paper for the ICCP. Retrieved from: newinnovationsguide.com/NIST_Cloud_Definition.pdf
- Microsoft. (2010). State University of New York moves to Microsoft's cloud. Microsoft News Center. Retrieved from http://www.microsoft.com/enus/news/press/2010/dec10/12_21sunypr.aspx
- Microsoft. (2015a). *Office in Education*. Retrieved from: <http://products.office.com/en-us/student/office-in-education>.
- Miles, M.B., & Huberman, A.M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Sage Publications.
- Miller, M. (2009). *Cloud computing: Web-based applications that change the way you work and collaborate online*. USA: Que.
- Ministry of Higher Education and Scientific Research - Yemen. (2009). *Yemen Accreditation and Quality Assurance System Report Submitted to the Roundtable Meeting of Quality Assurance Agencies of the Organization of Islamic Conference Member Countries*. Legend Hotel, Kuala Lumpur, Malaysia.
- Mircea, M., & Andreeescu, A.I. (2010). Using cloud computing in higher education: A strategy to improve agility in the current financial crisis. *IBIMA*, pp. 1-14.
- Moghram, M. A. (2006). Political Culture of Corruption and State of Corruption in Yemen. Faculty of Law & Shariah, Sana'a University. Retrieved from <http://youthdo.org/en/images/yemen/10.pdf>.
- Momoh, A., Roy, R., & Shehab, E. (2010). Challenges in enterprise resource planning implementation: state-of-the-art. *Business Process Management Journal*, 16(4), 537–565. Available at: <http://www.emeraldinsight.com/10.1108/14637151011065919> [Accessed March 30, 2013].

- Monroy, C. R., Arias, C. A., & Guerrero, Y. N. (2013). The new cloud computing paradigm: the way to IT seen as a utility. *Latin American and Caribbean Journal of Engineering Education*, 6(2), 24–31.
- Montalbano, E. (2012). Feds Refine Cloud Security Standards. Information Week. Retrieved from <http://www.informationweek.com/news/government/security>
- Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Inf. Syst. Res.* 2(3), 192–222.
- Moore, G., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation, *Information Systems Research*, 2(3), 192-222.
- Motaher M. (2015). National Information Center of the Republic of Yemen, *International Journal of Social Economics*, 31(1/2) 94-110. Retrieved from. <http://www.yemen-nic.info/contents/Idustrial/> IndustrialPointers/book01-2007.pdf
- Motaher, M. (2015) *Yemen's tribal system dominates all aspects of economic*. Issue 11671. Retrieved from <https://www.moe.gov.ye/808736>
- Musawa, M. S., & Wahab, E. (2012). The adoption of electronic data interchange (EDI) technology by Nigerian SMEs: A conceptual framework. *Journal of Business Management and Economics*, 3(2), 055-068.
- Mustonen-Ollila, E., & Lyytinen, K. (2003). Why organizations adopt information system process innovations: a longitudinal study using Diffusion of Innovation theory. *Information Systems Journal*, 13(3), 275–297.
- Naoum, S. G. (2007) *Dissertation research and writing for construction students*. 2nd Editio. Oxford: Butterworth-Heinemann.
- Nasir, A. (2014). The guidelines and laws in innovational development in Yemen. Al-Thawar Newspaper. Issue 10989. Retrieved from <http://www.aawsat.com/details.asp?section=4&article=594803&issueno=10989>
- Nasir, A. (2014, November 11) The Equation of the Tribe in Yemen. *Middle East Newspaper*. Issue 11671. Retrieved from <http://www.aawsat.com/details.asp?section=4&article=594803&issueno=11671>
- Nicholson, J. L. (2009). Cloud Computing Top Issues for Higher Education <https://www.universitybusiness.com/author/john-l-nicholson>
- OECD. (2003) The e-government imperative: Main findings. *OECD Observer*.

OECD (2014) *Technology Foresight Forum*. A White paper publication. Retrieved from: <http://www.oecd.org/dataoecd/39/47/43933771>.

Ojo, A., Janowski, T., Estevez, E., & Khan, I. K. (2007). *Human capacity development for e-government*. UN University International Institute for Software Technology, Macau, UNU-IIST Report (362).

Oliveira, T., & Martins, M.F. (2010). Understanding e-business adoption across industries in European countries, *Ind. Manage. Data Syst.* 110, 1337–1354.

Oliveira, T., Martins, M. F. & Lisboa, U.N. De. (2011). Literature Review of Information Technology Adoption Models at Firm Level, *14*(1), 110–121.

Oliveira, T., Thomas, M., & Espadanal, M. (2014). Assessing the determinants of cloud computing adoption: an analysis of the manufacturing and services sectors. *Inf. Manage.* 51(5), 497–501.

Ozkan, S., Koseler, R., & Baykal, N. (2009). Evaluating Learning Management Systems. *Transforming Government: People, Process and Policy*, 3, 111-130. <http://dx.doi.org/10.1108/17506160910960522>.

Pan, M. J., & Jang, W.Y. (2008). Determinants of the adoption of enterprise resource planning within the technology-organization-environment framework: Taiwan's communications industry. *Journal of Computer Information Systems*, 48, 94-102.

Pardeshi, V. H. (2014). Cloud computing for Higher Education Institutes: Architecture, Strategy and Recommendations for effective adaptation. *Procedia Economics and Finance*, 11, 589-599.

Pearson, S., & Benamer, A. (2010). Privacy, securityand trust issues arising from cloud computing. *2010 IEEE Second International Conference on InCloud Computing Technology and Science* (Cloud-Com), pp. 693–702

Peter, M., & Tim, G. (2010). The NIST Definition of Cloud Computing. Association for Computing Machinery. Communications of the ACM. *New York: Association for Computing Machinery*.

Peterson, J. E. (2008). *Tribes and Politics in Yemen*. Paper presented at the Arabian Peninsula Background Note, No. APBN-007. Retrieved from http://www.jepeterson.net/sitebuildercontent/sitebuilderfiles/APBN-007_Tribes_and_Politics_in_Yemen.pdf

Peterson, R. A., & Kim, Y. (2013). On the relationship between coefficient alpha and composite reliability, *Journal of Applied Psychology*, 98(1), 194–198

Phillips, S. (2010). *Yemen: On The Brink, What Comes Next in Yemen? Al-Qaeda, the Tribes, and State-Building*. Washington, DC: Carnegie Endowment for International Peace.

- Plummer, D., Bittman, T., Austin, T., Cearley, D., & Smith, D. (2009). *Cloud Computing: Defining and Describing an Emerging Phenomenon*, Gartner, Stamford.
- Powelson, S. E. (2011). *An examination of small businesses' propensity to adopt cloud-computing innovation*. PhD thesis, Walden University. Minnesota, USA. Retrieved from <http://scholarworks.waldenu.edu/dissertations>.
- Praveena, K., & Betsy T., (2009). Application of Cloud Computing in Academia. *IUP Journal of Systems Management*, 7 (3), 50-54.
- Premkumar, G. (2003). A meta-analysis of research on information technology implementation in small business. *Journal of Organizational Computing and Electronic Commerce*, 13(2), 91-121.
- Premkumar, G., & Ramamurthy, K. (1995). The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interorganizational Systems. *Decision Sciences*, 26(3), 303–336.
- Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega*, 27(4), 467–484.
- Punch, K.F. (2005). *Introduction to Social Research: Quantitative and Qualitative Approaches*. SAGE Publications
- Pyke, J. (2009). Now is the time to take the cloud seriously. *Working Paper*, Retrieved from <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazine%20Volum/UniversitiesandLibrariesMoveto/206531>
- Ramdani, B. (2008). *Technological, organisational & environmental factors influencing SMEs adoption of enterprise systems: A study in the Northwest of England*, Manchester University.
- Ramdani, B. and Kawalek, P. (2008). Predicting SMEs willingness to adopt ERP, CRM, SCM & E-procurement systems, *16th European Conference on Information Systems*. Galway, Ireland.
- Ramdani, B., & Kawaiek, P. (2007). SME Adoption of Enterprise Systems in the Northwest of England: An Environmental, Technological and Organizational Perspective', in *IFIP WG 8.6 - Organizational Dynamics of Technology-Based Innovation: Diversifying the Research Agenda*. Springer.
- Ramdani, B., & Kawalek, P. (2007). SMEs & IS Innovations Adoption: A Review & Assessment of Previous Research *Revista Latinoamericana de Administración*, pp. 47-70.

- Ramdani, B., Kawalek, P., & Lorenzo, O. (2009). Predicting SMEs' adoption of enterprise systems. *Journal of Enterprise Information Management*, 22 (1/2) 10-24.
- Rao, N. M., Kumar, V. S., Sudhakar, D., & Seetharam, P. (2010). Cloud computing approaches for educational institutions. *International Journal of Computational intelligence and information and Security*, 2150-5570.
- Reinartz, W., Haenlein, M., & Henseler, J. (2009). An Empirical Comparison of the Efficacy of Covariance-Based and Variance-Based SEM, *International Journal of Research in Marketing*, 26(4), 332–344.
- Riemenschneider, C., & McKinney, V. (2001). An Assessment of Small Business Executive Belief Differences in Adopters and Non-Adopters of Web-Based E-Commerce. *AMCIS 2001 Proceedings*, pp. 341.
- Ringle, C. M., Sarstedt, M. & Straub, D. (2012). A Critical Look at the Use of PLS-SEM in MIS Quarterly, *MIS Quarterly*, 36(1), 3 -14.
- Ringle, C. M., Wende, S., & Will, A. (2013). *SmartPLS 2.0*. Hamburg. Retrieved from: www.smartpls.de.
- Ringle, C. M., Wende, S., & Will, A. (2015). *SmartPLS 2.0, SmartPLS 2.0*. Available at: www.smartpls.de (Accessed: 1 December 2016).
- Rittinghouse, J., & Ransome, J. (2010). *Cloud computing implementation, management and security*. Boca Raton: Taylor and Francis.
- Robinson, G. E., Wilcox, O., Carpenter, S., & Al-Iryani, A. (2006). Yemen Corruption Assessment. *United States Agency for International Development (USAID)*. Retrieved from <http://yemen.usembassy.gov/root/pdfs/reports/yemen-corruption-assessment.pdf>
- Robson, C. (2002). *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. 2 edn. Oxford: Wiley-Blackwell.
- Rogers, E. M. (2003). *Diffusion of innovations*. 5th ed. New York, NY: The Free Press.
- Rogers, E.M. (1983), Diffusion of Innovations, 3rd ed., The Free Press, New York, NY.
- Rogers, E. M. (1993). Diffusion of preventive innovations. Addictive behaviors, 27(6), 989-993.
- Rogers, E.M. (1995). *Diffusion of innovations*. New York: Free Press.
- Rold, C. (2009). Infrastructure Utility Services The business between outsourcing and the cloud. Available at: <http://www.gartner.com/id=1244819>.

- Roseman, I. J., Dhawan, N., Rettek, S. I., Naidu, R., & Thapa, K. (1995). Cultural differences and cross-cultural similarities in appraisals and emotional responses. *Journal of Cross-Cultural Psychology*, 26(1), 23-48.
- Ross, V. W. (2010). *Factors influencing the adoption of cloud computing by decision making managers*. Capella University. Minneapolis, Minnesota.
- Sabherwal, R., Jeyaraj, A., & Chowdary, C. (2006). Information system success: Individual and organizational determinants. *Management Science*, 52(12), 1849-1864.
- Sabi, H. M., Uzoka, F. M. E., Langmia, K., & Njeh, F. N. (2016). Conceptualizing a model for adoption of cloud computing in education. *International Journal of Information Management*, 36(2), 183-191.
- Sakr, S. (2014). Cloud-hosted databases: technologies, challenges and opportunities. *Clust. Comput.* 17(2), 487–502.
- Salkind, N. J. (2010). *Encyclopedia of research design (hardcover)*. London, UK: SAGE Publications.
- Sangle, S. (2011). Adoption of cleaner technology for climate proactivity: A technology– firm–stakeholder framework, *Bus. Strat. Environ.*, 20, 365–378.
- Sarkar, P., & Young, L. (2011). Sailing the cloud: A case study of perceptions and changing roles in an Australian University. In: *ECIS 2011 Proceedings*. Retrieved from: <http://aisel.aisnet.org/ecis2011/124>
- Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011). *Research methods for business students* (5th ed.). England: Pearson Education Limited.
- Saunders, M., Lewis, P., & Thornhill, A. (2003) *Research Methods for Business Students*. Harlow: Pearson Education.
- Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research Methods for Business Students* (Sixth Edit). London: Pearson Custom Publishing.
- Savu, L., (2011). Cloud Computing: Deployment Models, Delivery Models, Risks and Research Challenges, *International Conference on Computer and Management (CAMAN)*, pp. 19-21.
- Saya, S., Pee, L. G., & Kankanhalli, A. (2010). The Impact of Institutional Influences on Perceived Technological Characteristics and Real Options in Cloud Computing Adoption. In ICIS.
- Sayre, S. (2001). *Qualitative methods for marketplace research*. CA: SAGE Publications.

- Schneiderman, R. (2011). For cloud computing, the sky is the limit. *Signal Process. Mag. IEEE*, 28, 15–18.
- Schneiderman, R. (2011). For cloud computing, the sky is the limit [Special Reports]. *Signal Processing Magazine, IEEE*, 28(1), 15-144.
- Scott, W.R. (1995). *Institutions and organizations*. Choice Reviews Online U6
- Scott, W.R. (2001). *Institutions and organizations*. London: SAGE.
- Sedayao, J. (2008). Implementing and operating an internet scale distributed application using service oriented architecture principles and cloud computing infrastructure. Pages 417–421 of: iiWAS '08: *Proceedings of the 10th International Conference on Information Integration and Web-based Applications & Services*. New York, NY, USA: ACM.
- Sekaran, U. (2003). *Research Methods for Business: A Skill Building Approach*. 4th Edition. John Wiley & Sons.
- Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach*. Fifth Edition. New York: John Willey & Sons.
- Sekaran, U., & Bougie, R. (2016). *Research Methods for Business: A Skill Building Approach*. 7th Edition. John Wiley & Sons.
- Selznick, P. (1948). Foundations of the theory of organization. *American Sociological Review*, 25-35.
- Seng, W. M., Jackson, S., & Philip, G. (2010). Cultural issues in developing e-government in Malaysia. *Behaviour & Information Technology*, 29(4), 423-432.
- Seng, W. M., Jackson, S., & Philip, G. (2010). Cultural issues in developing e-government in Malaysia. *Behaviour & Information Technology*, 29(4), 423-432.
- Sheard, R. (2010). Innovating in the cloud: Exploring cloud computing to solve IT challenges. *EDUCAUSE Quarterly*, 33(2).
- Shen, Z., & Tong, Q. (2010). The security of cloud computing system enabled by trusted computing technology. *2nd International Conference on Signal Processing Systems (ICSPS), IEEE*.
- Sherman, S. J., & Fazio, R. H. (1983). Parallals between attitudes and traits as predictors of behavior. *Journal of personality*, 51(3), 308-345.
- Shimba, F., (2010). Cloud Computing: Strategies for Cloud Computing Adoption
Cloud Computing: Strategies for Cloud Computing Adoption
- Sila, I. (2013). Factors affecting the adoption of B2B e-commerce technologies. *Electronic Commerce Research*, 13(2), 199-236.

- Sila, I., & Dobni, D. (2012). Patterns of B2B e-commerce usage in SMEs, *Industrial Management and Data Systems*, 112 (8), 1255–1271
- Smith, J. M. (1972) *Interviewing in Social and Market Research*. Routledge and Kegan Paul LTD., London.
- Smith, M., & Norman, C. S. (2002). *How culture affects the use of information technology*. Paper presented at the Accounting Forum, (27)1, 84-109. Retrieved from SSRN: <https://ssrn.com/abstract=376504>.
- Snyder, M. (1983). The influence of individuals on situations: Implications for understanding the links between personality and social behavior. *Journal of Personality*, 51, 497-516
- Soares-Aguiar, A., & Palma-Dos-Reis, A. (2008). Why Do Firms Adopt EProcurement Systems? Using Logistic Regression to Empirically Test a Conceptual Model *Transactions on Engineering Management*, 55(1), 120- 133
- Socratica (2015). About Socratica. Retrieved from: <http://www.socratica.com/about.htm>
- Srite, M., & Karahanna, E. (2006). The role of espoused national cultural values in technology acceptance. *MIS Quarterly*, 30(3), 679–704. JOUR. Retrieved from <http://www.jstor.org/stable/25148745>
- Stanoevska-Slabeva, K., & Wozniak, T. (2010) Grid Basics. In: Grid and Cloud Computing: A Business Perspective on Technology and Applications, pp. 23 – 45, Heidelberg: Springer
- Straub, D. W. (1989). Validating instruments in MIS research. *MIS Quarterly*, 13(2), 147–169. Retrieved from <http://www.jstor.org/stable/248922>
- Straub, D., Loch, K., & Hill, C. (2003). Transfer of information technology to the Arab world: A test of cultural influence modeling. *Advanced Topics in Global Information Management*, 2, 141-172.
- Strickland, J. (2008). *How cloud computing works*. Retrieved from <http://computer.howstuffworks.com>.
- Sultan, N. (2010). Cloud computing for education: A new dawn? *International Journal of Information Management*, 30, 109-116.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics*. 4th Edition. New York: Pearson Education Inc.
- Talalay, M., & Farrands, C. (1997). *Technology, culture, and competitiveness: Change and the world political economy*. UK: Psychology Press.

- Tan, M., & Lin, T.T.C. (2014). Exploring organizational adoption of cloud computing in Singapore. IN: *19th ITS Biennial Conference 2012 Bangkok, Thailand*.<http://hdl.handle.net/10419/72509>.
- Tan, M., & Teo, T. S. H. (2000). Factors Influencing the Adoption of Internet Banking. *Journal of the AIS*, 1, 1-42.
- Tashakkori, A., & Teddlie, C. (2010). *Sage handbook of mixed methods in social & behavioral research*. Second edition. CA: Sage.
- Tashkandi, A. N., & Al-Jabri, I. M. (2015). Cloud computing adoption by higher education institutions in Saudi Arabia: An exploratory study. *Cluster Computing*, 18(4), 1527-1537.
- Tashkandi, A. N., & Al-Jabri, I. M. (2015). Cloud Computing Adoption by Higher Education Institutions in Saudi Arabia: Analysis Based on TOE. *International Conference on Cloud Computing (ICCC)*, 26-29 April 2015. Saudi Arabia.
- Taweel, A. (2012) *Examining the relationship between technological, organizational, and environmental factors and cloud computing adoption*. ProQuest, UMI Dissertations Publishing.
- Taylor, C.W., & Hunsinger, D.S. (2011). A study of student use of cloud computing applications. *Journal of Information Technology Management*, 22(3), 36-50.
- Teo, T.S.H., Lin, S., & Lai, K. (2009). Adopters and non-adopters of e-procurement in Singapore: An empirical study. *Omega*, 37(5), 972–987.
- Tharenou, P., Donohue, R., & Cooper, B. (2007). *Management Research Methods*. Cambridge University Press.
- Thatcher, S. M., Foster, W., & Zhu, L. (2006). B2B e-commerce adoption decisions in Taiwan: The interaction of cultural and other institutional factors. *Electronic Commerce Research and Applications*, 5(2), 92-104.
- Thiesse, F., Staake, T., Schmitt, P., & Fleisch, E. (2011). The rise of the next-generation bar code: An international RFID adoption study. *Supply Chain Manage.: Int. J.* 16, 245–328.
- Thomas, S. J. (2004). *Using web and paper questionnaires for data-based decision making from design to interpretation of the results*. Mumbai, India: Corwin.
- Thong, J. Y. L. (1999). An Integrated Model of Information Systems Adoption in Small Businesses, *Journal of Management Information Systems*, 15 (4), 187-214.
- Thorpe, R., Easterby-Smith, M., & Lowe, A. (2002). *Management Research: An Introduction*. SAGE Publications.

- To, M., & Ngai, E. (2006). Predicting the organisational adoption of B2C e-commerce: an empirical study. *Industrial Management and Data Systems*, 106(8), 1133-1147.
- Tornatzky, L. G., & Klein, R. J. (1982) Innovation characteristics and innovation adoption-implementation: a meta-analysis of findings. *IEEE Trans. Eng. Manage*, 29(1), 28–45.
- Tornatzky, L.G., & Fleischer, M. (1990). *The Process of Technological Innovation*. Lexington: Lexington Books
- Troshani, I., Rampersad, G. C., & Plewa, C. (2011). Adopting innovation management software in university innovation commercialization. *Journal of Computer Information Systems*, 52(2), 83-92.
- Twati, J. M. (2006). *Societal and organisational culture and the adoption of management information systems in Arab countries*. Griffith Business School Brisbane, Australia
- United Nations (2015). World Economic Situation and Prospects 2015. Department of Economics and Social Affairs. Retrieved from http://www.un.org/en/development/desa/policy/wesp/wesp_current/2015wesp_country_classification.pdf
- UNCTAD. (2015). The Least Developed Countries Report, Transforming Rural Economies. Geneva. Retrieved Sep 01, 2016 from http://unctad.org/en/PublicationsLibrary/ldc2015_en.pdf.
- Van Der Schyff, K., & Krauss, K. (2014). Higher education cloud computing in South Africa: towards understanding trust and adoption issues. *South African Computer Journal*, 55, 40-55.
- Vaquero, L. M., Rodero-Merino, L., Caceres, J., & Lindner, M. (2008). A break in the clouds: towards a cloud definition. *SIGCOMM Comput. Commun. Rev.*, 39, 50-55.
- Veiga, J. F., Floyd, S., & Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology*, 16(3), 145-158.
- Veiga, J. F., Floyd, S., & Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology*, 16(3), 145-158.
- Venkatesh, V., Davis, F. D., & Morris, M. G. (2007). Dead or Alive? The Development, Trajectory and Future of Technology Adoption Research, *Journal of the Association for Information Systems*, 8(4), 268-286.

- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478.
- VMware (2015). Virtual Desktop Infrastructure (VDI) Features of Horizon (with View). [online] Retrieved from: <http://www.vmware.com/uk/products/horizon-view/features.html>
- Wang, T., & Lai, Y. (2014). Examining the adoption of KMS in organizations from an integrated perspective of technology, individual, and organization. *Computers in Human Behavior*, 38, 55-67
- Wang, Y.M., Wang, Y.S., & Yang, Y.F. (2010), Understanding the determinants of RFID adoption in the manufacturing industry, *Technological Forecasting & Social Change*, 77, 803-15.
- Wargin, J., & Dobiéy, D. (2001). E-business and change—Managing the change in the digital economy. *Journal of Change Management*, 2(1), 72-82.
- Weaver, D. (2013). *Six advantages of cloud computing in education*. Retrieved from <http://www.pearsonschoolsystems.com/blog>.
- Weber, A. S. (2011). Cloud computing in education in the Middle East and North Africa (MENA) region: Can barriers be overcome? *eLearning and Software for Education(eLSE) Journal*, 1(1), 72-82.
- Weerakkody, V. (Ed.). (2009). Handbook of Research on ICT-Enabled Transformational Government: A Global Perspective: A Global Perspective. IGI Global
- Wengraf, T. (2001). *Qualitative research interviewing: Biographic narrative and semi-structured methods*. SAGE.
- Weiner IB. (2003). *The assessment process*. In: Weiner IB, editor. *Handbook of psychology*. Hoboken, NJ: John Wiley & Sons.
- Wen, K. W., & Chen, Y. (2010). E-business value creation in Small and Medium Enterprises: a US study using the TOE framework. *International Journal of Electronic Business*, 8(1), 80-100.
- Wetzel, M., Odekerken-Schroder, G., & Van Oppen, C. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration, *MIS Quarterly*, 33(1), 177–195
- Wheeler, B., & Waggener, S., (2009). Above Campus Services: Shaping the Promise of Finnish Early Childhood Education, *ECIS 2008 Proceedings*, pp. 133.
- Williams, M., Dwivedi, Y., Lal, B., & Schwarz, A. (2009). Contemporary trends and issues in IT adoption and diffusion research, *Journal of Information Technology*, 24(1), 1-10.

- Workman, M. (2005). Expert decision support system use, disuse, and misuse: a study using the theory of planned behavior. *Computers in Human Behavior*, 21(2), 211–231.
- Wu, F., Mahajan, V., & Balasubramanian, S. (2003). An analysis of e-business adoption and its impact on business performance. *Journal of the Academy of Marketing Science*, 31(4), 425–447.
- Wyld, D. C. (2010). Risk in the Clouds? *Security Issues Facing Government Use of Cloud Computing*, pp. 7-12. doi:10.1007/978-90-481-9112-3_2
- Yang, H., & Tate, M. (2012). A descriptive literature review and classification of cloud computing research. *Communications of the Association for Information Systems*, 31(2), 35-60.
- Yang, J., & Chen, Z. (2010). Cloud computing research and security issues. Paper presented at the *2010 International Conference on Computational Intelligence and Software Engineering (CiSE)*.
- Yoon, T. (2009). *An empirical investigation of factors affecting organizational adoption of virtual worlds*. Florida State University. USA
- Young-Chan, L., & Sun-Kyu, L. (2007). Capabilities, Processes, and Performance of Knowledge Management: A Structural Approach, *Human Factors and Ergonomics in Manufacturing*, 17(1), 21–41.
- Zeineldin, Y. (2014). Gulf cloud computing market poised to grow sevenfold. *Gulf News*.
- Zhang, Q., Cheng, L., & Boutaba, R. (2010). Cloud computing: state-of-the-art and research challenges. *Journal of Internet Services and Applications*, 1(1), 7–18.
- Zhao, F., Scheruhn, H.-J., & von Rosing, M. (2014). The impact of culture differences on cloud computing adoption. *Human-computer interaction. Applications and services*. Springer, 776-785.
- Zhu, K., & Kraemer, K. L. (2002). E-commerce metrics for net-enhanced organizations: Assessing the value of e-commerce to firm performance in the manufacturing sector. *Information Systems Research*, 13(3), 275-295.
- Zhu, K., & Kraemer, K. L. (2005). Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry. *Information Systems Research*.
- Zhu, K., Kraemer, K. & Xu, S. (2003). Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors. *European Journal of Information Systems*, 12(4), 251–268.

- Zhu, K., Kraemer, K. L., & Xu, S. (2006). The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on E-Business. *Management Science*, 52(10), 1557–1576.
- Zhu, K., Kraemer, K.L., Xu, S. & Dedrick, (2004). Information technology payoff in e-business environments: an international perspective on value creation of e-business in the financial services industry. *Journal of Management Information Systems*, 21, 17-54.
- Zhu, Y. Li, Y., Wang, W.Q., & Chen, J. (2010). What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry, *Int. J. Inf. Manage.*, 30, 265–276
- Zikmund, W. G. (2003). *Business Research Methods*. Oklahoma: South-Western
- Zissis, D., & Lekkas, D. (2012). Addressing cloud computing security issues. *Future Generation Computer Systems*, 28(3), 583-592
- Zoogah, D. B. (2016). Tribal diversity, human resources management practices, and firm performance. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 33(3), 182-196.



Appendix A

The interview Questions in English and Arabic

Cloud Computing Adoption Semi-Structured Interviews Script: - English version

Institution's Background:

1. Can you please tell us about your institution's background? (Number of employees/ main services industry/ Years since establishment...)
2. Why has your institution's decided to use / not to use cloud computing services?

Impact of TOE Factors on Cloud Computing Adoption:

For clarity and easy understanding, the semi-structured questions will be carefully drafted and categorized as thus: Technological, Organisational and Environmental.

3. How do you think the technological factors could impact the cloud computing adoption in the higher educational institutions of Yemen particularly in your university? And why
4. What is the impact of (relative advantage, security, compatibility, complexity, and reliability, cost) on the adoption of cloud computing?
5. What organisational factors do you think may impact the adoption of cloud computing in your university ? and Why?
6. What is the impact of (firm size, top management support, technology readiness) in the adoption of cloud computing for Yemenis and related to your institution?
7. What environmental factors would impact the cloud computing adoption in your university? Why?
8. What could be the impact of (regulatory policy, peer pressure, government support, culture) in the adoption of the cloud computing in your university?

Cloud Computing Adoption Semi-Structured Interviews Script- Arabic Version

لقابل قulus فيتن بن في حوس بـ قلساجي ة

نقفي ة ل هف س ة:

1. ملي مك من أنت يخن عن خفي ة ئهس س ة؟ (عدا لع املع ين من ناع ةالخدمات لليسي ة الشروات فـ هـذ
للأسـيس ...)؟
2. لم اذا قررت ئهـس س ة اـسـتـخدـام / عدم اـسـتـخدـام خـدمـاتـالـجـسـنـسـ ؟

عوامل لـلـثـغـرـ عـلـىـ بـنـىـ لـلـجـسـنـسـ قـلـسـاجـيـ ةـ TOE

1. من أـجلـاـلـوضـوـحـوسـهـولـاـفـمـفـإـنـاـ ةـ شـهـالـفـيـظـمـهـيـتـصـيـاـيـهـاـ وـتـصـرـفـهـاـعـلـىـلـنـحـوـ
الـتـلـاـيـ:ـالـقـبـيـةـ وـالـقـنـظـيـةـ وـالـبـيـهـيـةـ.
2. لـيـفـعـنـعـقـدـأـنـالـعـوـاـمـلـالـتـلـوـلـوـجـيـهـيـلـكـنـأـنـتـشـرـعـلـىـاعـمـادـالـجـسـنـسـقـيـئـهـسـاسـتـعـلـىـعـيـمـ
الـعـلـيـفـيـالـيـهـنـوـخـصـقـيـجـامـعـكـ.ـولـمـاـذاـ؟
3. مـاـوـهـتـنـفـيرـالـبـيـزـةـالـسـيـةـ،ـوـاـمـنـ،ـوـالـنـفـقـ،ـوـالـتـهـيـدـ،ـوـلـمـوـرـقـيـةـ،ـوـلـلـكـنـقـيـةـ(ـلـيـعـيـاعـمـادـالـجـسـنـسـ
لـسـجـلـيـهـ)ـ؟ـ
4. مـاـهـيـالـعـوـاـمـلـالـقـنـظـيـهـاـلـتـجـيـتـنـعـقـدـأـلـهـاـقـتـشـرـلـيـعـيـاعـمـادـالـسـجـبـذـالـجـسـنـسـقـيـجـامـعـكـ؟ـولـمـاـذاـ؟ـ
5. مـاـوـهـتـنـفـيرـ(ـحـجـطـلـاشـرـكـةـ،ـدـعـمـاـرـةـلـهـلـيـاـ،ـلـجـاهـنـيـةـالـقـبـيـةـفـيـيـتـبـيـيـالـجـسـنـسـقـيـالـيـهـنـ
وـالـتـعـلـقـقـبـؤـسـسـتـكـ؟ـ
6. مـاـالـعـوـاـمـلـالـبـيـهـيـةـاـلـتـجـيـتـنـعـقـدـأـلـهـاـقـتـشـرـلـيـعـيـاعـمـادـالـجـسـنـسـقـيـجـامـعـكـ؟ـلـمـاـذاـ؟ـ
7. مـاـوـهـتـنـفـيرـالـبـيـزـةـالـسـيـةـوـضـغـطـرـانـوـلـدـعـمـالـجـكـوـمـيـفـيـلـيـقـلـفـةـفـيـاعـمـادـالـجـسـنـسـ
لـسـجـلـيـفـيـجـامـعـكـ؟ـ

Appendix B

The Questionnaire English Version (Instrument)



**COLLEGE OF ARTS AND SCIENCES
UNIVERSITI UTARA MALAYSIA**

SURVEY ON CLOUD COMPUTING ADOPTION

Dear Respected Respondent,

We are conducting a survey regarding cloud computing adoption by higher education institutions in Yemen. Because you are one of the participants in this study that is expected to be in a decision-making position related to the adoption of cloud computing resources at your institution, thus we would like to invite you to participate in this survey. Basically the purpose of the study is to determine the factors related to cloud computing adoption by higher education institutions in Yemen. We are interested in your thoughts and opinions about cloud computing adoption at your institution.

Please tick () the most appropriate answer or write your rating accordingly. You are advised to answer the questions based on your knowledge and experience. We would appreciate it very much if you could answer the questions carefully as the information you provide will influence the accuracy and the success of this research. It will take around 20 minutes to complete the questionnaire. All answers will be treated as strictly confidential and will be used for the purpose of the study only.

Thank you for your cooperation and the time taken in answering this questionnaire. If you have any questions regarding this research, you may address them to us at the contact details below.

Abdullah Hussein Alghushami
Ph.D. Candidate
School of Computing
College of Art and Science
Universiti Utara Malaysia
06010 Sintok
Kedah
MALAYSIA

SECTION I: DEMOGRAPHIC INFORMATION

A. Respondent's Background

1. What is your gender?

Male Female

2. Please specify your age range:

18-25 26-35
 36-50 51-65
 more than 66

3. What is your highest level of education?

Associate Degree
 Bachelor's Degree
 Master's Degree
 Doctoral Degree
 Other (please specify): _____

4. How many years of work experience do you have?

Less than 2 years
 3 to 5 years
 6-10 years
 11-20 years
 More than 21 years

5. What is your position or title at your institution?

CIO IT Director/ Manager
 CTO General Supervisor
 President IT strategist
 VP of IT Other (please specify): _____
 Dean Of Computing School

6. What is your University?

| | | |
|---|--|---|
| <input type="checkbox"/> Aden University | <input type="checkbox"/> Ibb University | <input type="checkbox"/> Sabaa University |
| <input type="checkbox"/> Amran University of Technology | <input type="checkbox"/> Sana'a University | <input type="checkbox"/> Al-Ahgaff University |
| <input type="checkbox"/> Dhamar University | <input type="checkbox"/> Taiz University | <input type="checkbox"/> Yemeni University |
| <input type="checkbox"/> Hadhramout University | <input type="checkbox"/> 21 September University | <input type="checkbox"/> Universal University |
| <input type="checkbox"/> Hajja University | <input type="checkbox"/> Albayda University | <input type="checkbox"/> National University |
| <input type="checkbox"/> Hodeidah University | <input type="checkbox"/> Shabwa university | <input type="checkbox"/> Arwa University |
| <input type="checkbox"/> University of Sciences and Technology | <input type="checkbox"/> Lebanese International University | <input type="checkbox"/> Arabia University |
| <input type="checkbox"/> University of Modern Sciences | <input type="checkbox"/> Al-Eman University | <input type="checkbox"/> Dar Salam University |
| <input type="checkbox"/> Azal university for human development | <input type="checkbox"/> Al-Nasser University | <input type="checkbox"/> Yemen University |
| <input type="checkbox"/> University of Applied and Social Sciences | <input type="checkbox"/> Al-Andalous University | <input type="checkbox"/> Universal University |
| <input type="checkbox"/> Ittehad University Yemen | <input type="checkbox"/> British University | <input type="checkbox"/> |
| <input type="checkbox"/> Limkokwing University of Creative Technology - Yemen | <input type="checkbox"/> International University of Technology Twintech | <input type="checkbox"/> Arwa University |

7. Are you responsible for making decisions regarding the adoption of cloud computing?

[] Yes

No []

8. Is your institution public or private?

[] Public

[] Private

B. Institution's Background

9. What is the number of full-time students at your institution?

[] less than 3000

[] 2000 – 10000

[] 10001 – 14999

[] 15000 – 19999

[] 20000 or more

10. How many full-time employees currently work at your institution?

[] 500 or less

[] 5001 – 2000

[] 2001 – 10000

11. Which of the following resources and services are utilized by your institution?

Check all that apply.

[] E-mail

[] online collaboration or conferencing

[] File Sharing

[] cloud based anti-virus and anti-spam service

[] File backup and storage

[] Online learning management system

[] website hosting

[] cloud based databases

[] Student Record management

[] Other (please specify): _____

SECTION II: CLOUD COMPUTING ADOPTION

1. At what stage of cloud computing adoption is your institution currently involved in?

[] Not accounting for the cloud computing

[] Used to evaluated but have not planned for adopting cloud

[] Evaluating cloud computing

[] Have evaluated and planned for adoption

[] Already adopted cloud computing

2. If you're anticipating that your institution will adopt cloud computing in the future, for how long do you think it will happen?

[] Not considering

[] More than 5 years

[] Between 2 and 5 years

[] Between 0 and 2 years

[] already adopted

SECTION III: FACTORS OF CLOUD COMPUTING ADOPTION

A. Technology Factors

Relative Advantage (TF-RA)

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| 1. Cloud computing can curtail the time for Information Systems. (TFRA1) | | | | | |
| 2. Using cloud computing permits us to perform specific tasks more quickly. (TFRA2) | | | | | |
| 3. Cloud computing can lessen IT expenses. (TFRA3) | | | | | |
| 4. The use of cloud computing enable people to seize new educational and research opportunities. (TFRA4) | | | | | |
| 5. Cloud computing allows us to manage business operations in an efficient way. (TFRA5) | | | | | |
| 6. The use of cloud computing services improves the quality of operations. (TFRA6) | | | | | |

Security

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Our institution is concern about data security of the cloud computing. (TFSEC1) | | | | | |
| 2. Our institution is concern about privacy in cloud computing. (TFSEC2) | | | | | |
| 3. Our institution is concern with no loss or manipulation of the data by online criminals or hackers. (TFSEC3) | | | | | |
| 4. Our institution is concern with no-usage of the official data for commercial benefits by cloud providers. (TFSEC4) | | | | | |
| 5. Our institution is concerned that cloud computing data is not kept private. (TFSEC5) | | | | | |

Compatibility

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| 1. Cloud computing is suitable with our institution's IT infrastructure. (TFCOM1) | | | | | |
| 2. Using Cloud Computing is compatible with our institution's culture. (TFCOM2) | | | | | |
| 3. Cloud computing adoption is compatible with our preferred work practice. (TFCOM3) | | | | | |
| 4. The use of cloud computing technologies fits well with the way we operate. (TFCOM4) | | | | | |
| 5. Cloud computing is compatible with our institution's current hardware and software infrastructure. (TFCOM5) | | | | | |

Reliability:

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| 1. Cloud computing is act as an excellent 'backup' for my institutions data against hard-disk crash.(TFREL1) | | | | | |
| 2. Cloud computing is act as an excellent disaster recovery (in-case of an unforeseen event) with uninterrupted access.(TFREL2) | | | | | |
| 3. Cloud computing offers reliable 'storage' solution for my institution's data instead of thumb drive (USB) or portable hard disk.(TFREL3). | | | | | |
| 4. Cloud computing offers high uptime and availability of the cloud services round the clock. .(TFREL4). | | | | | |
| 5. The cloud computing service provider has the ability to recover our institution's data safely even if it gets corrupted due to spam or malware attack. .(TFREL5). | | | | | |

Top Management Support:

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 1. The institution's top management advocates the implementation of cloud computing.(OFTMS1) | | | | | |
| 2. The institution's top management demonstrates strong leadership and gets involved in the process with respect to cloud computing.(OFTMS2) | | | | | |
| 3. The institution's management is willing to take the risks (financial and organizational) involved in the cloud computing adoption.(OFTMS3) | | | | | |
| 4. The institution's top management is aware of the benefits of cloud computing.(OFTMS4) | | | | | |
| 5. The institution's top management is likely to consider the adoption of cloud computing as strategically important.(OFTMS5) | | | | | |
| 6. the institution's top management provides resources to adopt cloud computing .(OFTMS6) | | | | | |
| Technology Readiness: | | | | | |
| Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree. | | | | | |
| 1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 1.. Our institution knows how cloud computing can be used to support our operations.(OFTR1) | | | | | |
| 2. Our institution have the necessary technical, managerial and other skills to implement cloud computing.(OFTR2) | | | | | |
| 3. Our institutional values and norms support the adoption of cloud computing in our operations. .(OFTR3) | | | | | |
| 4. Our institution have sufficient technological resources to implement cloud computing--high bandwidth connectivity to the internet. .(OFTR4) | | | | | |
| 5. Our institution hires highly specialized or knowledgeable personnel for cloud computing. .(OFTR5) | | | | | |

Regulatory Policy:

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Our country's law and regulation facilitate the use of cloud computing.(EFRP1) | | | | | |
| 2. Our country's laws and regulation today are sufficient to protect the use of cloud computing. .(EFRP2) | | | | | |
| 3. Our government is providing us with incentives to adopt cloud computing technologies. (EFRP3) | | | | | |
| 4. Our government is active in setting up the facilities to enable cloud computing. (EFRP4) | | | | | |
| 5. Our institution is under pressure from some government agencies to adopt cloud computing technology. (EFRP5) | | | | | |
| 7. Current laws and regulations do not allow us to utilize cloud computing resources and services hosted outside our country. (EFRP6) | | | | | |

Competitive Pressure:

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Our institution thinks that cloud computing has an influence on competition. (EFCP1) | | | | | |
| 2. Our institution is under pressure from competitors to adopt cloud computing. (EFCP2) | | | | | |
| 3. Some of our competitors have already started using cloud computing. (EFCP3) | | | | | |

Culture:

Please mark (✓) regarding your agreement or disagreement on each of the following statements based on a scale ranging from strongly disagree to strongly agree.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5=Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| | | | | | |

| | | | | |
|--|--|--|--|--|
| 1. The identity of my tribe is an obstacle for getting an atmosphere of trust toward cloud adoption in my institution (EFCUL1) | | | | |
| 2. The identity of my tribe could be an obstacle to consider my thoughts and ideas in my institution. (EFCUL2) | | | | |
| 3. Because of my tribe identity, that refrains me from providing suggestions nor making decision in my institution. (EFCUL3) | | | | |
| 4. The identity of my tribe could be an obstacle for sharing the data and personal privacy in my institution. (EFCUL4) | | | | |
| 5. The tribe culture influences the leaders' decision in your institution for adopting the cloud computing. (EFCUL5) | | | | |
| 6. Cloud computing adoption is an important need to the group rather than the individual's needs. (EFCUL6) | | | | |
| 7. Developing and adopting new technologies require more freedom and less tribe restrictions. (EFCUL7) | | | | |
| 8. Because of tribe identity, it is not easy to adopt cloud computing in higher education institutions. (EFCUL8) | | | | |
| 9. The Tribalism support team work in a way it will encourage working within Cloud computing environment. (EFCUL9) | | | | |
| 10. The influential people in the tribe should establish campaigns in the society to spread an awareness of adopting cloud computing and encourage using it. (EFCUL10) | | | | |

-----END OF SURVEY-----

Thank you for participating in the survey

Appendix C

The Questionnaire Arabic Version



**لئنيه الاداب فاعلوم
جامعة طه ارا لمهنيه**

اس بي ان جعل تبني ظيسن خدام احوسوب قلس صحابي

ا لبيكم ورحمة راكته

أونفي ليديه أن شركتم سفأ على لشي ارك هئي هذا استبي ان لذى رق وجبه حول تبنيي ملتقى خدام لحوسبه الساجي فيموسس اتلتنجي ملاعنه في لج مهويه لي هي، ون ظرالك ونكم من لشي اركين لفينق ديوصلوا لى منص بصنع لقرارفيتني بنيل حوس ب قال سجاي هئي هيفستكم، فلين ان دفعوكملتكرم ولمش لك هئي هذا ان وبلي مس بة، فان ل دف ا مليي من هذه ل دراسة هو تجي دالع وامللت ميت تصل بمس لتقبن ي لخوس ب قال ساجي هئي هيفيموسس اتلتنجي ملاعنه في لاي من فن حرف تطبع لمعرف تفلايكركم وآراءكم حول تبنيي استخدام حوس بة الساجي في سهيفستكم.

نرجو منكم موضع مة (٧) (أمام ١ جب قلت يتردون ١ سبلكم أوق ملتبقني يهمكم ووجهة نظركم. كما نرجو منكم ١ جبة على ١ لقب وقب حسب معنكم وخطكم ن لملي ومات لتي تقدموه اسنت عليه دوراً هامفي في فرجاح هذا لبحث. وسنأخذ ١ جبة على لطيفه استبي ان حولي ٢٠ فرقه من فتكم لكريم، غير ما بأن اجلت شفيعي تطلع امل مع ملمسن ية خصوصية تامة فلي تلمسن خدا مهـا غراض هذه ل دراس فقـط.

شكركم على جعن تعاوكم وتخربي صجزء من فتكم جبة على هذا استبي ان. إذا كان لديكم أي ملمس ارات حول هذه لج بثملينكم الاتوض ولمعن عرب لب بري دلكتون ي (a_ghashami02@yahoo.com)

عب لغنا مي

طلب لكتوراه

قيلم حوس بة

لعي ب ولاعه و م

جامعه أوتارا لفانيه

06010

لفانيه

- [ن عم] 8. هل ل مهني قليت عمل به اح��وي ة أم عص ة؟
- [[خلس ة]] [جڪوي ة]]
- ب. بيانات مهني س ة**
9. كم عدد ل ب ل مهني بن بلن ظام هن تظفيوس س تك؟
- [[2000]] [أقل من 2000]]
- [[10000-2000]] [14999 - 10001]]
- [[19999 - 15000]] [19999 - 15000]]
- [[20000 أو أكثر]] [20000 أو أكثر]]
10. كم عدد ل موقعين ل مهني حافي في مفسيت ة؟
- [[500]] [أو أقل 500]]
- [[1000 - 501]] [1000 - 501]]
- [[2000 - 1001]] [2000 - 1001]]
- [[5000 - 2001]] [5000 - 2001]]
- [[10000 - 5001]] [10000 - 5001]]
11. أي من لمصادر ول خدمات ة تستخد مهني س تك؟
- ختركل ملين طبق.
- [[البو لكترون ي]] [البو لكترون ي]]
- [[مشارك ظلبات]] [مشارك ظلبات]]
- [[المرغبة]] [المرغبة]]
- [[تخفين ظلبات وعملن سخ اخي اطيق ل]] [تخفين ظلبات وعملن سخ اخي اطيق ل]]
- [[اوصياف ةال موقع]] [اوصياف ةال موقع]]
- [[إدارة سجل الطلب]] [إدارة سجل الطلب]]

ل جزء شل يبيسي يلاح وسی قلس جاي ة

1. لى اي مرحلة وصلت لاي جرس سفت ة تبني في حوس بة الساجي ة؟
- [[بت ظرف بيتن يال ج رس ئاس حلي]] [بت ظرف بيتن يال ج رس ئاس حلي]]
- [[ق اهستيبي ملوضع ع لم حططهن يال ج رس ئاس حلي]] [ق اهستيبي ملوضع ع لم حططهن يال ج رس ئاس حلي]]
- [[ق عمل حافي يقييم لاح وس ئاس حلي]] [ق عمل حافي يقييم لاح وس ئاس حلي]]
- [[اق اهستيبيم وخطت لفني يال ج رس ئاس حلي]] [اق اهستيبيم وخطت لفني يال ج رس ئاس حلي]]
- [[اق اهستيبين يال ج رس ئاس حلي]] [اق اهستيبين يال ج رس ئاس حلي]]
2. الذن تتتفق ع أئمه تك ستق وقم بن في حوس بة الساجي قي هن تبلغكم س تجاج من لقت لق ونم
- بل ؟
- [[توظفي ا مر]] [توظفي ا مر]]
- [[ائثر من 5 سنوات]] [ائثر من 5 سنوات]]
- [[بين 2 لى 5 سنوات]] [بين 2 لى 5 سنوات]]
- [[بين 0 لى 2 سنوات]] [بين 0 لى 2 سنوات]]
- [[اهستيبين يال ج رس ئاس حلي]] [اهستيبين يال ج رس ئاس حلي]]

ل جز ملثلث: عوامت بینی لاح و سریب قلنسوایی

عوامل تأثیر جی ا 4

| | | | | | لفومن ذات لصله |
|-------|---|---|---|---|--|
| | | | | | يدجي وض عال |
| | | | | | (ا) أمام درجة مهلكتك من عدمها أمامك من لعيارات انتي فرق الله في اس انتي: |
| 5 | 4 | 3 | 2 | 1 | = 1 أفق بشدة |
| | | | | | 1 يي لكن حوسن جليق قتل لهم من لز من الذي ستر غرفة ل ظمة المعلم و مات |
| | | | | | 2 است خدام ال حوسن جليق سحب أداء ال ملهمش ملأس رع. |
| | | | | | 3 قتله صالح حوسن جليق من تاكيل قتلن ولو جي ال معلم و مات |
| | | | | | 4 است خدام ال حوسن جليق من تاكيل فرطين تاعيبيه من قتله فالج حبيه |
| | | | | | 5 بفتح لف ل حوسن جليق إمكانيه ادار فالعلمي انتبه فعال. |
| | | | | | 6 است خدام ال حوسن جليق حسن من جوده ال علمي ات. |
| | | | | | 1 هفيه |
| | | | | | يدجي وض عال |
| | | | | | (ا) أمام درجة مهلكتك من عدمها أمامك من لعيارات انتي فرق الله في اس انتي: |
| 5 | 4 | 3 | 2 | 1 | = 1 وفق بشدة |
| | | | | | 1 لدى مؤسستي ببعض المخاوف حول مدى أهمية ال معلم و انتبه حوسنة لحس جليق. |
| | | | | | 2 لدى مؤسستي ببعض المخاوف إزاء خصوصي فالعلم و انتبه حوسنة لحس جليق. |
| | | | | | 3 لدى مؤسستي ببعض المخاوف إزاء تفاقم دان العيارات أو ال تفاصيل في ال جرام او الخطر قوى. |
| | | | | | 4 لدى مؤسستي ببعض المخاوف إزاء است خدام العيارات الوسفيه غراض تجاري في قبل مزودي خدام انتله حوسن جليق. |
| | | | | | 5 لدى مؤسستي ببعض المخاوف إزاء حول عدم المكانية اظ بخصوصي للعيارات في ال حوسن جليق |
| لتفوق | | | | | |
| | | | | | يدجي وض عال |
| | | | | | (ا) أمام درجة مهلكتك من عدمها أمامك من لعيارات انتي فرق الله في اس انتي: |
| 5 | 4 | 3 | 2 | 1 | = 1 أفق بشدة |
| | | | | | 1 بتعمل حوسن جليق لبيه قتله لعيارات ولو جي ال معلم و مات تلاميذ عظيم حوسنة. |
| | | | | | 2 يع مدليت خدام ال حوسن جليق نتفقا مع عقوله مؤسستي. |

| | | | | | |
|---|--------|---------|--------|--------------|---|
| | | | | | 3 يعهني لحوسة السجليه تتفق مع ممارسات أعمالنا الشائعة. |
| | | | | | 4 يعدها من خدام تقنيات لحوسبة السجليه مئماً وبذلك أطريق عملنا بتقنية. |
| | | | | | 5 بعمل حوسبي ظاس سجليه تفقة مع ا متز والبرمجهات والبيانات بخيه للتحفه حله الالدي مؤسستنا. |
| ل موضوع | | | | | |
| يرجى وضع عالع (٧) أمام درج فهمتك من عدمها أمام كل من البارات انتي فرق الله تعالى اس انتي: | | | | | |
| =1 أفق بشدة | =2 أفق | =3 محلد | =4 أفق | =5 وأفق بشدة | |
| 5 | 4 | 3 | 2 | 1 | |
| | | | | | 1 بعمل لاحوسبي ظاس سجليه ذلك خيار هنوز لعمل سخ ايجي اطيه من بيلان ملمسه في حال حدوث تحمل اوناضراب راصلا اصليه. |
| | | | | | 2 بعمل لاحوسبي ظاس سجليه ذلك خيار هنها ترجال العيلات دون أي عوظنه(في حال وقوع حدث غير مرتفع) |
| | | | | | 3 بقدم لاحوسبي سجليه ح افضل و موثيق اتخفيه لعيارات التبعه للهؤلين قبده من شات(USB) او راص الصليب ظالم حموله. |
| | | | | | 4 بفرالاحوسبي ظاس سجليه مدقش خليل عاليه وخدمات سجليه على مدار الساعه. |
| | | | | | 5 بيمثلك مزودي خدماتي لاحوسبي ظاس سجليه القدرة على ترجماعييلات مؤسستنا بأمان حتى ولو حدث لها أي مثلي فبس بيلفات خير مرغوب بها أو غيرها. |

ب) اعمال لاحظي هة

| | | | | | |
|--|--------|---------|--------|--------------|--|
| | | | | | دعماً داراً لاحظي ها |
| يرجى وضع عالع (٧) أمام درجة مفهوك من عدمها أمام كل من البارات انتي فرق الله تعالى اس انتي: | | | | | |
| ل ادنى ة لاحظي هة | | | | | |
| =1 أفق بشدة | =2 أفق | =3 محلد | =4 أفق | =5 وأفق بشدة | |
| 5 | 4 | 3 | 2 | 1 | |
| | | | | | 1 تبويدي ا الرعوي يا في موسسيتنا امسال قتاعي قال ح س، ظاس سجليه. |
| | | | | | 2 تبويدي ا الرعوي يا في موسسيتنا اداه جيء از الماحوسبي ظاس سجليه وتعمل علعن فيزدا. |
| | | | | | 3 بترغب إداره الاحوسبي حمل المخاطر الهماليه وللتقطي هه(المتعلقه بيئي بالاحوسبي ظاس سجليه). |
| | | | | | 4 تدرك ا راق عليل الموسسي فلوي بطا لاحوسبي ظاس سجليه. |
| | | | | | 5 بترغب ا راق عليل الموسسي فبيتن عل لاحوسبي ظاس سجليه اكتين ها ذات امهاتي هجي. |
| | | | | | 6 كوفرا راق عليل موس فل مصادر زهقنيي الاحوسبي ظاس سجليه. |
| ل ادنى ة لاحظي هة | | | | | |
| يرجى وضع عالع (٧) أمام درج فهمتك من عدمها أمام كل من البارات انتي فرق الله تعالى اس انتي: | | | | | |

| | | | | | أفق بشدة = 1 | أفق محيـد = 2 | أفق = 3 | محيـد = 4 | أفق بشدة = 5 |
|----------|----------|----------|----------|----------|--|----------------------|----------------|------------------|---------------------|
| 5 | 4 | 3 | 2 | 1 | | | | | |
| | | | | | ١. تدرك مؤسساتي في مكان استخراج الماء حوض مائي جليـة لدعم عمليـة. | | | | |
| | | | | | ٢. تتطلب المؤسسات المائية والري والماء زمة لتطهير قاع حوض مائي. | | | | |
| | | | | | ٣. بدعم من مبادئ نوتروج هام المؤسسات افضلية قاع حوض الماء الجليـة عمليـة. | | | | |
| | | | | | ٤. تتطلب المؤسسات المائية والري والري قاع حوض مائي جليـة، نقل المياه بسرعة لتصريفها بسرعة عرض الماء الماء الماء. | | | | |
| | | | | | ٥. يتحقق وظائف المؤسسات المائية والري قاع حوض مائي جليـة. | | | | |

ج. عوامل بيـئة لـحـيـة

| | | | | | لبيـات لـقـطـيـة = 1 | يدـجيـة وضعـالـع = 2 | أـفـقـيـة = 3 | مـحـيـدـيـة = 4 | أـفـقـيـة = 5 |
|------------------------|----------|----------|----------|----------|--|-----------------------------|------------------------|------------------------|----------------------|
| 5 | 4 | 3 | 2 | 1 | | | | | |
| | | | | | ١. تتسارع ملحوظة في انتشار خدام حوض مائي جليـة. | | | | |
| | | | | | ٢. تتعذر قدرة النباتات على تحمل التغيرات المناخية التي تؤدي إلى تغييرات في حوض مائي جليـة. | | | | |
| | | | | | ٣. تتحقق دعم الماء الجليـة ونوع الماء الجليـة في حوض مائي جليـة. | | | | |
| | | | | | ٤. تتعذر قدرة النباتات على تحمل التغيرات المناخية التي تؤدي إلى تغييرات في حوض مائي جليـة. | | | | |
| | | | | | ٥. تتسارع دعم الماء الجليـة في حوض مائي جليـة. | | | | |
| | | | | | ٦. يتعذر انتشار النباتات في قدرة الماء الجليـة على تحمل التغيرات المناخية التي تؤدي إلى تغييرات في حوض مائي جليـة. | | | | |
| لـضـغـطـيـة = 1 | | | | | | | | | |
| | | | | | يدـجيـة وضعـالـع = 1 | أـفـقـيـة = 2 | مـحـيـدـيـة = 3 | أـفـقـيـة = 4 | أـفـقـيـة = 5 |
| 5 | 4 | 3 | 2 | 1 | | | | | |
| | | | | | ١. تتعذر قدرة المؤسسات على حوض مائي جليـة بسبب التغيرات المناخية. | | | | |
| | | | | | ٢. تتعذر قدرة المؤسسات على حوض مائي جليـة بسبب التغيرات المناخية. | | | | |
| | | | | | ٣. تتعذر قدرة المؤسسات على حوض مائي جليـة بسبب التغيرات المناخية. | | | | |

مئوفقة

يرجى وضع عالع (٧) أمام درجة مهافتك من عدمها أمام كل من لعيارات انجية فوق الـ في اس انتي:
 ٥ = أفق بشدة ٤ = أفق ٣ = ملحوظ ٢ = أفق بشدة

| 5 | 4 | 3 | 2 | 1 | |
|---|---|---|---|---|---|
| | | | | | ١ تحد حية قليلاً جنباً ج والمنطقة ن حيث يال ح وسب ظلس جلية في المؤسسات التي أعملها. |
| | | | | | ٢ وتناهنون هي قليلاً بسيطة في غضون اكالت ياقدها في الموسسات التي أعملها ملخص وصريح على ح وسب ظلس جلية. |
| | | | | | ٣ تشجعني هي قليلاً على تقييم أحقتر حات واتخاذ أي قرارات في الموسسات التي أعملها ملخص وصريح على ح وسب ظلس جلية. |
| | | | | | ٤ بتعارض هي قليلاً مش راكه اليهيلات لياخ صريح قليلاً في المؤسسات التي أعملها. |
| | | | | | ٥ تؤدي المفهوم العلوي قراراتي ايجي في المؤسسات التي أعملها بخصوص وصريح على ح وسب ظلس جلية. |
| | | | | | ٦ هي عقلي ال ح وسب ظلس جلية حاجة مسأله جماعة لغير ما في ل راد. |
| | | | | | ٧ هي طلاق طهر هن يتألف لوجيات جيدة وحيث المزيد من ال حرية لولت حرر نب عطلاقي وللقطلي ف. |
| | | | | | ٨ سباليه القليعة فناء ليس من السمات التي يال ح وسب ظلس جلية في موسسة التعليم العالي. |
| | | | | | ٩ تعم المقلعي فالح ملأ حماعي إلى لاح دال ذي شجاع على الحلفي يعني تسهيل ح وسب ظلس جلية. |
| | | | | | ١٠ هي خليل شخصيات للفترة في التهيلة أتش جعلى تشن ح ت في المتحم علش الدوعي حول أمي قتبني على اح وسب ظلس جلية وليش جمع على اسنة خدامها. |

ان بـ

نـ هـ

نـ شـ كـ رـ كـ غـ ئـ اـ لـ مـ شـ رـ كـ قـ يـ هـ بـ يـ انـ !

Appendix D

The Pilot Study Validity Test

Correlations

| | | RP | SEC | COM | REL | TR | RA | CP | CUL | TMS_ |
|-----|---------------------|--------|--------|--------|--------|--------|----|----|-----|------|
| RP | Pearson Correlation | 1 | | | | | | | | |
| | Sig. (2-tailed) | | | | | | | | | |
| | N | 35 | | | | | | | | |
| SEC | Pearson Correlation | .553** | 1 | | | | | | | |
| | Sig. (2-tailed) | .001 | | | | | | | | |
| | N | 35 | 35 | | | | | | | |
| COM | Pearson Correlation | .669** | .796** | 1 | | | | | | |
| | Sig. (2-tailed) | .000 | .000 | | | | | | | |
| | N | 35 | 35 | 35 | | | | | | |
| REL | Pearson Correlation | .683** | .840** | .815** | 1 | | | | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | | | | | | |
| | N | 35 | 35 | 35 | 35 | | | | | |
| TR | Pearson Correlation | .591** | .861** | .831** | .865** | 1 | | | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | | | | | |
| | N | 35 | 35 | 35 | 35 | 35 | | | | |
| RA | Pearson Correlation | .541** | .857** | .788** | .713** | .781** | 1 | | | |
| | Sig. (2-tailed) | .001 | .000 | .000 | .000 | .000 | | | | |
| | N | 35 | 35 | 35 | 35 | 35 | 35 | | | |

| | | | | | | | | | | |
|-----|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|----|
| CP | Pearson Correlation | .462** | .583** | .672** | .675** | .596** | .622** | 1 | | |
| | Sig. (2-tailed) | .005 | .000 | .000 | .000 | .000 | .000 | | | |
| | N | 35 | 35 | 35 | 35 | 35 | 35 | 35 | | |
| CUL | Pearson Correlation | -.573** | -.837** | -.821** | -.746** | -.797** | -.949** | -.732** | 1 | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | |
| | N | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | |
| TMS | Pearson Correlation | .308 | .416* | .634** | .435** | .502** | .421* | .759** | -.597** | 1 |
| | Sig. (2-tailed) | .072 | .013 | .000 | .009 | .002 | .012 | .000 | .000 | |
| | N | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).



Appendix E

The Pilot Study Reliability Test

| Constructs | Cronbach's Alpha Value |
|------------|------------------------|
| SEC | 0.949 |
| RA | 0.710 |
| COM | 0.897 |
| REL | 0.888 |
| TMS | 0.741 |
| TR | 0.868 |
| RP | 0.923 |
| CP | 0.804 |
| CUL | 0.945 |
| CCA | 0.951 |

Source: The researcher

Sec= Security, RA= Relative advantage, COM= Compatibility, REL = Reliability, TMS = Top management support, TR = Technology readiness, RP= Regulatory policy, CP= Competitive pressure, CUL = Culture , CCA = Cloud Computing Adoption

Appendix F

The List of Higher Education Institutions in Yemen

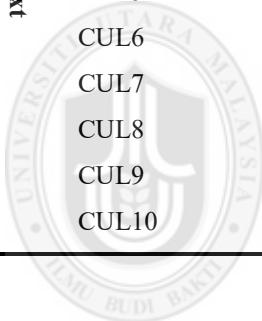
| No. | Institution | Type | State |
|-----|---|---------|------------|
| 1 | Aden University | Public | Aden |
| 2 | Amran University of Technology | | Amran |
| 3 | Dhamar University | | Dhamar |
| 4 | Hadhramout University | | Hadhramout |
| 5 | Hajja University | | Hajja |
| 6 | Hodeidah University | | Hodeidah |
| 7 | Ibb University | | Ibb |
| 8 | Sana'a University | | Sana'a |
| 9 | Taiz University | | Taiz |
| 10 | 21 September University | | Sana'a |
| 11 | Albayda University | | Albayda |
| 12 | Shabwa university | | Shabwah |
| 13 | Sabaa University | | Marib |
| 14 | Al-Ahgaff University | Private | Hadhramout |
| 15 | Yemeni University | | Sana'a |
| 16 | University of Sciences and Technology | | Sana'a |
| 17 | University of Modern Sciences | | Sana'a |
| 18 | Azal university for human development | | Sana'a |
| 19 | Universal University | | Sana'a |
| 20 | University of Applied and Social Sciences | | Sana'a |
| 21 | Ittehad University Yemen | | Sana'a |
| 22 | Queen Arwa University | | Sana'a |
| 23 | National University | | Sana'a |
| 24 | Limkokwing University of Creative Technology - Yemen | | Sana'a |
| 25 | Lebanese International University (Yemen) Lebanese International University | | Sana'a |
| 26 | Al-Eman University | | Sana'a |
| 27 | Al-Nasser University | | Sana'a |
| 28 | Al-Andalous University for Technical Sciences | | Taiz |
| 29 | British University in Yemen | | Sana'a |
| 30 | Future University - Yemen | | Sana'a |
| 31 | International University of Technology Twintech - Yemen | | Sana'a |
| 32 | Saba private university | | Sana'a |
| 33 | Emirates International University | | Sana'a |
| 34 | Arabia University | | Sana'a |
| 35 | Dar Salam University | | Sana'a |
| 36 | Hikma University | | Amran |
| 37 | Yemen University | | Sana'a |
| 38 | Al Saeeda University | | Damar |

Appendix G

The Variables Normality Test Result

| | Variable | Missing | Skewness | Kurtosis |
|------------------------|-----------------|----------------|-----------------|-----------------|
| Technology Context | CCA1 | 0 | -.600 | -.175 |
| | CCA2 | 0 | -.602 | -.565 |
| | RA - 1 | 0 | .002 | .390 |
| | RA - 2 | 0 | -.083 | -.098 |
| | RA - 3 | 0 | -.177 | .257 |
| | RA - 4 | 0 | -.062 | -.035 |
| | RA - 5 | 0 | -.210 | .100 |
| | RA - 6 | 0 | -.182 | -.334 |
| | SEC-1 | 0 | -.657 | .997 |
| | SEC-2 | 0 | -.480 | .667 |
| | SEC-3 | 0 | -.409 | .231 |
| | SEC-4 | 0 | -.208 | -.016 |
| | SEC-5 | 0 | -.569 | .716 |
| | COM-1 | 0 | -.220 | -.141 |
| Organizational Context | COM-2 | 0 | -.312 | .278 |
| | COM-3 | 0 | -.370 | .185 |
| | COM-4 | 0 | -.510 | .659 |
| | COM-5 | 0 | -.355 | .101 |
| | REL-1 | 0 | -.394 | .322 |
| | REL-2 | 0 | -.409 | .120 |
| | REL-3 | 0 | -.609 | .521 |
| | REL-4 | 0 | -.716 | .885 |
| | REL-5 | 0 | -.391 | .145 |
| | TMS-1 | 0 | -.516 | .075 |
| | TMS-2 | 0 | -.568 | .479 |
| | TMS-3 | 0 | -.157 | -.649 |
| | TMS-4 | 0 | -.194 | -.224 |
| | TMS-5 | 0 | -.531 | -.203 |
| | TMS-6 | 0 | -.458 | -.431 |
| | TR-1 | 0 | -.643 | .624 |
| | TR-2 | 0 | -.343 | -.100 |
| | TR-3 | 0 | -.328 | .038 |
| | TR-4 | 0 | -.319 | -.230 |

| Variable | Missing | Skewness | Kurtosis |
|-----------------|----------------|-----------------|-----------------|
| TR-5 | 0 | -.324 | -.136 |
| RP-1 | 0 | -.375 | .257 |
| RP -2 | 0 | -.470 | .430 |
| RP -3 | 0 | -.274 | -.025 |
| RP -4 | 0 | -.385 | .452 |
| RP -5 | 0 | -.185 | .241 |
| RP -6 | 0 | -.233 | .232 |
| CP - 1 | 0 | -.432 | 1.066 |
| CP - 2 | 0 | -.263 | .008 |
| CP - 3 | 0 | -.338 | .457 |
| CUL1 | 0 | .375 | .257 |
| CUL2 | 0 | .470 | .430 |
| CUL3 | 0 | .274 | -.025 |
| CUL4 | 0 | .385 | .452 |
| CUL5 | 0 | .185 | .241 |
| CUL6 | 0 | .231 | .222 |
| CUL7 | 0 | .460 | .494 |
| CUL8 | 0 | .388 | .221 |
| CUL9 | 0 | .516 | .075 |
| CUL10 | 0 | .568 | .479 |



Universiti Utara Malaysia

Appendix H

Publications

- Al-Ghushami, A. H., Zakaria, N. H., Aji, Z. M., (2018). Cloud Computing Adoption by Higher Education Institutions in Republic of Yemen: An Exploratory Study. *International Journal of Pure and Applied Mathematics (IJPAM)*, ISSN: 1311-8080 Vol No: Vol 119 – Issue 16 (October 2018)
- Al-Ghushami, A. H., Zakaria, N. H., Aji, Z. M., (2016). The Determinants Impacting the Adoption of Cloud Computing in Yemen Institutions. In *AIP Conference Proceedings* (Vol. 1891, No. 1, p. 020093). AIP Publishing.
- Al-Ghushami, A. H., Zakaria,. (2016). A Review of Factors Affecting Cloud Computing In Higher Education Institutions Based On Technology, Environment & Organization (Toe) Framework. *JOURNAL OF ENGINEERING AND APPLIED SCIENCES* ISSN: 1816-949X - EISSN: 1818-7803 (Scopus Index Journal)
- Gamal Abdulnaser Alkawsi, Nor'ashikin Bte. Ali, Al-Ghushami, A. H(2018). Toward Understanding Individuals' Acceptance Of Internet Of Things –Based Services: Developing An Instrument To Measure The Acceptance Of Smart Meters, *On Journal Of Theoretical And Applied Information Technology* (E-Issn 1817-3195 / Issn 1992-8645
- Al-Ghushami, A. H., Zakaria, N. H., Katuk, N., & Mohammed, A. (2015). Analysis of Single Sign-On Protocols from the Perspective of Architecture Deployment, Security and Usability. *Proceedings of Knowledge Management International Conference*, 545-550.
- Tahir, H. M., Al-Ghushami, A. H., & Yahya, Z. R. (2014). Selection of access network using cost function method in heterogeneous wireless network. *International Conference on Multimedia Computing and Systems (ICMCS)*, 2014 789-793. IEEE.
- Katuk, N., Zakaria, N. H., Shariff, A. A. M., Al-Ghushami, A., & Yusoff, M. H. (2013). Web information gathering processes for gold and silver price information. *International Conference on Research and Innovation in Information Systems (ICRIIS)*, 291-295. IEEE.