

**AN EVALUATION OF INFORMATION SYSTEM SUCCESS BASED  
ON STUDENTS' PERSPECTIVE: THE CASE OF HADRAMOUT  
UNIVERSITY**

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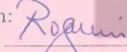
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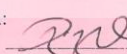
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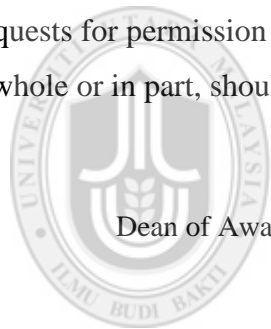
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## Abstrak

Penilaian sistem adalah bahagian yang penting dalam pembangunan sistem bagi meningkatkan prestasi sesebuah sistem. Walau bagaimanapun, kajian telah menunjukkan kurangnya penyelidikan terhadap penilaian kejayaan sistem maklumat di universiti-universiti di Yaman. Dapat juga diperhatikan bahawa banyak projek sistem maklumat yang dibiayai di Yaman telah siap dan dilaksanakan tanpa dibuat penilaian. Sistem Maklumat Pengurusan Pengajian Tinggi Yaman (YHEMIS) antaranya merupakan pembangunan aplikasi berskala besar dan telah dilaksanakan tanpa penilaian. Justeru, kajian ini menilai aplikasi YHEMIS dengan meneliti faktor-faktor yang mempengaruhi kepuasan pengguna dan penggunaan sistem yang akan memperlihatkan manfaat sistem berkenaan. Kajian ini mencadangkan model DeLone dan McLean dengan tambahan sokongan pengurusan sebagai faktor luaran untuk mengenal pasti apakah faktor yang mempengaruhi penggunaan YHEMIS dan begitu juga faktor yang menjejaskan kepuasan pengguna ketika menggunakan aplikasi. Tujuan kajian antara lain adalah untuk mengetahui sama ada pembangunan YHEMIS memberi manfaat kepada pelajar. Kajian ini menggunakan kaedah kuantitatif dengan mengagihkan borang soal selidik kepada pengguna (iaitu pelajar) YHEMIS di Universiti Hadramout. Kaedah pensampelan rawak berstrata digunakan, dan sebanyak 261 borang soal selidik telah dikumpulkan. Dapatan kajian menunjukkan bahawa kualiti maklumat, kualiti sistem dan sokongan pengurusan mempengaruhi penggunaan dan kepuasan pengguna serta memainkan peranan penting dalam kejayaan YHEMIS. Selain itu, hasil kajian menunjukkan bahawa kepuasan pelajar mempunyai kesan yang kuat ke atas faedah bersih persepsi yang dibawa YHEMIS untuk pelajar. Penyelidikan ini menyediakan data empirikal pertama terhadap penilaian kejayaan sistem maklumat yang dijalankan ke atas YHEMIS bagi sebuah universiti di Yaman. Berdasarkan keputusan kajian, pihak yang berkepentingan boleh mendapatkan maklum balas untuk menambah baik sistem dan memberi input untuk membangunkan projek-projek sistem maklumat. Dapatan kajian juga berupaya memberikan sokongan kepada pengurusan Universiti Hadramout terhadap projek-projek atas talian yang lain. Oleh itu, YHEMIS boleh dikatakan berjaya dan kepuasan pengguna (pelajar) boleh dianggap sebagai penanda aras kejayaan ke atas penggunaan sistem dan faedah bersih.

**Kata kunci:** DeLone dan McLean, Yemen, Mukalla, Universiti, Sistem Maklumat, Penilaian, Kejayaan, Sokongan Pengurusan, Pelajar.

## Abstract

Evaluation of systems is an important part of systems development to improve systems performance. However, studies showed a lack of research done on information system success evaluation in Yemen universities. It was also observed that many funded information system projects, in Yemen, were completed and implemented without evaluation. The Yemen Higher Education Management Information System (YHEMIS), is a large scale application developed and implemented without evaluation. Hence, this research evaluates the YHEMIS application by investigating into the factors that influence user satisfaction and system use which will further show the benefit of the system. This research endeavors to propose an evaluation DeLone and McLean model with the addition of an external factor management support to identify what factors influence the use of YHEMIS and likewise affect the user satisfaction when using the application. The aim of this study is to also to find out whether the development of YHEMIS is of benefit to the students. This study applies the quantitative approach to distribute questionnaires to users (students) of YHEMIS in Hadramout University. The stratified random sampling method was used, and 261 questionnaires were collected. The research findings showed that information quality, system quality and management support influenced the use and users satisfaction and played a vital role in the success of YHEMIS. The findings showed that students' satisfaction have the strongest effect on the perceived net benefits YHEMIS brought for the students. This study provides the first empirical data on the evaluation of information system success conducted on YHEMIS for a Yemen university. Based on the results, stakeholders can get the feedback to improve the systems and provide input to develop other information system projects. The research findings can provide the support to the management of Hadramout University to other online projects. Hence, YHEMIS can be said to be successful and users (students) satisfaction can be considered as the indicator of the success on system usage and net benefit.

**Keywords:** DeLone and McLean, Mukalla, University, Information System, Evaluation, Success, Management Support, Students.

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## Glossary of Terms

<b>Acronym</b>	<b>Definition</b>
IS	Information System
ISs	Information Systems
IT	Information Technology
ISD	Information Systems Development
DM	DeLone & McLean
HDI	Human Development Index
YHEMIS	Yemen Higher Education Management Information System
ICT	Information Communication Technology
SPSS	Statistical Package for the Social Science
PLS	Partial Least Squares



# CHAPTER ONE

## INTRODUCTION

Chapter one gives an idea about this study. This chapter describes the Background to the Problem Statement, Problem Statement, Research Questions and Objectives, Scope, and Significance of the study.

### 1.1 Overview

Information system (IS) research has been evolved from well-formed majors like (computer science, operational research, organizational behavior and administration). However, information systems (ISs), itself, cannot develop an individual discipline, even though; it is deemed as a valid applied research that supports the organizational process changes. Supporting deep understanding of IS needs analytical, empirical models and conceptual research (Irani, Gunasekaran & Love, 2006). Irani et al (2006), emphasized that IS had formidable impact in all parts of society including education, health, etc. IS life cycle begins with its creation and ends with its termination. Actually, information systems development (ISD) follows the IS life cycle.

ISD is a long process that is comprised of various stages and based on Cohen (2010), these stages are “requirements, analysis, design, coding, testing, installation, operation, maintenance and less emphasized retirement”. Based on Jirava (2004), “investigation, user requirements, analysis, design, implementation and release” are the stages of the IS life cycle. Thus, an information system can be initiated and implemented, but changes are needed from different stakeholders.

The contents of  
the thesis is for  
internal user  
only



## REFERENCES

- Agourram, H. (2009). Defining information system success in germany. *International Journal of Information Management*, 29(2), 129–137.
- Agourram, H., & Ingham, J. (2007). The impact of national culture on the meaning of information system success at the user level. *Journal of Enterprise Information Management*, 20(6), 641–656.
- Aladwani, A. M. (2002). Organizational actions, computer attitudes, and end-user satisfaction in public organizations: An empirical study. *Journal of Organizational and End User Computing (JOEUC)*, 14(1), 42–49.
- Alakklouk, S. A. A. (2012). The factors influencing the effectiveness of e-learning at Al-Quds open university in Palestine. Universiti Utara Malaysia.
- Al-Gahtani, S. S. (2004). Computer technology acceptance success factors in saudi arabia: An exploratory study. *Journal of Global Information Technology Management*, 7(1), 5–29.
- Allwood, C. M. (1999). Människa-datorinteraktion—ett psykologiskt perspektiv, 1998, studentlitteratur. ISBN 91-44-00587-3.
- Almarashdeh, I. A., Sahari, N., Zin, N. M., & Alsmadi, M. (2010). The success of learning management system among distance learners in malaysian universities. *Journal of Theoretical & Applied Information Technology*, 21(2).
- Almutairi, H. (2001). Evaluating information system success in public organizations: A theoretical model and empirical validation. Pennsylvania State University.
- Almutairi, H., & Subramanian, G. H. (2005). An empirical application of the DeLone and McLean model in the Kuwaiti private sector. *The Journal of Computer Information Systems*, 45(3), 113.
- Ang, J., & Soh, P. H. (1997). User information satisfaction, job satisfaction and computer background: An exploratory study. *Information & Management*, 32(5), 255–266.
- Augustie, C. (2014). An analysis on factors influencing international online shopping: Indonesian perspective. Universiti Utara Malaysia.
- Azeemi, I. K., Lewis, M., & Tryfonas, T. (2013). Migrating to the cloud: Lessons and limitations of “traditional”is success models. *Procedia Computer Science*, 16, 737–746.
- Bagozzi, R. P., Davis, F. D., & Warshaw, P. R. (1992). Development and test of a

- theory of technological learning and usage. *Human Relations*, 45(7), 659–686.
- Baheshwan, F. (2014). Evaluation of information systems in yemen based on user's' perspective. Mukalla: Hadramout University.
- Bailey, J. E., & Pearson, S. W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. *Management Science*, 29(5), 530–545.
- Balaban, N., & Platiša, G. (2009). Methodological approaches to evaluation of information system functionality performances and importance of successfulness factors analysis. *Management Information Systems*, 4(2), 11–17.
- Bandara, W. (2007). Process modelling success factors and measures. Queensland University of Tecchonology Brisbane Australia.
- Baroudi, J. J., & Orlikowski, W. J. (1988). A short-form measure of user information satisfaction: a psychometric evaluation and notes on use. *Journal of Management Information Systems*, 44–59.
- Bazarah, T. (2015). Status of computer and administrative academic research in Yemen. Mukalla: Hadramout University.
- Behrens, S., Cranston, M., Jamieson, K., & Jones, D. (2005). Predicting system success using the technology acceptance model: a case study. *ACIS 2005 Proceedings*, 70.
- Belhaj, F. A. S. (2012). The influence of transformational leadership and job characteristics on absenteeism among telecommunication company employees in Yemen. Universiti Utara Malaysia.
- Bharati, P. (2002). People and information matter: task Support satisfaction from the Other Side. *Journal of Computer Information Systems*.
- Bharati, P., & Berg, D. (2005). Service quality from the other side: Information systems management at duquesne light. *International Journal of Information Management*, 25(4), 367–380.
- Bharati, P., & Chaudhury, A. (2004). An empirical investigation of decision-making satisfaction in web-based decision support systems. *Decision Support Systems*, 37(2), 187–197.
- Bostrom, R. P., & Heinen, J. S. (1977). MIS problems and failures: a socio-technical perspective, part II: the application of socio-technical theory. *MIS Quarterly*, 11–28.
- Brewerton, P. M., & Millward, L. J. (2001). Organizational research methods: A guide for students and researchers. Sage.

- Byrd, T. A., Thrasher, E. H., Lang, T., & Davidson, N. W. (2006). A process-oriented perspective of IS success: Examining the impact of IS on operational cost. *Omega*, 34(5), 448–460.
- Chang, J. C.-J., & King, W. R. (2014). Measuring the performance of information systems: a functional scorecard. *Journal of Management Information Systems*, 22(1), 85–115.
- Chen, H.-J., & Kao, C.-H. (2012). Empirical validation of the importance of employees' learning motivation for workplace e-learning in Taiwanese organisations. *Australasian Journal of Educational Technology*, 28(4), 580–598.
- Chen, R.-F., & Hsiao, J.-L. (2012). An investigation on physicians' acceptance of hospital information systems: a case study. *International Journal of Medical Informatics*, 81(12), 810–820.
- Chen, Y. (2012). The empirical analysis model on critical success factors for emergency management engineering information system. *Systems Engineering Procedia*, 5, 234–239.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295(2), 295–336.
- Chiu, C., Chiu, C., & Chang, H. (2007). Examining the integrated influence of fairness and quality on learners' satisfaction and Web-based learning continuance intention. *Information Systems Journal*, 17(3), 271–287.
- Cho, K. W., Bae, S.-K., Ryu, J.-H., Kim, K. N., An, C.-H., & Chae, Y. M. (2015). Performance evaluation of public hospital information systems by the information system success model. *Healthcare Informatics Research*, 21(1), 43–48.
- Cho, V. (2007). A study of the impact of organizational learning on information system effectiveness. *International Journal of Business and Information*, 2(1), 127–158.
- Choe, J.-M. (1996). The relationships among performance of accounting information systems, influence factors, and evolution level of information systems. *Journal of Management Information Systems*, 215–239.
- Chou, C.-P., & Bentler, P. M. (1995). Estimates and tests in structural equation modeling.
- Cohen, S., Dori, D., de Haan, U., Cohen, S., De Haan, U., & Dori, D. (2010). A software system development life cycle model for improved stakeholders'

- communication and collaboration. *International Journal of Computers, Communications & Control*, 1, 23–44.
- Cronbach, L. J. (1946). Response sets and test validity. *Educational and Psychological Measurement*, 6(4), 475–494.
- Dadmand, F. (2014). Evaluating information system success in university: An empirical test of the Delone-Mclean Model. *A Journal of Multidisciplinary Research*, 3(2), 38–50.
- Dařena, F. (2011). Information systems evaluation criteria based on attitudes of graduate students. *Journal on Efficiency and Responsibility in Education and Science*, 4(1), 46–56.
- Davarpanah, A., & Mohamed, N. (2013). Human resource information systems (HRIS) success factors in a public higher education institution context. In *Research and Innovation in Information Systems (ICRIIS), 2013 International Conference on* (pp. 79–84). IEEE.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319–340.
- Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38(3), 475–487.
- Delone, W. H. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems*, 19(4), 9–30.
- DeLone, W. H., & McLean, E. R. (1992). Information systems success: the quest for the dependent variable. *Information Systems Research*, 3(1), 60–95.
- Delone, W. H., & Mclean, E. R. (2004). Measuring e-commerce success: Applying the DeLone & McLean information systems success model. *International Journal of Electronic Commerce*, 9(1), 31–47.
- Dernbecher, S. (2014). Having the mind in the cloud: Organizational mindfulness and the successful use of desktop as a service. In *System Sciences (HICSS), 2014 47th Hawaii International Conference on* (pp. 2137–2146). IEEE.
- Diniz, E., Porto, R. M., & Adachi, T. (2005). Internet banking in Brazil: evaluation of functionality, reliability and usability. *The Electronic Journal of Information Systems Evaluation*, 8(1), 41–50.
- Doll, W. J., & Torkzadeh, G. (1988). The measurement of end-user computing

- satisfaction. *MIS Quarterly*, 259–274.
- Dominguez, J. (2009). The curious case of the chaos report 2009. *Project Smart*, 1–16.
- Edlund, S., & Lövquist, A. (2012). The role of system administrators in information systems success. Uppsala University.
- Elpez, I., & Fink, D. (2006). Information systems success in the public sector: Stakeholders' perspectives and emerging alignment model. *Issues in Informing Science and Information Technology*, 3(2), 219–231.
- Gable, G. G., Sedera, D., & Chan, T. (2008). Re-conceptualizing information system success: the IS-impact measurement model. *Journal of the Association for Information Systems*, 9(7), 18.
- Galliers, R. D., & Leidner, D. E. (2014). Strategic information management: challenges and strategies in managing information systems. Routledge.
- Garrity, E. J., & Sanders, G. L. (1998). Information systems success measurement. Igi Global.
- Gerson, K., & Horowitz, R. (2002). Observation and interviewing: Options and choices in qualitative research. *Qualitative Research in Action*, 199–224.
- Gordon, R. (2012). Forecast Alert: IT Spending, Worldwide, 2008-2015, 4Q11 Update. *Stamford, CT: Gartner, January, 3*.
- Gorla, N., Somers, T. M., & Wong, B. (2010). Organizational impact of system quality, information quality, and service quality. *The Journal of Strategic Information Systems*, 19(3), 207–228.
- Guba, E. G. (1989). Fourth generation evaluation. Sage.
- Guimaraes, T., Yoon, Y., & Clevenson, A. (1996). Factors important to expert systems success a field test. *Information & Management*, 30(3), 119–130.
- Hafid Agourram, A. N. T. (2006). The evaluation of information systems success a new perspective. *6th Global Conference on Business & Economics*. Gutman Conference Center USA.
- Hair, J. F. J., Anderson, R. E., Tatham, R. I., & Balck, W. C. (2010). Multivariate data analysis (7th Editio). New Jersey:Prentice Hal.
- Halawi, L. A., McCarthy, R. V, & Aronson, J. E. (2007). An empirical investigation of knowledge management systems'success. *The Journal of Computer Information Systems*, 48(2), 121.

- Hasan, Y., Shamsuddin, A., & Aziati, N. (2013). The impact of management information systems adoption in managerial decision making: A review. *The International Scientific Journal of Management Information Systems*, 8(4), 10–17.
- Hellsten & Markova, M., M. (2006). The DeLone and McLean Model of information systems success- Original and Updated Models.
- Hong, W., Thong, J. Y. L., & Wai-Man Wong, K.-Y. T. (2002). Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of Management Information Systems*, 18(3), 97–124.
- Hsieh, J. J. P.-A., & Wang, W. (2007). Explaining employees' extended use of complex information systems. *European Journal of Information Systems*, 16(3), 216–227.
- Huraibi, F. A. (2015). distances between main cities of YEMEN republic (k.m.). Retrieved July 25, 2015, from <http://www.yementourism.com/information/detail.php?ID=1405>
- HUST. (2014). Overview of Hadramout University. Retrieved from [www.hust.edu.ye](http://www.hust.edu.ye)
- Ifinedo, P. (2006). Extending the Gable et al. enterprise systems success measurement model: a preliminary study. *Journal of Information Technology Management*, 17(1), 14–33.
- Ifinedo, P., & Nahar, N. (2007). ERP systems success: an empirical analysis of how two organizational stakeholder groups prioritize and evaluate relevant measures. *Enterprise Information Systems*, 1(1), 25–48.
- Igbaria, M., & Tan, M. (1997). The consequences of information technology acceptance on subsequent individual performance. *Information & Management*, 32(3), 113–121.
- Iivari, J. (2005). An empirical test of the DeLone-McLean model of information system success. *ACM SIGMIS Database*, 36(2), 8–27.
- InformationSystem. (2014). In Business-Dictionary.com. Retrieved from <http://www.businessdictionary.com/definition/information-system.html>
- Irani, Z., Gunasekaran, A., & Love, P. (2006). Quantitative and Qualitative approaches to information systems evaluation. *European Journal of Operational Research*, 173(3), 951–956. <http://doi.org/http://dx.doi.org/10.1016/j.ejor.2005.06.001>

- Irani, Z., & Love, P. (2001). Information Systems Evaluation: Past, Present and Future. *European Journal of Information Systems*, 10(4), 183–188.
- Irani, Z., & Love, P. (2008). *Evaluating Information Systems: Public and Private Sector*. Routledge.
- Irani, Z., Themistocleous, M., Love, P., & Cowan, E. (2007). Information systems evaluation: mini-track introduction. *AMCIS 2007 Proceedings*, 367.
- Irani Zahir, P. E. D. (2000). The propagation of technology management taxonomies for evaluating investments in information systems. *Journal of Management Information Systems*, 17(3), 161–177.
- Isaias, P., & Issa, T. (2015). *Information system development life cycle models. in high level models and methodologies for information systems*. Springer.
- Jirava, P. (2004). System development life cycle. *Scientific Papers of the University of Pardubice. Series D Faculty of Economics and Administration*. 9 (2004).
- John, D. (2004). “Information Systems.” A Dictionary of Computing. Retrieved from Encyclopedia.com: <http://www.encyclopedia.com/doc/1O11-informationsystem.html>
- Johnson, J., Boucher, K. D., Connors, K., & Robinson, J. (2001). Collaborating on project success. *Software Magazine*, 7(2), 15.
- K, S. (2015). A report from an al Qaeda-controlled city in Yemen. Retrieved July 31, 2015, from <http://observers.france24.com/en/20150708-yemen-mukalla-al-qaeda-control>
- Kanaracus, C. (2008). Gartner: global IT spending growth stable. *InfoWorld*. Retrieved from <http://www.infoworld.com/article/2651482/technology-business/gartner--global-it-spending-growth-stable.html>
- Kanellis, P., Lycett, M., & Paul, R. J. (1998). An interpretive approach to the measurement of information systems success: From concept to practical application. *Information Systems Success Measurement*, 133–151.
- Khalil, O. E. M., & Elkordy, M. M. (1999). The relationship between user satisfaction and systems usage: empirical evidence from Egypt. *Journal of Organizational and End User Computing (JOEUC)*, 11(2), 21–28.
- Khayun, V., & Ractham, P. (2011). Measuring e-excise tax success factors: applying the DeLone & McLean information systems success model. In *System Sciences (HICSS), 2011 44th Hawaii International Conference on* (pp. 1–10). IEEE.
- Kim, J., Chae, Y. M., Kim, S., Ho, S. H., Kim, H. H., & Park, C. B. (2012). A study

- on user satisfaction regarding the clinical decision support system (CDSS) for medication. *Healthcare Informatics Research*, 18(1), 35–43.
- Kim, J., Lee, J., Han, K., & Lee, M. (2002). Businesses as buildings: Metrics for the architectural quality of Internet businesses. *Information Systems Research*, 13(3), 239–254.
- Kline, R. B. (2011). Principles and practice of structural equation modeling. (3rd ed.). New York: The Guilford Press.
- Koh, C. E., Prybutok, V. R., Ryan, S. D., & Wu, Y. (2010). A model for mandatory use of software technologies: An integrative approach by applying multiple levels of abstraction of informing science. *Informing Science: The International Journal of an Emerging Transdiscipline*, 13, 177–203.
- Kositanurit, B., Ngwenyama, O., & Osei-Bryson, K.-M. (2006). An exploration of factors that impact individual performance in an ERP environment: an analysis using multiple analytical techniques. *European Journal of Information Systems*, 15(6), 556–568.
- Kulkarni, U. R., Ravindran, S., & Freeze, R. (2006). A knowledge management success model: Theoretical development and empirical validation. *Journal of Management Information Systems*, 23(3), 309–347.
- Langer, E. J. (1989). Minding matters: The consequences of mindlessness–mindfulness. *Advances in Experimental Social Psychology*, 22, 137–173.
- Laudon, K. C., & Laudon, J. P. (2004). Management information systems: managing the digital firm. *New Jersey*, 8.
- Leclercq, A. (2007). The perceptual evaluation of information systems using the construct of user satisfaction: case study of a large French group. *ACM SIGMIS Database*, 38(2), 27–60.
- Lee, S.-Y. T., Kim, H.-W., & Gupta, S. (2009). Measuring open source software success. *Omega*, 37(2), 426–438.
- Legris, P., Ingham, J., & Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), 191–204.
- Limtrairut, P., & Sarwar, M. I. (2012). A proposal to measure success factors for location-based mobile cardiac telemedicine system (LMCTS).
- Lucas, H. C., & Spitler, V. K. (1999). Technology use and performance: A field study of broker workstations. *Decision Sciences*, 30, 291–312.



- Luftman, J. (2004). Assessing business-IT alignment maturity. *Strategies for Information Technology Governance*, 4, 99.
- Lwoga, E. T. (2014). Critical success factors for adoption of web-based learning management systems in Tanzania.
- Mamma, E. (2010). Quality and evaluation of information systems in institutional organizations.
- Marble, R. P. (2003). A system implementation study: Management commitment to project management. *Information & Management*, 41(1), 111–123.
- Markus, M. L., & Tanis, C. (2000). The enterprise systems experience—from adoption to success. *Framing the Domains of IT Research: Glimpsing the Future through the Past*, 173, 173–207.
- McGill, T. J., Hobbs, V. J., & Klobas, J. E. (2003). User developed applications and information systems success: A test of DeLone and McLean's model. *Information Resources Management Journal*, 16(1), 24–45.
- McGill, T. J., & Klobas, J. E. (2005). The role of spreadsheet knowledge in user-developed application success. *Decision Support Systems*, 39(3), 355–369.
- Miller, J., & Doyle, B. A. (1987). Measuring the effectiveness of computer-based information systems in the financial services sector. *MIS Quarterly*, 107–124.
- Moh'd Al-Adaileh, R. (2009). An evaluation of information systems success: A user perspective-The case of Jordan telecom group. *European Journal of Scientific Research*, 37(2), 226–239.
- Morris, S. A., Marshall, T. E., & Rainer Jr, R. K. (2002). Impact of user satisfaction and trust on virtual team members. *Information Resources Management Journal*, 15(2), 22.
- Myers, M. D., & Avison, D. (1997). Qualitative research in information systems. *Management Information Systems Quarterly*, 21, 241–242.
- Net, H. (2015). Hadramout University Announces the Continuation of Suspension of Classes in Mukalla. Retrieved July 21, 2015, from <http://www.alsjl.com/n/340274/>
- Organization. (2014a). In Business-Dictionary.com. Retrieved from <http://www.businessdictionary.com/definition/organization.html>
- Organization. (2014b). In Merriam-Webster.com. Retrieved from <http://www.merriam-webster.com/dictionary/organization>
- Organization. (2014c). West's Encyclopedia of American Law. Retrieved January 5,

2015, from Encyclopedia.com: <http://www.encyclopedia.com/doc/1G2-3437703198.html>

- Özkan, S., Baykal, N., & Sincan, M. (2006). Evaluation of a hospital information system in an international context: Towards implementing PB-ISM in Turkey. *The Electronic Journal of Information Systems in Developing Countries*, 28.
- Pai, F.-Y., & Huang, K.-I. (2011). Applying the technology acceptance model to the introduction of healthcare information systems. *Technological Forecasting and Social Change*, 78(4), 650–660.
- Pallant, J. (2007). *SPSS survival manual: A step by step guide to data analysis using SPSS*. Open University Press: McGraw Hill.
- Pallant, J. (2013). *SPSS survival manual*. McGraw-Hill Education (UK).
- Palmer, J. W. (2002). Web site usability, design, and performance metrics. *Information Systems Research*, 13(2), 151–167.
- Perks, C., & Beveridge, T. (2003). *Guide to enterprise IT architecture*. Springer.
- Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems*, 17(3), 236–263.
- Piccoli, G. (2007). *Information systems for managers: texts and cases*. Wiley Publishing.
- Piccoli, G. (2012). *Information Systems for Managers*. Wiley Global Education.
- Powell, A. (2008). K12 online learning: a global perspective. In *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (Vol. 2008, pp. 2353–2380).
- Rabaa'i, A. A. (2012). Evaluating the success of large-scale, integrated information systems through the lens of IS-impact and IS-support.
- Rai, A., Lang, S. S., & Welker, R. B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Information Systems Research*, 13(1), 50–69.
- Rakels, H. & Perspectivity (2012). The future of ICT in Yemeni higher Education. *Future Search Case*. Yemen.
- Ramayah, T., Ahmad, N. H., & Lo, M.-C. (2010). The role of quality factors in intention to continue using an e-learning system in Malaysia. *Procedia-Social and Behavioral Sciences*, 2(2), 5422–5426.

- Raymond, L. (1990). Organizational context and information systems success: a contingency approach. *Journal of Management Information Systems*, 5–20.
- Rivard, S., Poirier, G., Raymond, L., & Bergeron, F. (1997). Development of a measure to assess the quality of user-developed applications. *ACM SIGMIS Database*, 28(3), 44–58.
- Roscoe, J. T. (1975). *Fundamental research statistics for the behavioral sciences*. New York, NY.
- Rouibah, K., Hamdy, H. I., & Al-Enezi, M. Z. (2009). Effect of management support, training, and user involvement on system usage and satisfaction in Kuwait. *Industrial Management & Data Systems*, 109(3), 338–356.
- Sabherwal, R., Jeyaraj, A., & Chowa, C. (2006). Information system success: individual and organizational determinants. *Management Science*, 52(12), 1849–1864.
- Saunders, M. N. K., Saunders, M., Lewis, P., & Thornhill, A. (2011). *Research methods for business students, 5/e*. Pearson Education India.
- Scheuren, F., & Association, A. S. (2004). *What is a survey?* American Statistical Association.
- Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean model of IS success. *Information Systems Research*, 8(3), 240–253.
- Seddon, P. B., Graeser, V., & Willcocks, L. P. (2002). Measuring organizational IS effectiveness: an overview and update of senior management perspectives. *ACM SIGMIS Database*, 33(2), 11–28.
- Seddon, P. B., Staples, S., Patnayakuni, R., & Bowtell, M. (1999). Dimensions of information systems success. *Communications of the AIS*, 2(3es), 5.
- Seddon, P., & Kiew, M.-Y. (1996). A partial test and development of DeLone and McLean's model of IS success. *Australasian Journal of Information Systems*, 4(1).
- Sekaran, U., & Bougie, R. (2003). *Research methodes for business: Askill- bulding approach (4th ed.)*. United Kingdom: John Wiley & Sons, Inc.
- Sekaran, U., & Bougie, R. (2010). *Research methodes for business: Askill- bulding approach (5th ed.)*. United Kingdom: John Wiley & Sons, Inc.
- Shang, S., & Seddon, P. B. (2002). Assessing and managing the benefits of enterprise systems: the business manager's perspective. *Information Systems Journal*, 12(4), 271–299.

- Shih, Y.-Y., & Huang, S.-S. (2009). The actual usage of ERP systems: An extended technology acceptance perspective. *Journal of Research and Practice in Information Technology*, 41(3), 263.
- Smithson, S., & Hirschheim, R. (1998). Analysing information systems evaluation: another look at an old problem. *European Journal of Information Systems*, 7(3), 158–174.
- Stair, R., & Reynolds, G. (2011). Principles of information systems. Cengage Learning.
- Stenkamp, A. L., & Basal, A. (2009). Building an integrated student information system in a k-12 school system. In *Proc ISECON* (p. v26).
- Stewart, T. (1986). Task fit, ease-of-use and computer facilities. *Managing Computer Impact: An International Study of Management and Organizations*, 63–76.
- Stockdale, R., & Standing, C. (2006). An interpretive approach to evaluating information systems: A content, context, process framework. *European Journal of Operational Research*, 173(3), 1090–1102. <http://doi.org/http://dx.doi.org/10.1016/j.ejor.2005.07.006>
- Suh, K., Kim, S., & Lee, J. (1994). End-user's disconfirmed expectations and the success of information systems. *Information Resources Management Journal*, 7(4), 30.
- Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics & Data Analysis*, 48(1), 159–205.
- Thomas, G. (2011). A typology for the case study in social science following a review of definition, discourse, and structure. *Qualitative Inquiry*, 17(6), 511–521.
- Torkzadeh, G., & Doll, W. J. (1999). The development of a tool for measuring the perceived impact of information technology on work. *Omega*, 27(3), 327–339.
- Tornatzky, L. G., & Klein, K. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, (EM-29).
- UNDP. (2013). About Yemen. Retrieved from <http://www.ye.undp.org/content/yemen/en/home/countryinfo/>
- UNHCR. (2013). 2015 UNHCR country operations profile - Yemen. Retrieved from <http://www.unhcr.org/pages/49e486ba6.html>

- Urbach, N., & Müller, B. (2012). The updated DeLone and McLean model of information systems success. In *Information systems theory* (pp. 1–18). Springer.
- Vaidya, K. (2007). Applying the DeLone & McLean information systems success model to measure public eprocurement success. *Proceedings of the 10 Th Collaborative Electronic Commerce Technology and Research, COLLECTeR*.
- Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273–315.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.
- 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.
- Vlahos, G. E., & Ferratt, T. W. (1995). Information technology use by managers in Greece to support decision making: amount, perceived value, and satisfaction. *Information & Management*, 29(6), 305–315.
- Vlahos, G. E., Ferratt, T. W., & Knoepfle, G. (2004). The use of computer-based information systems by German managers to support decision making. *Information & Management*, 41(6), 763–779.
- Wang, Y.-S., & Liao, Y.-W. (2008). Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success. *Government Information Quarterly*, 25(4), 717–733.
- Whittaker, L. (2001). Information systems evaluation: A post-dualist interpretation. University of Pretoria.
- Whittaker, L. (2005). Information systems evaluation : a post-dualist interpretation : reviewed article. Retrieved from [http://reference.sabinet.co.za/webx/access/electronic\\_journals/comp/comp\\_v35\\_a16.pdf](http://reference.sabinet.co.za/webx/access/electronic_journals/comp/comp_v35_a16.pdf)
- Winarto, S. A., & HADIPRAJITNO, P. B. (2011). Analysis effect of external variables on system usage and user satisfaction using technology acceptance model (empirical study on bank Pekreditan Rakyat in Semarang city region). Universitas Diponegoro.
- Winter, S. J., M Chudoba, K., & Gutek, B. A. (1998). Attitudes toward computers: when do they predict computer use? *Information & Management*, 34(5), 275–284.

- Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85–102.
- Wixom, B. H., & Watson, H. J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS Quarterly*, 17–41.
- Wu, J.-H., & Wang, Y.-M. (2006). Measuring KMS success: A respecification of the DeLone and McLean's model. *Information & Management*, 43(6), 728–739.
- Wu, J.-H., & Wang, Y.-M. (2007). Measuring erp success: The key-users' viewpoint of the erp to produce a viable IS in the organization. *Computers in Human Behavior*, 23(3), 1582–1596.
- YCIT. (2010). About YCIT-HE. Retrieved from [http://ycit-he.net/e/?page\\_id=49](http://ycit-he.net/e/?page_id=49)
- Yin, R. K. (2013). Case study research – Design and methods. (3rd ed). Sage, Newbury Park, C.
- Zaied, A. N. H. (2012). An integrated success model for evaluating information system in public sectors. *Journal of Emerging Trends in Computing and Information Sciences*, 3(6), 814–825.



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