Impact of the System, Information, and Service Quality of Online Learning on User Satisfaction among Public Universities Students in Bangladesh

MD Main Uddin [a] *, **Abhijit Ghosh [b]**, **Osama Isaac [c]**
[a b c] *Faculty of Business and Accountancy, Lincoln University College, Selangor, Malaysia*
* Correspondence: Mainuddinmy1@gmail.com

Abstract

It has become widely agreed that technology has a vital role within the high education institutions. Specifically in the teaching and learning processes, in the supportive and managerial aspects alike. The main objective of this study is to examine the impact of system, information, and service quality on the user satisfaction of eLearning among public universities student in Bangladesh. Data were collected from 417 students is Dhaka university, only 388 were analyzed using SMART-PLS 3.0., the variance explained of the user satisfaction is 44%. The findings of this study can provide policymakers with important insights on how to more successfully design and utilize online learning within public universities

Keywords: Online learning; system quality; information quality; service quality; user satisfaction; Bangladesh.

1. Introduction

It has become widely agreed that technology has a vital role within the high education institutions. Specifically in the teaching and learning processes, in the supportive and managerial aspects alike (Husin, Abou-Shouk, and Khalifa, 2013; Agwa, Aziz and Khalifa, 2018b, 2018a; Alharthi *et al.*, 2019). Since its inception, online learning has been interchangeably used with multiple similar terms like "eLearning", "distance learning", and "blended learning". According to Clark & Mayer (2016), it is defined as delivering instructions via the internet using digital devices like smartphones, laptops, tablets, and desktop computers. Which provides the traditional institutions with the means to expand curriculum (Lapovsky, 2015). Discussions about online learning should be placed squarely within a context shaped by the prospects for higher education (Bowen, 2013), the context pertaining to this research is the public educational institutions in Bangladesh. It is clear that modern organizations are trying to become a leading technology center based on the innovation strategy of the 4th Industrial Revolution (Husin, Abou-Shouk and Khalifa, 2013; Khalifa and Hewedi, 2016; Alkhateri *et al.*, 2018; Alkutbi *et al.*, 2019; Ameen, Almari and Isaac, 2019; Mohamed *et al.*, 2019).

Education is the key to the overall development of a nation. This realization exists among the post-independent government education policy makers of Bangladesh. However, various challenges in the education system mars success achieved thus far. Compared to international level education in Bangladesh system is not competitive and this has critical implications upon the overall national development. In most contemporary organizations, adopting technology is not only uses ICT to fill up some forms and records but rather it is also a tool that performs the process of identification, accumulation, analysis, measurement, preparation, interpretation and communication of the information used by management to plan (Ameen and Ahmad, 2011, 2013b, 2014; Khalifa and Abou-Shouk, 2014; Nusari *et al.*, 2018). It is used in evaluating and controlling within an organization and to assure appropriate use and accountability for their resources (Ameen and Ahmad, 2011, 2012, 2013a; Khalifa and Abou-Shouk, 2014; Abd-Elaziz *et al.*, 2015; Morsy, Ahmed and Ali, 2016; Mohamed *et al.*, 2018).

Furthermore, according to The Global Competitiveness Report (2017) Bangladesh has one of the least quality education systems in the world, which denies Bangladesh from its benefits of eLearning, although some of the neighbour countries have better education systems like Bhutan, Sri Lanka, and India which are ranked 48,41, and 29 respectively, Bangladesh's position is 84 (among 138 countries) (see figure 1). This indicates that Yemen urgently needs a solution that enhances education quality and maximizes cost-efficiency. Various global indicators will help in understanding the position of in this area according to a set of measures that are recognized internationally(Badran and Khalifa, 2016; Khalifa and Hewedi, 2016; Al-Ali et al., 2018; Al-Obthani et al., 2018; Al-Shamsi et al., 2018; Haddad, Ameen and Mukred, 2018; Mohamed et al., 2018; Shamsi et al., 2018). The main objective of the current study is to examine the impact of the system, information, and service quality on the user satisfaction of eLearning.
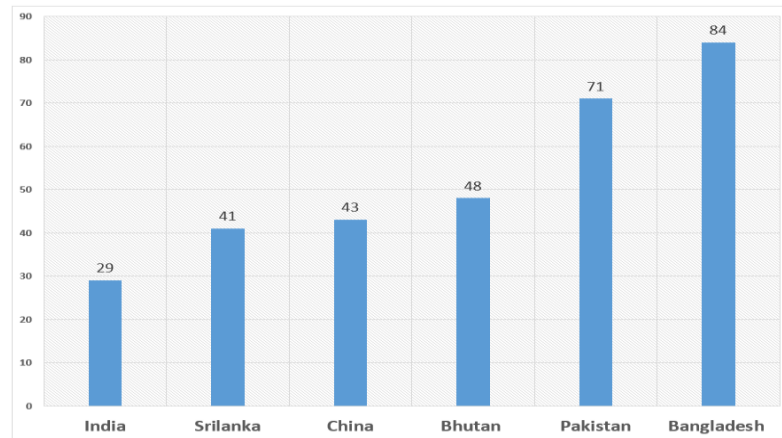
Figure 1: Quality of education system ranking in Bangladesh compared to neighboring countries
(among 138 countries)
Source: (Global Competitiveness Report, 2017)

2. Literature Review

2.1 System Quality (SYSQ)

System Quality is defined as suitability, reliability of the system, and stability of the software and hardware whereby information needed are supported (DeLone & Mclean, 2003). Quality has been the focus of most IS researches around the world ever since its inception in the Delone & Mclean information system success model (1992) and its updated model in 2003. Many researches have been done about the role of system quality in many technology applications all over the world. In the knowledge management systems context, two studies in Taiwan and Malaysia by Wang & Lai (2014) and Cham et al. (2016) respectively, have found that system quality has a significant positive relationship with usage, and user satisfaction (Abou-Shouk and Khalifa, 2017; Khalifa and Mewad, 2017). Similarly, Almarashdeh (2016) revealed that in Saudi Arabia in the context of e-learning where the findings reported the same. Moreover, in the context of online learning, a study in turkey reported the significance of the relationship between system quality and usage of online learning (Dokhan and Akkoyunlu, 2016).

In a new study in the United Arab Emirates to investigate factors that influence users of the new e-government services that were recently introduced, found that system quality has significant positive effect on user satisfaction (AL Athmay, Fantazy, and Kumar, 2016). Likewise, two studies in Portugal and Mexico in the fields of mobile banking and information systems respectively concluded with the significance of the relationship of system quality with usage and user satisfaction (Tam and Oliveira, 2016; Abrego-Almazán, Sánchez-Tovar and Medina-Quintero, 2017). Notwithstanding, it was found that system quality have a significant effect on both of usage and user satisfaction when it was tested in a recent study in Chile in the context of learning management system (Ramirez-Correa *et al.*, 2017). This is also the case in a New Zealand study to investigate factors affecting the use of knowledge management system in the healthcare industry, where it was empirically proven that system quality significantly affect user satisfaction (Ali *et al.*, 2017). Furthermore, a study about cloud e-bookcase system was conducted in Taiwan and notably although it reported a significant effect of system quality on user satisfaction, (Chiu *et al.*, 2016). Consequently, the following hypothesis is proposed:

H1: System quality has a positive effect on user satisfaction.

2.2 Information Quality (INFQ)

Information quality is referred to as the characteristics of system output as being accurate, up-to-date, and complete (Petter and McLean, 2009), besides relevance, understanding, and accessibility as other characteristics of information quality as described by Tam & Oliveira (2016). Moreover, in the context of online learning, the term information quality is sometimes substituted for knowledge quality as suggested by Wu & Wang (2006) where they consist of content quality and context and linkage quality. Nevertheless, Wang et al. (2014) described information quality as the instructional attributes shaped by educators and their students. Additionally, other researchers in the online learning context have described information quality as being well organized, effectively presented, and useful (Halonen *et al.*, 2009).

Rana et al. (2014) have studied information quality in E-government and E-commerce as an antecedent to user satisfaction, the result revealed the significant effect of information quality on user satisfaction. Similarly, AL Athmay et al. (2016) did the same study in the UAE and found that information quality has a significantly positive effect on user satisfaction. A three recent studies (Abrego-Almazán, Sánchez-Tovar and Medina-

Quintero, 2017; Aparicio, Bacao and Oliveira, 2017; Ramirez-Correa *et al.*, 2017) in Mexico, Portugal, and Chile respectively, the trio investigated the effect of information quality in the context of e-learning, and have reported the same result that information quality has a significant positive effect with usage and user satisfaction as well, the results came in line with the vast majority of studies employing the Delone & Mclean information system success model to study the implementation of new technology applications.

On the other hand, a Taiwanese study to investigate factors affecting the implementation of cloud e-bookcase, revealed that there is no significant relationship between information quality and user satisfaction indicating that in this specific application student do not see information quality crucial for them to use cloud e-bookcase. Consequently, the following hypotheses are proposed:

H2: Information quality has a positive effect on user satisfaction.

2.3 Service Quality (SERQ)

Service quality refers to the fulfillment of delivered service in meeting customers' requirements, expectations and satisfaction (Parasuraman et al., 1985; Khalifa & Fawzy, 2017; Khalifa, 2015, 2018). In the context of IS research, in their updated information system success model, Delone & McLean (2003) have referred to service quality through these attributes: tangibles, reliability, responsiveness, assurance, and empathy (Mohamud *et al.*, 2017). Whereas Petter & McLean (2009) suggested that service quality represents the support of users by the IS department, and is often measured by the responsiveness, reliability, and empathy. Nevertheless, service quality in the online learning context encompasses both the responsiveness of the instructor and the technical support provided by the university as illustrated by Freeze et al. (2010).

With the growing number of technology applications with sophisticated and creative functionalities, service quality becomes an essential factor for the success of any technology application specifically for online learning which the core of this research is. Many types of research have investigated the role of information technology in different applications and different contexts, for instance, a recent study by Aparicio et al. (2017) in Portugal to investigate the role of individual grit on the success of e-learning systems, the results showed that there is significant positive relationship between service quality and user satisfaction. Equally, a study in Taiwan on cloud e-bookcase system indicated that there is a significant positive relationship between service quality and satisfaction (Chiu, Chao, Kao, Pu, & Huang, 2016).

In the online learning field, a study in Jordan found that service quality significantly affects usage of online learning among university students (Althunibat, 2015). The same results that service quality has a significant positive effect with user satisfaction was found in a Turkish study about E-justice system (Oktal, Alpu, and Yazici, 2016), the results came in line with the vast majority of studies employing the Delone & Mclean information system success model to study the implementation of new technology applications. Consequently, the following hypotheses are proposed:

H3: Service quality has a positive effect on user satisfaction.

2.4 User Satisfaction (SAT)

User Satisfaction is defined as the degree to which the internet users satisfied with the decision to use the internet and the internet meet the expectations (Wang, 2008; Wang & Liao, 2008; Roca et al., 2006) (Qoura and Khalifa, 2016; Sudigdo, Khalifa and Abuelhassan, 2019; Trung and Khalifa, 2019). It is considered as one of the crucial aspects in the field of information systems and technology usage (DeLone & Mclean, 2003). Therefore, it has extensively been used to study the use of technology systems and applications (Montesdioca et al., 2015). User satisfaction is a manifestation of the attitude of someone towards certain computer application who is directly interacting with (Daud, 2008), whereas Almarashdeh (2016) described it as the degree to which users think a specific system or application fulfills their informational requirements. Moreover, user satisfaction refers to the perception that is based on whether the user feels the system is useful and wants to use it again (Xinli, 2015).

As user satisfaction being one of the core constructs in the IS field, literature is full of studies where user satisfaction is used in numerous contexts and applications. In a study about information systems in Mexico by Abrego-Almazán et al. (2017) and after analyzing data collected from 133 users using SEM-PLS, it was found that user satisfaction has a positive significant relationship with organizational results. Similarly, Cham et al. (2016) concluded that user satisfaction has a significant effect on KMS success in their study about knowledge management systems in Malaysia. Moreover, in a study in Yemen about internet usage, it was revealed that user satisfaction significantly influences performance impact, the data was collected from 530 users and analyzed by SEM-AMOS (Osama Isaac, Abdullah, T Ramayah and Mutahar, 2017b).

3. Research Method
3.1 Overview of the Proposed Conceptual Framework

The proposed research model shows the direction of the hypothesized relationships among the proposed extension of the updated Delone & Mclean Information System Success Model (DMISM) (Figure 2).
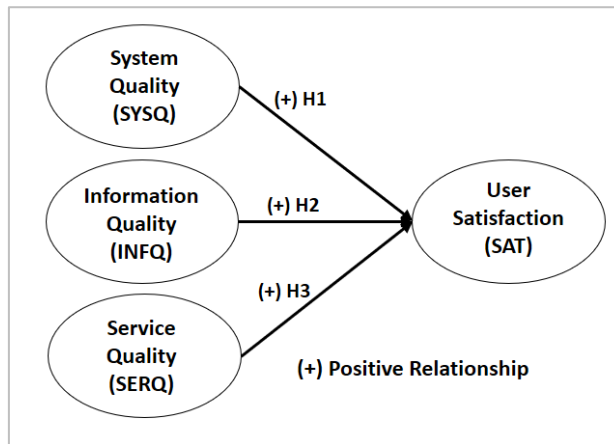
Figure 2: The proposed conceptual framework

3.2. Development of Instrument and Data collection

This study employs quantitative data, which are collected following the rules of statistical surveys. The respondents are the students at Dhaka University in Bangladesh. From 417 returned responses, only 388 responses were usable for analysis. Variables were measured using a Likert Scale which recommended in the previous studies (Isaac, Aldholay, Abdullah, & Ramayah, 2019; Isaac, Abdullah, Ramayah, & Mutahar, 2017; Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, 2017).

4. Data Analysis and Results

PLS (Partial Least Squares) SEM-VB (Structural Equation Modelling-Variance Based) was employed to assess the research model by utilizing the software SmartPLS 3.0 (Ringle, Wende, and Becker, 2015). The main reasons for choosing SEM as a statistical method for this study is that SEM offers a simultaneous analysis which leads to more accurate estimates (Isaac, Abdullah, Ramayah, & Mutahar, 2017a; Isaac, Abdullah, Ramayah, & Mutahar, 2017b; Isaac, Masoud, Samad, & Abdullah, 2016).

4.1 Measurement Model Assessment

Alpha coefficients of Cronbach and composite reality (CR) were used to test the Construct reliability. All the unique alpha coefficients of Cronbach ranged from 0.895 to 0.940, which went beyond the proposed value of 0.7 (Kannana & Tan, 2005; Nunnally & Bernstein, 1994). All the CR values ranged from 0.934 to 0.961, which went beyond 0.7 (Werts, Linn, & Jöreskog, 1974; Kline, 2010; Gefen, Straub, & Boudreau, 2000). Thus, as Table 1 shows, construct reliability has been fulfilled as Cronbach's CR and alpha was rather error-free for all the parameters. Item loadings were used to test the *indicator reliability. All items* exceeding values beyond 0.70 (Hair *et al.*, 2017). The average variance extracted (AVE) was used to analyze *convergent validity*. All the AVE values ranged from 0.826 and 0.7893, which went beyond the proposed value of 0.50 (Joseph F. Hair Jr , William C. Black , Barry J. Babin, 2010).

Table 1: *Mean, standard deviation, loading, cronbach's Alpha, CR and AVE*

Constructs	Item	Loading (> 0.7)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
System Quality (SYSQ)	SYSQ1	0.916	3.04	1.11	0.895	0.934	0.826
	SYSQ2	0.917					
	SYSQ3	0.893					
Information Quality (INFQ)	INFQ1	0.925	3.11	1.17	0.905	0.940	0.840
	INFQ2	0.922					
	INFQ3	0.902					
Service Quality (SERQ)	SERQ1	0.942	3.20	1.24	0.940	0.961	0.893
	SERQ2	0.936					
	SERQ3	0.957					
User Satisfaction (SAT)	SAT1	0.907	3.14	1.12	0.895	0.935	0.827
	SAT2	0.910					
	SAT3	0.911					

Note: M=Mean; SD=Standard Deviation, α= Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted.
Key: SYSQ: system quality, INFQ: information quality, SRVQ: service quality, SAT: user satisfaction.

4.2 Structural Model Assessment

The structural model can be tested by computing beta (β), *R²*, and the corresponding *t*-values via a bootstrapping procedure with a resample of 5,000 (Hair, Hult, Ringle, & Sarstedt, 2017).
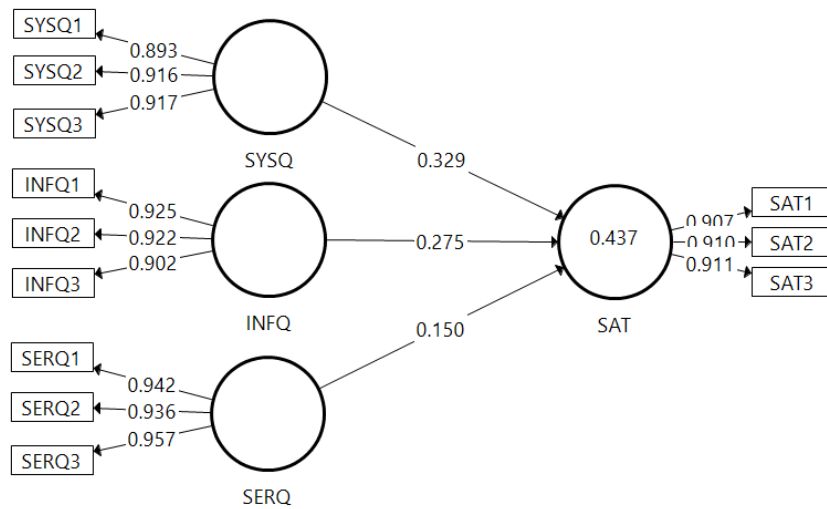
Key: SYSQ: system quality, INFQ: information quality, SRVQ: service quality, SAT: user satisfaction
Figure 3: PLS algorithm results

Figure 3 and Table 2 depict the structural model assessment, showing the results of the hypothesis tests. System quality, information quality, and service quality positively influence user satisfaction. Hence, H1, H2, and H3 are accepted with ($\beta = 0.329$, t= 5.806, p <0.001), ($\beta = 0.275$, t= 4.887, p <0.001) and ($\beta = 0.150$, t= 2.786, p <0.001) respectively. Forty-four percent of the variance in user satisfaction is explained by System quality, information quality, and service quality which is acceptable Cohen, 1988; Chin, 1998).

Table 2: *Structural path analysis result*

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision	R²
H1	SYSQ → SAT	0.329	0.057	5.806	0.000	Supported	0.44
H2	INFQ → SAT	0.275	0.056	4.887	0.000	Supported	
H3	SERQ → SAT	0.150	0.054	2.786	0.003	Supported	

Key: SYSQ: system quality, INFQ: information quality, SRVQ: service quality, SAT: user satisfaction.

5. Discussion

The main objective of the current study is to determine the influence of the system, information, and service quality on the users' satisfaction. Three hypotheses were proposed to be tested. The three hypotheses H1, H2, and H3 were supported with ($\beta = 0.329$, t= 5.806, p <0.001), ($\beta = 0.275$, t= 4.887, p <0.001) and ($\beta = 0.150$, t= 2.786, p <0.001) respectively. It is noticed that information quality has the most impact on the user satisfaction which can be explained by the fact the higher the quality of online learning system in terms of easiness, flexibility, up-to-date, accuracy, relevance, comprehensively, responsiveness, functionality, and interactivity the more students perceive it as meeting their expectations and thus feeling satisfied. Moreover, H2 and H3 had a good impact on the user satisfaction meaning that information and service quality of the eLearning systems are important to reach user satisfaction.

6. Implications, limitations and Future Directions

The findings also can be a guideline for Bangladesh higher education institutions to develop efficient and effective plans to improve the performance of education institutions. Additionally, it highlights the areas that universities' management need to concentrate on IS tools that will contribute to higher student enrolment, overcome the lack of infrastructure, and improve the quality of education outcomes.

Even though the study offers positive new insights for both practice and theory, however, it faces limitations in three aspects. Firstly as the study population was students from one public university, it excluded academics and administrative staff. Secondly, due to the research being cross-sectional. Thus, a longitudinal study needs to be done to measure satisfaction while and after using eLearning systems.

7. Conclusion

The main objective of this study is to determine the influence of the system, information, and service quality on the user satisfaction of online learning among students at Dhaka University in Bangladesh. Regardless of various limitations of the study, the findings have been encouraging, as it has managed to shed some lights on new variables affecting the use of online learning. This study proposed a tested model of Delone and Mclean information system success model (DMISM). The findings of this study can provide policymakers with important insights on how to more successfully design and utilize online learning within public universities.

Appendix
Appendix A
Instrument for varibles

Varible	Measure	Source
System Quality (SYSQ)	SYSQ1: I find it easy to use Online learning to find what I want. SYSQ2: I find Online learning to be flexible to interact with. SYSQ3: I think using the Online learning is enjoyable.	(Aldholay *et al.*, 2018)
Information Quality (INFQ)	INFQ1: Online learning provides up-to-date information. INFQ2: Online learning provides accurate information. INFQ3: Online learning provides relevant information.	(Osama Isaac, Abdullah, T Ramayah and Mutahar, 2017c)
Service Quality (SERQ)	SERQ1: The online learning provides quick responses to my requests. SERQ2: I could use the online learning services at anytime, anywhere I want. SERQ3: The online learning system offers multimedia (audio, video, and text) types of course content.	(Osama Isaac, Abdullah, T Ramayah and Mutahar Ahmed, 2017)
User Satisfaction (SAT)	SAT1: My decision to use the Online learning was a wise one. SAT2: The Online learning has met my expectations. SAT3: Overall, I am satisfied with the Online learning.	(Isaac *et al.*, 2018)

References

Abd-Elaziz, M. E. *et al.* (2015) 'Determinants of Electronic word of mouth (EWOM) influence on hotel customers' purchasing decision', *International Journal of Heritage, Tourism, and Hospitality*, 9(2/2), pp. 194–223.

Abou-Shouk, M. A. and Khalifa, G. S. (2017) 'The influence of website quality dimensions on e-purchasing behaviour and e-loyalty: a comparative study of Egyptian travel agents and hotels', *Journal of Travel and Tourism Marketing*, 34(5), pp. 608–623.

Abrego-Almazán, D., Sánchez-Tovar, Y. and Medina-Quintero, J. M. (2017) 'Influence of information systems on organizational results', *Contaduría y Administración*. Universidad Nacional Autónoma de México, Facultad de Contaduría y Administración, 62(2), pp. 321–338. doi: 10.1016/j.cya.2017.03.001.

Agwa, Y., Aziz, W. and Khalifa, G. (2018a) 'Evaluating Food and Beverage Courses in Higher Private Tourism and Hotels Institutes in Alexandria: Professionals' Perception', *International Journal of Heritage, Tourism, and Hospitality*, 11(2/2).

Agwa, Y., Aziz, W. and Khalifa, G. (2018b) 'Evaluating of Food and Beverage Courses in Higher Private Tourism and Hotels Institutes in Alexandria: The Students' Perspective', *International Journal of Heritage, Tourism, and Hospitality*, 11(2/2).

Al-Ali, W. *et al.* (2018) 'Investigate the Influence of Underlying Happiness Factors on the Job Performance on the Oil and Gas Industry in UAE', *International Journal of Management and Human Science (IJMHS)*, 2(4), p. 32.

Al-Obthani, F. *et al.* (2018) 'Proposing SMART-Government Model : Theoretical Framework', *International Journal of Management and Human Science (IJMHS)*, 2(2), pp. 27–38.

Al-Shamsi, R. *et al.* (2018) 'The Impact of Innovation and Smart Government on Happiness: Proposing Conceptual Framework', *International Journal of Management and Human Science (IJMHS)*, 2(2), pp. 10–26.

Aldholay, A. H. *et al.* (2018) 'The role of transformational leadership as a mediating variable in DeLone and McLean information system success model: The context of online learning usage in Yemen', *Telematics and Informatics*. doi: 10.1016/j.tele.2018.03.012.

Alharthi, B. A. F. H. *et al.* (2019) 'Investigating the Influence of Strategic Planning on University Operational Performance: The Mediating Role of Organizational Commitment in UAE', *International Business Management*, 13(2), pp. 49–62.

Ali, N. *et al.* (2017) 'Knowledge management systems success in healthcare: Leadership matters', *International*

Journal of Medical Informatics. Elsevier Ireland Ltd, 97(1), pp. 331–340. doi: 10.1016/j.ijmedinf.2016.11.004.

Alkhateri, A. S. *et al.* (2018) 'The Impact of Perceived Supervisor Support on Employees Turnover Intention: The Mediating Role of Job Satisfaction and Affective Organizational Commitment', *International Business Management*, 12(7), pp. 477–492.

Alkutbi, S. *et al.* (2019) 'Impact of Ease of Use and Usefulness on the Driver Intention to Continue Using Car Navigation Systems in the United Arab Emirates', *International Journal of Management and Human Science*, 3(1), pp. 1–9.

Almarashdeh, I. (2016) 'Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning course', *Computers in Human Behavior*. Elsevier Ltd, 63, pp. 249–255. doi: http://dx.doi.org/10.1016/j.chb.2016.05.013.

Althunibat, A. (2015) 'Determining the factors influencing students intention to use m-learning in Jordan higher education', *Computers in Human Behavior*. Elsevier Ltd, 52(1), pp. 65–71. doi: 10.1016/j.chb.2015.05.046.

Ameen, A. and Ahmad, K. (2011) 'The Role of Finance Information Systems in anti financial corruptions: A theoretical review', in *11 International Conference on Research and Innovation in Information Systems (ICRIIS'11*. Ieee, pp. 267–272. doi: 10.1109/ICRIIS.2011.6125725.

Ameen, A. and Ahmad, K. (2012) 'Towards Harnessing Financial Information Systems in Reducing Corruption : A Review of Strategies', *Australian Journal of Basic and Applied Sciences*, 6(8), pp. 500–509.

Ameen, A. and Ahmad, K. (2013a) 'A conceptual framework of Financial Information Systems to reduce corruption', *Journal of Theoretical and Applied Information Technology*, 54(1), pp. 59–72.

Ameen, A. and Ahmad, K. (2013b) 'Proposing Strategy for Utilizing Financial Information Systems in Reducing Corruption', in *3rd International Conference on Research and Innovation in Information Systems – 2013 (ICRIIS'13)*, pp. 75–80.

Ameen, A. and Ahmad, K. (2014) 'A Systematic Strategy for Harnessing Financial Information Systems in Fighting Corruption Electronically', in *Knowledge Management International Conference (KMICe) 2014, 12 – 15 August 2014, Malaysia*, pp. 12–15.

Ameen, A., Almari, H. and Isaac, O. (2019) *Determining Underlying Factors that Influence Online Social Network Usage Among Public Sector Employees in the UAE*. Edited by Fathey M. Faisal Saeed, Nadhmi Gazem. Springer Nature Switzerland AG: Springer International Publishing. doi: 10.1007/978-3-319-99007-1.

Aparicio, M., Bacao, F. and Oliveira, T. (2017) 'Grit in the path to e-learning success', *Computers in Human Behavior*. Elsevier Ltd, 66(1), pp. 388–399. doi: 10.1016/j.chb.2016.10.009.

AL Athmay, Al. A. A., Fantazy, K. and Kumar, V. (2016) 'E-government adoption and user's satisfaction: an empirical investigation', *EuroMed Journal of Business Journal of Business*, 11(1), pp. 57–83. doi: 10.1108/EMJB-05-2014-0016.

Badran, N. and Khalifa, G. (2016) 'Diversity Management: Is it an Important Issue in Hotel Industry in Egypt?', *Intlernational Journal of Heritage, Tourism, and Hospitality*, 7(2), pp. 275–286.

Bowen, W. (2013) 'The Potential for Online Learning: Promises and Pitfalls', *Educase Review*, 48(5), pp. 12–26.

Cham, T. H. *et al.* (2016) 'Determinants of knowledge management systems success in the banking industry', *VINE Journal of Information and Knowledge Management Systems*, 46(1), pp. 2–20. doi: 10.1108/VJIKMS-03-2014-0021.

Chin, W. W. (1998) 'Issues and opinion on structural equation modeling', *MIS Quarterly*, 22(1), pp. 7–16.

Chiu, P.-S. *et al.* (2016) 'Implementation and evaluation of mobile e-books in a cloud bookcase using the information system success model', *Library Hi Tech*, 34(2), pp. 207–223. doi: 10.1108/LHT-12-2015-0113.

Clark, R. C. and Mayer, R. E. (2016) *e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning*. 4th editio. Wiley.

Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*. 2nd edn. London: Routledge.

Daud, N. M. (2008) *Factors determining intranet usage: an empirical study of middle managers in Malaysian port industry*. Faculty of Business and Law, Multimedia University.

Delone, W. H. and Mclean, E. R. (1992) 'Information Systems Success: The Quest for the Dependent Variable', *Information Systems Research*, 3(1), pp. 60–95.

DeLone, W. H. and Mclean, E. R. (2003) 'The DeLone and McLean Model of Information Systems Success: A Ten-Year Update', *Journal of Management Information Systems / Spring*, 19(4), pp. 9–30. doi: 10.1073/pnas.0914199107.

Dokhan, G. and Akkoyunlu, B. (2016) 'Modeling the continuance usage intention of online learning

environments', *Computers in Human Behavior*, 60(1), pp. 198–211. doi: 10.1016/j.chb.2016.02.066.

Freeze, R. D. *et al.* (2010) 'IS success model in e-learning context based on students' perceptions', *Journal of Information Systems Education*, 21(2), p. 173.

Gefen, D., Straub, D. and Boudreau, M.-C. (2000) 'Structural equation modeling and regression: Guidelines for research practice', *Communications of the Association for Information Systems*, 4(1), pp. 1–79.

Haddad, A., Ameen, A. and Mukred, M. (2018) 'The Impact of Intention of Use on the Success of Big Data Adoption Via Organization Readiness Factor', *International Journal of Management and Human Science (IJMHS)*, 2(1), pp. 43–51.

Hair, J. F. *et al.* (2017) *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 2nd edn. London: Thousand Oaks: SAGE.

Halonen, R. *et al.* (2009) 'DeLone & McLean success model as a descriptive tool in evaluating a virtual learning environment', *International Conference on Organizational Learning, Knowledge and Capabilities (OLKC 2009)*, (2008), p. 16. doi: 10.4018/jissc.2010040103.

Husin, I. E., Abou-Shouk, M. A. and Khalifa, G. S. A. (2013) 'Evaluating tourism and hospitality graduates: perceptions of stakeholders in Egypt.', in *Proceedings of the 3rdRegional Conference on Tourism Research, 29-31 Oct, 2013, Langkawi, Malaysia*, pp. 764–774.

Isaac, O. *et al.* (2016) 'The mediating effect of strategic implementation between strategy formulation and organizational performance within government institutions in Yemen', *Research Journal of Applied Sciences*, 11(10). doi: 10.3923/rjasci.2016.1002.1013.

Isaac, Osama, Abdullah, Z., Ramayah, T and Mutahar, A. M. (2017a) ' Internet Usage within Government Institutions in Yemen: An Extended Technology Acceptance Model (TAM) with Internet Self-Efficacy and Performance Impact', *Science International*, 29(4), pp. 737–747.

Isaac, Osama, Abdullah, Z., Ramayah, T and Mutahar Ahmed, M. (2017) 'Examining the Relationship Between Overall Quality, User Satisfaction and Internet Usage: An Integrated Individual, Technological, Organizational and Social Perspective', *Asian Journal of Information Technology*, 16(1), pp. 100–124. doi: 10.3923/ajit.2017.100.124.

Isaac, O. *et al.* (2017) 'Internet usage, user satisfaction, task-technology fit, and performance impact among public sector employees in Yemen', *International Journal of Information and Learning Technology*, 34(3), pp. 210–241. doi: 10.1108/IJILT-11-2016-0051.

Isaac, Osama, Abdullah, Z., Ramayah, T and Mutahar, A. M. (2017b) 'Internet usage , user satisfaction , task-technology fit , and performance impact among public sector employees in Yemen', *The International Journal of Information and Learning Technology*, 34(3), pp. 210–241. doi: 10.1108/IJILT-11-2016-0051.

Isaac, Osama, Abdullah, Z., Ramayah, T and Mutahar, A. M. (2017c) 'Internet Usage and Net Benefit among Employees Within Government Institutions in Yemen: An Extension of Delone and Mclean Information Systems Success Model (DMISM) with Task-Technology Fit', *International Journal of Soft Computing*, 12(3), pp. 178–198. doi: 10.3923/ijscomp.2017.178.198.

Isaac, Osama, Abdullah, Z., Ramayah, T., *et al.* (2017) 'Towards a Better Understanding of Internet Technology Usage by Yemeni Employees in the Public Sector: An Extension of the Task-Technology Fit (TTF) Model', *Research Journal of Applied Sciences*, 12(2), pp. 205–223. doi: 10.3923/rjasci.2017.205.223.

Isaac, O. *et al.* (2018) 'Factors determining user satisfaction of internet usage among public sector employees in Yemen', *International Journal of Technological Learning, Innovation and Development*, 10(1), pp. 37–68. doi: 10.1504/IJTLID.2018.10012960.

Isaac, O. *et al.* (2019) 'Online learning usage within Yemeni higher education: The role of compatibility and task-technology fit as mediating variables in the IS success model', *Computers & Education*, 136(1), pp. 113–129. doi: https://doi.org/10.1016/j.compedu.2019.02.012.

Joseph F. Hair Jr , William C. Black , Barry J. Babin, R. E. A. (2010) *Multivariate Data Analysis*. 7th edn. Prentice Hall.

Kannana, V. R. and Tan, K. C. (2005) 'Just in time, total quality management, and supply chain management: understanding their linkages and impact on business performance', *Omega: The International Journal of Management Science*, 33(2), pp. 153–162.

Khalifa, G. S. A. (2015) 'Ethnic Restaurants' Meal Experience: Egyptian Customers' Perceptions', *Journal of Faculty of Tourism and Hotels*, 9(1), pp. 92–112.

Khalifa, G. S. A. (2018) 'The Egyptian Hotels, Where in the Competitive Environment? Competitive Strategies and Market Orientation and its Impact on Customer Loyalty: The Mediating Role of Operational Performance', *International Journal of Management and Human Science (IJMHS)*, 2(4), pp. 60–72. Available at: http://www.ijmhs.org/index.aspx.

Khalifa, G. S. A. and Abou-Shouk, M. A. A. (2014) 'Investigating the Success Factors of Hotel Websites: The

Case of Egyptian Hotels', *Asia-Pacific Journal of Innovation in Hospitality and Tourism (APJIHT)*, 3(2), pp. 1–21.

Khalifa, G. S. A. and Fawzy, N. M. (2017) 'Measuring E-Service Quality (Expectation Vs. Perception) From Travel Agencies' Perspective: An Empirical Study on Egyptian Hotel Websites', *International Journal on Recent Trends in Business and Tourism (IJRTBT)*, 1(3), pp. 36–48.

Khalifa, G. S. A. and Hewedi, M. M. (2016) 'Factors Affecting Hotel Website Purchasing Intentions: Evidence from Egypt', *Journal of Faculty of Tourism and Hotels*, 8(2), pp. 50–69.

Khalifa, G. S. A. and Mewad, E.-H. A. (2017) 'Managing drivers and boundaries of information technology risk management (ITRM) to increase Egyptian hotels market share', *International Journal on Recent Trends in Business and Tourism (IJRTBT)*, 1(1), pp. 12–31.

Kline, R. B. (2010) *Principles and practice of structural equation modeling*. 3rd edn. New York: The Guilford Press.

Lapovsky, L. (2015) *Online Learning: What Next?*

Mohamed, M. S. *et al.* (2018) 'Effect of Organizational Excellence and Employee Performance on Organizational Productivity Within Healthcare Sector in the UAE', *Journal of Engineering and Applied Sciences*, 13(15), pp. 6199–6210.

Mohamed, M. S. *et al.* (2019) 'The Mediation Effect of Innovation on the Relationship between Creativity and Organizational Productivity: An Empirical Study within Public Sector Organizations in the UAE', *Journal of Engineering and Applied Sciences*, 14(10), pp. 3234–3242. Available at: https://medwelljournals.com/ref.php?doi=jeasci.2019.3234.3242.

Mohamud, S. S. *et al.* (2017) 'Investigating the Antecedents of Coffee Shop Customers'Behavioral Intentions in Kuala Lumpur', *International Journal on Recent Trends in Business and Tourism (IJRTBT)*, 1(4), pp. 1–14.

Montesdioca, G. P. Z. and Maçada, A. C. G. (2015) 'Measuring user satisfaction with information security practices', *Computers & Security*, 48(1), pp. 267–280. doi: 10.1016/j.cose.2014.10.015.

Morsy, M. A., Ahmed, G. S. and Ali, N. A. (2016) 'Impact of Effective Training on Employee Performance in Hotel Establishments', *International Journal of Heritage, Tourism, and Hospitality*, 10(1/2), pp. 92–109.

Nusari, M. *et al.* (2018) 'The Impact of Project Management Assets and Organizational Culture on Employee Performance', *International Journal of Management and Human Science (IJMHS)*, 2(3), pp. 15–26.

Oktal, O., Alpu, O. and Yazici, B. (2016) 'Measurement of internal user satisfaction and acceptance of the e-justice s...: EBSCOhost', *Aslib Journal of Information Management*, 68(6), pp. 716–735. doi: 10.1108/AJIM-04-2016-0048.

Parasuraman, A., Zeithaml, V. A. and Berry, L. L. (1985) 'Model Service Its Quality and Implications for Future', *The journal of marketing*, 49(4), pp. 41–50.

Petter, S. and McLean, E. R. (2009) 'A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level', *Information and Management*, 46(3), pp. 159–166. doi: 10.1016/j.im.2008.12.006.

Qoura, O. and Khalifa, G. S. (2016) 'The Impact of Reputation Management on Hotel Image among Internal Customers: The Case of Egyptian Hotels', *Intlernational Journal of Heritage, Tourism, and Hospitality*, 7(2), pp. 261–274.

Ramirez-Correa, P. E. *et al.* (2017) 'Moderating effect of learning styles on a learning management system's success', *Telematics and Informatics*, 34(1), pp. 272–286. doi: 10.1016/j.tele.2016.04.006.

Rana, N. P. *et al.* (2014) 'Investigating success of an e-government initiative: Validation of an integrated IS success model', *Information Systems Frontiers*, pp. 1–16. doi: 10.1007/s10796-014-9504-7.

Ringle, C. M., Wende, S. and Becker, J.-M. (2015) *SmartPLS 3. Bonningstedt: SmartPLS*.

Shamsi, R. S. H. A. *et al.* (2018) 'The Impact of Innovation and Smart Government on Happiness: Proposing Conceptual Framework.', *International Journal of Management and Human Science (IJMHS)*, 2(2), pp. 10–26.

Sudigdo, A., Khalifa, G. S. A. and Abuelhassan, A. E. (2019) 'Driving Islamic Attributes, Destination Security Guarantee & Destination Image to Predict Tourists' Decision to Visit Jakarta', *International Journal on Recent Trends in Business and Tourism*, 3(1), pp. 59–65.

Tam, C. and Oliveira, T. (2016) 'Understanding the impact of m-banking on individual performance: DeLone & McLean and TTF perspective', *Computers in Human Behavior*. Elsevier Ltd, 61(1), pp. 233–244. doi: 10.1016/j.chb.2016.03.016.

The Global Competitiveness Report (2017) *The Global Competitiveness Report 2016–2017, World Economic Forum*. doi: 92-95044-35-5.

Trung, N. V. H. and Khalifa, G. S. A. (2019) 'Impact of Destination Image Factors on Revisit Intentions of Hotel's International Tourists in Ba Ria-Vung Tau (Br-Vt) The Mediating Role of Positive Word-of-

Mouth', *International Journal on Recent Trends in Business and Tourism*, 3(2).

Wang, W.-T. and Lai, Y.-J. (2014) 'Examining the adoption of KMS in organizations from an integrated perspective of technology, individual, and organization', *Computers in Human Behavior*. Elsevier Ltd, 38(1), pp. 55–67. doi: 10.1016/j.chb.2014.05.013.

Wang, Y.-S. *et al.* (2014) 'A model for assessing blog-based learning systems success', *Online Information Review*, 38(7), p. 969. doi: 10.1108/OIR-04-2014-0097.

Wang, Y.-S. and 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), pp. 717–733. doi: 10.1016/j.giq.2007.06.002.

Werts, C. E., Linn, R. L. and Jöreskog, K. G. (1974) 'Intraclass reliability estimates: Testing structural assumptions', *Educational and Psychological Measurement*, 34(1), pp. 25–33.

Wu, J. H. and Wang, Y. M. (2006) 'Measuring KMS success: A respecification of the DeLone and McLean's model', *Information and Management*, 43(6), pp. 728–739. doi: 10.1016/j.im.2006.05.002.

Xinli, H. (2015) 'Effectiveness of information technology in reducing corruption in China', *Electronic Library*, 33(1), pp. 52–64. doi: 10.1108/EL-11-2012-0148.