

Understanding Health Professionals' Intention to Use Telehealth in Yemen: Using the DeLone and McLean IS Success Model

Abdulrahman A. Al-Fadhli¹(✉), Marini Othman¹, Nor'ashikin Ali¹,
and Bassam A. Al-Jamrh²

¹ College of Computer Science and Information Technology, Universiti Tenaga Nasional, Jalan IKRAM-UNITEN, 43000 Kajang, Selangor, Malaysia
abaar79@yahoo.com

² Faculty of Economic and Management, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

Abstract. Telehealth is considered as an innovative technology for enhancing healthcare systems in rural areas. Rural areas in Yemen are suffering from poor healthcare due to limited access of health services. Therefore, the aim of this study is to determine Health Professionals' intention to use Telehealth in Yemen. DeLone and McLean model has been developed by integrating indirect factor "Anxiety" from the unified theory of acceptance and use of technology (UTAUT). A quantitative approach based on self-administrated questionnaire has been deployed. SPSS has been used for analysis purposes. Results found that factors System quality, Information quality, Service quality, Net benefit and User satisfaction had a positive and significant impact on Intention to use Telehealth. The results revealed that the Health Professionals have intention to use the Telehealth to do their duties.

Keywords: Health information technology · Telehealth · DeLone and McLean IS model · Anxiety · Intention to use a telehealth

1 Introduction

Due to the ongoing conflict in Yemen there is a severe shortages of health professionals and most of health facilities are closed [1]. Consequently, more than 80% of the population is in need for health assistance, in particular in rural areas [1]. In addition, rural areas in Yemen are suffering from poor healthcare due to limited access of health services [2–4]. Therefore, this study proposed using Telehealth to improve the healthcare system in the rural areas of Yemen.

Due to the vital role of health professionals in the success of Telehealth [5], they have been used as the sample population of this study. Thus, the aim was to determine Health Professionals' intention to use Telehealth in Yemen.

2 Literatures Review

The Yemeni government is striving hard to find a successful and acceptable solution to improve the current health system in Yemen and especially in the rural areas [6]. Therefore, a new solution would be welcomed by the government.

Technology has been utilized to invent many innovations in improving the health system such as Health Information Technologies. Due to many reasons, some of them succeeded, and the rest failed [7]. These reasons vary from country to another. Therefore, to improve the Yemeni health system, a successful technology must be chosen in order to improve the healthcare status as well as meet people's health needs. Furthermore, this paper suggests that the success of the health information technology is important should be determined before adoption. Moreover, the success of an information technology is important because of its impact on the success of the institutions [8]. Thus, the Yemeni government need to know the extent to which the health information technology success based on the health professionals' intention to use it in the future.

One of these technologies is Telehealth [9]. Therefore, this study suggests using Telehealth as a solution to meet healthcare needs of rural societies in Yemen.

Reid [10] defined Telehealth as *"the use of advanced telecommunication technologies to exchange health information and provide healthcare services across geographic, time, social, and cultural barriers"*. Telehealth is a clinical information system [11] which has the potential to deliver health services and exchange health information to rural areas [10]. Consequently, it will improve the accessibility and quality of healthcare [12]. Moreover, the Telehealth system is suitable for solving the health problems of countries that encountered with limited resources [13].

A successful Telehealth must have features and characteristics to meet health professionals' needs [14]. Thus, it is believed that Telehealth will be more successful if users have the intention to use it. According to Hellstén and Markova [15], opinions of success of the same system are different among users. Furthermore, the success of technology depends on user acceptance [7]. Moreover, "Intention to use" and "success" are terms that are closely related [16] and linked in several studies [17]. Therefore, it is important to determine the users' intention to use in order to measure the success of an information system [8]. In this paper, "users" refers to health professionals (i.e., including all physicians, paramedical, and nurses in the Ministry of Public Health).

Health professionals with experience in using Telehealth are important to predict the success of the Telehealth because they have a clear understanding of patients' health needs and challenges that could be solved using Telehealth [18–20]. Moreover, patients could be more willing to use Telehealth if informed by their health professionals [21].

From the above mentioned literature, this paper aimed to determine health professionals' intention to use it in the future based on determining the success of Telehealth.

A literature review was undertaken to achieve the paper's aim, as shown in Table 1.

The literature indicates that the IS success model is a good model to identify determinants for Telehealth success [29, 30]. According to [8], in some contexts,

Table 1. Shows several studies were conducted to determine factors that influence the health professionals' intention to use Health Information Technologies.

Study	Technology	Participants	Factors influenced
[22]	Electronic health record	157	Perceived ease of use, professional norm, social norm, and demonstrability of the results
[23]	Computerized clinical practice guidelines	238	Attitudes toward using, organizational support, perceived usefulness, and social influence
[24]	Telemedicine	117	Perceived usefulness
[25]	Smartphone in healthcare	138	Perceived usefulness and attitude
[26]	Telemedicine	400	Perceived usefulness and attitude
[21]	Telemonitoring system	234	Perceived usefulness
[27]	Telemonitoring system	268	Perceived usefulness, compatibility, and facilitators
[28]	Telemedicine	398	Perceived usefulness
[29]	Telehealth	336	System quality and user satisfaction

intention to use is a worthwhile alternative factor to measure the information system success. Furthermore, increased user satisfaction of the information system lead to increase the user intention to use it [8]. Moreover, user satisfaction and intention to use would be affected by other factors such as system quality, information quality, service quality and the net benefit [8, 31]. Thus, intention to use factor has been chosen due to its importance in predicting the future use [32]. In addition, the relationships are strong between intention to use and the rest factors of IS success model [32]. Telehealth technology is not existing in Yemen. Therefore, the factor anxiety was used to determine the health Professionals' anxiety of using Telehealth.

Finally, based on the above and in achieving the paper's aim, DeLone and McLean's (2003) IS Success Model has been chosen and developed to determine the intention to use Telehealth by health professionals.

2.1 DeLone and McLean IS Success Model

DeLone and McLean produced their model in 1992. This model comes with six dimensions [33].

In 2003, DeLone and McLean updated and refined their model [8] by adding service quality and intention to use. Furthermore, organisational and individual impacts are replaced by net benefits. The IS Success Model is widely adopted and validated in the evaluation of different systems kinds [23]. Furthermore, A model can be used to measure the information system's success in the public sector [34].

3 The Research Model

Research model has been developed by integrating DeLone and Mclean model and the indirect factor “Anxiety” from the unified theory of acceptance and use of technology (UTAUT) [35], as shown in Fig. 1 below.

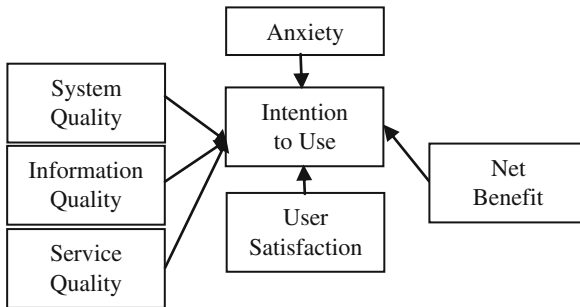


Fig. 1. The research model

3.1 The Dimensions of the Research Model and Hypotheses

DeLone and McLean Model did not identify the measures of the dimensions. Nonetheless, they have suggested using the measures that they have studied and validated before [8]. Therefore, this research has identified the measures of the dimensions based on several studies [36–44].

System Quality: System quality is the first dimension of the IS Success Model. It has been explained by DeLone and McLean [33] as the desired characteristics of the information system. Petter, DeLone [39] mentioned some of the success measures of system quality, which are: “*ease of use, system flexibility, system reliability, and ease of learning and response times*”. Meanwhile, Hellstén and Markova [15] mentioned six: “*ease of use, ease of learning, convenience of access, realization of user requirement, usefulness of system features and functions, and data and system accuracy*”. Noticeably, there is no specific concept about system quality. It differs from one study to another as the purpose of the study. Based on the literature review, the concept of system quality from the perspectives of this paper is the system that has the specific characteristics such as ease of use, ease of learning, user-friendly, and enhances the efficiency of the work. In other words, the Telehealth system should have these characterisations. Thus, the H1 is as follows: System quality would positively affect Health Professionals’ intention to use Telehealth technology.

Information Quality: DeLone and McLean (1992) defined information quality as the desirable characteristics of information that are produced from the system. Petter, DeLone [39] mentioned some of the success measures of information quality, which are: “*accuracy, completeness, relevancy, timeliness, and format of the information*”. Whereas Hellstén and Markova [15] mentioned: “*importance, relevance, usefulness,*

timelines, readability, and content". In this paper, the concept of information quality is that the Telehealth system information should be accurate, sufficient, secure, up-to-date, clear, able to enhance the job, and is better than using paper. Thus, the H2 is as follows: Information quality would positively affect Health Professionals' intention to use Telehealth technology.

Service Quality: DeLone and McLean (2003) explained service quality as the overall support for the information technology unit or technicians to the information system users. Petter, DeLone [39] mentioned some of the success measures of service quality, which are: "responsiveness, assurance, reliability, and empathy", which have used in this paper. Thus, the H3 is as follows: Service quality would positively affect Health Professionals' intention to use Telehealth technology.

Net Benefits: According to Srur and Drew [45], Net benefit is considered as the main dimension of the Information Success Model. In addition, it measures the benefits of the electronic system that affect positively or negatively on individuals or organisations. Furthermore, they added that benefits are determined by the type of information system, for example, in the context of health information systems, the benefits are "*cost and time savings, reduced search costs, improved efficiency, better healthcare, and others*". Whereas Petter, DeLone [39] mentioned examples of benefits such as: "*improved decision-making, improved productivity, increased sales, cost reduction, improved profits, market efficiency, consumer welfare, creation of jobs, and economic development*". Overall, DeLone and McLean (2003) referred that benefits should depend on the purpose of the system and to whom. Therefore, this paper refers that the Telehealth system in Yemen should provide these benefits: improve the quality of healthcare; enhance the accessibility; reduce cost; save health professionals' time; and decrease their efforts of using traditional treatment. Thus, the H4 is as follows: Net benefit would positively affect Health Professionals' intention to use Telehealth technology.

User Satisfaction: [46] explained user satisfaction as the feeling of pleasure or displeasure of the benefits of information system that a person is expected to receive. Aman [12] observed the user satisfaction as a signal of users' acceptance. This paper considers user satisfaction as an important sign of acceptance of Telehealth by health professionals. Thus, the H5 is as follows: Health Professionals' satisfaction would positively affect Health Professionals' intention to use Telehealth technology.

Intention to Use: DeLone and McLean (2003) suggested that the intention to use is an alternative measure in some contexts. Therefore, this paper has used it to predict the health professionals' intention to use Telehealth in Yemen in the future.

Anxiety: is defined as "*negative emotions and cognitions evoked in actual or imaginary interaction with computer-based technology*" [47]. This paper will investigate health Professionals' anxiety of using Telehealth. Thus, hypothesis is as follows: H6 Anxiety would positively affect Health Recipients' behavioural intention to use Telehealth.

4 Methodology

This study used a quantitative approach. A questionnaire was adopted to assess the health professionals' intention to use Telehealth based on the Delone and Maclean IS success model (Delone and Mclean 2003) and UTAUT [35]. Two language professionals translated the questionnaire to Arabic in order to make sure that the questions' meaning had not change. The questionnaire consists of three parts which are introduction, demographic data, and questions. A written permission from the government of Yemen and verbal consents from the participants are taken before distributing the questionnaires.

5 Analysis and Findings

This section presents data analysis and findings.

5.1 Response Rate

The targeted sample was the Yemenis health professionals. Specifically, those who are working in rural areas and those have worked there before. Furthermore, only who have the experience in using Health Information Technologies. The questionnaires were distributed to 200 health professionals, 199 were retrieved, 21 questionnaires were excluded because there is no experience in using Health Information Technologies. 8 outliers cases have been detected and then removed. And thus, the number of valid questionnaires was 170. Thus, the valid questionnaires response rate is 85%.

5.2 Data Screening

Handling data missing and identifying outliers are the procedures that used in this paper to screen data [48]. Surprisingly, in this study there were no cases with missing data. This may be due to the great sense of responsibility of respondents in order to solve the healthcare problems in Yemen. The researchers have given the respondents the sufficient time for answers.

5.3 Normality and Reliability

The researchers used SPSS Skewness test has used to check the normality of data distribution according to [48], as shown in Table 2.

Check the reliability of the questionnaire was done using Cronbach's alpha [49]. As shown in Table 2, the questionnaire has seven variables. One of them is ranked as Acceptable which is System Quality and the rest six are ranked as Good. The cronbach's alpha for all questionnaire items were 0.860, which ranked as excellent.

Table 2. The normality and reliability result

Factors	Cronbach's Alpha	Item no.	Skewness	Kurosis
System quality	.657	4	-.479	-.190
Information quality	.750	7	-.114	-.968
Service quality	.715	5	-.443	-.413
Net benefit	.759	5	-.458	-.477
User satisfaction	.708	3	-.453	-.296
Intention to use	.771	3	-.548	-.535
Anxiety	.857	4	-.167	-.727

5.4 Descriptive Analysis for Respondents

From Table 3 it can be noticeable that: the government made the rural service mandatory for medical graduates directly after graduation. Therefore, the majority of respondents were less than thirty years old. Health Policy in Yemen supports the distribution of specialized medical staff (highly educated) in urban areas. Therefore, the majority of respondents were the people who have bachelor degree. In this paper, the term of "Paramedical" has been used to represent many professions such as doctor assistance, pharmacist, laboratory technician, imaging technologist. The prerequisite for participation in the survey is the experience in the use of technology in healthcare. Therefore, the majority of respondents were the doctors who had the ability to use health information technologies. Most of the respondents had internet access through computers and smart phones in rural areas.

Table 3. Summary of health professionals respondents profile

Measures	Categories	No. of respondent	Percentage
Gender	Male	103	60.6%
	Female	67	39.4%
Age	Less than 30	122	71.8%
	30-49	38	22.4%
	More than 50	10	5.9%
Education	Diploma	25	14.7%
	Bachelor	113	66.5%
	Master and PhD	32	18.8%
Profession	Doctors	106	62.4%
	Paramedical	46	27.1%
	Nurse	18	10.6%
Internet exposure	Yes	151	88.8%
	No	19	11.2%
HIS experience	Yes	170	100%

5.5 Pearson Correlation Result

In this paper, Pearson correlation has been used to examine the strength of the relationship between the research factors [50] (Table 4).

Table 4. Health professionals Pearson correlation result

Factors	Correlations	User satisfaction	Strength of relationship
System quality	Pearson correlation	.411	Moderate
	Sig. (2-tailed)	.000	
	N	170	
Information quality	Pearson correlation	.484	Moderate
	Sig. (2-tailed)	.000	
	N	170	
Services quality	Pearson correlation	.358	Weak
	Sig. (2-tailed)	.000	
	N	170	
Net benefit	Pearson correlation	.533	Moderate
	Sig. (2-tailed)	.000	
	N	170	
User satisfaction	Pearson correlation	.490	Moderate
	Sig. (2-tailed)	.000	
	N	170	
Anxiety	Pearson correlation	.17	Weak
	Sig. (2-tailed)	.830	
	N	170	

Furthermore, according to Pearson correlation result in Table 3 above:

- There was a moderating effect and significant relationship between the independent variables System Quality and the dependent variable Intention to Use, ($r = .411$, $n = 170$, $p = .000$). Consequently, H1 is support.
- There was a moderating effect and significant relationship between the independent variables Information Quality and the dependent variable Intention to Use, ($r = .484$, $n = 170$, $p = .000$). Consequently, H2 is support.
- There was a weak effect and significant relationship between the independent variables Services Quality and the dependent variable Intention to Use, ($r = .358$, $n = 170$, $p = .000$). Consequently, H3 is support.
- There was a moderating effect and significant relationship between the independent variables Net Benefit and the dependent variable Intention to Use, ($r = .533$, $n = 170$, $p = .000$). Consequently, H4 is support.
- There was a moderating effect and significant relationship between the variables User Satisfaction and Intention to Use, ($r = .490$, $n = 170$, $p = .000$). Consequently, H5 is support.

- There was no significant relationship between the variables User Satisfaction and Intention to Use, ($r = .017$, $n = 170$, $p = .830$). Consequently, H5 is support.

6 Discussion

Discussing Health Professionals' Intention to Use Telehealth revealed that all of the hypotheses were supported except H6. Thus, findings are consistent with the Delone and Mclean (2003) model, which has been used in this paper to determine the Health Professionals' Intention to Use Telehealth. As a result, all factors effect on the health professionals' intention to use Telehealth in Yemen. Net Benefit factor was the most predicated of the Intention to Use ($\beta = .533$, $p = .000$) then User Satisfaction, Information Quality, System Quality and Services Quality, respectively ($\beta = .490$, $p = .000$; $\beta = .484$, $p = .000$; $\beta = .411$, $p = .000$; $\beta = .358$, $p = .000$). The use of Delone & Mclean IS success model gives a better understating of health professionals' intention to use Telehealth due to the perception of its factors in explaining that intention to use Telehealth is an essential step in accepting and adopting Telehealth. Overall, the discussion of findings revealed that health professionals have the intention to use Telehealth.

7 Conclusion

There are shortages of studies in using Health Information Technologies such as Telehealth for improving Yemen's rural health system. Hence, this study is considered as the first study in understanding and predicting the Yemeni health professionals' intention to use Telehealth.

This study would contribute in increasing the knowledge of the Yemeni government towards using Health Information Technologies to overcome the current health challenges such as the lack of health facilities, professionals, and equipment.

The researchers faced two problems in conducting the questionnaire. Firstly, the study targeted samples working in all governorates of Yemen. Secondly, researchers have limited resources. However, the researchers conducted questionnaires in the capital city of Yemen. Researchers attended special events in specific dates in where a large numbers of health professionals meet for medical conferences, international tests (ex., medical board exams, and distance education exams), medical seminars and workshops, formal meetings of the Ministry of Public Health and doctors who are working in international health agencies in rural areas. Therefore, further studies should be conducted Telehealth acceptance from hospital level for successful introducing of Telehealth in Yemeni health system.

References

1. OCHA: Humanitarian needs overview, Yemen (2016). http://reliefweb.int/sites/reliefweb.int/files/resources/2016_HNO_English_%20FINAL.pdf
2. OCHA: 2014–15 Yemen Humanitarian Response Plan 2015 Revision (2015). https://www.humanitarianresponse.info/en/system/files/documents/files/yemen_hrp_revised_2015.pdf
3. UN: THE LEAST DEVELOPED COUNTRIES REPORT 2013: Geneva 10, Switzerland (2013)
4. UNICEF: The state of the world's children 2015: Executive summary. Reimagine the future: Innovation for every child. UNICEF (2015)
5. Broens, T.H., et al.: Determinants of successful telemedicine implementations: a literature study. *J. Telemed. Telecare*. **13**(6), 303–309 (2007)
6. GovernmentofYemen: National Dialogue Conference (NDC) (2013). <http://www.pdf-yemen.com/PDF/Democratic/NDC%20Final%20Document.pdf>
7. Mohamadali, N.A.K., Garibaldi, J.M.: A novel evaluation model of user acceptance of software technology in healthcare sector. In: *Healthinf* (2010)
8. Delone, W.H., McLean, E.R.: The DeLone and McLean model of information systems success: a ten-year update. *J. Manag. Inf. Syst.* **19**(4), 9–30 (2003)
9. Chumbler, N.R., Haggstrom, D., Saleem, J.J.: Implementation of health information technology in veterans health administration to support transformational change: telehealth and personal health records. *Med. Care* **49**(Suppl), S36–S42 (2011)
10. Reid, A.: *Telemedicine Primer: Understanding the Issues*. Innovative, Medical Communications, Montana (1996)
11. Dansky, K., Bowles, K., Palmer, L.: Clinical outcomes of telehomecare for diabetic patients. *J. Inform. Technol. Healthcare* **1**, 61–74 (2003)
12. Aman, A.: Clinical information systems in private hospitals. In: 2013 15th International Conference on Advanced Communication Technology (ICACT). IEEE (2013)
13. Heinzelmann, P.J., Lugn, N.E., Kvedar, J.C.: Telemedicine in the future. *J. Telemed. Telecare* **11**(8), 384–390 (2005)
14. Alkmim, M.B., et al.: Improving patient access to specialized health care: the telehealth network of Minas Gerais, Brazil. *Bull. World Health Organ.* **90**(5), 373–378 (2012)
15. Hellstén, S.-M., Markova, M.: The DeLone and McLean model of information systems success-original and updated models. In: *SIGCHI Conference* (2006)
16. Seen, M., Rouse, A.C., Beaumont, N.: Explaining and predicting information systems acceptance and success: an integrative model. In: *ECIS* (2007)
17. Rho, M.J., Chang, Y.H., Lee, J.: Determinants of physicians' intention to use telemonitoring: an empirical study of task technology fit and quantitative overload. *Int. J. Adv. Comput. Technol.* **5**(12), 403 (2013)
18. Doolittle, G.C.: Telemedicine in Kansas: the successes and the challenges. *J. Telemed. Telecare* **7 Suppl 2**(suppl 2), 43–46 (2001)
19. Jennett, P., et al.: Organizational readiness for telemedicine: implications for success and failure. *J. Telemed. Telecare* **9 Suppl 2**(suppl 2), S27–S30 (2003)
20. Smith, A.C.: *The feasibility and cost-effectiveness of a novel telepaediatric service in Queensland*. University of Queensland (2004)
21. Gagnon, M.P., et al.: Using a modified technology acceptance model to evaluate healthcare professionals' adoption of a new telemonitoring system. *Telemed. e-Health* **18**(1), 54–59 (2012)
22. Gagnon, M.P., et al.: Electronic health record acceptance by physicians: testing an integrated theoretical model. *J. Biomed. Inform.* **48**, 17–27 (2014)

23. Topi, H., Tucker, A.: *Computing Handbook: Information Systems and Information Technology*, vol. 2. CRC Press, Boca Raton (2014)
24. Kowitlawakul, Y.: The technology acceptance model: predicting nurses' intention to use telemedicine technology (eICU). *Comput. Inform. Nurs.* **29**(7), 411–418 (2011)
25. Park, Y., Chen, J.V.: Acceptance and adoption of the innovative use of smartphone. *Ind. Manag. Data Syst.* **107**(9), 1349–1365 (2007)
26. Chau, P.Y., Hu, P.J.H.: Information technology acceptance by individual professionals: a model comparison approach. *Decis. Sci.* **32**(4), 699–719 (2001)
27. Asua, J., et al.: Healthcare professional acceptance of telemonitoring for chronic care patients in primary care. *BMC Med. Inform. Decis. Mak.* **12**(1), 139 (2012)
28. Croteau, A.-M., Vieru, D.: Telemedicine adoption by different groups of physicians. In: *Proceedings of the 35th Annual Hawaii International Conference on System Sciences, HICSS. IEEE* (2002)
29. Hsieh, H.L., et al.: Factors affecting success of an integrated community-based telehealth system. *Technol. Health Care* **23 Suppl 2**(s2), S189–S196 (2015)
30. Tannery, N.H., et al.: Impact and user satisfaction of a clinical information portal embedded in an electronic health record. *Perspect. Health Inf. Manag.* **8**(Fall), 1d (2011)
31. Wang, Y.S.: Assessing e-commerce systems success: a respecification and validation of the DeLone and McLean model of IS success. *Inf. Syst. J.* **18**(5), 529–557 (2008)
32. Petter, S., McLean, E.R.: A meta-analytic assessment of the DeLone and McLean IS success model: an examination of IS success at the individual level. *Inf. Manag.* **46**(3), 159–166 (2009)
33. DeLone, W.H., McLean, E.R.: Information systems success: the quest for the dependent variable. *Inf. Syst. Res.* **3**(1), 60–95 (1992)
34. Elpez, I., Fink, D.: Information systems success in the public sector: Stakeholders' perspectives and emerging alignment model. *Issues Informing Sci. Inf. Technol.* **3**(2), 219–231 (2006)
35. Venkatesh, V., et al.: User acceptance of information technology: toward a unified view. *MIS Q.* **27**, 425–478 (2003)
36. Van Dyke, T.P., Kappelman, L.A., Prybutok, V.R.: Measuring information systems service quality: concerns on the use of the SERVQUAL questionnaire. *MIS Q.* **21**, 195–208 (1997)
37. Seddon, P.B.: A respecification and extension of the DeLone and McLean model of IS success. *Inf. Syst. Res.* **8**(3), 240–253 (1997)
38. Pitt, L.F., Watson, R.T., Kavan, C.B.: Service quality: a measure of information systems effectiveness. *MIS Q.* **21**, 173–187 (1995)
39. Petter, S., DeLone, W., McLean, E.: Measuring information systems success: models, dimensions, measures, and interrelationships. *Eur. J. Inf. Syst.* **17**(3), 236–263 (2008)
40. Parasuraman, A., Zeithaml, V.A., Berry, L.L.: Servqual. *J. Retail.* **64**(1), 12–40 (1988)
41. Jiang, J.J., Klein, G., Saunders, C.: Discrepancy theory models of satisfaction in IS research. In: *Information Systems Theory*, pp. 355–381. Springer (2012)
42. Doll, W.J., Torkzadeh, G.: The measurement of end-user computing satisfaction. *MIS Q.* **12**, 259–274 (1988)
43. Davis, F.D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* **13**, 319–340 (1989)
44. Bharati, P., Chaudhury, A.: An empirical investigation of decision-making satisfaction in web-based decision support systems. *Decis. Support Syst.* **37**(2), 187–197 (2004)
45. Srur, B.L., Drew, S.: Challenges in designing a successful e-health system for Australia. In: *2012 International Symposium on Information Technology in Medicine and Education (ITME). IEEE* (2012)

46. Seddon, P., Kiew, M.-Y.: A partial test and development of DeLone and McLean's model of IS success. *Australas. J. Inf. Syst.* **4**(1), 90–109 (1996)
47. Bozionelos, N.: Computer anxiety: relationship with computer experience and prevalence. *Comput. Hum. Behav.* **17**(2), 213–224 (2001)
48. Hair, J.F., et al.: *Multivariate Data Analysis: A Global Perspectives*, 7th edn. Pearson Education, Upper Saddle River (2010)
49. George, D., Mallery, M.: *Using SPSS for Windows step by step: a simple guide and reference*. Allyn y Bacon, Boston (2003)
50. Field, A.: *Discovering statistics using SPSS*. Sage Publications, Thousand Oaks (2009)