Document details

‹ Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More... ›

Full Text View at Publisher

International Conference on Research and Innovation in Information Systems, ICRIIS
Volume December-2019, December 2019, Article number 9073655
6th International Conference on Research and Innovation in Information Systems: Empowering Digital Innovation, ICRIIS 2019; DoubleTree by HiltonJohor Bahru; Malaysia; 2 December 2019 through 3 December 2019; Category numberCFP1939N-ART; Code 159491

Internet of things-based smart facilities management services successful implementation instrument development, validity, and reliability (Conference Paper)

Sidek, N.[a] ✉, Ali, N.[b] ✉, Rosman, R.[c] ✉

[a]University Tenaga Nasional, Department of Computing, Kajang, Selangor, Malaysia
[b]University Tenaga Nasional, College of Graduate School, Kajang, Selangor, Malaysia
[c]Institute of Islamic Banking Finance, International Islamic University, Gombak Selangor, Malaysia

Abstract

View references (51)

The purpose of Internet of Things-based Smart Facilities Management Services (IoTbSFMS) is to increase the efficiency and effectiveness of facilities management services through improvement and innovation. Despite a common understanding that individual technology readiness and overall quality is an essential element in IoT-based technology success, there is a dearth of theoretical and empirical research on these elements as a facilitator of successful IoTbSFMS implementation. This study develops the IoTbSFMS validated instrument and proposes an integrated approach of instrument development through a multi-stage technique and rigorous statistical testing. Thirteen IoT experts had evaluated the content validity where two measurement items were excluded as per expert review's suggestion, which remaining 11 constructs and 58 measurement items. The process was followed by a pre-test assessment to determine the effectiveness of the measurement items. Finally, a pilot study assessment was conducted among 33 respondents. The collected data were analysed using SPSS25, Smart-PLS, and JASP software. As a result, the Content Validity Index (CVI) for the final IoTbSFMS constructs and items was deemed acceptable (CVI =0.82). The internal consistency reliability of the measurement instruments showed that the Cronbach's alpha and McDonald's omega for independent variables ranged from 0.682 to 0.989 and 0.685 to 0.989. These values suggest that all the constructs had acceptable validity and reliability. This paper contributes in encouraging researchers to look beyond the traditional approach in measuring the internal consistency reliability of the measurement instruments. © 2019 IEEE.

SciVal Topic Prominence

Topic: SERVQUAL | E-Service Quality | Consumer Satisfaction

Prominence percentile: 98.443

Author keywords

Content Validity | Facility Management | Information System | Instrument Development | Internet of Things

Indexed keywords

Engineering controlled terms: Information systems | Information use | Instrument testing | Reliability | Terbium compounds

Engineering uncontrolled terms: Content validity indices | Facilities management | Independent variables | Individual technology | Instrument development | Internal consistency reliability | Measurement instruments | Traditional approaches

Engineering main heading: Internet of things

Funding details

Funding sponsor	Funding number	Acronym
Badan Tenaga Nuklir Nasional		BATAN

Funding text

ACKNOWLEDGMENT This study was funded by University Tenaga Nasional Internal Grant (UNIIG) 2018 and Malaysian Public Service Department.

ISSN: 23248149
ISBN: 978-172816726-8
Source Type: Conference Proceeding
Original language: English
DOI: 10.1109/ICRIIS48246.2019.9073655
Document Type: Conference Paper
Publisher: IEEE Computer Society

References (51)

View in search results format >

All | Export | Print | E-mail | Save to PDF | Create bibliography

1 Heaton, J., Parlikad, A.K.
A conceptual framework for the alignment of infrastructure assets to citizen requirements within a Smart Cities framework
(2019) *Elsevier*

2 Sidek, N., Ashikin, N., Rosman, R.
Wireless communication-: A conceptual model of iot services success for government agencies
(2018) *Int. J. Eng. Technol.*, 7 (4-35), pp. 857-865. Cited 4 times.

3 Alenezi, A., Almeraj, Z., Manuel, P.
Challenges of IoT based smart-government development
(2018) *IEEE Green Technologies Conference*, 2018-April, pp. 155-160. Cited 7 times.
http://ieeexplore.ieee.org
ISBN: 978-153865183-4
doi: 10.1109/GreenTech.2018.00036
View at Publisher

4 Bi, Z.
(2016) *IoT Based System Forcommunication and Coordination of Football Robot Team*. Cited 2 times.

5 Castro, D., New, J., McQuinn, A.
(2016) *How Is the Federal Government Using the Internet of Things*. Cited 7 times.

6 Termizi, A.A.A., Ahmad, N., Omar, M.F., Wahap, N.A., Zainal, D., Ismail, N.M.
Smart facility application: Exploiting space technology for smart city solution (Open Access)

(2016) *IOP Conference Series: Earth and Environmental Science*, 37 (1), art. no. 012049. Cited 4 times.
http://www.iop.org/EJ/volume/1755-1315
doi: 10.1088/1755-1315/37/1/012049

View at Publisher

7 MacKenzie, S.B., Podsakoff, P.M., Podsakoff, N.P.
Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques

(2011) *MIS Quarterly: Management Information Systems*, 35 (2), pp. 293-334. Cited 1096 times.
http://misq.org/misq/downloads/
doi: 10.2307/23044045

View at Publisher

8 Ali, N., Tretiakov, A., Whiddett, D.
A content validity study for a knowledge management systems success model in healthcare
(2014) *J. Inf. Technol. Theory Appl.*, 15 (2), pp. 21-36. Cited 13 times.

9 Shrotryia, V.K., Dhanda, U.
Content Validity of Assessment Instrument for Employee Engagement (Open Access)

(2019) *SAGE Open*, 9 (1). Cited 9 times.
https://in.sagepub.com/en-in/sas/journal/sage-open
doi: 10.1177/2158244018821751

View at Publisher

10 Love, J., Selker, R., Marsman, M., Jamil, T., Dropmann, D., Verhagen, J., Ly, A., (...), Wagenmakers, E.-J.
JASP: Graphical statistical software for common statistical designs (Open Access)

(2019) *Journal of Statistical Software*, 88 (1). Cited 19 times.
https://www.jstatsoft.org/index.php/jss/article/view/v088i02/v88i02.pdf
doi: 10.18637/jss.v088.i02

View at Publisher

11 Dunn, T.J., Baguley, T., Brunsden, V.
From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation

(2014) *British Journal of Psychology*, 105 (3), pp. 399-412. Cited 730 times.
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)2044-8295
doi: 10.1111/bjop.12046

View at Publisher

12 Atkin, B., Bildsten, L.
Editorial: A future for facility management

(2017) *Construction Innovation*, 17 (2), pp. 116-124. Cited 11 times.
http://www.emeraldinsight.com/info/journals/ci/ci.jsp
doi: 10.1108/CI-11-2016-0059

View at Publisher

13 Bibri, S.E.
The IoT for smart sustainable cities of the future: An analytical framework for sensor-based big data applications for environmental sustainability

(2018) *Sustainable Cities and Society*, 38, pp. 230-253. Cited 97 times.
http://www.elsevier.com/wps/find/journaldescription.cws_home/724360/description#description
doi: 10.1016/j.scs.2017.12.034

View at Publisher

14 Chen, W., Chen, K., Cheng, J.C.P., Wang, Q., Gan, V.J.L.
BIM-based framework for automatic scheduling of facility maintenance work orders

(2018) *Automation in Construction*, 91, pp. 15-30. Cited 35 times.
doi: 10.1016/j.autcon.2018.03.007

View at Publisher

15 Almanasreh, E., Moles, R., Chen, T.F.
Evaluation of methods used for estimating content validity

(2019) *Research in Social and Administrative Pharmacy*, 15 (2), pp. 214-221. Cited 18 times.
http://www.journals.elsevierhealth.com/periodicals/rsap
doi: 10.1016/j.sapharm.2018.03.066

View at Publisher

16 Clark, V.L.P., Creswell, J.W.
(2015) *Understanding Research: A Consumer ' S Guide*. Cited 89 times.

17 Straub, D., Gefen, D.
Validation guidelines for is positivist research
(2004) *Commun. Assoc. Inf. Syst.*, 13. Cited 1434 times.
March

18 Chatterjee, S., Kar, A.K., Gupta, M.P.
Success of IoT in Smart Cities of India: An empirical analysis

(2018) *Government Information Quarterly*, 35 (3), pp. 349-361. Cited 43 times.
http://www.elsevier.com/locate/govinf
doi: 10.1016/j.giq.2018.05.002

View at Publisher

19 Martínez-Caro, E., Cegarra-Navarro, J.G., García-Pérez, A., Fait, M.
Healthcare service evolution towards the Internet of Things: An end-user perspective

(2018) *Technological Forecasting and Social Change*, 136, pp. 268-276. Cited 17 times.
www.elsevier.com/inca/publications/store/5/0/5/7/4/0/
doi: 10.1016/j.techfore.2018.03.025

View at Publisher

20 Fu, Y., Wu, W.
Behavioural informatics for improving water hygiene practice based on IoT environment (Open Access)

(2018) *Journal of Biomedical Informatics*, 78, pp. 156-166. Cited 3 times.
http://www.elsevier.com/inca/publications/store/6/2/2/8/5/7/index.htt
doi: 10.1016/j.jbi.2017.11.006

View at Publisher

21 Gefen, D.
Research: A state-of-The-art assessment
(2001) *MIS Q.*, 25 (1), pp. 1-16. Cited 2 times.

22 Lam, K.W., Hassan, A., Sulaiman, T., Kamarudin, N.
Evaluating the Face and Content Validity of an Instructional Technology Competency Instrument for University Lecturers in Malaysia
(2018) *Int. J. Acad. Res. Bus. Soc. Sci.*, 8 (5), pp. 367-385. Cited 4 times.

23 Shirali, G., Shekari, M., Angali, K.A.
Assessing Reliability and Validity of an Instrument for Measuring Resilience Safety Culture in Sociotechnical Systems (Open Access)

(2018) *Safety and Health at Work*, 9 (3), pp. 296-307. Cited 11 times.
http://www.e-shaw.org/
doi: 10.1016/j.shaw.2017.07.010

View at Publisher

24 Grant, J.S., Davis, L.L.
Selection and use of construct experts for instrument development
(1997) *Int. J. Child. Rights*, 25 (2), pp. 285-306.

25 Schmiedel, T., Vom Brocke, J., Recker, J.
Development and validation of an instrument to measure organizational cultures' support of Business Process Management

(2014) *Information and Management*, 51 (1), pp. 43-56. Cited 75 times.
doi: 10.1016/j.im.2013.08.005

View at Publisher

26 Recker, J., Rosemann, M.
The measurement of perceived ontological deficiencies of conceptual modeling grammars

(2010) *Data and Knowledge Engineering*, 69 (5), pp. 516-532. Cited 24 times.
doi: 10.1016/j.datak.2010.01.003

View at Publisher

27 Trizano-Hermosilla, I., Alvarado, J.M.
Best alternatives to Cronbach's alpha reliability in realistic conditions: Congeneric and asymmetrical measurements (Open Access)

(2016) *Frontiers in Psychology*, 7 (MAY), art. no. 769. Cited 130 times.
http://journal.frontiersin.org/article/10.3389/fpsyg.2016.00769/full
doi: 10.3389/fpsyg.2016.00769

View at Publisher

28 Chakraborty, A.P.R.
Estimation of greatest lower bound reliability of academic delay of gratification scale
(2017) *IOSR J. Res. Method Educ.*, 7 (2), pp. 75-79. Cited 3 times.

29 Ercan, I., Yazici, B., Sigirli, D., Ediz, B., Kan, I.

Examining cronbach alpha, theta, omega reliability coefficients according to the sample size

(2007) *Journal of Modern Applied Statistical Methods*, 6 (1), pp. 291-303. Cited 14 times.
http://tbf.coe.wayne.edu/jmasm/vol6_no1.pdf
doi: 10.22237/jmasm/1177993560

View at Publisher

30 Zinbarg, R.E., Revelle, W., Yovel, I., Li, W.

Cronbach's, α Revelle's β and McDonald's ω $_H$: Their relations with each other and two alternative conceptualizations of reliability

(2005) *Psychometrika*, 70 (1), pp. 123-133. Cited 591 times.
doi: 10.1007/s11336-003-0974-7

View at Publisher

31 Viladrich, C., Angulo-Brunet, A., Doval, E.

A journey around alpha and omega to estimate internal consistency reliability
(Open Access)

(2017) *Anales de Psicologia*, 33 (3), pp. 755-782. Cited 51 times.
http://revistas.um.es/analesps/article/download/analesps.33.3.268401/215531
doi: 10.6018/analesps.33.3.268401

View at Publisher

32 Peters, G.J.Y.
The alpha and the omega of scale reliability and validity
(2014) *Eur. Heal. Psychol.*, 16 (2), pp. 56-69. Cited 140 times.

33 Jw, C.
(2014) *Research Design Qualitative, Quantitative and Mixed Methods Approaches*. Cited 225 times.

34 Sekaran, U., Baugie, R.
(2016) *Research Methods for Business, Seventh*. Cited 5709 times.
West Sussex, UK: Wiley

35 Asderaki, F.

The impact of the Bologna process on the development of the Greek quality assurance system

(2009) *Quality in Higher Education*, 15 (2), pp. 105-122. Cited 17 times.
doi: 10.1080/13538320902995758

View at Publisher

36 Black, A.K.
Language translation for mental health materials-: A comparison of current back-translation and skopostheorie-Based Methods
(2018) *Brigham Young University*

37 Saidon, I.M.
(2012) *Moral Disengagement in Manufacturing: A Malaysian Study of Antecedents and Outcomes Intan Marzita Saidon*. Cited 5 times.

38 Memon, M.A., Ting, H., Ramayah, T., Chuah, F., Cheah, J.
A review of the methodological misconceptions and guidelines related to the application of structural equation modeling
(2017) *J. Appl. Struct. Equ. Model.*, 1. Cited 33 times.
June

39 Parasuraman, A., Colby, C.L.
An Updated and Streamlined Technology Readiness Index: TRI 2.0

(2015) *Journal of Service Research*, 18 (1), pp. 59-74. Cited 179 times.
http://www.sagepub.co.uk/journal.aspx?pid=105683
doi: 10.1177/1094670514539730

View at Publisher

40 DeLone, W.H., McLean, E.R.
The DeLone and McLean model of information systems success: A ten-year update

(2003) *Journal of Management Information Systems*, 19 (4), pp. 9-30. Cited 5304 times.
http://www.tandfonline.com/loi/mmis20
doi: 10.1080/07421222.2003.11045748

View at Publisher

41 Doll, W.J., Torkzadeh, G.
The measurement if end-user computing satisfaction
(1988) *MIS Q.*, 12 (2), pp. 180-194.

42 Doll, W.J., Torkzadeh, G.
Developing a multidimensional measure of system-use in an organizational context

(1998) *Information and Management*, 33 (4), pp. 171-185. Cited 203 times.
doi: 10.1016/S0378-7206(98)00028-7

View at Publisher

43 Seddon, P., Kiew, M.Y.
A partial test and development of delone and mclean's model of is success
(1996) *Australas. J. Inf. Syst.*, 4 (1), pp. 90-109. Cited 319 times.

44 Titah, R., Barki, H.
Nonlinearities between attitude and subjective norms in information technology acceptance: A negative synergy?

(2009) *MIS Quarterly: Management Information Systems*, 33 (4), pp. 827-844. Cited 74 times.
http://misq.org/misq/downloads/
doi: 10.2307/20650329

View at Publisher

45 Hill, R.
What Sample Size is Enough in Internet
(1998) *Interpers. Comput. Technol. An Electron. J. 21st Century*, 6 (3), pp. 1-10. Cited 108 times.

46 Cooper, D.R., Schindler, P.S.
(2014) *Business Research Methods*. Cited 2637 times.
TWELFTH ED. New York London: McGraw-Hill

47 Connelly, L.M.
Pilot studies.

(2008) *Medsurg nursing : official journal of the Academy of Medical-Surgical Nurses*, 17 (6), pp. 411-412. Cited 103 times.

48 Khan, M.A., Ramayah, T., Hossain, M.M.
The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh-: Self-efficacy as A Moderator
(2011) *Int. Bus. Res.*, 4 (2), pp. 80-89. Cited 41 times.

49 Sekaran, U.
Research methods for business, fourth edi
(2003) *John Wiley & Sons, Inc*, 65 (3). Cited 6 times.

50 McNeish, D.
Thanks coefficient alpha , We ' ll Take it from Here
(2017) *Physchologogical Methods*. Cited 16 times.
February

51 Devellies, R.F.
(2017) *Scale development theory and applications*. Cited 8885 times.
Fourth Edi. London, New York: Sage Publications Ltd