A COMPREHENSIVE APPROACH TO CAPTURING WEBSITE QUALITY MEASURES

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ABSTRACT

Numerous approaches to measuring the quality of websites exist. Twenty-seven empirical studies are typologically classified into six functions. This approach allows captures the broad divisions of website quality as a tabulation from which a comprehensive website quality model is developed. The study suggests breadth is not adequately captured when considering a business's website quality.

Key Words: typology, dimensions of quality, online and e-qualities, website value

INTRODUCTION

Several researchers investigate the quality of websites [1] [8] [14]. Others study e-Service quality [23] [29], content quality [10], design quality [13] [15], information quality [17] and e-Commerce quality [18]. Whereas [9] consider a number of key quality factors.

Measured components from such studies of quality sometimes overlap. Based on the following review of the literature (Table 1) we believe that measured components from each study of quality can be grouped into one or more of the following six functions of quality - service, content, design, information, security, and technical (Figure 1). Hence, in website research we believe studies of quality should consider all six perspectives.

QUALITY

Views differ as to what is 'quality' – especially when related to a website, and to what measurable components best represent quality [34]. In 'bricks-and-mortar' in-store quality studies, links to trustworthiness of the store often emerge [8]. However in online store studies the quality of the website may offer links to trustworthiness of the website, rather than the store itself [8].

Researcher(s) show preference to defining how quality can be measured, as opposed to what quality is, and so conclude if certain results occur – then quality exists. We now consider differing ways quality is measured.

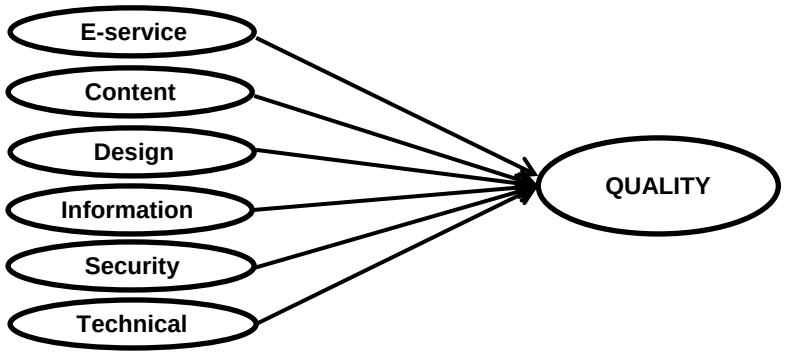
When studying website quality, [1], includes technical quality in his list of components to be measured, whereas [8] use the term 'technical aspects.' Although these terms differ we consider they measure the same components. Such similarities are prevalent in other studies, and where possible we collectively group these same/similar component measures into a generic term. Some component measures (or variants to these measures) regularly appear in many past studies.

The most common components measures in website quality studies are content quality [1] [8] [19] [24]; usability [4] [2] [14] [22]; information quality [4] [6] [14] [38]; satisfaction [2] [19] [22]; and security [24] [35] [36].

A full list of components measured in website quality studies (typologically classified) is provided in Table 1 (appendix). While several components such as content quality, satisfaction, information quality, service quality, customer service, loyalty, overall quality, system quality, perceived usefulness, ease of use, riskiness, accessibility, and design, are regularly measured in website quality studies still more quality measures appear in other studies (see Table 1). We group all these website quality component measures, from twenty seven empirically supported studies, into six representative functions of quality (e-service, content, design, information, security, and technical) and display these as Figure 1. The following sections discuss each quality grouping, its definitions and key component measure focus, with key links to past literary studies.

FIGURE 1

Comprehensive website quality model



FUNCTIONAL DIMENSIONS OF WEBSITE QUALITY

E-service

Website e-service (or electronic service) does not show general agreement regarding a precise definition. However, [30] define e-service as 'the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery.' Other researchers define e-service as relating to customers perceptions, possibly delivering a highly innovative experience [29], or fulfilling a customers' expectations [23] [31] [33] with the e-service perceived positively by its customers. Hence, we group component measures such as perceived service value, perceived service quality, perceived service outcome, service convenience, and entertaining (Table 1) as e-service.

Content

A customer often visits a website for the content [19]. Thus, content may determine how a customer perceives e-service of the website [33]. Content is business-related and is provided to engage with the customer/consumer [9], and it should relate to the business, and be presented logically and efficiently [27]. Thus, content should be unique, possibly innovative, objective, trustworthy, and useful – and grouped as per Table 1.

Design

Design captures the overall look of a website [1], and should reflect the company/organization image [9]. Therefore, design component measures include the appropriateness of the design [4] [14] [36], how attractive the design is [14] [19] [36], and are fonts and colors properly used [1] [8] [16]. These and other design component measures are grouped in Table 1.

Information

The information provided on a website may influence a customer's perception of the quality of the website. Hence, information should be accessible, relevant, accurate, believable, and in a format that is easy to understand [4] [24] [38]. Information may also be structured in downloadable or interactive formats [27]. Thus information collates another dimension of Table1.

Security

Website security may be defined as the sites ability to protect personal/private information provided to it by customers [25]. A website should meet (exceed) customer expectations of safety, information security, the security of all communication and transactions with the site while providing easy transactions (Table 1).

Technical

A competitive imperative suggests businesses should pursue keeping the technical attributes of their website current. In addition technical currency also influences the retention of customers [1]. Technical component measures such as valid links, page load speed, ease of

navigation, availability of the site, interactivity, and availability of search functions are some that require continual assessment and/or updating (further components Table 1).

IMPLICATIONS AND LIMITATIONS

Management implications

Websites of a higher quality attract and retain customers/users, but such online offerings are not tactile, and present limited input to the customer's sensory detectors [10]. Customers finding a website that lacks in quality can reposition elsewhere with a click of a 'mouse' [9]. Managers treating their websites as quality delivery vehicles that emulate their business and its deliverables can consider adopting this study's broad six functions approach to assess their customer's and their differing perspectives of the business's website. Assessed from an acceptable customer perspective, this approach offers a detailed understanding of the website. Further, weak website quality measures can then be enhanced or modified, while stronger quality measures can be differentiated or promoted as potential leading edge considerations against competitors.

Theoretical implications

This typological study collates website quality measures, and exposes a new approach to understanding how the customer perceives the business's website 'quality' offerings. As a large number of website quality measures are exposed – but embedded within only six functions, new and theoretical studies can re-develop the understanding of website quality. This 'new' Comprehensive Website Quality Model can then be assessed against satisfaction, trust and loyalty as a means to engage the customer more closely and repeatedly with the business.

Our typology assessment of existing website quality studies sources twenty-seven empirically-supported quality works. Twenty six of these studies employ Likert scaling (Table 1), but Likert questionnaires remain slow to develop, and only offer delayed-responses to present-time or 'now' situations.

Website studies must also be carefully developed. Cognitive theory of response order-effects show questionnaire weaknesses including: question-order (or list-position); survey-verbiage; rating-scale-range; and responsiveness-to-situations-investigated – and, each can affect the customer's individual answers [5] [20] [21]. Well-designed questionnaires [32] that also capture question clarity and conciseness of verbiage can improve customer response accuracy [3] [5]. Provided implementation is appropriate [11] astute website quality interpretations may be possible.

Practical implications

As twenty six of the twenty seven empirical studies use Likert measures and these can be transposed into dichotomous scales [12] a new computer programmed approach to trawling and gauging website quality is feasible [7]. Managers can then weight these computer trawling assessments and so gain instant assessments of their website changes. These can be tested against recent customer perceived questionnaire responses. Customer website surveys of the business's website can also be moved online (and can be modified as new quality

features are added), or into social networks, and customer responses can be continually logged, and then mapped to show changes in customer trends. When matched against results from the computer trawling of the existing website, differences (and areas to be fixed) can be readily exposed. Thus, a new responsive way to assess website quality emerges directly from this study.

FUTURE RESEARCH

Theoretical

This approach and above implications delivers opportunities to reframing website quality and should be adopted for other literature considered customer value dimensions - including performance, servicing and economic value. Such an approach likely teases out new conceptual frameworks, that in the future offer mangers accurate, near-real-time understanding of website customers. This allows the website to become a strategic management tool. This negates the traditional physical website survey approaches – connected to point-in-time customer/user opinion. Such studies rarely capture representative website users – as they do not reach the global market.

Past studies seeking website usage information have asked whether: the site was easy to use [14]; navigating the website is easy [6] [8]; the site conveyed a sense of competency; the information was believable [14]; the website provided accurate information [6]; the web site used colors properly [8]. Such studies can yield enhanced information if researchers ask 'why' or 'how'. This elicits added information relating to the website and demonstrates the thoughtfulness of the respondent in considering their answer. Such questions also restrict the coverage of a study, so careful question consideration is required in the survey construction phase.

Measurement

Each set of relevant functional measures of website quality can be further segregated into individual measures, with each tested for relevance and capability to convey a sense of quality to the business's customers and/or to casual website visitors.

Our research shows the quality of a website is one dimension of a customer's requirements, and that quality can be assessed from at least three domain considerations – marketing, technical and design. This is a rich area for further research.

CONCLUSION

Numerous approaches to measuring the quality of websites exist. Twenty-seven empirical studies are typologically classified herein into a six functions Comprehensive Website Quality Model. This approach allows captures the broad divisions of website quality to be captured in one study. We suggest first breadth and then depth must be considered when assessing a business's website quality.

APPENDIX

Table 1: Quality functions and components

e-Service	**Researcher(s)**
Personalisation	[1] [4] [6] [14] [36] [38]
Customer service	[9] [36]
Customer support	[1] [4] [8] [24] [28] [36]
Word of Mouth behaviour	[29]
Behavioural intentions	[33]
Purchase intentions	[2] [22]
Perceived service value	[23] [31]
Perceived service quality	[18] [37]
Perceived service outcome	[37]
Perceived usefulness	[6] [23]
Perceived satisfaction	[2] [18] [19] [23] [33]
Perceived sacrifice	[37]
Site conveys a sense of competency	[4] [14]
Site creates a positive experience	[4]
Creates a sense of community	[4] [6] [16]
Customer/business interactive feedback	[6] [24] [28] [36]
Efficiency	[30] [31]
Fulfilment	[30] [31]
Overall quality	[4] [31]
Service convenience	[33]
Service quality	[6] [33] [38]
Perceived shopping value	[18]
Entertaining	[10] [24] [26]
Different languages	[2]
Reliability	[6] [34] [36] [38]
Assurance	[34] [38]
Accessibility	[1] [8] [9] [34]
Content	
Useful content	[10]
Clarity	[1] [8]
Contact information	[1] [2] [8] [14] [28]
Product details	[1] [2] [8]
Unique/innovative	[29]
Complete	[8]
Objective	[16]
Virtual activities	[28]
Photos/videos	[28]

Content quality	[1] [8] [10] [19] [24] [33]
Trustworthy content	[10]
Enjoyment	[10]
Design	
Internet customisation	[13]
Design quality	[13] [15] [17]
Internet marketing strategy	[13]
Pleasure & arousal	[15]
Word of Mouth intentions	[15]
Ease of use	[1] [2] [4] [10] [14] [22] [26] [36] [38]
Attractiveness	[1] [4] [6] [8] [14] [15] [16] [19] [24] [36]
Appropriate	[4] [10] [14] [36]
Proper use of colours	[1] [8] [15] [16] [19] [35]
Proper use of fonts	[1] [8] [15] [28]
Proper use of multimedia	[1] [8] [15] [28]
Layout & graphics	[2] [8] [16] [19] [35]
Completeness	[1]
Consistent	[26]
Information	
Information quality	[4] [6] [14] [15] [17] [18] [38]
Firm's reputation	[17]
Perceived ease of payment	[17]
Benefits of online shopping	[17]
Trustworthy	[17]
Accurate	[1] [4] [6] [8] [14] [16] [24] [26] [34]
Believable	[4] [14] [26] [34]
Relevant	[4] [6] [10] [14] [24] [26] [36] [38]
Current	[1] [4] [8] [16] [26] [38]
Ease of understanding	[4] [26] [38]
Conciseness	[1] [8] [26] [36]
Quality	[2]
Correct level of detail	[4] [14]
Correct format	[4] [14]
Update frequently	[26]
Useful	[26]
Security	
Perceived risk	[14] [23] [29] [33]
Perceived trust	[38]
Privacy/Security	[30] [31] [38]
A feeling of safety/security	[4] [6] [14] [24] [29]
Information is secure	[4] [16] [29] [36]

Confidence in site	[10]
Communication is secure	[14] [36]
Transactions are secure	[14] [24] [36]
Transactions are easy	[24] [36]
Trust seals	[28] [38]
Customer policies	[1] [8] [28]
Technical	
Technical quality	[1]
Technical adequacy	[8]
System quality	[6] [18] [38]
System availability	[1] [10] [26] [30] [31]
Functionality	[2] [22]
Interactivity	[1] [8] [14]
Navigation (easy & consistent)	[1] [2] [4] [8] [10] [16] [19] [26] [35] [36] [38]
Speed (pages)	[1] [6] [9] [16] [26] [38]
Search facilities	[1] [6] [8] [14] [26] [28] [36]
Fast search display time	[28]
Valid links	[1] [8] [26]
User interface	[2]
Multimedia capability	[6]
Adequacy	[8]
Stable operation	[16]
Site map	[28]
3D manipulation	[28]

REFERENCES

[1] Aladwani, A.M. *An empirical test of the link between web site quality and forward enterprise integration with web consumers.* Business Process Management, 2006, 12(2), 178-190.

[2] Bai, B., Law, R. & Wen, I. *The impact of website quality on customer satisfaction and purchase intentions: Evidence from Chinese online visitors.* International Journal of Hospitality Management, 2008, 27(3), 391-402.

[3] Baker, J., Burkman, J. & Jones, D.R. *Using visual representations of data to enhance sensemaking in data exploration tasks.* Journal of the Association for Information Systems, 2009 10(7), 533-559.

[4] Barnes, S.J. & Vidgen, R. *Measuring web site quality improvements: a case study of the forum on strategic management knowledge exchange.* Industrial Management and Data Systems, 2003, 103(5), 297-309.

[5] Brunelle, E. *The moderating role of cognitive fit in consumer channel preference.* Journal of Electronic Commerce Research, 2009, 10(3), 178-195.

[6] Cao, M., Zhang, Q. & Seydel, J. *B2C e-commerce web site quality: an empirical examination.* Industrial Management and Data, 2005, 105(5), 645-661.

[7] Cassidy, L. & Hamilton, J. Multi-level website benchmarking: typological collation of recent approaches. *Paper presented at the 26th Annual Australian and New Zealand Academy of Management Conference: Managing for Volatility and Instability, Perth, WA, Australia, Dec 5-7, 2012.*

[8] Chang, H.H. & Chen, S.W. *The impact of online store environment cues on purchase intention: trust and perceived risk as a mediator.* Online Information Review, 2008, 32(6), 818-841.

[9] Cox, J. & Dale, B.G. *Key quality factors in web site design and use: an examination.* International Journal of Quality and Reliability Management, 2002, 19(7), 862-888.

[10] Dickinger, A. & Stangl, B. *Website performance and behavioral consequences: A formative measurement approach.* Journal of Business Research, In Press, 2011.

[11] Dillman, D.A., Smyth, J.D. & Christian, L.M. Internet, Mail, and Mixed-mode Surveys, The Tailored Design Method (3rd ed.). Hoboken, NJ: John Wiley & Sons Inc., 2009.

[12] Dolnicar, S. & Grun, B. *How constrained a response: a comparison of binary, ordinal and metric answer formats.* Journal of Retailing and Consumer Services, 2007, 14(2), 10

[13] Fan, W.-S. & Tsai, M.-C. *Factors driving website success - the key role of internet customisation and the influence of website design quality and internet marketing strategy*. Total Quality Management, 2010, 21(11), 1141-1159.

[14] Fink, D. & Nyaga, C. *Evaluating web site quality: the value of a multi paradigm approach.* Benchmarking: An International Journal, 2009, 16(2), 259-273.

[15] Ha, Y. & Im, H. *Role of web site design quality in satisfaction and word of mouth generation.* Journal of Service Management, 2012, 23(1), 79-96. doi: 10.1108/09564231211208989

[16] Hong, S. & Kim, J. *Architectural criteria for website evaluation - conceptual framework and empirical evaluation.* Behaviour and Information Technology, 2004, 23(5), 337-357.

[17] Kartavianus, O. & Napitupulu, T.A. *Determining factors on purchasing decision through e-commerce: a structural equaltions modelling framework.* Procedia Engineering, 2012, 50, 463-473. doi: 10.1016/j.proeng.2012.10.052

[18] Kim, C., Galliers, R.D., Shin, N., Ryoo, J.-H. & Kim, J. *Factors influencing internet shopping value and customer repurchase intention.* Electronic Commerce Research, 2012, 11(4), 374-387.

[19] Kincl, T. & Strach, P. *Measuring website quality: asymmetric effect of user satisfaction.* Behaviour and Information Technology, 2012, 31(7), 647-657.

[20] Krosnick, J.A. *Response strategies for coping with the cognitive demands of attitude measures in surveys.* Applied Cognitive Psychology, 1991, 5(3), 213-236.

[21] Krosnick, J.A. & Alwin, D.F. *An evaluation of a cognitive theory of response-order effects in survey measurement.* Public Opinion Quarterly, 1987, 51(2), 201-219.

[22] Law, R. & Bai, B. *How do the preferences of online buyers and browsers differ on hte design and content of travel websites?* International Journal of Contemporary Hospitality Management, 2008, 20(4), 388-400. doi: 10.1108/0956110810873507

[23] Lee, F.-H. & Wu, W.-Y. *Moderating effects of technology acceptance perspectives on e-service quality formation: evidence from airline websites in Taiwan.* Expert Systems with Applications, 2011, 38(6), 7766-7773. doi: 10.1016/j.eswa.2010.12.131

[24] Lim, K.-S., Heinrichs, J. H. & Lim, J.-S. *Testing a MIMIC model of e-shopping site usage*. International Journal of Retail and Distribution Management, 2009, 37(10), 852-866.

[25] Madu, C.N. & Madu, A.A. *Dimensions of e-quality.* International Journal of Quality and Reliability Management, 2002, 19(3), 246-258. doi:10.1108/02656710210415668
[26] McKinney, V., Yoon, K. & Zahedi, F.M. *The measurement of web-customer satisfaction: an expectation and disconfirmation approach.* Information Systems Research, 2002, 13(3), 296-315.
[27] Mohammed, R., Fisher, R., Jaworski, B. & Paddington, G. Internet Marketing: Building Advantage in the Networked Economy (2nd ed.). New York, NY: McGraw-Hill, 2004.
[28] Nusair, K.K. & Kandampully, J. *The antecedents of customer satisfaction with online travel services: a conceptual model*. European business Review, 2008, 20(1), 4-19.
[29] O'Cass, A. & Carlson, J. *An e-retainling assessment of perceived website-service innovativeness: Implications for website quality evaluations, trust, loyalty and word of mouth.* Australasian Marketing Journal, 2012, 20(1), 28-36.
[30] Parasuraman, A., Zeithaml, V.A. & Malhotra, A. *E-S-QUAL a mulitple-item scale for assessing electronic service quality.* Journal of Service Research, 2005, 7(3), 213-233.
[31] Santouridis, I., Trivellas, P. & Tsimonis, G. *Using E-S-QUAL to measure internet service quality of e-commerce web sites in Greece.* International Journal of Quality and Service Sciences, 2012, 4(1), 86-98. doi: 10.1108/17566691211219751
[32] Sekaran, U. Research Methods for Business, a Skill Building Approach (3rd ed.). New York, NY: John Wiley & Sons Inc., 2000.
[33] Udo, G.J., Bagchi, K.K. & Kirs, P.J. *An assessment of customers' e-service quality perception, satisfaction and intention.* International Journal of Information Management, 2010, 30(6), 481-492. doi: 10.1016/j.ijinfomgt.2010.03.005
[34] Webb, H.W. & Webb, L.A. *SiteQual: an integrated measure of website quality.* The Journal of Enterprise Information Management, 2004, 17(6), 430-440.
[35] Wells, J.D., Parboteeah, V. & Valacich, J.S. *Online impulse buying: understanding the interplay between consumer impulsiveness and website quality.* Journal of the Association for Information Systems, 2011, 12(1), 32-56.
[36] Wolfinbarger, M. & Gilly, M.C. (2003). *eTailQ: dimensionalizing, measuring and predicting etail quality.* Journal of Retailing, 79(3), 183-198.
[37] Xu, J., Benbasat, I. & Cenfetelli, R. *The effects of service and consumer product knowledge on online customer loyalty.* Journal of the Association for Information Systems, 2011, 12(11), 741-766.
[38] Yoon, C. & Kim, S. *Developing the causal model of online store success.* Journal of Organizational Computing and Electronic Commerce, 2009, 19(4), 265-284.