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## A Review of Web Evaluation Criteria for E-Commerce Web Sites

**Chai-Lee Goi**
**Senior Lecturer, School of Business, Curtin University, Malaysia**
*Postal Address:* **CDT 250, 98009 Miri, Sarawak, Malaysia**
*Author's Personal/Organizational Website:* **http://www.curtin.edu.my**
*Email:* **goichailee@hotmail.com**
Chai-Lee Goi is a senior lecturer at School of Business, Curtin University, Sarawak Campus, Malaysia. His areas of interest are Internet marketing and Marketing.

## Abstract

Few sets of criteria are available on the Web and from the researchers' Web site evaluation criteria. Most of these Web site evaluations focus on Web site attributes, organisation and technology. The most common Web site criteria to be applied are quality, function, credibility, reliability, attractiveness, systematic structure and navigation.

Keywords: **Web evaluation; quality; function; credibility; reliability; attractiveness; systematic structure; navigation**

## INTRODUCTION

A study found by Kerner (2010), the total number of domain name (Top Level Domain (TLD)) registration was 196.3 million. World Wide Web Size (n.d) released a statistic shows that the indexed Web contains 12.08 billion pages (as of 1st November 2011) and

number of Internet users (as of 31st March, 2011) was 2,095,006,005 (Internet World Stats, n.d). The level of interactivity has a positive associate with overall Web site performance (Auger, 2005). Overall, this positive performance has positive influence online consumers' perception and behaviour (Flavian et. al, 2009).

There are many sets of criteria available on online and from the researchers' evaluation criteria Web site (Smith, 1999, 2001) and the effective evaluation of Web sites has therefore become a point of concern for practitioners and researchers (Chiou et al., 2010). Overall, Cunliffe (2000) identified informal Web site development model, which are covers to establish the need before the Web site is adopted as a solution; gather information before any Web site development takes place; develop and evaluate before creating the complete site; implementation should be done once all design decisions have been finalised; and maintain, which is continuously after the site has been launched.

The objective of this study is to review the current Web site evaluation criteria based on previous theoretical considerations and studies.

## WEB SITE EVALUATION CRITERIA

Smith (2001) adapted Eschenfelder et al's (1997) Criteria for the Evaluation of Government Web sites and applied to sample of five Web sites of New Zealand government entities. The study shows that it is important that Web sites should provide orientation information, conditions for re-use of information be made clear, privacy concerns be addressed, print materials be properly adapted to the web environment, materials be kept current, that contact details to be available, metadata be used effectively, external links be made appropriately, pages be accessible to users with disabilities, and help information on search engines and other facilities be made available to users.

A literature survey done by Kim et al. (2003), found that six categories of Web site evaluation criteria, which are business function, corporation credibility, content's reliability, Web site attractiveness, systematic structure and navigation. They even have used these criteria to evaluate whether there are differences in Web site design between 12 industries in Korea. Their study found that there are significant differences in the design of Web sites across these different industry groups.

World Best Enterprises (2004) developed the Quality Criteria for Web site Excellence. To achieve the World Best Web site awards, five criteria at the level 1 are required. The quality for Web site excellence should cover functionality, design, content, originality, and professionalism and effectiveness.

Au Yeung and Law (2004) focused on usability and functionality in their study on applied the modified heuristic evaluation technique to compute Usability Hazards Indices of hotel Web sites in Hong Kong. Their study found that due to the strong support and wide operation scale, chain hotels received overall Usability Hazards Indices, which were significantly lowered than independent hotels.

De Wulf et al. (2006) developed and empirically validated a process model of Web site success in an online shopping context by identifying the role of pleasure as a key mediating variable. Web site evaluation includes content, organisation and technology factors were posited as affecting the successes, which are involving satisfaction, commitment and trust of a multi-dimensional Web site. They found that pleasure partially mediated the evaluations–success relationship. Secondly, the analysis also found significant support for direct relationships between Web site evaluations and success.

Law et al. (2010) reviewed tourism studies that pertain to methodological approaches to Web site evaluation, which were published from 1996 to July 2009. The prior research can be divided into five evaluation approaches, which are counting, automated, numerical computation, user judgment and combined methods.

Park and Gretzel (2007) suggested 12 unified factors of Web site evaluation, which are ease of use, information quality, responsiveness, visual appearance, security/privacy, interactivity, trust, fulfillment, personalisation, advertising/persuasion, playfulness and technology integration. Woodside et al. (2011) also focused on two mainstreams of Web site quality, which are content richness and ease of use. To increase the applicability of evaluation frameworks, Chiou et al. (2010) condensed each study's dimensional factors into Park and Gretzel's (2007) 12 unified factors. Their review showed that most studies conducted user-based surveys to examine a Web site, but that very few addressed strategic issues of Web site evaluation. Thus, they proposed a strategic framework as an internal evaluation to ensure consistency between web strategy and actual Web site presence, which was involved analysis of Web strategy and a hybrid approach that included evaluation during three transaction phases; the framework was designed to be applied by a specific Web site vis-à-vis its goals and objectives through a five-stage evaluation process (see Figure 1). Flavian et al. (2009) mentioned that a Web site design should be addressed to simplicity and freedom of navigation provides clear, timely and accurate information in all its contents and an appearance that calls for the users' attention.

Figure 1: The Five-stage Web site Evaluation Process
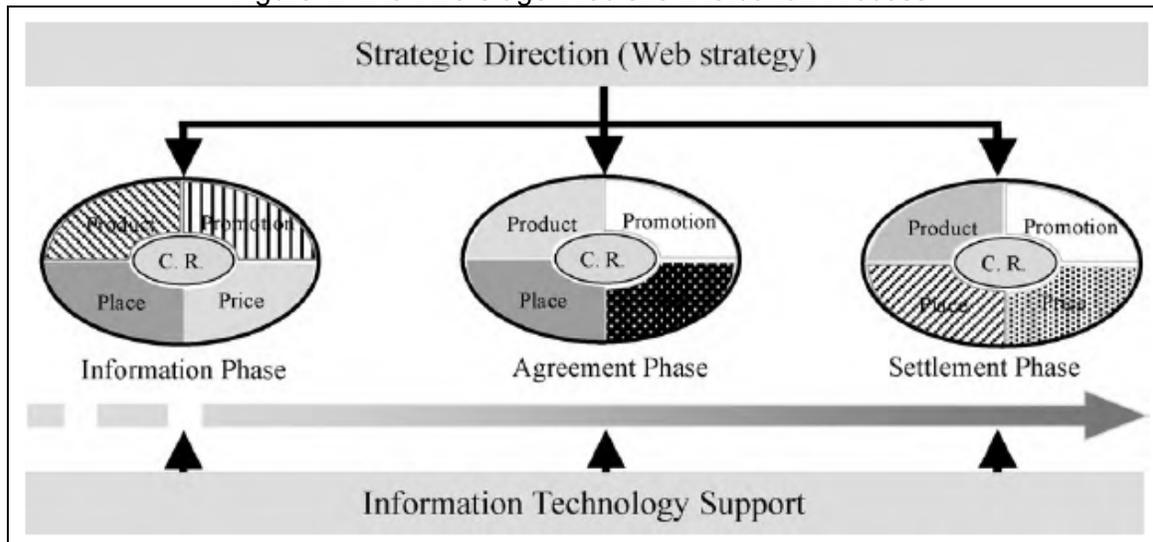


Source: Adopted from Chiou et al. (2010)

A review done by Tsai et al. (2010) on relevant criteria for assessing national park Web sites (see Table 1) showed that Web site Quality Evaluation Criteria should cover navigability, speed, links, relevancy, richness, currency, attractiveness, security, personalisation and responsiveness.

Table 1: Web site Quality Evaluation Criteria

| Criterion | Definition |
|---|---|
| Navigability | This criterion measures how easy it is to navigate around the site, how easy it is to return to the home page of the site, how easy it is to find relevant information (Miranda-González and Baňegil-Palacios, 2004), how many links are required to get from one point in a site to another, and what search tools the site provides (Smith, 2001). |
| Speed | This criterion refers to quick connection and delivery, minimal use of large graphics and bright colours, easy access to links (Bilsel et al., 2006) and Web site loading speed (Smith, 2001). |
| Links | This criterion refers to availability of links to other government organisations (Büyüközkan and Ruan, 2007), different national parks, eco-protection, tourism and travel, and other related Web sites. |
| Relevancy | This criterion includes relevant depth and scope and completeness of information (Lee and Kozar, 2006). Different parts of the Web site should be designed to meet the needs of different group of visitors (Cao et al., 2005), such as travellers, researchers, students, and local citizens. |
| Richness | This criterion refers to detailed level and scope of information content. That is, formations contained on the Web site are rich in content (Bilsel et al., 2006). |
| Currency | This criterion refers to up-to-date information. Last update/review dates are a critical way of notifying users of the currency of content (Lee and Kozar, 2006; Smith, 2001). |
| Attractiveness | This criterion consists of whether web pages are fun to read and help visitor promote their excitement, such as through graphics, online games, cartoons, screensavers, software downloads, and Q&As (Cao et al., 2005; Huizingh, 2000; Miranda-González and Baňegil-Palacios, 2004). |
| Security | This criterion deals with how a Web site proves to be trustworthy for customers (Ho and Lee, 2007). A confident Web site should assure the secrecy of its users' personal and private data as well as prevent the content of a message from being tampered with (Büyüközkan et al., 2007; Chu, 2001). |
| Personalisation | This criterion includes an individualised interface, effective one-to-one information, and customised service (Lee and Kozar, 2006). Customised content of the Web site can provide a user with the relevant and up-to-date information that will address his specific needs (Ho and Lee, 2007). |
| Responsiveness | This criterion deals with the provision of information on FAQs and prompts assistance for solving problems (Ahn et al., 2007; Ho and Lee, 2007). Various service functions, such as complaint management systems (Lee and Kozar, 2006) should be provided. |

Source: Adopted from Tsai et al. (2010)

Ip et al. (2011) proposed a Web site evaluation framework that includes evaluation by phases, evaluation by features and evaluation by features and effectiveness. They analysed prior studies of tourism and hospitality Web site evaluation (see Figure 2).

Figure 2: Summary of Web site Evaluation
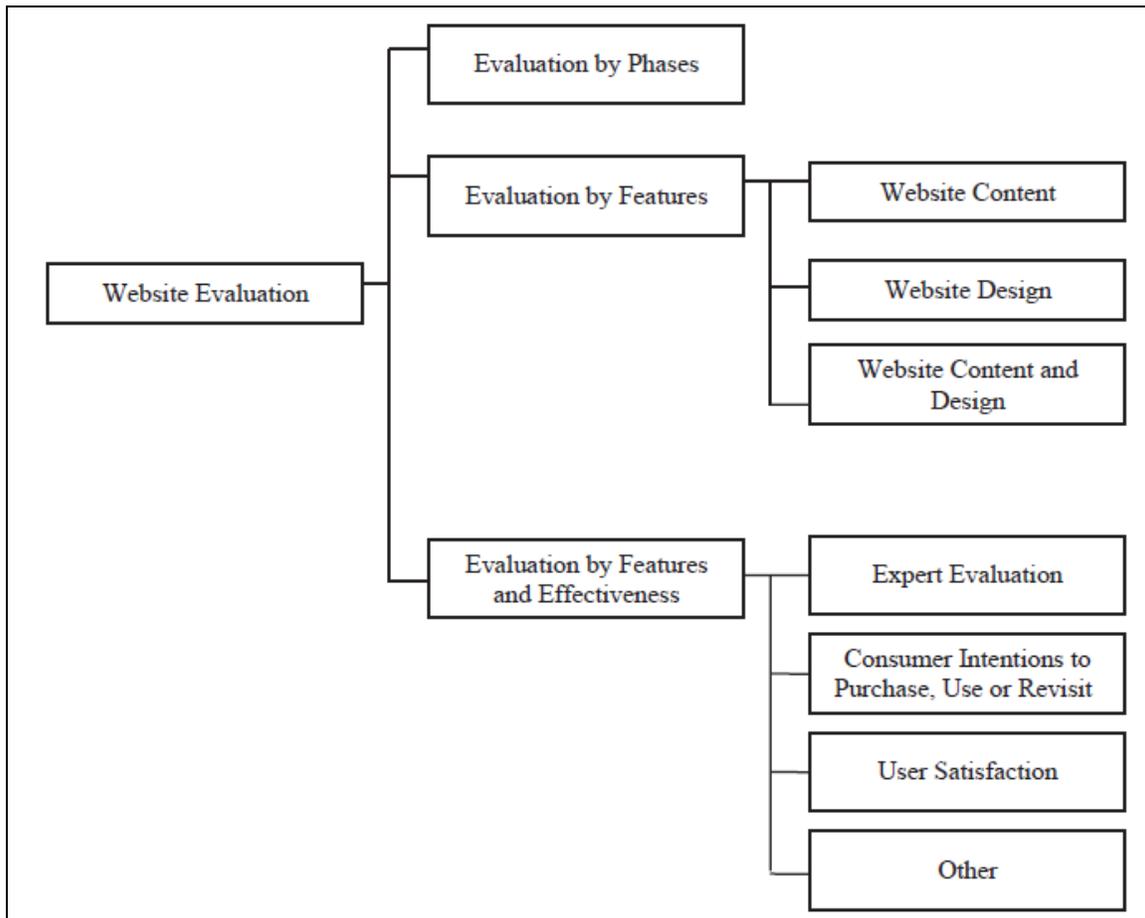


Source: Adopted from Ip et al. (2011)

Another review done by Dickinger and Stangl (2011) finalised previous 11 research works on Web site evaluation criteria (see Table 2). Dickinger and Stangl (2011) suggested a theory-based alternative, formative measurement approach for Web site performance. The construct comprised eight dimensions. All these dimensions are system availability, ease of use, usefulness, navigational challenge, Web site design, content quality, trust and enjoyment. Their study developed a sound and parsimonious measure allowing the monitoring and benchmarking of traveler perceptions over time.

Table 2: Web site Evaluation Criteria

| Model | Method | Constructs included | Author |
|---|---|---|---|
| WebQual | Qualitative and quantitative surveys, n=46 | Usability, design, information, trust, empathy and quality | Barnes and Vidgen (2002) |
| TAM, TRA | Experiment, n=107 | Ease of use, usefulness, attitude and intention to use | Davis, Bagozzi, and R. (1989) |
| TAM with extensions | Survey, experimental design, n=392 | Performance, fun, self-efficacy, novelty seeking, need for interaction, self-consciousness, perceived waiting time, social anxiety, attitude, ease of use and intention to use | Dabholkar and Bagozzi (2002) |
|  | Meta analysis of 153 academic papers | Ease of use, responsiveness, fulfillment, security/privacy, personalisation, visual appearance, informations quality, trust and interactivity | Park and Gretzel (2007) |
| Web site persuasiveness | Survey, n=1416 | Informativeness, usability, credibility, inspiration, involvement and reciprocity | Kim and Fesenmaier (2008) |
| I/S Success | Conceptual study | System quality, information quality, use, user satisfaction, individual impact and organisational impact | DeLone and McLean (1992) |
| E-S Qual | Survey, n=549 | Efficiency, system availability, fulfillment, privacy, responsiveness, compensation, contact, perceived value and loyalty intentions | Parasuraman et al. (2005) |
| TAM | Web based survey, n=828 | Perceived attractiveness, perceived enjoyment, ease of use, usefulness, attitude, intention to use and perceived attractiveness | Van der Heijden (2003) |
| UTAUT | Survey, n=215 | Effort expectancy, performance expectancy, facilitating conditions, social norms, intention to use, gender, age, experience and voluntariness of use | Venkatesh et al. (2003) |
| eTailQ | Focus groups, tasks, survey, n=1013 | Quality, fulfillment/ reliability, Web site design, privacy/security and customer service | Wolfinbarger and Gilly (2001) |
|  | Survey, n=110 | Escapism, intrinsic enjoyment, attitude toward the brand and site, navigational challenge, internet search skill, internet usage, decisional control and product involvement | Mathwick and Rigdon (2004) |

Source: Adopted from Dickinger and Stangl (2011)

Chou and Cheng's (2011) study aimed to build a hybrid approach that combines the fuzzy analytic network process (FANP) and fuzzy VlseKriterijumska Optimizacija I Kompromisno Resenje (FVIKOR) for evaluating Web site quality of the top-four CPA firms in Taiwan and provide worthwhile recommendations for enhancing Web site design and content. Their finding found that these four CPA firms did not utilise the Internet to its full potential and need to improve their Web sites. Deloitte has the best overall performance, followed by PricewaterhouseCoopers, Ernst & Young and KPMG. Additionally, the top-five evaluation criteria in order of importance are richness, understandability, assurance, relevance and reliability (see Figure 3).

Figure 3: The Analytic Structure of CPA Firm Web sites Evaluation
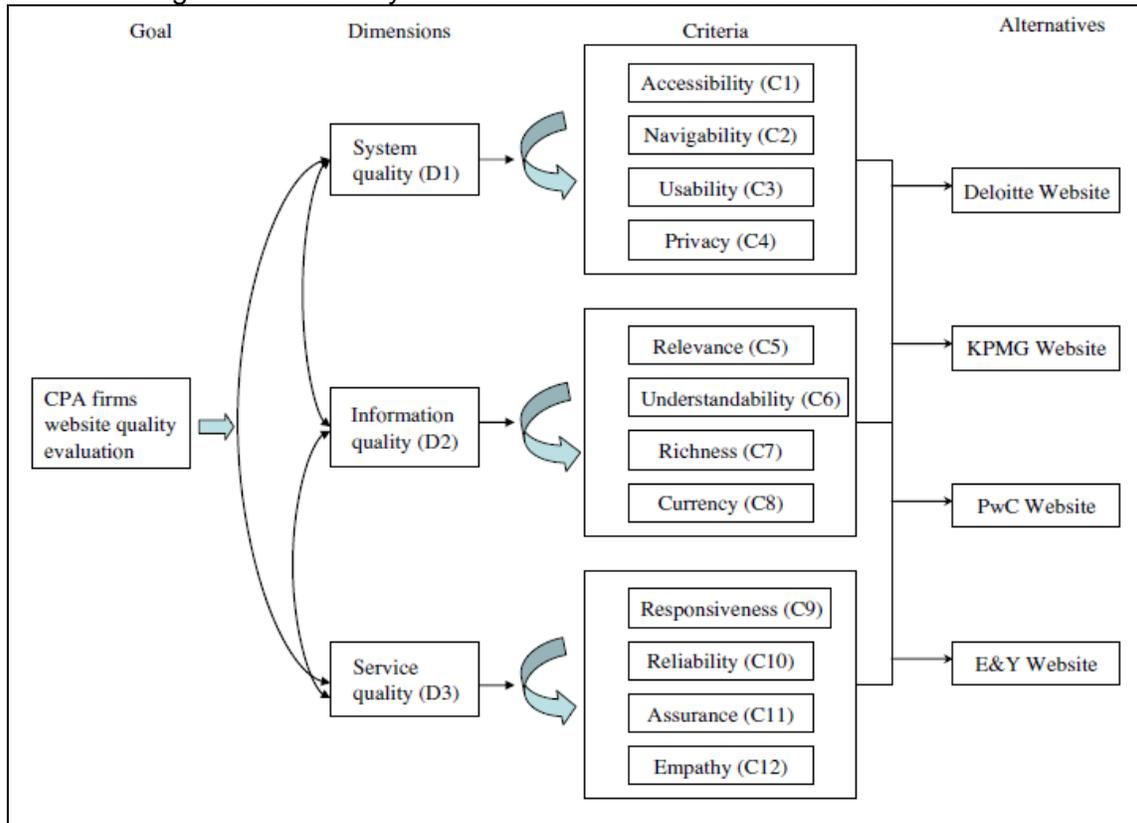


Source: Adopted from Chou and Cheng (2011)

## CONCLUSION

This study found that the existing literatures do not have any commonly agreed-upon standards or techniques for Web site evaluation. However, Web site evaluation focuses on 3 main areas, which are Web site attributes, organisation and technology. Even, Wulf et al.'s (2006) study involved three higher-order dimensions, which are Web content, crganisation and technology. The summary of the literatures can be referred to Table 3.

Table 3: Summary of Web Evaluation

| Criteria | Reference |
|---|---|
| • Information content criteria: Orientation to Web site, content, currency, metadata (facilitates retrieval and navigation), services, accuracy, privacy and external recognition (ways in which the value of the site is recognised by users, wider Internet community).<br>• Ease-of-use criteria: Links, feedback mechanisms (for users to provide comments, request clarification, suggest improvements and corrections to site), accessibility, design and navigability. | Smith, 2001 |
| Business function, corporation credibility, contents reliability, Web site attractiveness, systematic structure and navigation | Kim et al., 2003 |
| • Dimension 1: Language Usability<br>• Dimension 2: Layout and Graphics Usability<br>• Dimension 3: Information Architecture Usability<br>• Dimension 4: User Interface and Navigation Usability<br>• Dimension 5: General Usability | Au Yeung and Law, 2004 |
| Functionality, design, content, originality, and professionalism and effectiveness | World Best Enterprises, 2004 |
| Content, organisation and technology | De Wulf et. al, 2006 |
| Ease of use, information quality, responsiveness, visual appearance, security/privacy, interactivity, trust, fulfillment, personalisation, advertising/persuasion, playfulness and technology integration | Park and Gretzel, 2007 |
| Simplicity and freedom of navigation provides clear, timely and accurate information in all its contents and an appearance that calls for the users' attention. | Flavian et al., 2009 |
| Counting, automated, numerical computation, user judgment and combined methods | Law et al., 2010 |
| • Stage one: Users identify the Web site strategy (with goal, objectives, and actions) through an in-depth interview with senior managers.<br>• Stage two: Develop a web-based evaluation instrument with two main sections.<br>• Stage three: Conduct a Web site evaluation with the aid of experts, using fuzzy linguistic terms to express their agreement or disagreement with the statement of each questionnaire.<br>• Stage four: Compute the criteria weights and scores in three steps.<br>• Stage five: Conduct data analysis and discuss it from three perspectives. | Chiou et al., 2010 |
| Web site quality and overall performance (navigability, speed, links, relevancy, richness, currency, attractiveness, security, personalisation and responsiveness). | Tsai et al., 2010 |
| • Evaluation by phases<br>• Evaluation by features<br>• Evaluation by features and effectiveness | Ip et al., 2011 |
| System availability, ease of use, usefulness, navigational challenge, Web site design, content quality, trust and enjoyment | Dickinger and Stangl, 2011 |
| Accessibility, navigability, usability, privacy, relevance, understandability, richness, currency, responsiveness, reliability, assurance and empathy | Chou and Cheng, 2011 |
| Content richness and ease of use | Woodside et al., 2011 |

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