Title
Key Factors for Developing a Successful E-commerce Website

Osama Mohammed Ahmad Rababah and Fawaz Ahmad Masoud
The University of Jordan, Jordan
Abstract

The most experienced and successful E-commerce companies are beginning to realize that key determinants of success or failure are not merely a web presence or
low price but delivering on a high quality website. To attain the desired quality of website software, it is necessary to produce a framework and model that enables evaluation of a website’s quality. This paper
defines and categorizes the quality factors for measuring an E-commerce website. The software is an essential part of the E-commerce website. The ISO 9126-1 standard for software engineering product quality states
that the main purpose of software quality evaluation is to supply referential quantitative results for software products that are reliable, understandable and acceptable. According to Larsson (2004), quality factors are
primarily attributes of the software that are often labeled as “non-functional requirements.” The key challenge of these attributes is the lack of a formal specification of a means of measurement. This paper provides
a framework to establish quality factors in terms of attributes, in addition to their level of importance based on the opinion of highly-skilled professionals. The primary goals are identifying,
qualifying, categorizing and ranking these factors.

**Keywords:** E-commerce Website, Development, Quality, Evaluation
Introduction
The quality of a website is a property difficult to define and capture in an operational way, yet everybody feels it when it is missing. In fact, for a website there can be as many views of its quality
as there are usages. Quality may depend on task-related factors affecting end users such as presentation quality and appeal, content and function adequacy, and navigability. It may also depend on performance-related
factors that affect the efficiency of end users and the economics of the website within the company running it. These factors include response time, transaction throughput, reliability and robustness. It may depend on
development-related factors that affect developers and maintainers of a website. These include code complexity, code readability, code flexibility, portability, page coupling and modifiability (Darie and Balanescu, 2008). The
foundation model used to identifying quality factors and attributes is based on research by Albuquerque and Belchior (2002). The model is extended with further research investigation and expert reviews and interviews.
Albuquerque and Belchior have organized a comprehensive set of software quality attributes into objectives where each objective is composed of a set of quality factors. Each quality factor is further decomposed into sub-
factors. According to Albuquerque and Belchior (2002), three broad objectives formulate the model, as illustrated below which enables the evaluation of an E-commerce website’s quality.
Fig 1: E-commerce quality objectives
Usability is a quality objective that refers to the characteristics that allow the use of the E-commerce site in the most diverse situations, not only during its development process, but also during its operation and maintenance. This
objective builds on the reliability of the web site. Reliability is composed of two aspects, according to Albuquerque and Belchior (2002).
Conceptual reliability is concerned with the E-commerce site’s capacity to implement, satisfactorily, what was specified and designed. Representative reliability refers to the E-commerce site’s representation
characteristics that affect its understanding and manipulation through its lifecycle (Cox and Dale, 2002). Albuquerque and Belchior’s identification of the factors under these objectives was derived from their extensive questionnaires to
both the user and developer communities in E-commerce.

Identifying
Further quality factors and attributes were researched to
ensure having a comprehensive list of quality factors. In particular, scalability and availability were added as, according to Suh et al. (2009), E-commerce website software is large and complex, but quality requirements demand the
key performance of factors such as availability, performance, scalability, and security. This, in essence, provides the biggest influence on the effective implementation of a website. Scalability is the website readiness
to meet rising demands of users and usage. Thus, website software applications must be prepared to grow quickly both in terms of users serviced and in terms of services offered. According to Firesmith (2003), the need for
scalability has been a driver for much of the technology innovations in the past few years. Industry has developed new software languages, new design strategies, and new communication and data transfer
protocols, in part to allow web sites to grow as needed. According to Firesmith (2003), availability is of two parts. The first relates to the website accessibility and being up and running 24 hours a day, 7 days a week and 365 days a year.
The second relates to the web software and its accessibility by diverse types of web browsers. Using the common denominator of features among all browsers as the baseline and removing any use of features unique to a particular
browser ensures cross-browser availability. To be available in this sense requires significantly more knowledge and effort on the part of the software engineers. Table 1 lists the factors used with a short explanation of each factor. At this
stage, and based on the academic research exercised, it was felt that a list of sixteen factors within three objectives satisfy an assessment of the quality of the operational software of an E-commerce website. The next step
was to extend the factors with sub-factors that allow measurement to qualify the assessment. Table 2 displays the complete set of those quality attributes. They are a total of eighty four sub-factors
organized within the quality factors.

- Table 1: E-commerce Quality Factors -

(large table - see full paper online)
- Table 2: Identified Quality Sub-Factors –

(large table - see full paper online)
Qualifying

To establish a rating system for the factors, a standard statistical rating scheme based on frequency of expert rating was used to reflect the relative importance of the
different sub-factors within a factor (Wang, 2003). The weighting system was generated based on questionnaire results from expert specialists in E-commerce development and
representative consumers of E-commerce.

Participants in the questionnaires were selected based on meeting qualifying criteria. The qualifying criteria were derived from the
industry best practices. The selection of the sampled participants was based on the following:

- The number of E-commerce websites developed by the
• expert / respondent (at least 5 websites to be considered).
• The level of experience for each expert / respondent
• The complexity and size of the developed E-commerce websites.
A total of twenty experts were surveyed from largest IT companies. The questionnaires were administered by the first researcher visiting these companies and interviewing the respondents. Each question gave
the respondents the option to select one answer from multiple answers. Each answer was assigned a score from 0 to 7 depending on the question. The answers were recorded by the first researcher.
A score of 20 or above was used as the qualification to be considered as an expert (A score of 20 was chosen for convenience to get a range of experience of building websites with several different companies). The first researcher
was able to define 13 experts/respondents out of 20 sampled, most of whom used to be software engineers and developers. Once identified as an expert, the participants were asked to
respond to the questionnaire that asked them to rate each of the sub-factors in order of importance of their contribution to the factor. The questionnaire also provides an explanation of how each sub-factor influences the factor it belongs to.
Initially, one randomly selected expert was identified for a pilot run to validate the content and style of the questionnaire. When the answers had been received from the pilot run, they were verified to make sure that the
questions were clear, complete and unambiguous; the questionnaire was then distributed to the remaining twelve participants. Data generated from the pilot run was excluded from the final results.
100% of the twelve respondents gave back their responses to the questionnaire. However, some of those who were given the questionnaire did not answer all parts of the questionnaire.
The questionnaire was administered during a face-to-face interview with the experts. For each interview engagement, an introduction orientation was given on the questionnaire followed by a one-on-one question and answers.
session to gain the answers and clarified any ambiguities. The answers were recorded by the first researcher to assure accuracy and consistency, which follows the guidelines of the Delphi method. In general, the process of soliciting
answers followed the standard Delphi method (Grisham, 2009) in soliciting expert opinions.
Ranking
The rating of sub-factors was done within each factor. The rating is sequentially based on the order of the importance of the sub-factors in their influence on the factor. So, for factor S having six sub-factors
of SS1 to SS6, each participant rated each sub-factor according to its importance in influencing S, where 1 was the most important and 6 was the least.
In handling missing values for sub-factors, the average of received responses was calculated to fill in the gaps of missing observations. It was intended that sub-factors that had six or fewer responses would be removed from the analysis, but
this did not prove to be necessary as each sub-factor had at least ten responses.

Once all results were collected, a weighting scheme was applied to reflect the relative importance
(rating) of the different sub-factors based on the following formula:
Sub-factor Percent Importance = 100 – (M / N)*100 Where M represents the average rating received on a sub-factor and N represents the total number of
sub-factors attributes for a given factor. The subtraction from 100 is to reverse the rating scale of the questionnaire so that the questionnaire rating of “1” has the highest percentage importance. The final rating achieved has the
highest percentage given to the most important sub-factor, proceeding to the least important in a descending fashion.
Results
The final rating achieved has the highest percentage given to the most important sub-factor as the key factors to assessing the qualities of an E-commerce website, proceeding to the least
important in a descending fashion. Table 3 shows the rating received by each sub factor.

- Table 3: Identified Quality Sub-

(large table - see full paper online)
Conclusions
This paper has determined the factors that assess the quality of an E-commerce website, identifying and rating the main quality attributes to this application domain. The list of attributes was
derived from the specialized literature. The survey and analysis described in this paper enabled a greater understanding of the interrelations and influences these sub-factors have on the main quality factors. The results provide an
important foundation for the understanding of quality in E-commerce websites that will allow developers to assess the strengths and weaknesses of their sites in order to know where to focus further development to achieve
the high quality needed for E-commerce success.
References: