

# Key Aspects to Evaluate the Performance of a Commercial Website

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## ABSTRACT

Nowadays, the growth of e-commerce industry is at peak level. To compete with other e-commerce firms and for enhancing the quality of a commercial website, design and evaluation measures have been becoming the key elements. To improve the services of websites both in terms of quality and usefulness, one needs measurement and models that quantify various attributes of websites. After designing a quality website, one has to improve its quality features regularly to survive in market. So, one needs to monitor website regularly to measure its various aspects. This article begins with a review of the literature on website quality features. Three key factors i.e. accessibility, usability and speed of any e-business strategy are discussed to evaluate the performance of a website. Web Performance Index Formula is proposed based on the above factors.

## Keywords

Accessibility, Navigability, Content, Speed, Web Assessment Index (WAI), Web Performance Index (WPI), Web Quality Model

## 1. INTRODUCTION

As commercial websites are developed in shortage of time to advertise the firms on web as early as possible, they don't start with perfect success. They all start roughly and improve the quality with time. For achieving better performance, one must know how to analyze a website and to determine those features, which can be enhanced to improve website performance so that website can compete with other business competitors.

The key to this is web metrics. The earliest attempt to make global measurements about the web was undertaken in 1996 [6]. Measurement function involves two terms: magnitude (the property of the objects that determines the assignment according to some rule) and second is measure (the amount or degree of magnitude). However, one also needs scale to measure. The metrics which is recommended by WAA (web analytics association standard committee) are of technical importance only and is meant for technical staff only.

To analyze and evaluate the performance of a website, some quality metrics are needed, which can be quantitatively measure. This paper suggests the key aspects for designing and evaluation of the site. The section 2 begins with a review of the literature on website quality features that form key factors of any e-business strategy. In section 3, the key factors those are required during designing of a website and performance evaluation is discussed. Finally, an evaluation criterion for web performance index is proposed.

## 2. LITERATURE REVIEW

Website performance quality depends on its accessibility, content, speed and ease of use. To provide the ease of use several factors can be considered during design of a commercial web site. In 1990's, most of the studies considerate on content, use and objectives as important aspects during website design [14], [17], [23]. But one should identify which factors must always be present to improve company e-strategy [20].

Mostly two main groups of indicators have been considered, one is content and other is design [12], [22]. The content means the information, the characteristics or the services offered on a website which enable its users to clarify ambiguity and enhance their understanding of issues in a timely manner. The design means the way by which content is made available to its user. So, interface design has major impact on sales. Interactivity has been considered as the major feature to promote communication and to complete transactions [3], [8], [15].

Evaluation or success factors of website (system quality, information quality, service quality) have also been considered [1], [10], [16]. System quality features like interface, loading time and response time [4] is responsible for overall performance. Information quality (up-to-date, accurate and useful [4], [10],) is responsible for content quality and its value to its customer. Finally, service quality plays the role after purchasing and it refers to the availability of a communication mechanism for accepting and solving consumer complaints [1], [16].

From the literature review, it can be concluded that research on web quality is fragmented and differs from one paper to another. Some authors have considered only three or four factors where as others have considered 11 factors [17], and Olsina, Godoy, & Rossi considered 39 [21]. Calero considered 326 metrics according to the three different dimensions as represented in Fig. 1 of WQM (Web Quality Model) [9].

It can be further concluded that existing literature is undertaken in a general context not in a specialized form and factors can vary from one website to another due to different aims of each site in different sectors. Three main factors i.e accessibility, speed, usability which can be applied for evaluating performance of any commercial website, are proposed where as some flexibility is provided with factor others. This fourth factor can take those sub-factors which is inherent to a particular site. To measure all above factors various measurement models are proposed[11].

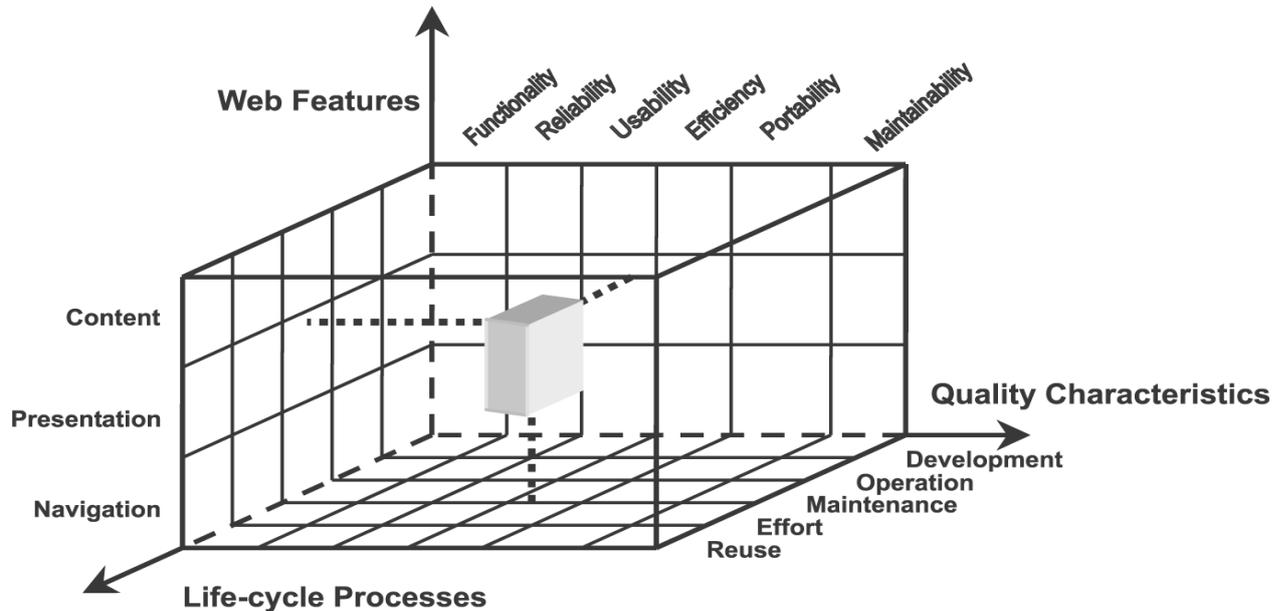


Fig. 1 Web Quality Model Cube [9]

### 3. KEY FACTORS FOR DESIGN AND PERFORMANCE EVALUATION

An online shopping experience consists of three phases: pre-purchase, purchase, and post-purchase. The pre-purchase phase aims at product search, product comparison, product selection, and an understanding and an agreement on terms such as price, delivery options, delivery times, etc. The purchase phase aims at the placement of an order, payment authorization, and the receipt of a product. Finally, the post-purchase phase considerate on future interactions with customer service for previously purchased items such as returns, exchanges, order cancellations, etc. [19]. It is also realized that there are other elements such as navigational support, security, privacy, credibility and trust, error handling and system feedbacks, and help mechanism that affect all three phases which should be taken into consideration while designing a website.

The following are the factors inherent to design and performance evaluation of a commercial website as shown in Fig. 2 of WPI.

#### 3.1 Accessibility

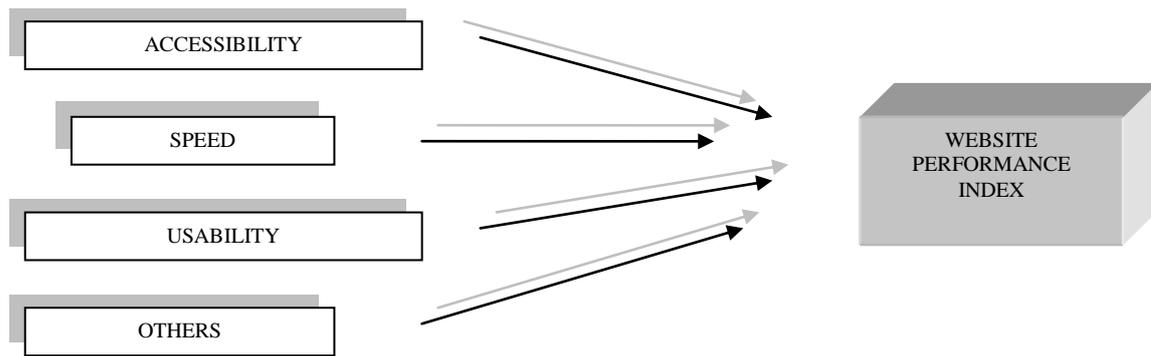
It is related to the performance quality by determining ease of identification of the website and access for current and potential users of the website so, it is the very first step in pre-purchase phase. It can be measured by two indicators: the position of the website in popular search engines and site popularity. Success of a website depends upon a level of traffic which in turn increases the website's power to attract customers. As the most common measure "hits" has very low precision as these can be artificially generated so, in order to increase precision, this measurement may be supplemented by the number of linked sites (external links) which direct users to the web page. The greater this measure, the higher the traffic to the website.

To measure accessibility, one needs SEO (Search Engine Optimization) and SEM (Search Engine Marketing) tools [28]. SEO tools do not require any payment to the search engine and obtain results in the medium term whereas SEM is the fastest way of advertising on the internet. Also SEO has long term impact than SEM. To measure the first indicator, one can use SEO which tries to locate the website within a Cartesian coordinated system (X,Y). The X coordinate refers to the breadth of terms related to the firm in a search engine. The Y coordinate refers to the position of website in the search engine [2].

The second indicator of accessibility is site popularity, can be measured by the number of independent external links on the web that point to the website. This quantification can be performed using Link Popularity [26], and Link vendor [27].

#### 3.2 Speed

It is a very important factor as it has positive correlation with user satisfaction. It is related to all three phases. Fast loading time is essential for online transactions to be completed. In case of excessive loading time, users will either redirect the search engine to another site or give up their search [7], [24]. To study speed, the information provided by Alexa [25]. This service provides comparison of website loading time with other pages. One can also measure speed with a chronometer but it is influenced by several factors like the equipment used, the time of connection, the traffic to the page etc. so, for more reliable results Alexa is better. Research shows that when page loading time exceeds 10s, user loses his interest. But this video factor is controversial of the very important factor i.e. contents or information as fine contents which includes pictures and videos will take more time for loading and these things are also necessary to attract customers.



**Fig. 2 Key Factors for WPI**

### 3.3 Usability

It refers to the contents and ease of use which company must offer in its website design. This factor has following main objectives:

- To identify the contents
- To organize and classify the content.
- To label information.
- To design navigation systems.
- To help users find information.

Content is the most important factor as information supply is the basic goal of a website [5]. It evaluates the relevance and accuracy of the information provided on the website by the company. Moreover, information should be up to date and complete which is presented in the most adequate manner. These lines just cover one aspect only that contents should be informative.

There are two more aspects of content: transactional and communicative. Transactional aspect deals the easiness with which the internet transactions should be completed. It should involve the facilities of the websites such as financial cyber-mediaries, e-commerce training for customers and the number of clicks necessary to finish a purchase. The third aspect refers to the facilities and communication channels that website provide to users so that they can establish direct contact (contact e-mail, telephone numbers, contact address etc.). It shows the continuous communication of the company with customers.

Companies must facilitate searches by providing its own keyword search engines, which allow users to find the information required; a permanent site menu, which provides rapid access to the various sections of the site and prevent users from perceiving a lack of control while navigating; a site map [7], allowing familiarity with the site prior to navigation, and a help page which supplies information regarding frequently asked questions (FAQ) and tries to establish a feedback mechanism, improving the quality of service. One should not use pop-ups to show its products. All the pages should contain home buttons define labels that prevent user from feeling lost during his/her interaction. The fewer clicks should be needed to find the object required and to increase the user satisfaction. It will enhance the probability of producing loyal customers. To measure usability one should take multiple sub factors into consideration so that fine

usability index can be calculated. The following set of metrics are proposed to measure the usability of a Business-to-Consumer (B2C) ecommerce sites as shown in Fig. 3 of Usability factors. Each metric further depends on multiple sub-factors and indexes of each sub-factor should be evaluated to determine the factor index. Each of these factors assesses a particular aspect of the site. The proposed usability indexes measure usability of:

- Navigational support (UI navig)
- Product search mechanism (UI srch)
- Product listings (UI pl)
- Product comparison mechanism (UI cmp)
- Product information presentation and product selection aspects of a site (UI pips)
- Shopping cart mechanism (UI shcart)
- Registration, account logon, and account information aspects of a site (UI rali)
- Checkout mechanism (UI chkout)
- Security, privacy, credibility, and trust aspects of a site (UI spct)
- Error handling and system feedback features of a site (UI ef)
- Help mechanism and customer service aspects of a site (UI hcs)

The above set of metrics can be used by web designers and developers. The required data for evaluation of metrics can be calculated using a questionnaire or other data collection instruments. However, all factors do not have same significance. Some factors are critical where as others are non critical [13]. So, one can survey and assign weights to these factors and finally evaluate usability as follows:

1. Determine the weight of each factor ( $W_i$ ) and its usability index ( $U_i$ ) and multiply.
2. Add all calculated values in previous step.
3. Add all weights.
4. Divide value calculated in step 2 by value calculated in step 3 to determine final index.

$$\text{i.e. Usability} = \frac{\sum(W_i * U_i)}{\sum W_i}$$

### 3.4 Others

There are some features which do not have equal importance to each commercial site e.g. reliability is important to large business sites which are selling costlier items than small business sites. Similarly, extensibility is more important to growing business. So, this term is included to weigh to those factors which are required by a particular site.

Evaluation criterion involves the consideration of each above said factor and its measurements. Weighing value can be assigned to each factor according to its impact on performance quality. Then, Web Performance Index (WPI) can be evaluated and compared to others for success.

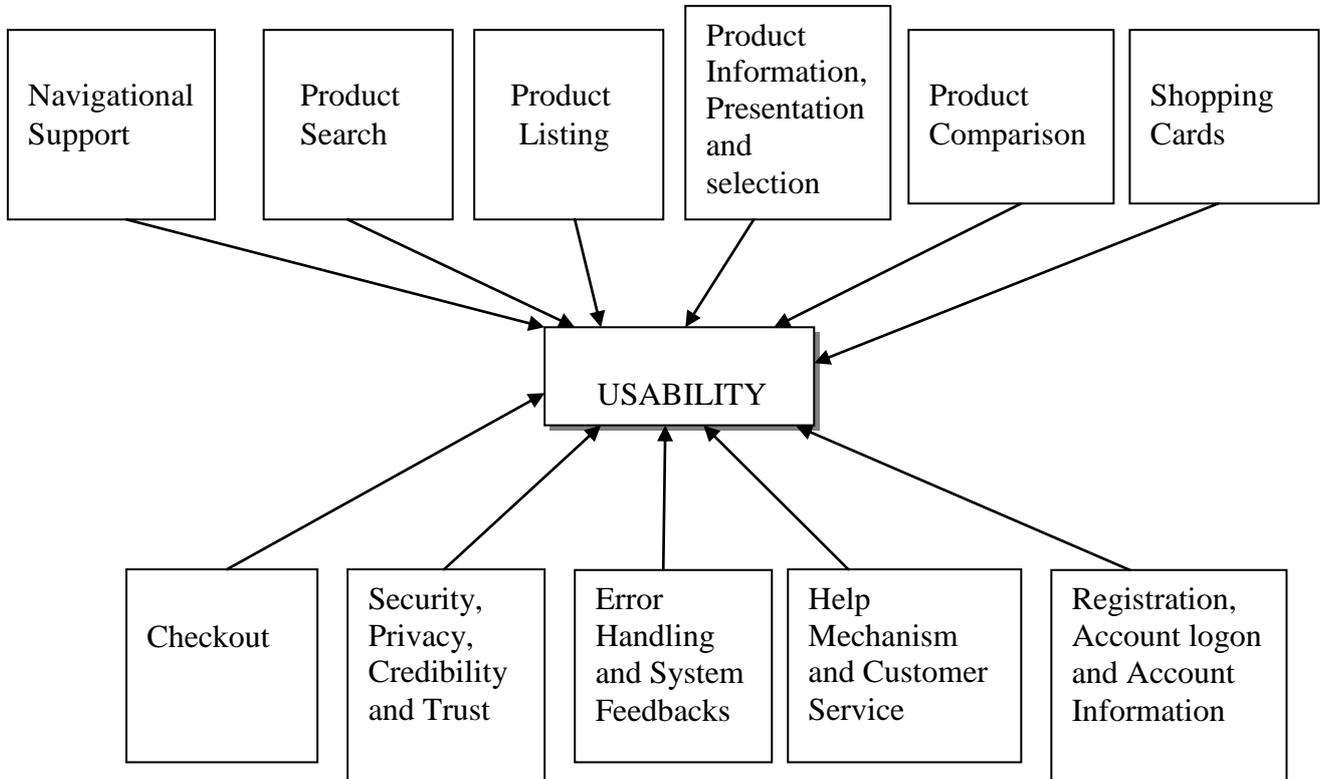


Fig. 3 Usability Factors [ Isaac J. Gabriel (2007) ]

These four factors refer to the quality of the site from the point of view of the pre-purchase, purchase and post-purchase stages. To evaluate the WPI the following assignments are made. As usability is essential to enter the target market and perform electronic transactions, so the impact figure of 60 percent is proposed. Then, 20 percent to accessibility and 10 percent speed and others are also proposed. One can calculate the WPI for a particular web site, by following formula.

$$WPI = \text{Accessibility} * 0.2 + (\text{Speed} + \text{others}) * 0.1 + \text{Usability} * 0.6$$

The maximum value for WPI can be 100 if each factor value is between 1 to 100. WPI is much better than WAI [18] as it includes more important factors which are not considered for WAI . It can be measured and compared for various sites.

### 4. CONCLUSIONS

The purpose of this research paper is to determine the key aspects which must be taken into account while designing a commercial website and then evaluate WPI. Here, we evaluate WPI and hence web quality by taking client perceptions as well as role played by firm. There are, of course, a relatively high number of studies in this field, but there is no uniform classification of the most important categories. Furthermore,

these studies consist of a mere theoretical description, without empirically exploring a real website.

After an exhaustive review of literature, four factors i.e. accessibility, navigability, content and speed are opted to use the WAI [18] to determine web site quality. But usability is not only defined by navigability and content. It needs more factors which are discussed, and finally WPI is determined. To facilitate entry to practically inaccessible markets, one must have internet popularity via links and good search engine positioning. To achieve long term results, one should invest in SEO instead of SEM as SEO improves the traffic in natural ways and allows the benefits obtained to be enjoyed longer. SEM tools achieve more rapid results but for very short duration [28]. To enhance navigability and usability of a website, companies must make the information easily available through internal search engines, general menus, site maps, etc. the website contents must fulfill the informational, communicative and transactional functions, which are decisive for individuals to trust the company activity. Finally, attention must be given to other technical factors of website like download speed, reliability, scalability etc. This is not end of story because the user is human being and each human experience in using a particular website is unique. So, one also needs end user experience monitoring to enhance the performance of website and survive in market.

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