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Implementation of a Framework for Website Quality Evaluation: Himachal Pradesh University Website

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Abstract

Objectives: The fast expansion of net applications will increase the essentiality to assess net application quantitatively. Recently certain valuable efforts like Website Quality Evaluation Method (Web-QEM) attempted to purposely evaluate the web application are entirely skewed, relying generally on expert's opinions. In this paper, a quantitative assessment approach is elucidated to evaluate the features of the websites. **Methods:** The methodology is valuable in analytically evaluating the traits, sub-traits and features that influence product superiority. In this paper the website superiority metrics and means to compute the website interface has been proposed. The evaluation metrics has a framework of five quality characteristics: Functionality, Usability, Reliability, Presentation and Content. **Findings:** The home web page is exceedingly imperative in comparison to others; hence the estimation of the entire nature of the site is characterized by home web page. An outcome is additionally from 0 to 1, 0 speaks to low-class and 1 implies fabulous class. The prospective site quality measurements could be used as a site assessment system in order to assess functional sites and dispense superiority scores. **Applications:** This paper would act as a sort of blueprint highlighting the pathway and its elucidation, for evaluating a particular website. Eventually, a meticulous evaluation procedure is being illustrated by this paper.

Keywords: Attribute Weighing, Web Attribute, Web Quality, Web-QEM

1. Introduction

In the present technological era many new sites are being propelled each day. Those with comparative substance won't have the same level of quality. On the off-chance if the features are not satisfactory, the user would basically run off the site and visit different sites. And mostly there seems to be no other opportunity to recover a user to that particular site. Thus, in a way to revamp the eminence of a website, which makes a website productive, user friendly and easily comprehensible and it is also provides constructive and consistent information, offering effective outline and visual outlook to fulfill the user's requirements and prospects[1], and all of this could be accomplished only by defining the measurable website standards[2,3].

The worth of a website can be computed from two aspects: Programmers and End users[4]. The programmer's viewpoint of website quality focuses on Maintainability, Security, Functionality etc. whereas the end-users give more consideration to Usability, Efficiency, Creditability etc.

The primary objective of current paper is to demonstrate updated and innovative procedure, used for the quantifiable evaluation during the operative stage[5]. The nuclear assessment models and processes are indoctrinated in the LSP (Logical Scoring of Preferences) model and continual preference rationale as computative foundation. Here, paper deliberates the general procedural steps that evaluator must consider while applying Web-QEM. In an order, to explicitly depict how to assess the Himachal Pradesh University's (HPU) site orderly, the website assessment apparatus will ascertain the five value attributes in the HPU's home web page. The above mentioned higher learning institution is of global repute and located at Shimla (Himachal Pradesh) in India.

The aim of the paper is to assess the accomplishment level of requisite attributes as Functionality, Usability, Reliability, Presentation and Content and figured out comprehensive assessment to investigate and deduce outcomes about the cutting edge of website quality.

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Eventually, on the verge of assessment and testing process, paper gets for every chosen website framework a worldwide quality index utilizing the rating from 0 to 100%. Aforesaid fundamental ranking would land in three classifications or inclination parameters in particular: *unsatisfactory* (from 0 to 40%), *marginal* (from 40 to 60%) and *satisfactory* (from 60 to 100%).

The current paper is organized into various segments as following: In segment 2, paper makes some *fundamental Measurements about the site*. Paper illustrates *quality attributes and properties* with respect to the student visitor outlook and rating level, in segment 3. In the next section, paper evaluates *overall assessment* and computations; and lastly, finishing up with conclusive comments and recommended work.

2. Fundamental Measurement about Website

Principally the paper is attempting to depict some broad issues and hypotheses for the selected site. One of the prime objectives for scholastic evaluation is to comprehend the degree which a chosen set of superiority characteristics satisfy in a given arrangement of expressed prerequisites. Especially, in the undertaken work manuscript concentrates on the operational period of a site. Figure 1 demonstrates a depiction of root web page.

Talking in a broader sense, programming softwares are mostly created to fulfill particular user's needs, and webpage programs are not exceptional. In outlining webpage antiquities, numerous difficulties are come across that are regularly curtailed. For example, when users visit for the first instance at certain landing page they often can perceive to discover the required data rapidly. In order to help them

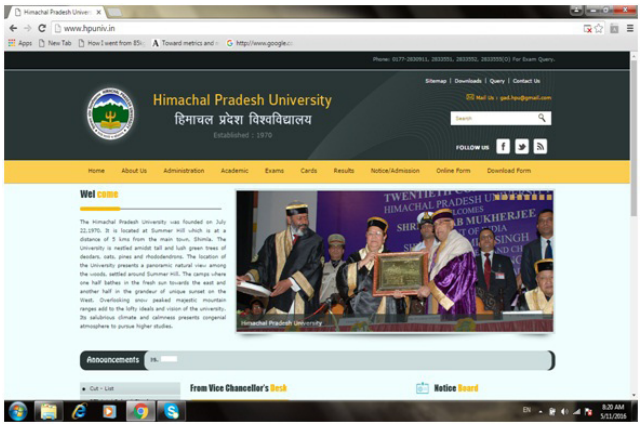

Figure 1. Himachal Pradesh University's Root Page.

in doing so the following two mechanisms i.e. browsing and searching are a boon. In this manner, to get an era-efficient rational model of the comprehensive website (i.e. configuration and substance), there are qualities like a site sketch, a directory, or a chapter by chapter guide, that aid in getting a speedy worldwide site understandability.

These characteristics encourage browsing. Nonetheless, a worldwide searching capacity given in the root page would adequately help in acquiring the required chunk of data and evade browsing. In addition, both the capacities can be enhanced at any time frame. There exist numerous components and aspects that add to site superiority, for example, functionality, usability and reliability are important among others; that a designer ought to consider when planning for target groups.

3. Quality Attributes Evaluation

This segment characterizes and sorts a broad arrangement of scholastic quality properties classifying them into a prerequisite framework[6]. The elementary objective is to categorize qualities and characteristics by carrying out the third step of the Web-QEM. In order to ensure global benchmarks paper follows the prominent trademarks like Functionality, Usability, Reliability, Presentation and Content. These attributes offer evaluators a theoretical and notional depiction of software quality and give a threshold for farther disintegration. These attributes, provide paper with sub-attributes and from them, investigation could determine quantifiable properties and variables.

Further, the related significance of qualities alters relying upon the diverse application domains and users. Thus, in conformity to above, three viewpoints of value i.e. visitor, designer, and administrator views are being defined by the current paper. Figure 2 highlights the dominant qualities and quantifiable properties with respect to the student visitor point of view. Particularly, artifact qualities, like portability and maintainability won't be important to be graded out from the angle of student visitors. Generally, student visitors are mostly keen in the usability and informativeness of the website, in its search and browsing instruments, in its consistent exploration system and reliant-domain predicted efficacy and furthermore, in the webpage consistency and usability.

3.1 Functionality Evaluation

The ISO 9126-1 model defines the functionality characteristic as "a set of attributes that relate to the

existence of a set of functions and their specified properties". The functions indicate some specific tasks that help to accomplish stated or implied needs[7]. Accuracy is already grouped under the functionality. The functionality assessment result is depicted in Figure 3.

For the sake of fair evaluation of the degree of functionality in a webpage, every sub-attribute has to specify the weight. Sub-attributes in Navigation draw extra consideration than others, by weight of 0.4, Suitability and Search each weigh equal at 0.3. As reported by the evaluation equation and corresponding benchmarks, the final outcome of Functionality is 0.8.

3.2 Usability Evaluation

In general Usability is described as a value characteristic that assesses to what extent user interface is easier to use[8]. Website usability is defined as a combination of several design goals like learning ease, ease at remembering, understandability ease, ease at finding etc.

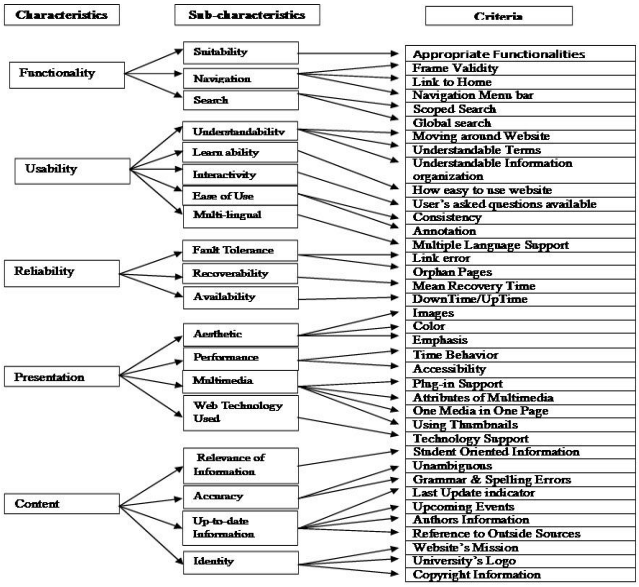

Figure 2. Major and Sub-Characteristics.

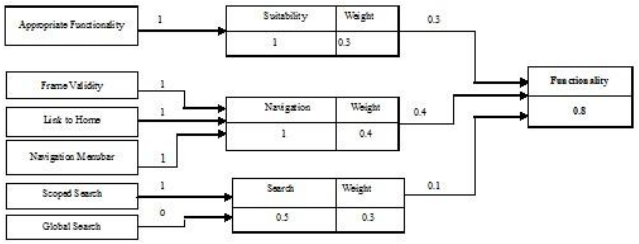

Figure 3. Functionality Characteristics for HPU Website's Home Page in May 2016.

Usability attribute and its sub-attributes are equally tremendous elements as all of them need to ascertain the quantifiable markers by means of equations to assess their superiority standards. Like, the usability feature as of HPU's home page was being calculated by this modus operandi and revealed in Figure 4.

The result indicates the outcome for the scores of sub-attributes and the absolute value of the usability feature. The assessor could comfortably observe quality rating for every stage. Evidently, Learnability and Interactivity got highest grade, while there is a need of Multi Language Support in the website and the final satisfaction rating for Usability is 0.6.

3.3 Reliability Evaluation

Reliability is related to the website performance. The performance of the website and capability of the website is to recover quickly at times of any kind of problems[9].

Reliability comprises of elements which have to compute their quality rate by means of formulated equations for measurable indicators. The HPU website is being quantified as an illustration in Figure 5 underneath.

3.4 Presentation Evaluation

The presentation is the website's ability to present it in front of users. A new technology should be applied on the website and it should be impressive[10].

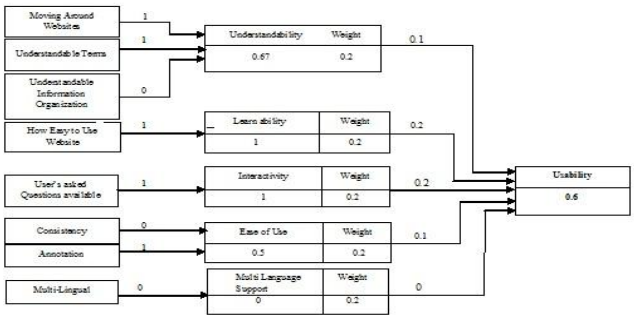

Figure 4. Usability Characteristics for HPU Website's Home Page in May 2016.

Figure 5. Reliability Characteristics for HPU Website's Home Page in May 2016.

The assessment procedure is accomplished by means of a standard mathematical equation which computes the final grades and for which the related composing scores should be collected. From an illustration point of view HPU website's home page is being evaluated as under. Figure 6 displays the outcome of the presentation assessment procedure. The superiority of metrics defined in every rating of indicator and summation of the composing ratings exhibit higher quality in the HPU website.

3.5 Content Evaluation

Web applications are a combination of information, services or functionalities. Users come to a website, primarily looking for a particular sort of data; they give less consideration to the navigation, visual design and interactivity of the website[11].

An assessment of content is being done particularly by taking HPU website as an example. Figure 7 below illustrates the entire procedure of evaluation.

The content's assessment is being worked out in Figure 7 which reveals each computable pointer with outstanding quality grade. The ultimate outcome of content came out to be 01, which signifies the level of excellence of the content's quality in the website of the HPU.

4. Overall Evaluation

In the entire evaluation course a total of five quality features have been analyzed and computed, as per the derived equations. The outcomes are illustrated in the Table 1 as under.

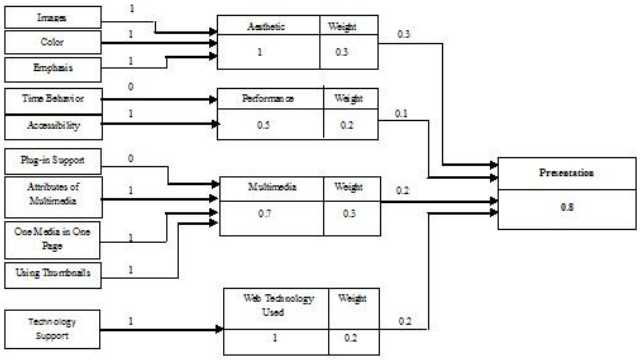

Figure 6. Presentation Characteristics for HPU Website's Home Page in May 2016.

Subsequent to the entire calculation process for selected quality characteristics, it is evident from Table 2 beneath that the final rankings came out to be functionality = 80% (i.e. 0.8 in fraction), usability = 60% (i.e. 0.6 in fraction), reliability = 80% (i.e. 0.8 in fraction), presentation = 80% (i.e. 0.8 in fraction) and content = 100% (i.e. 1.0 in fraction).

An equation for calculating the absolute quality outcome for HPU's website is as follows:

Final Web = 0.2 × Total Functionality + 0.3 × Total Usability + 0.1 × Total Reliability + 0.1 × Total Presentation + 0.3 × Total Content

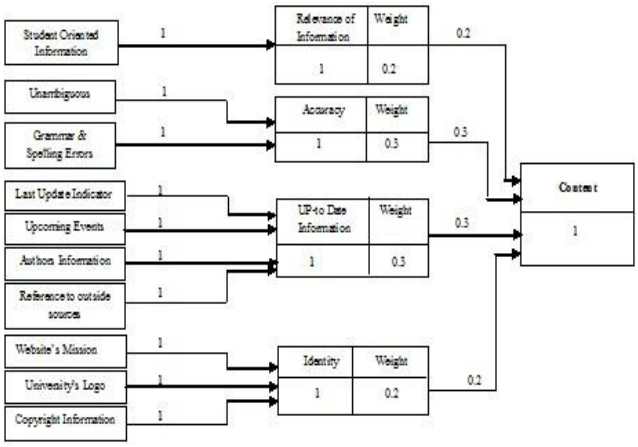

Figure 7. Content Characteristics for HPU Website's Home Page in May 2016.

Table 2. Comprehensive Outcomes of Quality Preferences after Enumerating the Related Cumulative Criteria Functions

S. No.	Characteristics	HPU (in Decimal)	HPU (in %)	Satisfaction Level
1	Functionality	0.8	80%	Completely Satisfies
2	Usability	0.6	60%	Satisfies
3	Reliability	0.8	80%	Completely Satisfies
4	Presentation	0.8	80%	Completely Satisfies
5	Content	1	100%	Completely Satisfies

Table 1. Final Ratings for the Selected Quality Characteristics in the HPU Website's Home Page

Quality	Functionality (Weight = 0.2)	Usability (Weight = 0.3)	Reliability (Weight = 0.1)	Presentation (Weight = 0.1)	Content (Weight = 0.3)	Final Score
HPU	0.8	0.6	0.8	0.8	1	0.80

$$\text{Final Score} = 0.2 \times 0.8 + 0.3 \times 0.6 + 0.1 \times 0.8 + 0.1 \times 0.8 + 0.3 \times 1 = 0.80$$

5. Conclusion

A three-tier configuration i.e. quality attributes, sub–attributes and quantifiable aspects (markers) proposes the significance of the web assessment system. The principal level of the web assessment structure proposes five quality attributes that are Functionality, Usability, Reliability, Presentation and Content. The second level quality attribute is classified into many sub-attributes. All of these sub–attributes are acquired from parental quality attributes.

Finally, the site quality measurement figures compute the quality factors by means of many assessment equations providing final outcomes with the significant quality ranks. After analyzing the quality factors, the standard equation is worked out considering the cumulative scores of every quality factor. The outcomes would be from 0 to 1, furthermore, the average of weights is taken into account in the assessment procedure. Clearly, the home page is exceedingly significant in comparison to others. Hence, the prediction of the overall quality of the site is portrayed by the home page. The outcome as well ranges between 0 to 1, where 0 symbolizes low quality and 1 signifies magnificent quality. The designed site quality measurement criterion could serve as a site assessment system to assess existing sites and assign quality ranks; moreover, it can also help in enhancing quality of site by virtue of re-engineering.

6. Future Work

With a specific end goal to ultimately assess the merit of a site by applying an assessment tool specifically designed for a website, certain complications are always there. For instance, certain identified quality norms may not be examined absolutely by the web evaluation instrument, on the grounds that a majority of the sites are devised by divergent divisions (entity specific tasks). Moreover, it is hard to extricate the source codes of HTML from a site. Furthermore, as of now site assessment apparatus is a Window application. Later on it is ought to be running on-line.

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