

# Assessing the quality of WEB based on Structure

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**Abstract-** WEB sites are playing very vital role in information dissemination. Most of the businesses are using their WEB sites to promote market and conduct business. The quality of the WEB sites has indirect relationship with quantum of business conduct by the industrial establishments. Quality of a web site is based on number of characteristics; computation of the same in quantitative terms is a complex process. Structure of a WEB site plays a vital role in hosting the content in most comprehensive manner.

In this paper the subjecting of the WEB to data mining and determining the structure contained is presented. The structures are evaluated to find the quality of the same individually and also combined considering all the structures that are mined. A method is presented in this paper using which the quality of a web site is computed considering the structure of the WEB site alone.

**Keywords-** Quality of WEB sites, Quality Assessment framework, Structure mining, Structure assessment, Quality assessment of WEB structures

## I. INTRODUCTION

The information exchange is predominantly taking place due to advent of Internet and WEB technologies. Most of the content these days is hosted on the WEB making it easy for the people have the access to the information in least time and negligible cost. The information hosted on the WEB is of different forms which include text, images, audio and videos. Information is also being available in streamed mode. The Web sites are being used for doing e-commerce including marketing. The way the people live is changing drastically with the content being available on the web changing. How the quality of the content hosted on the WEB needs to be assessed before taking the content hosted on web for granted. The attitude of the people requiring the information is changing heavily. The customers won't be satisfied if the WEB site is not of quality. The WEB site loses its existence and never be surfed if the quality of information hosted on the WEB is erroneous and some time has no relevance or connectedness. The quality of a website can be assessed using some quality factors such as Usability, content Reliability, Flexibility, Functionality, Portability, Maintainability, Privacy, Security, Adequacy of Information, Safety, Content, Navigation and etc. The quality of website can be assessed in many ways. The assessment can also be done using evaluation tools. Many organisations are developing their information in terms of Videos, audios, graphics, text, tables, forms, animations, Logos, dynamic content, mouse over effects,

graphics etc. While some web sites are static in nature some other sites are dynamic.

Many methods existing in literature for computing the quality of the WEB site are either subjective or objective. There is prejudice involved in the subjective assessment and there is lack of completeness in the objective assessment of quality of WEB sites. Some methods are biased due to individual preferences or some purely based statistical measurements relating down time, response time etc. The quality of a web site is based on the persons who look at the WEB sites. Programmers look at the WEB site characteristics that include security, functionality and maintainability whereas the users using the WEB site look at the quality of the WEB site in terms of usability, credibility, efficiency and credibility.

Every web site has certain number of quality characteristics. The characteristics must be evaluated to assess the quality of the WEB site and also to find the extent to which the user needs are being met. Assessing the quality of the web site is quite complicated especially when the web sites are complex. The WEB sites that are related to e-commences, museums, sites that deal with animations are actually quite complicated. Even the process that is used for evaluating the quality of a web site is more complex. Most of the quality characteristics of web sites is also are interleaved and inter connected through complex logic that relates the Quality characteristics of the web site. Some of the quality factors can only be computed subjectively and some other parameters are to be evaluated objectively and some other parameters are computed quantitatively. A composite model comprising all aspects of computation of quality is required. Connectivity between subjective, objective and quantitative is required for the development of proper quality assessment model.

The expectations of a site must first be determined. Quality parameters that are representative of the expectations must be determined and must form into a base or a quality assessment model using which the overall quality of the web site can be assessed. The metrics that measures the quality characteristic must be determined and the quantitative technique that can be used for measuring the quality characteristic must be determined.

The quality assessment methods vary from factor to factor and the number of features that must be considered shall also vary from factor to factor. Each feature and the combined effect of all the features must be measured through most suitable computational methods. In this paper the features and computational methods related to the quality factor "structure" is presented.

## II. LITERATURE SURVEY

Miss. KausarFiaz Khawaja1 et al., [1] have dealt with factors that include Usability, Privacy Security, and Adequacy of information and Appearance which can be used for evaluating the quality of a WEB site. Usability is the ease of use and learnability of a human-made object such as a tool or device. It describes the quality of user experience across websites. Appearance means the visibility of the WEB site which includes appealing, polished and professional presentation. Adequacy of Information means Putting sufficient and useful information in the website. A method has been presented paper that helps computing the quality based on the observations made while the WEB site is in use.

Vijay kumarMantri et al. [2], have presented that quality of a WEB site can be computed using the factors such as Usability, Safety and Flexibility. Usability of a website must be effective, efficient and satisfactory. Safety of a Website must ensure that no interaction of a user with the WEB site could be ever revealed. Flexibility is the ability to add / modify / remove functionality affecting the WEB pages without damaging the functioning of current ongoing system. The authors have used a tool called Portal Data Quality Assessment Tool (PoDQA) using a quality model called Portal Data Quality Model (SPDQM).

Several quality factors have been considered by Vassilis S. Moustakis et al., [3] that include Structure and Design, Content, Multimedia, Navigation, Appearance, Uniqueness. Information provided to the end user through user interface is called as Content, The extent to which the web site specialised or generalised, reliability and completeness of the information etc., reflects the quality of a web site considering content as a lone parameter. Every user should have a facility to move around the WEB site. Such facility is called navigation. The ability of moving around the WEB site, easy understand the moving around the web site, and the proper functioning and availability of the links reflects the quality of the navigation built into the implementation of the WEB site. The way the content is presented, speed with which the content is browsed is related to the structure of the web site. The Look and feel and the appearance of the web site is very much dependent on use of multimedia objects along with the graphics. Every web site must be differentiate and should look unique different from others. The uniqueness of the site makes more available for the users. User can very easily distinguish the unique sites.

AndrinaGraniü et al., [4] have presented the quality of a WEB site from the point of portability. Portability means the ability to move the website from one host platform to another and the platform that runs the site will work on the new host.

Tanya Singh et al. [5], have used quality factors that include Usability, Privacy and Security, Adequacy of information and Appearance. Usability is the ease of use and learnability of a human-made object such as a tool or device. It describes the quality of user experience across websites. Privacy is all about revealing information to those users who are identified by the owner of the user. Only selected users are provided with the information of those data elements intended to be

shared by the owner of the data. Security is all about preserving the interaction of the user with the WEB site. Adequacy of information is related to making available complete data without any loose ends that suffice the actual requirements of the end user. Appearance of a WEB site is all about displaying the content in most understandable by using colours. Graphics, sequences etc.

Anushaet. al., [6] have considered Factors such as Portability, Reliability, Functionality, Usability, Maintainability, and Efficiency to asses quality of a WEB site. Portability means the ability to move the website from one host to another and the platform that runs the site will work on the new host. Reliability means that a WEB site shall reflect the same information any number of times it is sought in the same context. It is the probability that the intended page will be available and presented to the user. Website must be Free from errors. Functionality of a website includes accuracy, security, suitability and etc. Usability is the ease of use and learnability of a human-made object such as a tool or device. Maintainability includes analysability, changeability, stability, Testability. Maintainability implies the simplicity with which changes can be made to the WEB site while the WEB site is up and being used for other. Analysability includes the readability of the content and the ability to intemperate the same including the tracing of navigational paths. Stability is a feature that dictates that the same content is displayed any number of times a user visits a WEB page in the same context. Testability of a WEB site includes all those features using which the proper working of the WEB site is tested while the WEB site is up and running.

Filippo Ricca et al., [7] have considered Content, Design, Organization and user friendliness as the quality factors that must be considered in evaluating the quality of a WEB site. Organization of a Web site includes the identification of WEB pages and the way the WEB pages are linked hierarchically. The linking of the WEB pages is done in such way that is easy to navigate. The WEB pages must be simple and user friendly in the sense, the content shall be presented to the user as per preferences of the user.

Saleh Alwahaishiet. al., [8] have considered playfulness, and Level of representation of the content as the most important factors that should be considered for evaluating the Quality of a WEB site. Most of the presentation on the basement of quality framework has neither provided a framework or appropriate computational methods using which quality of a WEB site can be computed. Layla Hasan and Emad Abuelrub [9] have proposed a general criterion for evaluating the quality of any website regardless of the type of service that it offers. The have contended that the dimensions of quality criteria that include content, design, organization and user-friendliness. These dimensions together with their comprehensive indicators and checklist can be used by web designers and developers to create quality websites to improve the electronic service and then the image of any organization on the Internet.

**Kavindra Kumar Singh** et al., [10] have expressed that the rapid growth of web applications increases the need to

evaluate web applications quantitatively. WebQEM (Web Quality Evaluation Method) have been used for objectively trying to evaluate the web applications. Weighing a web attribute has been proved to be subjective and mostly dependent on judgements made by the experts. The authors have presented quantitative evaluation strategy to access the quality of WEB sites and Applications. The methodology proposed by them is useful to systematically assess characteristics, sub-characteristics and attributes that influence product quality. They have presented models, methods, procedures, principles and for assessing quality of a WEB site.

Long-Sheng Chen et al., [11] have presented that heavy interaction is taking place among the members especially through social WEB sites. It has become very important to consider the quality of WEB sites. The authors have attempted to define the quality factors of virtual communities and then proceeded to identify key factors by attracting new members by using feature selection technique

Naw Lay Wah et al., [12] have presented that the WEB sites must be evaluated and measured for quality. He has presented several metrics that are quite related to usability associated with good design elements such as word count, total pages, size in bytes, body text percentage, average link text count and others. He has presented the computation of WEB site quality on basis of 16 factors. He has used support vectors to predict good and bad web pages. A quantitative analysis of WEB page attributes has been presented.

### III. Assessing quality of a web site based on Structure

Every web site is designed using structures. A structure in a web is a hierarchal connectedness of WEB links. A example structure is shown in Figure-1

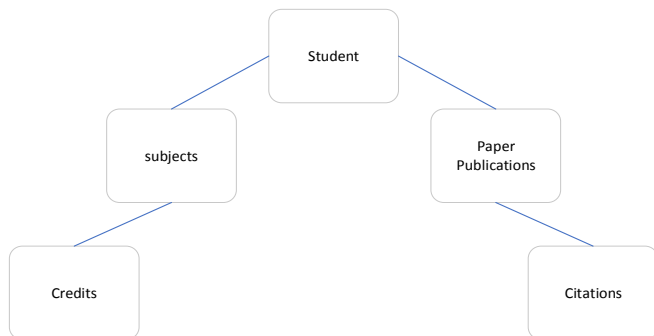


Fig.1: Example Structure

A structure is at Macro level or at Micro level. An element in a Macro level could be structure by its self and therefore needs to be expanded to the micro level. All Micro level and Micro level structures are to be enumerated before quality of each structure and the quality of the web site considering all enumerated structures is carried.

Quality of each structure can be computed in terms of number of elements, number of edges that connects the elements and

the depth of each structure. The quality of each of these aspects can be computed as follows:

Quality assessment based on depth( $Q_d$ )

Depth	Depth >=5	Depth = 4	Depth = 3	Depth <=2
Quality	0.25	0.50	0.75	1.00

Quality assessment based on Number of edges ( $Q_e$ )

Edges	Edges >=7	Edges = 6	Edges = 5	Edges <=4
Quality	0.25	0.50	0.75	1.0

Quality assessment based on Number of pages ( $Q_p$ )

Pages	Pages >=8	Pages = 7	Pages =6	Pages <=5
Quality	0.25	0.50	0.75	1.0

The overall quality of a structure ( $Q_s$ )= $Q_d * Q_e * Q_p$

Number of structures contained in a WEB site = n

Overall quality of the WEB site considering all the structures is computed as  $WQ_s = \sum_{i=1}^n Q_s(i)$

Following algorithm be used for computing the quality of a WEB site considering the structures contained in the WEB site.

#### Step-1

Define the root directory of the WEB site

#### Step-2

Count number of resources files

#### Step-3

Trace the resources files and stores the URLs of the sources files in in an array URL (i)

#### Step-4

Carry WEB mining using the resources file at Macro Level and store the structures mined in a triple dimensional array **MacroStrut**(I,j,k)

#### Step 5

For each of structure and for each element in the structure mine the structures if any in a recursive fashion and expand **MacroStrut** (I,j,k) to **MicroSTRUCT** (l,m,n)

#### Step-6

Consider each structure and compute the Quality through computation of depth, edge and element quality and sum the structure quality to overall quality

#### Step-7

Report overall quality

## IV. CONCLUSIONS

Every web site must be meticulously designed and developed for the use of information hosted on the WEB site. Most of the world is dependent on the quality of information hosted on the WEB site. The dependability on a web site for information can be expressed in terms of the quality of the WEB site. Many factors are to be considered for computing the quality of a WEB site. Structure is one such factor. Every factor must be expressed using the computational expressions so that the factor is expressed in quantitative terms. Every factor may involve in subsidiary factors existing in hierarchical fashion. The computation of the quality must be expressed considering computations of the entire subsidiary factors. The computation of the quality of structure of the WEB site can be expressed in terms of depth, edges and number of elements that are contained in the structure.

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