

DEVELOPING QUALITATIVE MEASURES USING ERRORS OF WEBSITE CONTENT

Sreedhar G.

Assistant Professor, Department of Computer Science,
Rashtriya Sanskrit Vidyapeetha, Tirupati
E-mail: gsrid74@yahoo.com

ABSTRACT

The main theme of the paper is to identify quality measures for website content. With rapid development of web sites and applications, developers and evaluators have interesting challenges not only from the development but also from the quality assurance point of view. The quality model must be able to assess the quality of each and every aspect of the website and it should cover the process of all web engineering activities. To design a quality website, the website should be free errors of with the content A set of guidelines are considered to establish the procedure for identifying errors of website content. The qualitative measures are identified in the procedure and these measures are divided into Text Formatting Measures (TFM), Graphics Element Measures (GEM), Page Formatting Measures (PFM), Link Formatting Measures (LFM), Page Performance Measures (PPM).

Keywords: Website Content, QAP, TFM, PFM, GEM, LFM, PPM

I. INTRODUCTION

Over the last few years there has been a remarkable increase in use of the World Wide Web (WWW) for a wide and variety of purposes. There was also a fast growth in its applications. This led the Internet users to realize the importance and the benefits gained from a globally interconnected hypermedia system. On the other hand it causes a larger number of useless, meaningless and badly designed websites on the Internet world causing unwanted additional traffic; this is all because of an unorganized non-planned websites development processes. Due to the unceasing growth of web sites and applications, developers and evaluators have interesting challenges not only from the development but also from the quality assurance point of view.

II. RELATED WORK

As we know, the quality assurance was and is one of the challenging processes in software engineering as well as for the web engineering, as a new discipline. Although there exists many design guidelines, and metrics for the evaluation of web sites and applications, most of them lack a well-defined specification framework and even worse a strategy for consultation and reuse. Some initial efforts have been recently made to classify metrics for some entity type as for example metrics for software products. Particularly, in last few years a set of web site metrics were defined and specified based on the data collection point of view. The quality model must be able to assess

the quality of each and every aspect of the website and it should cover the process of all web engineering activities. A set of guidelines are evolved to build a qualitative model of a website. A guideline consists of a design and evaluation principle to be observed to get and to guarantee a usable user interface [1]. Guidelines can be found in many different formats with contents varying both in quality and level of detail, ranging from ill-structured common sense statements to formalized rules ready for automatic guidelines checking. Certain rules are validated by experimental results provided by user tests, experiments in laboratory or other techniques. Guidelines can be classified (Figure 1) by type ranging from the most general to the most specific: principles, guidelines and recommendations. *Principles* are general objectives guiding conceptual User Interface (UI) decisions. They reflect the knowledge around human perception, learning and behavior and are generally expressed in generic terms like "Use images and metaphors consistent with real world" so that they can be applied for a wide range of cases. *Guidelines* are based on principles specific to a particular design domain. For example, a web design rule can stipulate to "use a consistent look and a visual language inside the site". Some guidelines have to be interpreted more and altered to reflect the needs of a particular organization or a design case. *Recommendations* determine conceptual decisions specific to a particular domain of application and should reflect the needs and the terminology of a given organization. They are unambiguous statements so that

no place for interpretation is left. Recommendations include ergonomic algorithms, user interface patterns and design rules. Design rules are functional and operational requirements specifying the design of a particular interface, e.g. "Every web page needs an informative title"

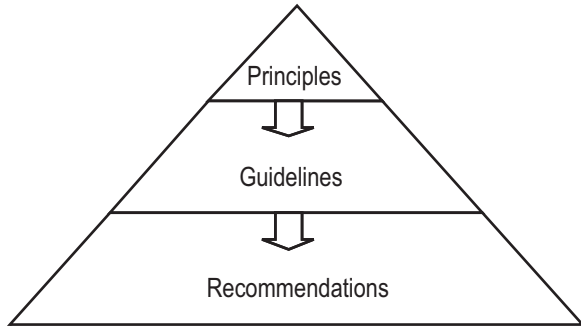


Fig. 1. Types of guidelines and sources

Kwaresmi [2] developed a framework to define a Guideline Definition Language (GDL) to investigate quality evaluation procedure. The GDL expresses guideline information in a sufficiently rich manner so that evaluation engine can perform GDL-compliant guideline.

$$\begin{aligned}
 U(p) &= f_{\text{kwaresmi}}(\text{Web_page}, \text{UES}_{i,j}) \\
 &= \text{EXEC}(\text{EC}_{ij} \{ \text{INST_UES}_{i,j} \}) \\
 &= \{ \text{"Respected"} \mid \text{"Violated"} \mid \text{"Partially Respected"} \} \\
 &\dots(1)
 \end{aligned}$$

Where $\text{UES}_{i,j}$ be the set of evaluation sets associated to the guideline i in the source j and that will be used for the evaluation of the evaluated web page. $\text{EC}_{i,j}$ be the set of evaluation conditions associated to $\text{UES}_{i,j}$. $\text{INST_UES}_{i,j}$ is the set of captured instances of $\text{UES}_{i,j}$ in the evaluated page. In practice, the executes each $\text{EC}_{i,j}$ condition and then it combines the results to have the overall result for the guideline i . We say that a web page satisfies a guideline $G_{i,j}$, if the execution of all $\text{EC}_{i,j}$ on all the $\text{INST_UES}_{i,j}$ is true. Using the above evaluation parameters allows us to define a kind of quality model to balance the evaluation result. In the accessibility field, Bobby [3] defined a set of accessible evaluation tools. All these tools are based on accessibility guidelines. It does this through automatic checks as well as manual checks. It also analyzes web pages for compatibility with various

browsers (equation 2). Accessibility tools use a binary model to evaluate the accessibility of web pages.

$$\text{Accessibility errors} = \sum_{\text{guidelines}}^{i=1} a_i x_i \dots \quad (2)$$

Where a_i is 0 when guideline is violated and 1 when guideline is not violated and x_i is a guideline. An easy way to comply with the conference paper formatting requirements is to use this document as a template and simply type your text into it.

III. METHODOLOGY TO OPTIMIZE QUALITY OF WEBSITE CONTENT

A set of guidelines are considered to establish the procedure for *Quality Assessment Process (QAP)*. The World Wide Web Consortium (W3C) [4] is an open source organization and it defines various web standards for designing a website. The W3C is led by web inventor Tim Berners-Lee and CEO. The standards defined by W3C are considered as guidelines and these guidelines help in assessing the quality of website content in presenting the web content. The guidelines are as summarized as follows.

Guideline 1: Provide a text equivalent for every non-text element. This includes images, graphical representations of text, image map regions, animations, applets and programmatic objects, frames, scripts, spaces, audio and video files.

Guideline 2: Do not rely on color scheme only. The content of web page must match with foreground and background color. Also provide sufficient contrast to the content for visibility.

Guideline 3: Use markup and style sheets instead of images to convey information. Style sheets controls the layout and presentation of the web page and decreases the download time of the web page.

Guideline 4: Clearly mention the text information of web page with natural language. Specify the expansion of each abbreviation or acronym in the document.

Guideline 5: Use tables properly in the web document. For data tables, clearly specify row and column headers and number of rows and columns exactly.

Guideline 6: Ensure that web pages featuring new technologies transform gracefully. When dynamic contents are updated, ensure that content is changed.

Ensure that pages are available and meaningful when scripts, applets or other programmatic objects are not supported by the browsers. If this is not possible, provide equivalent information as alternative in the web page.

Guideline 7: Ensure user control of time sensitive content changes. Until user agents provide the ability to stop the refresh, do not create periodically auto-refreshing pages.

Guideline 8: Ensure direct accessibility of embedded user interfaces. Make programmatic elements such as scripts and applets directly accessible or compatible with assistive technologies.

Guideline 9: Design for device-independence. Ensure that any element that has its own interface can be operated in a device-independent manner.

Guideline 10: Provide context orientation information. Title each frame to facilitate frame identification and navigation. Divide large blocks of information into more manageable groups wherever appropriate.

Guideline 11: Provide clear navigation mechanisms. Clearly identify the target of each link. Provide information about the general layout of a site such as site map or table of contents.

Guideline 12: Ensure that documents are clear and simple. Create a style of presentation that is consistent across pages.

A set of qualitative measures are identified to satisfy the quality factors for optimizing website content. These measures derived from the Web page errors that are generated using the W3C Validation Service. This process uses the standard web tool W3C HTML Validator to validate and identify the number of different errors according syntax errors of HTML tags, properties of web page and standards mentioned by various organizations such as W3C. Most pages on the World Wide Web are written in computer languages (such as HTML) that allow Web authors to structure text, add multimedia content, and specify what appearance or style, the result should have. As for every language, these have their own *grammar*, *vocabulary* and *syntax*, and every document written with these computer languages are supposed to follow these rules. Markup

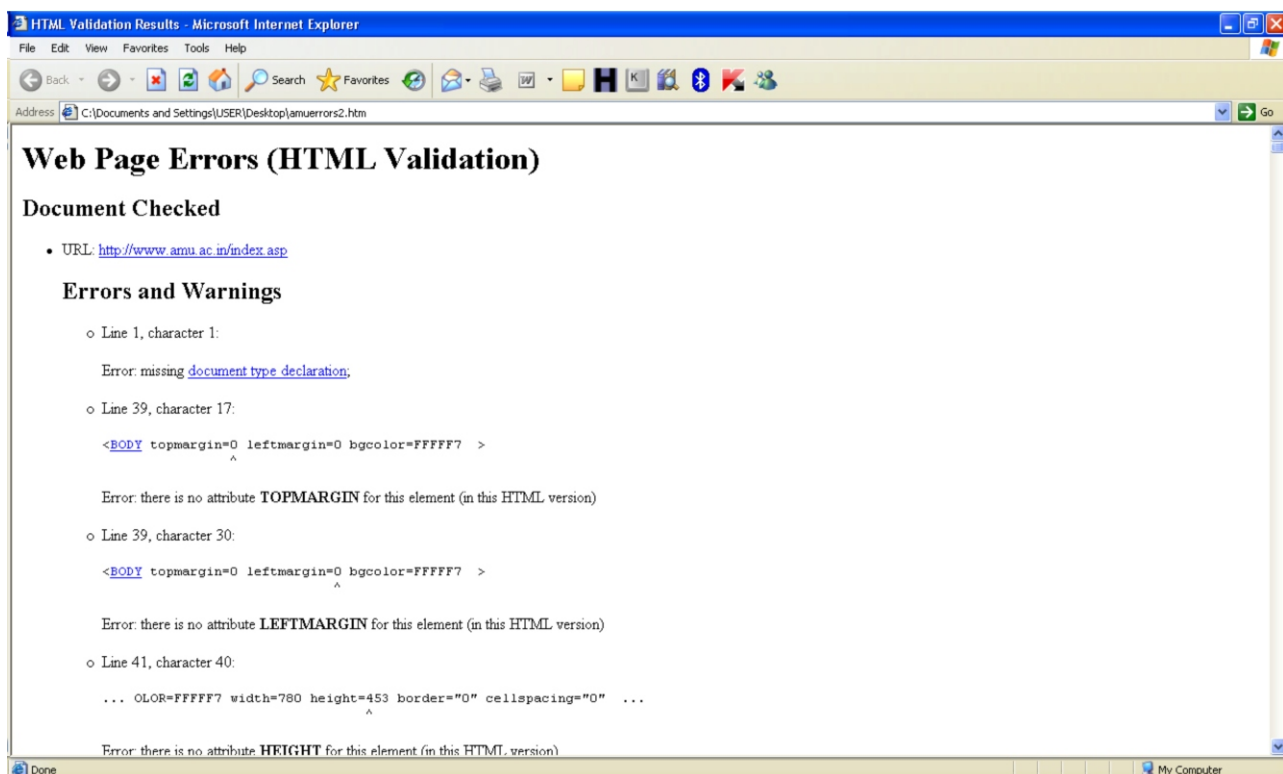


Fig. 2. W3C HTML Validator

languages are defined in *technical specifications*, which generally include a *formal grammar*. The tool compares HTML document to the defined syntax of HTML and reports any discrepancies. The outputs of the Markup Validator are a list of error messages and their interpretation W3C HTML validator helps to ensure that documents are free of potential problems that can result in unexpected output when users view the bad documents with different browsers. A screenshot of W3C HTML Validator is shown in figure 2.

The errors related to website content cause incorrect display of some components of Web pages. These errors include:

(i) *Table Tag Errors (TTE)*: All the sub tags in table tag should be properly used in the web page design. Errors in table tag cause for display problems of web page.

(ii) *Body Tag Errors (BTE)*: Body Tag Errors cause the errors in displaying the contents of the web page.

(iii) *Image Tag Errors (ITE)*: Image Tag Errors cause for errors in downloading the image in a website.

(iv) *Head Tag Errors (HTE)*: Head Tag Errors cause for errors in displaying heading and title of the web page.

(v) *Font Tag Errors (FoTE)*: Font Tag Errors cause the errors in textual display of the web page.

(vi) *Script Tag Errors (STE)*: Script Tag Errors cause the errors in programming at client side scripting.

(vii) *Style Tag Errors (StTE)*: Style Tag Errors cause errors in dynamic display features of the web page.

(viii) *Form Tag Errors (FmTE)*: Form Tag Errors cause errors in input and output display of the script programming in a web page.

(ix) *Link Tag Errors (LTE)*: Link Tag Errors cause errors in linking various web components.

III. CONCLUSION

The main theme of the research paper is to provide some qualitative measure for clear and quality web content of website. It is observed that website must be informative and all contents of the website must be accommodated in page layout according to standard guidelines. An attempt is made to enhance the quality of website content and layout so that web designer shall follow the quality of content in designing a web site.

REFERENCES

- [1] Dreyfus P (1998), Principles of usability, http://www.devedge.netscape.com/viewsource/archive/edition98_3_23.html
- [2] Beirekdar A, Vanderdonckt J, Noirhomme-fraiture M: A Framework and a Language for Usability Automatic Evaluation of Web sites by static Analysis of HTML Source Code: Kolski Ch, Vanderdonckt J (eds): Proceedings of 4th International Conference on Computer-Aided Design of User Interfaces CADUI (2002).
- [3] Bobby, <http://webxact.watchfire.com/>
- [4] www.w3c.org
- [5] Etnoteam S.P.A, marzo 2000, 1995-96, available at <http://www.etnoteam.it/webquality>