Improving Usability of Website Design Using W3C Guidelines

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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.

BACKGROUND

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. According to Drefus P (1998) 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 state-

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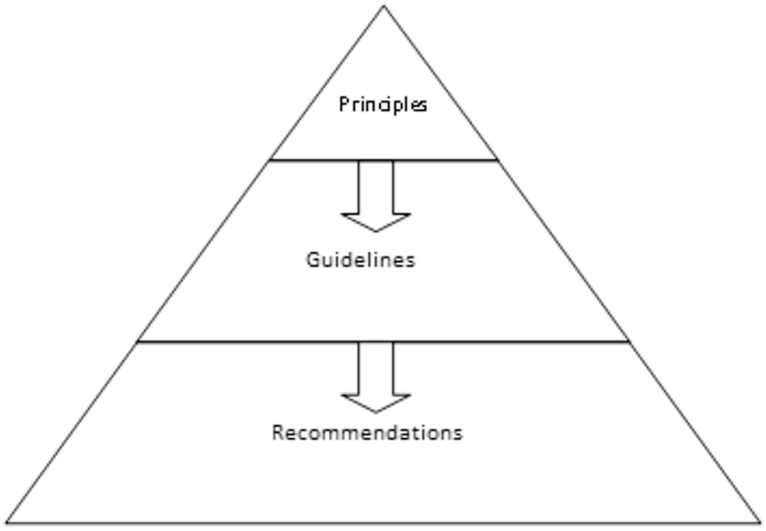
Figure 1. Website Guidelines and Sources



ments 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". Beirekdar A et al (2002) 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.

$$\begin{aligned} & U(p) \\ = \quad & f_{kwaresmi}(Web\_page, UES_{i,j}) \\ = \quad & EXEC(EC_{i,j}\{INST\_UES_{i,j}\}) \\ = \quad & \{"\text{Re}spected" \mid "Violated" \mid "Partially\ \text{Re}spected"\} \end{aligned} \tag{1}$$

Where $UES_{i,j}$ 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. $EC_{i,j}$ be the set of evaluation conditions associated to $UES_{i,j}$. $INST\_UES_{i,j}$ is the set of captured instances of $UES_{i,j}$ in the evaluated page. In practice, the $f(Web\_page, UES_{i,j})$ executes each $EC_{i,j}$ 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 $EC_{i,j}$ on all the $INST\_UES_{i,j}$ 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, Valet, and EvalIris define 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 (eq. 3.2). Accessibility tools use a binary model to evaluate the accessibility of web pages (eq. 3.2).

$$Accessibility\ errors = \sum_{i=1}^{guidelines} a_i x_i \tag{2}$$

where a_i is 0 when guideline is violated and 1 when guideline is not violated and x_i is a guideline. A set of guidelines are considered to establish the procedure for Correctness of the Website. The World Wide Web Consortium (W3C) is an open source organizations 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