Chapter 48
An Empirical Study of Usability Metric for Websites

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ABSTRACT

A Concern is any important property or area of interest of a system that can treat in a modular way. One of the most important Concerns is Usability which is considered one of the key principles in Software Engineering. The importance of Usability Evaluation has dramatically increased due to extremely fast growth in Internet technology. The website design is directly related to the purpose of the website. Website with poor usability can easily destroy the purpose of website. So, the authors have chosen one of the concern "usability" which is the core component of web applications. The purpose of this chapter is to analysis and proposes an appropriate web usability metric for evaluation of universities website. The proposed method will be based partly on a literature study and partly on the survey analysis response by visitors.

1. INTRODUCTION

The term *separation of concerns* was probably coined by Edsger W. Dijkstra in 1982. Separation of Concerns (SoC) refers to the ability to identify, encapsulate and manipulate the software parts relevant to a particular concern. It has emerged as one of the important principles in Software Engineering. Separation of Concerns (SoC) is the principle for better control of software complexity, during development, maintenance and reuse. The main goal of SoC is the ability to deal with a concern (aspect) separately, during maintenance. A good SoC policy is useful to increase software quality and decrease the effort to test, maintain, understand, reuse and document software. For example, in object-oriented paradigm the separated concerns are modeled as objects and classes and in structural paradigm, concerns are represented as procedures (ISO 9241,1998). One of the most important concerns used in web applications is Usability.

1.1 Usability

1.1.1 Definitions

Usability is a quantitative and qualitative measurement of the design of a user interface, grouped into five key factors: learnability, efficiency, memorability, errors, and satisfaction. Usability measures of effectiveness, efficiency and satisfaction can be specified for overall goals. Basically Usability is a quality attribute of software that evaluates how easy user interfaces are to use. Usability also refers to the ease of use for a particular software application. Means how easily users can use the software to carry out their required task. The various definitions of Usability are as follows:

- "The capability of the software product to be understood learned, used and attractive to the user, when used under specified conditions." (ISO/IEC 9126-1, 2000) (Marchetto, 2005).
- "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use." (ISO9241-11, 1998) (ISO 9241, 1998).
- "The ease with which a user can learn to operate, prepares inputs for, and interprets outputs of a system or component." (IEEE Std.610.12-1990) (IEEE std. 1061, 1998).

Usability consists of five kinds of attributes (Nielsen J. & V.Philips,1993):

- **Learnability:** User should be able to start the work in first go which means that the software should be easily learnable.
- **Efficiency:** The software should be efficient to use, the user should be able to understand the software fully and thereafter the yield will be high.
- **Memorability:** Software should be easy to remember so that the user should be able to use the software even after some period of time.
- **Errors:** The software should have low error rate due to which the users will not be able to make errors while using the software.
- **Satisfaction:** The software should be easy and pleasant to use.

Examples of appropriate measures are given below in Table 1.

Web usability is a core component of web quality. Without good usability features the web quality will always be a question mark.

Likewise, McLaughin and Skinner break usability down into six related but distinct components (McLaughlin, J., & Skinner, D., 2000):

Table 1.

Usability Objective	Effectiveness Measures	Efficiency Measures	Satisfaction Measures
Overall usability	Percentage of goals achieved; Percentage of users successfully completing task; Average accuracy of completed tasks	Time to complete a task Tasks completed per unit time	Rating scale for satisfaction Frequency of complaints

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