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Usability Determination Using Multistage Fuzzy System

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Abstract

The evaluation of software is important for enhancing the modification and improvement in a software development process. There are many factors to evaluate a software process. One of the factors is the Quality of software, which cannot be calculated with ease; as Quality of software is dependent on other factors. Software Usability is one of the significant aspects on which quality of software depends. A number of software usability models have been proposed by a number of researchers, each model considers a set of factors. In real world, we are facing many obstacles in implementing any of these proposed usability models as there is a lack in its precise definition and the concept of globally accepted usability. This paper aims to define the term 'usability' using a detailed taxonomy which includes all the aspects of usability and is globally accepted. Generalized Usability Model (GUM) with taxonomy has been proposed in this paper. This paper also shows how to determine the usability of a software application using a fuzzy based system which has been implemented using multistage fuzzy logic toolbox.

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Keywords: usability; quality; software; factors; GUM; evaluation; fuzzy logic; soft computing; fuzzy system.

1. Introduction

Over the few decades the software engineering practices have been changing to produce good quality software products. According to International Standard Organization (ISO) [8] there have been different quality factors like efficiency, effectiveness, reliability, usability etc. All the major Quality factors are listed in the Table 1.

Table 1. Quality of Software.

QUALITY OF SOFTWARE					
Functionality	Reliability	Usability	Efficiency	Maintainability	Portability

Out of the listed quality factors, usability is a significant quality factor that has to be considered during software development. The term usability is derived from user friendly. Many Software Engineering Experts defines usability in their own term.

In simple terms Software Usability is the ease of use, remembrance and learnability of a

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human-made object. Basically, usability will ease the human computer interaction so that the user will communicate better with the software system. Usability can also be defined as an extent to which a product can be used by a specific group of users to achieve the specified usability goals like effectiveness, efficiency and satisfaction. The degree of satisfaction will vary from one user to another.

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