Software Usability Metrics and Methods

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1 Introduction

Potential customers usually want to know how they will benefit if they hire a usability professional, and they may want numbers to measure those benefits, or calculate a return on investment. However, many professionals become confused when customers ask them to measure the usability of a software application, software program, web site, or other software product. In order to clarify the process of measuring usability, this tutorial first offers a definition of software usability metrics, gives examples of usability metrics, and reviews reasons for usability metrics. Next, the tutorial steps through the process of deciding what metrics and methods to use as well as when, where, and how to use them.

2 Definition of Metrics

For the purpose of this tutorial, we define software usability metrics as measures, in numerical terms, to assess software usability impacts on customers, potential customers, and other stakeholders.

3 Examples of Metrics

Some examples of usability metrics include the following: 1) Percentage of sales increases after software improvements compared to before software improvements, 2) Number of minutes it takes users to find information in a data repository, 3) Scores on tests and reports on surveys following an on-line training program, 4) Number of errors, fatal errors, and/or successes in accomplishing tasks, 5) Cost of budget and schedule overruns as a result of having to recode unusable software.

4 Purpose of Using Metrics

Reasons for applying metrics to software usability include, but are not limited to, the following: 1) To assist stakeholders in understanding the need for software usability, 2) To calculate a return on investment for potential customers, 3) To easily visualize usability findings (for example, via graphs, pie charts, and bar charts), and 4) To convey to stakeholders the results of usability tests, consultations, and experiments.

5 Analysis to Determine Metrics, and Methods to Yield Metrics

When analyzing the situation for a usability project usability professionals determine "what," "when," "where," and "how" they will use metrics and the prerequisites to incorporate those metrics. That is, what will be measured, when will it be measured, where will it be measured, and how will it be measured. To determine the answers to these questions professionals involve all stakeholders to ensure the metrics will meet stakeholder needs and goals. For example, if stakeholders want decreased time to perform a task, the metrics should include time on task. If stakeholders want their end users to experience certain emotions, metrics need to measure those emotions. If stakeholders want end users to remember on-line training, you will need to measure user recall. When designing the methods to yield metrics, professionals discuss the tests, experiments, and consultations necessary to provide the metrics their stakeholders need. The tutor discusses the use of subjective and objective metrics, principles of good test and experimental design, the environment to gather metrics (lab experiment, field study, tracking technologies), and reviews basic indicators of usability.

6 Implementation of Method to Determine Metrics

When implementing a usability test, experiment, or consultation, attendees are encouraged to measure iteratively (formative, interim, and summative evaluations), to be consistent when interacting with study participants, to gain and maintain participant support, and to incorporate solid research ethics.

7 Evaluation of Metrics and Methods

In evaluating their metrics, the attendees are encouraged to ask themselves: 1) Were my metrics appropriate? 2) Do I need additional metrics? 3) Do I need a different test, experiment, or consultation design? 4) If this project is part of an empirical study, should I report my findings? 5) How should I report my findings?

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