

Iteration in design processes

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Abstract

Ideally, specifications for all products should be based on a systematic analysis of what prospective users need to do, and how they can do it most effectively and efficiently. In practice, the design process is disturbed by many 'pragmatic' factors, such as conflicting constraints, interference from management, personnel changes in design teams and technological progress leading to new possibilities. Therefore, design is an iterative process. In this paper the design task of training simulator specification is used to illustrate the iterative nature of design processes. The results of two empirical studies show no clear relation between the amount of iteration and the quality of the resulting designs. Frequent iteration can be part of both an effective and an ineffective design style. In order to develop support for managing iteration during the design process it is necessary to understand in which circumstances iteration needs to occur, and how these circumstances can be predicted or recognised. For this purpose, a list of triggers for iteration is described. Finally, a number of measures to help designers to manage an iterative design process is proposed.

Introduction

Ideally, specifications for all products should be based on a systematic analysis of what prospective users need to do, and how they can do it most effectively and efficiently. During the specification process analysis, design and production can be performed in a sequential, cyclic or overlapping way. In practice, this process is disturbed by many 'pragmatic' factors, such as conflicting constraints, interference from management, personnel changes in design teams and technological progress leading to new possibilities. Reacting to these disturbances can make the process chaotic, but not reacting to them will certainly lead to solutions that do not fulfil the requirements or will not be accepted in the organisation. Therefore, design is an iterative process.

The designers of advanced products often tend to give much attention to technical aspects. This is understandable since advanced technology has to be carefully designed and constructed. The key question, however, is not what is technologically possible or most advanced, but what would be the optimal choice for future users. Thus, the challenge for designers is to design the best solution from a user's point of