

Performance Rather than Capability Problems. Insights from Assessments of Usability Engineering Processes

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Abstract. Improving the performance and effectiveness of usability engineering in software and product development in companies is perceived as a true challenge by many usability professionals. Findings from interviews and observations in eleven assessments of usability engineering processes indicate that usability engineering include typically problems such as poor impact of usability activities in product designs; limited skills and knowledge on usability among the designers and management; unawareness on various activities of usability engineering life-cycle; inappropriately used usability methods; even political games around usability. On the other hand, issues such as project and configuration management, and process performance measures are not the key problems of usability. It is concluded other kinds of methods but standard process assessment should be considered for revealing the problems of usability engineering. The problems identified in the assessment should be clearly communicated to the management, but for developers an assessment should aim for a constructive training occasion on usability.

1 Introduction

Usability has been recognized as one of the important quality characteristics of software systems and products. Usable systems are easy to learn, efficient to use, not error-prone, and satisfactory in use [1]. Usability brings many benefits such as "increased productivity, enhanced quality of work, improved user satisfaction, reductions in support and training costs and improved user satisfaction" [2].

Usability is defined in ISO 9241-11 [3] as follows: "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". This definition emphasizes how the usability of a product relates to its context of use. The definition is largely used in the HCI community. For example, it is used as a reference for usability in the Common Industry Format (CIF) for usability testing [4].

To guide the development of usable products and software systems, *usability engineering* approaches and methodologies have been proposed. The standard ISO 13407 [2] is a widely used general reference of usability engineering, and is an important reference also in this study. ISO 13407 identifies four principles of usability engineering: user involvement, iterative design, multi-disciplinary teamwork, and appropriate

allocation of functions between users and the system. The standard further identifies four main activities of usability engineering, illustrated in **Fig. 1**. These activities represent a general overview of a user-centered development process: analyzing users and the context of use, determining user-driven requirements, producing designs and evaluating the usability of the designs.

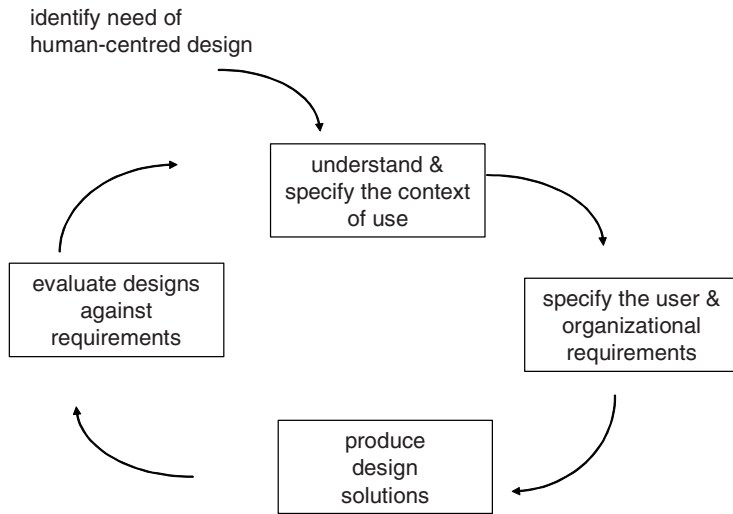


Fig. 1. The four usability engineering processes of ISO 13407

Many products or systems with usability problems reveal that the position of usability engineering is not effective in many organizations. Thus the improvement of the position of usability engineering has been widely recognized as a challenge in practice and in the literature: [5], [6], [7], [8], [9], and [10]. The integration of usability engineering and software engineering has also been a topic of a number of recent workshops, e.g. [11] and [12]. The problem has been persistent over the years. Even the recent issue of ACM Interactions – the ‘flagship’ magazine of the HCI community – addresses the topic [13].

A logical first step in the process of making organizational improvements is to carry out a current state analysis of the development practices of a company. Following the capability maturity model trend in software engineering, several *usability capability maturity (UCM)* models¹ have been presented from the early 1990s. The first UCM models are Trillium [14] by Bell Canada (a general assessment model including a specific part for usability engineering), Usability Leadership Maturity Model, UMML, [15] by IBM, HumanWare Process Assessment, HPA, [16] by Philips, and User Centred Design Maturity, UCDM, [17] by the Loughborough University. In the late 1990s, Usability Maturity Model: Processes, UMM-P, [18] – which follows the format of software process assessment (ISO 15504) – and Usability Maturity Model: Human-Centredness Scale; UMM-HCS [19] were developed in a Euro-

¹ Other terms, such as usability maturity model, UMM, are also used in literature.