



## **The improvement of human-centred processes—facing the challenge and reaping the benefit of ISO 13407**

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Human-centred design processes for interactive systems are defined in ISO 13407 and the associated ISO TR 18529. The publication of these standards represents a maturing of the discipline of user-centred design. The systems development community see that (at last) Human Factors has processes which can be managed and integrated with existing project processes. This internationally agreed set of human-centred design processes provides a definition of the capability that an organization must possess in order to implement user-centred design effectively. It can also be used to assess the extent to which a particular development project employs user-centred design. As such, it presents a challenge to the Human Factors community, and indeed a definition of good practice may even be regarded by some as an unwelcome constraint. This paper presents the background to the process-level definition of user-centred design and describes how it relates to current practice. The challenges, benefits and use of a defined human-centred design process are presented. The implications for Human Factors and other disciplines are discussed. In Appendices A–D, the process terminology and the contents of ISO 13407 and ISO TR 18529 are described in more detail, and three examples are given (in Appendix D) of using this process improvement approach to improve the actual design methods in three organizations.

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**KEYWORDS:** user-centred design; ISO 13407; human-centred design; ISO TR 18529; process improvement; process capability assessment.

### **1. Introduction**

This paper discusses the development of standards for user-centred design and the implications of their application. It is included in this special issue of IJHCS to show how far the infrastructure for a user-centred approach to system development has

progressed and to describe the impact on, and opportunities for, the Human Factors community. The paper discusses the outcomes and challenges of the process standard for user-centred design, ISO 13407:1999 *Human-centred design processes for interactive systems* and the associated ISO TR 18529:2000 *Human-centred lifecycle process descriptions*

Section 2 relates usability to project risk and introduces the purpose and vocabulary of process improvement. Section 3 introduces the two ISO documents that define the human-centred design and briefly presents the history of their development and their influence on other ISO process standards. Section 4 examines the difference between current practice in usability engineering and the human-centred design process defined in ISO 13407. Section 5 relates a process-level definition of human-centred design to user-centred design activities on a particular project. The benefits of, and rationale for, the emergence of process-level standard models of good practice in business and system development are discussed. Section 6 presents the challenges to the system development and Human Factors communities that result from ISO 13407. Section 7 presents the opportunities arising from ISO 13407. Finally, the implications for systems development, Human Factors and Human Computer Interaction (HCI), and applied research are reviewed.

In this paper, the term user-centred design is used to refer, in a general sense, to a design process that takes account of the users of a system. The term human-centred design is used to refer to the particular design process defined in ISO 13407 and ISO TR 18529.

## 2. Determinants of usability and their use in assurance

### 2.1. DETERMINANTS OF USABILITY

Taking a user-centred approach to design can reduce development times and rework for new versions, improve the productivity of users, and reduce training, documentation and support costs (Bevan, 2001a). ISO 9241-11 defines usability in terms of effectiveness, efficiency and satisfaction. ISO 9126-1 makes effectiveness, efficiency, safety and satisfaction (there called *quality in use*) the main goal of systems development. Attributes of the product such as understandability, learnability and operability contribute to usability. As usability becomes widely recognized as a requirement for products, purchasers and users increasingly need some guarantee that the claims for the usability of a product are valid.

Six approaches to the assurance of usability have been described by Daly-Jones, Bevan and Thomas (1997), Bevan, Claridge, Earthy and Kirakowski (1998), Earthy (1998a, b) and EUSC (1998). Bevan (2001b) describes the international standards that relate to each approach. From a practical point of view, each approach can have a role to play in providing assurance of the usability of a product or system. As such, the approaches may be seen as components of a managed assurance scheme. For any business a combination of components will be required to give the required degree of assurance that product quality targets as regards usability are valid and achievable. Table 1 summarizes each component, their purpose and makes comments on practical application.

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