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Embedded and embodied usability
Success factors for user-centred design in complex product development

Guido Stompff

Author bio

Guido Stompff bridges the world of design practice and design research. He is senior designer at Océ Technologies, part of the Canon Group. His study of design and innovation in-the-wild, resulted in him being awarded a PhD in 2012 for his thesis: Facilitating Team cognition. How designers mirror what teams do.

Introduction

In our digital and networked society, high tech systems offer increasing functionality while human abilities and skills to cope with complex tasks essentially remain the same. To empower users, the challenge is to design intelligent systems that offer a simple and enjoyable interaction. Unfortunately, developing systems is also becoming increasingly difficult, as systems are composed of a range of products, software applications and services. This study aims to distil success factors for enhancing user-centred design from the complex, distributed and multidisciplinary product development at Océ.

Research Method

In this project, development practitioners from Océ are joined by external researchers in an attempt to better understand their own practice. It is an inquiry into product development 'in-the-wild', blending theories and observations. Data included interviews with developers and stakeholders; a range of workshops with designers and developers; over 30 hours of filmed meetings; and participatory observations. Experiments were also conducted to validate the insights gained.

Findings

Multidisciplinary product development includes many experts with distinct knowledge and skills. It is often difficult for teams to integrate all the experts' activities seamlessly into a coherent whole, whereby the contribution of all team members impacts the usability and user experience of

products, either directly or indirectly. Thus, usability is not something that can be done separately from the activities of these experts; rather it is a result of collective efforts.

Success factors are:

Think 'prototypes'

No one can truly oversee beforehand what the impact is of the efforts of many developers working together on the eventual product. Only by means of building and testing integrated prototypes, can teams learn 'on-the-go' what the impact is of their choices on usability and what is possible.

Talk 'stories' and 'visuals'

Language is generic and thus an impoverished means for non-existing products. Requirements may be comprehensive, but provide no clue as to what the 'big picture' is. Therefore vivid and compelling representations of the intended system are required, for example stories and visualizations.

Experience 'the real thing'

The experience of interacting with tangible, real world objects enables teams to reconcile contesting aims. Seeing how something works, how it sounds or how it feels: these experiences are relatively the same for all. Actively deploying prototypes, models or demonstrators in meetings are highly beneficial for usability.

Seeing 'the user'

Usability testing or customer trials that involve team members are highly beneficial for the resulting usability of products. Those involved in these tests see how users struggle with the artefacts of their work. They observe how they can adapt their work to enhance usability, without even the need for discussion.

Innovation & benefits

This study's findings are extremely practical and suggest a paradigm shift for developing usable products. The study conceives usability as an integral part of development, engineering and design, rather than something separate. Usability is not the sole responsibility of designers or usability experts; it needs to be deeply embedded in the practice of product development.

Project specs

Team members

Guido Stompff (Océ/TUD), Fred de Jong (Océ) and Eddy van Vliembergen (Océ), Lilian Henze (P5 consultants), Pieter-Jan Stappers (TUD), Frido Smulders (TUD), Jan Buijs (TUD) and Jo Geraedts (Océ/TUD).

Duration

August 2009 – December 2010

Figure 1 : The product that served as the context for the research: the Océ VarioPrint DP line. It is launched end 2011.

Figure 2: A usability test in the wild: team members observe a usability test themselves.