DESIGN UNITED

Platform for Dutch Research in Design

Tools and methods for optimizing user involvement

REPAR

Resolving the Paradox of User-centred Design through Flexible Prototyping (REPAR)

About

The REPAR project aims to increase the effectiveness of industrial design processes through providing electronic prototyping tools and guidelines for the early stages of the design process. While exploiting the opportunities of modern technology, the tools should be easy-to-learn and easy-to-use, enabling designers to quickly create and modify so-called "experience prototypes". The guidelines should inform designers how to apply these tools in the design process to collect input and feedback from end users on early versions of concepts.

Background

Companies creating products which people use in everyday life and work need to organize the design process such that the outcome is tuned to the interests and needs of the users. Information from and about users is often available at early (research) and late (prototyping) stages of the design process, but not in between. It is generally believed that reflection on the potential value of premature concepts requires a level of abstraction that users cannot deal with due to a lack of appropriate concept representations. Tools for creating virtual prototypes and methods which enable designers and users to jointly conduct early concept exploration should fill this gap.

Questions

The REPAR project aims to develop a tool chain that enables designers to create a range of concept representations, suited for different stages of the design process. These representations range from dynamic, interactive sketch-like impressions to hi-fi representations based on Virtual and Augmented Reality.
The research focuses on three issues:
1) what requirements should such tools meet for designers to adopt them; 2) what is the added value of such tools in the design process; 3) how can the tools be applied best in different stages of the design process to elicit input and feedback from end users.

Results

Investigations of design practice showed that companies face challenges in three areas:

- Internal communication during the design process
- Involving users in the early stages of the design process
- Incorporating novel design tools and methods

Supporting design exploration was then added as a goal for the REPAR project.

Expected results:

- A suite of electronic tools for creating low-fi (sketch-like) representations for early concept exploration and development
- A suite of electronic tools for creating hi-fi (Virtual and Augmented Reality) for early concept exploration and development in context
- Guidelines for how and when to apply which tools in the design process.

Facts

Project duration: November 2009 to April 2013
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Partners

- Eindhoven University of Technology
- University of Twente
- Océ Technologies
- Daf Trucks
- Rademaker BV
- Philips Research
- TomTom
- Green Dino
- Rabobank
- Van Berlo
- GBO

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Case

The main challenge for the designer is to create concept representations which enable the user to predict how the product will affect his or her daily life and work - in short, whether it will create value. A study was conducted investigating how the nature of concept representations affects the feedback obtained from users. Animation (stills vs animation) did not influence the nature of the feedback, whereas fidelity did. Rough, sketch-like low-fi representations elicited elaborate feedback, which often included a reference to a personal experience providing evidence why the concept would have been valuable in a particular situation. A follow-up study with designers indicated that, in the early stages of the design, designers find such personal histories, conveying insights into the users' daily life experiences, most valuable. Our research shows that users provide valuable feedback most easily when they are provided with means to imagine concrete situations and contexts of use. Follow-up research will investigate the added value of exploring concepts in such (simulated) contexts, how the exploration should be shaped, and what requirements the representation of the context should meet in order to help users to provide valuable feedback.

Case: Concept lab