Supporting the creation of Mood Boards: Industrial Design in Mixed Reality

Andrés Lucero, Jean-Bernard Martens
Department of Industrial Design
Eindhoven University of Technology
P.O.Box 513, 5600 MB, Eindhoven, the Netherlands
{A.A.Lucero, J.B.O.S.Martens}@tue.nl

Abstract

Advancements in mixed-reality (MR) systems have concentrated on the technology required for implementation, providing proof-of-concepts by means of technology-tailored usage scenarios. These systems have been tested mainly on well-contained tasks and applications specifically developed for these platforms. The potential impact of such techniques on actual work practices hence remains largely unexplored. We plan to investigate this practical relevance in more detail for industrial designers. Specific activities have been identified during a full ethnographic study conducted by means of Cultural Probes and Workshops with representative participants. For one such activity, creating mood boards, a new MR interaction concept will be designed and evaluated. We will continue to use participatory design techniques to involve industrial designers at different stages of the design cycle.

1. Introduction

Advancements in mixed mixed-reality (MR) [6] systems in the last decade, of which our own Visual Interaction Platform (VIP) [1] is a representative example, have been inspired by a priori insights in technological opportunities and human perceptual and cognitive abilities. As far as available systems have been tested, it has been mainly on well-contained tasks and applications that have been specifically developed to illustrate the strengths of the systems concerned. The question of whether or not such systems can effectively complement current practices and tools in real-world situations remains largely unexplored.

For example, our own Electronic Paper (EP) [5] tabletop prototype uses MR techniques, such as optical tracking, two-handedness, tablets and transparency, to integrate traditional pen and paper with computer functionalities (such as for creating, handling, storing and retrieving images and sketches). With the experience gained in such projects, which is mostly on aspects such as technology and usability, we can focus on investigating how MR systems can better support professional users in their daily activities. Extensions to our prototypes with new functionalities need to be increasingly guided by end-user requirements.

Our work focuses on industrial designers for several reasons. First, since our lab is part of a department of industrial design, we have there many existing contacts with practicing designers. Second, designers rely on several different techniques to create and shape their ideas, including ways to depict, visualize and communicate their ideas, both to themselves and to others. Creating and manipulating visual objects in both 2D and 3D space is hence an important activity in industrial design. Third, due to the visual nature of many industrial design tasks, there is ample opportunity for supporting specific activities, provided that the tools created enhance rather than obstruct the design process. Existing bottlenecks in industrial design practices need to be identified and new (MR) solutions need to be compared to existing solutions with respect to efficiency, effectiveness and satisfaction.

2. Research

2.1. User Study

The primary goal of this user study was to identify important industrial design activities that could be better supported by MR interaction techniques. Based on ethnographic design research, we studied a small number of users in depth rather than a large number shallowly, obtaining a richer, deeper and textured understanding of user needs [3]. We recruited ten practicing industrial designers to ensure different viewpoints. The main research question was 'how would industrial designers use MR for their work?'

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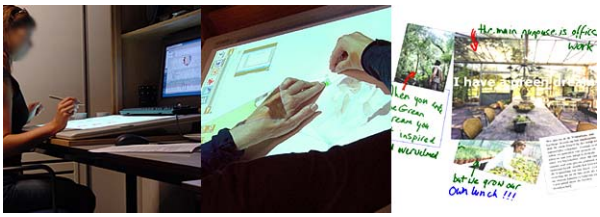

Figure 1. Participants creating mood boards on the VIP system during the Workshops. An example of a mood board created by one participant (right).

2.1.1. Cultural Probes. The first part of the study took place in the participants' design studios and looked into their activities and objects they use in the practice of industrial design. Cultural Probes [2] were used at this stage. The main advantages of this way to elicit requirements include collecting data from participants over a longer period of time (one week), allowing them to reflect and look back on what they are being asked.

2.1.2. Workshops. The second part of the study took place in the VIP lab through a series of Workshops. Participants were shown several videos of projects that present the latest advances of MR in different contexts. We wanted to trigger the imagination of the designers and start building a discussion on how these technologies could better support their work. Next, an MR prototype developed in the VIP lab was shown, i.e., the Electronic Paper with Visual Interaction Enriched Windows (VIEWs) [5]. This prototype was originally targeted at the early stages of architectural design, but is sufficiently general to also be of interest to industrial designers. After an interactive tutorial explaining the main aspects of the system, participants were asked to create a mood board (Figure 1). Finally, a brainstorming session took place where new ideas were discussed.

2.1.3. Preliminary findings. In the Cultural Probes study, participants mentioned mood boards as an important activity for their work. Mood boards are a commonly accepted design technique in most design processes [4]. Mood boards capture the atmosphere of experiences by means of photographs or other expressive aids [7]. In the Workshops, we look further into how industrial designers create these mood boards by asking them to create one using the EP prototype.

2.1.4. Discussion. Designers collect visual material they can later use in the design process for reference and inspiration. While Cabinet [4] is an MR tool to collect and organize visual material, the EP prototype [5] is most suitable for manipulating and creating images and sketches. Combining the functionalities within these two tabletop prototypes would not only support the collection and organization of visual material, but also the creation of mood boards.

Instead of forcing the transition of an existing computer tool from the vertical screen (computer) onto the horizontal workspace (tabletop), we chose an activity (creation of mood boards) that is now naturally performed on the horizontal workspace with physical media, in order to explore how this natural feeling can be kept (and hopefully expanded) with the use of MR interaction techniques.

3. Conclusion

An important first step towards designing an MR interaction concept that supports the work of industrial designers has been taken. Instead of looking for a technology-tailored usage scenario that would fit an MR application, we have used user-centered design techniques to ask designers how these systems can better support the work in their design studios. We have identified an important task, the creation of mood boards, to focus our future work on. Once we complete the workshops, we will proceed to design, implement and evaluate the new MR interaction concept. For successive design cycles, we will carefully look into the lessons learnt before deciding if we continue along the mood board idea, or maybe focus our attention on other important activities for industrial designers.

4. References

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