Chapter 25
Co–Designing Novel Interior Design Services that Utilise Augmented Reality:
A Case Study

Tiina Kymäläinen
VTT Technical Research Centre of Finland – Tampere, Finland

Sanni Siltanen
VTT Technical Research Centre of Finland – Espoo, Finland

ABSTRACT

In this chapter, the authors describe a co-design process and the implementation requirements of an interactive interior design service system. To gain design information for the system, they study two focus groups composed of designers, bloggers, and serious amateurs in the field of interior design – the estimated critical users of the forthcoming service system. The framework for the co-design study is twofold. The design aim is to study users’ innovation capability in the early phase of a complex process by utilising co-sketching as a means of obtaining a user model of the interactive system. The technological aim is to create interior design concepts that exploit Augmented Reality (AR), 3D models, and user-generated content within the system framework. This chapter reports the design process and results of the co-design sessions; furthermore, it presents requirements for the system, use cases utilising AR technology, plus consideration and evaluation of the AR functionalities.

INTRODUCTION

The case study was part of research that aimed at studying the use of new technologies and applications – social media services, augmented reality (AR) features and location awareness – in the field of advertising, and find new revenue models for media. This chapter presents a case study which aimed at understanding the needs and requirements of the design service providers. Research was carried out by co-designing interactive user-centred interior design system concepts.
that utilised AR features. Co-design focus group sessions were arranged with interior designers and design bloggers – the anticipated critical users of the interior design system.

The participants of the study had taken part in a preliminary online survey, and were therefore all familiar with the background of the system concept. Participants received further information relating to the concept in the focus group sessions, first viewing scenarios that described possible ways of comprising interior 3D and AR services. Participants were then presented with some information from the preliminary online survey, including the key elements and materials thought by most respondents to be critical for the service. This was followed by a short presentation by the facilitators of the AR technology and existing AR applications.

In the co-design phase, the focus group participants co-sketch the system concepts. Sketching proved to be a practical method in this context, as the participants were able to produce dissectible results. Participants provided valuable design information during the discussions – in the form of use cases – concerning the promising ways of utilising AR technology in the service concept.

**KEY TECHNOLOGY: AUGMENTED REALITY**

Augmented reality is defined as an interactive real-time system that combines real and virtual elements in 3D (Azuma, et al., 2001). Virtual reality (VR) consists only of virtual elements. Diminished reality is a system where objects are removed from the real environment, and mediated reality refers to a system where real environment is altered virtually (Mann, 2002). Mixed reality (MR) is a concept that covers all possible combinations of real and virtual elements, from reality to total virtuality (Milgram, Takemura, Utsumi & Kishino, 1994). From the user’s point of view, the functionalities of a system are more important than the technology categorisation. “The basis in all the discussions was an AR system in which real images are augmented with

*Figure 1. With a mobile AR application the user can see virtual designs in the real environment*