Chapter 6

PARTICIPATORY DESIGN MEETS MIXED REALITY DESIGN MODELS

Implementation Based on a Formal Instrumentation of an Informal Design Approach

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Abstract

Participatory design and model-based approaches are two major HCI design approaches. Traditionally opposed, the first ones promote user’s creativity while the second ones support a more systematic approach of the design space. In Mixed Reality domain, combining these two aspects is especially crucial in order to support the design and to help the users to take into account the wide variety of emerging technologies. We introduce in this paper a solution to bring these two approaches together. In addition, we illustrate how the outcomes of this combination of formal and informal approaches serve as input for the implementation of the designed solution

Keywords:

Design method, Focus group, Mixed reality, Software modeling, User interface modeling

1. INTRODUCTION

As illustrated in [4], the term Mixed System has been defined to denote every kind of interactive systems that combine physical and digital worlds: Tangible User Interface (TUI), Augmented Reality, Mixed Reality, etc.
Initially confined to specific applications domains such as military, surgery and maintenance, more and more areas try to adopt this interaction mode: games, museum, education, tourism, etc. In order to face this rapid expansion, prototype based development approaches are no longer sufficient and there is a crucial need to define design processes.

Traditionally, two forms of design approaches can be met in the field of interactive systems. The first one focuses on human-centered approaches and aims at understanding user’s needs in a comprehensive way. The second one is more formal: it aims at structuring the design space and generating conceptual models in order to facilitate the transition between the requirements analysis phase and the development phase. It mainly relates to software engineering considerations.

Most of the time, these two approaches are used in a concurrent manner, by experts of different domains. In this paper we present an articulation of an informal design method, the focus-group, with a formal design model for mixed systems, the ASUR model. We show how the formal representation tool can be used as a resource for guiding the management of the Focus-Group, and how the outcome is directly reusable and beneficial in further steps of a development process. Before motivating the need for participatory design and modeling to connect rather than to compete, we introduce existing design approaches of both domains.

1.1 Participatory Design Approaches

Participatory Design approach is a particular form of the more generic Human-Centered Design process. The main originality of Participatory Design is that it relies on an iterative approach. In addition, it relies on methods that involve the participation of users and are only a subset of the usability methods supporting Human-Centered Design [11]. Concretely, a splitting of the Participatory Design process into four steps, as described in [15], has been adopted and each of these steps is instrumented with several methods: 1) “user’s observations” in situ with probes or in vitro within labs, 2) “ideas generations” with brainstorming or focus group, 3) “prototyping” with paper, video or mock-ups, and 4) “Evaluation” with user’s test or speak aloud.

In comparison with other kinds of human-centered design approaches, Participatory Design specificity is the systematic use of creativity methods involving the active participation of users to generate ideas. The purpose is to identify interactive solutions for specific needs. Creativity methods are considered as informal or projective techniques for revealing in concrete terms the shapes of future systems wished by users. In other terms, these methods have a strong revealing power and constitute a way to generate useful and usable shapes of prototypes, good candidates to resolve