

---

# Design for Extreme Settings: Becoming the User

**Tom Bartindale**

Culture Lab  
School of Computing Science  
Newcastle University  
Newcastle Upon Tyne  
NE1 7RU, UK  
tom@bartindale.com

**Abstract**

When replicated in a prototyping environment, many of the factors that comprise the essence of collaborative interaction scenarios are lost. These lost factors can be classed as extreme, in that by their very nature they only appear in the true setting. In order to better design for these settings we can temporarily become the user. By configuring the design process to ensure a direct experience for the designer, it can become not just contextual but autobiographical. In doing this the designer becomes intimately involved in the context of use and assumes a personal stake. By letting the interaction designer integrate into the environment these elusive extreme factors are revealed, observed and can be factored into the design. We present a case study of design in an extreme setting in which our designer became a user in the scenario and discuss how personal designer experience influences the outcome.

**Keywords**

Collaborative interface design, extreme settings, live scenarios, autobiographical design

**ACM Classification Keywords**

H5.m. Information interfaces and presentation

---

Copyright is held by the author/owner(s).

*CHI 2011*, May 7–12, 2011, Vancouver, BC, Canada.

ACM 978-1-4503-0268-5/11/05.



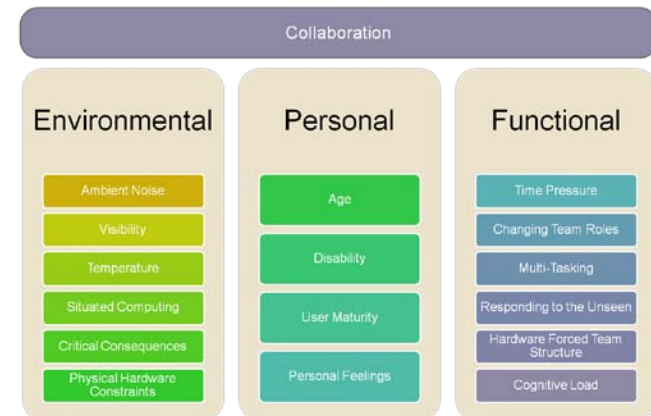
**Figure 1** Live events - an extreme design setting.

## Introduction

A typical initial element of a design process is to develop a set of requirements based on an understanding the user. Preece et al [2] explains how users can be understood and modelled and the role that experts can play in gathering and interpreting information gathered social and collaborative aspects of the design. Although structured observation and description allows in-depth analysis of a situation, we can only design aspects that can be articulated effectively by the methods employed. The distinction between the designer and user, that they are separate and distinct actors, is assumed to be the only effective way to construct objective accounts of the situation at hand. However, such a configuration is limited to factors of a situation that can be observed directly or articulated by traditional analysis (and thus understood by the designer).

## The Extreme

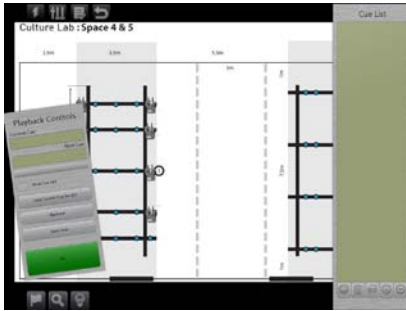
A recent survey by Hussain et al. shows that the most frequently used development methods for HCI researchers are “low-fidelity prototyping, conceptual designs, observational studies of users, usability expert evaluations and field studies” [1]. Some features of a domain, by their nature, cannot be replicated during prototyping or re-created in a lab environment and these often subtle factors can be classed as extreme as they fall outside of the relative normality of most design spaces. Such factors are not as uncommon as they might first appear, and many design contexts contain these elements which can loosely be categorized into three classes: environmental, personal and functional (see Figure 2).



**Figure 2** Common categories of extreme factors.

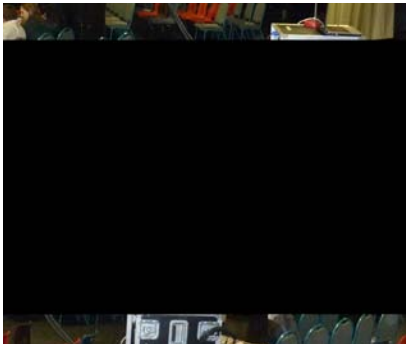
A traditional solution for designing within scenarios would involve an iterative process, in which each iteration is implemented offline, and subsequently tested within the live setting. Observations would be taken during each testing session, and these used in the design and development of the next prototype. Consequently, only the resulting effect of the new system is observed, in essence acting as a black box development process. Such approaches may not highlight key design constraints which needed to be included in the design as the designer is only empathising rather than participating in the interaction. Our proposal is that by embedding the designer in the design space for these scenarios, the designer can experience these extreme factors firsthand, as they occur.

## Becoming a User



**Figure 3** Screenshot of Surface lighting interface.

We are taught as designers that we should empathise with our users and not design for ourselves, Visser et al. shows us this in practice by incorporating empathy, inspiration and engagement into a method for understanding the user [3]. By becoming a user, we not only contextually understand our target, but embody their activity. We retain a stake in the success of any designs that we create, and nuances of design that would have been overlooked otherwise can be appreciated. Intimately involving ourselves in a team also encourages respect from other members of the group, and often results in anecdotal evidence that leads to a deeper understanding of key problems. Similarly to participatory design, members of the team then gain an element of ownership over the final result, and are more likely to continue using it.



**Figure 4** Surface lighting on location.

### In the Spotlight

Imagine attending a theatre production in your local venue. The stage is often lit with literally hundreds of different lighting effects, smoke, projectors and even moving elements of set. All of these elements need to be designed, rigged, focused and programmed into a complicated and rich sequence of events which fit with the timing and mood of the event and triggered live to match visual and auditory features [Figure 1]. This entire process is carried out by a team of people varied in skills and experience: The lighting director has a vision of how it should look and feel; technicians know the technology and operators have skills in sequencing and controlling the scene as a whole.

In addition to the social complexity, the environment incorporates a number of extreme factors which could not be replicated appropriately within a traditional prototyping setting, for example:

- During an event, lighting is low and volume is often loud making visual and verbal communication between team members difficult.
- Any hardware needs to be robust and quick to set up and maintain, as riggers move rapidly between venues and have little set-up time.
- Operations on the interface are time and consequence critical, as they affect real world factors during an event.

### Bridging the Gap

Our design goal was to create a collaborative tool which would bridge the communication gap between conceptually minded lighting designers and technically minded riggers and operators, whilst still being effective given the extreme factors. This gap was articulated by the designer/user whilst embedded within the team, and was not considered previously as efforts had been centred on how technicians and operators work. Although we hoped to increase the quality of the team's output, our primary aim was to inform the team about their working practices and encourage communication.

We chose to embed ourselves within a local amateur theatre group, with which we had prior contact. A member of the design team was allowed to assume a role within the lighting team for a number of events prior to designing the interface. During this time we implemented the basic functionality of a lighting system. Although seemingly counter-intuitive, implementing basic functionality before entering the live workplace was an important consideration, as in a live scenario, the equipment still needs to fulfil a role that to some extent works. A specific event was then chosen in which to deploy the interface. During this

week long event, the system replaced the team's older control desk. Each day, we implemented changes to the software, changing the system to accommodate for unforeseen factors. The resulting system consisted of a simple lighting desk in software on a Microsoft Surface, in part due to its small form factor and high visibility and ability for users to view the global state of the system easily. This was connected to the lighting rig of the theatre via DMX. The resulting interface can be seen in Figures 3 and 4.

### To Think About

Extreme scenarios are an area of design where the designer would benefit from becoming part of the user team (in a collaborative setting) in order to discover and articulate factors which would have otherwise been obscured. However, such an approach of design brings to the fore a number of questions:

- When integrating into a team, do we need to be skilled in that specific task in order to understand design subtleties and fully empathize with the other users?
- By becoming part of a specific process is there a risk of fixating on addressing the specific and immediate problems that we encounter – and is this detrimental to the overall goals of the design?
- Can we usefully transfer design ideas from one extreme scenario to others (and thereby inform a wider design space)?

### Another Angle

The scenario we present here centres on a group of professional event technicians and designers, who have prior experience and skill in performing their tasks. If we were to design an interface a similar context, but



Figure 5 Public lighting control in action at a live event

intended for members of the public, would embedding a designer as a user make any sense? The designer would have to become a member of the public with no prior experience of the domain, and yet design for it in a knowledgeable way.

### References

1. Hussain, Z., Slany, W., and Holzinger, A. Current State of Agile User-Centered Design: A Survey. *HCI and Usability for e-Inclusion*, (2009), 416–427.
2. Preece, J., Rogers, Y., and Sharp, H. *Interaction design: beyond human-computer interaction*. John Wiley, 2002.
3. Sleeswijk Visser, F., Lugt, R. van der, and Stappers, P.J. Sharing User Experiences in the Product Innovation Process: Participatory Design Needs Participatory Communication. *Creativity and Innovation Management* 16, 1 (2007), 35-45.