

Extreme Prototyping: discount design for the experimental system artisan

Jennifer G. Sheridan and Alan Dix
Lancaster University
Computing Department
sheridaj@comp.lancs.ac.uk, alan@hcibook.com

Rapid prototyping in HCI [3, 5] is an experimental tool used in the very early stages of prototyping to initially test users with an interface before any serious time, money or people power has been resourced. Rapid prototyping allows user interface designers and usability engineers to observe system behaviours at a very early stage of system creation so that they may uncover problems in the system design.

Rapid prototyping focuses on efficiency -- on mapping certain tasks to functionality to create the most effective interface between human and computer. HCI methods and tools used to uncover these problems include GOMS, task analysis and style guides [7] among others. However, increasingly we are seeing *experimental systems artisans* pairing computing with the arts [4, 6] and focusing on experience design [11] and on non task-based uses of technologies [2]. In many of these cases, classical HCI design and analysis tools and methodologies are inefficient.

In this paper, we describe *extreme prototyping*, a design methodology for extremely rapid prototyping. Whilst we suppose that extreme prototyping can be extended to design any system, in this paper we focus on using our methodology to design experimental systems.

Experimental systems artisans borrow design methodology from both the arts and science [12]. The arts and sciences differ in their approach and attitude toward the production, value, impact, distribution, and originality not only of work but also of the practitioner and marketplace. These divergent approaches frequently result in tensions among those collaborating on a design, often hindering or slowing the progression of innovative practice in arts and science collaborations. However, rather than attempting to ignore these possible conflicts, extreme prototyping deliberately places these tensions at the centre and at the beginning of the design process.

Our paper describes how extreme prototyping begins with the bringing together of people with contrasting backgrounds from both the arts and the sciences. These contrasting groups are split into design teams of 4 to 6 people and are then given a predetermined and abstract design challenge. Teams are given some kind of incentive, like an award, and told that activity must result in a physical prototype. Finally, teams must work to a tight deadline, usually only one day.

Our results show that extreme prototyping is an enormously valuable HCI design method. We discovered that entire systems can be discussed, designed, developed, tested and presented over the course of one day. The quality of these systems is staggering; several designs are currently used in gallery exhibitions and as mobile interactive installations.

Another positive aspect of extreme prototyping is that it is a “discount” design methodology because of its tight deadline. Teams always develop systems using recycled materials and code in order to maximize their development time. As well, a short development time also requires that teams combine disparate domain knowledge, such as skills and language, in an efficient and timely manner.

To illustrate extreme prototyping in practice, we describe several extreme prototyping activities in which we brought together select and intimate groups of creative thinkers in computing, engineering, design and the arts for explorative activity and scientific inquiry. Art-Cels [1], Scrapheap (Computing) Challenge [10], several out-of-lab experiences [9], and No One Opens Attachments Anymore [8] differed in theme and motivation yet were the same in terms of collaboration and production. We show how teams managed each other and their workload in the allotted timeframe as well as the results of each activity. We conclude with lessons learned and future work.

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1. Art-Cels. [online], Available: <<http://www.art-cels.com>> [Accessed: September 29, 2004].
2. Sheridan, J.G., Dix, A., Bayliss, A., Lock, S. [2004], Understanding Interaction in Ubiquitous Guerrilla Performances in Playful Arenas. In *Proceedings of the 18th British HCI Group Annual Conference, Designing for Life*, Springer.
3. Beaudouin-Lafon M. and Mackay, M. [2003], Prototyping tools and techniques. In Jacko, J.A. and Sears, A (eds.), *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications*, Lawrence Erlbaum Associates, Inc.
4. Candy, L and Edmonds, E. A. [2002], *Explorations in Art and Technology*, Springer-Verlag.
5. Dix, A., Finlay, J., Abowd, G., and Beale, R. [1998], *Human-Computer Interaction* (3rd ed.), Prentice Hall.
6. Fishwick, P. [2003], Nurturing Next-Generation Computer Scientists, *IEEE Computer Society Press*, 36(12), pp. 132-134.
7. Neilson, J. [1994], Guerrilla HCI: Using Discount Usability Engineering to Penetrate the Intimidation Barrier, [online] Available: <http://www.useit.com/papers/guerrilla_hci.html> [Accessed: September 29, 2004].

8. No One Opens Attachments Anymore. [online], Available: <<http://www.folly.co.uk/projects/nooattachments/>> [Accessed: September 29, 2004].
9. ..thePooch:. [online], Available: <<http://www.thepooch.com>> [Accessed: September 29, 2004].
10. Scrapheap Challenge. [online], Available: <<http://polo.lancs.ac.uk/scrapheap/>> [Accessed: September 29, 2004].
11. Shedroff, N. [2001], *Experience Design 1*, New Riders Publishing.
12. Wilson, S. [2003], *Information Arts: Intersections of Art, Science and Technology*, MIT Press.