

Considering the Evaluation and Design of (Public) Situated Displays: Enabling Users to Choose Amongst
Different Design Alternatives In-situ
Keith Cheverst, Antonio Krüger, Jörg Müller and Nick Taylor

1. Introduction

In this position paper we explore some of the issues surrounding the evaluation of public situated displays. We discuss how and more importantly what we hope to achieve through our evaluation of such systems. Sometimes we may wish to evaluate against some kind of performance metric, however, often the evaluation goal is less tractable, e.g. how a public display system may support notions of community or how information flows in an organisation can be distributed. Furthermore, our ‘evaluation’ of public situated displays involves obtaining feedback from the user which may then be used in participatory design workshops. However, the number of participants of such workshops is typically limited and other approaches for supporting participatory design may be necessary. In this paper we propose an approach that we feel may help encourage users who encounter and use one of our public displays to reflect more on the design possibilities that may be available and, we hypothesise, be more likely to provide explicit feedback. The main idea of this approach is to allow users to choose amongst different design alternatives in-situ, thus enabling them to explore the design space by themselves.

The paper is structured as follows. In section 2, we describe two situated display systems that the authors have developed (and started to evaluate) which have directly motivated and informed the discussions in this paper. In section 3 we discuss our intended approach for encouraging user feedback and reflection upon design possibilities.

2. Example Public Situated Display Systems.

We explore some of the issues surrounding the evaluation of public situated displays and we do so by drawing upon our experiences of evaluating a number of deployed situated display based systems. Examples include the iDisplay system (Muller, 2007) and the Wray Village Photo Display (Taylor,2007).

The Munster Situated Display System (see figure 1) has been developed to provide information to faculty members and students of the Geoscience Department at Münster University. The current installation consists of seven displays of varying sizes, of which two are visible in the figure below (top left and bottom right). The iDisplay system has gone through a couple of prototype stages and consists currently of two different display types. The “news-board” version provides a good overview on new information and is designed to accommodate short viewing times (3-10 seconds). In contrast, the “reminder-boards” provide more detailed and personalised information. The current design choices are the result of a contextual inquiry, user observations and various interviews.



Figure 1. The Munster iDisplay System.

The Wray Photo Display (see figure 2) has been deployed as a technology probe (Hutchinson, 2003) with the goal of increasing our understanding of how digital displays can help support communities. Using a simple photo gallery application, deployed in a central social point in a small rural village and displaying user-generated photos and videos, we have been able to gain an understanding of this setting, field test our device and inspire new ideas directly from members of the community. One of the more novel ways in which we obtain feedback from those that use the system is through the use of a comments book, essentially an A4 pad, placed next to the photo display. The current design is the result of comments in the comments book, user observations, usage log analysis, semi-structured interviews and design workshops.



Figure 2. The Wray Village Photo Display (comments book can be seen to the right of the display) and comments book.

With both the Wray and iDisplay deployments we are not so much evaluating against specific performance criteria or even overall usability, but rather we are trying to gain an insight into how useful the systems are in terms of support notions of community (the primary aim of the Wray Photo Display) and supporting enhanced information flows (the primary aim of the iDisplay system). Furthermore, given our goals we chose to evaluate in the field rather than the lab (an interesting discussion on this issue is made in (Kjeldskov, 2004). While lab based studies can certainly uncover certain usability problems, clearly such an approach is less suitable for uncovering more social issues that may arise from these socio-technical deployments, e.g. only by observing usage did Brignull *et al* (Brignull, 2003) undercover the ‘social embarrassment’ phenomenon that can arise when users interact with a display in a publicly visible way. We are also keen advocates of longer term deployments and evaluations. We argue that the long term use of novel technologies, especially their collaborative and community effects, cannot be deeply understood through short-term experiments or ‘toy’ installations. This development and deployment enables longitudinal studies as well as being a technology demonstrator for dissemination and inspiration.

3. Encouraging user feedback and reflection upon design possibilities

In this section we describe one idea that we have had for encouraging users to provide feedback on the deployed system *in-situ*. The basic idea is to deploy a system with a small number of implemented design choices – for example, the Wray Photo Display could offer the user two example UI layouts and users would then be invited to vote for their favourite design as well as to suggest any possible improvements etc. Our hypothesis is that the comments provided from the users shown and asked to reflect on the multiple choices will be richer than those only shown one design instantiation. There are a couple of issues that have to be addressed in relation to the in-situ design choice:

How many design choices should be offered? The number of offered design choices could range from two alternatives to several different designs, from which the user could choose. This depends on information that is a-priori available, for example from contextual interviews, first prototypes or literature studies.

On which granularity should users modify the design choice? Although it might be good to restrict the design choices to only a few instances, in later stages of the deployment it could be possible to enable users to not only choose between discreet design alternative but to be able to alter more continuous parameters of the design, such as individual colours or placements of control widgets. This could be combined with a choice between different functional units of the PD.

How could users be enable to change the design in-situ? This addresses a very practical problem. Of course the answer to this question is related to the question of the amount and granularity of design alternatives. For a couple of choices it might be sufficient to place two buttons in the vicinity of the display. If several design choices are available or users are empowered to continuously modify the design parameters of the displays, this will be no trivial task.

How to make the exploration process as transparent as possible? Again this issue is closely related to the question of the physical and logical controls that enable users to modify or choose the design. For a couple of discreet alternatives, a poster explaining the different design alternatives might be sufficient. However, a more complex design space would require an explanation of the different dimensions involved in the design space. While providing these explanations, designers must, of course, keep in mind that in most settings the users will be laymen and might have had little access to computing technology in the past.

How to evaluate the effects of the individual design choices? Finally, an important question is how to evaluate the results of the individual design choices. One source of information is the log files of the user interaction. Additionally, voting mechanisms could be implemented that allow users to cast votes for different design alternatives. Another simple method would be to compare the overall times different designs have been selected.

References

- Brignull, H. and Rogers, Y. (2003) Enticing People to Interact with Large Public Displays in Public Spaces, in *Proc. of INTERACT'03*, Zurich, pp. 17-24.
- Hutchinson, H., Mackay, W., Westerlund, B., Bederson, B. B., Druin, A., Plaisant, C., Beaudouin-Lafon, M., Conversy, S., Evans, H., Hansen, H., Roussel, N., and Eiderbäck, B. (2003) Technology probes: inspiring design for and with families. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Ft. Lauderdale, Florida, USA, April 05 - 10, 2003). CHI '03. ACM Press, New York, NY, 17-24.
- Kjeldskov J., Skov M. B., Als B. S. and Hoegh R. T. (2004) *Is it Worth the Hassle? Exploring the Added Value of Evaluating the Usability of Context-Aware Mobile Systems in the Field*. Proceedings of the 6th International Mobile HCI 2004 conference, Glasgow, Scotland. LNCS, Berlin, Springer-Verlag, pp. 61-73
- Müller,J., Paczkowski,O., Krüger, A. (2007) Situated Public News & Reminder Displays, Proc of AMI 2007, Springer.
- Taylor, N., Cheverst, K., Fitton, D., Race, N., Rouncefield, M. and Graham, C.(2007) Probing Communities: Study of a Village Photo Display, to appear in Proc of OzCHI '07. ACM DL

ACKNOWLEDGMENTS

This work is funded by the EPSRC funded CASIDE project (grant ref: EP/C005589).