

Mixers

a participatory approach to design prototyping

by Ramia Mazé¹ and Monica Bueno²

In this design exhibit, we describe methods we have used to design a noticeboard interface for an older community in London. Three low-fidelity methods of prototyping interaction provided shared and accessible means for us and our end users to communicate design ideas, explore qualities of the user experience, and evaluate them within situations of use. This approach facilitated the development of an appropriate, innovative and feasible solution for a unique context.

Keywords: design methodology, prototypes, experience design, participatory design, tangible interface

Mixers is a design project for enhancing communications within a community of older people in London. The University of the Third Age (U3A) is a volunteer-run learning organization for people between the ages of 60 and 90. We worked with them to reconsider their physical and information environment as they moved to a new headquarters within London.

Existing means for finding out about events, changes, and news at the University involved notes printed on bits of paper, which were difficult to read, filter through, and remember. They expressed an explicit wish for a better notice system.

We designed a tangible interface to an audio noticeboard, to support students at the University in accessing recorded announcements. It has three components: lights which indicated relevant messages, a tactile bar for tuning among them, and a hand-held earphone. The system is accessed by slotting the student ID card into the interface.

We produced a working electronic prototype of the interface. This was projected to be one of several embedded in coffee tables in the atrium space, where students enter the building and gather to chat in between classes.

The design solution was evolved through a series of site visits and participatory workshops. Users at the University of the Third Age are 'experts' on their needs and values as older people, as the volunteers who would be interacting with the system on a daily basis, and on what would work within their community. Considering them as 'design partners', we engaged them at many levels throughout the project.

We used various methods for developing our interaction design from concept to user interface, three of which will be described



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here. In our design process, prototypes provided means of imagining new kinds of information experiences, of evaluating interaction alternatives through trying them out, and for refining qualities of the user interface. Above all, they provided an accessible and reciprocal means for users to participate in evolving the design.

Participatory Prototyping

Prototypes are a common means for testing and problem-solving during product development. Inspired by participatory design, experience design, and critical design methods, we used prototypes as a means of generating ideas, communicating interaction alternatives, and trying out product experiences. To these ends, we used three prototyping methods: video scenarios, interaction props, and working mock-ups.

These prototypes were participatory in the sense that we used them to open our design process to user input as much, and at as many levels, as possible. At the project level, users engagement with prototypes gave us insight into their values, community culture, and contexts of use. At the level of design, users applied themselves – hands-on and in real-life situations – in trying out and generating design concepts. At the interaction level, users engaged first-hand in evaluating and reflecting on interface possibilities.

Interaction In Action

Prototyping activity took place in our studio, at external workshops with end users, and on location at the U3A. For working ‘in the field’ and collaboratively with users, we used low-fidelity prototypes to provide a familiar and accessible means for users to enter creatively into the design space with us. For example, at video scenario work-shop in a user’s home, prototyping means consisted of starter scenarios on a VHS tape, cardboard interaction props, and a camcorder. These provided ample inspiration, material for testing interactions, and means for reiterating scenarios of use.

The general rule of thumb throughout was: “Show me what you mean.” Beyond merely discussing ideas, prototypes were used to experience them through role-playing and trying out simple representations. In this way, we explored, evaluated, and even experienced interaction concepts with users on site and in real situations.



methods in practice

In our design process for Mixers, we identified three prototyping methods which furthered valuable development of the interaction design together with users:

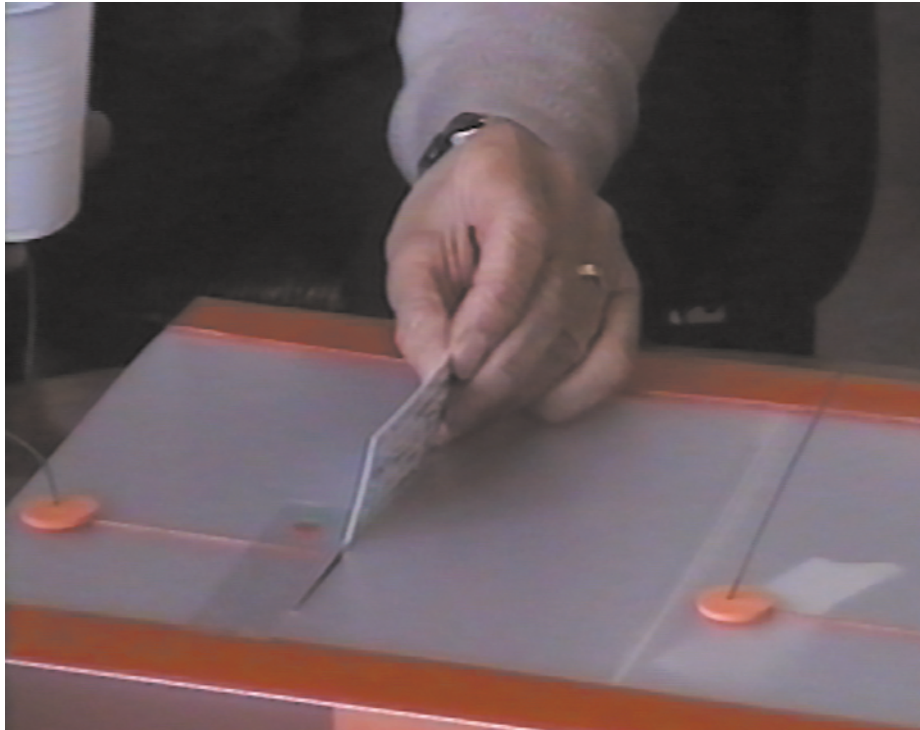
- **Video Scenarios** as a means of projecting possible user experiences.
- **Interaction props** for communicating and experiencing interaction options.
- **Working mock-ups** for refining qualities of the interaction design.

Video Scenarios

While considering the informational needs that the product would support, we were also concerned with situating it within a wider understanding of user experience. Together with end-users, we explored possibilities for everyday rituals of accessing notices and potential roles for

the noticeboard in the life of the University. Would it become a kind of library, where users would linger and immerse themselves in researching all kinds of topics? Could it be a means for finding out in on what friends in other classes were up to? We used video scenarios to involve users in ‘trying on’ different experiences.





Initially, we improvised interaction concepts internally, involving colleagues in acting out situations which we videotaped. We then took these scenarios to an off-site workshop, where they set the stage for discussion and role-playing with users. Using stop-motion and other techniques, video scenarios enabled us to simulate interactive functions, interact in social and public situations, and test various types of noticeboard content. Improvisation itself revealed unexpected roles for the system, such as communal messages as an excuse for starting a conversation with a stranger. Facilitating direct experience and immediate reflection, video scenarios provided a means for users to evaluate ideas by acting them out.

Video scenarios were a means of evolving interaction concepts with users in real situations, a kind of experiential sketching. We didn't hold back from acting out provocative concepts or edit out accidents and unexpected situations arising from improvisation. By exposing the entire design space to users, we discovered unexpected opportunities. For instance, in one sketch, a personal message was accidentally overhead by someone else. Rather than discounting it as a privacy problem, our users were intrigued by the

possibility of audio overlap as a means of learning about other classes and sparking face-to-face encounters. This finding, among others, was reflected in the final design as physical proximity between two interfaces embedded in a coffee table and the design of the audio speaker for personal - and potentially shared - use.

Interaction Props

Collaboratively with users, we explored possibilities for structuring, representing, and accessing information. Would users want to save, browse, edit, or share notices? What made more sense, organizing information by time, topic, or relevance? Should the system offer information or do users want to seek it out? In moving from interaction concepts to the user interface, we used a series of simple physical sketches to role-play alternatives for information organization and product functionality. Interaction 'props' became a sort of lingua franca for communicating, structuring, and evaluating interaction schemes together.

Made of craft materials and fashioned in a modular fashion, the props were immediately understandable as sketches. Users felt free to take them apart and reconfigure them as a means of explaining

things in a way that made sense to them. In role-play scenarios, we tried out and refined combinations of props for activities such as seeking a topic, panning through messages, replaying an item, and sharing notices. User reactions ranged from "I really wouldn't ever skim through a single message, only among several messages," to pure delight when simple actions worked. Collaboratively, we were discovering the value of simple, direct, tangible interaction for our users and the public context that we were designing for.

Assemblages of interaction props, sequenced in scenarios, provided an increasingly clear picture of the most favorable interaction scheme from the users' point of view, as well as gaining insight into the look and feel of the experience. From these, we developed a further cardboard prototype, which we installed for a day at the University. We observed how formal qualities of the product fit within the physical space, surveyed general public reactions to the legibility of the interface, and listened to how people explained the projected functionality to each other. We took our findings forward in developing the scale and formal aesthetics of the product and the look and feel of the product for the particular site.

Working Mock-ups

At this point we had a collaboratively designed physical model and scenarios conveying interactive functions. It was time for us to transition to crafting the physical form and developing the working electronics for the product. We continued to engage our user group in trying out finely-grained variables in the experience, such as behavior of lights in the interface, tangible and auditory feedback, and cues for guiding users from one action to the next. We used 'soft' mock-ups for testing and refining these with users.

Inspired by the useful modularity of interaction props, we crafted soft mock-ups with transplantable elements made of malleable plastic and foam materials. Easily slotted into variable physical

mock-ups, electronic elements consisted of sensors, actuators, and a barcode reader, coordinated using Basic Stamp and Macromedia Director. Through physically reconfiguring the interface and making simple modifications to the programming, we were able to isolate and fine-tune variables of the experience for internal testing and with users.

The evolved interaction design to date consisted of a simple set of easily-learned, satisfying, and essential interactions with information. For such a tightly coordinated user experience, success depended on careful and coherent integration of visual, interactive, and tangible qualities at each point of a user's interaction with the product. The simple user action of inserting the ID card to retrieve messages involved the choreography of design factors such as graphical indicators on the card, subtle tactile feedback on insertion, and clear response of light indicators on the interface. Flexible, working mock-ups enabled us to respond to user feedback and quickly iterate product qualities, toward developing a seamless and satisfying junction between the look and the feel of the product experience.

Conclusions

In Mixers, design prototypes were essential to our development of an interaction design solution for a particular user group, public context of use, and site at the University of the Third Age. Prototyping activity took us 'in the field' with low-fidelity means of situating concepts in everyday scenarios of use. As a sort of experiential sketching, we used hands-on prototyping and role-playing to try out and quickly iterate various interactions immersed within a wider context of user experience.

The methods we used for prototyping ideas engaged users in sharing, designing, and making choices with us. Video scenarios opened up an imaginative space for generating concepts, using improvisation to design sequences of interaction embedded in public and social situations. Interaction props enabled users to try out, take apart, and reconfigure schemes for organizing information. We tested and continued to refine the look and feel of the interface as working mock-ups. With users, we evolved an innovative, feasible, and appropriate experience for interacting with noticeboard content.

Through a participatory approach to design prototyping, our interaction design solution went beyond designing for communication needs at the University of the Third Age. We explored and designed an experience of interacting with information which enhances the social possibilities and cultural life of the University as well.

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Mixers was completed in June, 2000, during our postgraduate studies in Computer Related Design at the Royal College of Art, London. Video clips of the process and design can be viewed at www.viktoria.se/~ramia/mixers.html.

