KEEPING VIEWERS IN THE PICTURE: REAL-WORLD USABILITY PROCEDURES IN THE DEVELOPMENT OF A TELEVISION CONTROL INTERFACE

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ABSTRACT

This paper describes practical techniques used to ensure user oriented design of a TV control interface. Key issues were the early involvement of usability specialists, the use of different techniques throughout the design process to ensure the whole project team had direct contact with users, and ensuring usability principles were communicated effectively. The paper emphasises the importance of usability procedures in the design of consumer products, and of taking usability 'out of the lab' to the environments in which products will be used.

USABLE CONSUMER PRODUCTS

Most usability studies are aimed at improving life in the work environment, particularly at products for information workers. The same level of effort (or, arguably, more, given the wide range of users involved) is required to develop consumer products for domestic and leisure use.

In developing a TV interface for Nokia Consumer Electronics, IDEO were designing for a range of television viewers, with different levels of affinity for technology. The interface was to be appropriate for TV services and viewing cultures in different European countries. The number of channels now available by cable and satellite make navigation and selection difficult (channel hopping and information 'grazing' become impractical). So our goal was to devise a graphical TV interface to help viewers set up and find channels or information, without recourse to instruction manuals.

This paper describes the practical techniques we used to ensure that product development was bound to the real needs of TV viewers. The project time scale was tight (development cycles in consumer products are typically condensed) and dedicated human factors resources were limited. So we needed to establish the right level of involvement with potential users to steer product development; and to extend understanding of users' needs to the whole project team.

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LEADING WITH USABILITY

A recurrent complaint of usability practitioners is that their involvement in product development comes after all other parties have established their interests, too late to make significant improvements [1, 5]. In this project, Nokia project management initiated usability-led development by ensuring that the IDEO human factors and interaction design team joined forces with their own design, engineering and marketing team early in the product development cycle. Initially Nokia helped IDEO understand their internal development of TV control systems. Thereafter members of the Nokia team joined IDEO in user research, and participated in workshops where feedback from the research was presented.

MULTIPLE USABILITY METHODS

IDEO's interaction design work comprises four stages:
- *understand* (client briefing and background research)
- *observe* (study people using existing or related products in environments where new products might be used)
- *visualise* (design and model or prototype new products)
- *evaluate* (test visualised products with potential users).

The process combines techniques drawn both from the field study and the psychology lab – no question of 'either/or' an ethnographic or experimental approach [4]. The process's strength is the different opportunities it gives for understanding how people use products. Although the process is listed sequentially (see a similar sequence in Mander, Salamon and Wong [3]), a smooth progression is often difficult in real-world project management (indeed, it may even be a strength that, for example, fresh insights from observations are still coming in as visualisation begins). The process certainly should not be sequential during visualisation and evaluation, where a series of iterations is essential.

At the start of the observation phase Nokia and IDEO identified European countries with differing TV services (France, Germany, England, Sweden) and types of household where TV use was likely to differ (families, young non-family, retired/elderly households). We observed 6 to 8 households across the different types in each country. Additionally we observed TV retailers in order to understand their needs when TV controls are first demonstrated – many more kinds of 'user' interact with products than just 'end users' [2].

Later we returned to test prototypes with some of our original observees. Although returning to test the same group of users does not yield the same level of user involvement as participatory design, repeated engagement with the product means that users develop an understanding that can enrich the feedback they give. At the same time, of course, we also tested new subjects to get relatively naive feedback too.

Visualisation and testing went through several iterations. We started with some general experimentation with remote pointers, designed to target and select screen options at typical TV viewing distances (we subsequently rejected this input technique). We then developed four different cursor control options which we tested with paper prototypes. Finally a full working prototype of the most successful option was developed and tested with touch-screen implementation.

DISTRIBUTING USABILITY PROCEDURES

Both observations and testing were carried out by joint teams of human factors and interaction design specialists, together with participants from the Nokia project team. We covered different locations in a short space of time by having a core team work together initially to establish a common approach. They then separated to work with other team members in order to draw the whole project team into contact with users.

Distributing usability procedures among the team may have potential weaknesses. But its great strength is the opportunity it brings for real-world contact with users, who both challenge and reinforce design decisions. Getting interaction designers, without human sciences training, involved in usability procedures requires careful implementation (setting up and testing the procedures; impressing the importance of consistent procedures on the whole project team). But in our view, the involvement (even with its risks) is far preferable to compartmentalised usability research, which may not succeed in influencing design. One of our designers will always carry with him the subject who left the room half-way through an early testing session, saying that she just wanted to watch TV, and hadn't time for 'all this nonsense'. It was a salutary reminder (for the whole project team) of the real goals of TV viewers. And the reminder was all the more powerful for being delivered directly to the designer, rather than being relayed in a report from 'the usability specialist'.

COMMUNICATING USABILITY PRINCIPLES

Despite the involvement of the wider project team in usability research, we still needed to record our findings in a manner that ensured we continued to keep the TV viewer 'in the picture'. Vivid and concise records were essential, since product design culture does not have a strong tradition of reference and cross reference to research findings.

We presented each observation as a captioned photographic record, with individual 'needs and opportunities' drawn out for quick reference. Observations were then used as a foundation for developing user scenarios. The scenarios were distillations of material from several different observations, or parts of observations, into stories about three different TV viewers (two scenarios were based in imagined viewers' homes, and one in a store, as the scenario characters went to buy a new TV). The scenarios were story-boarded in detail in order to highlight in a memorable way, not only people's interactions with their TV, but also the social and technical background to the interactions. The scenarios were then used to guide the process of designing, and the development of the initial, prototype interfaces.

During visualisation and evaluation, reports of testing were brief, and emphasised key issues arising from user feedback that would drive the next iteration of visualisation.

BRINGING USABILITY 'OUT OF THE LAB'

The methods summarised here took human factors specialists and interaction designers out of the lab (real or metaphorical), into the environments where people would use the final product. Although informal, the methods are systematic and structured, which is essential if involvement in, and responsibility for, usability is to be spread throughout the project team. We believe that the methods made the best possible use of the available human factors resources, and that the benefits of distributed usability practice will be evident in the resulting TV control interface, to be launched during 1994.

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