

The New Usability

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This paper introduces the motivation for and concept of the ‘New Usability’ and positions it against existing approaches to usability. It is argued that the contexts of emerging products and systems means that traditional approaches to usability engineering and evaluation are likely to prove inappropriate to the needs of ‘digital consumers’. The paper briefly reviews the contributions to this special issue in terms of their relation to the idea of the ‘New Usability’ and their individual approaches to dealing with contemporary usability issues. This helps provide a background to the ‘New Usability’ research agenda, and the paper ends by posing what are argued to be the central challenges facing the area and those which lie at the heart of the proposed research agenda.

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“As new technologies penetrate our lives at an increasing rate, we no longer know what functionality to expect from our refrigerator, our television, our car, our heating control system, and so forth. There is a trend towards product integration and we see an increased complexity of especially domestic technology. Thus, our expectations become challenged in the meeting with new products and they are formed and modified as we gain experiences with using the new technology. This exploration does not stop after the first hours or day of use. Our use continuously develops over time, new possibilities emerge and others fade away. Unfortunately, present usability engineering methodologies provide little support in understanding how use develops right from the first meeting with the whole product till we later discover small facets of the technology and more importantly how this development in use may be supported by the design of the technology. “

So starts the paper in this issue by Peterson, Masden, and Kjær in this issue of TOCHI, “The New Usability”.

What they highlight is exactly the theme we intended to pursue in this special issue of TOCHI – how far current conceptions of usability, and its methods, theories and tools, have managed to keep pace with changing technologies.

For these authors, the answer lies in activity theory, which emphasizes that the context of use is incredibly important to understanding technology. In the case of this research, the object of study is a domestic appliance – a Bang & Olufsen integrated television and video recorder, but of course approaches such as this can be extended to many kinds of technology. However, we think it particularly appropriate that this kind of artefact is the focus of the study, since it illustrates all too well the problem that traditional usability faces, and that the ‘new usability’ needs to face. This is that the objects of study for usability – and so the challenges for design – have changed dramatically in the last few years, and are set to change perhaps even more radically in the next few years.

For example, the appliance computing paradigm, (Kohtake *et al.* 2001, Sharpe 2002) presents immense challenges for traditional usability. What appliances represent is the way in which computers are finding their way back towards being things that fit our physical natures, and this means designing information products around *human* inputs and



outputs rather than computer ones. So, all the devices such as cameras, printers, speakers or microphones that were formerly considered peripheral must become central in the design process. For an approach such as usability engineering – which matured and gained its character against a background of office-based personal computer applications – this presents considerable challenges in the creation of effective devices. Usability is now a central issue in the design of a vast range of technologies, particularly handheld and mobile personal systems used away from the organisation, and in new application scenarios, particularly internet-based e-commerce applications accessed from the home and the community.

Established usability engineering methodologies, and particularly usability testing, are ill-suited to the emerging technologies and applications, and to the business contexts in which they will be developed and applied to the market. Our experience suggests that businesses are struggling with unwieldy and complex usability techniques in environments where the usability engineering issues are increasingly demanding and complex, since emerging systems and applications have a broader user base, a wider range of uses, and more demanding user expectations. The place of 'the user' is increasingly being taken by 'the digital consumer', and the existing usability paradigm is unable to handle such a complex and multifaceted definition, as highlighted in Palen and Salzman's contribution to this issue. Dramatically shortened product timescales, immense growth centred around the explosion of digital media content, a move toward mass consumer markets, and the global digital trading of knowledge-based products and services, has created a reorganisation in the value network for Information Technology and Communication industries, with the result that communications and computing products will be selected for their ability to deal with the latest content in a highly usable fashion.

And, one of the traditional approaches to ensuring usability – the idea of laboratory-based usability testing – is, of course, largely meaningless in this context. The environment has changed dramatically in the five years since Jacob Nielsen reviewed the state of the art in usability laboratories in a special issue of the UK journal *Behaviour and Information Technology* (Nielsen 1994). Usability is now accepted as a fundamental activity, many organisations have well-established usability functions, and usability has been 'productised' to assist companies in making a differentiated customer offering in a fiercely competitive technology marketplace. In an environment where information technologies are treated as commodities, usability is now a key factor in a product's success, and consumer expectations are that products will have usability engineered-in. Initiatives in the UK such as the United Kingdom's highly visible DTI *Usability Now!* in the late 1980's, and projects funded under the United Kingdom's EPSRC Human Factors (now the *Interactivity and People*) programme, have served to contribute to this maturity.

The expectation is that new generations of products such as emerging appliances will benefit from the understandings developed in the usability community, and that the well-established approaches, such as usability testing, will be of immediate relevance. But this is not the case. How is it possible to 'test' an appliance which is based around design requirements such as 'ambience' or 'attention'? Most usability testing, and experience in interaction design, has been developed in the context of a person facing a computer, where you have the luxury of the person's full attention, in a comfortable environment, with distractions at a manageable level. Information appliances on the other hand need to work in low-attention situations, or where the user's attention needs to be fleetingly channeled through the appliance – while walking, talking, or any of the multitude of other day-to-day activities that would be routinely classed as



‘distractions’. Rather than being edited out of the context in the usability lab, these features are at the centre of understanding and designing these technologies. This theme is pursued in the paper in this issue by Hallnäs and Redström, which takes a phenomenological approach, providing existential descriptions of presence instead of functional descriptions of use.

Or for example, consider emerging Digital Interactive TV (DiTV) applications, which present use scenarios quite unlike any that usability engineering has faced before. One approach, ‘enhanced TV’, is attempting to look at ways of providing interactivity through and contained within the broadcast stream of a domestic TV appliance. So-called ‘walled garden’ interactivity – where limited access to managed internet context is provided – is simple, but it is now recognized that full ‘enhanced TV’ interactivity is a key uptake driver for new products and services in this space (Lowe 2001). Even the simple issues, such as how could users best manage a variety of interaction devices (remote handset, wirefree keyboard, special-purpose controller) are largely outside the scope of traditional usability approaches. Add to that the essentially domestic nature of the application, the diversity of expertise and expectation in the user population, and the month-on-month changes in the underlying technologies and the problem looks all the more difficult – as discussed by Bødker and Burr in their paper in this issue – especially since understanding ‘use’ in this setting involves the emergence of use.

Without such an understanding, what currently happens is that designers turn to existing human factors guidelines and methods which will prove inapplicable to such radically different technology and user models; they may also look to emerging knowledge of internet services design which, whilst sharing some of the same characteristics, is of an essentially different character to, for example, DiTV. The likelihood is, however, that designers will develop a mix of ad hoc, in-house standards for design, many of which are incompatible, lack coherence, and are founded on human factors and cognitive science knowledge which has been generated on the basis of a now-outdated economic, social and technological environment.

This helps frame what we see as the ‘new usability’ challenge and defines our initial vision of the ‘new usability’ which motivated this special issue. We need to consider and respond to the discontinuity between emerging technologies and applications and the current usability engineering and testing paradigm. We suggest that this will be the defining issue for usability engineering in the next few years, with questions such as the following at the heart of the ‘new usability’ research agenda:

- what is now the role of usability testing and its relationship to usability inspection and usability enquiry, in formulating usability engineering methodologies and tools which can be successfully applied to emerging technologies and applications?
- what new usability engineering and testing methodologies are required allow the creation of highly-usable technologies and applications for future information appliances and environments?

If we are to research answers to this type of question, there is a need for the research community to embrace different perspectives and challenge approaches which have served us well in more traditional contexts. The papers gathered together in this special issue of ACM TOCHI represent the first focused attempt to do this and report research in this area coherently. As such, we see it as a landmark collection of research contributions, and hope that it will act as a catalyst for more research in this area in the same way that Nielsen’s (1994) collection in Behaviour and Information Technology did for the first wave of focused usability research. If it does, the future for the ‘new usability’ should be



bright and we can expect to see an increasing range of tools, techniques and methods to help us face the challenges brought by on-going developments in digital technologies with the 'digital consumer' firmly at the heart of product and system design.

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