Is Prior Experience the same as Intuition in the context of Inclusive Design?

Patrick Langdon
Engineering Design Centre
Department of Engineering
University of Cambridge
+44 1223 76961
pml24@eng.cam.ac.uk

Jörn Hurtienne
EDC Visiting Researcher
Chair of Human-Machine Systems
TU Berlin
+44 1223 76961
hurtienne@acm.org

ABSTRACT
Prior experience and intuitive use have been discussed as tools for inclusive design. Indeed, recent theory intermingles both when defining intuitive use as the subconscious application of prior knowledge. But are there levels of prior knowledge that are more intuitive than others? What is the role of general sensorimotor knowledge versus specific tool knowledge in inclusive design? The workshop brings together different theoretical approaches and empirical findings that enhance the understanding of prior experience and intuitive use in inclusive design.

Categories and Subject Descriptors
H5.2 [**User Interfaces**]: User Centered Design.

General Terms
Human Factors, Experimentation, Theory.

Keywords
Inclusive Design, Universal Design, Prior Experience, Interaction Design.

1. INTRODUCTION

Recently, intuitive interaction has been characterised as the subconscious use of prior knowledge (Blackler, 2006; Hurtienne & Blessing, 2007). Consequently, intuitive use becomes an issue of mental demand and experiential familiarity with products' function, appearance and behaviour. Research into the effect of Prior experience on the use of everyday products of daily living (Langdon et al 2007, 2008) has found little evidence for the use of conscious reasoning or knowledge-based exploration during such interactions but significant effects of age, cognitive capability and ageing. This workshop explores; through both empirical and theoretical discussion, the differences between general and specific experience, and generationally linked experience and knowledge, in their effects on mental demand and interaction performance.

2. INCLUSIVE DESIGN

In the context of demographic changes leading to a greater number of older people, inclusive design research strives to relate the capabilities of the population to the design of products by effectively characterising the user. By 2020, almost half the adult population in the UK will be over 50, with the over 80's being the most rapidly growing sector. Recent research into inclusive design has investigated the relationship between capabilities of the population at large, derived from statistical data sets and properties of the design of features of products. The philosophy underlying inclusive design specifically extends the definition of product users to include people who are excluded by new developments in technology, particularly the elderly and disabled, and also emphasises the role and value of extreme users in innovation and new product and service development. It also prioritises the context of use; physical, social and psychological, and the understanding of the complexity of interactions between products, services and interfaces in specific scenarios, such as those of independent living (Persad, Langdon, Clarkson, 2007).

3. PRIOR EXPERIENCE

Many products today are laden with a host of features which for the majority of users remain unused and often obscure the use of the simple features of use for which the product was devised (Norman, 2002; Keates and Clarkson, 2004). The motivation for this may lie in providing the functionality required separately for a number of disparate sub-groups that are not together consistent with a single, non-modular or simple interface (Norman, 2002, Thimbleby, 2007) or may lie in commercial motivation to maximise the functionality in a product that is costly to produce.
Since the target cognitive capabilities anticipated by the designers are often similar to their own demographic and largely not affected by age-related cognitive impairment, the cognitive demand made by such products are frequently high (Blackler et al, 2003; Lewis and Clarkson, 2005; Langdon et al, 2007). In addition, the age and technology generation of a product user will colour their expectations of the product interface and the range of skills they have available to deploy (Freudenthal, 1998; Docampo-Rama, 2001). New products are often an evolution of a previous design or make strong reference to products that have gone before them. Interaction design and usability has focussed on instantaneous interaction but the effects of prior experience are also evidently important (Blackler, 2005; Norman, 2002; Monk, 2002).
Extant theories debate the effects of hypothetical mental models or knowledge structures and their content but less emphasis has

been given to the nature of the effects of the various learnt contributors to "unconscious" prior experience and their interaction with capability in interaction and ageing. Approaches such as engineering psychology have been forced to address the effect of experience using constructs such as training transfer, intuitive performance, cognitive error and situation awareness in order to develop predictive models for interaction performance in time limited and information rich domains, such as vehicle control, air traffic control and plant or operation management. These approaches form a useful theoretical framework for investigating the role of prior experience on product use (Freudenthal, 1998) and for investigating cognitive capability and inclusive product use (Freudenthal, 1999).

4. SENSORIMOTOR KNOWLEDGE

Prior knowledge is a critical factor of how easy the interaction with a new product is to learn (Freudenthal, 1998). If users can match their knowledge to what is presented at the user interface, the user interface will be easy to understand and be intuitive to use. To better understand the different sources prior knowledge can stem from, a continuum of knowledge sources has been proposed, shown in Figure 1 (Hurtienne & Blessing, 2007).

The first and lowest level of the continuum consists of innate knowledge that is 'acquired' through the activation of genes or during the prenatal stage of development. Generally, this is what reflexes or instinctive behaviour draw upon.

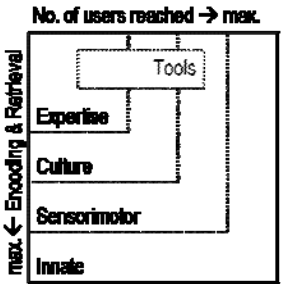

Fig. 1. Continuum of knowledge sources

The sensorimotor level consists of general knowledge, which is acquired very early in childhood and is from then on used continuously through interaction with the world. Children learn for example to differentiate faces; they learn about gravitation; they build up concepts of speed and animation. Scientific notions like affordances, gestalt laws, and image schemas reside at this level of knowledge. Further knowledge stems from cultural experience, specialized areas of expertise, and the knowledge of tools. The hypothesis, put forward by (Hurtienne & Blessing, 2007), is that knowledge from the lower level of the continuum is more likely to be used subconsciously than knowledge from the higher levels of the continuum. Hence, user interfaces that tap on sensorimotor knowledge are more intuitive to use.

5. INTUITIVE USE / PRIOR KNOWLEDGE

This workshop explores; through both empirical and theoretical discussion, the differences between general and specific experience, and generationally linked experience and knowledge, in their effects on mental demand and interaction performance. In particular, it examines the interplay between the concepts of Intuition, prior knowledge and sensorimotor schemas as explanations for experimental findings that suggest that the older and cognitively impaired resort to strategies of trial-and error when interaction with a product interface for which they have no previous experience and no appropriate skill-based or rule-based knowledge that they can apply.

6. PROGRAMME

After a lead introduction and presentation by each of the coordinators to set the scene we will have 25 minute presentations from around 5-7 solicited participants. We will then facilitate a plenary discussion, also involving attendees from HCI2009, of the issues raised in the presentations, particularly focusing on resolving the difficulties between Prior experience and intuition on inclusive interaction. Finally, we will summarise workshop findings and draw conclusions preliminary to invitations to contribute to an edited special edition.

7. ACKNOWLEDGMENTS

Work carried out under UK EPSRC funded Inclusive Design 3 project and EU FP7 INCLUDIS.

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