Concept of Intuitive Interaction

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Abstract: Intuition is a type of cognitive processing that is often non-conscious and utilises stored experiential knowledge. Intuitive interaction involves the use of knowledge gained from other products and/or experiences. We have developed novel approaches and techniques for studying intuitive use of interfaces, and shown that intuitive interaction is based on past experience with similar artefacts. Based on our empirical work we have developed principles and tools for designers to assist them in making interfaces more intuitive. These principles are discussed in this paper.

1 Theoretical foundation

Our theoretical approach to the concept of intuitive interaction is grounded in literature and several years of careful empirical research All those who have seriously researched intuition have agreed that it is based on experience [Ag86; Bs03; BRBP90; DDA86; Fs87; KC02; Kl98; Lg97; NS84]. Tools, artefacts and other life experiences all contribute to the store of information on which intuition can draw. Intuition is generally non-conscious and so is not verbalisable or recallable, and can influence people's actions without their conscious knowledge [Ag86; Bs03; BRBP90; DDA86; Fs87; KC02; Lg97; NS84]. Because it is efficient, intuition is also generally faster than conscious forms of cognitive processing [Bs03; Sl83] and researchers agree that it is often correct but not infallible [Bs03]. From this understanding, we formulated a definition of intuition:

> Intuition is a type of cognitive processing that utilises knowledge gained through prior experience. It is a process that is often fast and is non-conscious, or at least not recallable or verbalisable [Bl08; BPM02].

Based on our definition of intuition and the very limited literature on intuitive interaction at the time, our definition of intuitive interaction was:

> Intuitive use of products involves utilising knowledge gained through other experience(s). Therefore, products that people use intuitively are those with features they have encountered before. Intuitive interaction is

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fast and generally non-conscious, so people may be unable to explain how they made decisions during intuitive interaction [Bl08; BPM02; BPM03a; BPM03b; BPM04a; BPM04b; BPM05; BPM07].

No authors had previously established how people can use things intuitively, and exactly how designers can apply familiar things to an interface in order to make it intuitive. We empirically established how intuitive interaction and familiarity are related and how the different aspects of an interface design can affect intuitive interaction [Bl08; BPM02; BPM03a; BPM03b; BPM04b; BPM05; BPM07; BPM09]. The main findings from our research were: familiarity with similar features allowed people to use features more quickly and intuitively than those with a lower level of familiarity with relevant features; the appearance of a feature had more effect than its location on how intuitively it was used; and aspects of ageing also have an effect on how quickly and how intuitively participants complete tasks [Bl08].

2 Principles for designing for intuitive use

Based on our research, we have developed three principles for designing for intuitive use. We have also developed and tested a tool for designing for intuitive use, which is currently undergoing further development. The tool is based on our continuum of intuitive interaction (Figure 1). How these ideas relate to others within the intuitive interaction community is discussed by Blackler and Hurtienne [BH07].

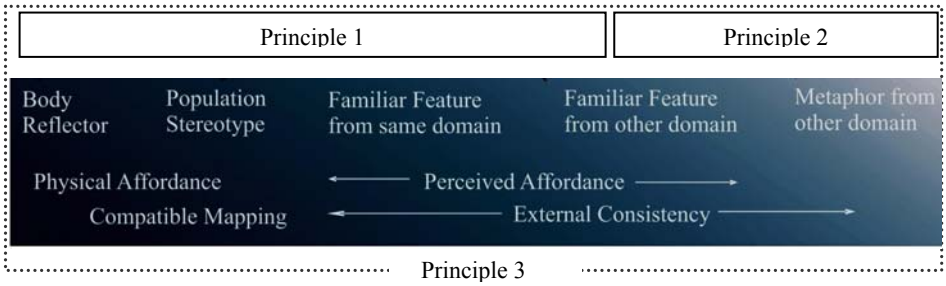

Figure 1: Intuitive interaction continuum

Figure 1 illustrates the intuitive interaction continuum as it relates to the three principles for intuitive interaction and other theories of interaction design [Bl08]. They are the following:

Principle 1: use familiar features from the same domain. Make function, appearance and location familiar for features that are already known. Use familiar symbols and/or words; put them in a familiar or expected position and make the function comparable with similar functions users have seen before.

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Principle 2: transfer familiar things from other domains. Make it obvious what less well-known functions will do by using familiar things to demonstrate their function. Use familiar function, appearance and location. This principle requires transfer of features from differing domains (either different types of technologies or things from the physical world transferred to the virtual world).

Principle 3: redundancy and internal consistency. Redundancy is essential in ensuring that as many users as possible can use an interface intuitively. This involves providing different ways of doing things so that both novices and experts, and older and younger users, can use the same interface easily and efficiently. Increasing internal consistency means that function, appearance and location of features are consistent between different parts of the design and on every page, screen, part and/or mode.

The following are examples of interface features which are intuitive to use, based on the categories in our continuum:

- Body reflector - a handle that is obviously and easily graspable.
- Population stereotype - Clockwise to increase dials and indicators, well known colour codes.
- Familiar features from same domain - a standard play icon used in a music or media player.
- Familiar feature from other domain - adapted play icon transferred to digital camera domain.
- Metaphor - Software icons such as bin, folder, file.

Interfaces which are not intuitive are:

- Those which ignore standard conventions. For example, power switches have a population stereotype of down for on in Australia and in the UK, and up for on in the US. A product which is not properly localised and contains a power switch which goes the wrong way is likely to cause some confusion.
- Those which use obscure or new features or icons which are not familiar to the target audience. This is more likely to happen with newer technologies, and also sometimes occurs when companies are keen to establish their own “language” for an interface. In these cases employing redundancy and labelling the features with words as well as the unfamiliar icons could help address usability issues.

3 Current work

Our current work is focusing on investigating links between ageing and intuitive interaction. This will lead towards the design and development of a practical tool to guide designers to apply intuitive interaction principles to design. The knowledge that we have developed is significant as it has provided a good foundation for researchers in this area and can be transferred to other domains.

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