Issues for Human-Computer Interaction in Developing Countries

Andy Smith, Lynne Dunckley,
Institute for IT, Institute for IT,
Thames Valley University, UK Thames Valley University, UK
andy.smith@tvu.ac.uk lynne.dunckley@tvu.ac.uk

ABSTRACT
This paper summarizes some issues that have arisen and need to be addressed for the successful adoption of the principles and practices of human-computer interaction (HCI) in the developing world. It highlights three prerequisites that the HCI community needs to address urgently and provides illustrations from previous experiences in developing countries.

Author Keywords
HCI education, cross-cultural models, institutionalisation

ACM Classification Keywords
H5.m. Information interfaces and presentation (HCI): H1.2 Human Factors

INTRODUCTION
Many countries in the developing world seek to adopt Information and Communication Technologies (ICT) as a way to leverage industrial and economic progress. However the initial focus tends to be on the technical aspects of software engineering and electronics. This often means that human-computer interaction is not included within higher education computer programmes and/or within software engineering practice.

We suggest that there are three prerequisites for the effective use of human computer interaction (HCI) in developing countries:

a) ICT and Internet development
b) development of correct cultural models.
c) institutionalisation of HCI

In this paper we set out our views on each of these with some brief illustrations based on our experiences in India, China and Africa.

ICT and Internet development
In the context of developing countries we are facing the challenge of developing new products and services not merely providing process improvement, as is currently the case for most HCI activities in Western societies. In the West we expect users to be familiar with ICT, the Internet and mobile technologies. This is not so in the developing world where users may know about the Internet, particularly from Western films but have no actual experience of it. This means we may need to develop new participative methods and strategies. Techniques such as PICTIVE and story boards rely on users having a concept of what a user interface would be like and works well for process improvement activities. Prototyping too unconsciously relies on users’ tacit knowledge of both technology and the way tasks can be accomplished with technology.

Obviously the situation in the developing world provides novel opportunities as well as threats. On the one hand we would not want developing countries to have to repeat the ICT mistakes and learning curves that have been gone through in the West. In any case as technology has moved on we find, for example, developing countries rapidly adopting mobile technologies ahead of fixed landlines and cables. In the same way the adoption of alternative energy solutions such as solar power and wind farms are economic alternatives to putting in power lines where none exist but this then significantly affects usage patterns - batch processing may be more appropriate than online provision, speech preferable to text interfaces.

Correct cultural models
In the last ten years HCI practitioners have changed their approach significantly to embrace cross-cultural development often based on some consideration of cultural cognitive models. Cultural models are based on the assumption that cultural differences are the result of social learning and are of very long duration. These cultural models serve as a point of departure as described by for example Hofst (1996) Edward Hall (1989), Trompenaars (1993), Victor (1992) and Hofstede (1991). Semiotics research in HCI (Bourges-Waldegg and Scrivener, 1998) has been used to understand how cultural backgrounds influence people’s interpretation of user interface elements. The model of national culture proposed by Hofstede’s
(1991) has been frequently involved in the intercultural study of the use of such systems (Smith, and Dunkley, 1998). However Hofstede’s model being based on a study of IBM employees in the 1970s there are significant gaps for the developing world.

We give two examples where cultural differences may impinge on effective HCI:

a) **Cultural asymmetry.** In Western societies the right side is given preference over the left. This dates back to at least the Graeco-Roman period. The Latin for left being *sinistra*, suggesting something shady and undesirable while the Nicean Creed describes Christ as being at the right hand of God. In China the left side is more honoured than the right so the Emperor’s most trusted advisor would be situated at his left hand. This difference has potential significance for the position of items on a user interface and within graphical displays as well as human to human interactions and work design.

b) **Age concepts.** In many societies, particularly Western ones, youth is valued and emphasised. Age is regarded as a stage of life with few advantages and the desirability of youthful interests and attributes is often emphasised in interface design and interaction. In Africa older people are respected and the young defer to the wisdom of the old. This affects the way people greet each other and the way knowledge and power is distributed in the society.

We need therefore both to improve the spread and accuracy of cultural models, and to improve the understanding of the extent to which cultural models are relevant to HCI. In addition we need to develop resource banks of local knowledge so that developers can avoid misunderstandings.

**Institutionalisation of HCI**

By the institutionalisation of HCI we mean developing institutional structures for the ownership and indigenous development of our discipline. These needs to exist both in academia (so that effective teaching and research can be supported) and industry (so that software engineers can understand and implement the principles and practices of HCI).

Through European Union funded projects the authors have attempted to assist in the institutionalisation of HCI in both India and China. The Indo European Systems Usability partnership (IESUP) enabled collaboration between the British HCI Group and the Computer Society of India (Smith, Gulliksen and Bannon, 2005). In China the Sino European Systems Usability Network (www.sesun-usability.org) is currently establishing active collaboration with the CSIP (Chinese Ministry of Information Industry - Software and Integrated Circuit Promotion Centre). In both India and China the number of usability professionals is growing significantly. Through a wide range of engagements with usability practitioners it is clear that there is a considerable appetite to learn about Western HCI case studies in the expectation that these can be implemented locally. However there are two problems to overcome:

a) Firstly a holistic understanding of HCI is necessary in order for the most effective tools or techniques to be successfully selected and implemented – this implies a much broader ‘education in HCI’ rather than just ‘training in tools’.

b) Secondly cultural and organisational differences between countries means that HCI tools and techniques that have been developed in Western countries may not be the most effective in developing countries. What is required is the localisation of methods to meet local requirements.

It is for these reasons that we believe it is critical for developing countries to take local ownership of the discipline. However helpful international groups such as CHI chapters can be, we believe that national organisations are critical to ensure effective HCI development in promoting the localisation of methods, supporting the growth of HCI teaching (and research) in universities and disseminating best practice within industry (most notably in organisations where HCI and usability have yet to take root).

In this paper we have briefly set out our vision of the approaches that need to be urgently addressed so that activities are prioritized strategically and so that resources are deployed effectively.

**REFERENCES**


