

Designing ICT based solutions for the developing world.

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ICT4Dev projects and initiatives have progressed a great deal in the last few years. In particular mobile and wireless technologies have been at the forefront of this progression due to their ability to cope with and adapt to environments with poor fixed-line infrastructure. As with many emerging fields the technology matures and develops around a initial set of usage scenarios. If we consider a wireless technology such as WiFi or GSM, we can immediately list some of the more '*common*' uses for each. For example, surfing the Internet at a WiFi hotspot or the use of mobile voice and text messaging would be the first to come to mind.

It is widely understood that candidate ICTs must first be re-evaluated for their appropriateness before deploying them in a developing world context. The above mentioned wireless technologies, WiFi and GSM, have been re-evaluated and re-applied in numerous ICT4Dev projects. Examples include the MuTI and Cell-life projects [2,4].

During 2005 and 2006 my research focused on the MuTI [1,2] project, a collaborative ICT4Dev initiative between the University of Cape Town and the University of the Western Cape. In 2003 the MuTI project aimed to re-evaluate VoIP (voice over IP) technology for its potential deployment in under-serviced, rural areas. VoIP technology was, at that time, subject to strict South African government legislation and regulation. Chetty, Tucker and Blake[2] succeeded in deploying a simple VoIP enabled prototype in the rural areas of the Eastern Cape Province of South Africa. Their results supported the argument that VoIP and WiFi technologies can play an important role in enabling communication in under-serviced areas of South Africa and that the legislation relating to these technologies was limiting their use.

As 2004 drew to a close the MuTI project [1,2] was forced to re-locate its wireless test bed to a new site elsewhere in the Eastern Cape. It was at this point that I joined the field team as the resident 'HCI' researcher. March 2005 saw the start of an intensive ethnographical study that examined possible ways of using ICTs to enhance the collaboration between the central hospital doctors and nurses working at isolated clinics. Existing user centred techniques, such as contextual design, workshops and user interviews, were utilised in an attempt to understand the dynamics of the hospital-clinic relationship. The resulting communication and workflow models proved vital in developing a detailed understanding of how the clinic nurses and hospital doctors communicated and collaborated at that time.

The next step was to incorporate the findings into a detailed 'system requirements' and design specification. This proved to be a difficult task due to the diverse and complex nature of the contributing factors and forces - these included technical, social,

environmental, and even legislative issues. bridges.org provide the ‘*Real Access*’ criteria [3] as one example of a general framework that can provide a useful set of guidelines for addressing some of these issues.

At present the focus of my research is to define an iterative, user-centred development model that incorporates existing ICT4Dev and user-centred techniques, guidelines, and best-practices into a more structured and focussed framework. The goal of the framework is to produce a design specification for a useful and usable system that effectively meets local needs.

Possible workshop discussion ideas:

- How can we design and plan the iterations? Any given iteration will consist of 5 basic phases, namely an ethnographic, requirements and design, prototyping, testing, and training phase. The phase duration and the techniques used within each phase will vary depending on where the iteration is positioned on the project timeline.
- How to choose an appropriate ICT? The MuTI [1,2] project revealed that some user, environmental, economic, and legislative factors may conflict, thus choosing an suitable ICT may be difficult.

Further areas of interest include the concept of ‘*Progressive Participatory Design*’. Progressive implies that the nature/level of user participation matures and develops throughout the duration of the project. Progressive elements may include the relationship between the user group and the researchers, the development of the users understanding of the project and their skill set. The goal is to empower the user so that they will be able to actively voice his/her views and opinions relating to the ICTs and future project directions.

Possible workshop discussion topics:

- How can researchers engage users during the early stages of a participatory design project? Possible topics of discussion may include multi-media (informative videos in particular), arts and crafts, story-telling, etc.
- How can we effectively progress the levels of user participation in future project iterations?

References:

1. A. Maunder, W.D. Tucker and G. Marsden. Evaluating the relevance of the ‘*Real Access*’ criteria as a framework for rural HCI research. *Proc. 5th Conference on Human Computer Interaction in Southern Africa*, Cape Town, South Africa
2. M. Chetty, W.D. Tucker and E.H. Blake. Developing Locally Relevant Applications for Rural Areas: A South African Example. *Proc. Annual research conference of the*

- South African Institute of Computer Scientists and Information Technologists, (SAICSIT 2004), Cape Town, South Africa, pp. 234-239.*
3. bridges.org, “Spanning the Digital Divide – Understanding and tackling issues”, (2003), Available: <http://www.bridges.org>.
 4. S. Anand and U. Rivett, ICT in the management of HIV treatment: Cell-Life a South African solution. *Convergence* (2005), 6(3), pp. 56-59.